APPENDIX 4F

MMSD WWTP UNIT PROCESS ANALYSIS AND REGULATION REVIEW

General notes that apply to Tables 4F-2 through 4F-23 unless otherwise noted on specific unit process table are listed below.
Note 0 relates to the title of each unit process. Notes 1-7 refer to reference numbers listed in the column headings of each of the tables.

0) Unit Process Numbers Assigned are based on	MMSD, *Jones Island I&C Upgrade* , Contract J06014D01, Attachment 1, Addendum No. 2 Not all unit process numbers were assigned according to this source. The numbers not assigned are No. 14, 16, 17, 19, 21, and 22. Also, the ISS Pump Station was assigned its pump number, PS0801, since technically it is not a JIWWTP unit process.
1) Facility and Design Information/Capacity Documentation:	MMSD, *Jones Island Operations and Maintenance Manual : Plant Summary and Administration* (1 July 1993).
2) 2003 Performance Data Taken From:	2003 JIWWTP UWS Daily/Weekly Operating Report
3) Unit Process Structural/Equipment Age Information:	DRAFT Asset Management System data provided by MMSD April 2004. DRAFT, FOR REVIEW PURPOSES ONLY MMSD Contract Compliance Office, *Annual Summary of United Water Service Performance* (1999-2004).
4) Current NR 110/204 Regulations:	Department of Natural Resources, *Wisconsin Administrative Code* , Volume 11, Chapter NR 110 (Revisor of Statutes Bureau, May 2001). Department of Natural Resources, *Wisconsin Administrative Code* , Volume 11, Chapter NR 204 (Revisor of Statutes Bureau, November 1996). Current NR 110 regulations were updated after the WWTP unit processes were constructed. Applicable NR 110 regulations were most recently updated May 2001. NR 110 aplies to new or modified sewerage systems. Nr 110.04 authorizes the WDNR to approve alternate requirements.
5) Advisory 10-States Standards:	Wastewater Committee of the Great Lakes – Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, *Recommended Standards for Wastewater Facilities* (Health Education Services Division, 2004). Advisory 10-States Standards were updated after the WWTP unit processes were constructed. Applicable 10-States Standards were most recently updated in 2004.
6) Committed/MMSD Recommended Projects:	Committed Projects are defined as: - Projects with construction contracts as of December 31, 2006 - Projects identified by the State of Wisconsin Circuit Court, Stipulation: State of Wisconsin, Plaintiff v. Milwaukee Metropolitan Sewerage District, Defendant, Case No. 02-CV-2701 (May 29, 2002) but not yet completed - Projects that were identified as committed by MMSD as of December 31, 2006 (Milwaukee Metropolitan Sewerage District, Technical Services Committed Projects as of June 30, 2006 (June 30, 2006)) and included in the Milwaukee Metropolitan Sewerage District 2007 Annual Budget (November 2006) MMSD Recommended Projects are defined as projects included in the MMSD 2007 Annual Budget, but not yet committed
7) Existing Issues/Information:	*Response by MMSD to Questions by Wisconsin Department of Natural Resources (* January 2001). UWS, *United Water Service Requested Projects* (2001-2004). UWS, *Monthly Report for Milwaukee Metropolitan Sewerage District* (1999-2003). MMSD, *Contract Compliance Office Monthly Report* (1998-2003).

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Acronym table that applies to Tables 4F-2 through 4F-33:

Acronym	Definition
ACFM	actual cubic foot per minute
AD	average day
ADF	airport deicing fluid
Agri	Agri-Life® biosolids
ave	average
AVG	average
BFP	belt filter press
BHP	brake horsepower
BOD	biochemical oxygen demand
BSD	blended sludge dry
BTU	British thermal unit- standard unit of energy
CaO	calcium oxide
cf	cubic foot
cf/hr	cubic foot per hour
cfm/CFM	cubic foot per minute
Ch	Chapter
Cl_2	Chlorine gas
Clarif	Clarifier
CY	cubic yard
cy/hr	cubic yard per hour
D&D	Drying & Dewatering
DAF	dissolved air flotation
det	detention
dia/DIA	diameter
Disinf	disfection
DMR	Discharge Monitoring Report
DNR	Department of Natural Resources
DSD	digested sludge dry
DWOR	daily/weekly operating report
Eff	effluent
Elec	electrical
Elev	elevation
EP	East Plant
EP RAS	East Plant return activated sludge
EP WAS	East Plant waste activated sludge
Est	estimated
fps	foot per second
ft	foot
gal	gallon
GBT	gravity belt thickener
GMIA	General Mitchel International Airport
gpd	gallon per day
gpd/sf	gallon per day per square foot
gphr	gallon per hour
gpm/GPM	gallong per minute
HL	High Level
hp	horsepower
hr	hour
hrly	hourly

Acronym	Definition
Hyd	hydraulic
I&C	instrumentation and control
ICFM	inlet cubic feet per minute
in	inch
inf	influent
IPS	interplant solids
ISHF	interplant solids handling facility
ISS	inline storage system
JIWWTP	Jones Island Wastewater Treatment Plant
JIHT	Jones Island Head Tank
KCFM	1000 cubic feet per minute
KGD	1000 gallons per day
kW	kilowatts
lb	pound
lb/cf	pound per cubic foot
lb/d	pound per day
lb/d/sf	pound per day per square foot
lbs/sf/hr	pound per square foot per hour
LCP	link control protocol (part of instrumentation control system)
Liq	liquid
LL	Low Level
Max	Maximum
MCC	motor control center
MD	maximum day
Mech	Mechanical
Mech/Elec	Mechanical/Electrical
MG	million gallons
mg/L	milogram per liter
MG/yr	million gallons per year
MGD	million gallons per day
MILO	Milorganite
min	minute
MinD	minumum day
Misc	miscellaneous
MLSS	mixed liquor suspended solids
MLVSS	mixed liquor volatile suspended solids
mm	milometer
MMBTU	million British thermal units
MMSD	Milwaukee Metropolitan Sewerage District
MSCF	million standard cubic feet
NaBi	Sodium Bisulfate
$NaHSO_3$	Sodium Bisulfate
NaOCl	Sodium Hypochlorite
NEP	New East Plant
NR	Natural Resources
O&M	operation & maintenance
oF	degrees Fahrenheit
Oper	Operation
Ops	Operation

Acronym	Definition
orig	original
PAC	process air compressor
PE	primary effluent
PH	peak hour
PL	pickle liquor
Pri	primary effluent
PSD	primary sludge dry
psi	pound per square inch
Q	flow
RAS	return activated sludge
Rehab'd	rehabilitated
Rem	removal
Req'd	required
rpm	revolutions per minute
RTU	remote terminal unit (part of instrumentation control system)
scf	standard cubic foot
Sec	secondary
sf	square foot
SLR	solids loading rate
SO_2	sulfer dioxide
SOR	surface overflow rate
SSHT	South Shore Head Tank
SSWWTP	South Shore Wastewater Treatment Plant
Sta	Station
Stor	Storage
SVI	sludge volume index
swd	side wall depth
TAS	thickened activated sludge
TDH	total dynamic head
ton/d	ton per day
tpd	ton per day
TSS	total suspended solids
TWAS	thickened waste activated sludge
UWS	United Water Service
VFD	variable-frequency drive
Vol	volume
w/	with
WAS	waste activated sludge
WDNR	Wisconsin Department of Natural Resources
WLR	weir loading rate
WP	West plant
WPDES	Wisconsin Pollutant Discharge Elimination System
WP RAS	West Plant Return Activated Sludge
WP WAS	West Plant Waste Activated Sludge
WWTP	Wastewater Treatment Plant
WxHxL	width by height by length
yr	year

Facility[1]	Design Info/ Capacity[1]	1997-June 30, 2004 Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Pump out separate and combined sewer overflow collected in the Deep Tunnel to JIWWTP and SSWWTP for treatment		Pump Options Utilized: – 1 pump to JI, 1 pump to SS – 2 pumps to JI, 1 pump to SS – 3 pumps to JI, by directing Pump #1 flow from South Shore Head Tank to Jones Island Head Tank Average Pumpout, available Event data Pump #1: 18.7 MGD Pump #2: 31.2 MGD Pump #3: 31.7 MGD Total Pumpout: 82.0 MGD Maximum Pumpout, available Event data Pump #1: 64.3 MGD Pump #2: 69.8 MGD Pump #3: 62.6 MGD Total Pumpout: 162.2 MGD Ave Maximum Pumpout (take out outliers) Pump #1: 38.2 MGD Pump #2: 47.5 MGD Pump #3: 47.0 MGD Total Pumpout: 124.5 MGD	ISS Pump Station Structure – 1987 ISHF Structure – 1987 Head Tanks – replaced in 2004 Mechanical Equipment – All in 1987 except for Head Tanks equipment – replaced in 2004 ISHF Pumps, Screens – 1990 Electrical Equipment – All in 1986-7 except for RTU Unit – replaced in 2003 "Bumpless" power transfer system – installed 2003 ISHF VFDs, switchgear – 1990, Screen pump VFD – 1997	Applicable Regulation: NR 110.14 Sewerage lift station design criteria. In compliance with all current regulations, except: Does not meet NR 110.14.3 (e) – "must be capable of pumping the design pumping rate... with one unit out of service" <u>HOWEVER:</u> Per letter from WDNR dated November 2, 1982, this regulation (NR 110.14(2)(d) at the time) does not apply to the ISS Pump Station	Applicable Advisory Standard: Ch 40: Wastewater Pumping Stations Meets all advisory standards, except: Does not meet Sec. 42.31 – " w/ any one unit out of service, the remaining units will have the capacity to handle the design peak hourly flow"	<u>Committed Projects:</u> J01003 – JIWWTP Inline Pump Station (Cone Valve Isolation) (J026) <u>MMSD Recommended Projects:</u> J01009 – Conceptual Design to Upgrade JIWWTP ISS Pump Station	• The ISS pumps and the head tanks have had excessive vibrations during various operating conditions. This has led to the replacement of the head tanks. • The liquid rheostat Flomatcher controls and wound rotor motors for the pumps are prone to unpredictable malfunction. Parts for the motor speed controls and high voltage equipment are difficult to obtain as they are no longer manufactured. • Maximum usage of the tunnel wet weather storage requires that the tunnel remain empty, which requires daily dewatering . The existing pumps are not suitable for low volume dewatering duty, since the pumps are designed to pump higher volumes. The pumping of low volumes of groundwater infiltration creates increased wear on the pumps. • There is no permanent equipment in place to isolate the cone valves located on the suction side of the pumps from the ISS. Should it become necessary to replace or repair a valve, isolation of the valves would be difficult. • Pumping to SSWWTP is limited during wet weather events. The wastewater flows from SSHT to an MIS in the system which goes to SSWWTP. When that MIS is at full capacity, pumping to the MIS stops.
2) System:							
Total Capacity (MGD)	150						
Pumpout to Jones Island (MGD)	Max Day - 100						
Pumpout to South Shore (MGD)	Max Day - 50						
Firm Capacity (MGD, 1 unit out of service)	100						
Bar Screens	Manually cleaned						
Clear Opening (inch)	4						
Solids Hopper capacity (cf)	4000						
Pumps							
Total Number	3						
Type	Horizontal, mix flow type centrifugal						
Capacity (MGD each)	50						
Total Head (ft)	380						
Motor, type	Variable Speed						
Horsepower (each)	4000						
Speed control units	Liquid rheostat (electrolytic solution), adjustable speed						
Head Tanks							
Jones Island Head Tank (JIHT)	Flow from Pump #2 or #3 Directly, #1 through SSHT						
Size	25' Dia by 28' high						
South Shore Head Tank (SSHT)	Flow from Pump #2 or #1						
Size	14' Dia by 78' high						
Backup Power							
"Bumpless" power transfer system	Change power source from WE Energies to JI turbines w/o pump shutdown						
South Shore Force Main							
Req'd Capacity from SSHT (MGD)	50						
Full Capacity at 10 fps, (MGD)	81						
Size (in)	48						
Length (ft)	16900						
Inline Solids Handling Facility (ISHF)							
Solids Storage Tank							
Capacity (MG)	5						
Screening System							
Rotary Drum Screens, number	2						
Capacity (gpm, each)	1000						
Solids Concentration (%)	0.5-1.0						
Screen Opening (inch)	0.25						
Screen Presses, number	2						
Capacity (cf/hr)	140						
Transfer Pump, number	1						
Capacity (gpm @ ft head)	2000 @ 51						
Grit Separator, number	1						
Capacity (cf/hr)	4						
Removal (% of 65-mesh)	95						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-1, JIWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

1) Facility and Design Information/ Capacity Documentation: MMSD, *Inline Storage System O & M Manual : Part 2 Unit Process Operations vol.1 Inline Pump Station* (1 March 1995).
MMSD, *Inline Storage System Operations and Maintenance Manual Part 1: System Summary* (1 September 1992).

2) Performance Data: 2003 was a dry year so not many pumping events. Reviewed all available storm event reports for existing condition period, 1997-June 30, 2004, instead. Full analysis included in Appendix 4-C, *ISS Pumpout Analysis*
Additional operation information: MMSD, *Wet Weather Standard Operating Procedures Memorandum* (20 March 2003) and John Jankowski (MMSD), interview with author, 17 March 2006, Milwaukee, WI.

7) Existing Issues/Information: James Ibach (MMSD), correspondence with William Baumann and R.L. Larson (WDNR), 26 October 1982, Milwaukee, WI.
Roger Larson (WDNR), correspondence with James Ibach (MMSD), 2 November 1982, Madison WI

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TABLE 4F-2
JIWWTP UNIT PROCESS NO. PS0801: INLINE STORAGE SYSTEM PUMP STATION
2020 TREATMENT REPORT
6/02/07 TR_4-A.T4F02.07.06.02.cdr

Facility[1]	Design Info/ Capacity[1]	1998-2003 Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Pump raw wastewater from Low Level (LL) and High Level (HL) conveyance systems into JIWWTP. LL pumps only pump LL system, HL pumps for both LL & HL systems.		LL Pumps: Ave Day – 27 MGD Max Day – 66 MGD Peak Hour – 97 MGD HL Pumps: Ave Day – 79 MGD Max Day – 198 MGD Peak Hour – 256 MGD	Structure – 1983 Mech/Elec Equip – 1985	Applicable Regulation: NR 110.14 Sewerage lift station design criteria. In compliance with all current regulations	Applicable Advisory Standard: Ch 40: Wastewater Pumping Stations Meets all advisory standards	<u>Committed Projects:</u> J01006 – JIWWTP Preliminary Treatment Facility Upgrade – Includes replacement of one and overhaul of the rest of the screw pump bearings/ gearboxes	• Pumping through screw pumps is limited by the capacity of the Harbor Siphons – see Performance column. Harbor Siphon project, scheduled to begin construction in 2006, will increase the capacity of siphons so screw pumps can reach peak design capacity. • The flow measured through the meters on HL and LL siphons plus the metered flow from the ISS pump station is used to determine influent flow. The measured influent flow was also used to report effluent flow during the existing condition time period due to metering limitations at the end of the plant. The committed Jones Island I&C Upgrade Final Design project, J06014, includes adding metering to the recycled water lines so effluent flow can accurately be measured.
2) System:							
LL Pumps							
Total Capacity (MGD)	187						
Firm Capacity (MGD, 1 unit out of service)	140						
Capacity, MGD (each)	46.7						
Total Head (ft)	24						
Type	Screw						
Total Number	4 (includes 1 redundant)						
Size (in.)	114						
Horsepower (each)	350						
Drive	Constant Speed						
HL Pumps							
Total Capacity (MGD)	413						
Firm Capacity (MGD, 1 unit out of service)	330						
Capacity, MGD (each)	82.6						
Total Head (ft)	13.1						
Type	Screw						
Total Number	5 (includes 1 redudant)						
Size (in.)	120						
Horsepower (each)	350						
Drive	Constant Speed						
LL Flow Measurement							
Type	Magnetic Meter						
Size (in.)	72						
HL Flow Measurement							
Type	Magnetic Meter						
Size (in.)	84						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-1, JIWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

2) Performance Data: All performance data was calculated from measured data. The calculations can be found in this appendix under Table 4F-24, JIWWTP Unit Process No. 1: High Level/Low Level Pumping Calculations.
Utilized 1998-8/31/03 hourly flow data rather than just 2003 to get a better sense of what the approximate flow was being pumped during the existing condition time period. 2003 was a drier year.

7) Existing Issues/Information: Discussions with UWS and MMSD staff, review of performance calculations,
Rust/Harxa, *Harbor Siphons & Downstream MIS Preliminary Engineering Report,* August 2001
John Kontor (CDM), *Technical Memorandum No. 2, Jones Island WWTP Effluent Flow Measurement* , done as a part of the Instrumentation and Control Upgrades project, MMSD Contract Nos. J06014C01/S06004C01 (7 January 2005).

Facility[1]	Design Info/ Capacity[1]	Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Remove trash, rags, leaves and other large debris from influent wastewater		330 MGD	Structure – 1983 Mech/Elec Equip – 1985	Applicable Regulation: NR 110.16 Screening Devices. In compliance with all current regulations	Applicable Advisory Standard: Ch 60: Screening, Grit Removal, and Flow Equalization, Section 61, Screening Devices Does not meet section 61.1242 – "Where two or more mechanically cleaned screens are used, the design shall provide for taking any unit out of service without sacrificing the capability to handle the design peak instantaneous flows."	<u>Committed Projects:</u> J01006 – JIWWTP Preliminary Treatment Facility Upgrade – Includes replacement of existing 5 screens with 8 screens (2 will be redundant), along with modifications to the lugger loadout area	• Larger debris which pass through the larger coarse screen openings are creating problems in downstream equipment • Some flotables also pass that are ultimately discharged into the lake - effluent nets installed (see Unit Process No. 8) • Screening conveyor equipment is old and in need of replacement • Lugger loadout area needs to be upgraded – ineffieciencies require additional operator attention, especially during high flow conditions. • During high flow loadings (typically leaf loading situations), the actual capacity declines and all five pumps are required to meet screening requirements.
2) System:							
Total Capacity (MGD)	412.5						
Firm Capacity (1 unit out of service, MGD)	330						
Screenings (cy/d)	AD - 5, MD - 25						
Units in Service	5						
Capacity, (MGD, each)	82.5						
Clear spacing between bars (in.)	3/4						
Type	Conventional						
Total Number	5 (includes 1 redudant)						
Screen Width (ft)	7						
Horsepower (hp, each)	3						
Drive	constant 2 speed						
Bar Screen Conveyors							
Total Capacity (cf/hr)	60						
Number	2						
Rated Capacity (cf/hr, each)	30						
Solids Loading (lb/cf, each)	65						
Belt Width (in.)	18						
Max Speed (fpm)	75						
Horsepower (hp, each)	5						
Drive	adjustable speed						
Lugger Loading Conveyors							
Total Capacity (cf/hr)	500						
Number	2						
Rated Capacity (cf/hr, each)	250						
Solids Loading (lb/cf, each)	65						
Belt Width (in.)	20						
Max Speed (fpm)	100						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-1, JIWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

2) Performance Data: No specific measurable data available but system has been able to process peak capacities, though sometimes with all screens in service

7) Existing Issues/Information: Michael J. Martin (MMSD), *Memorandum regarding Draft Technical Memoranda, Design of the Jones Island Wastewater Treatment Plant Preliminary Treatment Facility Upgrade Project* (10 November, 2005).

Facility[1]	Design Info/ Capacity[1]	Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Removes grit, which consists of sand, gravel, coffee grounds, eggshells and other heavy materials, in the raw sewage which could damage downstream processes		330 MGD	Structure – 1983 Orig Mech/Elec Equip – 1983 Fluidizing Pumps – 1999 Grit Pumps – 2000 6 Grit Concentrator Modifictions – 2002, 2003	Applicable Regulation: NR 110.17 Grit removal facilities In compliance with all current regulations	Applicable Advisory Standard: Ch 60: Screening, Grit Removal, and Flow Equalization, Section 63, Grit Removal Facilities Meets all advisory standards		• Grit removal system concern: grit has entered primary clarifiers during 1st flush of wet weather events, interupting mechanical equipment and shutting primary clarifiers down. • Since repairs were made in 2002, plugging has been reduced to acceptable levels. • During wet weather events, though plugging has been reduced, grit is still getting into the primary clarification process
2) System:							
Total Treatment Capacity (MGD)	330						
Firm Treatment Capacity (MGD, 1 unit out of service)	275						
Total Hydraulic Capacity (MGD)	420						
Firm Hydraulic Capacity (MGD, 1 unit out of service)	350						
Units in Service	AD - 2, MD - 5						
Grit Volume (cy/d)	12 Ave Day, 89 Max Day						
Grit Basin & Mechanisms							
Treatment Capacity (MGD, each)	55						
Hydraulic Capacity (MGD, each)	70						
Type	Vortex (Swirl) Concentrator						
Diameter, ft (each)	24						
Total Number	6						
Total Depth (ft)	8.5						
Total volume (Gal)	172577						
Volume (cf, each)	3845						
Horsepower (hp, each)	2						
Pumps							
Grit							
Total Capacity (GPM)	3000						
Capacity (GPM, each)	500						
Total Dynamic Head (ft)	45						
Type	Centrifugal						
Total Number	6						
Fluidizing							
Total Capacity (GPM)	1560						
Capacity (GPM, each)	260						
Head (psi)	30						
Type	Progressing Cavity						
Total Number	6						
Speed (rpm)	370						
Horsepower (hp, each)	10						
Grit Concentrator							
Total Capacity (GPM)	3000						
Rated Capacity (GPM, each)	500						
Max Headloss (ft)	18						
Type	Centrifugal						
Total Number	6						
Grit Dewatering Screws							
Type	Inclined Screw						
Number	3						
Grit Conveyor							
Type	Belt Conveyor						
Total Number	2						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-1, JIWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

1) Facility and Design Information/
Capacity Documentation: DRAFT Jones Island O&M Manual, Part 2, Volume 4, Grit Removal System, 2003

2) Performance Data: No specific measurable data available. Technically the system has been able to process peak capacities, though sometimes with failures of grit basins and grit overflow to the Primary Clarification process.

7) Existing Issues/Information: Dean Schmidtke (Metcalf & Eddy), *Task-Group B.2.1.6, Grit Handling, Final Technical Memorandum* , written as part of the Design of the Jones Island Wastewater Treatment Plant Preliminary Treatment Facility Upgrade Project, MMSD Contract No. J01006D01, 18 May 2004

Facility[1]	Design Info/Capacity [1]	Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Removes influent total suspended solids (TSS) and BOD by settling out primary sludge from wastewater		2003 Ave Day - SOR – 520 gpd/sf - WLR – 20,600 gpd/lf 2/9/01 Peak Hour (more realistic – 2003 flows below ave) - SOR - 2590 gpd/sf - WLR – 103,600 gpd/lf 2003 Removal on Max Day: – TSS – 39%, BOD – 9% Ave 2003 Removal: – TSS – 46%, BOD – 22%	Structure – 1984 Prim Clarifers – 1986 Pri Sludge Pumps – 1986 Pri Scum Pumps – 1986 Other Mech/Elec Equip – 1984	Applicable Regulation: NR 110.18 Settling tanks. Does not meet NR 110.18.2 (d).1 - "Operating design parameters for settling parameters may not exceed the values given in Table 3." Table 3 states that the maximum hourly surface settling rate for primary clarification is 1500 gpd/sf and the average day weir overflow rate is 15,000 gpd/sf.	Applicable Advisory Standard: Chap. 70, Settling 1) Does not meet Sec. 72.21 - "The following surface overflow rates should not be exceeded in the design: 1500-2000 gpd/sf Design Peak Hourly Flow." 2) Does not meet Sec. 72.42 - "Weir loading rates shall not exceed: 30,000 gpd/lf Design Peak Hourly Flow."	MMSD Recommended Project: J01008 – Upgrade Primary Clarifier Mechanisms – Originally included rehabilitation of the primary sludge removal mechanisms, which have reached their useful life. Expanded to include sampling and quantification of grit, and cost analyses comparison of primary sludge alternatives.	• Primary Clarification Influent Channel Flooding. Grit and scum has collected in the primary clarifier influent channels. During wet weather events, surging water can lift access hatches and covers allowing small amounts of scum material to escape onto concrete channel covers. • Primary Clarifier Flooding. The flooding of the effluent weirs and scum baffles is a recurring wet weather problem that significantly reduces the capability of these units to remove scum, grease and floatables. When scum baffles are flooded, no floatables are removed. In addition, this condition may be impacting the ability of the primary clarifiers to settle solids. • The flooding issues were reviewed in a Technical Memorandum. As part of this Technical Memorandum, UWS isolated the two west primary influent channels feeding primary clarifiers 5, 6, 7, and 8. The north channel, which feeds primary clarifiers 5 and 7, was found to have scum and grit along the length of the channel at depths up to seven feet. The south channel, which feeds primary clarifiers 6 and 8, was found to have minimal scum and grit accumulation, possibly one-foot high. • Sludge drain plugging seems to have been fixed through the completed Sludge Drain project.
2) System:							
Total Capacity (MGD)	330						
Firm Capacity (1 unit out of service, MGD)	289						
Surface Overflow Rate (gpd/sf)	AD - 760, MD - 1870						
Peak SOR (calculated) (gpd/sf)	2050						
Weir Loading Rate (1000 gpd/lf)	AD - 30.6, MD - 74.6						
Peak WLR (calculated) (gpd/lf)	82,100						
Detention Time (hr)	AD - 2.6, MD - 1.1						
TSS Removed (%)	AD - 70, MD - 60						
BOD_5 Removed (%)	AD - 35, MD - 25						
Primary Sludge Production (tpd)	AD - 116, MD - 236						
Sludge Concentration (% solids)	4						
Sludge Flowrate (MGD)	AD - 0.7, MD - 1.4						
Peak Operating capacity (MGD, each)	41.2						
Type	Center feed, conventional						
Size, (ft each)	160 dia. x 12 swd						
Total Number	8						
Operating volume (MG each)	1.8						
Total Surface Area (sf)	160850						
Total Volume (MG)	14.4						
Horsepower (hp)	1.5						
Drive	constant speed						
Primary Sludge Pumps							
Total Capacity (GPM)	1120						
Total Number	8						
Capacity (GPM, each)	140						
Discharge Pressure, PSIG	60						
Type	Diaphragm						
Horsepower	--						
Drive	Air Operated						
Primary Scum Pumps							
Total Capacity (standby units out of service, GPM)	560						
Total Number	8 (4 standby)						
Capacity, GPM (each)	140						
Discharge Pressure, PSIG	60						
Type	Diaphragm						
Horsepower	--						
Drive	Air Operated						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-1, JIWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

2) Performance Data: All performance data was calculated from measured data. The calculations can be found in this appendix under Table 4F-25, JIWWTP Unit Process No. 4: Primary Clarification Calculations.

7) Existing Issues/Information: Frank Tiefert, *JI2 – Jones Island Primary Treatment Hydraulic and Treatment Capacity* , a part of Review of United Water Services Requested Projects, Jones Island Wastewater Treatment Plant, Contract No. JO6015DO3 (Applied Technologies, 14 June 2004).

Facility[1]	Design Info/ Capacity[1]	2003 Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Activated sludge process provides stabilization of the primary effluent by biologically transforming dissolved biodegradable continuents into acceptable end products, capturing suspended and nonsettleable solids into floc, and removing unwanted nutrients.		Maximum Secondary Influent BOD: 317,300 lb/d % of total calculated secondary capacity data that capacity was less than 300 MGD: 45% Calculated Secondary Capacity was NEVER less than influent flow	East Basin Structures – 1954 East Basin Structures – 1954 East Basin Mech/Elec Equipment – 1982 West Basin Mech/Elec Equipment – 1988	Applicable Regulation: NR 110.21 Activated sludge. In compliance with all current regulations	Applicable Advisory Standard: Chap. 90, Biological Treatment, Section 92, Activated Sludge Meets all advisory standards		• Completed Phase I of JIWWTP Wet Weather Secondary Capacity Improvements Project seem to have addressed all operational problems
System:							
MD Total Capacity (lb BOD/d)	508,500						
MD Firm Capacity (lb BOD/d)	492,600						
AD Total Capacity(lb BOD/d)	191,500						
F/M (lb BOD_5/lb MLVSS-d)	AD - 0.3, MD - 0.8						
MLSS (mg/L)	2400						
MLVSS (mg/L)	1800						
Detention Time (hr)	AD - 9, MD - 4						
BOD_5 Loading (lb BOD_5/1000 cf)	AD - 32, MD - 85						
Oxygen Demand (1000 lb/d)	AD - 184, MD - 361						
Aeration System							
Total Volume (MG)	44.75						
West Plant							
Total Number	12						
Operating Volume, single pass (MG, 2 channels per basin)	1						
Tank Dimensions (ft, per channel)	212.5x22x14.25 swd						
No. of Diffuser Plates (each)	1738						
East Plant							
Total Number	20						
Basin 1							
Operating Volume, single pass (MG, 2 channels per basin)	1.4						
(2 channels per basin)							
Tank Dimensions (ft, per channel)	320x21.3x14 swd						
No. of Diffuser Plates (each)	2509						
Basin 2-20							
Operating Volume, single pass (MG, 2 channels per basin)	1.65						
Tank Dimensions (per channel)	370x21.3x14 swd						
No. of Diffuser Plates (Basin 2)	2890						
No. of Diffuser Plates (Basin 3-20 each)	2908						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-1, JIWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

2) Performance Data: All performance data was calculated from measured data. The calculations can be found in this appendix under Table 4F-26, JIWWTP Unit Process No. 5: Secondary Flow Control/Aeration System Calculations.

7) Existing Issues/Information: XCG Consultants Ltd, *Wet Weather Flow Optimization Study for Jones Island and South Shore WWTP* (5 December 2001).

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TABLE 4F-7
JIWWTP UNIT PROCESS NO. 5: SECONDARY FLOW CONTROL/AERATION SYSTEM
2020 FACILITIES PLAN
6/02/07 TR_4-A.T4F07.07.06.02.cdr

Facility[1]	Design Info/ Capacity[1]	Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Settles out biologically transformed solids from the activated sludge process		East clarifiiers, which should represent 45% of total secondary clarification capacity, only represented 30% during existing conditions due to poor settleablity and short circuiting problems.	West Clarifier Structures – 1954, 1988 West Clarifier Mech Equipment – 1990, except WP #6 – 1997 West Clarifier Elec Equipment – 1954, 1988 est East Clarifier Structures – 1954, 1983 est East Clarifier Mech Equipment – 1985, except EP #1&5 – 1997 East Clarifier Elec Equipment – 1954, 1983 est New East Clarifier Structures – 1988 New East Clarifier Mech Equipment – 1990, except NEP #21 – 1997 New East Clarifier Elec Equipment – 1988	Applicable Regulation: NR 110.18 Settling tanks. In compliance with all current regulations	Applicable Advisory Standard: Chap. 70, Settling If Pickle Liquor Add used Does not meet Sec 72.232, "The following design crtieria shall not be exceeded: Activated Sludge with Chemical addition to Mixed Liquor forPhosphorus Removal – 900 gpd/sf at Design Peak Hourly Flow."	<u>MMSD Recommended Project:</u> J02007 – Secondary Clarifier Drive Replacement	• Wet Weather Secondary Capacity projects seem to have addressed all operational problems but needs to be reviewed again in Chapter 5.
2) System:							
Total Capacity (MGD)	330						
Firm Capacity (MGD, 1 West unit out of service, 1 East Dual unit out of service)	306						
Surface Overflow Rate (gpd/sf)	AD - 410, MD - 1000						
Est. Peak hour SOR (calc, gpd/sf)	1100						
Capacity based on SOR (MGD)	AD - 123.6, MD - 301.4						
Solids Loading Rate (lb/d/sf)	AD - 12, MD - 31						
Est. Peak hour SLR (calc, lb/d/sf)	34.4						
Detention Time (hr)	AD - 5.6, MD - 2.4						
Return Sludge Flow (MGD)	AD - 49, MD - 160						
Return Sludge Flow, % of ave flow	AD - 40, MD - 130						
Sludge Concentration (mg/L)	AD - 8500, MD - 6000						
Waste Sludge Production (tpd)	AD - 109, MD - 200						
Waste Sludge Flow (MGD)	AD - 3.1, MD - 8						
West Plant							
Total Number	11						
Surface Area (sf, each)	8550						
% of Total Clarification Capacity	31.2%						
Total Volume (MG)	8.8						
Operating Volume (MG, each)	0.8						
Configuration	Octogonal						
Size (ft, each)	98 dia. (short length) x 12.6 swd						
Horsepower & Drive (each)	1.0 hp constant speed						
East Plant, No. 1-10							
Number	10						
Surface Area (sf, each)	13230						
% of Total Clarification Capacity	43.9%						
Total Volume (MG)	12.9						
Operating Volume (MG, each)	1.29						
Configuration	Octogonal						
Size (ft, each)	Dual 84 dia (tangent distance) x13.3 swd						
Horsepower & Drive (each)	1.0 hp constant speed						
New East Plant, No 11-22							
Number	12						
Surface Area (sf, each)	6250						
% of Total Clarification Capacity	24.9%						
Total Volume (MG)	6.6						
Operating Volume (MG, each)	0.55						
Configuration	Circular						
Size (ft, each)	89.25 dia. x 11.5 swd						
Horsepower & Drive (each)	1.0 hp constant speed						
Total Area (sf)	301350						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-1, JIWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

1) Facility and Design Information/ Capacity Documentation: The Estimated Peak hour SOR is based on 330 MGD peak hour capacity

The Estimated Peak hour SLR was determined based on a best fit curve using given SLRs for Average and Maximum Day Design Flows. Calculation included in Table 4F-27, JIWWTP Unit Process No. 6: Secondary Clarification Calculations.

2) Performance Data: XCG Consultants Ltd, *Wet Weather Flow Optimization Study for Jones Island and South Shore WWTP* (5 December 2001).

7) Existing Issues/Information: XCG Consultants Ltd, *Wet Weather Flow Optimization Study for Jones Island and South Shore WWTP* (5 December 2001).

Facility[1]	Design Info/ Capacity[1]	2003 Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Return activated sludge (RAS) system returns micro-organisms to primary effluent to maintain desired mass of organisms for stabilization. Waste activated sludge (WAS) system wastes off excess micro-organisms from the secondary system.		• Est. Return Sludge – Ave Day 30 MGD – Max Day 60 MGD • Waste sludge – Ave Day 2075 gpm – Max Day 4420 gpm	EP Gallery Structure – 1933 WP Gallery Structure – 1987 RAS flow control, utilizing RAS pumping – 2003 WP RAS Pumps – 1985 EP RAS Pumps – 1985/6 except Pump #2 – 1997 WP WAS Pumps – 1986 EP WAS Pumps – 1982 RAS/WAS Booster Pump – 1997 All elec equipment – 1983 except Switchgear RAS/WAS – 1985 MCC EP RAS #2 & #4 – 1997 WAS MCC – 1984	Applicable Regulation: NR 110.21 Activated Sludge. <u>Meets</u> NR 110.21.7(e) – "The maximum waste activated sludge (WAS) pumping rate shall be at least 200% of the anticipated volumetric sludge production rate." WAS Average Day Flow (GPM): 2,150 200% of Average Day Flow (GPM): 4,300 Actual WAS Total Capacity: 5,390 GPM	Applicable Advisory Standard: Section 92, Activated Sludge Does not meet Section 92.44 – "Waste sludge control facilities (WAS) shall have a capacity of at least 25 percent of the design average rate of wastewater flow..." Average Day Flow (MGD): 123 25% of Ave Day Flow (MGD): 30.75 25% of Ave Day Flow (GPM): 21,400 Actual WAS Total Capacity: 5,390 GPM	<u>MMSD Recommended Projects:</u> J02005 – JIWWTP RAS Pump Station Switchgear Ventilation J02006 – JIWWTP RAS Discharge Pipeline Improvements J04011 – RAS Pump Motors & VFD Upgrades	• RAS piping is corroding and needs replacement • RAS and WAS capacities are sufficient for the operational requirements of JIWWTP
2) System:							
Return Sludge Flow (MGD)	AD - 49, MD - 160						
Return Sludge Flow (% of ave flow)	AD - 40, MD - 130						
Sludge Concentration (mg/L)	AD - 8500, MD - 6000						
Waste Sludge Production (tpd)	AD - 109, MD - 200						
Waste Sludge Flow (GPM)	AD - 2150, MD - 5390						
Return Sludge Pumping							
Total Capacity (MGD)	165						
Firm Capacity (MGD, Largest unit out of service from East and West plants)	120						
West Plant							
Capacity (MGD, each)	14.8						
Total Head (ft)	28						
Speed (rpm)	585						
Type	Vertical Centrifugal						
Total Number	3						
Horsepower (each)	125						
Drive	Variable Speed						
East Plant							
Capacity (MGD, each)	30.2						
Total Head (ft)	24						
Speed (rpm)	440						
Type	Vertical Centrifugal						
Total Number	4						
Horsepower (each)	200						
Drive	3 Variable Speed, 1 Constant Speed						
Waste Sludge Pumping							
Total Capacity (GPM)	5390						
Firm Capacity (GPM, Largest unit out of service)	3350						
West Plant							
Capacity (GPM)	730						
Total Head (ft)	80						
Speed (rpm)	1750						
Type	Vertical Centrifugal						
Total Number	2						
Horsepower	25						
Drive	Adjustable Speed						
East Plant							
Capacity (GPM)	1310						
Total Head (ft)	80						
Speed (rpm)	1750						
Type	Vertical Centrifugal						
Total Number	3						
Horsepower	50						
Drive	Adjustable Speed						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-1, JIWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:
2) Performance Data: All performance data was calculated from measured data. The calculations can be found in this appendix under Table 4F-28, JIWWTP Unit Process No. 7: Activated Sludge Pumping Calculations.
7) Existing Issues/Information: Discussions with UWS and MMSD staff

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TABLE 4F-9
JIWWTP UNIT PROCESS NO. 7: ACTIVATED SLUDGE PUMPING
2020 TREATEMNT REPORT
6/02/07 TR_4-A.T4F09.07.06.02.cdr

Facility[1]	Design Info/ Capacity[1]	2003 Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Chlorination destroys disease-causing organisms in the wastewater. Dechlorination removes the chlorine to protect organisms in the receiving water.		– NaOCl used: Ave Day – 1480 gal, Max Day – 6710 gal – Cl_2 Dose: Ave Day – 3 mg/L, Max Day – 13 mg/L – $NaHSO_3$ used: Ave Day – 240 gal, Max Day – 1200 gal – SO_2 Dose: Ave Day – 0.4 mg/L, Max Day – 2 mg/L	Contact Basin Structure – 1984 Disinf Building – 1984 Storage Tanks – 1999/2000 Hypo/bisulf pumps – 1999/2000 All elec equipment – 1984/7 except Circuit breakers – 1990 MCCs – 1986	Applicable Regulation: NR 110.23 Disinfection. In compliance with all current regulations	Applicable Advisory Standard: Chap. 100, Disinfection Meets all advisory standards		• The net installation has had limited success so far – though collecting a lot of debris, some floatables are still escaping into open water. In addition, the nets become clogged with algae and therefore must be changed more often than planned
2) System:							
Total Oper Cap (MGD, all basins in service, min detention time of 30 min)	409						
Firm Oper Cap (MGD, largest basin out of service, min det time 30 min)	307						
Chemical Unloading / Disinfection							
Contact Time, Peak hr (min)	37.2						
Contact Time, Peak hr w/ allowed blending(min)	31.5						
Contact Time (min)	AD - 100, MD - 30						
Cl2 Dose (lb/d)	AD - 6200, MD - 15,000						
NaOCl Use (gal/d)	AD - 4900, MD - 12000						
Emergency Disinfection (330 MGD Secondary Bypass Flow)							
Cl2 Dose (lb/d)	55000						
NaOCl Use (gal/d)	44000						
Dechlorination							
SO2 Dose (lb/d)	AD - 2050, MD - 5000						
Sodium Bisulfite Use (gal/d)	AD - 790, MD - 1925						
Contact Basins							
Total Number	4						
Total Capacity (MG)	8.52						
Operating Volume (MG, each)	1.7 - 2.13						
Tank Size, ft (each)	420x36						
Operating Depth Range (ft)	15 - 18.83						
Passes per Basin	3						
NaOCl Storage Tanks							
Total Capacity (gal)	101400						
Operating Volume (MG, each)	1.7 - 2.13						
Number	6						
Size (gal, each)	16900						
Sodium Bisulfite Storage Tanks							
Total Capacity (gal)	36000						
Number	3						
Size (gal, each)	12000						
Chemical Induction Units							
Type	Stranco Water Champ						
Number, Sod Hypochlorite	4						
Total Capacity (gpm)	240						
Capacity (gpm, each)	60						
Number, Sod Bisulfite	4						
Total Capacity (gpm)	100						
Capacity (gpm, each)	25						
Metering Pumps							
Sodium Hypochlorite							
Total Capacity (gpm)	51.8						
Number	9						
Capacity							
3 pumps (gpm, each)	3						
4 pumps (gpm, each)	2.8						
2 pumps (gpm, each)	15.8						
Sodium Bisulfite							
Total Capacity (gpm)	3.5						
Number	5						
Capacity (gphr, each)	42						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-1, JIWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

1) Facility and Design Information/ Capacity Documentation: Contact time for average day flow listed in O&M Manual was 73 minutes but at 123 MGD Design Average Day, contact time calculated at 100 minutes. Used calculated number US Filter Stranco Capacities based on Equipment Information supplied by Equipment Supplier & was not included in O&M Manual

2) Performance Data: All performance data was calculated from measured data. The calculations can be found in this appendix under Table 4F-29, JIWWTP Unit Process No. 8: Disinfection Calculations.

7) Existing Issues/Information: Discussions with UWS and MMSD staff

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TABLE 4F-10
JIWWTP UNIT PROCESS NO. 8: DISINFECTION
2020 TREATMENT REPORT
6/02/07 TR_4-A.T4F10.07.06.02.cdr

Facility[1]	Design Info/Capacity [1]	Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Pump effluent from the plant when needed due to plant flow, number of channels in service and lake level require additional hydraulic elevation.		Used intermittently for the following reasons: – Pump out high flows – To keep effluent flap gates closed (wind out of east causes flap gates to bang) – Testing	Structure – 1984 Eff pumps – 1986 All electrical in 1984 except MCC #1 – 1986, MCC #2 – 1982 UPS – LCP – 1997	Applicable Regulation: NR 110.14 Sewerage lift station design criteria. In compliance with all current regulations	Applicable Advisory Standard: Ch 40: Wastewater Pumping Stations Meets all advisory standards	MMSD Recommended Project 7: J04011 – RAS Pump Motors & VFD Upgrades – Includes VFDs on Effluent Pumps	• Although not used much, these pumps are getting old • Pumps do not need to be run when lake levels high
2) System:							
Total Capacity (MGD)	520						
Firm Capacity (MGD, 1 unit out of service)	390						
Capacity (MGD, each)	130						
Total Head, ft	10.2						
Type	Vertical Propeller						
Total Number	4						
Horsepower	300						
Drive	Variable Speed						
Effluent Flow Measurement							
Type	Magnetic						
Size, in.	84						
Number	2						
Effluent Channels							
Height (ft)	19.5						
Width (ft)	13.5						
Velocity @ Q= 123 MGD & lake level at -0.66 (fps)	0.25						
Effluent Nets - Location	Downstream of Entrance of Each Contact Basin						
Number (6 per basin)	24						
Clear opening size (inch)	0.25						
Type	Reinforced nylon disposable mesh bag						
Netting Frame (WxHxL)	30"x48"x8'						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-1, JIWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:
2) Performance Data: Leonard Aprahamian (UWS), JI Effluent Pumping, e-mail correspondence with author, 15 March 2005.
7) Existing Issues/Information: Discussions with UWS and MMSD staff

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TABLE 4F-11
JIWWTP UNIT PROCESS NO. 9: EFFLUENT PUMPING
2020 TREATMENT REPORT
6/02/07 TR_4-A.T4F11.07.06.02.cdr

Facility[1]	Design Info/ Capacity[1]	2003 Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Thickens the WAS removed from the secondary treatment processes at JIWWTP and SSWWTP from approx. 1% solids to 4-5% solids for futher treatment.		GBT Feed – Average Day 2260 GPM – Maximum Day 4600 GPM TAS % – Average Day 4.5 – Maximum Day 6.0	Thick Building – 1987 Polymer Mix & Store Tanks – 1987 GBT #5 – 1987, GBT #8 – 1995, GBT #2 & 3 – 2000 Pumps – TAS Transfer, WAS Receive, Poly Transfer, IPS Transfer – 1987 Elec Equipment – 1987	Applicable Regulation: NR 110.26 Sludge handling, storage and disposal. Subsection (2)(b) Sludge thickening. In compliance with all current regulations	Applicable Advisory Standard: Chap. 80, Sludge Processing, Storage, and Disposal, Section 83, Sludge Thickeners Meets all advisory standards		• Addition of Iron Oxide is causing damage to solids building • Feeding the belt filter presses sludge thickened to 2-2.5% optimizes energy and chemical usage. As a result, only a portion of the secondary sludge is actually thickened to 6% with the remaining portion blended with un-thickened waste activated sludge (at 0.8% solids) and digested sludge (at approximately 2% solids) in the equalization and blend tanks
2) System:							
Gravity Belt Thickener							
Total Capacity (GPM)	5035						
Firm Capacity (GPM)	3780						
Units in Service	4						
TAS Concentration (%)	4						
Hydraulic Loading (gpm/unit)	1260						
Solids Loading (ton/day/unit)	45.25						
Thickened Sludge Transfer Pumps							
Total Capacity (GPM)	1800						
Type	Progressing Cavity						
Number	4						
Rated Capacity (GPM, each)	AD - 450, MD - 750						
Discharge Head (psi, each)	AD - 51, MD - 30						
Speed (rpm, each)	AD - 155, MD - 240						
Horsepower (hp)	60						
Drive	Variable speed						
Polymer Feed Pumps							
Total Capacity (GPM)	28						
Type	Progressing Cavity						
Number	7						
Rated Capacity (GPM, each)	4						
Discharge Head (psi, each)	34						
Speed (rpm, each)	AD - 180, MD - 400						
Horsepower (each)	3						
Drive	Variable Speed						
Polymer Transfer Pumps							
Total Capacity (GPM)	60						
Total Number	2						
Type	Progressing Cavity						
Capacity (GPM, each)	30						
Discharge Head (psi, each)	40						
Speed (rpm, each)	AD - 275, MD - 300						
Horsepower & Drive (each)	15 hp constant speed						
Ferric Oxide Addition							
Location	Gravity Belt Thickener #2 Discharge						
Loading (gal/d in 2003)*	4600						
Mix Tank Mixers							
Total Number	3						
Horsepower (each)	3						
Speed (rpm, each)	56						
Mix Tank							
Capacity (Gal)	2400						
Diameter (ft)	8						
Height (ft)	8						
Storage Tanks							
Capacity (Gal)	7500						
Diameter (ft)	12						
Height (ft)	10.75						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-1, JIWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

1) Facility and Design Information/ Capacity Documentation: MMSD, *Jones Island O&M Manual, Part 2, Volume 4, Grit Removal System* , 2003

* Ferric Oxide Loading value determined based on 2003 JIWWTP DWOR

2) Performance Data: All performance data was calculated from measured data. The calculations can be found in this appendix under Unit Process No. 10: Sludge Thickening within Table 4F-32, Milorganite Process Calculations.

7) Existing Issues/Information: Discussions with UWS and MMSD staff, site visit observations

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TABLE 4F-12
JIWWTP UNIT PROCESS NO. 10: SLUDGE THICKENING
2020 TREATMENT REPORT
6/02/07 TR_4-A.T4F12.07.06.02.cdr

Facility[1]	Design Info/ Capacity[1]	2003 Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Pumps primary sludge from the primary clarification process and screens out nuisance material to provide consistent feed for additional biosolids treatment.		Primary Sludge Pumped – Average Day 200 GPM – Maximum Day 360 GPM	Structure – 1983 Screened sludge pumps – 1985 Sludge screens – 2000, plus one Contra - 1985 Elec equipment – 1983 except 2) MCCs #1-9 – 1985	Applicable Regulation: NR 110.26 Sludge handling, storage and disposal. Subsection (4)(a) Sludge pumps. In compliance with all current regulations	Applicable Advisory Standard: Chap. 80, Sludge Processing, Storage, and Disposal, Section 83, Sludge Pumps and Piping Meets all advisory standards	<u>Committed Projects:</u> J01006 – JIWWTP Preliminary Treatment Facility Upgrade – Sludge screens installed under completed Grit Removal project did not have enough wet weather capacity. This project includes installation of additional Parkson Presses to replace Contra-Shear Drum screen.	• The screen presses are used for normal plant flows, but were found to have insufficient capacity to handle peak primary sludge production during wet weather events. The rotary screener is placed into operation during these wet weather events. A committed project, JIWWTP Preliminary Facility Upgrade, is evaluating the addition of more screen presses so that the rotary screen can be removed.
2) System:							
Total Capacity (GPM)	1450						
Firm Capacity (GPM, 1 unit out of service)	750						
Influent Solids (%)	4-5						
Compacted Solids (%)	35-50						
Sludge Screens							
Type	Parkson Strain Press Sludge						
Number	3						
Total Capacity (GPM)	750						
Capacity (GPM, each)	250						
Total Head (psig)	14						
Screen Opening (screening zone, mm)	5						
Screen Opening (press zone, mm)	2						
Type	Contra-Shear Rotary Drum						
Number of Units	1						
Rated Capacity (GPM, each)	700						
Screen Opening	1/4"						
Screen Surface (each)	58" Dia by 115"						
Horsepower & Drive (each)	2 hp, adjustable speed						
Screening Conveyor							
Type	Trough						
Number of Units	1						
Rated Capacity (cf/hr, each)	250						
Solids loading (lb/cf, each)	65						
Belt Width (inch)	24						
Max Speed (fpm)	100						
Horsepower (hp)	3						
Drive (each)	adjustable speed						
Screened Sludge Pumping							
Type	Horizontal Centrifugal Screw						
Number of Units	3						
Rated Capacity (GPM, each)	1080						
Head (ft)	104						
Speed (rpm)	1750						
Horsepower (hp)	40						
Drive (each)	adjustable speed						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-1, JIWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

1) Facility and Design Information/
Capacity Documentation: DRAFT Jones Island O&M Manual, Part 2, Volume 7, Primary Sludge Screening and Scum Handling, 2003

2) Performance Data: All performance data was calculated from measured data. The calculations can be found in this appendix under Unit Process No. 11: Sludge Screening and Pumping within Table 4F-32, Milorganite Process Calculations.

7) Existing Issues/Information: Discussions with UWS and MMSD staff, site visit observations

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TABLE 4F-13
JIWWTP UNIT PROCESS NO. 11: SLUDGE SCREENING AND PUMPING
2020 TREATMENT REPORT
6/02/07 TR_4-A.T4F13.07.06.02.cdr

Facility[1]	Design Info/ Capacity[1]	2003 Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: The equalization and blend process receives sludge for blending to form a uniform sludge consistency for downstream dewatering and drying processes. Operation is different than original design which was to only include JIWWTP thickened WAS and screened primary sludge - now typically thickened WAS, unthickened WAS from SSWWTP and digested primary sludge from SSWWTP are blended together.		Blended Sludge Pumped – Average Day 1160 GPM – Maximum Day 2850 GPM	Structure – 1990 Blended Sludge Pumps – 1987 Pri Recirculating Pumps – 1990 MCCs – 1987 Other elec equipment – 1990	No specific requirements but used the following: NR 110.26 Sludge handling, stoage and disposal. Subsection (10) Sludge storage. In compliance with all current regulations	No specific requirements but used the following: Chap. 80, Sludge Processing, Storage, and Disposal, Section 89, Sludge Storage and Disposal Meets all advisory standards		• The tanks were both originally intended to blend thickened WAS with primary sludge to produce a homogenous sludge for feed to the dewatering belt filter presses. Current operations use one blend tank as a screened primary sludge equalization tank while the other blend tank is used to blend thickened waste activated sludge, digested sludge, and WAS prior to feed to the belt filter presses.
2) System:							
Primary Sludge (tpd)	AD - 67, MD - 74						
Primary Sludge (MGD)	AD - 0.32, MD - 0.44						
Thickened Activated Sludge (tpd)	AD - 157, MD - 173						
Thickened Activated Sludge (MGD)	AD - 0.9, MD - 1						
Blended Sludge (tpd)	AD - 224, MD - 246						
Blended Sludge (MGD)	AD - 1.24, MD - 1.45						
Mix Tanks in Service	1						
Minimum Residence Time (hr)	3.5						
Tank 1							
Usage	Primary Sludge Equalization						
Tank 2							
Usage	Blend all sludge before Belt Filter Presses						
Thickened WAS %	6						
Dilute WAS %	0.8						
Digest Primary %	Variable						
Total Capacity (GPM, based on min det time)	3430						
Firm Capacity (GPM, 1 tank in service and based on min det time)	1715						
Mix Tanks, Total	2						
Nominal Volume (Gal, each)	360000						
Tank Dimensions (ft)	45 dia x 30.5 swd						
Sludge Depth at Maximum Day	18						
Blended Sludge Pumps in Service	2						
Total Capacity (GPM)	1800						
Rated Capacity (GPM, each)	900						
Total Dynamic Head (ft)	120						
Horsepower (hp)	60						
Drive (each)	adjustable speed						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-1, JIWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

1) Facility and Design Information/
Capacity Documentation: Operation of Unit Process is different than when Jones Island O&M Manual was written - digested primary sludge is also included in tanks. Design values included but not applicable.

2) Performance Data: All performance data was calculated from measured data. The calculations can be found in this appendix under Unit Process No. 12: Equalization and Blend within Table 4F-32, Milorganite Process Calculations.

7) Existing Issues/Information: JI O&M Manual, discussions with UWS and MMSD staff, site visit observations

Facility[1]	Design Info/ Capacity[1]	2003 Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: The interplant solids (IPS) pumping process provides for balancing of sludge between JIWWTP and SSWWTP – current operation typically sends JIWWTP primary sludge to SSWWTP and SSWWTP WAS and digested sludge to JIWWTP.		**TO SSWWTP**: Primary Sludge: – Average Day: 190 GPM – Maximum Day: 360 GPM	Structure – 1987 Pumps – 1987 All elec equip – 1987 except MCCs # 7 & 8 – 1999	Applicable Regulation: NR 110.26 Sludge handling, storage and disposal. Subsection (4)(a) Sludge pumps. In compliance with all current regulations	Applicable Advisory Standard: Chap. 80, Sludge Processing, Storage, and Disposal, Section 83, Sludge Pumps and Piping Meets all advisory standards	MMSD Recommended Projects: P01001 – IPS Cathodic Protection P01002 – IPS & Blended Sludge System Plug Valves J06025 – TAS/IPS Wet Wells	• Since JIWWTP was expected to generate equal amounts of primary sludge and WAS, excess JIWWTP primary sludge was to be pumped to SSWWTP for digestion and additional SSWWTP WAS was to be pumped to JIWWTP for Milorganite® production. In addition, excess JIWWTP WAS during high wastewater loadings and inline solids removed at ISHF during wet weather events were to be pumped intermittently to SSWWTP. However, the current operation involves pumping most of JIWWTP primary sludge to SSWWTP to be digested, and pumping most of the SSWWTP WAS and over half of the digester sludge to JIWWTP for Milorganite® production. Since ISHF has rarely been used, no inline solids have been pumped to SSWWTP.
2) System:							
Dilution/Mix Tanks in Service	1						
Mixing Residence Time (min)	AD - 10.3, MD - 3						
Diluted Sludge Flow (MGD)	AD - 0.7, MD - 2.4						
IPS Pump Sets in Service	AD - 1, MD - 2						
Sludge Pipelines in Service	AD - 2, MD - 3						
% Solids	1.5 to 2.0						
Dilution/Mix Tanks							
Total Capacity (GPM)	3333						
Number	2						
Operating Volume (gal, each)	5000						
Tank Dimensions (ft)	10' dia x 14'-5" depth						
IPS Wetwell Mixers							
Total Capacity (GPM)	16200						
Type	Submersible						
Number	3						
Capacity (GPM)	5400						
Speed (rpm)	301-632						
Horsepower (hp)	9.4						
Drive	Variable						
IPS Pumps							
Total Capacity (GPM)	6000						
Firm Capacity (GPM, 1 pair out of service)	4000						
Type	Horizontal Centrifugal						
Number	Three 2-stage Pairs						
Capacity (GPM, each)	2000						
Head (ft)	420						
Horsepower (hp, per pair)	400						
Drive	Adjustable speed						
IPS Pipes							
Number	#1, #4						
Size (in)	14.0						
Number	#2, #3						
Size (in)	12.0						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-1, JIWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

2) Performance Data: All performance data was calculated from measured data. The calculations can be found in this appendix under Table 4F-62, Interplant Solids Pumping Process Calculations.

7) Existing Issues/Information: JI O&M Manual, discussions with UWS and MMSD staff, site visit observations

Facility[1]	Design Info/ Capacity[1]	2004-2005 Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Provides air required for mixing and biological treatment in the activated sludge aeration basins.		Air Usage – Ave Day: 115,000 cfm – Max Day: 142,000 cfm	Building Structure – 1977 Building – 1989 Mech Equipment – 1973 Original elec install – 1977 Elec equipment – 1989	Applicable Regulation: NR 110.21 Activated sludge. Subsection (5) Aeration Systems and (6) Aeration Equipment. In compliance with all current regulations	Applicable Advisory Standard: Chap. 90, Biological Treatment, Section 92.33, Aeration Equipment Meets all advisory standards	<u>MMSD Recommended Project:</u> J02004 – Upgrade of Electrical Switch Gear for PACs	• The old diffusers, which remain in 26 non-storage basins, require that the air still be supplied to a basin even if it is not in service to prevent the diffusers from plugging with solids. • Blowers appear to be oversized - only need to run one blower most of the time, and when 2nd blower needs to kick on, too much air is then supplied. • Need more detailed study to confirm observations.
2) System:							
Total Air Flow Rate (CFM/1000 cf basins)	79						
Firm Air Flow Rate (CFM/1000 cf, 2 unit out of service)	39						
Min Air Flow Rate (CFM/1000 cf, 1 unit in service)	20						
Total Capacity (CFM)	472000						
Firm Capacity (CFM, 2 units in service)	236000						
Air Flow Rate (1000 cfm)	AD - 65, MD - 146						
Capacity, ACFM (each)	118000						
Discharge Pressure, PSIG	10						
Type	Centrifugal						
Total Number	4 (includes 2 redudant)						
Horsepower (each)	5500						
Drive	Constant Speed, Adjustable Vane						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-1, JIWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

2) Performance Data: All performance data was calculated from measured data. The calculations can be found in this appendix under Table 4F-30, JIWWTP Unit Process No. 15: Process Air Calculations. Note that UWS only keeps air records for 12 month period, felt 2004-2005 representative of past average usage.

7) Existing Issues/Information: Discussions with UWS and MMSD staff, site visit observations, review of DMR data

Facility[1]	Design Info/ Capacity[1]	Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Removes water from scum removed from primary clarifiers before disposal.		Daily equipment operation is not monitored so no comparison to design capacities could be performed 2003 total scum waste hauled away was low Average per day for 2001 – June, 2004 – 4 cy/d	Structure – 1983 Scum dewatering screen – 2001 Elec equipment – 1983	Applicable Regulation: NR 110.18 Settling tanks. Subsection (2)(c) Sludge and scum removal. In compliance with all current regulations	Applicable Advisory Standard: Chap. 70, Settling, Section 73.1, Scum Removal Meets all advisory standards	<u>Committed Project:</u> J01006 – JIWWTP Preliminary Treatment Facility Upgrade – Includes modifications to scum concentration system	• Scum handling equipment has not operated up to design requirements. As part of the committed Preliminary Facility Upgrade project, the system will be upgraded to at least provide more consistent feed to the scum screens, and potentially to include an equalization tank, mixing pump and other improvements.
2) System:							
Total Capacity (GPM)	600						
Firm Capacity (GPM)	300						
Capacity (GPM, each)	AD - 50, MD - 300						
Operation	Continuous						
Screen Opening (in)	0.06						
Spray Water							
Capacity (GPM)	16						
Head (psi)	40						
Temp (deg F)	130-140						
Number	2						
Type	Rotating Drum						
Scum Press							
Total Capacity (cf/hr)	141						
Inlet Capacity (cf/hr, each)	70.5						
Feed Material Screen Opening (in dia)	0.19						
Press zone screen opening (in)	0.04						
Spray Water							
Capacity (GPM)	20						
Head (psi)	40						
Temp (deg F)	130-140						
Number	2						
Type	Screw						
Dilute Scum Storage Tank							
Surface Area (sf)	144						
Max Volume (gal)	6200						
Tank Dimensions (ft)	16 x 9						
Max Depth (ft)	7.5						
Scum Concentrator Feed Pump							
Type	Progressing Cavity						
Rated Capacity (GPM, each)	50						
Total Head (psi)	40						
Horsepower (hp, each)	3						
Drive	adjustable speed						
Concentrate Scum Storage Tank							
Surface Area (sf)	60						
Max Volume (gal)	3366						
Tank Dimensions (ft)	4 x 15						
Max Depth (ft)	7.5						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-1, JIWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

2) Performance Data: All performance data was calculated from measured data. The calculations can be found in this appendix under Table 4F-31, JIWWTP Unit Process No. 18: Scum Concentration Calculations.

7) Existing Issues/Information: Michael J. Martin (MMSD), Draft Technical Memoranda, *Design of the Jones Island Wastewater Treatment Plant Preliminary Treatment Facility Upgrade Project* , MMSD Contract No. J01006D01, 10 November 2005

Facility[1]	Design Info/ Capacity[1]	Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Pickle liquor or ferric chloride (pickle liquor availability has decreased) is fed to the secondary treatment process to precipitate out excess phosphorus (P) which is removed in the secondary clarifiers.		Process suspended in September 2002 Usage information for 2001 no longer available Iron added in the form of ferric chloride in September 2004 – only time iron was added to plant since pickle liquor addition was suspended	Facility – 1961 Improvements – 1982 Storage tanks – 2000 Mech Equipment – 2003 Elec equipment – 1982	Applicable Regulation: NR 110.22 Physical-chemical treatment. Subsection (3)(c) Phosphorus removal. In compliance with all current regulations	Applicable Advisory Standard: Chap. 110, Supplemental Treatment Processes, Section 111, Phosphorus Removal By Chemical Treatment Meets all advisory standards	<u>Committed Projects:</u> J02002 – JIWWTP Phase 2 Wet Weather Secondary Capacity Improvements – Specific items related to unit process: reconfiguration of phosphorus control chemical feed from aeration basin influent to aeration basin effluent to assist sludge settability	• Pickle liquor or ferric chloride fed dry to system • Total P in effluent is usually well within permit limits without pickle liquor addition
2) System:							
Pumped Feed							
Max Pickle Liquor feed (GPM)	25						
Maximum Iron Addition (lb/d)	25200						
Gravity Feed							
Max Pickle Liquor feed (GPM)	15						
Maximum Iron Addition (lb/d)	15000						
Application Points	1) Grit basin effluent channels within Prelim Facilities						
	2) Flow Control Structure						
Storage Tanks							
Number	4						
Size (Gal, each)	30000						
Air Compressor							
Type	Two-stage						
Number	1						
Capacity (cfm)	75						
Pressure (psig)	100						
Horsepower (hp)	20						
Transfer Pumps							
Type	Centrifugal						
Number	1						
Capacity (GPM)	100						
Head (ft)	25						
Horsepower (hp)	2						
Feed Pumps							
Type	Centrifugal						
Number	2						
Capacity (GPM)	25						
Head (ft)	26						
Horsepower (hp)	1						
Throttling Capability	Down to 2 GPM						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-1, JIWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

2) Performance Data: Performance data was taken from MMSD, *Contract Compliance Office Monthly Report* (Septmeber 2004).

7) Existing Issues/Information: Discussions with UWS and MMSD staff, site visit observations, review of DMR data

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TABLE 4F-18
JIWWTP UNIT PROCESS NO. 20: PICKLE LIQUOR
2020 TREATMENT REPORT
6/02/07 TR_4-A.T4F18.07.06.02.cdr

Facility[1]	Design Info/ Capacity[1]	2003 Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Receives all WAS from JIWWTP and SSWWTP and sends it to WAS thickening or to Equalization/Blend Unit Processes.		WAS Processed – Average Day 2670 GPM – Maximum Day 4200 GPM		Applicable Regulation: NR 110.26 Sludge handling, storage and disposal. Subsection (4) Sludge pumps and piping. In compliance with all current regulations	Applicable Advisory Standard: Chap. 80, Sludge Processing, Storage, and Disposal, Section 83, Sludge Pumps and Piping Meets all advisory standards	<u>MMSD Recommended Project:</u> J06025 – TAS/IPS Wet Wells	• Receives digested sludge and SS WAS
2) System:							
JI WAS Received (MGD)	AD - 3.1, MD - 8						
SS WAS Received (MGD)	AD - 1.5, MD - 8.0						
WAS to Thickening (MGD)	AD - 4.6, MD - 7.2						
WAS to IPS Pumping (MGD)	AD - 0, MD - 0.7						
WAS Receiving Pumps in Service	AD - 2, MD - 3						
Total Capacity (GPM)	5610						
Firm Capacity (GPM)	3740						
WAS Receiving Pumps, No.	3						
Capacity (gpm, each)	1870						
TDH (ft)	138						
Horsepower (hp)	100						
Wet Wells, no.	2						
Volume (gal, each)	21200						
Width (ft, each)	6						
Height (ft, each)	25.5						
Length (ft, each)	18.5						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-1, JIWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:
2) Performance Data: All performance data was calculated from measured data. The calculations can be found in this appendix under Unit Process No. 23: WAS Receiving / Gallery Solids Piping Intertie within Table 4F-32, Milorganite Process Calculations.
7) Existing Issues/Information: Discussions with UWS and MMSD staff, site visit observations

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TABLE 4F-19
JIWWTP UNIT PROCESS NO. 23: WAS RECEIVING / GALLERY SOLIDS PIPING INTERTIE
2020 FACILITIES PLAN
6/02/07 TR_4-A.T4F19.07.06.02.cdr

Facility[1]	Design Info/ Capacity[1]	Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: The dewatering process receives blended sludge from the Equalization/Blend Unit Process for dewatering before the sludge is dried.		No data specifically for this unit process. See Unit Process No. 27, Milorganite Storage for total dried sludge processed in 2003	Facility – 1987 Tanks, Silos – 1992 Poly Feed, Transfer Pumps – 1992 BFPs – 1992 Elec equipment – 1987 except MCCs – 1992 Poly feed pump VFDs – 1992	Applicable Regulation: NR 110.26 Sludge handling, storage and disposal. Subsection (8) Dewatering. In compliance with all current regulations	Applicable Advisory Standard: Chap. 80, Sludge Processing, Storage, and Disposal, Section 88, Dewatering Meets all advisory standards	<u>Committed Project:</u> J06020 – Metasys & Simplex System Upgrade <u>MMSD Recommended Projects:</u> J04013 – D&D VFDs Replacement J04014 – D&D Dust Containment System J04015 – D&D Conveyors and Transporters	• Equipment wear and tear is an issue
2) System:							
- Belt Filter Press							
Blended Sludge Feed, % Solids	AD - 2.5						
Cake solids, %	AD - 17						
Max Hydraulic Loading (gpm, each)	100						
Total Capacity (lb dry solids/hr)	38400						
Number of units	24						
Number of banks	6						
Number of units in bank	4						
Number of dryers connected directly to each bank	2						
Rated Capacity (each)	1200-1600 lb dry solids/hr/press						
Effective Belt Width (meter)	2						
Belt Surface Area (each)	330 sf						
Drive (each)	variable frequency						
Dry Polymer (lb/ton dry solids)	2-8						
Ferric Chloride (lb/ton dry solids)	100						
Hyd. Peroxide (lb/ton dry solids)	2-6						
Polymer							
Polymer Solution Conc. (%)	0.25-1.0						
Dry Polymer Silo Cap (cf, each)	1580						
Number	2						
Liq Poly Stor Tank Cap (gal, ea)	14975						
Number	2						
Polymer Mix/Feed							
Tank Capacity (gal, each)	10300						
Number	3						
Feed Pumps							
Number	2						
Storage Pumps							
Number	2						
Product Storage Silo							
Number	4						
Ferric Chloride							
Loading Range (lb/dry ton blended sludge)	0-150						
Storage Tank Cap (gal, each)	26600						
Number	4						
Feed Tank Capacity (gal, each)	752						
Number	2						
Hydrogen Peroxide							
Loading (lb/ton dry blended sludge)	2-6						
Tank Storage (gal, each)	5000						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-1, JIWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:
7) Existing Issues/Information: Discussions with UWS and MMSD staff, site visit observations

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TABLE 4F-20
JIWWTP UNIT PROCESS NO. 24: DEWATERING
2020 TREATMENT REPORT
6/02/07 TR_4-A.T4F20.07.06.02.cdr

Facility[1]	Design Info/ Capacity[1]	Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: The facility dries the dewatered sludge through the use of rotary dryers to produce the Milorganite product.		No data specifically for this unit process. See Unit Process No. 27, Milorganite Storage for total dried sludge processed in 2003	Facility – 1987 Tanks, Silos – 1992 Misc Milo Equip (Elev, exhaust fan, screw feeder screen, etc) – 1988 Misc Milo Equip (Classification, bins, tranport, etc) – 1992 Milo Dryers – 1992 Dryer Cyclones – 2002 Elec equipment – 1987 except Substation 1 & 2, MCC 2 & 3 – 1988 Misc Elec (Switches, transformers, etc) – 1992 Dryer Main Drive #1 – 1995 Substations #1B, 2B, 3B – 1999	Applicable Regulation: NR 110.26 Sludge handling, storage and disposal. Subsection (9)(b) Other sludge reduction facilities. In compliance with all current regulations	Applicable Advisory Standard: Chap. 80, Sludge Processing, Storage, and Disposal, Section 89.35, Other Disposal Methods Meets all advisory standards	<u>Committed Project:</u> J06020 – Metasys & Simplex System Upgrade <u>MMSD Recommended Projects:</u> J04013 – D&D VFDs Replacement J04014 – D&D Dust Containment System J04015 – D&D Conveyors and Transporters	• Typically run 10 dryers • If 4 Belt Filter Presses are isolated, 2 dryers have to be isolated • 30-50% increase in dryer capacity when using natural gas versus waste heat
2) System:							
Dryer Feed Screws							
Type	Screw Conveyor						
Number	1						
Size (in width x ft length)	18 x 31						
Capacity (cf/hr, each)	1614						
Dryer Drums							
Type	horizontal, cylindrical drum						
Number	12						
Size (ft, dia, length)	8, 57.5						
Slope (inch/ft)	0.25						
Horsepower (hp)	60						
Speed (rpm)	1200						
Drive	constant						
Dryer Burner System							
Type	Duel fuel burner						
Number	12						
Capacity (million BTU/hr, each)	25						
Fuel	Natural gas or fuel oil						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-1, JIWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:
7) Existing Issues/Information: Discussions with UWS and MMSD staff, site visit observations.

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TABLE 4F-21
JIWWTP UNIT PROCESS NO. 25: DRYING
2020 TREATMENT REPORT
6/02/07 TR_4-A.T4F21.07.06.02.cdr

Facility[1]	Design Info/ Capacity[1]	Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Provides backup power to the Harbor and Dewey electrical services. Waste heat is used to heat the dryers.			Power–house facility – 1974 Gas Turbine #1 – 1972 Gas Turbine #2 – 1998 Guillotine Dampers – 2003 Twin Turbine Gas Compressors – 2003 General Elec – 1974 Substation #1 & 2 – 1987 Incoming Harbor Switchgear – 1971 Transformers – 1973	No specific requirements	No specific requirements		• Turbines very old • Structural integrity of turbine foundations in question • Gas and back up system – may not be enough redundancy • Biosolids Analysis is reviewing the replacement or removal of turbines
2) System:							
Turbines							
Number	2						
Max Power Output (MW, each)	20						
Typical Plant Loads (MW)	11-15						
Type	Simple cycle, single shaft						
Fuel Oil							
Total supply (days)							
Tanks							
Capacity (gal, each)	48000						
Number	2						
Size (ft dia)	12						
Pumps							
Capacity (gpm, each)	35.0						
Head (psi)	100						
Number	3						
Heat Exchangers							
Number	2						
Type	Tube in shell, No. 2 Fuel oil						
Temp	-10 to 50 deg F						
Capacity (gpm, each)	67						
Gas Compressors							
Number	3						
Capacity (psig discharge)	2-222, 1-230						
Natural Gas	Interuptable						
Supply	12" Pipeline						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-1, JIWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:
7) Existing Issues/Information: Discussions with UWS and MMSD staff, site visit observations.

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TABLE 4F-22
JIWWTP UNIT PROCESS NO. 26: POWERHOUSE
2020 TREATMENT REPORT
6/03/07 TR_4-A.T4F22.07.06.03.cdr

Facility[1]	Design Info/ Capacity[1]	2003 Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Milorganite produced in the Dewatering and Drying Facility is stored in the Storage Facility before loading onto railcars or trucks for offsite transport.		Milorganite Produced – Total – 47700 tons – Est Average Day – 136 tons	Chaff Dumping Station – 1990	Applicable Regulation: NR 110.26 Sludge handling, storage and disposal. Subsection (10) Sludge storage facilities. In compliance with all current regulations	Applicable Advisory Standard: Chap. 80, Sludge Processing, Storage, and Disposal, Section 89.1, Storage Meets all advisory standards	<u>Committed Project:</u> J04006 – Milorganite Processing Facilities Upgrade <u>MMSD Recommended Projects:</u> J04008 – Silo Dust System Upgrade J04018 – Milorganite Facilities Improvements – Debris Removal	
2) System:							
Storage Units	Silos						
Number	12						
Days of storage	45						
Normal Milorganite production							
Production rate (tpd)	200						
Total storage capacity (tons)	9000						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-1, JIWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

1) Facility and Design Information/
Capacity Documentation: Jones Island O&M Manual Part 2: Unit Process No. 27, Milorganite Storage

2) Performance Data: All performance data was calculated from measured data. The calculations can be found in this appendix under Unit Processes No. 23, 24, 27: Dewatering and Drying Facility within Table 4F-32, Milorganite Process Calculations and Table 4F-33, Milorganite Production Chart.

LL Pumps

	Average Day (MGD)	Maximum Day (MGD)	Peak Hour (MGD)
1998	26.8	57.9	90.7
1999	28.9	75.2	118.1
2000	27.2	83.7	96.6
2001	25.1	70.9	95.8
2002	27.7	59.0	92.5
2003	26.0	47.1	88.2
Average	**27.0**	**65.6**	**97.0**

HL Pumps

	Average Day (MGD)	Maximum Day (MGD)	Peak Hour (MGD)
1998	79.5	187.3	264.1
1999	78.4	220.1	260.1
2000	83.2	240.8	260.1
2001	80.4	211.7	267.8
2002	77.2	179.8	253.0
2003	72.4	147.8	232.6
Average	**78.5**	**197.9**	**256.3**

NOTES:

1) Raw metered data used to develop the data presented in this table was provided by Brown & Caldwell, managing the 2020 Facility Plan conveyance team, who in turn received it from MMSD. Raw metered data was too extensive to present in this appendix but is included in the 2020 Facility Plan project files.

Data that Brown & Caldwell had available was from 1998 through 8/31/03.

2) Data provided was metered flow through the High Level (HL) and Low Level (LL) siphons. The two assumptions made were:

LL metered flow from siphons equals LL Pumping though not exact

HL+LL metered flow from siphons equals HL Pumping through not exact

Surface Overflow Rate (SOR) and Weir Loading Rate (WLR)

Estimated Design Weir Loading Rate (not presented in O&M)

Diameter of clarifiers[2]:		160 ft				
Est. weir length/clarifier		502.7 ft				
No. of Clarifiers[2]:		8				
Flow(MGD)[2]:	Average Day	123	Maximum Day	300	Peak Hour	330
WEIR LOADING (gpd/ft):						
	Average Day	30,600	Maximum Day	74,600	Peak Hour	82,100

Performance

Maximum Day[1]	2/9/2001
Flow	321
00:00	282.11
01:00	249.98
02:00	270.65
03:00	308.48
04:00	329.28
05:00	324.77
06:00	324.75
07:00	278.54
08:00	252.76
09:00	341.29
10:00	405.41
11:00	416.44 Peak Hour
12:00	404.62
13:00	380.93
14:00	360.43
15:00	347.49
16:00	330.71
17:00	314.20
18:00	301.32
19:00	291.75
20:00	286.34
21:00	281.24
22:00	275.72
23:00	269.91

Primary Clarifier Info[2]

Total Area (sf)	160,850
Total Weir Length (lf)	4021
2003 Average Flow[3]	83 MGD

	Peak Hour	2003 Average Day
SOR (gpd/sf)	2590	520
WLR (1000 gpd/lf)	103.6	20.6

NOTES:

1) The date 2/9/01 was established in Appendix 4J, *Wet Weather Events Analysis* , Table 4J-4, Top JIWWTP and SSWWTP Average Daily Flows, 1997 through June 30, 2004 as being the date with the 3rd highest flow to JIWWTP. This date was the 1st date on the list for which hourly data was available from Storm Event Reports. The specific data is included in the Table 4B-14, Storm Event: February 7, 2001 in Appendix 4B, *Storm Event Summary Data* .

2) Data taken from MMSD, *Jones Island Operations and Maintenance Manual : Plant Summary and Administration* (1 July 1993).

3) Data taken from UWS, *Daily/Weekly Operating Report* (2003).

Primary Sludge Removal for 2003[1]

	BOD			TSS		
	Primary Influent (lb/d)[4]	Primary Effluent (lb/d)	% Rem.	Primary Influent (lb/d)[4]	Primary Effluent (lb/d)	% Rem.
Average [2]	268,393	210,152	22%	218,018	118,820	46%
Max Flow Day (5/9/03)[3]	181,645	165,132	9%	298,063	180,463	39%

NOTES:

1) Used year 2003 as a snapshot year - it was the last full year of existing condition analysis.

2) Average estimate of primary sludge removal was calculated in the JIWWTP 2003 Mass Balance spreadsheets developed for future Mass Balance calibration. The 2003 Mass Balance is included in the 2020 Facility Plan project files.

3) The BOD and TSS removal on the max flow day in 2003 was calculated based on the 2003 data collected in UWS, *Daily/Weekly Operating Report* (2003)

4) The influent loadings assume that 0% of the BOD load and 5% of the TSS load are removed in the influent screening and grit removal unit processes.

DATE	Plant Flow[1] MGD	PE BOD[2] mg/L	Sec Influent BOD[3] lb/d	Hydraulic Capacity[2,4] MGD <390	Secondary Capacity[2,4] MGD <300	# of Times Secondary Capacity <300
1-Jan	63	200	0	390	330	
2-Jan	67			390	330	
3-Jan	69	250	0	390	330	
4-Jan	66			390	330	
5-Jan	69			390	330	
6-Jan	71	320	0	390	330	
7-Jan	72			390	330	
8-Jan	72	360	0	390	330	
9-Jan	72			390	330	
10-Jan	70	290	0	390	330	
11-Jan	69			390	330	
12-Jan	65			390	310	
13-Jan	71	330	0	390	330	
14-Jan	72			390	330	
15-Jan	74	320	0	390	330	
16-Jan	75			390	330	
17-Jan	75	300	0	390	330	
18-Jan	70			390	330	
19-Jan	68			390	346	
20-Jan	68	280	0	390	334	
21-Jan	65			390	324	
22-Jan	66	420	0	390	322	
23-Jan	66			390	298	1
24-Jan	68	350	0	390	325	
25-Jan	84			390	325	
26-Jan	86			390	334	
27-Jan	75	270	0	390	361	
28-Jan	66			390	326	
29-Jan	68	390	0	390	318	
30-Jan	66			390	338	
31-Jan	73	280	0	390	351	
1-Feb	101			390	369	
2-Feb	75			390	385	
3-Feb	92	300	0	390	351	
4-Feb	86			390	354	
5-Feb	69	370	0	390	347	
6-Feb	74			390	318	
7-Feb	71	350	0	390	366	
8-Feb	68			390	355	
9-Feb	69			390	290	1
10-Feb	68	290	0	390	336	
11-Feb	72			390	282	1
12-Feb	78	300	0	390	343	
13-Feb	76			390	352	
14-Feb	72	260	0	390	325	
15-Feb	70			390	293	1
16-Feb	68			390	371	
17-Feb	72	310	0	390	392	
18-Feb	72			390	343	
19-Feb	76	350	0	390	349	
20-Feb	75			390	349	
21-Feb	73	280	0	390	355	
22-Feb	69			390	344	
23-Feb	67			390	330	
24-Feb	72	330	0	390	286	1
25-Feb	73			390	226	1
26-Feb	73	350	0	390	334	
27-Feb	71			390	306	
28-Feb	69	270	0	390	325	

DATE	Plant Flow[1] MGD	PE BOD[2] mg/L	Sec Influent BOD[3] lb/d	Hydraulic Capacity[2,4] MGD <390	Secondary Capacity[2,4] MGD <300	# of Times Secondary Capacity <300
1-Mar	70			390	284	1
2-Mar	65			390	287	1
3-Mar	69	210	0	390	318	
4-Mar	75			390	322	
5-Mar	75	370	0	390	309	
6-Mar	72			390	313	
7-Mar	82	290	0	390	277	1
8-Mar	82			390	278	1
9-Mar	70			390	217	1
10-Mar	72	230	0	390	204	1
11-Mar	80			390	237	1
12-Mar	81	370	0	390	251	1
13-Mar	88			390	245	1
14-Mar	99	230	0	390	233	1
15-Mar	105			390	209	1
16-Mar	83			390	160	1
17-Mar	69	340	0	390	168	1
18-Mar	69			390	182	1
19-Mar	100	350	0	390	203	1
20-Mar	86			390	205	1
21-Mar	76	300	0	390	226	1
22-Mar	62			390	228	1
23-Mar	59			390	218	1
24-Mar	68	160	0	390	247	1
25-Mar	66			390	295	1
26-Mar	72	330	0	390	276	1
27-Mar	76			390	291	1
28-Mar	105	250	0	390	297	1
29-Mar	85			390	279	1
30-Mar	70			390	280	1
31-Mar	78	280	0	390	284	1
1-Apr	78			390	318	
2-Apr	77	360	0	390	285	1
3-Apr	76			390	270	1
4-Apr	134	210	0	390	252	1
5-Apr	106			390	214	1
6-Apr	66			390	236	1
7-Apr	101	250	0	390	255	1
8-Apr	102			390	253	1
9-Apr	108	210	0	390	245	1
10-Apr	97			390	197	1
11-Apr	90	220	0	390	205	1
12-Apr	84			390	181	1
13-Apr	77			390	177	1
14-Apr	82	260	0	390	201	1
15-Apr	81			390	224	1
16-Apr	80	410	0	390	233	1
17-Apr	78			390	229	1
18-Apr	77	270	0	390	196	1
19-Apr	127			390	169	1
20-Apr	99			390	161	1
21-Apr	82	250	0	390	145	1
22-Apr	78			390	145	1
23-Apr	80	300	0	390	204	1
24-Apr	79			390	201	1
25-Apr	79	280	0	390	201	1
26-Apr	74			390	198	1
27-Apr	72			390	200	1
28-Apr	74	240	0	390	222	1
29-Apr	71			390	207	1
30-Apr	111	280	0	390	207	1

DATE	Plant Flow[1] MGD	PE BOD[2] mg/L	Sec Influent BOD[3] lb/d	Hydraulic Capacity[2,4] MGD <390	Secondary Capacity[2,4] MGD <300	# of Times Secondary Capacity <300
1-May	174			390	207	1
2-May	135	120	0	390	262	1
3-May	147			390	314	
4-May	114			390	289	1
5-May	168	120	0	390	305	
6-May	129			390	329	
7-May	183	170	0	390	307	
8-May	117			390	347	
9-May	198	100	0	390	444	
10-May	140			390	316	
11-May	130			390	359	
12-May	109	160	0	390	336	
13-May	103			390	465	
14-May	111			390	472	
15-May	123			390	304	
16-May	94	170	0	390	268	1
17-May	91			390	319	
18-May	84			390	304	
19-May	89	250	0	390	320	
20-May	104			390	256	1
21-May	83	320	0	390	233	1
22-May	82			390	249	1
23-May	82	240	0	390	224	1
24-May	78			390	224	1
25-May	72			390	257	1
26-May	73	210	0	390	257	1
27-May	80			390	254	1
28-May	82			390	293	1
29-May	82			390	258	1
30-May	79	120	0	390	259	1
31-May	96			390	129	1
1-Jun	116			390	129	1
2-Jun	92	160	0	390	258	1
3-Jun	78			390	327	
4-Jun	78	290	0	390	341	
5-Jun	78			390	278	1
6-Jun	76	310	0	390	246	1
7-Jun	74			390	191	1
8-Jun	73			390		
9-Jun	135	240	0	390	150	1
10-Jun	86			390	168	1
11-Jun	82	300	0	390	229	1
12-Jun	79			390	330	
13-Jun	78	270	0	390	330	
14-Jun	84			390	358	
15-Jun	74			390	336	
16-Jun	71	260	0	390	308	
17-Jun	79			390	385	
18-Jun	83	330	0	390	385	
19-Jun	77			390	315	
20-Jun	89	290	0	390	295	1
21-Jun	75			390	273	1
22-Jun	72			390	437	
23-Jun	78	230	0	390	549	
24-Jun	74			390	521	
25-Jun	82	270	0	390	578	
26-Jun	72			390	489	
27-Jun	85	230	0	390	578	
28-Jun	113			390	462	
29-Jun	68			390	354	
30-Jun	75	260	0	390	546	

DATE	Plant Flow[1] MGD	PE BOD[2] mg/L	Sec Influent BOD[3] lb/d	Hydraulic Capacity[2,4] MGD <390	Secondary Capacity[2,4] MGD <300	# of Times Secondary Capacity <300
1-Jul	77			390	581	
2-Jul	82	330	0	390	486	
3-Jul	80			390	424	
4-Jul	73	210	0	390	386	
5-Jul	112			390	395	
6-Jul	92			390	345	
7-Jul	102	270	0	390	395	
8-Jul	103			390	345	
9-Jul	90	350	0	390	357	
10-Jul	58			390		
11-Jul	80	300	0	390	283	1
12-Jul	73			390	296	1
13-Jul	69			390	270	1
14-Jul	57	200	0	390	333	
15-Jul	92			390		
16-Jul	81	320	0	390		
17-Jul	79			390		
18-Jul	77	300	0	390		
19-Jul	73			390	278	1
20-Jul	70			390	297	1
21-Jul	84	220	0	390	304	
22-Jul	89			390	291	1
23-Jul	76	340	0	390	264	1
24-Jul	76			390	260	1
25-Jul	82	310	0	355	214	1
26-Jul	74			355	252	1
27-Jul	76			355	212	1
28-Jul	74	290	0	355	246	1
29-Jul	81			355	242	1
30-Jul	85	310	0	355	237	1
31-Jul	79			355	22	1
1-Aug	88	260	0	355	242	1
2-Aug	88			355	252	1
3-Aug	128			355	309	
4-Aug	98	160	0	355	252	1
5-Aug	82			355	349	
6-Aug	84	270	0	355	363	
7-Aug	78			355	331	
8-Aug	79	320	0	355	309	
9-Aug	75			355	290	1
10-Aug	74			355	265	1
11-Aug	78	230	0	355	269	1
12-Aug	95			355	324	
13-Aug	80	280	0	355	335	
14-Aug	85			355	337	
15-Aug	89	250	0	355	378	
16-Aug	78			355	346	
17-Aug	70			355	346	
18-Aug	86	160	0	355	359	
19-Aug	83			355	354	
20-Aug	88	270	0	355	345	
21-Aug	83			355	391	
22-Aug	86	210	0	355	342	
23-Aug	73			355	332	
24-Aug	73			355	330	
25-Aug	84	350	0	355	330	
26-Aug	81			355	328	
27-Aug	78	340	0	355		
28-Aug	80			355	286	1
29-Aug	70	240	0	355	273	1
30-Aug	70			355	276	1
31-Aug	66			355	296	1

DATE	Plant Flow[1] MGD	PE BOD[2] mg/L	Sec Influent BOD[3] lb/d	Hydraulic Capacity[2,4] MGD <390	Secondary Capacity[2,4] MGD <300	# of Times Secondary Capacity <300
1-Sep	67	180	0	355	302	
2-Sep	73			355	237	1
3-Sep	76	370	0	355	225	1
4-Sep	78			355	216	1
5-Sep	79	280	0	355	216	1
6-Sep	71			355	234	1
7-Sep	79			355	210	1
8-Sep	78	140	0	355	201	1
9-Sep	76			355	273	1
10-Sep	80	350	0	355	255	1
11-Sep	78			355	255	1
12-Sep	103	210	0	355	298	1
13-Sep	115			355	298	1
14-Sep	85			355	220	1
15-Sep	97	160	0	355	220	1
16-Sep	80			355	239	1
17-Sep	74	320	0	355	280	1
18-Sep	70			355	269	1
19-Sep	81	350	0	355	288	1
20-Sep	75			355	261	1
21-Sep	66			355	292	1
22-Sep	97	340	0	355	314	
23-Sep	81			355	334	
24-Sep	80	300	0	355	353	
25-Sep	72			355	303	
26-Sep	83	240	0	355	298	1
27-Sep	71			355	284	1
28-Sep	61			355	296	1
29-Sep	67	280	0	355	296	1
30-Sep	75			355	351	
1-Oct	70	340	0	355	425	
2-Oct	71			355	328	
3-Oct	78	310	0	355	321	
4-Oct	66			355	298	1
5-Oct	62			355	321	
6-Oct	66	270	0	355	289	1
7-Oct	61			355	289	1
8-Oct	71	280	0	355	330	
9-Oct	70			355	326	
10-Oct	67	320	0	355	326	
11-Oct	66			355	313	
12-Oct	68			355	271	1
13-Oct	69	390	0	355	268	1
14-Oct	112			355	344	
15-Oct	66	290	0	355	336	
16-Oct	69			355	317	
17-Oct	71	460	0	355	366	
18-Oct	67			355	290	1
19-Oct	65			355	290	1
20-Oct	68	360	0	355	306	
21-Oct	72			355	317	
22-Oct	68	330	0	355	361	
23-Oct	68			355	343	
24-Oct	100	260	0	355	365	
25-Oct	76			355	330	
26-Oct	75			355	330	
27-Oct	68	330	0	355	391	
28-Oct	74			355	384	
29-Oct	71	400	0	355	349	
30-Oct	72			355	374	
31-Oct	69	270	0	355	347	

DATE	Plant Flow[1] MGD	PE BOD[2] mg/L	Sec Influent BOD[3] lb/d	Hydraulic Capacity[2,4] MGD <390	Secondary Capacity[2,4] MGD <300	# of Times Secondary Capacity <300
1-Nov	68			355	332	
2-Nov	195			355	333	
3-Nov	173	130	0	355	341	
4-Nov	169			355	311	
5-Nov	146	170	0	355	309	
6-Nov	107			355	312	
7-Nov	87	330	0	355	267	1
8-Nov	96			355	267	1
9-Nov	70			355	310	
10-Nov	72	320	0	355	279	1
11-Nov	73			355	254	1
12-Nov	78	390	0	355	255	1
13-Nov	76			355	243	1
14-Nov	71	460	0	355	255	1
15-Nov	66			355	254	1
16-Nov	58			355	254	1
17-Nov	61	250	0	390	392	
18-Nov	168			390	409	
19-Nov	109	210	0	390	374	
20-Nov	88			390	327	
21-Nov	91			390	339	
22-Nov	77			390	324	
23-Nov	74			390	295	1
24-Nov	70	320	0	390	359	
25-Nov	70			390	366	
26-Nov	69	330	0	390	379	
27-Nov	66			390	366	
28-Nov	65	120	0	390	357	
29-Nov	67			390	359	
30-Nov	68			390	417	
1-Dec	72	330	0	390	422	
2-Dec	70			390	405	
3-Dec	70	330	0	390	409	
4-Dec	77			390	377	
5-Dec	72			390	354	
6-Dec	69			390	312	
7-Dec	67			390	261	1
8-Dec	71	240	0	390	253	1
9-Dec	107			390	270	1
10-Dec	183	160	0	390	277	1
11-Dec	123			390	281	1
12-Dec	134	220	0	390	289	1
13-Dec	158			390	303	
14-Dec	112			390	285	1
15-Dec	78	260	0	390	316	
16-Dec	95			390	323	
17-Dec	86	350	0	390	335	
18-Dec	78			390	319	
19-Dec	80	420	0	390	339	
20-Dec	73			390	356	
21-Dec	69			390	379	
22-Dec	77	290	0	390	361	
23-Dec	75			390	376	
24-Dec	70	200	0	390	398	
25-Dec	64			390	403	
26-Dec	66	120	0	390	413	
27-Dec	68			390	455	
28-Dec	91			390	483	
29-Dec	80	190	0	390	486	
30-Dec	71			390	470	
31-Dec	73			390	421	

Secondary Influent BOD Loading

Maximum Secondary Influent BOD Loading:	0
Day Maximum Occurs:	3/19/2003

Calculated Daily Secondary Capacity

Total # Days that Calculated Capacity <300	161
Total # Days that Data was Available	358
% of total data available that capacity <300	44.97%

Calculated Secondary Capacity was NEVER less than influent flow

NOTES:

1) Daily Flow Data from 2003 Monthly DMRs:
UWS on behalf of MMSD, *Discharge Monitoring Report for Permit No. 0036820-1*(2003).

2) Data from UWS, *Daily/Weekly Operating Report* (2003)

3) Secondary Influent includes return flow and loading.

% Increase in Q for recycle flows from WWTP inf to PE:	107%
% Increase in lb/d BOD for recycle BOD from PE to Sec Inf:	102%

Average estimate of recycle flow & BOD was calculated in the JIWWTP 2003 Mass Balance spreadsheets developed for future Mass Balance calibration. The 2003 Mass Balance is included in the 2020 Facility Plan project files.

4) UWS calculates Hydraulic Capacity and Secondary Capacity daily.

Design Peak Hourly Surface Overflow Rate (SOR) Estimation

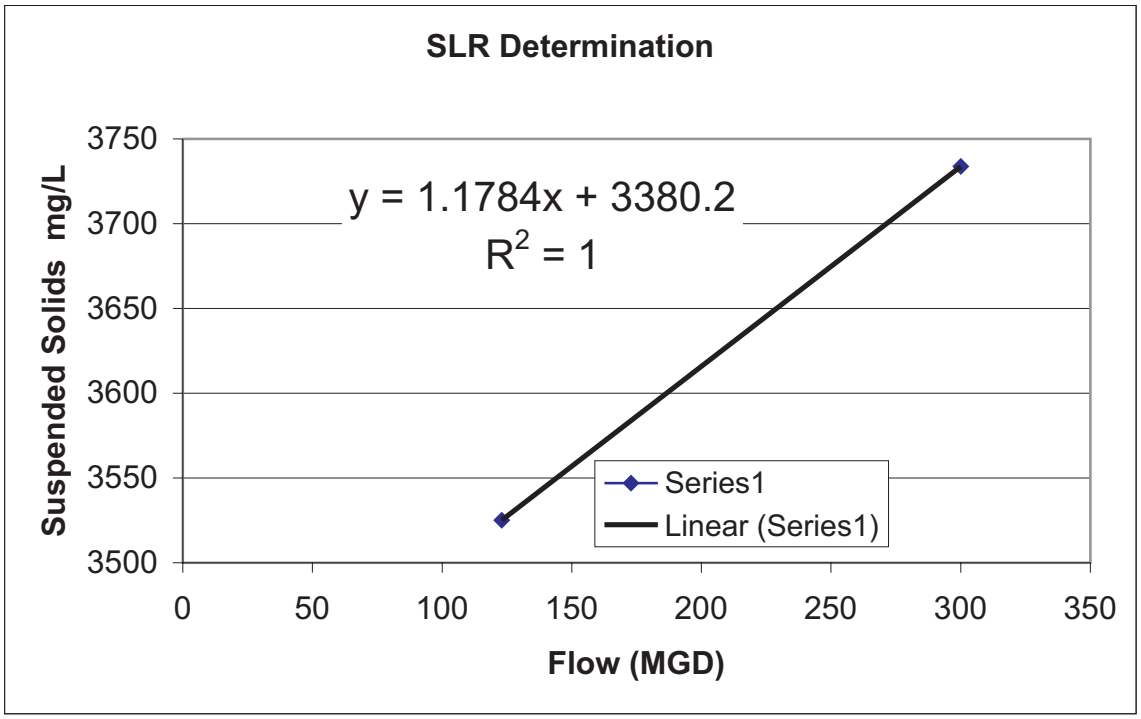
Sec Clarifier Info			# of each
EP Clarifier Area	13230	sf	10
NEP Clarifier Area	6250	sf	12
WP Clarifier Area	8550	sf	11
Total Area (sf)	**301350**		

Peak Hourly Design Flow:	330	MGD
Estimated Peak Hourly SOR:	1100	gpd/sf

Design Peak Hourly Solids Loading Rate (SLR) Estimation

	Flow	SLR	Calculated Suspended Solids Concentration (mg/L)
Ave Day	123	12	3525
Max Day	300	31	3734
Peak Hour*	330	34.4	3769

* Peak Hour Suspended Solids Concentration was estimated based on straight-line trend line below



Source: Jones Island O&M Manual, 1993

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TABLE 4F-27
JIWWTP UNIT PROCESS NO. 6: SECONDARY CLARIFICATION CALCULATIONS
2020 TREATMENT REPORT
6/03/07 TR_4-A.T4F27.07.06.03.cdr

DATE	Est. EP RAS MGD	EP WAS totalizer	EP WAS MGD	Est. WP RAS MGD	WP WAS totalizer	WP WAS MGD	WAS Total MGD
1/1/2003	19		2.358	7		0.000	2.358
1/2/2003			2.187			0.609	2.796
1/3/2003			1.383			1.136	2.519
1/4/2003			1.732			1.471	3.203
1/5/2003			1.307			1.552	2.859
1/6/2003			1.396			1.432	2.828
1/7/2003			1.771			1.064	2.835
1/8/2003			2.179			0.000	2.179
1/9/2003			1.972			0.000	1.972
1/10/2003			1.244			0.806	2.050
1/11/2003			1.196			1.100	2.296
1/12/2003			1.503			1.100	2.603
1/13/2003			1.458			1.190	2.648
1/14/2003			1.604			1.170	2.774
1/15/2003	19		1.872	7		1.410	3.282
1/16/2003			1.968			1.420	3.388
1/17/2003			1.862			1.280	3.142
1/18/2003			2.010			1.100	3.110
1/19/2003			1.886			1.090	2.976
1/20/2003			1.769			1.170	2.939
1/21/2003			1.992			0.990	2.982
1/22/2003			1.992			1.150	3.142
1/23/2003			1.439			1.630	3.069
1/24/2003			2.058			1.360	3.418
1/25/2003			1.776			1.500	3.276
1/26/2003			1.544			1.520	3.064
1/27/2003			1.864			1.520	3.384
1/28/2003			2.165			1.310	3.475
1/29/2003	19		2.111	7		1.180	3.291
1/30/2003			1.976			1.240	3.216
1/31/2003			1.895			1.276	3.171
2/1/2003			1.627			0.247	1.874
2/2/2003			1.852			2.177	4.029
2/3/2003			1.772			1.174	2.946
2/4/2003			1.684			1.183	2.867
2/5/2003			1.603			1.323	2.926
2/6/2003			1.547			1.296	2.843
2/7/2003			1.788			1.248	3.036
2/8/2003			1.597			1.504	3.101
2/9/2003			1.365			1.489	2.854
2/10/2003			1.340			1.839	3.179
2/11/2003			1.300			1.850	3.150
2/12/2003	19		2.644	7		0.102	2.746
2/13/2003			1.929			0.773	2.702
2/14/2003			1.133			1.123	2.256
2/15/2003			1.384			1.063	2.447
2/16/2003			1.541			0.979	2.520
2/17/2003			1.371			1.000	2.371
2/18/2003			1.515			1.011	2.526
2/19/2003			1.725			1.000	2.725
2/20/2003			1.783			1.381	3.164
2/21/2003			1.474			0.742	2.216
2/22/2003			1.261			0.901	2.162
2/23/2003			1.233			0.900	2.133
2/24/2003			1.213			0.825	2.038
2/25/2003			1.807			0.915	2.722
2/26/2003	19		1.576	7		0.850	2.426
2/27/2003			1.576			0.850	2.426
2/28/2003			1.509			0.851	2.360
3/1/2003			1.557			0.850	2.407
3/2/2003			1.232			0.841	2.073
3/3/2003			1.190			1.053	2.243
3/4/2003			1.130			1.117	2.247
3/5/2003			1.051			0.927	1.978
3/6/2003			0.887			0.958	1.845
3/7/2003			0.368			0.601	0.969
3/8/2003			0.595			0.744	1.339
3/9/2003			0.857			0.700	1.557
3/10/2003			1.505			0.700	2.205

DATE	Est. EP RAS MGD	EP WAS totalizer	EP WAS MGD	Est. WP RAS MGD	WP WAS totalizer	WP WAS MGD	WAS Total MGD
3/11/2003			1.978			0.693	2.671
3/12/2003	19		2.269	7		0.825	3.094
3/13/2003			1.930			0.759	2.689
3/14/2003			1.601			0.776	2.377
3/15/2003			1.636			1.262	2.898
3/16/2003			2.013			1.190	3.203
3/17/2003			2.047			1.453	3.500
3/18/2003			2.627			1.477	4.104
3/19/2003			2.661			1.826	4.487
3/20/2003			1.915			2.003	3.918
3/21/2003			2.141			2.685	4.826
3/22/2003			1.870			1.122	2.992
3/23/2003			1.325			0.751	2.076
3/24/2003			2.001			1.249	3.250
3/25/2003			2.010			1.286	3.296
3/26/2003	19		2.626	7		1.314	3.940
3/27/2003			1.904			1.332	3.236
3/28/2003			1.790			1.057	2.847
3/29/2003			1.952			1.014	2.966
3/30/2003			2.486			0.997	3.483
3/31/2003			2.046			0.816	2.862
4/1/2003			2.092			1.063	3.155
4/2/2003			1.936			1.088	3.024
4/3/2003			1.584			1.114	2.698
4/4/2003			1.346			0.744	2.090
4/5/2003			2.050			0.726	2.776
4/6/2003			1.580			0.742	2.322
4/7/2003			1.216			0.755	1.971
4/8/2003			1.342			0.945	2.287
4/9/2003	23		2.558	10		0.996	3.554
4/10/2003			0.538			1.042	1.580
4/11/2003			1.210			0.897	2.107
4/12/2003			1.156			1.212	2.368
4/13/2003			1.450			1.182	2.632
4/14/2003			1.878			2.033	3.911
4/15/2003			1.668			2.324	3.992
4/16/2003			1.592			1.704	3.296
4/17/2003			1.780			1.379	3.159
4/18/2003			1.162			1.255	2.417
4/19/2003			1.616			1.194	2.810
4/20/2003			2.118			1.214	3.332
4/21/2003			2.392			1.186	3.578
4/22/2003			2.378			1.214	3.592
4/23/2003	19		2.794	7		1.918	4.712
4/24/2003			1.888			1.872	3.760
4/25/2003			2.040			2.096	4.136
4/26/2003			1.478			2.234	3.712
4/27/2003			1.290			2.020	3.310
4/28/2003			1.752			2.124	3.876
4/29/2003			1.896			2.350	4.246
4/30/2003			2.190			2.326	4.516
5/1/2003			2.780			2.186	4.966
5/2/2003			3.156			2.290	5.446
5/3/2003			2.064			1.938	4.002
5/4/2003			1.988			1.830	3.818
5/5/2003			2.120			2.056	4.176
5/6/2003			2.100			2.048	4.148
5/7/2003	38		1.724	16		1.718	3.442
5/8/2003			2.588			1.720	4.308
5/9/2003	42		2.712	18		1.980	4.692
5/10/2003			2.540			2.000	4.540
5/11/2003			2.712			2.132	4.844
5/12/2003			2.516			1.764	4.280
5/13/2003			2.780			1.952	4.732
5/14/2003			2.219			1.770	3.989
5/15/2003			0.610			1.936	2.546
5/16/2003			1.523			1.804	3.327
5/17/2003			1.592			1.800	3.392
5/18/2003			1.716			1.800	3.516
5/19/2003			1.980			1.644	3.624

DATE	Est. EP RAS MGD	EP WAS totalizer	EP WAS MGD	Est. WP RAS MGD	WP WAS totalizer	WP WAS MGD	WAS Total MGD
5/20/2003			2.208			1.384	3.592
5/21/2003	19		2.492	7		1.756	4.248
5/22/2003			2.516			1.748	4.264
5/23/2003			2.252			1.480	3.732
5/24/2003			2.404			1.580	3.984
5/25/2003			2.016			1.212	3.228
5/26/2003			2.512			1.544	4.056
5/27/2003			1.780			1.036	2.816
5/28/2003			2.180			1.268	3.448
5/29/2003			1.764			1.668	3.432
5/30/2003			3.024			0.580	3.604
5/31/2003			2.636			1.392	4.028
6/1/2003			1.984			0.916	2.900
6/2/2003			2.196			1.056	3.252
6/3/2003			2.640			1.496	4.136
6/4/2003	19		2.420	7		1.636	4.056
6/5/2003			2.628			1.924	4.552
6/6/2003			2.356			1.536	3.892
6/7/2003			2.128			1.212	3.340
6/8/2003			2.116			1.204	3.320
6/9/2003			1.820			0.980	2.800
6/10/2003			2.052			1.140	3.192
6/11/2003			2.404			1.428	3.832
6/12/2003			1.668			0.928	2.596
6/13/2003			1.552			0.840	2.392
6/14/2003			1.464			0.816	2.280
6/15/2003			1.376			0.820	2.196
6/16/2003			1.480			0.888	2.368
6/17/2003			1.684			0.968	2.652
6/18/2003	19		1.584	7		0.928	2.512
6/19/2003			1.736			0.992	2.728
6/20/2003			1.848			1.048	2.896
6/21/2003			1.704			0.960	2.664
6/22/2003			2.064			1.224	3.288
6/23/2003			2.496			1.528	4.024
6/24/2003			2.756			1.620	4.376
6/25/2003			2.376			1.796	4.172
6/26/2003			1.688			1.008	2.696
6/27/2003			2.460			1.872	4.332
6/28/2003			2.272			1.680	3.952
6/29/2003			2.680			1.672	4.352
6/30/2003			2.468			1.740	4.208
7/1/2003			1.664			1.088	2.752
7/2/2003	19		1.488	7		1.032	2.520
7/3/2003			1.224			0.832	2.056
7/4/2003			1.224			0.776	2.000
7/5/2003			1.096			0.756	1.852
7/6/2003			1.544			1.036	2.580
7/7/2003			1.264			0.832	2.096
7/8/2003			1.544			0.908	2.452
7/9/2003			1.416			0.928	2.344
7/10/2003			1.368			0.916	2.284
7/11/2003			1.432			0.952	2.384
7/12/2003			1.536			1.032	2.568
7/13/2003			1.536			1.028	2.564
7/14/2003			1.504			1.008	2.512
7/15/2003			2.200			1.480	3.680
7/16/2003	19		1.944	7		1.224	3.168
7/17/2003			1.720			1.168	2.888
7/18/2003			1.192			0.832	2.024
7/19/2003			1.904			1.224	3.128
7/20/2003			2.064			1.316	3.380
7/21/2003			1.536			1.000	2.536
7/22/2003			1.064			0.716	1.780
7/23/2003			1.312			0.900	2.212
7/24/2003			1.344			0.960	2.304
7/25/2003			1.648			1.108	2.756
7/26/2003			2.064			1.340	3.404
7/27/2003			1.632			1.052	2.684
7/28/2003			1.856			1.196	3.052

DATE	Est. EP RAS MGD	EP WAS totalizer	EP WAS MGD	Est. WP RAS MGD	WP WAS totalizer	WP WAS MGD	WAS Total MGD
7/29/2003			2.400			1.804	4.204
7/30/2003	19		2.400	8		1.804	4.204
7/31/2003			1.912			1.028	2.940
8/1/2003			2.256			1.180	3.436
8/2/2003			2.504			1.360	3.864
8/3/2003			2.192			1.212	3.404
8/4/2003			2.400			1.412	3.812
8/5/2003			2.312			1.484	3.796
8/6/2003			1.872			1.320	3.192
8/7/2003			2.288			1.508	3.796
8/8/2003			1.680			1.336	3.016
8/9/2003			1.024			0.716	1.740
8/10/2003			1.416			0.052	1.468
8/11/2003			1.560			0.244	1.804
8/12/2003	20		1.424	9		0.964	2.388
8/13/2003			1.552			1.060	2.612
8/14/2003			1.816			1.132	2.948
8/15/2003			2.232			1.336	3.568
8/16/2003			2.520			1.464	3.984
8/17/2003			2.384			1.352	3.736
8/18/2003			1.856			1.272	3.128
8/19/2003			2.424			1.548	3.972
8/20/2003			2.680			1.648	4.328
8/21/2003			2.560			1.660	4.220
8/22/2003			2.192			1.488	3.680
8/23/2003			2.016			1.368	3.384
8/24/2003			2.160			1.484	3.644
8/25/2003			2.128			1.456	3.584
8/26/2003			1.832			1.256	3.088
8/27/2003	19		1.816	7		1.232	3.048
8/28/2003			1.616			1.096	2.712
8/29/2003			1.640			1.112	2.752
8/30/2003			1.704			1.136	2.840
8/31/2003			1.424			1.080	2.504
9/1/2003			1.496			0.992	2.488
9/2/2003			2.424			0.412	2.836
9/3/2003			2.360			0.428	2.788
9/4/2003			1.640			1.120	2.760
9/5/2003			1.704			1.160	2.864
9/6/2003			1.648			1.120	2.768
9/7/2003			1.416			0.968	2.384
9/8/2003			1.128			0.692	1.820
9/9/2003			2.448			1.400	3.848
9/10/2003	19		2.168	7		1.180	3.348
9/11/2003			1.904			1.040	2.944
9/12/2003			2.064			1.180	3.244
9/13/2003			2.064			1.180	3.244
9/14/2003			2.152			1.232	3.384
9/15/2003			1.928			1.056	2.984
9/16/2003			2.072			1.144	3.216
9/17/2003			2.336			1.320	3.656
9/18/2003			2.080			1.184	3.264
9/19/2003			2.176			1.248	3.424
9/20/2003			1.496			0.856	2.352
9/21/2003			2.152			1.256	3.408
9/22/2003			1.880			1.104	2.984
9/23/2003			2.208			1.272	3.480
9/24/2003	19		1.648	7		0.936	2.584
9/25/2003			1.864			1.040	2.904
9/26/2003			1.488			0.816	2.304
9/27/2003			1.456			0.800	2.256
9/28/2003			1.528			0.856	2.384
9/29/2003			1.856			1.040	2.896
9/30/2003			1.520			0.984	2.504
10/1/2003			1.784			1.208	2.992
10/2/2003			1.520			1.000	2.520
10/3/2003			1.576			1.056	2.632
10/4/2003			1.680			1.144	2.824
10/5/2003			1.800			1.200	3.000
10/6/2003			1.560			1.024	2.584

DATE	Est. EP RAS MGD	EP WAS totalizer	EP WAS MGD	Est. WP RAS MGD	WP WAS totalizer	WP WAS MGD	WAS Total MGD
10/7/2003			1.864			1.104	2.968
10/8/2003	19		1.920	7		1.024	2.944
10/9/2003			2.432			1.288	3.720
10/10/2003			1.912			0.992	2.904
10/11/2003			2.152			1.120	3.272
10/12/2003			2.016			1.040	3.056
10/13/2003			2.120			1.080	3.200
10/14/2003			1.816			0.408	2.224
10/15/2003			2.296			0.776	3.072
10/16/2003			1.976			1.024	3.000
10/17/2003			2.280			1.232	3.512
10/18/2003			2.192			1.168	3.360
10/19/2003			2.192			1.152	3.344
10/20/2003			2.096			1.128	3.224
10/21/2003			1.816			0.976	2.792
10/22/2003	19		1.712	7		0.976	2.688
10/23/2003			2.240			1.216	3.456
10/24/2003			1.936			1.072	3.008
10/25/2003			1.976			1.056	3.032
10/26/2003			1.736			0.976	2.712
10/27/2003			1.536			0.848	2.384
10/28/2003			1.824			0.984	2.808
10/29/2003			1.888			0.880	2.768
10/30/2003			1.720			0.808	2.528
10/31/2003			1.864			0.888	2.752
11/1/2003			1.944			0.952	2.896
11/2/2003			1.368			0.664	2.032
11/3/2003			1.072			0.512	1.584
11/4/2003			1.088			0.472	1.560
11/5/2003	31		1.288	13		0.480	1.768
11/6/2003			1.648			0.648	2.296
11/7/2003			1.936			0.264	2.200
11/8/2003			2.176			0.000	2.176
11/9/2003			2.224			0.000	2.224
11/10/2003			2.120			0.000	2.120
11/11/2003			2.160			0.000	2.160
11/12/2003			2.192			0.000	2.192
11/13/2003			2.136			0.000	2.136
11/14/2003			2.312			0.000	2.312
11/15/2003			2.112			0.000	2.112
11/16/2003			2.208			0.000	2.208
11/17/2003			2.664			0.000	2.664
11/18/2003			2.080			0.000	2.080
11/19/2003	23		2.496	10		0.000	2.496
11/20/2003			1.840			0.000	1.840
11/21/2003			2.448			0.000	2.448
11/22/2003			2.672			0.000	2.672
11/23/2003			3.280			0.000	3.280
11/24/2003			3.488			0.008	3.496
11/25/2003			3.680			0.000	3.680
11/26/2003			2.880			0.744	3.624
11/27/2003			1.744			0.936	2.680
11/28/2003			1.552			0.856	2.408
11/29/2003			1.696			0.936	2.632
11/30/2003			2.144			1.200	3.344
12/1/2003			1.696			0.920	2.616
12/2/2003			1.840			0.824	2.664
12/3/2003	19		1.440	7		0.512	1.952
12/4/2003			0.000			0.000	0.000
12/5/2003			0.000			0.000	0.000
12/6/2003			0.000			0.000	0.000
12/7/2003			0.000			0.000	0.000
12/8/2003			1.152			0.648	1.800
12/9/2003			2.656			1.104	3.760
12/10/2003			2.208			1.144	3.352
12/11/2003			2.064			1.248	3.312
12/12/2003			1.952			1.192	3.144
12/13/2003			1.920			1.160	3.080
12/14/2003			2.128			1.312	3.440
12/15/2003			2.656			1.592	4.248

DATE	Est. EP RAS MGD	EP WAS totalizer	EP WAS MGD	Est. WP RAS MGD	WP WAS totalizer	WP WAS MGD	WAS Total MGD
12/16/2003			2.944			1.896	4.840
12/17/2003	19		2.832	8		1.688	4.520
12/18/2003			2.352			1.312	3.664
12/19/2003			2.656			1.552	4.208
12/20/2003			2.416			1.376	3.792
12/21/2003			2.256			1.216	3.472
12/22/2003			2.896			1.744	4.640
12/23/2003			1.904			1.152	3.056
12/24/2003			1.984			1.192	3.176
12/25/2003			1.680			0.992	2.672
12/26/2003			1.744			1.080	2.824
12/27/2003			1.792			1.120	2.912
12/28/2003			1.904			1.152	3.056
12/29/2003			1.424			0.792	2.216
12/30/2003			1.248			0.688	1.936
12/31/2003	19		1.424	7		0.744	2.168
Ave	**21.250**		**1.872**	**8.286**		**1.117**	**2.989**
Max	**42.00**		**3.68**	**18.00**		**2.69**	**6.365**

Ave RAS Total	29.5	Ave WAS Total	2.989
Max RAS Total	60.0	Max WAS Total	6.365
		Ave WAS Total (gpm)	2075
		Max WAS Total (gpm)	4420

NOTES:

1) Data from UWS, Daily/Weekly Operating Report (2003).

2) Estimated East Plant (EP) and West Plant (WP) RAS from Plant Schematic provided in the UWS, Daily/Weekly Operating Report (2002) and using 2003 flows

Preserving The Environment • Improving Water Quality

TABLE 4F-28 SHEET 6 OF 6

JIWWTP UNIT PROCESS NO. 7: ACTIVATED SLUDGE PUMPING CALCULATIONS

2020 TREATMENT REPORT

6/03/07 TR_4-A.T4F28.07.06.03.cdr

DATE	NaOCl Used GPD	Act Cl_2 Dose mg/l	$NaHSO_3$ Used GPD	SO_2 Dose mg/l
1-Jan	0	0	228.42	0.522349
2-Jan	1743.76	3.730311	186.12	0.398154
3-Jan	1550.18	3.21024	186.12	0.385433
4-Jan	1810.44	3.941519	253.8	0.552549
5-Jan	1497.42	3.128447	194.58	0.406521
6-Jan	1395.9	2.842068	169.2	0.344493
7-Jan	1132.02	2.26223	101.52	0.202878
8-Jan	991.12	1.980655	152.28	0.304317
9-Jan	1184.4	2.366906	228.42	0.456475
10-Jan	1116.72	2.295416	194.58	0.399959
11-Jan	1099.8	2.306773	186.12	0.390377
12-Jan	693.72	1.535628	118.44	0.26218
13-Jan	1142.1	2.31452	169.2	0.342892
14-Jan	1184.4	2.366906	152.28	0.304317
15-Jan	855.62	1.664334	76.14	0.148106
16-Jan	866.68	1.662695	101.52	0.194763
17-Jan	795.24	1.52564	109.98	0.210993
18-Jan	778.32	1.599836	42.3	0.086948
19-Jan	769.86	1.628989	-8.46	-0.017901
20-Jan	871.38	1.8438	152.28	0.322218
21-Jan	727.56	1.610537	575.28	1.273448
22-Jan	922.14	2.010334	16.92	0.036887
23-Jan	846	1.844343	-109.84	-0.239459
24-Jan	617.2	1.305967	431.46	0.91295
25-Jan	905.22	1.550565	-16.92	-0.028983
26-Jan	955.98	1.599431	25.38	0.042463
27-Jan	778.32	1.49318	253.8	0.486906
28-Jan	651.42	1.422947	-64.86	-0.141679
29-Jan	727.56	1.539484	321.48	0.680237
30-Jan	829.08	1.807456	287.64	0.627077
31-Jan	785	2	109.98	0.216892
1-Feb	989.82	1.4101	50.76	0.072313
2-Feb	685.26	1.311151	-8.46	-0.016187
3-Feb	1285.92	2.011135	8.46	0.013231
4-Feb	989.82	1.656048	8.46	0.014154
5-Feb	905.22	1.887645	769.86	1.60538
6-Feb	651.42	1.266615	270.72	0.526385
7-Feb	891.16	1.805978	702.18	1.423001
8-Feb	719.1	1.521583	372.24	0.787643
9-Feb	778.32	1.623022	194.58	0.405755
10-Feb	871.38	1.8438	253.8	0.537029
11-Feb	794.26	1.58725	194.58	0.388849
12-Feb	972.9	1.794687	211.5	0.390149
13-Feb	998.28	1.889966	203.04	0.3844
14-Feb	905.22	1.808993	203.04	0.405755
15-Feb	896.76	1.843289	296.1	0.608633
16-Feb	736.02	1.557385	177.66	0.37592
17-Feb	736.02	1.470863	169.2	0.338129
18-Feb	700.28	1.39944	177.66	0.355036
19-Feb	765.04	1.448391	143.82	0.272283
20-Feb	820.62	1.574331	167.72	0.321765
21-Feb	939.06	1.850912	228.42	0.450222
22-Feb	998.28	2.081702	296.1	0.617454
23-Feb	998.28	2.143842	228.42	0.49054
24-Feb	1108.26	2.214748	279.18	0.557914
25-Feb	1082.88	2.134385	253.8	0.500246
26-Feb	947.52	1.867586	126.9	0.250123
27-Feb	896.76	1.817327	8.46	0.017145
28-Feb	688.1	1.434887	313.02	0.652737
1-Mar	744.48	1.530277	262.26	0.539075
2-Mar	871.38	1.928899	253.8	0.561815
3-Mar	784.42	1.635742	219.96	0.45868
4-Mar	820.62	1.574331	262.26	0.503137
5-Mar	744.48	1.420682	245.34	0.468179
6-Mar	913.68	1.815811	219.96	0.43714
7-Mar	630.12	1.107288	194.58	0.341929
8-Mar	913.68	1.603229	279.18	0.489875
9-Mar	939.06	1.930236	219.96	0.452127
10-Mar	829.98	1.658633	211.5	0.422662
11-Mar	922.14	1.658525	160.74	0.289101

DATE	NaOCl Used GPD	Act Cl_2 Dose mg/l	$NaHSO_3$ Used GPD	SO_2 Dose mg/l
12-Mar	1032.12	1.833413	236.88	0.420783
13-Mar	1150.56	1.885944	-68.28	-0.111921
14-Mar	1294.38	1.88104	313.02	0.454892
15-Mar	1285.92	1.754784	262.26	0.357884
16-Mar	989.82	1.724632	245.34	0.427473
17-Mar	947.52	1.975852	160.74	0.335189
18-Mar	1071.42	2.23422	203.04	0.423397
19-Mar	1431.84	2.068268	338.4	0.488813
20-Mar	1133.64	1.894688	177.66	0.296929
21-Mar	1446.66	2.738849	219.96	0.416433
22-Mar	1133.64	2.630866	211.5	0.490833
23-Mar	1311.3	3.197903	169.2	0.412633
24-Mar	1336.68	2.828354	296.1	0.626534
25-Mar	1776.6	3.885483	270.72	0.592074
26-Mar	1862.2	3.742736	228.42	0.459089
27-Mar	1583.72	2.981855	152.28	0.286715
28-Mar	2368.8	3.254722	169.2	0.23248
29-Mar	1869.66	3.164892	169.2	0.286416
30-Mar	1768.14	3.634409	84.6	0.173895
31-Mar	1529.34	2.82114	566.82	1.0456
1-Apr	1302.02	2.401808	186.12	0.343331
2-Apr	1370.52	2.569678	211.5	0.396555
3-Apr	1565.1	2.958022	296.1	0.559626
4-Apr	2250.36	2.416364	397.62	0.426952
5-Apr	1708.92	2.319696	296.1	0.401928
6-Apr	1370.52	2.987835	329.94	0.719294
7-Apr	1292.92	1.841898	236.88	0.33746
8-Apr	1197.94	1.689858	304.56	0.429623
9-Apr	1362.06	1.814628	270.72	0.360671
10-Apr	1074.42	1.59374	126.9	0.188237
11-Apr	1040.58	1.670092	16.92	0.027156
12-Apr	1142.1	1.961458	194.58	0.334174
13-Apr	1006.74	1.869334	186.12	0.345591
14-Apr	605.66	1.062748	143.82	0.25236
15-Apr	1042.12	1.851177	250.94	0.445759
16-Apr	1531.26	2.754065	346.86	0.623849
17-Apr	1108.26	2.044383	228.42	0.421361
18-Apr	1082.88	2.023507	203.04	0.379408
19-Apr	1429.74	1.619827	287.64	0.325882
20-Apr	1328.22	1.930412	270.72	0.39346
21-Apr	1286.46	2.257343	228.42	0.400807
22-Apr	834.62	1.539605	220.18	0.406161
23-Apr	862.92	1.552014	211.5	0.380396
24-Apr	642.96	1.171041	194.58	0.354394
25-Apr	778.32	1.42298	211.5	0.386679
26-Apr	1015.2	1.973945	160.74	0.312541
27-Apr	812.16	1.623022	203.04	0.405755
28-Apr	761.4	1.480459	143.82	0.279642
29-Apr	634.5	1.285845	135.36	0.274314
30-Apr	1552.72	2.012729	338.4	0.438654
1-May	3096.36	2.560456	812.16	0.671595
2-May	1624.32	1.731223	355.32	0.378705
3-May	1725.84	1.689267	372.24	0.364352
4-May	989.82	1.2493	194.58	0.245589
5-May	2284.26	1.956372	617.58	0.528931
6-May	1396.36	1.557481	321.48	0.358575
7-May	2757.96	2.168463	575.28	0.452317
8-May	1455.12	1.789485	304.56	0.374543
9-May	3874.68	2.815697	1108.26	0.805363
10-May	1937.34	1.99352	321.48	0.330803
11-May	1632.78	1.811771	355.32	0.394271
12-May	852.54	1.125391	177.66	0.234519
13-May	1336.68	1.867263	1203.52	1.681246
14-May	1167.48	1.513358	262.26	0.339957
15-May	1175.1	1.374627	101.52	0.118758
16-May	963.98	1.477598	135.36	0.207481
17-May	964.44	1.529296	109.98	0.174393
18-May	955.98	1.639465	84.6	0.145085
19-May	896.76	1.445555	101.52	0.163648
20-May	1159.02	1.599976	75.34	0.104004
21-May	1218.24	2.11852	118.44	0.205967

DATE	NaOCl Used GPD	Act Cl_2 Dose mg/l	$NaHSO_3$ Used GPD	SO_2 Dose mg/l
22-May	1315.64	2.308545	118.44	0.207826
23-May	1336.94	2.34592	109.98	0.192981
24-May	1159.02	2.138019	177.66	0.327726
25-May	1632.78	3.26295	50.76	0.101439
26-May	1116.72	2.201084	118.44	0.233448
27-May	1218.24	2.191079	93.06	0.167374
28-May	1353.6	2.381543	194.58	0.342347
29-May	1152.26	2.021863	219.96	0.385962
30-May	2140.46	3.898479	219.96	0.400619
31-May	1556.64	2.333094	304.56	0.456475
1-Jun	1362.06	1.689482	236.88	0.293823
2-Jun	1159.02	1.812668	211.5	0.330779
3-Jun	1252.08	2.309685	228.42	0.421361
4-Jun	1141.06	2.104888	203.04	0.374543
5-Jun	1319.76	2.434532	42.3	0.07803
6-Jun	1166.48	2.208406	169.2	0.320333
7-Jun	1362.06	2.648376	76.14	0.148046
8-Jun	2106.54	4.152045	219.96	0.433547
9-Jun	1742.76	1.857458	160.74	0.171319
10-Jun	4035.42	6.751581	931.52	1.558508
11-Jun	6674.94	11.71248	287.64	0.50472
12-Jun	3828.24	6.97248	279.18	0.508478
13-Jun	2064.3	3.807969	152.28	0.280908
14-Jun	1988.1	3.405447	160.74	0.275334
15-Jun	1886.58	3.668248	203.04	0.394789
16-Jun	1969.56	3.991407	279.18	0.565772
17-Jun	1937.34	3.528531	296.1	0.539295
18-Jun	1852.96	3.212204	169.2	0.293317
19-Jun	1818.9	3.39886	169.2	0.316173
20-Jun	3588.72	5.801827	160.74	0.259866
21-Jun	6708.78	12.87056	177.66	0.340835
22-Jun	4703.76	9.4	160.74	0.321223
23-Jun	2098.08	3.870282	169.2	0.31212
24-Jun	1226.7	2.385184	143.82	0.279642
25-Jun	2033.08	3.567433	169.2	0.296894
26-Jun	1828.64	3.654357	1003.5	2.005396
27-Jun	1937.34	3.279458	245.34	0.415303
28-Jun	2174.22	2.768473	296.1	0.377029
29-Jun	1387.44	2.93576	279.18	0.590732
30-Jun	1582.02	3.03505	253.8	0.486906
1-Jul	1639.48	3.06359	101.52	0.189704
2-Jul	1545.94	2.712651	118.44	0.207826
3-Jul	1522.8	2.738849	236.88	0.426043
4-Jul	1336.68	2.634631	219.96	0.433547
5-Jul	1734.3	2.228032	262.26	0.336922
6-Jul	1658.16	2.593306	236.88	0.370472
7-Jul	1472.04	2.076513	186.12	0.262548
8-Jul	2383.36	3.317174	287.64	0.400339
9-Jul	1703.9	2.715011	287.64	0.458328
10-Jul	1277.46	3.16909	275.72	0.683999
11-Jul	2191.14	3.947314	287.64	0.51818
12-Jul	1522.8	3.001478	203.04	0.400197
13-Jul	1641.24	3.437404	169.2	0.354372
14-Jul	1461.66	3.689663	219.96	0.555244
15-Jul	1849.7	2.892868	194.58	0.304317
16-Jul	1607.4	2.855316	186.12	0.330616
17-Jul	1598.94	2.912194	1193.7	2.174119
18-Jul	1745.2	3.261142	203.04	0.379408
19-Jul	1928.88	3.801872	321.48	0.633645
20-Jul	1556.64	3.213443	279.18	0.576324
21-Jul	2188.16	3.748133	380.7	0.652107
22-Jul	1708.92	2.762784	304.56	0.492377
23-Jul	1583.2	2.997349	338.4	0.640666
24-Jul	1548.18	2.931049	321.48	0.608633
25-Jul	1437.38	2.522162	211.5	0.371118
26-Jul	1353.6	2.631927	228.42	0.444138
27-Jul	1573.56	2.979099	304.56	0.5766
28-Jul	1388.92	2.700603	253.8	0.493486
29-Jul	1421.28	2.5247	177.66	0.315588
30-Jul	1505.88	2.549099	109.98	0.18617
31-Jul	1404.36	2.5578	267.78	0.487715

DATE	NaOCl Used GPD	Act Cl_2 Dose mg/l	$NaHSO_3$ Used GPD	SO_2 Dose mg/l
1-Aug	1650.3	2.698332	253.8	0.414977
2-Aug	1556.64	2.545193	304.56	0.497973
3-Aug	2233.44	2.510612	380.7	0.427945
4-Aug	1607.4	2.360006	321.48	0.472001
5-Aug	1632.78	2.865029	414.54	0.727391
6-Aug	1192.86	2.043268	456.84	0.782528
7-Aug	1446.66	2.668622	245.34	0.452573
8-Aug	1731.48	3.153593	253.8	0.462253
9-Aug	1446.66	2.775367	186.12	0.357065
10-Aug	1243.62	2.418083	186.12	0.36189
11-Aug	1546.06	2.851983	203.04	0.374543
12-Aug	1302.84	1.973253	253.8	0.3844
13-Aug	1260.54	2.267158	169.2	0.304317
14-Aug	1514.34	2.563419	203.04	0.343699
15-Aug	1557	2.517177	152.28	0.246189
16-Aug	1793.52	3.308467	143.82	0.265302
17-Aug	1785.06	3.64834	194.58	0.397686
18-Aug	1624.86	2.718521	1080.16	1.807194
19-Aug	1868.28	3.254446	262.26	0.456843
20-Aug	1801.98	2.946337	245.34	0.401145
21-Aug	1708.92	2.962503	169.2	0.293317
22-Aug	2131.92	3.566873	296.1	0.495399
23-Aug	1717.38	3.385	228.42	0.450222
24-Aug	1522.8	3.001478	143.82	0.283473
25-Aug	2046.5	3.505481	152.28	0.260843
26-Aug	1784.02	3.169056	203.04	0.360671
27-Aug	1602.24	2.955617	186.12	0.343331
28-Aug	1302.84	2.343237	160.74	0.289101
29-Aug	1971.18	4.051757	321.48	0.660802
30-Aug	1776.6	3.651799	253.8	0.521686
31-Aug	1658.16	3.614912	219.96	0.479529
1-Sep	1345.14	2.888736	169.2	0.363363
2-Sep	2207.02	4.350094	253.8	0.500246
3-Sep	1292.54	2.447066	101.52	0.1922
4-Sep	1759.68	3.246043	219.96	0.405755
5-Sep	1871.7	3.408979	844.5	1.538111
6-Sep	1455.12	2.94887	169.2	0.342892
7-Sep	1793.52	3.266588	279.18	0.508478
8-Sep	1626.66	3.000664	236.88	0.436967
9-Sep	1641.24	3.107232	160.74	0.304317
10-Sep	2098.08	3.773525	253.8	0.456475
11-Sep	2277.36	4.200996	296.1	0.546209
12-Sep	2453.4	3.427254	262.26	0.366362
13-Sep	2757.96	3.450685	304.56	0.381057
14-Sep	2741.04	4.639932	296.1	0.501227
15-Sep	2134.18	3.165735	253.8	0.376474
16-Sep	1879.88	3.381079	219.96	0.395612
17-Sep	1901.78	3.697803	296.1	0.575734
18-Sep	1971.18	4.051757	304.56	0.626023
19-Sep	2681.82	4.763869	262.26	0.465867
20-Sep	1835.82	3.521957	236.88	0.454446
21-Sep	1768.14	3.854676	194.58	0.424199
22-Sep	2148.7	3.203787	253.8	0.378425
23-Sep	1652.82	2.935998	194.58	0.345643
24-Sep	1700.46	3.058381	721.54	1.297734
25-Sep	1615.86	3.236779	211.5	0.423662
26-Sep	1683.54	2.907995	279.18	0.48223
27-Sep	1455.12	2.965578	203.04	0.413802
28-Sep	1378.98	3.275246	219.96	0.522432
29-Sep	1487.2	3.193815	219.96	0.472372
30-Sep	1451.84	2.785305	253.8	0.486906
1-Oct	1446.66	2.973607	236.88	0.486906
2-Oct	1387.44	2.811713	236.88	0.480049
3-Oct	1621.38	2.990924	253.8	0.468179
4-Oct	1235.16	2.69274	152.28	0.331982
5-Oct	1269	2.944999	186.12	0.431933
6-Oct	1243.62	2.711184	160.74	0.350425
7-Oct	1200.12	2.830806	169.2	0.399104
8-Oct	1167.48	2.365954	186.12	0.377181
9-Oct	1328.22	2.730154	279.18	0.573854
10-Oct	1235.7	2.634833	160.74	0.342739

DATE	NaOCl Used GPD	Act Cl_2 Dose mg/l	$NaHSO_3$ Used GPD	SO_2 Dose mg/l
11-Oct	1514.34	3.301373	211.5	0.461086
12-Oct	1505.88	3.186373	406.08	0.859247
13-Oct	1252.08	2.610948	219.96	0.45868
14-Oct	1548.18	1.988926	346.86	0.445606
15-Oct	972.9	2.120994	169.2	0.368869
16-Oct	1023.66	2.134626	236.88	0.493963
17-Oct	852.02	1.726659	160.74	0.325747
18-Oct	939.06	2.016665	143.82	0.308859
19-Oct	1108.26	2.441989	152.28	0.33554
20-Oct	1032.12	2.179752	84.6	0.178668
21-Oct	1074.42	2.147122	228.42	0.456475
22-Oct	727.56	1.539484	152.28	0.322218
23-Oct	806.54	1.706602	143.82	0.304317
24-Oct	1314.64	1.891568	253.8	0.36518
25-Oct	888.3	1.681749	177.66	0.33635
26-Oct	1133.64	2.174849	219.96	0.421986
27-Oct	1032.12	2.183919	101.52	0.214812
28-Oct	1260.54	2.450982	279.18	0.542835
29-Oct	702.18	1.423001	160.74	0.325747
30-Oct	1006.74	2.011871	118.44	0.236691
31-Oct	955.98	1.993494	177.66	0.370472
1-Nov	1243.62	2.631443	270.72	0.572831
2-Nov	2106.54	1.554355	448.38	0.330847
3-Nov	1913.84	1.591749	465.3	0.386992
4-Nov	2110.68	1.797012	346.86	0.295313
5-Nov	1996.56	1.967636	262.26	0.258461
6-Nov	1725.84	2.320769	329.94	0.443676
7-Nov	1429.74	2.364575	186.12	0.307814
8-Nov	2140.38	3.208004	270.72	0.405755
9-Nov	1666.62	3.425735	228.42	0.469517
10-Nov	1362.48	2.722782	177.66	0.355036
11-Nov	1683.54	3.318301	185.06	0.364758
12-Nov	1269	2.340897	152.28	0.280908
13-Nov	1878.12	3.555699	228.42	0.43245
14-Nov	1598.94	3.240328	152.28	0.308603
15-Nov	1514.34	3.301373	152.28	0.331982
16-Nov	2013.48	5.029676	211.5	0.528327
17-Nov	1315.78	3.103621	253.8	0.598656
18-Nov	3536.28	3.028674	338.4	0.289825
19-Nov	2005.02	2.646716	129.88	0.171447
20-Nov	1336.68	2.185546	177.66	0.290484
21-Nov	1613.34	2.550937	253.8	0.401297
22-Nov	1582.02	2.956218	253.8	0.47426
23-Nov	1759.68	3.421505	186.12	0.36189
24-Nov	2148.84	4.442322	304.56	0.62962
25-Nov	1303.22	2.678767	118.44	0.243453
26-Nov	1442.46	3.007945	177.66	0.370472
27-Nov	1429.74	3.116939	228.42	0.497973
28-Nov	1488.96	3.273821	228.42	0.502234
29-Nov	1438.2	3.088586	236.88	0.508708
30-Nov	1277.46	2.703047	135.36	0.286416
1-Dec	1623.9	3.245204	245.34	0.490288
2-Dec	1402.44	2.882713	186.12	0.382569
3-Dec	1345.14	2.764933	177.66	0.36518
4-Dec	1463.22	2.734224	124.58	0.232795
5-Dec	1438.2	2.874101	101.52	0.202878
6-Dec	1522.8	3.175477	169.2	0.352831
7-Dec	1260.54	2.707055	177.66	0.381531
8-Dec	1734.3	3.514642	160.74	0.325747
9-Dec	2901.78	3.902078	296.1	0.398171
10-Dec	4302.8	3.383103	1023.66	0.804859
11-Dec	2198.26	2.571515	313.02	0.36617
12-Dec	2647.98	2.843316	245.34	0.263438
13-Dec	2309.58	2.103251	219.96	0.20031
14-Dec	1937.34	2.488875	135.36	0.173895
15-Dec	1764.18	3.254344	279.18	0.514997
16-Dec	1448.54	2.193927	296.1	0.448466
17-Dec	1768.14	2.95824	203.04	0.339702
18-Dec	1311.3	2.418926	160.74	0.296514
19-Dec	1267.4	2.279496	-25.38	-0.045647
20-Dec	1319.76	2.601281	126.9	0.250123

DATE	NaOCl Used GPD	Act Cl_2 Dose mg/l	$NaHSO_3$ Used GPD	SO_2 Dose mg/l
21-Dec	1252.08	2.610948	186.12	0.388114
22-Dec	1582.02	2.956218	76.14	0.142278
23-Dec	1865.34	3.57859	172.92	0.331741
24-Dec	1615.86	3.321398	329.94	0.678191
25-Dec	1209.78	2.719829	177.66	0.399415
26-Dec	1387.44	3.024722	194.58	0.424199
27-Dec	1116.72	2.362928	228.42	0.483326
28-Dec	989.82	1.565057	186.12	0.294284
29-Dec	1337.303	2.405221	270.72	0.486906
30-Dec	964.44	1.954484	25.38	0.051434
31-Dec	1015.2	2.000986	135.36	0.266798
Total	**540792**	**953**	**86395**	**151**
Ave Day	**1482**	**3**	**237**	**0.41**
Max Day	**6709**	**13**	**1204**	**2**

Note:

Data from UWS, Daily/Weekly Operating Report (2003).

Preserving The Environment • Improving Water Quality

TABLE 4F-29 SHEET 6 OF 6

JIWWTP UNIT PROCESS NO. 8: DISINFECTION CALCULATIONS

2020 TREATMENT REPORT

6/04/07 TR_4-A.T4F29.07.06.04.cdr

	FI150201 PAC HEADER AIR FLOW 1		FI150202 PAC HEADER AIR FLOW 2		Total	
	HOURLY RATE KCFM	Daily Rate KCFM	HOURLY RATE KCFM	Daily Rate KCFM	Hourly KCFM	Daily KCFM
Maximum	111.1	107.6	37.7	35.7	146.7	142.0
Minimum	23.0	76.3	0.0	12.7	23.0	100.1
AVE	93.1	93.1	21.9	21.9	115.0	114.9

NOTES:

1) Raw Process Air Compressor air flow data provided by UWS.

2) Data provided:

Start Time 6/30/2004

End Time 6/7/2005

Time Interval 1 hr

3) UWS only keeps for a 12 month period but felt that this data was representative.

4) UWS data gave hourly rates in cubic feet per minute (CFM) but that appears to be wrong knowing capacity of blowers so used 1000 CFM (KCFM).

5) Hourly data was too extensive to provide all data.

JIWWTP	SCUM 2004 CY	SCUM 2003 CY	SCUM 2002 CY	SCUM 2001 CY	
Jan	96	48	132	324	
Feb	120	96	156	408	
Mar	120	48	96	468	
Apr	108	48	144	456	
May	108	36	72	420	
Jun	72	12		360	
Jul		0	96	120	
Aug		0	84	0	
Sep		36	144	12	
Oct		96	156	24	
Nov		108	72	132	
Dec		96	48	120	
Total/yr	624	624	1200	2844	
Total/ month	104	52	100	237	
Lugger/month	8.7	4.3	8.3	19.8	4-Yr Average
Average/day	3.43	1.71	3.29	7.79	4.05

Note: Data provided by UWS 6/7/05

Raw Data[2]

DATE	JIWWTP WAS EPWAS MGD	JIWWTP WAS WPWAS MGD	JIWWTP WAS WAS Total MGD	GBT feed MGD	TAS TS %	BSD TS %	PSD MGD	PSD to E/B MGD	PSD to E/B TPD	IPS TO SS CALC'D PSD TO SS MGD	SS WAS GPM	TOTAL WAS Processed at JI - Calc'd GPM	Gravity Belt Thickened WAS %	Gravity Belt Thickened DSD %	Gravity Belt Thickened PSD %	BSD MGD	IPS FROM SS WAS GPM	IPS FROM SS DSD GPM	MILO Total T/Day
1/1/2003	2.358	0.000	2.358	3.455	3.55	2.05	0.169	0.000	0.000	0.169	1084	2721	78.7%	21.3%	0.0%	1.61	1084	169.4444444	118
1/2/2003	2.187	0.609	2.796	3.907	3.99	2.07	0.167	0.000	0.000	0.167	1066	3008	82.4%	17.6%	0.0%	1.787	1066	211.1111111	127
1/3/2003	1.383	1.136	2.519	3.663	3.87	2.13	0.178	0.000	0.000	0.178	778	2528	80.1%	19.9%	0.0%	2.293	778	247.9166667	140
1/4/2003	1.732	1.471	3.203	3.421	4.58	2.06	0.238	0.000	0.000	0.238	462	2686	75.1%	24.9%	0.0%	1.312	462	288.8888889	125
1/5/2003	1.307	1.552	2.859	2.951	4.58	2.09	0.241	0.000	0.000	0.241	445	2431	71.8%	28.2%	0.0%	1.824	445	277.7777778	144
1/6/2003	1.396	1.432	2.828	2.975	4.76	1.97	0.217	0.000	0.000	0.217	435	2399	68.1%	31.9%	0.0%	1.664	435	309.0277778	127
1/7/2003	1.771	1.064	2.835	3.222	4.60	2.05	0.204	0.000	0.000	0.204	861	2830	81.1%	18.9%	0.0%	1.632	861	311.8055556	123
1/8/2003	2.179	0.000	2.179	3.423	4.42	2.24	0.203	0.000	0.000	0.203	1113	2626	75.6%	24.4%	0.0%	1.872	1113	251.3888889	150
1/9/2003	1.972	0.000	1.972	3.257	4.60	2.23	0.205	0.000	0.000	0.205	1060	2429	81.1%	18.9%	0.0%	1.776	1060	259.7222222	148
1/10/2003	1.244	0.806	2.050	3.375	3.81	2.21	0.173	0.000	0.000	0.173	1095	2518	61.9%	38.1%	0.0%	1.68	1095	268.75	169
1/11/2003	1.196	1.100	2.296	3.327	3.88	2.20	0.134	0.000	0.000	0.134	974	2568	79.9%	20.1%	0.0%	1.888	974	238.8888889	155
1/12/2003	1.503	1.100	2.603	3.431	3.89	2.02	0.175	0.000	0.000	0.175	893	2701	64.5%	35.5%	0.0%	1.744	893	232.6388889	168
1/13/2003	1.458	1.190	2.648	3.333	3.81	2.11	0.167	0.000	0.000	0.167	852	2691	76.1%	23.9%	0.0%	1.776	852	149.3055556	160
1/14/2003	1.604	1.170	2.774	3.447	4.23	2.16	0.180	0.000	0.000	0.180	629	2556	86.0%	14.0%	0.0%	1.92	629	126.3888889	161
1/15/2003	1.872	1.410	3.282	3.369	4.44	2.14	0.191	0.000	0.000	0.191	434	2713	88.4%	11.6%	0.0%	1.856	434	176.3888889	159
1/16/2003	1.968	1.420	3.388	3.460	4.56	2.11	0.171	0.000	0.000	0.171	406	2759	90.0%	10.0%	0.0%	1.856	406	141.6666667	153
1/17/2003	1.862	1.280	3.142	3.179	4.86	2.12	0.154	0.000	0.000	0.154	426	2608	85.1%	14.9%	0.0%	4.096	426	123.6111111	169
1/18/2003	2.010	1.100	3.110	3.183	4.29	2.12	0.159	0.000	0.000	0.159	440	2599	84.7%	15.3%	0.0%	1.536	440	118.75	156
1/19/2003	1.886	1.090	2.976	3.091	4.36	2.22	0.135	0.000	0.000	0.135	447	2513	93.2%	6.8%	0.0%	0.928	447	95.13888889	164
1/20/2003	1.769	1.170	2.939	3.064	4.50	2.08	0.151	0.000	0.000	0.151	500	2541	91.9%	8.1%	0.0%	0.928	500	104.8611111	162
1/21/2003	1.992	0.990	2.982	3.587	4.40	2.04	0.204	0.000	0.000	0.204	542	2613	88.6%	11.4%	0.0%	2.338	542	113.1944444	155
1/22/2003	1.992	1.150	3.142	3.407	4.27	2.12	0.241	0.000	0.000	0.241	574	2756	89.5%	10.5%	0.0%	1.454	574	113.1944444	156
1/23/2003	1.439	1.630	3.069	3.289	4.72	2.10	0.253	0.000	0.000	0.253	579	2711	88.9%	11.1%	0.0%	1.872	579	90.97222222	153
1/24/2003	2.058	1.360	3.418	3.511	4.53	2.07	0.224	0.000	0.000	0.224	568	2942	88.8%	11.2%	0.0%	1.784	568	111.8055556	160
1/25/2003	1.776	1.500	3.276	3.207	4.44	2.11	0.222	0.000	0.000	0.222	501	2776	91.3%	8.7%	0.0%	1.945	501	120.8333333	163
1/26/2003	1.544	1.520	3.064	2.967	4.75	2.13	0.195	0.000	0.000	0.195	562	2689	92.2%	7.8%	0.0%	1.855	562	115.2777778	157
1/27/2003	1.864	1.520	3.384	3.295	4.34	2.07	0.160	0.000	0.000	0.160	558	2908	89.4%	10.6%	0.0%	1.927	558	132.6388889	164
1/28/2003	2.165	1.310	3.475	3.440	4.66	2.11	0.196	0.000	0.000	0.196	561	2974	90.0%	10.0%	0.0%	1.785	561	152.0833333	162
1/29/2003	2.111	1.180	3.291	3.327	4.80	2.08	0.222	0.000	0.000	0.222	575	2861	84.1%	15.9%	0.0%	0.576	575	161.8055556	168
1/30/2003	1.976	1.240	3.216	3.197	4.86	2.17	0.256	0.000	0.000	0.256	563	2796	88.8%	11.2%	0.0%	0.56	563	118.75	167
1/31/2003	1.895	1.276	3.171	3.217	4.66	2.20	0.226	0.000	0.000	0.226	650	2852	87.9%	12.1%	0.0%	0.512	650	84.02777778	170
2/1/2003	1.627	0.247	1.874	2.873	4.98	2.15	0.206	0.000	0.000	0.206	639	1941	87.1%	12.9%	0.0%	0.512	639	69.44444444	158
2/2/2003	1.852	2.177	4.029	2.847	4.90	2.16	0.216	0.000	0.000	0.216	544	3342	93.4%	6.6%	0.0%	0.512	544	63.19444444	168
2/3/2003	1.772	1.174	2.946	2.831	4.62	2.22	0.235	0.000	0.000	0.235	540	2586	89.4%	10.6%	0.0%	1.264	540	69.44444444	160
2/4/2003	1.684	1.183	2.867	2.783	4.70	2.13	0.247	0.000	0.000	0.247	603	2594	90.4%	9.6%	0.0%	1.84	603	70.83333333	157
2/5/2003	1.603	1.323	2.926	2.873	4.75	2.07	0.282	0.000	0.000	0.282	561	2593	86.0%	14.0%	0.0%	1.84	561	111.8055556	155
2/6/2003	1.547	1.296	2.843	2.832	4.49	2.10	0.262	0.000	0.000	0.262	605	2579	88.0%	12.0%	0.0%	1.936	605	119.4444444	162
2/7/2003	1.788	1.248	3.036	2.976	4.39	2.08	0.240	0.000	0.000	0.240	559	2667	89.5%	10.5%	0.0%	1.856	559	111.8055556	151
2/8/2003	1.597	1.504	3.101	3.008	4.55	2.13	0.220	0.000	0.000	0.220	523	2676	88.8%	11.2%	0.0%	1.888	523	100.6944444	155
2/9/2003	1.365	1.489	2.854	2.736	4.24	2.14	0.177	0.000	0.000	0.177	587	2569	90.8%	9.2%	0.0%	1.792	587	89.58333333	147
2/10/2003	1.340	1.839	3.179	2.672	4.62	2.00	0.176	0.000	0.000	0.176	578	2786	84.8%	15.2%	0.0%	1.885	578	109.0277778	153
2/11/2003	1.300	1.850	3.150	3.360	4.73	2.04	0.223	0.000	0.000	0.223	563	2751	87.0%	13.0%	0.0%	1.823	563	104.1666667	147
2/12/2003	2.644	0.102	2.746	2.880	4.61	2.02	0.226	0.000	0.000	0.226	634	2541	89.5%	10.5%	0.0%	1.824	634	93.75	127
2/13/2003	1.929	0.773	2.702	2.880	4.83	2.12	0.238	0.000	0.000	0.238	609	2485	89.0%	11.0%	0.0%	1.908	609	88.19444444	178
2/14/2003	1.133	1.123	2.256	2.576	4.90	2.24	0.220	0.000	0.000	0.220	612	2179	87.6%	12.4%	0.0%	1.664	612	102.7777778	149
2/15/2003	1.384	1.063	2.447	2.704	4.86	2.14	0.294	0.000	0.000	0.294	683	2382	90.2%	9.8%	0.0%	1.792	683	100.6944444	154
2/16/2003	1.541	0.979	2.520	2.784	4.68	2.19	0.293	0.000	0.000	0.293	670	2420	89.7%	10.3%	0.0%	1.824	670	80.55555556	164
2/17/2003	1.371	1.000	2.371	2.544	4.70	2.16	0.204	0.000	0.000	0.204	691	2338	91.8%	8.2%	0.0%	1.856	691	68.75	168
2/18/2003	1.515	1.011	2.526	2.688	4.55	2.13	0.195	0.000	0.000	0.195	710	2464	89.6%	10.4%	0.0%	1.888	710	70.13888889	144
2/19/2003	1.725	1.000	2.725	3.008	4.30	2.05	0.190	0.000	0.000	0.190	715	2607	89.2%	10.8%	0.0%	1.904	715	78.47222222	152
2/20/2003	1.783	1.381	3.164	3.104	4.57	2.06	0.204	0.000	0.000	0.204	734	2931	88.8%	11.2%	0.0%	2.016	734	88.19444444	159
2/21/2003	1.474	0.742	2.216	2.656	4.47	2.00	0.220	0.000	0.000	0.220	836	2375	83.7%	16.3%	0.0%	1.76	836	108.3333333	156
2/22/2003	1.261	0.901	2.162	2.944	4.49	2.16	0.252	0.000	0.000	0.252	961	2462	78.8%	21.2%	0.0%	1.872	961	114.5833333	154
2/23/2003	1.233	0.900	2.133	2.912	4.55	2.15	0.250	0.000	0.000	0.250	919	2400	85.3%	14.7%	0.0%	1.84	919	106.9444444	148
2/24/2003	1.213	0.825	2.038	2.560	4.59	2.27	0.176	0.000	0.000	0.176	753	2168	83.0%	17.0%	0.0%	1.856	753	122.2222222	152
2/25/2003	1.807	0.915	2.722	3.360	4.22	1.99	0.186	0.000	0.000	0.186	912	2802	78.7%	21.3%	0.0%	1.968	912	125	149
2/26/2003	1.576	0.850	2.426	2.976	4.17	2.10	0.226	0.000	0.000	0.226	886	2571	86.2%	13.8%	0.0%	1.856	886	106.9444444	157
2/27/2003	1.576	0.850	2.426	3.024	4.63	2.12	0.229	0.000	0.000	0.229	877	2562	83.2%	16.8%	0.0%	1.888	877	165.2777778	143
2/28/2003	1.509	0.851	2.360	3.024	4.64	2.03	0.188	0.000	0.000	0.188	948	2587	90.4%	9.6%	0.0%	1.952	948	163.8888889	133
3/1/2003	1.557	0.850	2.407	2.976	4.52	2.16	0.209	0.000	0.000	0.209	914	2586	83.8%	16.2%	0.0%	1.856	914	118.0555556	174
3/2/2003	1.232	0.841	2.073	2.784	4.57	2.11	0.220	0.000	0.000	0.220	949	2389	80.8%	19.2%	0.0%	1.792	949	125.6944444	136
3/3/2003	1.190	1.053	2.243	2.960	4.49	2.13	0.172	0.000	0.000	0.172	890	2448	80.9%	19.1%	0.0%	1.808	890	151.3888889	146.69
3/4/2003	1.130	1.117	2.247	3.024	4.68	2.06	0.187	0.000	0.000	0.187	864	2424	78.4%	21.6%	0.0%	1.792	864	187.5	144
3/5/2003	1.051	0.927	1.978	2.784	4.34	1.90	0.260	0.000	0.000	0.260	918	2292	84.6%	15.4%	0.0%	1.776	918	143.0555556	134.21
3/6/2003	0.887	0.958	1.845	2.784	4.55	2.08	0.280	0.000	0.000	0.280	946	2227	77.6%	22.4%	0.0%	1.808	946	117.3611111	136.49
3/7/2003	0.368	0.601	0.969	1.840	4.20	2.10	0.283	0.000	0.000	0.283	704	1377	72.5%	27.5%	0.0%	1.344	704	149.3055556	129.16
3/8/2003	0.595	0.744	1.339	1.648	4.60	2.19	0.303	0.000	0.000	0.303	598	1528	80.5%	19.5%	0.0%	1.408	598	101.3888889	116

Raw Data[2]

DATE	JIWWTP WAS EPWAS MGD	JIWWTP WAS WPWAS MGD	JIWWTP WAS WAS Total MGD	GBT feed MGD	TAS TS %	BSD TS %	PSD MGD	PSD to E/B MGD	PSD to E/B TPD	IPS TO SS CALC'D PSD TO SS MGD	SS WAS GPM	TOTAL WAS Processed at JI - Calc'd GPM	Gravity Belt Thickened WAS %	Gravity Belt Thickened DSD %	Gravity Belt Thickened PSD %	BSD MGD	IPS FROM SS WAS GPM	IPS FROM SS DSD GPM	MILO Total T/Day
3/9/2003	0.857	0.700	1.557	1.664	4.37	2.04	0.254	0.000	0.000	0.254	578	1659	75.3%	24.7%	0.0%	1.504	578	102.0833333	116
3/10/2003	1.505	0.700	2.205	2.064	4.23	2.09	0.271	0.000	0.000	0.271	427	1958	89.6%	10.4%	0.0%	1.664	427	138.1944444	126
3/11/2003	1.978	0.693	2.671	2.320	4.19	2.13	0.286	0.000	0.000	0.286	289	2144	84.2%	15.8%	0.0%	2.006	289	149.3055556	150
3/12/2003	2.269	0.825	3.094	2.720	4.18	2.09	0.309	0.000	0.000	0.309	276	2425	83.9%	16.1%	0.0%	1.844	276	120.1388889	145
3/13/2003	1.930	0.759	2.689	2.352	4.20	2.15	0.281	0.000	0.000	0.281	282	2149	88.9%	11.1%	0.0%	1.68	282	97.22222222	136
3/14/2003	1.601	0.776	2.377	2.128	3.92	2.03	0.398	0.000	0.000	0.398	268	1919	86.6%	13.4%	0.0%	1.744	268	136.8055556	92.15
3/15/2003	1.636	1.262	2.898	2.624	3.96	2.02	0.492	0.000	0.000	0.492	277	2290	85.2%	14.8%	0.0%	1.808	277	133.3333333	119.53
3/16/2003	2.013	1.190	3.203	2.896	3.91	2.02	0.417	0.000	0.000	0.417	263	2487	85.6%	14.4%	0.0%	1.776	263	140.2777778	139.23
3/17/2003	2.047	1.453	3.500	3.120	4.26	1.98	0.313	0.000	0.000	0.313	266	2697	80.4%	19.6%	0.0%	2.032	266	140.9722222	136.5
3/18/2003	2.627	1.477	4.104	3.696	3.80	1.93	0.281	0.000	0.000	0.281	275	3125	83.7%	16.3%	0.0%	2.112	275	146.5277778	168.7
3/19/2003	2.661	1.826	4.487	4.160	4.03	2.01	0.328	0.000	0.000	0.328	262	3378	88.4%	11.6%	0.0%	2.112	262	117.3611111	161
3/20/2003	1.915	2.003	3.918	3.664	4.66	2.24	0.504	0.000	0.000	0.504	256	2977	87.4%	12.6%	0.0%	1.984	256	133.3333333	164.7
3/21/2003	2.141	2.685	4.826	0.626	4.34	2.16	0.371	0.000	0.000	0.371	265	3616	91.3%	8.7%	0.0%	1.996	265	112.5	179
3/22/2003	1.870	1.122	2.992	6.622	3.62	2.05	0.341	0.000	0.000	0.341	242	2320	82.6%	17.4%	0.0%	1.844	242	117.3611111	120
3/23/2003	1.325	0.751	2.076	1.888	4.22	2.07	0.243	0.017	1.943	0.226	167	1609	85.2%	11.9%	2.9%	0.992	167	43.05555556	53
3/24/2003	2.001	1.249	3.250	3.232	3.78	2.20	0.222	0.000	0.000	0.222	323	2580	86.4%	13.6%	0.0%	1.68	323	113.1944444	146
3/25/2003	2.010	1.286	3.296	3.152	4.11	2.14	0.254	0.000	0.000	0.254	304	2593	82.2%	17.8%	0.0%	1.776	304	129.1666667	153
3/26/2003	2.626	1.314	3.940	3.776	4.34	2.14	0.235	0.000	0.000	0.235	285	3021	90.1%	9.9%	0.0%	1.888	285	120.8333333	158.6
3/27/2003	1.904	1.332	3.236	3.136	4.80	2.30	0.287	0.000	0.000	0.287	431	2678	83.2%	16.8%	0.0%	1.856	431	122.9166667	155
3/28/2003	1.790	1.057	2.847	2.880	5.05	2.17	0.312	0.000	0.000	0.312	634	2611	86.2%	13.8%	0.0%	1.872	634	81.25	168
3/29/2003	1.952	1.014	2.966	3.232	4.78	2.10	0.337	0.000	0.000	0.337	704	2764	87.0%	13.0%	0.0%	1.968	704	119.4444444	161
3/30/2003	2.486	0.997	3.483	3.792	4.13	2.01	0.289	0.000	0.000	0.289	721	3140	82.2%	17.8%	0.0%	1.936	721	127.0833333	142
3/31/2003	2.046	0.816	2.862	2.928	4.71	1.98	0.286	0.000	0.000	0.286	717	2705	93.9%	6.1%	0.0%	1.648	717	75	113
4/1/2003	2.092	1.063	3.155	3.584	4.61	2.08	0.290	0.000	0.000	0.290	759	2950	77.3%	22.7%	0.0%	1.872	759	198.6111111	157
4/2/2003	1.936	1.088	3.024	3.392	4.59	2.16	0.258	0.000	0.000	0.258	807	2907	73.1%	26.9%	0.0%	1.856	807	191.6666667	150
4/3/2003	1.584	1.114	2.698	3.376	4.72	2.17	0.264	0.000	0.000	0.264	1012	2886	77.5%	22.5%	0.0%	1.952	1012	122.2222222	144
4/4/2003	1.346	0.744	2.090	2.842	4.72	2.20	0.276	0.000	0.000	0.276	1080	2531	81.7%	18.3%	0.0%	1.783	1080	251.3888889	141
4/5/2003	2.050	0.726	2.776	3.782	4.72	2.04	0.299	0.000	0.000	0.299	1057	2985	81.5%	18.5%	0.0%	1.855	1057	226.3888889	125
4/6/2003	1.580	0.742	2.322	3.056	4.59	2.24	0.327	0.000	0.000	0.327	890	2503	80.6%	19.4%	0.0%	1.603	890	193.75	141
4/7/2003	1.216	0.755	1.971	2.496	4.79	2.26	0.274	0.000	0.000	0.274	751	2120	76.9%	23.1%	0.0%	1.672	751	177.0833333	133
4/8/2003	1.342	0.945	2.287	2.752	4.73	2.25	0.267	0.000	0.000	0.267	762	2350	83.8%	16.2%	0.0%	1.782	762	227.7777778	142
4/9/2003	2.558	0.996	3.554	2.928	4.71	2.13	0.265	0.000	0.000	0.265	819	3287	83.5%	16.5%	0.0%	1.925	819	229.8611111	147.83
4/10/2003	0.538	1.042	1.580	3.008	4.46	2.10	0.286	0.000	0.000	0.286	722	1819	59.4%	40.6%	0.0%	1.812	722	225.6944444	143
4/11/2003	1.210	0.897	2.107	2.192	4.61	2.15	0.263	0.000	0.000	0.263	390	1853	74.0%	26.0%	0.0%	1.438	390	151.3888889	115
4/12/2003	1.156	1.212	2.368	2.624	4.65	2.18	0.257	0.000	0.000	0.257	610	2254	78.9%	21.1%	0.0%	1.813	610	209.7222222	149
4/13/2003	1.450	1.182	2.632	3.024	4.53	2.05	0.225	0.000	0.000	0.225	641	2469	85.0%	15.0%	0.0%	1.876	641	143.75	137
4/14/2003	1.878	2.033	3.911	4.032	4.35	2.01	0.213	0.139	18.458	0.074	667	3383	87.4%	0.8%	11.8%	1.874	667	5.555555556	136
4/15/2003	1.668	2.324	3.992	2.206	4.53	1.95	0.312	0.157	28.114	0.155	604	3376	71.3%	13.2%	15.5%	1.838	604	141.6666667	148
4/16/2003	1.592	1.704	3.296	6.130	3.90	2.06	0.445	0.000	0.000	0.445	587	2876	77.8%	22.2%	0.0%	1.782	587	361.1111111	136
4/17/2003	1.780	1.379	3.159	4.032	4.56	2.04	0.321	0.000	0.000	0.321	610	2804	70.9%	29.1%	0.0%	1.79	610	404.8611111	131
4/18/2003	1.162	1.255	2.417	2.960	4.54	2.26	0.269	0.000	0.000	0.269	480	2158	67.2%	32.8%	0.0%	1.792	480	495.8333333	127
4/19/2003	1.616	1.194	2.810	2.576	4.37	2.11	0.322	0.000	0.000	0.322	362	2313	58.5%	41.5%	0.0%	1.785	362	420.1388889	143
4/20/2003	2.118	1.214	3.332	2.832	4.77	2.07	0.335	0.000	0.000	0.335	370	2684	66.9%	33.1%	0.0%	1.904	370	307.6388889	159
4/21/2003	2.392	1.186	3.578	3.040	5.22	2.00	0.311	0.000	0.000	0.311	340	2825	64.9%	35.1%	0.0%	1.885	340	292.3611111	155
4/22/2003	2.378	1.214	3.592	3.008	5.18	2.11	0.256	0.000	0.000	0.256	261	2755	65.4%	34.6%	0.0%	1.911	261	305.5555556	151.35
4/23/2003	2.794	1.918	4.712	4.128	4.50	2.05	0.325	0.000	0.000	0.325	275	3547	72.6%	27.4%	0.0%	2.38	275	320.8333333	158.07
4/24/2003	1.888	1.872	3.760	3.472	4.11	2.08	0.353	0.000	0.000	0.353	274	2885	69.6%	30.4%	0.0%	1.801	274	365.2777778	164
4/25/2003	2.040	2.096	4.136	3.952	3.88	2.14	0.303	0.000	0.000	0.303	270	3142	71.0%	29.0%	0.0%	1.845	270	388.1944444	169.39
4/26/2003	1.478	2.234	3.712	3.648	4.02	2.16	0.271	0.000	0.000	0.271	265	2843	72.1%	27.9%	0.0%	1.912	265	452.0833333	158
4/27/2003	1.290	2.020	3.310	3.072	4.39	2.20	0.219	0.000	0.000	0.219	271	2570	65.1%	34.9%	0.0%	1.888	271	444.4444444	160
4/28/2003	1.752	2.124	3.876	3.456	4.43	2.07	0.224	0.000	0.000	0.224	276	2968	64.2%	35.8%	0.0%	1.978	276	326.3888889	156
4/29/2003	1.896	2.350	4.246	3.904	4.39	2.07	0.262	0.000	0.000	0.262	288	3237	68.2%	31.8%	0.0%	1.92	288	318.75	153
4/30/2003	2.190	2.326	4.516	4.160	4.36	2.09	0.380	0.000	0.000	0.380	274	3410	73.4%	26.6%	0.0%	2.004	274	309.7222222	163.11
5/1/2003	2.780	2.186	4.966	4.784	4.38	2.13	0.508	0.000	0.000	0.508	354	3803	70.3%	29.7%	0.0%	2.012	354	322.2222222	189.71
5/2/2003	3.156	2.290	5.446	5.344	4.10	2.13	0.348	0.000	0.000	0.348	414	4196	74.8%	25.2%	0.0%	2.034	414	313.8888889	179.6
5/3/2003	2.064	1.938	4.002	4.112	4.43	2.25	0.305	0.000	0.000	0.305	452	3231	71.4%	28.6%	0.0%	2.048	452	402.0833333	176.96
5/4/2003	1.988	1.830	3.818	3.760	4.46	2.20	0.385	0.000	0.000	0.385	426	3077	66.1%	33.9%	0.0%	1.968	426	381.9444444	169
5/5/2003	2.120	2.056	4.176	4.096	4.39	2.25	0.320	0.000	0.000	0.320	447	3347	63.1%	36.9%	0.0%	2.112	447	356.9444444	186
5/6/2003	2.100	2.048	4.148	4.192	4.49	2.08	0.295	0.000	0.000	0.295	684	3565	74.4%	25.6%	0.0%	2.048	684	326.3888889	152
5/7/2003	1.724	1.718	3.442	3.568	4.58	2.23	0.244	0.000	0.000	0.244	719	3109	72.4%	27.6%	0.0%	2.064	719	341.6666667	194
5/8/2003	2.588	1.720	4.308	4.576	4.04	2.02	0.350	0.000	0.000	0.350	738	3730	72.4%	27.6%	0.0%	2.224	738	359.7222222	175.87
5/9/2003	2.712	1.980	4.692	5.120	3.74	1.98	0.407	0.000	0.000	0.407	835	4093	73.2%	26.8%	0.0%	2.208	835	361.8055556	182.24
5/10/2003	2.540	2.000	4.540	4.989	4.03	2.05	0.341	0.000	0.000	0.341	910	4063	75.1%	24.9%	0.0%	2.192	910	307.6388889	183.27
5/11/2003	2.712	2.132	4.844	5.219	3.98	2.05	0.417	0.049	7.947	0.368	680	4044	70.4%	25.5%	4.1%	2.008	680	317.3611111	140.3
5/12/2003	2.516	1.764	4.280	4.512	4.10	2.23	0.305	0.000	0.000	0.305	665	3637	70.2%	29.8%	0.0%	2.28	665	296.5277778	196
5/13/2003	2.780	1.952	4.732	4.848	4.01	2.03	0.461	0.000	0.000	0.461	568	3854	74.6%	25.4%	0.0%	2.16	568	355.5555556	181
5/14/2003	2.219	1.770	3.989	3.513	4.36	2.26	0.388	0.000	0.000	0.388	546	3316	68.7%	31.3%	0.0%	2	546	375	182

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TABLE 4F-32 SHEET 2 OF 7
MILORGANITE PROCESS CALCULATIONS
2020 TREATMENT REPORT
6/04/07 TR_4-A.T4F32.07.06.04.cdr

Raw Data[2]

DATE	JIWWTP WAS EPWAS MGD	JIWWTP WAS WPWAS MGD	JIWWTP WAS WAS Total MGD	GBT feed MGD	TAS TS %	BSD TS %	PSD MGD	PSD to E/B MGD	PSD to E/B TPD	IPS TO SS CALC'D PSD TO SS MGD	SS WAS GPM	TOTAL WAS Processed at JI - Calc'd GPM	Gravity Belt Thickened WAS %	Gravity Belt Thickened DSD %	Gravity Belt Thickened PSD %	BSD MGD	IPS FROM SS WAS GPM	IPS FROM SS DSD GPM	MILO Total T/Day
5/15/2003	0.610	1.936	2.546	3.232	4.56	2.38	0.347	0.000	0.000	0.347	570	2338	57.3%	42.7%	0.0%	1.799	570	334.0277778	176
5/16/2003	1.523	1.804	3.327	3.367	4.24	2.11	0.388	0.000	0.000	0.388	643	2953	71.5%	28.5%	0.0%	1.702	643	246.5277778	175.52
5/17/2003	1.592	1.800	3.392	3.424	4.19	2.08	0.286	0.000	0.000	0.286	635	2991	75.2%	24.8%	0.0%	1.861	635	209.0277778	145.59
5/18/2003	1.716	1.800	3.516	3.632	4.13	2.04	0.258	0.000	0.000	0.258	594	3036	76.5%	23.5%	0.0%	1.816	594	258.3333333	143.49
5/19/2003	1.980	1.644	3.624	3.808	3.77	1.98	0.295	0.000	0.000	0.295	658	3175	78.1%	21.9%	0.0%	1.901	658	248.6111111	142.55
5/20/2003	2.208	1.384	3.592	3.600	4.24	2.03	0.355	0.000	0.000	0.355	619	3113	73.6%	26.4%	0.0%	1.994	619	280.5555556	164.3
5/21/2003	2.492	1.756	4.248	4.336	4.26	1.99	0.276	0.000	0.000	0.276	598	3548	74.7%	25.3%	0.0%	2.06	598	272.9166667	165
5/22/2003	2.516	1.748	4.264	4.368	3.53	2.10	0.266	0.000	0.000	0.266	601	3562	73.7%	26.3%	0.0%	2.026	601	261.8055556	167
5/23/2003	2.252	1.480	3.732	3.776	4.07	2.23	0.256	0.000	0.000	0.256	587	3179	68.5%	31.5%	0.0%	1.914	587	228.4722222	171
5/24/2003	2.404	1.580	3.984	4.112	3.72	2.14	0.250	0.000	0.000	0.250	584	3351	77.4%	22.6%	0.0%	1.866	584	199.3055556	151
5/25/2003	2.016	1.212	3.228	3.360	4.17	2.18	0.248	0.000	0.000	0.248	647	2889	74.4%	25.6%	0.0%	1.73	647	200	152.76
5/26/2003	2.512	1.544	4.056	4.320	3.44	2.02	0.219	0.000	0.000	0.219	577	3394	77.8%	22.2%	0.0%	1.852	577	280.5555556	150.03
5/27/2003	1.780	1.036	2.816	2.848	4.54	2.21	0.220	0.000	0.000	0.220	510	2466	62.3%	37.7%	0.0%	1.602	510	279.1666667	152
5/28/2003	2.180	1.268	3.448	3.360	4.54	1.98	0.261	0.000	0.000	0.261	474	2868	66.5%	33.5%	0.0%	1.747	474	264.5833333	134
5/29/2003	1.764	1.668	3.432	3.520	4.41	1.98	0.289	0.000	0.000	0.289	496	2879	63.6%	36.4%	0.0%	1.805	496	298.6111111	131
5/30/2003	3.024	0.580	3.604	3.648	4.91	1.97	0.299	0.000	0.000	0.299	548	3051	71.9%	28.1%	0.0%	1.581	548	302.0833333	120
5/31/2003	2.636	1.392	4.028	4.336	4.20	2.04	0.400	0.000	0.000	0.400	577	3374	70.7%	29.3%	0.0%	1.746	577	347.9166667	138
6/1/2003	1.984	0.916	2.900	3.088	3.44	2.16	0.312	0.000	0.000	0.312	552	2566	66.3%	33.7%	0.0%	1.66	552	283.3333333	141
6/2/2003	2.196	1.056	3.252	3.248	2.79	1.91	0.278	0.000	0.000	0.278	509	2767	65.9%	34.1%	0.0%	1.851	509	204.1666667	129
6/3/2003	2.640	1.496	4.136	4.240	3.20	1.74	0.243	0.000	0.000	0.243	563	3435	75.8%	24.2%	0.0%	1.941	563	195.8333333	131
6/4/2003	2.420	1.636	4.056	4.352	3.43	1.89	0.229	0.000	0.000	0.229	645	3462	78.1%	21.9%	0.0%	1.884	645	240.9722222	142.6
6/5/2003	2.628	1.924	4.552	4.784	3.96	1.91	0.238	0.042	7.233	0.196	648	3809	83.6%	10.4%	5.9%	1.68	648	136.1111111	138
6/6/2003	2.356	1.536	3.892	3.888	3.89	2.04	0.269	0.040	7.242	0.229	705	3408	61.1%	34.2%	4.6%	2.013	705	327.0833333	134
6/7/2003	2.128	1.212	3.340	4.144	3.27	1.83	0.272	0.000	0.000	0.272	905	3224	72.8%	27.2%	0.0%	1.919	905	290.9722222	127
6/8/2003	2.116	1.204	3.320	4.496	3.21	1.84	0.407	0.000	0.000	0.407	991	3297	70.9%	29.1%	0.0%	1.799	991	370.1388889	135
6/9/2003	1.820	0.980	2.800	4.000	2.79	2.25	0.321	0.000	0.000	0.321	991	2935	63.2%	36.8%	0.0%	1.546	991	342.3611111	134
6/10/2003	2.052	1.140	3.192	4.032	3.23	2.03	0.274	0.000	0.000	0.274	817	3034	65.8%	34.2%	0.0%	1.568	817	249.3055556	114
6/11/2003	2.404	1.428	3.832	4.480	4.44	2.24	0.252	0.000	0.000	0.252	807	3468	75.8%	24.2%	0.0%	1.495	807	168.0555556	114
6/12/2003	1.668	0.928	2.596	3.152	4.26	1.98	0.229	0.000	0.000	0.229	856	2659	73.6%	26.4%	0.0%	1.586	856	218.75	104
6/13/2003	1.552	0.840	2.392	3.152	4.81	1.97	0.283	0.000	0.000	0.283	930	2591	73.9%	26.1%	0.0%	1.588	930	272.2222222	140
6/14/2003	1.464	0.816	2.280	3.152	4.82	2.01	0.277	0.000	0.000	0.277	884	2467	73.8%	26.2%	0.0%	1.552	884	326.3888889	134
6/15/2003	1.376	0.820	2.196	3.088	4.54	2.10	0.240	0.000	0.000	0.240	857	2382	67.5%	32.5%	0.0%	1.511	857	338.8888889	94
6/16/2003	1.480	0.888	2.368	3.072	4.33	2.13	0.218	0.000	0.000	0.218	777	2421	66.3%	33.7%	0.0%	1.535	777	288.8888889	131
6/17/2003	1.684	0.968	2.652	3.184	3.90	2.14	0.223	0.000	0.000	0.223	750	2592	65.3%	34.7%	0.0%	1.586	750	264.5833333	126
6/18/2003	1.584	0.928	2.512	3.028	3.80	2.09	0.312	0.000	0.000	0.312	697	2441	68.0%	32.0%	0.0%	1.51	697	236.1111111	115
6/19/2003	1.736	0.992	2.728	3.101	3.91	2.06	0.298	0.000	0.000	0.298	720	2614	68.5%	31.5%	0.0%	1.755	720	230.5555556	127
6/20/2003	1.848	1.048	2.896	3.258	4.20	2.17	0.300	0.000	0.000	0.300	729	2740	69.5%	30.5%	0.0%	1.647	729	222.9166667	133
6/21/2003	1.704	0.960	2.664	3.265	4.43	2.00	0.339	0.000	0.000	0.339	583	2433	69.3%	30.7%	0.0%	1.78	583	266.6666667	126
6/22/2003	2.064	1.224	3.288	3.559	4.77	2.07	0.342	0.000	0.000	0.342	553	2836	64.0%	36.0%	0.0%	1.774	553	372.9166667	137
6/23/2003	2.496	1.528	4.024	4.348	4.39	2.01	0.330	0.000	0.000	0.330	549	3343	68.9%	31.1%	0.0%	1.82	549	398.6111111	143
6/24/2003	2.756	1.620	4.376	4.454	4.64	2.02	0.361	0.000	0.000	0.361	651	3690	66.3%	33.7%	0.0%	1.776	651	394.4444444	130
6/25/2003	2.376	1.796	4.172	4.635	4.28	2.21	0.315	0.000	0.000	0.315	611	3508	62.0%	38.0%	0.0%	1.722	611	369.4444444	151
6/26/2003	1.688	1.008	2.696	2.301	4.34	2.00	0.333	0.056	8.756	0.278	302	2174	76.2%	11.0%	12.9%	1.096	302	50.69444444	67.24
6/27/2003	2.460	1.872	4.332	5.056	4.54	2.17	0.286	0.182	27.006	0.103	688	3696	64.9%	18.1%	17.0%	1.788	688	193.75	138.62
6/28/2003	2.272	1.680	3.952	4.711	4.31	2.14	0.447	0.013	1.963	0.434	736	3480	70.9%	27.9%	1.2%	1.66	736	381.25	137.3
6/29/2003	2.680	1.672	4.352	5.194	4.24	2.14	0.342	0.000	0.000	0.342	753	3775	67.0%	33.0%	0.0%	2.164	753	371.5277778	145.08
6/30/2003	2.468	1.740	4.208	5.015	4.15	2.11	0.337	0.000	0.000	0.337	778	3700	65.9%	34.1%	0.0%	1.422	778	404.8611111	145.18
7/1/2003	1.664	1.088	2.752	3.789	4.27	2.17	0.316	0.000	0.000	0.316	848	2759	61.0%	39.0%	0.0%	1.278	848	388.1944444	118
7/2/2003	1.488	1.032	2.520	3.348	3.94	2.19	0.346	0.000	0.000	0.346	727	2477	63.6%	36.4%	0.0%	1.402	727	361.1111111	116
7/3/2003	1.224	0.832	2.056	2.680	4.11	2.20	0.352	0.000	0.000	0.352	705	2133	59.3%	40.7%	0.0%	1.388	705	338.1944444	114.23
7/4/2003	1.224	0.776	2.000	2.692	4.42	2.09	0.389	0.000	0.000	0.389	658	2047	55.4%	44.6%	0.0%	1.434	658	343.75	106.01
7/5/2003	1.096	0.756	1.852	2.363	3.96	2.24	0.368	0.000	0.000	0.368	680	1966	58.4%	41.6%	0.0%	1.462	680	319.4444444	111.34
7/6/2003	1.544	1.036	2.580	3.153	3.85	2.02	0.353	0.000	0.000	0.353	706	2498	68.5%	31.5%	0.0%	1.61	706	345.1388889	130.09
7/7/2003	1.264	0.832	2.096	2.778	3.97	2.03	0.315	0.000	0.000	0.315	551	2007	56.9%	43.1%	0.0%	1.632	551	411.8055556	133
7/8/2003	1.544	0.908	2.452	2.516	4.53	2.17	0.359	0.000	0.000	0.359	392	2095	62.5%	37.5%	0.0%	1.578	392	424.3055556	141
7/9/2003	1.416	0.928	2.344	2.284	4.79	2.21	0.418	0.000	0.000	0.418	416	2044	57.7%	42.3%	0.0%	1.55	416	427.7777778	130
7/10/2003	1.368	0.916	2.284	2.340	4.29	2.25	0.391	0.000	0.000	0.391	769	2355	58.8%	41.2%	0.0%	1.652	769	389.5833333	132
7/11/2003	1.432	0.952	2.384	2.664	4.58	2.04	0.315	0.000	0.000	0.315	833	2489	69.4%	30.6%	0.0%	1.868	833	245.1388889	95
7/12/2003	1.536	1.032	2.568	2.792	4.32	2.05	0.311	0.000	0.000	0.311	744	2527	72.6%	27.4%	0.0%	1.826	744	315.2777778	110
7/13/2003	1.536	1.028	2.564	2.902	4.63	2.10	0.282	0.000	0.000	0.282	723	2504	63.4%	36.6%	0.0%	1.816	723	349.3055556	113
7/14/2003	1.504	1.008	2.512	3.092	4.43	2.08	0.240	0.000	0.000	0.240	612	2356	61.5%	38.5%	0.0%	1.81	612	298.6111111	134
7/15/2003	2.200	1.480	3.680	3.662	4.24	2.08	0.312	0.000	0.000	0.312	595	3151	75.2%	24.8%	0.0%	1.78	595	390.9722222	152
7/16/2003	1.944	1.224	3.168	3.560	4.62	2.18	0.288	0.000	0.000	0.288	657	2857	60.0%	40.0%	0.0%	1.708	657	458.3333333	153
7/17/2003	1.720	1.168	2.888	3.372	4.62	2.21	0.335	0.000	0.000	0.335	733	2739	58.6%	41.4%	0.0%	2.076	733	442.3611111	134
7/18/2003	1.192	0.832	2.024	2.426	4.03	2.08	0.296	0.000	0.000	0.296	789	2195	53.5%	46.5%	0.0%	1.506	789	402.7777778	140.92
7/19/2003	1.904	1.224	3.128	3.480	4.35	2.03	0.254	0.000	0.000	0.254	640	2812	67.1%	32.9%	0.0%	1.87	640	456.9444444	146
7/20/2003	2.064	1.316	3.380	3.648	4.11	2.05	0.205	0.000	0.000	0.205	565	2912	64.0%	36.0%	0.0%	1.858	565	477.0833333	140.3

Raw Data[2]	JIWWTP WAS													Gravity Belt Thickened				IPS FROM SS		
DATE	EPWAS MGD	WPWAS MGD	WAS Total MGD	GBT feed MGD	TAS TS %	BSD TS %	PSD MGD	PSD to E/B MGD	PSD to E/B TPD	IPS TO SS CALC'D PSD TO SS MGD	SS WAS GPM	TOTAL WAS Processed at JI - Calc'd GPM	WAS %	DSD %	PSD %	BSD MGD	WAS GPM	DSD GPM	MILO Total T/Day
7/21/2003	1.536	1.000	2.536	2.962		2.23	0.283	0.000	0.000	0.283	632	2393	54.7%	45.3%	0.0%	1.594	632	429.1666667	129
7/22/2003	1.064	0.716	1.780	1.952	4.05	2.02	0.303	0.000	0.000	0.303	387	1623	67.1%	32.9%	0.0%	1.236	387	208.3333333	76
7/23/2003	1.312	0.900	2.212	2.574	4.02	2.26	0.265	0.000	0.000	0.265	659	2195	59.8%	40.2%	0.0%	1.526	659	335.4166667	169
7/24/2003	1.344	0.960	2.304	2.832	4.51	2.18	0.275	0.000	0.000	0.275	673	2273	63.5%	36.5%	0.0%	1.576	673	348.6111111	138
7/25/2003	1.648	1.108	2.756	3.314	4.20	2.23	0.289	0.000	0.000	0.289	746	2660	69.0%	31.0%	0.0%	1.678	746	349.3055556	146
7/26/2003	2.064	1.340	3.404	3.720	4.16	2.13	0.258	0.000	0.000	0.258	692	3056	64.7%	35.3%	0.0%	1.94	692	351.3888889	144
7/27/2003	1.632	1.052	2.684	2.914	4.22	2.26	0.197	0.000	0.000	0.197	661	2525	62.0%	38.0%	0.0%	1.666	661	294.4444444	139
7/28/2003	1.856	1.196	3.052	3.226	4.04	2.13	0.200	0.000	0.000	0.200	566	2685	62.2%	37.8%	0.0%	2	566	285.4166667	155
7/29/2003	2.400	1.804	4.204	4.212	3.82	1.97	0.236	0.000	0.000	0.236	491	3410	74.1%	25.9%	0.0%	1.908	491	313.1944444	145
7/30/2003	2.400	1.804	4.204	4.332	3.79	2.03	0.347	0.000	0.000	0.347	434	3353	74.1%	25.9%	0.0%	1.816	434	368.75	153
7/31/2003	1.912	1.028	2.940	2.772	4.49	2.14	0.353	0.000	0.000	0.353	459	2501	56.9%	43.1%	0.0%	1.802	459	347.2222222	130
8/1/2003	2.256	1.180	3.436	3.424	3.77	2.02	0.300	0.000	0.000	0.300	553	2939	64.7%	35.3%	0.0%	1.824	553	272.9166667	140
8/2/2003	2.504	1.360	3.864	3.988	3.83	1.96	0.270	0.000	0.000	0.270	588	3271	72.2%	27.8%	0.0%	1.888	588	270.8333333	139
8/3/2003	2.192	1.212	3.404	3.668	4.30	2.09	0.308	0.000	0.000	0.308	560	2924	70.8%	29.2%	0.0%	1.716	560	329.8611111	121
8/4/2003	2.400	1.412	3.812	4.004	3.69	2.05	0.346	0.000	0.000	0.346	526	3173	64.9%	35.1%	0.0%	1.744	526	351.3888889	138.5
8/5/2003	2.312	1.484	3.796	3.828	3.99	2.34	0.246	0.000	0.000	0.246	584	3220	64.5%	35.5%	0.0%	1.864	584	263.8888889	167
8/6/2003	1.872	1.320	3.192	3.200	3.60	2.00	0.221	0.046	6.048	0.175	513	2730	56.6%	39.3%	4.1%	1.804	513	213.8888889	151
8/7/2003	2.288	1.508	3.796	4.108	3.71	1.99	0.234	0.000	0.000	0.234	859	3495	80.6%	19.4%	0.0%	1.676	859	275.6944444	119
8/8/2003	1.680	1.336	3.016	4.308	3.77	2.25	0.321	0.000	0.000	0.321	1002	3096	68.6%	31.4%	0.0%	1.68	1002	409.0277778	153
8/9/2003	1.024	0.716	1.740	2.940	4.56	2.20	0.318	0.000	0.000	0.318	934	2142	62.8%	37.2%	0.0%	1.296	934	416.6666667	111
8/10/2003	1.416	0.052	1.468	2.504	4.64	2.33	0.292	0.000	0.000	0.292	949	1968	55.3%	44.7%	0.0%	1.356	949	343.0555556	107
8/11/2003	1.560	0.244	1.804	2.544	4.23	2.13	0.289	0.000	0.000	0.289	838	2091	56.8%	43.2%	0.0%	1.444	838	284.0277778	70
8/12/2003	1.424	0.964	2.388	2.820	4.35	2.30	0.482	0.000	0.000	0.482	735	2393	59.0%	41.0%	0.0%	1.508	735	235.4166667	136
8/13/2003	1.552	1.060	2.612	2.888	4.45	2.06	0.423	0.000	0.000	0.423	752	2566	62.6%	37.4%	0.0%	1.712	752	179.1666667	114
8/14/2003	1.816	1.132	2.948	3.300	3.93	1.94	0.444	0.000	0.000	0.444	675	2722	69.9%	30.1%	0.0%	1.856	675	198.6111111	119
8/15/2003	2.232	1.336	3.568	3.624	4.20	1.94	0.400	0.000	0.000	0.400	581	3059	73.4%	26.6%	0.0%	1.844	581	244.4444444	158
8/16/2003	2.520	1.464	3.984	4.008	4.54	2.03	0.366	0.000	0.000	0.366	434	3201	69.7%	30.3%	0.0%	1.8	434	313.8888889	136
8/17/2003	2.384	1.352	3.736	3.804	4.68	2.23	0.333	0.000	0.000	0.333	465	3059	65.2%	34.8%	0.0%	1.716	465	348.6111111	146
8/18/2003	1.856	1.272	3.128	3.216	4.55	2.41	0.304	0.000	0.000	0.304	573	2745	53.7%	46.3%	0.0%	1.736	573	287.5	136
8/19/2003	2.424	1.548	3.972	3.876	4.21	1.94	0.314	0.000	0.000	0.314	478	3236	64.3%	35.7%	0.0%	1.82	478	224.3055556	127
8/20/2003	2.680	1.648	4.328	4.216	4.17	1.90	0.371	0.000	0.000	0.371	443	3449	69.2%	30.8%	0.0%	1.836	443	271.5277778	130
8/21/2003	2.560	1.660	4.220	4.212	4.16	1.87	0.302	0.000	0.000	0.302	423	3354	72.8%	27.2%	0.0%	1.832	423	326.3888889	145
8/22/2003	2.192	1.488	3.680	3.824	4.15	2.01	0.279	0.000	0.000	0.279	461	3017	66.3%	33.7%	0.0%	1.648	461	377.0833333	128
8/23/2003	2.016	1.368	3.384	3.584	4.17	2.25	0.274	0.000	0.000	0.274	463	2813	61.8%	38.2%	0.0%	1.62	463	329.8611111	131
8/24/2003	2.160	1.484	3.644	3.780	3.85	1.84	0.216	0.000	0.000	0.216	518	3049	62.8%	37.2%	0.0%	1.664	518	311.8055556	111
8/25/2003	2.128	1.456	3.584	3.844	3.95	2.17	0.280	0.000	0.000	0.280	566	3055	59.9%	40.1%	0.0%	1.668	566	313.1944444	106
8/26/2003	1.832	1.256	3.088	3.264	4.30	2.14	0.300	0.000	0.000	0.300	543	2687	57.5%	42.5%	0.0%	1.508	543	277.0833333	130
8/27/2003	1.816	1.232	3.048	3.348	4.42	2.02	0.304	0.000	0.000	0.304	543	2660	60.5%	39.5%	0.0%	1.46	543	254.8611111	100
8/28/2003	1.616	1.096	2.712	2.996	4.23	1.94	0.316	0.000	0.000	0.316	574	2457	65.8%	34.2%	0.0%	1.472	574	278.4722222	106
8/29/2003	1.640	1.112	2.752	3.212	4.43	2.04	0.248	0.000	0.000	0.248	583	2494	64.7%	35.3%	0.0%	1.456	583	359.0277778	123
8/30/2003	1.704	1.136	2.840	3.032	4.27	1.98	0.234	0.000	0.000	0.234	614	2586	68.4%	31.6%	0.0%	1.448	614	406.25	93
8/31/2003	1.424	1.080	2.504	2.908	4.12	2.26	0.225	0.000	0.000	0.225	600	2339	59.1%	40.9%	0.0%	1.372	600	368.75	103
9/1/2003	1.496	0.992	2.488	2.840	4.27	2.09	0.241	0.000	0.000	0.241	471	2199	55.5%	44.5%	0.0%	1.432	471	304.1666667	110
9/2/2003	2.424	0.412	2.836	3.048	4.03	2.10	0.252	0.000	0.000	0.252	492	2461	53.2%	46.8%	0.0%	1.416	492	282.6388889	105
9/3/2003	2.360	0.428	2.788	3.084	4.34	2.13	0.267	0.000	0.000	0.267	533	2469	57.1%	42.9%	0.0%	1.444	533	257.6388889	116
9/4/2003	1.640	1.120	2.760	3.056	4.41	2.17	0.240	0.000	0.000	0.240	496	2413	54.6%	45.4%	0.0%	1.4	496	288.1944444	115
9/5/2003	1.704	1.160	2.864	3.232	4.30	2.16	0.273	0.000	0.000	0.273	468	2457	64.2%	35.8%	0.0%	1.34	468	281.25	106
9/6/2003	1.648	1.120	2.768	3.272	3.99	2.07	0.244	0.000	0.000	0.244	472	2394	66.7%	33.3%	0.0%	1.456	472	317.3611111	102.67
9/7/2003	1.416	0.968	2.384	2.848	4.23	2.15	0.218	0.000	0.000	0.218	480	2136	62.8%	37.2%	0.0%	1.276	480	361.8055556	112
9/8/2003	1.128	0.692	1.820	2.032	4.26	2.08	0.220	0.000	0.000	0.220	535	1799	54.1%	45.9%	0.0%	1.468	535	305.5555556	101.36
9/9/2003	2.448	1.400	3.848	3.992	4.14	2.04	0.255	0.000	0.000	0.255	462	3134	68.0%	32.0%	0.0%	1.704	462	291.6666667	154
9/10/2003	2.168	1.180	3.348	3.632	4.46	2.07	0.321	0.000	0.000	0.321	472	2797	68.4%	31.6%	0.0%	1.52	472	295.1388889	118
9/11/2003	1.904	1.040	2.944	3.272	4.59	2.11	0.325	0.000	0.000	0.325	451	2495	71.1%	28.9%	0.0%	1.44	451	359.7222222	103
9/12/2003	2.064	1.180	3.244	3.408	4.85	2.07	0.319	0.000	0.000	0.319	430	2683	70.6%	29.4%	0.0%	1.528	430	329.8611111	125
9/13/2003	2.064	1.180	3.244	3.104	4.67	2.16	0.462	0.000	0.000	0.462	288	2541	61.3%	38.7%	0.0%	1.56	288	308.3333333	139.1
9/14/2003	2.152	1.232	3.384	3.189	4.81	2.10	0.431	0.000	0.000	0.431	331	2681	62.4%	37.6%	0.0%	1.616	331	259.0277778	124.27
9/15/2003	1.928	1.056	2.984	2.859	4.65	2.16	0.321	0.000	0.000	0.321	440	2512	62.5%	37.5%	0.0%	1.54	440	211.1111111	120.71
9/16/2003	2.072	1.144	3.216	3.184	5.30	1.97	0.283	0.000	0.000	0.283	491	2724	70.2%	29.8%	0.0%	1.612	491	201.3888889	123
9/17/2003	2.336	1.320	3.656	3.536	4.86	2.02	0.333	0.000	0.000	0.333	403	2942	66.6%	33.4%	0.0%	1.64	403	250.6944444	131
9/18/2003	2.080	1.184	3.264	3.376	4.99	2.14	0.365	0.000	0.000	0.365	403	2670	64.3%	35.7%	0.0%	1.472	403	270.8333333	122
9/19/2003	2.176	1.248	3.424	3.440	5.16	2.15	0.383	0.000	0.000	0.383	389	2767	68.9%	31.1%	0.0%	1.728	389	276.3888889	135
9/20/2003	1.496	0.856	2.352	2.344	5.30	2.11	0.375	0.000	0.000	0.375	354	1987	59.3%	40.7%	0.0%	1.244	354	305.5555556	126
9/21/2003	2.152	1.256	3.408	3.440	5.03	2.15	0.300	0.000	0.000	0.300	379	2746	69.4%	30.6%	0.0%	1.564	379	284.0277778	117
9/22/2003	1.880	1.104	2.984	3.056	4.95	2.20	0.373	0.000	0.000	0.373	349	2421	64.7%	35.3%	0.0%	1.424	349	295.8333333	127
9/23/2003	2.208	1.272	3.480	3.528	5.44	2.17	0.313	0.000	0.000	0.313	349	2766	67.3%	32.7%	0.0%	1.496	349	296.5277778	122
9/24/2003	1.648	0.936	2.584	2.544	5.53	2.28	0.336	0.000	0.000	0.336	347	2141	61.6%	38.4%	0.0%	1.344	347	298.6111111	112
9/25/2003	1.864	1.040	2.904	2.704	4.68	2.22	0.295	0.000	0.000	0.295	569	2586	60.9%	39.1%	0.0%	1.512	569	288.8888889	133

Raw Data[2]

DATE	JIWWTP WAS EPWAS MGD	JIWWTP WAS WPWAS MGD	JIWWTP WAS WAS Total MGD	GBT feed MGD	TAS TS %	BSD TS %	PSD MGD	PSD to E/B MGD	PSD to E/B TPD	IPS TO SS CALC'D PSD TO SS MGD	SS WAS GPM	TOTAL WAS Processed at JI - Calc'd GPM	Gravity Belt Thickened WAS %	Gravity Belt Thickened DSD %	Gravity Belt Thickened PSD %	BSD MGD	IPS FROM SS WAS GPM	IPS FROM SS DSD GPM	MILO Total T/Day
9/26/2003	1.488	0.816	2.304	2.824	4.53	2.20	0.333	0.000	0.000	0.333	899	2499	62.8%	37.2%	0.0%	1.452	899	252.0833333	133
9/27/2003	1.456	0.800	2.256	2.912	4.39	2.13	0.364	0.000	0.000	0.364	814	2381	68.6%	31.4%	0.0%	1.452	814	292.3611111	119
9/28/2003	1.528	0.856	2.384	3.048	4.76	2.16	0.279	0.000	0.000	0.279	818	2474	64.9%	35.1%	0.0%	1.532	818	322.2222222	120
9/29/2003	1.856	1.040	2.896	3.760	4.52	2.08	0.202	0.000	0.000	0.202	872	2883	65.1%	34.9%	0.0%	1.744	872	341.6666667	122
9/30/2003	1.520	0.984	2.504	2.992	4.31	2.12	0.237	0.000	0.000	0.237	708	2447	61.3%	38.7%	0.0%	1.336	708	324.3055556	108
10/1/2003	1.784	1.208	2.992	3.576	3.87	2.19	0.248	0.000	0.000	0.248	635	2713	63.1%	36.9%	0.0%	1.58	635	290.2777778	106
10/2/2003	1.520	1.000	2.520	2.840	4.01	2.18	0.274	0.000	0.000	0.274	529	2279	60.3%	39.7%	0.0%	1.408	529	231.9444444	112
10/3/2003	1.576	1.056	2.632	2.720	4.45	2.04	0.306	0.000	0.000	0.306	522	2350	64.4%	35.6%	0.0%	1.4	522	252.7777778	139
10/4/2003	1.680	1.144	2.824	3.120	4.66	2.14	0.281	0.000	0.000	0.281	570	2531	68.9%	31.1%	0.0%	1.488	570	278.4722222	127
10/5/2003	1.800	1.200	3.000	3.184	4.56	2.12	0.198	0.000	0.000	0.198	538	2621	62.5%	37.5%	0.0%	1.552	538	297.2222222	126
10/6/2003	1.560	1.024	2.584	2.952	4.78	2.22	0.222	0.000	0.000	0.222	646	2440	63.5%	36.5%	0.0%	1.464	646	296.5277778	127
10/7/2003	1.864	1.104	2.968	3.224	5.15	2.11	0.244	0.000	0.000	0.244	688	2749	62.3%	37.7%	0.0%	1.768	688	247.2222222	120
10/8/2003	1.920	1.024	2.944	3.032	4.95	2.08	0.261	0.000	0.000	0.261	589	2633	66.5%	33.5%	0.0%	1.52	589	221.5277778	120
10/9/2003	2.432	1.288	3.720	3.936	4.89	2.07	0.286	0.000	0.000	0.286	504	3087	71.3%	28.7%	0.0%	1.564	504	218.0555556	133
10/10/2003	1.912	0.992	2.904	3.168	5.07	2.11	0.285	0.000	0.000	0.285	498	2515	68.6%	31.4%	0.0%	1.332	498	261.1111111	128
10/11/2003	2.152	1.120	3.272	3.560	4.84	2.16	0.363	0.000	0.000	0.363	436	2708	66.1%	33.9%	0.0%	1.432	436	291.6666667	133
10/12/2003	2.016	1.040	3.056	3.492	5.11	2.15	0.361	0.000	0.000	0.361	468	2590	66.9%	33.1%	0.0%	1.392	468	289.5833333	122
10/13/2003	2.120	1.080	3.200	3.284	5.06	2.20	0.291	0.000	0.000	0.291	464	2686	65.2%	34.8%	0.0%	1.364	464	257.6388889	124
10/14/2003	1.816	0.408	2.224	2.280	5.02	2.23	0.323	0.000	0.000	0.323	462	2006	62.0%	38.0%	0.0%	1.268	462	220.8333333	102
10/15/2003	2.296	0.776	3.072	3.176	4.34	2.17	0.373	0.000	0.000	0.373	508	2641	66.5%	33.5%	0.0%	1.396	508	214.5833333	115
10/16/2003	1.976	1.024	3.000	3.208	4.51	2.05	0.327	0.000	0.000	0.327	495	2578	73.2%	26.8%	0.0%	1.38	495	181.9444444	114
10/17/2003	2.280	1.232	3.512	3.920	4.97	2.22	0.291	0.000	0.000	0.291	459	2898	72.6%	27.4%	0.0%	1.352	459	218.75	104
10/18/2003	2.192	1.168	3.360	3.656	5.15	2.24	0.271	0.000	0.000	0.271	452	2785	72.8%	27.2%	0.0%	1.372	452	243.0555556	115
10/19/2003	2.192	1.152	3.344	3.608	4.93	2.07	0.222	0.000	0.000	0.222	439	2761	71.3%	28.7%	0.0%	1.444	439	265.9722222	113
10/20/2003	2.096	1.128	3.224	3.376	4.76	2.06	0.204	0.000	0.000	0.204	469	2708	72.1%	27.9%	0.0%	1.488	469	307.6388889	150
10/21/2003	1.816	0.976	2.792	2.840	4.86	2.18	0.259	0.000	0.000	0.259	471	2410	63.0%	37.0%	0.0%	1.54	471	325	151
10/22/2003	1.712	0.976	2.688	2.528	4.77	2.16	0.252	0.000	0.000	0.252	467	2334	59.7%	40.3%	0.0%	1.74	467	279.1666667	150
10/23/2003	2.240	1.216	3.456	3.584	5.14	2.02	0.260	0.000	0.000	0.260	472	2872	71.3%	28.7%	0.0%	1.428	472	261.8055556	157
10/24/2003	1.936	1.072	3.008	3.240	5.36	2.11	0.327	0.000	0.000	0.327	443	2532	66.8%	33.2%	0.0%	1.516	443	320.8333333	125
10/25/2003	1.976	1.056	3.032	3.352	5.20	2.14	0.320	0.000	0.000	0.320	496	2602	71.8%	28.2%	0.0%	1.536	496	362.5	124
10/26/2003	1.736	0.976	2.712	3.046	5.59	2.15	0.189	0.000	0.000	0.189	499	2382	67.0%	33.0%	0.0%	1.56	499	357.6388889	120
10/27/2003	1.536	0.848	2.384	2.554	5.56	2.21	0.196	0.000	0.000	0.196	499	2155	59.6%	40.4%	0.0%	1.536	499	311.1111111	120
10/28/2003	1.824	0.984	2.808	2.904	5.27	2.20	0.278	0.000	0.000	0.278	494	2444	60.4%	39.6%	0.0%	1.544	494	279.8611111	117
10/29/2003	1.888	0.880	2.768	2.928	5.32	2.19	0.296	0.000	0.000	0.296	518	2440	64.9%	35.1%	0.0%	1.488	518	247.2222222	119
10/30/2003	1.720	0.808	2.528	2.688	5.52	2.25	0.253	0.000	0.000	0.253	507	2263	64.0%	36.0%	0.0%	1.424	507	262.5	115
10/31/2003	1.864	0.888	2.752	2.912	5.20	2.14	0.207	0.000	0.000	0.207	506	2417	65.6%	34.4%	0.0%	1.528	506	306.9444444	131
11/1/2003	1.944	0.952	2.896	2.984	5.01	1.99	0.203	0.000	0.000	0.203	485	2496	67.7%	32.3%	0.0%	1.536	485	304.8611111	122
11/2/2003	1.368	0.664	2.032	2.168	4.92	2.07	0.251	0.000	0.000	0.251	471	1882	62.9%	37.1%	0.0%	1.472	471	353.4722222	115
11/3/2003	1.072	0.512	1.584	1.688	4.87	2.09	0.279	0.000	0.000	0.279	460	1560	57.9%	42.1%	0.0%	1.456	460	345.8333333	121
11/4/2003	1.088	0.472	1.560	1.800	5.90	2.12	0.322	0.000	0.000	0.322	677	1760	62.6%	37.4%	0.0%	1.544	677	260.4166667	114
11/5/2003	1.288	0.480	1.768	2.064	5.70	2.24	0.329	0.000	0.000	0.329	743	1971	67.3%	32.7%	0.0%	1.592	743	220.8333333	134.63
11/6/2003	1.648	0.648	2.296	2.696	5.60	2.13	0.263	0.000	0.000	0.263	713	2307	76.0%	24.0%	0.0%	1.616	713	225	136.57
11/7/2003	1.936	0.264	2.200	2.536	5.59	2.17	0.301	0.000	0.000	0.301	634	2162	72.6%	27.4%	0.0%	1.6	634	234.0277778	141.18
11/8/2003	2.176	0.000	2.176	2.360	5.49	2.11	0.222	0.000	0.000	0.222	557	2068	72.0%	28.0%	0.0%	1.568	557	242.3611111	134
11/9/2003	2.224	0.000	2.224	2.528	5.55	2.14	0.216	0.000	0.000	0.216	572	2116	74.1%	25.9%	0.0%	1.632	572	262.5	128
11/10/2003	2.120	0.000	2.120	2.392	5.06	2.11	0.217	0.000	0.000	0.217	565	2037	70.2%	29.8%	0.0%	1.48	565	273.6111111	131
11/11/2003	2.160	0.000	2.160	2.328	5.36	2.20	0.230	0.000	0.000	0.230	541	2041	67.7%	32.3%	0.0%	1.52	541	241.6666667	133
11/12/2003	2.192	0.000	2.192	2.320	5.56	2.23	0.275	0.000	0.000	0.275	549	2071	67.2%	32.8%	0.0%	1.584	549	231.9444444	152.83
11/13/2003	2.136	0.000	2.136	2.192	5.61	2.27	0.259	0.000	0.000	0.259	567	2050	64.6%	35.4%	0.0%	1.552	567	221.5277778	136.62
11/14/2003	2.312	0.000	2.312	2.512	5.37	2.08	0.285	0.000	0.000	0.285	588	2194	73.5%	26.5%	0.0%	1.56	588	231.25	126.03
11/15/2003	2.112	0.000	2.112	2.448	5.96	2.13	0.236	0.000	0.000	0.236	572	2039	71.8%	28.2%	0.0%	1.464	572	267.3611111	114.25
11/16/2003	2.208	0.000	2.208	2.464	5.82	2.10	0.189	0.000	0.000	0.189	507	2040	68.6%	31.4%	0.0%	1.432	507	299.3055556	112
11/17/2003	2.664	0.000	2.664	2.960	5.69	2.07	0.265	0.000	0.000	0.265	513	2363	71.0%	29.0%	0.0%	1.552	513	313.1944444	113
11/18/2003	2.080	0.000	2.080	2.496	6.01	2.17	0.284	0.000	0.000	0.284	621	2065	68.3%	31.7%	0.0%	1.504	621	270.1388889	126
11/19/2003	2.496	0.000	2.496	2.752	5.74	2.14	0.273	0.000	0.000	0.273	650	2383	69.4%	30.6%	0.0%	1.536	650	224.3055556	122
11/20/2003	1.840	0.000	1.840	2.128	5.17	2.19	0.276	0.000	0.000	0.276	735	2013	68.3%	31.7%	0.0%	1.592	735	189.5833333	113.2
11/21/2003	2.448	0.000	2.448	2.816	5.30	2.00	0.256	0.000	0.000	0.256	685	2385	79.9%	20.1%	0.0%	1.664	685	188.1944444	128
11/22/2003	2.672	0.000	2.672	2.976	5.13	2.19	0.258	0.000	0.000	0.258	590	2446	80.5%	19.5%	0.0%	1.656	590	238.8888889	147
11/23/2003	3.280	0.000	3.280	3.160	4.96	2.08	0.272	0.000	0.000	0.272	372	2650	78.8%	21.2%	0.0%	1.784	372	225	128
11/24/2003	3.488	0.008	3.496	3.544	5.03	2.16	0.214	0.000	0.000	0.214	404	2832	79.5%	20.5%	0.0%	1.784	404	215.2777778	159
11/25/2003	3.680	0.000	3.680	3.688	4.98	2.11	0.224	0.000	0.000	0.224	382	2938	81.2%	18.8%	0.0%	1.808	382	217.3611111	151
11/26/2003	2.880	0.744	3.624	3.856	4.85	2.17	0.249	0.000	0.000	0.249	518	3035	81.6%	18.4%	0.0%	1.816	518	252.7777778	187
11/27/2003	1.744	0.936	2.680	3.160	5.05	2.11	0.227	0.000	0.000	0.227	650	2511	78.6%	21.4%	0.0%	1.64	650	278.4722222	145
11/28/2003	1.552	0.856	2.408	2.600	4.79	2.06	0.189	0.000	0.000	0.189	536	2208	67.4%	32.6%	0.0%	1.488	536	225.6944444	125
11/29/2003	1.696	0.936	2.632	2.824	4.88	2.05	0.193	0.000	0.000	0.193	379	2207	74.6%	25.4%	0.0%	1.408	379	129.1666667	118
11/30/2003	2.144	1.200	3.344	3.104	5.03	2.17	0.196	0.110	15.697	0.086	0	2322	81.6%	0.0%	18.4%	1.184	0	0	107
12/1/2003	1.696	0.920	2.616	2.288	5.36	2.10	0.248	0.115	15.324	0.133	0	1817				1	0	0	85

Raw Data[2]	JIWWTP WAS																			
DATE	EPWAS MGD	WPWAS MGD	WAS Total MGD	GBT feed MGD	TAS TS %	BSD TS %	PSD MGD	PSD to E/B MGD	PSD to E/B TPD	IPS TO SS CALC'D PSD TO SS MGD	SS WAS GPM	TOTAL WAS Processed at JI - Calc'd GPM	Gravity Belt Thickened WAS %	Gravity Belt Thickened DSD %	Gravity Belt Thickened PSD %	BSD MGD	IPS FROM SS WAS GPM	IPS FROM SS DSD GPM	MILO Total T/Day
12/2/2003	1.840	0.824	2.664	2.224	5.34	2.13	0.266	0.121	17.893	0.145	0	1850	79.9%	0.0%	20.1%	0.984	0	0	80
12/3/2003	1.440	0.512	1.952	1.568	5.18	1.97	0.252	0.085	13.745	0.167	0	1356	77.5%	0.0%	22.5%	0.936	0	0	84
12/4/2003	0.000	0.000	0.000	0.000			0.308	0.000	0.000	0.308	0	0				0	0	0	0
12/5/2003	0.000	0.000	0.000	0.000			0.289	0.027	4.569	0.262	0	0				0	0	0	0
12/6/2003	0.000	0.000	0.000	0.000			0.286	0.000	0.000	0.286	0	0				0	0	0	0
12/7/2003	0.000	0.000	0.000	0.000			0.236	0.000	0.000	0.236	0	0				0	0	0	0
12/8/2003	1.152	0.648	1.800	1.296	4.85	2.09	0.241	0.121	16.846	0.121	0	1250	77.2%	0.0%	22.8%	0.736	0	0	54
12/9/2003	2.656	1.104	3.760	2.928	4.33	2.09	0.272	0.241	35.149	0.031	221	2832	76.2%	4.6%	19.2%	1.832	221	76.38888889	151
12/10/2003	2.208	1.144	3.352	4.016	4.14	1.97	0.343	0.093	8.243	0.249	1135	3463	67.4%	27.5%	5.1%	1.8	1135	325.6944444	141
12/11/2003	2.064	1.248	3.312	4.736	3.51	1.96	0.351	0.000	0.000	0.351	1320	3620	71.9%	28.1%	0.0%	1.856	1320	267.3611111	162
12/12/2003	1.952	1.192	3.144	4.400	4.37	2.01	0.268	0.000	0.000	0.268	1254	3437	76.5%	23.5%	0.0%	1.904	1254	238.8888889	154
12/13/2003	1.920	1.160	3.080	3.952	4.63	2.08	0.203	0.000	0.000	0.203	1027	3166	75.4%	24.6%	0.0%	1.824	1027	253.4722222	149
12/14/2003	2.128	1.312	3.440	4.256	4.15	1.94	0.223	0.000	0.000	0.223	984	3373	75.3%	24.7%	0.0%	1.912	984	249.3055556	135
12/15/2003	2.656	1.592	4.248	4.976	3.72	1.80	0.262	0.000	0.000	0.262	849	3799	75.6%	24.4%	0.0%	2.04	849	292.3611111	149
12/16/2003	2.944	1.896	4.840	5.392	4.37	2.18	0.255	0.000	0.000	0.255	733	4094	79.0%	21.0%	0.0%	1.84	733	244.4444444	165
12/17/2003	2.832	1.688	4.520	5.104	4.23	2.10	0.262	0.000	0.000	0.262	785	3924	76.0%	24.0%	0.0%	1.912	785	259.7222222	148
12/18/2003	2.352	1.312	3.664	4.096	5.06	2.17	0.303	0.000	0.000	0.303	736	3280	72.2%	27.8%	0.0%	1.688	736	220.1388889	107
12/19/2003	2.656	1.552	4.208	4.800	4.40	2.20	0.307	0.000	0.000	0.307	733	3655	79.9%	20.1%	0.0%	1.808	733	245.8333333	152
12/20/2003	2.416	1.376	3.792	4.640	4.27	2.23	0.277	0.000	0.000	0.277	762	3395	73.2%	26.8%	0.0%	1.688	762	344.4444444	154
12/21/2003	2.256	1.216	3.472	4.368	4.29	2.19	0.239	0.000	0.000	0.239	762	3173	74.8%	25.2%	0.0%	1.752	762	344.4444444	140
12/22/2003	2.896	1.744	4.640	5.472	4.55	2.19	0.241	0.000	0.000	0.241	739	3961	74.1%	25.9%	0.0%	1.888	739	359.0277778	168
12/23/2003	1.904	1.152	3.056	3.552	4.68	2.19	0.262	0.000	0.000	0.262	685	2807	65.9%	34.1%	0.0%	1.6	685	363.1944444	153
12/24/2003	1.984	1.192	3.176	3.712	4.51	2.05	0.263	0.000	0.000	0.263	671	2877	70.1%	29.9%	0.0%	1.512	671	372.2222222	120
12/25/2003	1.680	0.992	2.672	3.328	5.20	2.34	0.216	0.000	0.000	0.216	625	2481	62.9%	37.1%	0.0%	1.376	625	349.3055556	115
12/26/2003	1.744	1.080	2.824	3.456	4.66	2.27	0.220	0.000	0.000	0.220	647	2608	69.0%	31.0%	0.0%	1.384	647	309.0277778	118
12/27/2003	1.792	1.120	2.912	3.552	4.58	2.25	0.240	0.000	0.000	0.240	639	2661	61.5%	38.5%	0.0%	1.464	639	313.1944444	110
12/28/2003	1.904	1.152	3.056	3.712	4.59	2.16	0.324	0.000	0.000	0.324	628	2750	72.3%	27.7%	0.0%	1.424	628	283.3333333	128
12/29/2003	1.424	0.792	2.216	2.896	4.60	2.25	0.286	0.000	0.000	0.286	564	2103	59.6%	40.4%	0.0%	1.304	564	319.4444444	106
12/30/2003	1.248	0.688	1.936	2.400	4.57	2.26	0.231	0.000	0.000	0.231	407	1751	46.7%	53.3%	0.0%	1.392	407	369.4444444	114.41
12/31/2003	1.424	0.744	2.168	2.480	4.60	2.10	0.240	0.000	0.000	0.240	446	1952	59.0%	41.0%	0.0%	1.416	446	439.5833333	101
Ave	1.872	1.117	2.989	3.252	4.489		0.278	0.005	0.663	0.3	589.1	2664.5	72.4%	27.1%	0.5%	1.7	589.1	245.8	135.6
Max	3.68	2.69	6.365	6.62	6.01		0.51	0.24	35.15	0.5	1320.0	4195.9	93.9%	53.3%	22.8%	4.1	1320.0	495.8	196.0
							Ave	3 GPM			190 GPM					1153 GPM			
							Max	167 GPM			353 GPM					2844 GPM			

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TABLE 4F-32 SHEET 6 OF 7

MILORGANITE PROCESS CALCULATIONS

2020 TREATMENT REPORT

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Milorganite Processes

Unit Process No. 10: Sludge Thickening

Gravity Belt Thickener (GBT) Feed 2003

Average Day Feed:	3.252	MGD
	2260	GPM
Maximum Day Feed:	6.622	MGD
	4600	GPM

Thickened Activated Sludge (TAS) % Solids 2003

Average Day:	4.5%
Maximum Day:	6.0%

Unit Process No. 11: Sludge Screening and Pumping

Primary Sludge Pumped 2003

Average Day:	0.278	MGD
	200	GPM
Maximum Day:	0.508	MGD
	360	GPM

Unit Process No. 12: Equalization and Blend

Blended Sludge Pumped 2003

Average Day:	1.661	MGD
	1160	GPM
Maximum Day:	4.096	MGD
	2850	GPM

Unit Process No. 23: WAS Receiving/Gallery Solids Piping Intertie[3]

WAS Pumped 2003

Average Day:	2670	GPM
Maximum Day:	4200	GPM

Unit Process Nos. 24, 25, 27: All under Dewater & Drying Facility

Milorganite® Produced 2003

Total for the year[4]:	47,700	Tons
Estimated Average Day:	136	Tons/day

NOTES:

1) Sludge Processes used to produce Milorganite and Agri-Life are interconnected. However to simplify the analysis, only the sludge processes at SSWWTP are discussed in the Agri-Life Process Calculations since Agri-Life is produced at SSWWTP.
2) Data from UWS, *Daily/ Weekly Operating Reports* (2003).
3) Process includes the distribution of all SSWWTP WAS pumped to JIWWTP and all JIWWTP WAS to GBT and to Equalization & Blend Process per Figure 3.3 in JIWWTP O&M Manual, Part 2, Volume 17: WAS Receiving
4) Biosolids Section of MMSD Contract Compliance Office, *Annual Summary of United Water Service Performance* (2003).

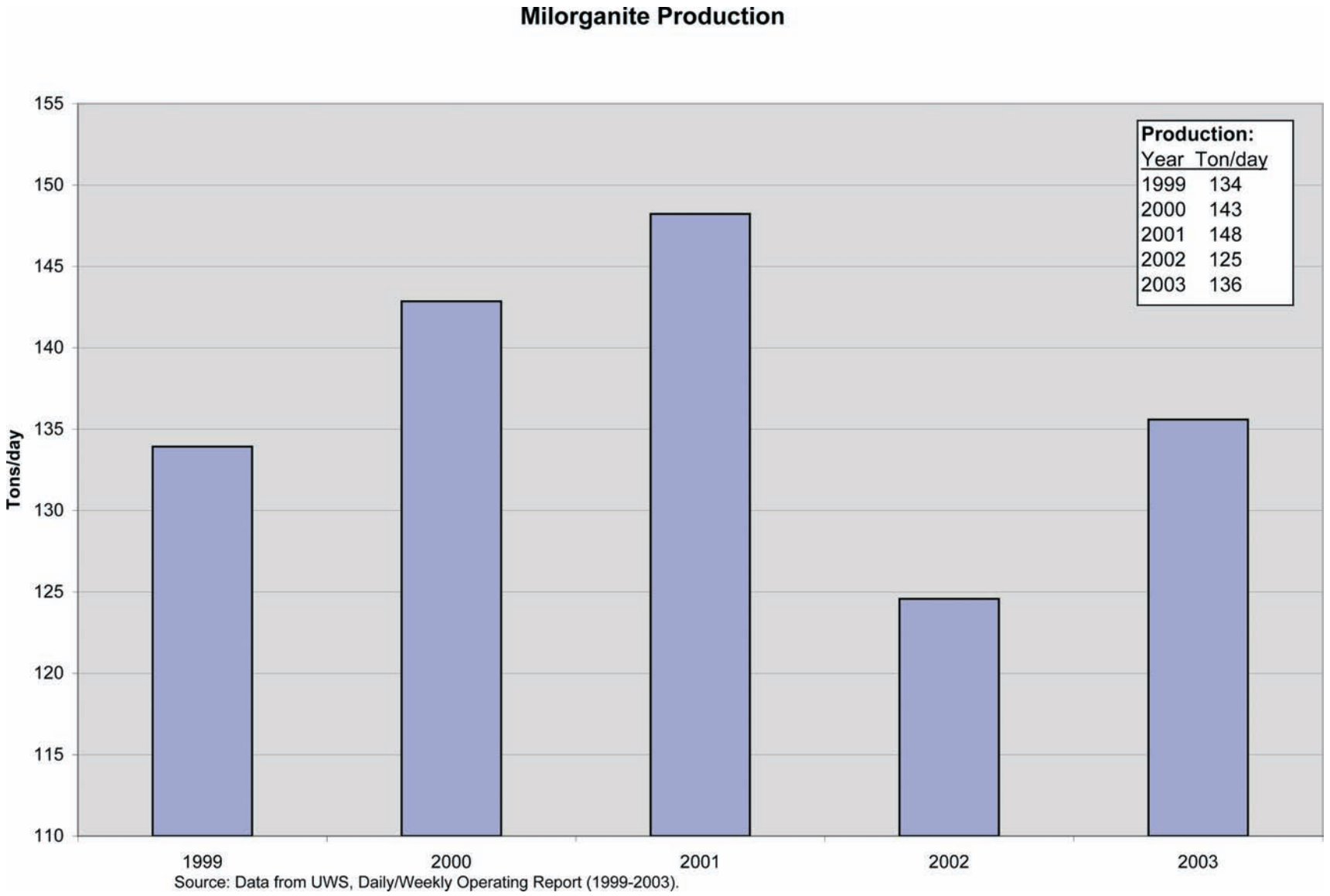

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TABLE 4F-33
MILORGANITE PRODUCTION CHART
2020 TREATMENT REPORT
6/04/07 TR_4-A.T4F33.07.06.04.cdr

General notes that apply to Tables 4F-35 through 4F-51 unless otherwise noted on specific unit process table are listed below.
Note 0 relates to the title of each unit process. Notes 1-7 refer to reference numbers listed in the column headings of each of the tables.

0) Unit Process Numbers Assigned are based on	MMSD, *Jones Island I&C Upgrade* , Contract J06014D01, Attachment B, Addendum No. 2 Not all unit process numbers were assigned according to this source. The numbers not assigned are No. 7, 17, and 19.
1) Facility and Design Information/Capacity Documentation:	MMSD, South Shore Operation & Maintenance Manual : Plant Summary and Administration (1 March 1986).
2) 2003 Performance Data Taken From:	2003 SSWWTP UWS Daily/Weekly Operating Report
3) Unit Process Structural/Equipment Age Information:	DRAFT Asset Management System data provided by MMSD April 2004 DRAFT, FOR REVIEW PURPOSES ONLY MMSD Contract Compliance Office, *Annual Summary of United Water Service Performance* (1999-2004).
4) Current NR 110/204 Regulations:	Department of Natural Resources, *Wisconsin Administrative Code* , Volume 11, Chapter NR 110 (Revisor of Statutes Bureau, May 2001). Department of Natural Resources, *Wisconsin Administrative Code* , Volume 11, Chapter NR 204 (Revisor of Statutes Bureau, November 1996). Current NR 110 regulations were updated after the WWTP unit processes were constructed. Applicable NR 110 regulations were most recently updated May 2001. NR 110 aplies to new or modified sewerage systems. Nr 110.04 authorizes the WDNR to approve alternate requirements.
5) Advisory 10-States Standards:	Wastewater Committee of the Great Lakes – Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, *Recommended Standards for Wastewater Facilities* (Health Education Services Division, 2004). Advisory 10-States Standards were updated after the WWTP unit processes were constructed. Applicable 10-States Standards were most recently updated in 2004.
6) Committed/MMSD Recommended Projects:	Committed Projects are defined as: - Projects with construction contracts as of December 31, 2006 - Projects identified by the State of Wisconsin Circuit Court, Stipulation: State of Wisconsin, Plaintiff v. Milwaukee Metropolitan Sewerage District, Defendant, Case No. 02-CV-2701 (May 29, 2002) but not yet completed - Projects that were identified as committed by MMSD as of December 31, 2006 (Milwaukee Metropolitan Sewerage District, Technical Services Committed Projects as of June 30, 2006 (June 30, 2006)) and included in the Milwaukee Metropolitan Sewerage District 2007 Annual Budget (November 2006) MMSD Recommended Projects are defined as projects included in the MMSD 2007 Annual Budget, but not yet committed
7) Existing Issues/Information:	*Response by MMSD to Questions by Wisconsin Department of Natural Resources (* January 2001). UWS, *United Water Service Requested Projects* (2001-2004). UWS, *Monthly Report for Milwaukee Metropolitan Sewerage District* (1999-2003). MMSD, *Contract Compliance Office Monthly Report* (1998-2003).

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Acronym table that applies to Tables 4F-34 through 4F-62:

Acronym	Definition
ACFM	actual cubic foot per minute
AD	average day
ADF	airport deicing fluid
Agri	Agri-Life® biosolids
ave	average
AVG	average
BFP	belt filter press
BHP	brake horsepower
BOD	biochemical oxygen demand
BSD	blended sludge dry
BTU	British thermal unit- standard unit of energy
CaO	calcium oxide
cf	cubic foot
cf/hr	cubic foot per hour
cfm/CFM	cubic foot per minute
Ch	Chapter
Cl_2	Chlorine gas
Clarif	Clarifier
CY	cubic yard
cy/hr	cubic yard per hour
D&D	Drying & Dewatering
DAF	dissolved air flotation
det	detention
dia/DIA	diameter
Disinf	disfection
DMR	Discharge Monitoring Report
DNR	Department of Natural Resources
DSD	digested sludge dry
DWOR	daily/weekly operating report
Eff	effluent
Elec	electrical
Elev	elevation
EP	East Plant
EP RAS	East Plant return activated sludge
EP WAS	East Plant waste activated sludge
Est	estimated
fps	foot per second
ft	foot
gal	gallon
GBT	gravity belt thickener
GMIA	General Mitchel International Airport
gpd	gallon per day
gpd/sf	gallon per day per square foot
gphr	gallon per hour
gpm/GPM	gallong per minute
HL	High Level
hp	horsepower
hr	hour
hrly	hourly
Hyd	hydraulic
I&C	instrumentation and control
ICFM	inlet cubic feet per minute
in	inch
inf	influent
IPS	interplant solids
ISHF	interplant solids handling facility
ISS	inline storage system
JIWWTP	Jones Island Wastewater Treatment Plant
JIHT	Jones Island Head Tank
KCFM	1000 cubic feet per minute
KGD	1000 gallons per day
kW	kilowatts
lb	pound
lb/cf	pound per cubic foot
lb/d	pound per day
lb/d/sf	pound per day per square foot
lbs/sf/hr	pound per square foot per hour
LCP	link control protocol (part of instrumentation control system)
Liq	liquid
LL	Low Level
Max	Maximum
MCC	motor control center
MD	maximum day
Mech	Mechanical
Mech/Elec	Mechanical/Electrical
MG	million gallons
mg/L	milogram per liter
MG/yr	million gallons per year
MGD	million gallons per day
MILO	Milorganite
min	minute
MinD	minumum day
Misc	miscellaneous
MLSS	mixed liquor suspended solids
MLVSS	mixed liquor volatile suspended solids
mm	milometer
MMBTU	million British thermal units
MMSD	Milwaukee Metropolitan Sewerage District
MSCF	million standard cubic feet
NaBi	Sodium Bisulfate
$NaHSO_3$	Sodium Bisulfate
NaOCl	Sodium Hypochlorite
NEP	New East Plant
NR	Natural Resources
O&M	operation & maintenance
oF	degrees Fahrenheit
Oper	Operation
Ops	Operation
orig	original
PAC	process air compressor
PE	primary effluent
PH	peak hour
PL	pickle liquor
Pri	primary effluent
PSD	primary sludge dry
psi	pound per square inch
Q	flow
RAS	return activated sludge
Rehab'd	rehabilitated
Rem	removal
Req'd	required
rpm	revolutions per minute
RTU	remote terminal unit (part of instrumentation control system)
scf	standard cubic foot
Sec	secondary
sf	square foot
SLR	solids loading rate
SO_2	sulfer dioxide
SOR	surface overflow rate
SSHT	South Shore Head Tank
SSWWTP	South Shore Wastewater Treatment Plant
Sta	Station
Stor	Storage
SVI	sludge volume index
swd	side wall depth
TAS	thickened activated sludge
TDH	total dynamic head
ton/d	ton per day
tpd	ton per day
TSS	total suspended solids
TWAS	thickened waste activated sludge
UWS	United Water Service
VFD	variable-frequency drive
Vol	volume
w/	with
WAS	waste activated sludge
WDNR	Wisconsin Department of Natural Resources
WLR	weir loading rate
WP	West plant
WPDES	Wisconsin Pollutant Discharge Elimination System
WP RAS	West Plant Return Activated Sludge
WP WAS	West Plant Waste Activated Sludge
WWTP	Wastewater Treatment Plant
WxHxL	width by height by length
yr	year

Facility[1]	Design Info/Capacity [1]	Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Maximizes the volume of sewage treated at SSSWWTP, while restricting flows to within its safe operating range.		WWTP Capacity limited during Preliminary Treatment Construction 2001–2003 Ave Flow 1997–2001: 108 MGD Max Flow 1997–2001, 2004 (through June): 323 MGD	Structure – 1993 Mech/Elec Equipment – 1983 Emergency Power – 2003	No specific requirements	Applicable Advisory Standard: Ch 50: Wastewater Treatment Facilities, Section 53.413, Flow Equalization Meets all advisory standards		
2) System:							
Sluice Gates							
Number	2.0						
Size (ft W x ft H)	6 x 10						
Invert Elevation (ft)	4.8						
Overflow Weir							
Number, Logs	5						
Elevation Range (ft)	36.0 - 41.0						
Normal Elevation (ft)	39.0						
Sluice Stop Logs							
Purpose	Maintenance						
Max Stack Height (ft)	12						
Water Level Monitors							
Upstream, Number	4						
Type	2- Ultrasonic, 2- Bubbler						
Level Range (ft)	0-50						
Downstream, Number	2						
Type	Bubbler						
Level Range (ft)	0-50						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-34, SSWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

2) Performance Data: All performance data was calculated from measured data. The calculations can be found in this appendix under Table 4F-52, SSWWTP Unit Process No. 1: MIS Control Structure Calculations.

Facility[1]	Design Info/ Capacity[1]	Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Remove trash, rags, leaves and other large debris from influent wastewater		May 2004 – Peak flow event since new influent screening system installed Peak flow recorded at SSWWTP during event – 321 MGD	House Structure – 1968, 1984 Structural Addition – 2003 Influent Screens – 2000-2003 Elec equipment – 2000-2003	Applicable Regulation: NR 110.16 Screening Devices. In compliance with all current regulations	Applicable Advisory Standard: Ch 60: Screening, Grit Removal, and Flow Equalization, Section 61, Screening Devices Meets all advisory standards		
2) System:							
Total Capacity (MGD)	350						
Firm Capacity (MGD, 1 unit out of service)	300						
Type	Parkson self cleaning						
Number	7						
Size, ft	5 wide x 15 high						
Capacity (MGD, each)	50						
Incline (degrees from vertical)	15						
Screenings (cy/hr)	2.2						
Maximum opening (in)	0.25						
Horsepower	2						
Diversion Channel Manual Bar Screen							
Total Capacity (MGD)	300						
Velocity at Total Capacity (fps)	2.3						
Width (ft)	25.5						
Height (ft)	7.84						
Incline	45						
Bar opening (in)	2						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-34, SSWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

1) Facility and Design Information/
Capacity Documentation: O&M states 70 MGD operating capacity per screen in CLEAN conditions, MMSD has found that operation capacity of each screen is around 50 MGD.

2) Performance Data: All performance data was calculated from measured data. The calculations can be found in this appendix under Table 4F-53, SSWWTP Unit Process No. 2&3: Influent Screening and Grit Rremoval Calculations

Facility[1]	Design Info/Capacity [1]	Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Removes grit, which consists of sand, gravel, coffee grounds, eggshells and other heavy materials, in the raw sewage which could damage downstream processes		May 2004 – Peak flow event since new influent screening system installed Peak flow recorded at SSWWTP during event – 321 MGD	Grit channels – 2000-2003	Applicable Regulation: NR 110.17 Grit removal facilities.	Applicable Advisory Standard: Ch 60: Screening, Grit Removal, and Flow Equalization, Section 63, Grit Removal Facilities		
2) System:							
Total Hydraulic Capacity (MGD, 7 channels in service & V = 1.2 fps)	>300		Building – 1968, 1984				
Total Treatment Capacity w/ **95**% removal of 65 mesh particles & V = 1.0 fps (MGD, 7 channels in service)	300		Building Addition – 2003	In compliance with all current regulations	Meets all advisory standards		
			Submersible pumps – 2000-2003				
Grit Channels							
Number	7						
Treatment Capacity w/ **95**% removal of 65 mesh particles & V = 1.0 fps (MGD, each)	42.9		Grit classifiers – 2000-2003				
Dimensions							
Depth (ft)	15.25						
Width (ft)	12 at top, 6 at bottom		Add grit equip – 2000-2003				
Length (ft)	120						
Grit Collectors							
Type	Chain and flight		Elec equipment – 2000-2003				
Size	5.5' wide						
Location	Every 11'						
Speed (fpm)	2-5						
Horsepower	1						
Grit Pumps							
Total Capacity (GPM)	4200						
Firm Capacity (GPM, 1 unit out of service)	3600						
Type	Submersible Impeller						
Number	7						
Capacity (GPM)	600						
Total Dynamic Head (ft)	46						
Horsepower (hp)	30						
Grit separation/classification unit							
Total Capacity (GPM)	4130						
Firm Capacity (GPM, 1 unit out of service)	3540						
Type	SlurryCup						
Number	7						
Capacity (GPM, each)	590						
Total Solids Concentration (%)	1						
Max Headloss (inch)	209						
Baffle Gap (inch)	0.25						
Grit dewatering unit							
Type	Conveyor						
Capacity (cy/hr, each)	2						
Horsepower	1/3						
Speed	Variable						
Grit Conveyor							
Type	Constant Speed Conveyor						
Capacity (cy/hr @ 40-60 lb/cf)	41						
Horsepower	10						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-34, SSWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

2) Performance Data: All performance data was calculated from measured data. The calculations can be found in this appendix under Table 4F-53, SSWWTP Unit Process No. 2&3: Influent Screening & Grit Removal Calculations.

Facility[1]	Design Info/ Capacity[1]	Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Removes influent total suspended solids (TSS) and BOD by settling out primary sludge of wastewater		Aeration Basins in Plug Flow Mode: 222 MGD w/ 24 Aeration basins & 12 Primary Clarifiers in service 228 MGD w/ 24 Aeration basins & 16 Primary Clarifiers in service 247 MGD w/ 28 Aeration basins & 12 Primary Clarifiers in service 256 MGD w/ 28 Aeration basins & 16 Primary Clarifiers in service	Structure – 1968 Collector Mech; Raw, Scum, Screened sludge Pumps, Flow meters – approx 1986 Parkson screens – 2002	Applicable Regulation: NR 110.18 Settling tanks. Does not meet NR 110.18.2 (d).1 – "Operating design parameters for settling parameters may not exceed the values given in Table 3." Table 3 states that the maximum hourly surface settling rate for primary clarification is 1500 gpd/sf.	Applicable Advisory Standard: Chap. 70, Settling Does not meet Section 72.21 – "The following surface overflow rates should not be exceeded in the design: Design average flow for primary clarification = 1000 gpd/sf; design peak hourly flow = 2000 gpd/sf."		• As part of the completed SSWWTP Primary Clarifier Improvements and SSWWTP Primary Clarifier Weirs Replacement projects, the sludge screens and scum concentrators were also upgraded and the effluent weir arrangements in all the clarifiers were replaced to reduce head loss and prevent the weirs from submerging during high flows
2) System:		Aeration Basins – Plug Flow Mode & Step Feed Values Open: 305 MGD w/ 24 Aeration basins & 12 Primary Clarifiers in service 332 MGD w/ 24 Aeration basins & 16 Primary Clarifiers in service 319 MGD w/ 28 Aeration basins & 12 Primary Clarifiers in service 357 MGD w/ 28 Aeration basins & 16 Primary Clarifiers in service	Influent Gate Operators, Elec Scum Mech – 2000-2003 Other elec equipment – 1988-1990				
Total Capacity (MGD)	300						
Firm Capacity (MGD, I unit out of service)	281						
Surface overflow rate (gpd/sf)	AD - 1100, MD - 2440						
Peak overflow rate (calculated)	2930						
Detention Time (hr)	AD - 1.6, MD - 0.7						
Weir Loading Rate (gpd/ft)	AD - 24500, PH - 65100						
TSS Removal (%)	AD - 60, MD - 44						
BOD_5 Removal (%)	AD - 32, MD - 17						
Sludge Flow Rate (MGD)	AD - 0.49, MD - 1.27						
Percent Solids (%)	AD - 4.5, MD - 3	Average Removal					
Pri Sludge Production (lbs/d)	AD - 183200, MD - 318900	– BOD 46%					
Basins		– TSS 40%					
Total Number	16						
Size (ft, each)	160x40x10 swd	Peak Flow Day Removal (5/9/03)					
Collector Mechanism	Chain & Flight	– BOD 26%					
Primary Sludge Pumps		– TSS 24%					
Total Capacity (MGD)	2.88						
Firm Capacity (MGD, 2 main units in service)	1.44						
Total Number	4						
Capacity (GPM, each)	500						
Type (each)	Progressing Cavity						
Horsepower	40						
Drive	Variable speed						
Primary Influent							
Plant Flow Metering							
Total Number	4						
Type	Magnetic						
Size	36"						
Capacity, Each (MGD)	120						
Control Valves							
Number	4						
Size	36"						
Scum Handling							
Scum Collection							
Scum Concentrator							
Primary Screens							
Type	Parkson						
Number	3						
Capacity							

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-34, SSWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

2) Performance Data: Flow performance data provided in Gary Cresey (Donahue & Associates), e-mail correspondence subject: South Shore PE Flow Charts with Greg Baker (MMSD), 1 May, 2006 . Removal data was calculated from measured data. The calculations can be found in this appendic under Table 4F-54, SSWWTP Unit Process No. 4, Primary Clarification Calculations.

7) Existing Issues/Information: Discussions with UWS and MMSD staff

Facility[1]	Design Info/ Capacity[1]	2003 Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: See JIWWTP Unit Process Analysis, Unit Process No. 5: Secondary Flow Control/ Aeration System and Unit Process No 7: Activated Sludge Pumping for descriptions of function.		Max Day Inf Act Sludge BOD: 147,300 lb/d % of total calculated secondary capacity data that capacity was less than 300 MGD: 8.3%	Aeration Basins – 1974 Aeration Basins #2 & 3 – 1993	Applicable Regulation: NR 110.21 Activated Sludge.	Applicable Advisory Standard: Section 92, Activated Sludge		• Rated capacity of secondary treatment is 250 MGD; however, operational experience has indicated that more than 300 MGD can be treated on a 24-hr-per-day basis
2) System:				<u>Meets</u> NR 110.21.7(e) – "The maximum waste activated sludge (WAS) pumping rate shall be at least 200% of the anticipated volumetric sludge production rate."	Does not meet Section 92.44 – "Waste sludge control facilities (WAS) shall have a capacity of at least 25 percent of the design average rate of wastewater flow..."		
MD Total Capacity (lb/d BOD)	442,400	Ave calculated secondary treatment capacity: 428 MGD					
MD Firm Capacity (lb/d BOD)	426,600						
Influent BOD_5 (lb/d)	AD - 156400, MD - 442400	UWS does not keep daily RAS records for South Shore	Aeration Eff Channels Structure – 1985				
AD Total Capacity (lb/d BOD)	158,500						
F/M (lb BOD_5/lb MLVSS-d)	AD - 0.24, MD - 0.84						
MLSS (mg/L)	AD - 3030, MD - 2450						
MLVSS (mg/L)	AD - 2240, MD - 1810	Est. RAS (Based on UWS DWOR Plant Schematic & 2003 Data):		WAS Average Day Flow (GPM): 1,600			
Detention Time (hr)	AD - 7.1, MD - 3.2	Ave Day 19 MGD, Max Day 49 MGD	3) Aeration/ Sec Control Buildings – 1974-1988				
BOD_5 Loading (lb BOD_5/1000 cf)	AD - 34, MD - 95			200% of Average Day Flow (GPM): 3,200	Average Day Flow (MGD): 113		
Return Sludge Flow (MGD)	AD - 57, MD - 125						
Sludge Concentration (mg/L)	AD - 9000, MD - 7000	Waste sludge: Ave Day 720 GPM, Max Day 1430 GPM	Membrane diffusers – 2002		25% of Ave Day Flow (MGD): 28.25		
Waste Sludge Production (lbs/d)	AD - 172900, MD - 320900			Actual WAS Total Capacity: 4790 GPM			
Waste Sludge Flow (GPM)	AD - 1600, MD - 3810		Feed Piping Flow Meters & Valves – 2003		25% of Ave Day Flow (GPM): 19,600		
Aeration Basins							
Total Number	28		RAS Pumps – 1984		Actual WAS Total Capacity: 4790 GPM		
Basin Size	370'x30'x15' swd						
Total Basin Volume (MG)	34.88		RAS Transfer Pumps – 1985				
Basin Air Distribution							
Basins No. 3-26			WAS Pumps – 1984				
Type	Fine Bubble Porous Plate						
Plates per basin	2448		Original Elec Equipment – 1974, 1985-1988				
Plate Surface Area (sf, each)	1						
Basins No. 1, 2, 27 and 28			VFDs – 2001				
Type	Fine Bubble Grid Diffusion						
Diffusers per Basin	2500						
Diffuser Surface Area (sf, each)	0.42						
RAS-WAS and Return Activated Sludge Pumping							
RAW-WAS Transfer Pumps							
Total Capacity (MGD, 6 in serv)	46						
Firm Capacity (MGD, 5 in serv)	38						
Capacity (GPM, each)	7.67						
Total Number	6 (3 per battery)						
Type	Centrifugal						
Horsepower (each)	50						
Drive	Variable Frequency						
RAS Pumps							
Total Capacity (MGD, 8 in serv)	125						
Firm Capacity (MGD, 7 in serv)	109						
Capacity (GPM, each)	15.63						
Total Number	8 (2 Per Battery)						
Type	Centrifugal						
Horsepower (Each)	150						
Drive	Variable Frequency						
WAS Pumping							
Total Capacity (GPM, 4 in Serv)	4792						
Firm Capacity (GPM, 3 in serv)	3594						
Capacity (GPM, each)	1198						
Pumps (No.)	4						
Type	Centrifugal						
Horsepower (each)	30						
Drive	Variable Frequency						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-34, SSWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

2) Performance Data: All performance data was calculated from measured data. The calculations can be found in this appendix under Table 4F-55, SSWWTP Unit Process No. 5, Aeration and WAS Pumping Calculations, and Table 4F-56, SSWWTP Unit Process No. 5, RAS Pumping Calculations.

7) Existing Issues/Information: SS O&M Manual, discussions with UWS and MMSD staff, review of DMR data

Facility[1]	Design Info/Capacity[1]	Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Settles out biologically transformed solids from the activated sludge process		No mixed liquor flow limitations - issues originally identified turned out to be flow meter measurement issues	Clarifiers #1-16 – 1974 Clarifiers #17-24 – 1985 Mech/elec equipment for Clarifiers #1-16 – 1974 Mech equipment for Clarifiers #17-24 – 1985 Elec equipment for Clarifiers #17-24 – 1988	Applicable Regulation NR 110.18 Settling tanks. Does not meet NR 110.18.2 (d).1 – "Operating design parameters for settling parameters may not exceed the values given in Table 3." Table 3 states that the maximum hourly surface settling rate for activated sludge clarification is 1200 gpd/sf.	Applicable Advisory Standard: Chap. 70, Settling Does not meet Section 72.232 – "The following design criteria shall not be exceeded: Surface Overflow Rate at Design Peak Hourly Flow – 900 gpd/sf for activated sludge with chemical addition to mixed liquor for phosphorus removal."	<u>MMSD Recommended Project</u> S02005 – Secondary Clarifier Upgrade	• XCG study did indicate that there was an imbalance of flows to all of the secondary clarifiers – some clarifiers received more flow, others less, when each clarifier should receive an even portion of the total flow; however, a recent evaluation indicated that the imbalance is not as significant as the study suggested
2) System:							
Total Capacity (MGD)	300						
Total Firm Capacity (MGD, 1 unit out of service)	288						
Surface Overflow Rate (gpd/sf)	AD - 480, MD - 1050						
Capacity based on SOR (MGD)	AD - 119, MD - 260						
Peak Overflow Rate	1250						
Solids Loading Rate (lb/d/sf)	AD - 18, MD - 32						
Detection Time (hr)	AD - 5.2, MD - 2.4						
Units in Service	24						
Configuration	Octagonal						
Size (ft)	Sides tangent to 112 Dia x 14 swd						
Total Surface Area (sf)	248000						
Total Volume (MG)	26						
Influent Feed	Peripheral						
Influent Feed Sludge Collection	Suction Header						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-34, SSWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

1) Facility and Design Information/ Capacity Documentation: Peak Hourly Surface Overflow Rate and Solids Loading Rate calculated based on measured data. Calculations are included in this appendix under Table 4-F57, SSWWTP Unit Process No. 6: Secondary Clarification Calculations.

2) Performance Data: Donahue & Associates, Inc., *Design Report for the Phase I Wet Weather Capacity Improvement Project at the Jones Island and South Shore WWTP* , MMSD Contract No. J02001D001 (August 2005).

7) Existing Issues/Information: Gary Cressey, *Technical Memorandum: South Shore Mixed Liquor Flow Distribution Improvements* , part of Phase 1 Wet Weather Capacity Improvements, Jones Island and South Shore Wastewater Treatment Plants, Contract No. J02001D01 (Donahue & Associates, Inc., 30 January 2004).

Facility[1]	Design Info/Capacity[1]	2003 Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Chlorination destroys disease-causing organisms in the wastewater. Dechlorination removes the chlorine to protect organisms in the receiving water.		NaOCl used: Ave Day – 930 gal, Max Day – 2920 gal Cl2 Dose: Ave Day – 2 mg/L, Max Day – 6 mg/L NaHSO3 used: Ave Day – 210 gal, Max Day – 910 gal So2 Dose: Ave Day – 1 mg/L, Max Day – 2 mg/L	Original structure – 1968 Add structure – 1985, 1986 NaOCl & NaBi tanks – 2001 NaOCl & NaBi equip – 2001 MCC – 1986 Original Elec Equipment – 1985 NaOCl & NaBi Elec – 2001	Applicable Regulation: NR 110.23 Disinfection. In compliance with all current regulations	Applicable Advisory Standard: Chap. 100, Disinfection Meets all advisory standards		• Emergency power shall be able to run disinfection during shutdowns after MMSD recommended project S02004 – SSWWTP Blower Engine System Upgrade Project is complete • NR 110 regulations require that the disinfection system shall be sized to provide a detention time of 60 minutes at average daily flow or 30 minutes at maximum design flow and effluent bacterial concentrations shall conform to WPDES permit requirements. Though the contact basins only have a total design capacity of 242 MGD at a 30-minute detention time, they provide more than 64 minutes of detention time at the design average daily flow of 113 MGD. Therefore, NR 110 regulations are met since effluent fecal coliform limits are met • Effluent meters are currently not used by UWS
2) System:							
Chlorination							
Total Capacity (MGD, 30 min detention time)	242						
Firm Capacity (MGD, 30 min detention time, one basin out of service)	121						
Contact Time, Peak Hr Flow (min)	24.2						
Contact Time, Ave Day Flow (min)	64.1						
Nominal Contact Time (min)	AD - 62, MD - 28						
Disinfection							
Cl2 Dose (lb/d)	AD - 3770, MD - 8340						
NaOCl Use (gal/d)	AD - 3020, MD - 6670						
Energency Disinfection (330 MGD Secondary Bypass Flow)							
Cl2 Dose (lb/d)*	50000						
NaOCl Use (gal/d)*	40000						
Oxidation							
Cl2 Dose (lb/d)	AD - 5330, MD - 11822						
NaOCl Use (gal/d)	AD - 4260, MD - 9457						
Odor Control							
Cl2 Dose (lb/d)	Exist AD - 1200						
NaOCl Use (gal/d)	Exist AD - 960						
RAS							
Cl2 Dose (lb/d)	MD - 3000						
NaOCl Use (gal/d)	MD - 2400						
Dechlorination							
SO2 Dose (lb/d)	AD - 1890, MD - 4170						
Sodium Bisulfite Use (gal/d)	AD - 720, MD - 1600						
NaOCl Storage Tanks							
Number	5						
Size (gal, each)	4 - 13900, 1 - 5000						
Total Capacity (gal)	60600						
Sodium Bisulfite Storage Tanks							
Number	2						
Size (gal, each)	9400						
Total Capacity (gal)	18800						
Contact Basins							
Total Number	2						
Passes per Basin	5						
Nominal Pass Length (ft)	300						
Nominal Pass Width (ft)	17.25						
Nominal Depth (ft)	13						
Nominal Contact Volume, Total (MG)	5.0						
Chemical Induction Units							
Type	Stranco Water Champ						
Number, Sod Hypochlorite	4						
Total Capacity (gpm)	240						
Capacity (gpm, each) **	60						
Number, Sod Bisulfite	4						
Total Capacity (gpm)	100						
Capacity (gpm, each) **	25						
Flow Metering							
Type	Parshall Flume						
Capacity, each (MGD)	150						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-34, SSWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

1) Facility and Design Information/
Capacity Documentation: US Filter Stranco Capacities based on Equipment Information supplied by Equipment Supplier & was not included in O&M Manual

2) Performance Data: All performance data was calculated from measured data. The calculations can be found in this appendix under Table 4F-58, SSWWTP Unit Process No. 8: Disinfection Calculations.

7) Existing Issues/Information: SS O&M Manual, discussions with UWS and MMSD staff, review of DMR data, WPDES Permit

Facility[1]	Design Info/Capacity [1]	Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Pump effluent from the plant when needed due to plant flow, number of channels in service and lake level require additional hydraulic elevation.		Effluent pumping has not been used for 5+ yrs. Lake Michigan water levels have been low enough to allow gravity discharge from South Shore even during wet weather events.	Eff Pump Sta – 1984 Eff pumps – 1985 Elec Equipment – 1984 MCCs – 1986	Applicable Regulation: NR 110.14 Sewerage lift station design criteria In compliance with all current regulations	Applicable Advisory Standard: Ch 40: Wastewater Pumping Stations Meets all advisory standards		• Pumping is used intermittently at SSWWTP. Effluent pumping has not been used at SSWWTP for more than five years
2) System:							
Total Capacity (MGD)	375						
Firm Capacity (MGD, 4 in Service)	300						
Total No.	5						
Capacity (MGD, each)	75						
Type	Wet Pit Axial Flow						
Horsepower (each)	200						
Drive	Variable Frequency						
Effluent Flow Measurement							
Type	Parshall Flume						
Size	15' Throat						
Number	2 (1 per Contact Basin)						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-34, SSWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

2) Performance Data: Craig Heisel (UWS), e-mail correspondence with author RE: Outstanding JI & SS Unit Process Questions, 8 June 2005.

7) Existing Issues/Information: Same as above

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TABLE 4F-42

SSWWTP UNIT PROCESS NO. 9: EFFLUENT PUMPING

2020 TREATMENT REPORT

Facility[1]	Design Info/Capacity [1]	2003 Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Thickens the WAS removed from the secondary treatment process at SSWWTP from approx. 1% solids to 4-5% solids for futher treatment.		WAS Feed – Average Day 150 GPM (1340 lb/d) – Maximum Day 1160 GPM (11,800 lb/d) TWAS Solids Concentration – Average Day 3.8% – Maximum Day 6.3%	Building – 1984 DAF Basins – 1984 Polymer Tanks – 1986 Original Thickened Sludge, Recycle, Polymer Pumps – 1984 Select replace pumps – 1999, 2001 Scrappers – 1984 Elec Equipment – 1984	Applicable Regulation: NR 110.26 Sludge handling, storage and disposal. Subsection (2)(b) Sludge thickening. In compliance with all current regulations	Applicable Advisory Standard: Chap. 80, Sludge Processing, Storage, and Disposal, Section 83, Sludge Thickeners Meets all advisory standards		• DAF units in Bldg 357 were abandoned to install Sodium Hypochlorite and Sodium Bisulfite tanks for disinfection
2) System:							
– Dissolved Air Flotation							
Total Capacity (lb/hr, Bldg 358 units only)	7440						
Firm Capacity (lb/hr, largest Bldg 358 unit out of service)	6200						
Units in Service – Bldg 357	None Currently						
Solids Loading (lb/hr/SF)	AD - 0.49, MD - 0.6						
Units in Service – Bldg 358	AD - 4, MD - 6						
Solids Loading (lb/hr/SF)	AD - 0.81, MD - 1						
Average Polymer Dose (lb/dry ton)	74						
Bldg 357 – Out of Service							
Bldg 358 – New (1984)							
Number	6						
Capacity (lb/hr, each)	1240						
Size (ft)	20 x 63						
Effective Surface Area (sf, each)	1240						
Air to Solids Ratio	0.02						
Operating Pressure (psig)	65						
Thickened Sludge Pumps							
Total Capacity (GPM, Bldg 358 only)	675						
Firm Capacity (GPM, 1 unit out of service in Bldg 358)	450						
Existing (Modified)							
Total Number	4						
Capacity (GPM, each)	150						
Type	Progressing Cavity						
Horsepower (each)	25						
Drive	Variable Frequency						
New							
Total Number	3						
Capacity (GPM, each)	225						
Type	Progressing Cavity						
Horsepower (each)	25						
Drive	Variable Frequency						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-34, SSWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

2) Performance Data: All performance data was calculated from measured data. The calculations can be found in this appendix under Unit Process No. 10: Sludge Thickening within Table 4F-61, *Agri-Life Process Calculations.*

7) Existing Issues/Information: Discussions with UWS and MMSD staff, site visit observations

Facility[1]	Design Info/Capacity [1]	2003 Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Stabilizes the biological activity and reduces the volume of the primary sludge from both JIWWTP and SSWWTP along with SSWWTP thickened WAS. Anaerobic (without air) bacteria convert the volatile solids in the sludges to a gas mainly made up of methane.		Digester Feed – Average Day 200,200 lb TS/d – Maximum Day 328,500 lb TS/d – Average Day 155,000 lb VS/d – Maximum Day 254,300 lb VS/d Volatile Solids Loading Rate: –Average Day 76 lb VS/1000 cf/d –Maximum Day 125 lb VS/1000 cf/d Average % Volatile Solids in Digester Feed: 77.40% Average Hydraulic Detention Time – 25.3 days Average Volatile Solids Destruction: 55.2%	Building – 1985 Digesters – 1985 Mech equipment – 1982-1985 Elec Equipment – 1985-1988	Applicable Regulation: NR 110.26 Sludge handling, storage and disposal. Subsection (5) Anaerobic digestion. Does not meet NR 110.26.5. (b).1.b – "The maximum system loading shall be 80 lbs VS/1000 cf/ d in the digester." At Max Day design, solids loading is 130 lb VS/ 1000 cf/d. Note however that the operation of the digesters has changed tremendously since the design requirements were set forth in the South Shore O&M Manual, with almost half of the original digesters now being used for Agri-Life® storage.	Applicable Advisory Standard: Chap. 80, Sludge Processing, Storage, and Disposal, Section 84, Anaerobic Sludge Digestion Does not meet Section 84.321 – "For digestion systems providing for intimate and effective mixing of the digester contents, the system may be loaded up to 80 lbs VS/1000 cf/ d in the digester." At Max Day design, solids loading is 130 lb VS/ 1000 cf/d.		• Originally designed to take SS PSD & WAS plus some JI PSD – now take mostly SS & JI PSD with almost no SS WAS • South units #1-5, 7 have been converted to Agri-Life Storage • Only North units #9-12 plus South units #6 & 8 used for digestion. • Mixing may be an issue, related to VS destruction. • Historically VS destruction less than expected for primary sludge, possibly due to mixing issues • In 2000, MMSD began accepting concentrated deicing fluid from the General Mitchell International Airport (GMIA) for treatment in the digesters
2) System:							
– Single stage, High rate							
Total Capacity (lb VS/d)	265000						
Firm Capacity (lb VS/d, largest unit out of service)	209000						
Digester Total Effective Volume (cf)	2036600						
Operating Temperature (^{o}F)	95						
Detention Time (days)	AD - 31, MD - 13						
Total Solids Loading (lb/d)	AD - 321600, MD - 643200						
Volatile Solids Loading (lb/d)	AD - 249400, MD - 524600						
Solids Loading (lb VS/cf/d)	AD - 0.06, MD - 0.13						
Volatile Solids Destruction (%)	AD - 50, MD - 46						
Volatile Solids Destruction (lb/d)	AD - 124700, MD - 241300						
Gas Production (scf/lb VS des)	15						
Gas Production (MSCF/d)	AD - 1.87, MD - 3.62						
Units in Service – South	**2**						
Size (ft)	110' dia x 21' side wall						
Effective Volume (MG, each – excluding allowance for grit & scum accumulation &	1.25						
Mixing	2 Mech						
Heating System	Spiral Heat Exchangers						
Heat Requirement (BTU/hr/digester)	2400000						
Units in Service – North	**4**						
Size (ft)	125' dia x 38' side wall						
Effective Volume (MG, each – excluding allowance for grit & scum accumulation &	3.19						
Mixing	Atara						
Heating System	Spiral Heat Exchangers						
Heat Requirement (BTU/hr/digester)	5600000						
Gas Storage							
Total Storage (scf)	840000						
Total Number	2						
Size	49' dia sphere						
Volume (scf @ 50 psig, each)	420000						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-34, SSWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

1) Facility and Design Information/ Capacity Documentation: Total and Firm Capacity were calculated based on the Maximum lb VS/cf/d Solids Loading multiplied by the number of active digesters not used for storage
Design Criteria listed from Detention Time through Gas Production are based on the original design which included the six operational digesters and the six digesters now used for Agri-Life Storage (see Table 4F-51, Unit Process No. 20: Agri-Life Storage)

2) Performance Data: All performance data was calculated from measured data. The calculations can be found in this appendix under Unit Process No. 11: Anaerobic Digestion within Table 4F-61, Agri-Life Process Calculations.

7) Existing Issues/Information: SS O&M Manual, discussions with UWS and MMSD staff

Facility[1]	Design Info/ Capacity[1]	2003 Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Thickens the digested sludge from 2-3% solids to 6-8% solids before either being stored for use as Agri-Life or sent to the dewatering process.		Centrifuge Feed – Average Day 180 GPM (25 Ton/d) – Max Day 710 GPM (110 Ton/d)	Building – 1987 Polymer Tank – 1988 Original centrifuges – 1988 Rehab'd – 199-2001 Pumps – 1992 GBT – 2005 (Future) Original Elec Equipment – 1988 GBT Elec Equipment – 2005	Applicable Regulation: NR 110.26 Sludge handling, storage and disposal. Subsection (2)(b) Sludge thickening. In compliance with all current regulations	Applicable Advisory Standard: Chap. 80, Sludge Processing, Storage, and Disposal, Section 83, Sludge Thickeners Meets all advisory standards		• 4 of 10 centrifuges in operation • Only need 1 or 2 to meet current operation, other provided in case of biosolids emergency with IPS pumping or Milorganite processes • Centrifuges are old and in need of replacement • Original design utilized centrifuges for DS, JI PSD/WAS from IPS and Inline Solids thickening. JI PSD/WAS was then to be routed back through digesters after thickening. • Now only used to thicken DS for Milorganite Prod at JI, Agrilife or landfill application depending on need. • Project comlpeted in 2005 will install GBT to handle most of sludge thickening with centrifuge(s) only used to handle excess biosolids or in event of emergency
2) System:							
Total Capacity (GPM)	1560						
Firm Capacity (GPM)	1170						
Current Use – Sludge to be thickened Anaerobically Digested Sludge Polymer Dose (lb/ton dry sludge)	2-4						
Gravity Belt Thickener (Future – 2005)							
Number	1						
Rated Capacity (gpm, each)	300						
Average Capacity (gpm, each)	230-250						
Centrifuges							
Sharples, number	4						
Drive (hp)	300.0						
Speed (rpm, constant)	1940						
Rated Capacity (gpm, each)	390						
Centrifuge Feed Pumps							
Total Capacity (GPM)	3120						
Number	6						
Type	Centrifugal						
Capacity (gpm)	520						
Head (ft)	75						
Speed & Horspower (rpm, hp)	1750, 25						
Thickened Sludge Pumps							
Total Capacity (GPM)	1900						
Number	10						
Type	Progressive Cavity						
Capacity (gpm)	190						
Head (psi)	80						
Speed & Horspower (rpm, hp)	310, 25						
Polymer							
Storage Tanks, Number	2						
Volume (gal, each)	12000						
Concentration (%)	0.1-1.0						
Feed Pumps, Number	10						
Capacity (gpm, psi)	6, 50						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-34, SSWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

1) Facility and Design Information/
Capacity Documentation: Alan Scrivner, Re: Gravity Belt Thickener at South Shore, e-mail correspondence with author, 24 June 2005. Note that this additional gravity belt thickener is not listed in the existing condition total & firm capacity because it is a future installation, reviewed in Chapter 5.

2) Performance Data: All performance data was calculated from measured data. The calculations can be found in this appendix under Unit Process No. 12: Centrifuge Thickening within Table 4F-61, Agri-Life Process Calculations.

7) Existing Issues/Information: SS O&M Manual, discussions with UWS and MMSD staff

Facility[1]	Design Info/Capacity [1]	2003 Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: The interplant solids (IPS) pumping process provides for balancing of sludge between JIWWTP and SSWWTP – current operation typically sends JIWWTP primary sludge to SSWWTP and SSWWTP WAS and digested sludge to JIWWTP.		**FROM SSWWTP**: WAS: – Average Day: 590 GPM – Maximum Day: 1320 GPM Digested Sludge: – Average Day: 250 GPM – Maximum Day: 500 GPM	Structure – 1988 Mech Equipment – 1984 Elec Equipment – 1988	Applicable Regulation: NR 110.26 Sludge handling, storage and disposal. Subsection (4)(a) Sludge pumps. In compliance with all current regulations	Applicable Advisory Standard: Chap. 80, Sludge Processing, Storage, and Disposal, Section 83, Sludge Pumps and Piping Meets all advisory standards	MMSD Recommended Projects: P01001 – IPS Cathodic Protection P01002 – IPS & Blended Sludge System Plug Valves	• Since JIWWTP was expected to generate equal amounts of primary sludge and WAS, excess JIWWTP primary sludge was to be pumped to SSWWTP for digestion and additional SSWWTP WAS was to be pumped to JIWWTP for Milorganite® production. In addition, excess JIWWTP WAS during high wastewater loadings and inline solids removed at ISHF during wet weather events were to be pumped intermittently to SSWWTP. However, the current operation involves pumping most of JIWWTP primary sludge to SSWWTP to be digested, and pumping most of the SSWWTP WAS and over half of the digester sludge to JIWWTP for Milorganite® production. Since ISHF has rarely been used, no inline solids have been pumped to SSWWTP.
2) System:							
IPS Pipes							
Number	#1, #4						
Size (in)	14.0						
Number	#2, #3						
Size (in)	12.0						
IPS Receiving							
Wet Wells							
Total Capacity (gal)	195600						
Number	3						
Capacity (gal, each)	65200						
IPS Transfer Pumps							
WAS Pumping Design (GPM)	MinD - 354, MD - 1930						
Total Capacity (GPM)	3480						
Firm Capacity (GPM, 1 unit out of	2320						
Type	Horizontal Centrifugal						
Number	Three 2-stage Pairs						
Capacity (gpm, each)	1160						
Total Dynamic Head (ft)	465						
IPS Pumping Wet Wells							
Number	2.0						
Wet Well Mixers							
Number	2						
Capacity (gpm, each)	9400						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-34, SSWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

2) Performance Data: All performance data was calculated from measured data. The calculations can be found in this appendix under Table 4F-62, Unit Process No. 13: Interplant Solids Pumping.

7) Existing Issues/Information: SS O&M Manual, discussions with UWS and MMSD staff, site visit observations

Facility[1]	Design Info/Capacity [1]	2003 Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Further dewaters the thickened sludge from the digesters. The cake produced is landfilled or land applied as part of the Agri-Life program.		No daily data on Filter Press operation Filter Cake Total Production: 1570 Dry Tons	Building – 1991 Silos, Chem Tanks, Sludge Storage Tanks – 1991-1993 Filter Presses – 1988 Pumps, Misc – 1990 Elec Equipment – 1990-1993	Applicable Regulation: NR 110.26 Sludge handling, storage and disposal. Subsection (8) Dewatering. In compliance with all current regulations	Applicable Advisory Standard: Chap. 80, Sludge Processing, Storage, and Disposal, Section 88, Dewatering Meets all advisory standards		• The plate and frame filter presses were installed in the late 1980's to landfill biosolids, but were rarely used until the last few years due to the high cost of landfilling. • The plate and frame filter presses are being used to produce a cake that is applied to farmland as part of the Agri-Life® program • Landfill of filter cake is an option; however, it is used only as a last resort as a part of MMSD's general policy to "beneficially reuse" all biosolids whenever possible, and also due to the high cost of landfill
2) System:							
Total Feed Capacity (GPM)	3200						
Firm Feed Capacity (GPM)	2000						
Total Cake Production (ton/d)	66.25						
Firm Cake Production (ton/d)	53						
Filter Press Concentration (%)	6-8						
Lime Dose, as CaO (%)	25						
Ferric Chloride Dose (%)	5						
Sludge Solids Loading Rate (lbs/sf/hr)	0.81						
Filtration Time per cycle (min)	60						
Cycles per day	14						
Thickened Digested Sludge Solids Unit Capacity (lbs/d)	128000						
Thickened Prim/WAS and Thickened Inline Solids Sludge Solids Unit Capacity (lbs/d)	78000						
Sludge Filter Press							
Number	5 (plus 1 future)						
Max Filtration Pressure (psi)	225.0						
Cake Thickness (mm)	30						
Volume Per Press (cf)	530						
Cake Bulk Unit Weight (lb/cf)	50						
Sludge Feed Pumping							
Number of Systems	3 (1 sys per pair of presses)						
Number of Pumps	8 (plus 1 future)						
Pumps Per System	3 (once last pump installed)						
Capacity (gpm)	400						
Head (psig)	160						
Horsepower (hp)	75						
Drive	Constant Speed						
Sludge Transfer Pumping							
Number of Systems	3 (1 sys per pair of presses)						
Number of Pumps	6						
Pumps Per System	2						
Capacity (gpm)	650						
Head (psig)	100						
Horsepower (hp)	125						
Drive	1 - AFD, 1 - Constant						
Sludge Conditioning System							
Ferric Chloride System	1 system per pair of presses						
Lime Slurry	1 system per pair of presses						
Sludge Containers							
Number	96						
Rated Capacity (cy, each)	30						
Sludge Transfer Wells							
Number	3 (1 per pair of presses)						
Effective Volume (gal, each)	88400						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-34, SSWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

2) Performance Data: All performance data was calculated from measured data. The calculations can be found in this appendix under Unit Process No. 14: Filter Press Dewatering within Table 4F-61, Agri-Life Process Calculations.

7) Existing Issues/Information: SS O&M Manual, discussions with UWS and MMSD staff, site visit observations

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TABLE 4F-47

SSWWTP UNIT PROCESS NO. 14: FILTER PRESS DEWATERING

2020 TREATMENT REPORT

6/05/07 TR_4-A.T4F47.07.06.05.cdr

Facility[1]	Design Info/Capacity [1]	2004-2005 Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Provides air required for mixing and biological treatment in the activated sludge aeration basins.		Air Usage	Aeration buildings – W in 1974, E in 1984	Applicable Regulation: NR 110.21 Activated sludge. Subsection (5) Aeration Systems and (6) Aeration Equipment.	Applicable Advisory Standard: Chap. 90, Biological Treatment, Section 92.33, Aeration Equipment	MMSD Recommended Project: S02004 – SSWWTP Blower Engine System Upgrade	• Performance review indicates that actual capacity is met with one unit out of service • Only Blower engine, not blower would be upgraded in MMSD recommended project – replacement of blower engines with electric motors
2) System:		Ave Day: 50,000 cfm Max Day: 64,000 cfm	Blower/ generator building – 1968 Mech Equipment –- 1970 Electric motors to replace engines in future	In compliance with all current regulations	Meets all advisory standards		
Total Capacity (CFM)	120,000						
Firm Capacity (CFM, 1 unit out of service)	90,000						
Firm Air Flow Rate (CFM/1000 cf, 1 unit out of service)	19.3						
Air Flow Rate (cfm)	AD - 51,700, MD - 64,100						
Air Compressors in Service	AD - 2, MD - 4						
Blowers	4						
Rated Capacity (ICFM, each)	30,000						
Temp (deg F)	100						
Rated Discharge Pressure (psig)	8.5						
Type	Centrifugal						
OLD Drive	Dual Fueled Gas Engines						
Rated Engine Horsepower (BHP)	1375						
Fuel Used	Digester or Natural						
NEW Drive	Electric Motors						
Rated Horsepower	1,500						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-34, SSWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

1) Facility and Design Information/
Capacity Documentation: Capacity information provided by MMSD, based on analysis done by Donohue & Associates, Inc. in conjunction with *Preliminary Engineering Report for the South Shore Wastewater Treatment Plant Blower System Upgrade* (October 2004).

2) Performance Data: All performance data was calculated from measured data. The calculations can be found in this appendix under Table 4F-59, SSWWTP Unit Process No. 15: Process Air Calculations.
Note that UWS only keeps air records for 12 month period, felt 2004-2005 representative of past average usage.

7) Existing Issues/Information: SS O&M Manual, discussions with UWS and MMSD staff, site visit observations

Facility[1]	Design Info/Capacity [1]	Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Provides alternative power to the electric power source, can be operated by either natural gas or digester gas.			Structure – 1974 Mech Equipment – 2000 Elec Equipment – 2000	No specific requirements	No specific requirements	<u>MMSD Recommended Project:</u> S02004 – SSWWTP Blower Engine System Upgrade	• Install four new engine-generator so five generators available
2) System:							
Engine Horsepower (hp)	2197						
Speed (rpm)	900						
Generator	1560 kW						
	4160 Volts						
	3 phase						
Heat Rate							
1560 kW	10,422 BTU/kW-hr						
1170 kW	11,309 BTU/kW-hr						
780 kW	12,327 BTU/kW-hr						
Heat Rejection	6.4 MMBTU/hr						
Fuel Use	Digester or Natural Gas						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-34, SSWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:
7) Existing Issues/Information: Discussions with UWS and MMSD staff

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TABLE 4F-49
SSWWTP UNIT PROCESS NO. 16: ENGINE GENERATOR
2020 TREATMENT REPORT
6/05/07 TR_4-A.T4F49.07.06.05.cdr

Facility[1]	Design Info/Capacity [1]	2003 Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Pickle liquor or ferric chloride (pickle liquor availability has decreased) is fed to the secondary treatment process to precipitate out excess phosphorus (P) which is removed in the secondary clarifiers.		Pickle Liquor Feed Ave Day 3 GPM Max Day 16 GPM	Original building – 1984 New building – 1992 Mech/Elec Equipment – 1992	Applicable Regulation: NR 110.22 Physical-chemical treatment. Subsection (3)(c) Phosphorus removal. In compliance with all current regulations	Applicable Advisory Standard: Chap. 110, Supplemental Treatment Processes, Section 111, Phosphorus Removal By Chemical Treatment Meets all advisory standards		• Pickle liquor or ferric chloride used for phosphorus control as needed
2) System:							
Pickle Liquor Dose (lb/d)	AD - 5200, MD - 13500						
Pickle Liquor Dose (gpm)	AD - 8, MD - 21						
Chlorine for Oxidation of PL (lb/d)	AD - 4680, MD - 12150						
Pickle Liquor Storage (gal)	20000						
Chlorine Oxication of PL							
Evaporators							
No.	2						
Capacity (lb/d)	8000						
Chlorinators							
No.	2						
Capacity (lb/d)	8000						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-34, SSWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

2) Performance Data: All performance data was calculated from measured data. The calculations can be found in this appendix under Table 4F-60, SSWWTP Unit Process No. 18: Pickle Liquor Calculations.

7) Existing Issues/Information: Discussions with UWS and MMSD staff

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TABLE 4F-50

SSWWTP UNIT PROCESS NO. 18: PICKLE LIQUOR STORAGE AND FEED

2020 TREATMENT REPORT

6/4/07

Facility[1]	Design Info/ Capacity[1]	2003 Performance[2]	Structural/Equipment Age[3]	Current NR 110/204 Regulation Review[4]	Advisory 10-States Standards Review[5]	Committed/MMSD Recommended Projects[6]	Existing Issues/Information[7]
1) Function: Stores of the thickened digested sludge before land application under the Agri-Life program. Sotrage is in converted digesters.		Agri-Life® Storage - Average – 4.4 MG - Maximum – 7.3 MG Agri-Life® Production - Average Day: 55,400 gpd	Old digesters - 1985 Oper Stor Tanks - 1993	Applicable Regulation: NR 110.26 Sludge handling, storage and disposal. Subsection (10) Sludge storage facilities.	Applicable Advisory Standard: Chap. 80, Sludge Processing, Storage, and Disposal, Section 89.1, Storage		• 6 of the south 8 digesters have been converted to Agri-Life storage. • Initial design was to convert all 8 of the South digesters to Agri-life storage.
2) System:		5300 Dry Tons Total	Transfer pumps - 1993	In compliance with all current regulations	Meets all advisory standards		• Mixing within storage digesters is a problem
Operational Storage Tanks		Estimated 6-mo storage required at 2003					
Total Storage Volume (gal)	9000000	average day production and subtracting	Sludge feed pumps - 1988				
Number	6	volume that was land applied: 4.6 MG					
Volume (gal, each) per MMSD	1500000	This is less than the 9 MG Total Storage Vol	Elec Equipment - 1993				
Operational Storage Pumps		so have enough storage					
Total Capacity (gpm)	1920						
Total Flow to Truck Loading (gpm)	AD - 1446, MD - 1430						
Max Pumps in Service	AD - 4, MD - 3						
Max Pumpout time (hrs)	AD - 9.4, MD - 12.5						
Number	6						
Pumpout Capacity (gpm, each)	320						
Head (psi)	80						
Digester Storage - From O&M							
Storage Time (days, AD - 130000 gal sludge, MD - 205,000 gal)	AD - 47, MD - 29						
Total Storage Volume (gal)	6000000						
Actual Storage (gal, each)	1000000						
Total Capacity (cf)	999000						
Number	6						
Capacity (cf, each)	166500						
Agri-Life Transfer Pumps							
Total Capacity (gpm)	2000						
Max Pumps in Service	AD - 1, MD - 4						
Number	8						
Pumpout Capacity (gpm, each)	250						
Head (psi)	80						

Reference numbers listed in each column heading above correspond to numbers listed in Table 4F-34, SSWWTP Unit Process Review General Notes. Additional notes for some reference numbers are listed below:

2) Performance Data: All performance data was calculated from measured data. The calculations can be found in this appendix under Unit Process No. 20: Agri-Life Storage within Table 4F-61, Agri-Life Process Calculations.

7) Existing Issues/Information: SS O&M Manual Part 2, Volume 10, Agri-Life Storage, Discussions with UWS and MMSD staff

Year	Total Flow[1] (MG/yr)	Ave Day (MGD)
1997	36303	99.5
1998	41811	114.6
1999	40632	111.3
2000	39040	106.7
2001	38703	106.0
Ave		107.6

SSWWTP Maximum Day Flows[2]		
1	6/22/1997	323
2	6/21/1997	311
3	4/23/1999	307
	5/23/2004	307
4	7/2/2000	304
5	2/12/1998	302
6	6/2/2000	301
	5/22/2004	301
	5/24/2004	301

NOTES:

1) Total flow per year calculated from daily flow data provided by MMSD from Discharge Monitoring Report data.
2) Maximum Day Flows data taken from Appendix 4J, *Wet Weather Events Analysis* in Table 4J-4, WWTP Average Daily Flows, 1997 through June 30, 2004.
3) Flow through WWTP limited during Preliminary Treatment Construction, 2001-2003. Therefore, flow through MIS Control Structure Reviewed was reviewed before and after construction:

Peak flow through unit processs since preliminary treatment systems installed

Wet weather event from end of 2003 through June, 2004: May 2004 Event

Peak 5-minute flow recorded at South Shore:
Occurred on 5/22/04 and was equal to: **321.16**

Note:
1) Data provided by MMSD in 5-minute increments from 5/10/04 through 5/24/06 included in 2020 Facility Plan project files.
2) Hourly data for the May 2004 Event is provided in Table 4B-19, Storm Event: May 10, 2004 in Appendix 4B, *Storm Event Summary Data*.

Primary Sludge Removal for 2003[1]

	BOD			TSS		
	Primary Influent (lb/d)[4]	Primary Effluent (lb/d)	% Rem.	Primary Influent (lb/d)[4]	Primary Effluent (lb/d)	% Rem.
Average[2]	152,086	82,431	46%	196,595	117,934	40%
Max Flow Day (5/9/03)[3]	194,681	144,440	26%	435,205	331,985	24%

NOTES:

1) Used year 2003 as a snapshot year - it was the last full year of existing condition analysis.
2) Average estimate of primary sludge removal was calculated in the SSWWTP 2003 Mass Balance spreadsheets developed for future Mass Balance calibration. The 2003 Mass Balance is included in 2020 Facility Plan project files.
3) The BOD and TSS removal on the max flow day in 2003 was calculated based on the 2003 data collected in UWS, *Daily/Weekly Operating Report* (2003)
4) The influent loadings assume that 0% of the BOD load and 1% of the TSS load are removed in the influent screening and grit removal unit processes based on information provided in 2003 UWS Monthly Reports.

Primary Weir Loading

Maximum Capacity of Primary Clarifiers[1]:	357 MGD with	16	clarifiers in service
Depth of flow at Maximum Capacity[2]:	10 ft		
Length[2]:	160 ft		

Weir length (total length per clarifier) 1864 ft

For following flows -		Weir loading:
Average Day Flow[2]:	113 MGD	3,800 gpd/sf
Peak Hour Flow[2]:	300 MGD	10,100 gpd/sf

Notes:

1) Data provided in Gary Cressey, subject: *South Shore PE Flow Chart*s, e-mail to Greg Baker (1 May, 2006).
2) MMSD, *South Shore Operation & Maintenance Manual: Plant Summary and Administration* (1 March 1986).

DATE	Plant Flow[1] MGD	PE BOD[2] mg/L	Sec Influent BOD[3] lb/d	Hydraulic Capacity MGD	Secondary Capacity MGD	# of Times Secondary Capacity <250 MGD	WAS Flow KGD	WAS Flow gpm
1-Jan	57	78	37,821	175	330		1571.0	1091.0
2-Jan	62			175	330		1542.0	1070.8
3-Jan	73	110	68,310	175	360		1125.0	781.3
4-Jan	59			175	340		670.0	465.3
5-Jan	66			175	325		1085.0	753.5
6-Jan	69	100	58,697	150	410		1151.0	799.3
7-Jan	78			150	390		1582.0	1098.6
8-Jan	84	110	78,603	150	275		1609.0	1117.4
9-Jan	66			150	305		1537.0	1067.4
10-Jan	64	86	46,821	150	370		1587.0	1102.1
11-Jan	71			150	305		1636.0	1136.1
12-Jan	70			150	325		1458.0	1012.5
13-Jan	67	90	51,296	150	540		1234.0	856.9
14-Jan	61			150	575		920.0	638.9
15-Jan	65	130	71,882	150	580		640.0	444.4
16-Jan	61			150	410		598.0	415.3
17-Jan	63	82	43,946	150	390		629.0	436.8
18-Jan	66			150	395		649.0	450.7
19-Jan	58			150	425		659.0	457.6
20-Jan	61	90	46,702	150	425		734.0	509.7
21-Jan	68			150	425		794.0	551.4
22-Jan	71	150	90,597	150	425		838.0	581.9
23-Jan	66			150	425		1093.0	759.0
24-Jan	73	110	68,310	150			837.0	581.3
25-Jan	72			150			736.0	511.1
26-Jan	71			150	580		822.0	570.8
27-Jan	72	110	67,374	150	580		812.0	563.9
28-Jan	72			150	533		820.0	569.4
29-Jan	71	120	72,478	150	533		841.0	584.0
30-Jan	72			150	510		825.0	572.9
31-Jan	70	95	56,570	150	580		950.0	659.7
1-Feb	70			150	422		934.0	648.6
2-Feb	70			150	436		797.0	553.5
3-Feb	74	130	81,835	150	422		797.0	553.5
4-Feb	73			150	441		888.0	616.7
5-Feb	72	120	73,499	150	441		825.0	572.9
6-Feb	70			150	427		1080.0	750.0
7-Feb	71	110	66,438	150	477		1200.0	833.3
8-Feb	69			150	405		1138.0	790.3
9-Feb	68			150	358		1016.0	705.6
10-Feb	69	110	64,567	150	416		853.0	592.4
11-Feb	67			150	450		834.0	579.2
12-Feb	68	140	80,985	150	234	1	934.0	648.6
13-Feb	69			150	350		894.0	620.8
14-Feb	69	120	70,436	150	264		1054.0	731.9
15-Feb	68			150	213	1	1422.0	987.5
16-Feb	67			150	250		1548.0	1075.0
17-Feb	65	79	43,682	150	233	1	1468.0	1019.4
18-Feb	66			150	206	1	1311.0	910.4
19-Feb	63	160	85,749	150	201	1	1226.0	851.4
20-Feb	61			150	216	1	1271.0	882.6
21-Feb	62	130	68,565	150	334		1313.0	911.8
22-Feb	68			150	363		1406.0	976.4
23-Feb	68			150	354		1345.0	934.0
24-Feb	66	150	84,217	150	343		1130.0	784.7
25-Feb	82			150	266		1336.0	927.8
26-Feb	76	130	84,047	150	259		1291.0	896.5
27-Feb	60			150	265		1330.0	923.6
28-Feb	62	110	58,016	150	265		1380.0	958.3

DATE	Plant Flow[1] MGD	PE BOD[2] mg/L	Sec Influent BOD[3] lb/d	Hydraulic Capacity MGD	Secondary Capacity MGD	# of Times Secondary Capacity <250 MGD	WAS Flow KGD	WAS Flow gpm
1-Mar	68			150	349		1333.0	925.7
2-Mar	69			150	404		1383.0	960.4
3-Mar	63	98	52,521	150	382		1300.0	902.8
4-Mar	60			150	372		1265.0	878.5
5-Mar	59	140	70,266	150	303		1341.0	931.3
6-Mar	63			150	214	1	1380.0	958.3
7-Mar	60	140	71,457	200	214	1	1331.0	924.3
8-Mar	62			200	214	1	1287.0	893.8
9-Mar	66			200	306		1256.0	872.2
10-Mar	62	130	68,565	200	325		1195.0	829.9
11-Mar	60			200	302		1328.0	922.2
12-Mar	63	140	75,030	200	333		1332.0	925.0
13-Mar	63			200	271		1304.0	905.6
14-Mar	70	140	83,367	200	207	1	1403.0	974.3
15-Mar	85			200	184	1	1610.0	1118.1
16-Mar	98			200	203	1	1990.0	1381.9
17-Mar	97	110	90,768	200	303		2023.0	1404.9
18-Mar	87			200	232	1	2049.0	1422.9
19-Mar	80	140	95,276	200	232	1	1931.0	1341.0
20-Mar	106			200	293		2018.0	1401.4
21-Mar	96			200	317		2055.0	1427.1
22-Mar	100			200	314		1912.0	1327.8
23-Mar	93			200	385		1623.0	1127.1
24-Mar	90	130	99,530	200	386		1473.0	1022.9
25-Mar	80			200	423		1334.0	926.4
26-Mar	83			200	453		1101.0	764.6
27-Mar	70			200	398		1046.0	726.4
28-Mar	75			200	398		1170.0	812.5
29-Mar	89			200	430		1166.0	809.7
30-Mar	84			200	430		1218.0	845.8
31-Mar	79			200	401		885.0	614.6
1-Apr	79			200	344		1118.0	776.4
2-Apr	79	85	57,123	200	423		1156.0	802.8
3-Apr	79			200	443		1477.0	1025.7
4-Apr	88	83	62,134	200	442		1566.0	1087.5
5-Apr	108			200	495		1212.0	841.7
6-Apr	100			200	415		1295.0	899.3
7-Apr	98	69	57,523	200	480		1045.0	725.7
8-Apr	96			200	506		1111.0	771.5
9-Apr	103	83	72,725	200	441		1191.0	827.1
10-Apr	120			200	450		1233.0	856.3
11-Apr	126	78	83,605	200	500		1168.0	811.1
12-Apr	115			200	438		1370.0	951.4
13-Apr	104			200	487		1362.0	945.8
14-Apr	102	78	67,680	200	495		1480.0	1027.8
15-Apr	97		0	300	504		1255.0	871.5
16-Apr	93	92	72,784	300	502		1229.0	853.5
17-Apr	89			300	506		963.0	668.8
18-Apr	87	72	53,287	300	547		1213.0	842.4
19-Apr	95			300	515		1221.0	847.9
20-Apr	115			300	506		1221.0	847.9
21-Apr	96	71	57,982	300	525		1320.0	916.7
22-Apr	95			300	500		1268.0	880.6
23-Apr	92	91	71,219	300	512		1237.0	859.0
24-Apr	87			300	554		1275.0	885.4
25-Apr	87	100	74,009	300	482		1235.0	857.6
26-Apr	85			300	497		1180.0	819.4
27-Apr	82			300	523		1198.0	831.9
28-Apr	84	68	48,591	300	529		1218.0	845.8
29-Apr	80			300	493		1198.0	831.9
30-Apr	91			300	471		1125.0	781.3

DATE	Plant Flow[1] MGD	PE BOD[2] mg/L	Sec Influent BOD[3] lb/d	Hydraulic Capacity MGD	Secondary Capacity MGD	# of Times Secondary Capacity <250 MGD	WAS Flow KGD	WAS Flow gpm
1-May	200			300	511		1207.0	838.2
2-May	147	44	55,022	300	518		1279.0	888.2
3-May	114			300	511		1319.0	916.0
4-May	107			300	518		1360.0	944.4
5-May	190	56	90,512	300	520		1230.0	854.2
6-May	169			300	555		1147.0	796.5
7-May	146	68	84,456	300	517		1042.0	723.6
8-May	178			300	511		1072.0	744.4
9-May	251	69	**147,329**	300	510		1210.0	840.3
10-May	243			300	523		1315.0	913.2
11-May	201			300	445		1242.0	862.5
12-May	217	40	73,839	300	508		1244.0	863.9
13-May	160			300	540		1076.0	747.2
14-May	143	54	65,690	300	541		1073.0	745.1
15-May	139			300	532		918.0	637.5
16-May	128	67	72,954	300	551		935.0	649.3
17-May	117			300	541		923.0	641.0
18-May	110			300	599		864.0	600.0
19-May	110	66	61,759	300	557		956.0	663.9
20-May	122			300	539		899.0	624.3
21-May	113			300	610		870.0	604.2
22-May	111			300	649		875.0	607.6
23-May	106			300	606		854.0	593.1
24-May	99			300	578		851.0	591.0
25-May	92			300	581		941.0	653.5
26-May	90	51	39,046	300	587		840.0	583.3
27-May	92			300	706		744.0	516.7
28-May	94			300	681		694.0	481.9
29-May	102			300	670		726.0	504.2
30-May	97			300	584		799.0	554.9
31-May	126			300	551		1265.0	878.5
1-Jun	104			300	515		1310.0	909.7
2-Jun	99	52	43,793	300	574		998.0	693.1
3-Jun	96			300	538		918.0	637.5
4-Jun	93	96	75,949	300	516		935.0	649.3
5-Jun	90			300	548		1047.0	727.1
6-Jun	91	100	77,412	300	481		1270.0	881.9
7-Jun	90			300	458		1308.0	908.3
8-Jun	115			300	479		1432.0	994.4
9-Jun	139	40	47,298	300	456		1425.0	989.6
10-Jun	114			300	484		1181.0	820.1
11-Jun	108	100	91,873	300	492		1166.0	809.7
12-Jun	103			300	459		1236.0	858.3
13-Jun	93	90	71,202	300	467		1342.0	931.9
14-Jun	90			300	453		1276.0	886.1
15-Jun	85			300	520		1237.0	859.0
16-Jun	86	59	43,164	300	569		1122.0	779.2
17-Jun	86			300	511		1083.0	752.1
18-Jun	84	100	71,457	300	555		1006.0	698.6
19-Jun	82			300	644		1041.0	722.9
20-Jun	81	72	49,612	300	603		1053.0	731.3
21-Jun	79			300	603		848.0	588.9
22-Jun	77			300	603		806.0	559.7
23-Jun	79	50	33,602	300	658		800.0	555.6
24-Jun	89			300	678		943.0	654.9
25-Jun	89	120	90,853	300	597		790.0	548.6
26-Jun	92			300	577		615.0	427.1
27-Jun	89	87	65,868	300	552		992.0	688.9
28-Jun	95			300	593		1063.0	738.2
29-Jun	85			300	551		1087.0	754.9
30-Jun	79	98	65,860	300	598		1123.0	779.9

DATE	Plant Flow[1] MGD	PE BOD[2] mg/L	Sec Influent BOD[3] lb/d	Hydraulic Capacity MGD	Secondary Capacity MGD	# of Times Secondary Capacity <250 MGD	WAS Flow KGD	WAS Flow gpm
1-Jul	78			300	508		1224.0	850.0
2-Jul	77			300	493		1049.0	728.5
3-Jul	77			300	636		1017.0	706.3
4-Jul	81	67	46,166	300	632		949.0	659.0
5-Jul	88			300	610		981.0	681.3
6-Jul	92			300	623		1019.0	707.6
7-Jul	117	56	55,737	300	533		796.0	552.8
8-Jul	102			300	571		571.0	396.5
9-Jul	98			300	516		614.0	426.4
10-Jul	90			300	526		1108.0	769.4
11-Jul	85			300	515		1199.0	832.6
12-Jul	82			300	533		1072.0	744.4
13-Jul	78			300	538		1042.0	723.6
14-Jul	79	64	43,010	300	536		911.0	632.6
15-Jul	98			300	446		859.0	596.5
16-Jul	90			300	488		946.0	656.9
17-Jul	82			300	479		1054.0	731.9
18-Jul	79			300	493		1136.0	788.9
19-Jul	72			300	493		923.0	641.0
20-Jul	72			300	493		815.0	566.0
21-Jul	80	85	57,846	300	538		913.0	634.0
22-Jul	77			300	406		928.0	644.4
23-Jul	75			300	477		952.0	661.1
24-Jul	74			300	471		971.0	674.3
25-Jul	74			300	471		1075.0	746.5
26-Jul	72			300	478		998.0	693.1
27-Jul	67			300	494		953.0	661.8
28-Jul	72	75	45,937	300	485		825.0	572.9
29-Jul	72			300	464		714.0	495.8
30-Jul	74			300	508		767.0	532.6
31-Jul	86			300	449		812.0	563.9
1-Aug	98			300	449		800.0	555.6
2-Aug	92			300	449		923.0	641.0
3-Aug	94			300	273		1008.0	700.0
4-Aug	97	83	68,488	300	348		946.0	656.9
5-Aug	93			300	356		977.0	678.5
6-Aug	72	120	73,499	300	382		743.0	516.0
7-Aug	115			300	308		1236.0	858.3
8-Aug	82	110	76,731	300	312		1441.0	1000.7
9-Aug	76			300	354		1343.0	932.6
10-Aug	72			300	337		1365.0	947.9
11-Aug	74	52	32,734	300	427		1205.0	836.8
12-Aug	75			300	425		1057.0	734.0
13-Aug	74	69	43,436	300	407		1083.0	752.1
14-Aug	74			300	467		971.0	674.3
15-Aug	73	96	59,616	300	461		837.0	581.3
16-Aug	74			300	547		634.0	440.3
17-Aug	72			300	568		794.0	551.4
18-Aug	72	56	34,299	300	399		824.0	572.2
19-Aug	73			300	458		694.0	481.9
20-Aug	73	86	53,406	250	445		646.0	448.6
21-Aug	83			250	445		616.0	427.8
22-Aug	80	100	68,054	250	445		688.0	477.8
23-Aug	71			250	509		672.0	466.7
24-Aug	69			250	482		751.0	521.5
25-Aug	72	240	146,998	250	546		814.0	565.3
26-Aug	84			250	534		788.0	547.2
27-Aug	76			250	478		785.0	545.1
28-Aug	71			250	521		828.0	575.0
29-Aug	82	88	61,385	250	501		840.0	583.3
30-Aug	72			250	494		885.0	614.6
31-Aug	64			250	528		867.0	602.1

DATE	Plant Flow[1] MGD	PE BOD[2] mg/L	Sec Influent BOD[3] lb/d	Hydraulic Capacity MGD	Secondary Capacity MGD	# of Times Secondary Capacity <250 MGD	WAS Flow KGD	WAS Flow gpm
1-Sep	64	46	25,044	250	518		**837.0**	**581.3**
2-Sep	70			250	545		**776.0**	**538.9**
3-Sep	68			250	534		**771.0**	**535.4**
4-Sep	68			250	512		**718.0**	**498.6**
5-Sep	68	91	52,640	250	494		**681.0**	**472.9**
6-Sep	65			250	483		**687.0**	**477.1**
7-Sep	57			250	480		**696.0**	**483.3**
8-Sep	69	150	88,045	250	480		**773.0**	**536.8**
9-Sep	69			250	508		**671.0**	**466.0**
10-Sep	69			250	511		**684.0**	**475.0**
11-Sep	69			250	496		**655.0**	**454.9**
12-Sep	70	91	54,188	250	526		**658.0**	**456.9**
13-Sep	81			250	507		**749.0**	**520.1**
14-Sep	90			250	449		**725.0**	**503.5**
15-Sep	88	87	65,128	250	423		**841.0**	**584.0**
16-Sep	66			250	433		**876.0**	**608.3**
17-Sep	77			250	410		**848.0**	**588.9**
18-Sep	73			250	430		**858.0**	**595.8**
19-Sep	68	85	49,169	250	429		**845.0**	**586.8**
20-Sep	66			250	424		**857.0**	**595.1**
21-Sep	65			250	511		**908.0**	**630.6**
22-Sep	84	85	60,739	250	491		**843.0**	**585.4**
23-Sep	83			250	443		**789.0**	**547.9**
24-Sep	71	90	54,358	250	344		**811.0**	**563.2**
25-Sep	68			250	320		**1020.0**	**708.3**
26-Sep	71			250	316		**1222.0**	**848.6**
27-Sep	80	97	66,013	250	284		**1170.0**	**812.5**
28-Sep	70			250	371		**1176.0**	**816.7**
29-Sep	74	87	54,767	250	326		**1254.0**	**870.8**
30-Sep	69			250	353		**1019.0**	**707.6**
1-Oct	68	86	49,748	250	450		**915.0**	**635.4**
2-Oct	68			250	475		**815.0**	**566.0**
3-Oct	74	100	62,950	250	442		**756.0**	**525.0**
4-Oct	76			250	336		**823.0**	**571.5**
5-Oct	69			250	329		**781.0**	**542.4**
6-Oct	71	97	58,586	250	297		**932.0**	**647.2**
7-Oct	71			300	303		**991.0**	**688.2**
8-Oct	70	94	55,975	300	432		**849.0**	**589.6**
9-Oct	70			300	454		**728.0**	**505.6**
10-Oct	70	120	71,457	300	466		**722.0**	**501.4**
11-Oct	68			300	466		**640.0**	**444.4**
12-Oct	73			300	491		**680.0**	**472.2**
13-Oct	69	81	47,545	300	489		**675.0**	**468.8**
14-Oct	92			300	510		**673.0**	**467.4**
15-Oct	96	88	71,865	300	479		**738.0**	**512.5**
16-Oct	81			250	440		**717.0**	**497.9**
17-Oct	69	140	82,176	250	442		**669.0**	**464.6**
18-Oct	68			250	426		**658.0**	**456.9**
19-Oct	67			250	460		**640.0**	**444.4**
20-Oct	76	73	47,196	250	452		**680.0**	**472.2**
21-Oct	67			250	451		**684.0**	**475.0**
22-Oct	67	130	74,094	250	468		**676.0**	**469.4**
23-Oct	73			250	443		**674.0**	**468.1**
24-Oct	68	100	57,846	250	455		**644.0**	**447.2**
25-Oct	124			250	417		**843.0**	**585.4**
26-Oct	91			250	412		**958.0**	**665.3**
27-Oct	72	69	42,262	250	408		**722.0**	**501.4**
28-Oct	70			250	431		**717.0**	**497.9**
29-Oct	77			250	401		**750.0**	**520.8**
30-Oct	68			250	423		**734.0**	**509.7**
31-Oct	68			300	423		**733.0**	**509.0**

DATE	Plant Flow[1] MGD	PE BOD[2] mg/L	Sec Influent BOD[3] lb/d	Hydraulic Capacity MGD	Secondary Capacity MGD	# of Times Secondary Capacity <250 MGD	WAS Flow KGD	WAS Flow gpm
1-Nov	73			300	418		704.0	488.9
2-Nov	135			300	446		685.0	475.7
3-Nov	179	47	71,568	275	407		717.0	497.9
4-Nov	207			275	471		974.0	676.4
5-Nov	193	40	65,672	275	428		1187.0	824.3
6-Nov	121			275	399		1286.0	893.1
7-Nov	107	52	47,332	275	446		1036.0	719.4
8-Nov	88			275	408		809.0	561.8
9-Nov	81			275	399		831.0	577.1
10-Nov	84	55	39,301	300	390		821.0	570.1
11-Nov	88			300	374		785.0	545.1
12-Nov	79			300	444		797.0	553.5
13-Nov	76			300	433		822.0	570.8
14-Nov	76	100	64,652	300	404		853.0	592.4
15-Nov	79			300	430		827.0	574.3
16-Nov	84			300	386		737.0	511.8
17-Nov	85	78	56,400	300	380		746.0	518.1
18-Nov	145			300	365		900.0	625.0
19-Nov	131	59	65,749	300	311		940.0	652.8
20-Nov	101			300	354		1060.0	736.1
21-Nov	87	79	58,467	250	360		989.0	686.8
22-Nov	86			250	358		975.0	677.1
23-Nov	117			250	363		1100.0	763.9
24-Nov	99	65	54,741	250	346		1081.0	750.7
25-Nov	90			300	311		920.0	638.9
26-Nov	88	77	57,642	300	278		924.0	641.7
27-Nov	91			300	295		935.0	649.3
28-Nov	75	41	26,158	300	302		939.0	652.1
29-Nov	76			300	253		939.0	652.1
30-Nov	76			300	305		939.0	652.1
1-Dec	78	88	58,391	300	305		946.0	656.9
2-Dec	77			300	279		981.0	681.3
3-Dec	75	79	50,403	300	246	1	921.0	639.6
4-Dec	75			300	231	1	950.0	659.7
5-Dec	78	81	53,746	300	242	1	940.0	652.8
6-Dec	74			300	256		1158.0	804.2
7-Dec	72			300	207	1	1330.0	923.6
8-Dec	74	74	46,583	300	157	1	1406.0	976.4
9-Dec	81			300	138	1	1523.0	1057.6
10-Dec	179	75	114,204	300	166	1	1708.0	1186.1
11-Dec	184			300	225	1	2066.0	1434.7
12-Dec	135	24	27,562	300	273		1905.0	1322.9
13-Dec	132			300	178	1	1480.0	1027.8
14-Dec	121			300	255		1420.0	986.1
15-Dec	92	60	46,958	300	243	1	1228.0	852.8
16-Dec	93			300	243	1	1061.0	736.8
17-Dec	101	67	57,566	300	273		1136.0	788.9
18-Dec	93			300	168	1	1066.0	740.3
19-Dec	94	110	87,960	300	252		882.0	612.5
20-Dec	94			300	170	1	1227.0	852.1
21-Dec	94			300	171	1	1403.0	974.3
22-Dec	90	67	51,296	300	204	1	1165.0	809.0
23-Dec	89			300	218	1	975.0	677.1
24-Dec	88	95	71,117	300	280		978.0	679.2
25-Dec	82			300	324		914.0	634.7
26-Dec	78	72	47,774	300	282		899.0	624.3
27-Dec	83			300	295		934.0	648.6
28-Dec	86			300	375		881.0	611.8
29-Dec	97	52	42,908	300	347		823.0	571.5
30-Dec	86			300	417		600.0	416.7
31-Dec	86	94		300	442		652.0	452.8
						Ave	1038.7	
						Max	2066.0	

2003 Secondary Influent BOD Loading

Maximum Secondary Influent BOD Loading:	147,329	
Day Maximum Occurs:	5/9/03	

Calculated Daily Secondary Capacity

Total # Days that Calculated Capacity <250	30	
Total # Days that Data was Available	363	
% of total data available that capacity <250	8.26%	
Calculated Secondary Capacity was less than influent flow once		
Average Calculated Secondary Treatment Capacity:	428	MGD

2003 WAS Pumping

Average Day WAS Pumping:	**721.299**	GPM
Max Day WAS Pumping:	**1434.722**	GPM

NOTES:

1) Daily Flow Data from 2003 Monthly DMRs:
UWS on behalf of MMSD, *Discharge Monitoring Report for Permit No. 0036820-1* (2003).

2) Data from UWS, *Daily/Weekly Operating Report* (2003)

3) Secondary Influent includes return flow and loading.
% Increase in Q for recycle flows from WWTP inf to PE: 100%
% Increase in lb/d BOD for recycle BOD from PE to Sec Inf: 102%
Average estimate of recycle flow& BOD was calculated in the JIWWTP 2003 Mass Balance spreadsheets developed for future Mass Balance calibration. The 2003 Mass Balance is included in 2020 Facility Plan project files.

4) UWS calculates Hydraulic Capacity and Secondary Capacity daily.

		Given from 2003 DWOR						Calculated from 2002 Plant Schematic						EAST PLANT						WEST PLANT						
1	2	5	6	9	10	15	16																			
DATE	Infl Flow (mgd)	MLSS East (mg/l)	MLSS West mg/L	SVI East	SVI West	# CLARIF. IN East.	# CLARIF. IN West.	% Split to EP	EP Flow MGD	% Split to WP	WP Flow MGD	Ave MLSS mg/L	Stirred SVI	Given Min RAS flow / clarifier MGD	Given Max RAS flow / clarifier MGD	Based on SVI RAS concentration %	RAS return rate %	RAS flow / clarifier MGD	EP RAS flow MGD	Given Min RAS flow / clarifier MGD	Given Max RAS flow / clarifier MGD	Based on SVI RAS concentration %	RAS return rate %	RAS flow / clarifier MGD	WP RAS flow MGD	TOTAL RAS FLOW
		2000	2000	50 ~ 110	51 ~ 110																					
1/1/2003	71	1600	1500	109.375	122.1719457	11	11	50.0%	36	50.0%	36	1550	120.77	0.5	6.2	0.83	23	0.74	**8**	0.5	6.2	0.83	77	0.74	**8**	16
1/2/2003	72	1500	1300	110	131.547619	11	11	50.0%	36	50.0%	36	1400	125.77	0.5	6.2	0.80	21	0.70	**8**	0.5	6.2	0.80	79	0.70	**8**	15
1/3/2003	73	1400	1450	114.2857143	117.1428571	11	11	50.0%	37	50.0%	37	1425	120.71	0.5	6.2	0.83	21	0.69	**8**	0.5	6.2	0.83	79	0.69	**8**	15
1/4/2003	75	1450	1500	103.5714286	120	11	11	50.0%	38	50.0%	38	1475	116.79	0.5	6.2	0.86	21	0.71	**8**	0.5	6.2	0.86	79	0.71	**8**	16
1/5/2003	73	1500	1650	110	121.5073529	11	11	50.0%	37	50.0%	37	1575	120.75	0.5	6.2	0.83	23	0.78	**9**	0.5	6.2	0.83	77	0.78	**9**	17
1/6/2003	57	1500	1500	106.6666667	106.6666667	11	11	50.0%	29	50.0%	29	1500	111.67	0.5	6.2	0.90	20	0.52	**6**	0.5	6.2	0.93	80	0.50	**6**	11
1/7/2003	82	1450	1350	103.5714286	122.2527473	11	11	50.0%	41	50.0%	41	1400	117.91	0.5	6.2	0.85	20	0.74	**8**	0.5	6.2	0.85	80	0.74	**8**	16
1/8/2003	83	1550	1650	125.8333333	118.1985294	11	11	50.0%	42	50.0%	42	1600	127.02	0.5	6.2	0.79	26	0.96	**11**	0.5	6.2	0.79	74	0.96	**11**	21
1/9/2003	73	1650	1700	118.1985294	111.7647059	11	11	50.0%	37	50.0%	37	1675	119.98	0.5	6.2	0.83	25	0.83	**9**	0.5	6.2	0.83	75	0.83	**9**	18
1/10/2003	72	1500	1600	113.8392857	107.0588235	11	11	50.0%	36	50.0%	36	1550	115.45	0.5	6.2	0.87	22	0.71	**8**	0.5	6.2	0.87	78	0.71	**8**	16
1/11/2003	71	1300	1400	126.9230769	125.8974359	11	11	50.0%	36	50.0%	36	1350	131.41	0.5	6.2	0.76	22	0.70	**8**	0.5	6.2	0.76	78	0.70	**8**	15
1/12/2003	72	1150	1350	131.4393939	123.0769231	11	11	50.0%	36	50.0%	36	1250	132.26	0.5	6.2	0.76	20	0.65	**7**	0.5	6.2	0.76	80	0.65	**7**	14
1/13/2003	73	1050	1300	95.45454545	111.5384615	11	11	50.0%	37	50.0%	37	1175	108.50	0.5	6.2	0.90	15	0.50	**6**	0.5	6.2	0.90	85	0.50	**6**	11
1/14/2003	71	1100	1200	110	91.66666667	11	11	50.0%	36	50.0%	36	1150	105.83	0.5	6.2	0.86	15	0.50	**6**	0.5	6.2	0.86	85	0.50	**6**	11
1/15/2003	70	1300	1300	100	88.69047619	11	11	50.0%	35	50.0%	35	1300	99.35	0.5	6.2	0.96	16	0.50	**6**	0.5	6.2	0.96	84	0.50	**6**	11
1/16/2003	71	1400	1250	110.7142857	115.7051282	11	11	50.0%	36	50.0%	36	1325	118.21	0.5	6.2	0.85	19	0.60	**7**	0.5	6.2	0.85	81	0.60	**7**	13
1/17/2003	70	1550	1200	103.125	125	11	11	50.0%	35	50.0%	35	1375	119.06	0.5	6.2	0.84	20	0.62	**7**	0.5	6.2	0.84	80	0.62	**7**	14
1/18/2003	70	1450	1200	113.8095238	116.6666667	11	11	50.0%	35	50.0%	35	1325	120.24	0.5	6.2	0.83	19	0.60	**7**	0.5	6.2	0.83	81	0.60	**7**	13
1/19/2003	69	1500	1250	103.3333333	115.7051282	11	11	50.0%	35	50.0%	35	1375	114.52	0.5	6.2	0.87	19	0.59	**6**	0.5	6.2	0.87	81	0.59	**6**	13
1/20/2003	71	1450	1400	103.8095238	92.85714286	11	11	50.0%	36	50.0%	36	1425	103.33	0.5	6.2	0.97	17	0.56	**6**	0.5	6.2	1.06	83	0.50	**6**	12
1/21/2003	71	1600	1500	87.5	86.66666667	11	11	50.0%	36	50.0%	36	1550	92.08	0.5	6.2	1.09	17	0.54	**6**	0.5	6.2	1.16	83	0.50	**6**	11
1/22/2003	57	1550	1450	90.41666667	89.76190476	11	11	50.0%	29	50.0%	29	1500	95.09	0.5	6.2	0.93	19	0.50	**6**	0.5	6.2	0.93	81	0.50	**6**	11
1/23/2003	68	1500	1450	93.75	86.19047619	11	11	50.0%	34	50.0%	34	1475	94.97	0.5	6.2	1.05	16	0.50	**6**	0.5	6.2	1.06	84	0.50	**6**	11
1/24/2003	73	1400	1350	96.42857143	96.42857143	11	11	50.0%	37	50.0%	37	1375	101.43	0.5	6.2	0.99	16	0.54	**6**	0.5	6.2	1.05	84	0.50	**6**	11
1/25/2003	72	1400	1450	100	99.76190476	11	11	50.0%	36	50.0%	36	1425	104.88	0.5	6.2	0.95	18	0.58	**6**	0.5	6.2	1.08	82	0.50	**6**	12
1/26/2003	71	1600	1550	84.50980392	84.66386555	11	11	50.0%	36	50.0%	36	1575	89.59	0.5	6.2	1.12	16	0.53	**6**	0.5	6.2	1.17	84	0.50	**6**	11
1/27/2003	72	1600	1500	90.625	90.625	11	11	50.0%	36	50.0%	36	1550	95.63	0.5	6.2	1.05	17	0.57	**6**	0.5	6.2	1.17	83	0.50	**6**	12
1/28/2003	72	1700	1700	85.29411765	82.63888889	11	11	50.0%	36	50.0%	36	1700	88.97	0.5	6.2	1.12	18	0.58	**6**	0.5	6.2	1.28	82	0.50	**6**	12
1/29/2003	71	1750	1650	85.78431373	90.99264706	11	11	50.0%	36	50.0%	36	1700	93.39	0.5	6.2	1.07	19	0.61	**7**	0.5	6.2	1.07	81	0.61	**7**	13
1/30/2003	72	1700	1750	79.41176471	80.06535948	11	11	50.0%	36	50.0%	36	1725	84.74	0.5	6.2	1.18	17	0.56	**6**	0.5	6.2	1.30	83	0.50	**6**	12
1/31/2003	70	1600	1550	103.125	90.41666667	11	11	50.0%	35	50.0%	35	1575	101.77	0.5	6.2	0.98	19	0.61	**7**	0.5	6.2	0.98	81	0.61	**7**	13
2/1/2003	70	1600	1500	97.45098039	110	11	11	50.0%	35	50.0%	35	1550	108.73	0.5	6.2	0.92	20	0.64	**7**	0.5	6.2	0.92	80	0.64	**7**	14
2/2/2003	70	1700	1500	94.11764706	106.6964286	11	11	50.0%	35	50.0%	35	1600	105.41	0.5	6.2	0.95	20	0.65	**7**	0.5	6.2	0.95	80	0.65	**7**	14
2/3/2003	74	1750	1550	97.22222222	103.5416667	11	11	50.0%	37	50.0%	37	1650	105.38	0.5	6.2	0.95	21	0.71	**8**	0.5	6.2	0.95	79	0.71	**8**	16
2/4/2003	73	1900	1700	89.47368421	97.36842105	11	11	50.0%	37	50.0%	37	1800	98.42	0.5	6.2	1.02	22	0.71	**8**	0.5	6.2	1.02	78	0.71	**8**	16
2/5/2003	72	1900	1900	94.73684211	89.47368421	11	11	50.0%	36	50.0%	36	1900	97.11	0.5	6.2	1.03	23	0.74	**8**	0.5	6.2	1.03	77	0.74	**8**	16
2/6/2003	70	1850	1750	83.91812865	94.28104575	11	11	50.0%	35	50.0%	35	1800	94.10	0.5	6.2	1.06	20	0.65	**7**	0.5	6.2	1.06	80	0.65	**7**	14
2/7/2003	72	1350	1700	115.8333333	97.91666667	11	11	50.0%	36	50.0%	36	1525	111.88	0.5	6.2	0.89	21	0.67	**7**	0.5	6.2	0.89	79	0.67	**7**	15
2/8/2003	69	1350	1900	105	89.47368421	11	11	50.0%	35	50.0%	35	1625	102.24	0.5	6.2	0.98	20	0.62	**7**	0.5	6.2	0.98	80	0.62	**7**	14
2/9/2003	68	1250	1700	123.3974359	105.8823529	11	11	50.0%	34	50.0%	34	1475	119.64	0.5	6.2	0.84	21	0.66	**7**	0.5	6.2	0.84	79	0.66	**7**	15
2/10/2003	69	1300	1750	111.3095238	99.67320261	11	11	50.0%	35	50.0%	35	1525	110.49	0.5	6.2	0.91	20	0.64	**7**	0.5	6.2	0.91	80	0.64	**7**	14
2/11/2003	67	1300	1850	111.3095238	100	11	11	50.0%	34	50.0%	34	1575	110.65	0.5	6.2	0.90	21	0.64	**7**	0.5	6.2	0.90	79	0.64	**7**	14
2/12/2003	68	1400	2050	141.5384615	108.7320574	11	11	50.0%	34	50.0%	34	1725	130.14	0.5	6.2	0.77	29	0.89	**10**	0.5	6.2	0.77	71	0.89	**10**	20
2/13/2003	68	1650	2050	111.6666667	95.23809524	11	11	50.0%	34	50.0%	34	1850	108.45	0.5	6.2	0.92	25	0.78	**9**	0.5	6.2	0.92	75	0.78	**9**	17
2/14/2003	69	2000	1700	137.7192982	100.7017544	11	11	50.0%	35	50.0%	35	1850	124.21	0.5	6.2	0.81	30	0.94	**10**	0.5	6.2	0.81	70	0.94	**10**	21
2/15/2003	68	2100	1850	135.9090909	108.8235294	11	11	50.0%	34	50.0%	34	1975	127.37	0.5	6.2	0.79	34	1.04	**11**	0.5	6.2	0.79	66	1.04	**11**	23
2/16/2003	67	2050	2000	124.1666667	102.5	11	11	50.0%	34	50.0%	34	2025	118.33	0.5	6.2	0.85	32	0.96	**11**	0.5	6.2	0.85	68	0.96	**11**	21
2/17/2003	69	1850	1900	129.7058824	110.5263158	11	11	50.0%	35	50.0%	35	1875	125.12	0.5	6.2	0.80	31	0.96	**11**	0.5	6.2	0.80	69	0.96	**11**	21
2/18/2003	69	1500	1750	150	117.1568627	11	11	50.0%	35	50.0%	35	1625	138.58	0.5	6.2	0.72	29	0.91	**10**	0.5	6.2	0.72	71	0.91	**10**	20
2/19/2003	69	1550	1750	142.0833333	123.2026144	11	11	50.0%	35	50.0%	35	1650	137.64	0.5	6.2	0.73	29	0.92	**10**	0.5	6.2	0.73	71	0.92	**10**	20
2/20/2003	68	1300	1650	141.0714286	130.6985294	11	11	50.0%	34	50.0%	34	1475	140.88	0.5	6.2	0.71	26	0.81	**9**	0.5	6.2	0.71	74	0.81	**9**	18
2/21/2003	68	1350	1750	103.5714286	131.372549	11	11	50.0%	34	50.0%	34	1550	122.47	0.5	6.2	0.82	23	0.72	**8**	0.5	6.2	0.82	77	0.72	**8**	16
2/22/2003	68	1450	1750	96.66666667	126.1437908	11	11	50.0%	34	50.0%	34	1600	116.41	0.5	6.2	0.86	23	0.71	**8**	0.5	6.2	0.86	77	0.71	**8**	16
2/23/2003	67	1450	1600	96.66666667	134.375	11	11	50.0%	34	50.0%	34	1525	120.52	0.5	6.2	0.83	23	0.69	**8**	0.5	6.2	0.83	77	0.69	**8**	15
2/24/2003	53	1300	1500	107.6923077	133.3333333	11	11	50.0%	27	50.0%	27	1400	125.51	0.5	6.2	0.80	21	0.51	**6**	0.5	6.2	0.81	79	0.50	**6**	11
2/25/2003	78	1350	1500	110.989011	156.6666667	11	11	50.0%	39	50.0%	39	1425	138.83	0.5	6.2	0.72	25	0.87	**10**	0.5	6.2	0.72	75	0.87	**10**	19
2/26/2003	76	1550	1600	100	168.75	11	11	50.0%	38	50.0%	38	1575	139.38	0.5	6.2	0.72	28	0.97	**11**	0.5	6.2	0.72	72	0.97	**11**	21
2/27/2003	70	1550	1750	96.875	170.0657895	11	11	50.0%	35	50.0%	35	1650	138.47	0.5	6.2	0.72	30	0.94	**10**	0.5	6.2	0.72	70	0.94	**10**	21
2/28/2003	69	1500	1750	103.3333333	163.0718954	11	11	50.0%	35	50.0%	35	1625	138.20	0.5	6.2	0.72	29	0.91	**10**	0.5	6.2	0.72	71	0.91	**10**	20
3/1/2003	69	1600	1850	90.625	129.8245614	11	11	50.0%	35	50.0%	35	1725	115.22	0.5	6.2	0.87	25	0.78	**9**	0.5	6.2	0.87	75	0.78	**9**	17
3/2/2003	68	1550	1750	90.41666667	116.9934641	11	11	50.0%	34	50.0%	34	1650	108.71	0.5	6.2	0.92	22	0.68	**7**	0.5	6.2	0.92	78	0.68	**7**	15
3/3/2003	70	1400	1600	100	122.5490196	11	11	50.0%	35	50.0%	35	1500	116.27	0.5	6.2	0.86	21	0.67	**7**	0.5	6.2	0.86	79	0.67	**7**	15
3/4/2003	69	1600	1550	96.875	122.7083333	11	11	50.0%	35	50.0%	35	1575	114.79	0.5	6.2	0.87	22	0.69	**8**	0.5	6.2	0.87	78	0.69	**8**	15
3/5/2003	69	1750	1600	114.379085	115.8823529	11	11	50.0%	35	50.0%	35	1675	120.13	0.5	6.2	0.83	25	0.79	**9**	0.5	6.2	0.83	75	0.79	**9**	17
3/6/2003	71	1850	1750	124.5614035	125.3267974	11	11	50.0%	36	50.0%	36	1800	129.94	0.5	6.2	0.77	31	0.99	**11**	0.5	6.2	0.77	69	0.99	**11**	22
3/7/2003	69	1850	1650	124.2690058	114.8897059	11	11	50.0%	35	50.0%	35	1750	124.58	0.5	6.2	0.80	28	0.87	**10**	0.5	6.2	0.80	72	0.87	**10**	19
3/8/2003	62	1900	1750	108.8888889	105.5555556	11	11	50.0%	31	50.0%	31	1825	112.22	0.5	6.2	0.89	26	0.73	**8**	0.5	6.2	0.89	74	0.73	**8**	16
3/9/2003	66	1900	1650	107.8947368	115.2573529	11	11	50.0%	33	50.0%	33	1775	116.58	0.5	6.2	0.86	26	0.78	**9**	0.5	6.2	0.86	74	0.78	**9**	17
3/10/2003	70	1800	1700	111.1111111	108.2043344	11	11	50.0%	35	50.0%	35	1750	114.66	0.5	6.2	0.87	25	0.80	**9**	0.5	6.2	0.87	75	0.80	**9**	18
3/11/2003	69	1700	1900	117.6470588	105.2631579	11	11	50.0%	35	50.0%	35	1800	116.46	0.5	6.2	0.86	27	0.83	**9**	0.5	6.2	0.86	73	0.83	**9**	18
3/12/2003	70	1850	1850	108.1871345	102.7777778	11	11	50.0%	35	50.0%	35	1850	110.48	0.5	6.2	0.91	26	0.82	**9**	0.5	6.2	0.91	74	0.82	**9**	18
3/13/2003	71	1900	1850	108.6111111	118.7134503	11	11	50.0%	36	50.0%	36	1875	118.66	0.5	6.2	0.84	29	0.92	**10**	0.5	6.2	0.84	71	0.92	**10**	20
3/14/2003	75	1950	1950	120.5263158	122.7631579	11	11	50.0%	38	50.0%	38	1950	126.64	0.5	6.2	0.79	33	1.12	**12**	0.5	6.2	0.79	67	1.12	**12**	25
3/15/2003	85	2000	2000	117.5	132.4561404	11	11	50.0%	43	50.0%	43	2000	129.98	0.5	6.2	0.77	35	1.36	**15**	0.5	6.2	0.77	65	1.36	**15**	30
3/16/2003	98	1800	1900	127.244582	123.6842105	11	11	50.0%	49	50.0%	49	1850	130.46	0.5	6.2	0.77	32	1.42	**16**	0.5	6.2	0.77	68	1.42	**16**	31
3/17/2003	103	1900	2000	105.8333333	107.5	11	11	50.0%	52	50.0%	52	1950	111.67	0.5	6.2	0.90	28	1.30	**14**	0.5	6.2	0.90	72	1.30	**14**	29
3/18/2003	96	2000	2000	112.5	119.7994987	11	11	50.0%	48	50.0%	48	2000	121.15	0.5	6.2	0.83	32	1.40	**15**	0.5	6.2	0.83	68	1.40	**15**	31
3/19/2003	92	1950	2100	100	104.3478261	11	11	50.0%	46	50.0%	46	2025	107.17	0.5	6.2	0.93	28	1.16	**13**	0.5	6.2	0.93	72	1.16	**13**	26
3/20/2003	110	2100	2100	95.23809524	113.6363636	11	11	50.0%	55	50.0%	55	2100	109.44	0.5	6.2	0.91	30	1.49	**16**	0.5	6.2	0.91	70	1.49	**16**	33

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TABLE 4F-56 SHEET 1 OF 5

SSWWTP UNIT PROCESS NO. 5: RAS PUMPING CALCULATIONS

2020 TREATMENT REPORT

6/04/07 TR_4-A.T4F56.07.06.04.cdr

														EAST PLANT						WEST PLANT						
	Given from 2003 DWOR							Calculated from 2002 Plant Schematic																		
1	2	5	6	9	10	15	16																			
DATE	Infl Flow (mgd)	MLSS East (mg/l)	MLSS West mg/L	SVI East	SVI West	# CLARIF. IN East.	# CLARIF. IN West.	% Split to EP	EP Flow MGD	% Split to WP	WP Flow MGD	Ave MLSS mg/L	Stirred SVI	Given Min RAS flow / clarifier MGD	Given Max RAS flow / clarifier MGD	Based on SVI RAS concentration %	RAS return rate %	RAS flow / clarifier MGD	EP RAS flow MGD	Given Min RAS flow / clarifier MGD	Given Max RAS flow / clarifier MGD	Based on SVI RAS concentration %	RAS return rate %	RAS flow / clarifier MGD	WP RAS flow MGD	TOTAL RAS FLOW
3/21/2003	105	2000	2250	100	99.90118577	11	11	50.0%	53	50.0%	53	2125	104.95	0.5	6.2	0.95	29	1.37	**15**	0.5	6.2	0.95	71	1.37	**15**	30
3/22/2003	100	1900	2050	102.6315789	104.8809524	11	11	50.0%	50	50.0%	50	1975	108.76	0.5	6.2	0.92	27	1.24	**14**	0.5	6.2	0.92	73	1.24	**14**	27
3/23/2003	93	1950	2000	92.5	97.86967419	11	11	50.0%	47	50.0%	47	1975	100.18	0.5	6.2	1.00	25	1.04	**11**	0.5	6.2	1.00	75	1.04	**11**	23
3/24/2003	96	1900	2050	94.73684211	100.1190476	11	11	50.0%	48	50.0%	48	1975	102.43	0.5	6.2	0.98	25	1.11	**12**	0.5	6.2	0.98	75	1.11	**12**	24
3/25/2003	92	2000	2200	87.59398496	86.36363636	11	11	50.0%	46	50.0%	46	2100	91.98	0.5	6.2	1.09	24	1.00	**11**	0.5	6.2	1.09	76	1.00	**11**	22
3/26/2003	83	2000	2000	77.5	95	11	11	50.0%	42	50.0%	42	2000	91.25	0.5	6.2	1.10	22	0.84	**9**	0.5	6.2	1.10	78	0.84	**9**	19
3/27/2003	78	1950	2150	89.73684211	93.20175439	11	11	50.0%	39	50.0%	39	2050	96.47	0.5	6.2	1.04	25	0.87	**10**	0.5	6.2	1.04	75	0.87	**10**	19
3/28/2003	83	2050	2150	80.47619048	83.54978355	11	11	50.0%	42	50.0%	42	2100	87.01	0.5	6.2	1.15	22	0.84	**9**	0.5	6.2	1.15	78	0.84	**9**	19
3/29/2003	89	2150	2200	81.63043478	86.36363636	11	11	50.0%	45	50.0%	45	2175	89.00	0.5	6.2	1.12	24	0.97	**11**	0.5	6.2	1.12	76	0.97	**11**	21
3/30/2003	84	1850	2000	91.66666667	90.47619048	11	11	50.0%	42	50.0%	42	1925	96.07	0.5	6.2	1.04	23	0.87	**10**	0.5	6.2	1.04	77	0.87	**10**	19
3/31/2003	82	1850	2000	91.8128655	97.5	11	11	50.0%	41	50.0%	41	1925	99.66	0.5	6.2	1.00	24	0.88	**10**	0.5	6.2	1.00	76	0.88	**10**	19
4/1/2003	79	1650	1750	106.1111111	111.4379085	11	11	50.0%	40	50.0%	40	1700	113.77	0.5	6.2	0.88	24	0.86	**9**	0.5	6.2	0.88	76	0.86	**9**	19
4/2/2003	79	1750	1750	94.28104575	100	11	11	50.0%	40	50.0%	40	1750	102.14	0.5	6.2	0.98	22	0.78	**9**	0.5	6.2	0.98	78	0.78	**9**	17
4/3/2003	79	1550	1550	100	102.1367521	11	11	50.0%	40	50.0%	40	1550	106.07	0.5	6.2	0.94	20	0.71	**8**	0.5	6.2	0.94	80	0.71	**8**	16
4/4/2003	88	1550	1600	97.68907563	103.125	11	11	50.0%	44	50.0%	44	1575	105.41	0.5	6.2	0.95	20	0.80	**9**	0.5	6.2	0.95	80	0.80	**9**	18
4/5/2003	108	1550	1700	96.66666667	88.54166667	11	11	50.0%	54	50.0%	54	1625	97.60	0.5	6.2	1.02	19	0.93	**10**	0.5	6.2	1.02	81	0.93	**10**	20
4/6/2003	100	1450	1400	103.3333333	114.2857143	11	11	50.0%	50	50.0%	50	1425	113.81	0.5	6.2	0.88	19	0.88	**10**	0.5	6.2	0.88	81	0.88	**10**	19
4/7/2003	98	1450	1450	96.66666667	103.5714286	11	11	50.0%	49	50.0%	49	1450	105.12	0.5	6.2	0.95	18	0.80	**9**	0.5	6.2	0.95	82	0.80	**9**	18
4/8/2003	96	1500	1600	93.33333333	94.11764706	11	11	50.0%	48	50.0%	48	1550	98.73	0.5	6.2	1.01	18	0.79	**9**	0.5	6.2	1.01	82	0.79	**9**	17
4/9/2003	103	1550	1500	100.6302521	103.5714286	11	11	50.0%	52	50.0%	52	1525	107.10	0.5	6.2	0.93	20	0.91	**10**	0.5	6.2	0.93	80	0.91	**10**	20
4/10/2003	120	1600	1800	93.75	97.22222222	11	11	50.0%	60	50.0%	60	1700	100.49	0.5	6.2	1.00	21	1.12	**12**	0.5	6.2	1.00	79	1.12	**12**	25
4/11/2003	126	1600	1850	93.75	83.91812865	11	11	50.0%	63	50.0%	63	1725	93.83	0.5	6.2	1.07	19	1.11	**12**	0.5	6.2	1.07	81	1.11	**12**	24
4/12/2003	115	1700	1850	94.44444444	94.73684211	11	11	50.0%	58	50.0%	58	1775	99.59	0.5	6.2	1.00	21	1.12	**12**	0.5	6.2	1.00	79	1.12	**12**	25
4/13/2003	104	1800	1900	86.11111111	86.84210526	11	11	50.0%	52	50.0%	52	1850	91.48	0.5	6.2	1.09	20	0.96	**11**	0.5	6.2	1.09	80	0.96	**11**	21
4/14/2003	102	1700	1850	91.17647059	89.18128655	11	11	50.0%	51	50.0%	51	1775	95.18	0.5	6.2	1.05	20	0.94	**10**	0.5	6.2	1.05	80	0.94	**10**	21
4/15/2003	97	1600	1750	91.17647059	88.7254902	11	11	50.0%	49	50.0%	49	1675	94.95	0.5	6.2	1.05	19	0.83	**9**	0.5	6.2	1.05	81	0.83	**9**	18
4/16/2003	93	1700	1850	85.29411765	86.5497076	11	11	50.0%	47	50.0%	47	1775	90.92	0.5	6.2	1.10	19	0.81	**9**	0.5	6.2	1.10	81	0.81	**9**	18
4/17/2003	89	1800	1850	83.28173375	86.69590643	11	11	50.0%	45	50.0%	45	1825	89.99	0.5	6.2	1.11	20	0.79	**9**	0.5	6.2	1.11	80	0.79	**9**	17
4/18/2003	87	1650	1700	84.74264706	85.29411765	11	11	50.0%	44	50.0%	44	1675	90.02	0.5	6.2	1.11	18	0.70	**8**	0.5	6.2	1.11	82	0.70	**8**	15
4/19/2003	95	1650	1650	90.80882353	88.05147059	11	11	50.0%	48	50.0%	48	1650	94.43	0.5	6.2	1.06	18	0.80	**9**	0.5	6.2	1.06	82	0.80	**9**	18
4/20/2003	115	1650	1700	88.05147059	91.17647059	11	11	50.0%	58	50.0%	58	1675	94.61	0.5	6.2	1.06	19	0.98	**11**	0.5	6.2	1.06	81	0.98	**11**	22
4/21/2003	96	1800	1800	83.59133127	83.59133127	11	11	50.0%	48	50.0%	48	1800	88.59	0.5	6.2	1.13	19	0.83	**9**	0.5	6.2	1.13	81	0.83	**9**	18
4/22/2003	95	1600	1700	91.17647059	91.17647059	11	11	50.0%	48	50.0%	48	1650	96.18	0.5	6.2	1.04	19	0.81	**9**	0.5	6.2	1.04	81	0.81	**9**	18
4/23/2003	92	1700	1700	85.29411765	91.17647059	11	11	50.0%	46	50.0%	46	1700	93.24	0.5	6.2	1.07	19	0.79	**9**	0.5	6.2	1.07	81	0.79	**9**	17
4/24/2003	87	1700	1600	82	88	11	11	50.0%	44	50.0%	44	1650	90.00	0.5	6.2	1.11	17	0.69	**8**	0.5	6.2	1.11	83	0.69	**8**	15
4/25/2003	87	1750	1750	91.33986928	88.7254902	11	11	50.0%	44	50.0%	44	1750	95.03	0.5	6.2	1.05	20	0.79	**9**	0.5	6.2	1.05	80	0.79	**9**	17
4/26/2003	85	1750	1650	85.78431373	94.11764706	11	11	50.0%	43	50.0%	43	1700	94.95	0.5	6.2	1.05	19	0.74	**8**	0.5	6.2	1.05	81	0.74	**8**	16
4/27/2003	82	1700	1700	91.66666667	82.35294118	11	11	50.0%	41	50.0%	41	1700	92.01	0.5	6.2	1.09	19	0.69	**8**	0.5	6.2	1.09	81	0.69	**8**	15
4/28/2003	84	1650	1550	84.92647059	94.11764706	11	11	50.0%	42	50.0%	42	1600	94.52	0.5	6.2	1.06	18	0.68	**7**	0.5	6.2	1.06	82	0.68	**7**	15
4/29/2003	80	1600	1500	93.75	96.66666667	11	11	50.0%	40	50.0%	40	1550	100.21	0.5	6.2	1.00	18	0.67	**7**	0.5	6.2	1.00	82	0.67	**7**	15
4/30/2003	91	1600	1550	96.875	96.875	11	11	50.0%	46	50.0%	46	1575	101.88	0.5	6.2	0.98	19	0.79	**9**	0.5	6.2	0.98	81	0.79	**9**	17
5/1/2003	200	1650	1600	90.80882353	90.625	11	11	50.0%	100	50.0%	100	1625	95.72	0.5	6.2	1.04	18	1.67	**18**	0.5	6.2	1.04	82	1.67	**18**	37
5/2/2003	147	1650	1700	91.17647059	85.29411765	11	11	50.0%	74	50.0%	74	1675	93.24	0.5	6.2	1.07	19	1.24	**14**	0.5	6.2	1.07	81	1.24	**14**	27
5/3/2003	114	1600	1550	91.17647059	93.54166667	11	11	50.0%	57	50.0%	57	1575	97.36	0.5	6.2	1.03	18	0.94	**10**	0.5	6.2	1.03	82	0.94	**10**	21
5/4/2003	107	1600	1600	90.78431373	90.625	11	11	50.0%	54	50.0%	54	1600	95.70	0.5	6.2	1.04	18	0.88	**10**	0.5	6.2	1.04	82	0.88	**10**	19
5/5/2003	190	1500	1400	87.05357143	104.3589744	11	11	50.0%	95	50.0%	95	1450	100.71	0.5	6.2	0.99	17	1.48	**16**	0.5	6.2	0.99	83	1.48	**16**	32
5/6/2003	169	1600	1700	81.25	88.77192982	11	11	50.0%	85	50.0%	85	1650	90.01	0.5	6.2	1.11	17	1.34	**15**	0.5	6.2	1.11	83	1.34	**15**	29
5/7/2003	146	1700	1750	82.35294118	91.33986928	11	11	50.0%	73	50.0%	73	1725	91.85	0.5	6.2	1.09	19	1.25	**14**	0.5	6.2	1.09	81	1.25	**14**	27
5/8/2003	178	1750	1800	83.00653595	88.88888889	11	11	50.0%	89	50.0%	89	1775	90.95	0.5	6.2	1.10	19	1.56	**17**	0.5	6.2	1.10	81	1.56	**17**	34
5/9/2003	251	1750	1850	83.22368421	87.5	11	11	50.0%	126	50.0%	126	1800	90.36	0.5	6.2	1.11	19	2.22	**24**	0.5	6.2	1.11	81	2.22	**24**	49
5/10/2003	243	1850	2100	76.33928571	80.95238095	11	11	50.0%	122	50.0%	122	1975	83.65	0.5	6.2	1.20	20	2.19	**24**	0.5	6.2	1.20	80	2.19	**24**	48
5/11/2003	201	1850	2050	86.5497076	90.70048309	11	11	50.0%	101	50.0%	101	1950	93.63	0.5	6.2	1.07	22	2.04	**22**	0.5	6.2	1.07	78	2.04	**22**	45
5/12/2003	217	1850	1950	81.28654971	83.83152174	11	11	50.0%	109	50.0%	109	1900	87.56	0.5	6.2	1.14	20	1.97	**22**	0.5	6.2	1.14	80	1.97	**22**	43
5/13/2003	160	2250	1850	67.5	81.14035088	11	11	50.0%	80	50.0%	80	2050	79.32	0.5	6.2	1.26	19	1.41	**16**	0.5	6.2	1.26	81	1.41	**16**	31
5/14/2003	143	1950	1750	74.6031746	85.78431373	11	11	50.0%	72	50.0%	72	1850	85.19	0.5	6.2	1.17	19	1.22	**13**	0.5	6.2	1.17	81	1.22	**13**	27
5/15/2003	139	1750	1750	80.06535948	88.7254902	11	11	50.0%	70	50.0%	70	1750	89.40	0.5	6.2	1.12	19	1.17	**13**	0.5	6.2	1.12	81	1.17	**13**	26
5/16/2003	128	1700	1700	79.41176471	88.23529412	11	11	50.0%	64	50.0%	64	1700	88.82	0.5	6.2	1.13	18	1.03	**11**	0.5	6.2	1.13	82	1.03	**11**	23
5/17/2003	117	1700	1600	82.35294118	90.625	11	11	50.0%	59	50.0%	59	1650	91.49	0.5	6.2	1.09	18	0.95	**10**	0.5	6.2	1.09	82	0.95	**10**	21
5/18/2003	110	1750	1800	71.40522876	80.55555556	11	11	50.0%	55	50.0%	55	1775	80.98	0.5	6.2	1.23	17	0.84	**9**	0.5	6.2	1.23	83	0.84	**9**	18
5/19/2003	110	1750	1750	77.2875817	85.78431373	11	11	50.0%	55	50.0%	55	1750	86.54	0.5	6.2	1.16	18	0.89	**10**	0.5	6.2	1.16	82	0.89	**10**	20
5/20/2003	122	1500	1650	93.33333333	84.92647059	11	11	50.0%	61	50.0%	61	1575	94.13	0.5	6.2	1.06	17	0.97	**11**	0.5	6.2	1.06	83	0.97	**11**	21
5/21/2003	113	1600	1700	78.125	79.41176471	11	11	50.0%	57	50.0%	57	1650	83.77	0.5	6.2	1.19	16	0.82	**9**	0.5	6.2	1.19	84	0.82	**9**	18
5/22/2003	111	1650	1650	72.97794118	75.91911765	11	11	50.0%	56	50.0%	56	1650	79.45	0.5	6.2	1.26	15	0.76	**8**	0.5	6.2	1.26	85	0.76	**8**	17
5/23/2003	106	1600	1650	81.25	78.86029412	11	11	50.0%	53	50.0%	53	1625	85.06	0.5	6.2	1.18	16	0.77	**9**	0.5	6.2	1.18	84	0.77	**9**	17
5/24/2003	99	1700	1700	82.35294118	79.16666667	11	11	50.0%	50	50.0%	50	1700	85.76	0.5	6.2	1.17	17	0.77	**8**	0.5	6.2	1.17	83	0.77	**8**	17
5/25/2003	92	1700	1750	82.29166667	76.97368421	11	11	50.0%	46	50.0%	46	1725	84.63	0.5	6.2	1.18	17	0.71	**8**	0.5	6.2	1.18	83	0.71	**8**	16
5/26/2003	90	1600	1450	85.29411765	85.71428571	11	11	50.0%	45	50.0%	45	1525	90.50	0.5	6.2	1.10	16	0.66	**7**	0.5	6.2	1.10	84	0.66	**7**	14
5/27/2003	92	1600	1400	75.29411765	71.42857143	11	11	50.0%	46	50.0%	46	1500	78.36	0.5	6.2	1.28	13	0.56	**6**	0.5	6.2	1.40	87	0.50	**6**	12
5/28/2003	94	1550	1550	80.83333333	67.70833333	11	11	50.0%	47	50.0%	47	1550	79.27	0.5	6.2	1.26	14	0.60	**7**	0.5	6.2	1.26	86	0.60	**7**	13
5/29/2003	102	1600	1550	81.25	67.91666667	11	11	50.0%	51	50.0%	51	1575	79.58	0.5	6.2	1.26	14	0.66	**7**	0.5	6.2	1.26	86	0.66	**7**	15
5/30/2003	97	1850	1750	79.46428571	74.34640523	11	11	50.0%	49	50.0%	49	1800	81.91	0.5	6.2	1.22	17	0.76	**8**	0.5	6.2	1.22	83	0.76	**8**	17
5/31/2003	126	1900	1950	81.57894737	71.84210526	11	11	50.0%	63	50.0%	63	1925	81.71	0.5	6.2	1.22	19	1.07	**12**	0.5	6.2	1.22	81	1.07	**12**	24
6/1/2003	104	1800	1800	88.88888889	80.6501548	11	11	50.0%	52	50.0%	52	1800	89.77	0.5	6.2	1.11	19	0.91	**10**	0.5	6.2	1.11	81	0.91	**10**	20
6/2/2003	99	1700	1650	85.41666667	78.67647059	11	11	50.0%	50	50.0%	50	1675	87.05	0.5	6.2	1.15	17	0.77	**8**	0.5	6.2	1.15	83	0.77	**8**	17
6/3/2003	96	1600	1650	93.75	81.66666667	11	11	50.0%	48	50.0%	48	1625	92.71	0.5	6.2	1.08	18	0.77	**9**	0.5	6.2	1.08	82	0.77	**9**	17
6/4/2003	93	1500	1550	100	86.875	11	11	50.0%	47	50.0%	47	1525	98.44	0.5	6.2	1.02	18	0.75	**8**	0.5	6.2	1.02	82	0.75	**8**	16
6/5/2003	90	1750	1800	88.5620915	78.01857585	11	11	50.0%	45	50.0%	45	1775	88.29	0.5	6.2	1.13	19	0.76	**8**	0.5	6.2	1.13	81	0.76	**8**	17
6/6/2003	91	1650	1700	93.93382353	91.17647059	11	11	50.0%	46	50.0%	46	1675	97.56	0.5	6.2	1.03	20	0.81	**9**	0.5	6.2	1.03	80	0.81	**9**	18
6/7/2003	90	1750	1750	97.22222222	88.5620915	11	11	50.0%	45	50.0%	45	1750	97.89	0.5	6.2	1.02	21	0.85	**9**	0.5	6.2	1.02	79	0.85	**9**	19
6/8/2003	115	1650	1850	97.24264706	83.77192982	11	11	50.0%	58	50.0%	58	1750	95.51	0.5	6.2	1.05	20	1.05	**12**	0.5	6.2	1.05	80	1.05	**12**	23

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TABLE 4F-56 SHEET 2 OF 5

SSWWTP UNIT PROCESS NO. 5: RAS PUMPING CALCULATIONS

2020 TREATMENT REPORT

6/04/07 TR_4-A.T4F56.07.06.04.cdr

	Given from 2003 DWOR							Calculated from 2002 Plant Schematic						EAST PLANT					WEST PLANT					
1	2	5	6	9	10	15	16																	
DATE	Infl Flow (mgd)	MLSS East (mg/l)	MLSS West mg/L	SVI East	SVI West	# CLARIF. IN East.	# CLARIF. IN West.	% Split to EP	EP Flow MGD	% Split to WP	WP Flow MGD	Ave MLSS mg/L	Stirred SVI	Given Min RAS flow / clarifier MGD	Given Max RAS flow / clarifier MGD	Based on SVI RAS concentration %	RAS return rate %	RAS flow / clarifier MGD	EP RAS flow MGD	Given Min RAS flow / clarifier MGD	Given Max RAS flow / clarifier MGD	Based on SVI RAS concentration %	RAS return rate %	RAS flow / clarifier MGD	WP RAS flow MGD	TOTAL RAS FLOW
6/9/2003	139	1500	1800	106.6964286	86.22291022	11	11	50.0%	70	50.0%	70	1650	101.46	0.5	6.2	0.99	20	1.27	**14**	0.5	6.2	0.99	80	1.27	**14**	28
6/10/2003	114	1600	1800	96.875	86.11111111	11	11	50.0%	57	50.0%	57	1700	96.49	0.5	6.2	1.04	20	1.02	**11**	0.5	6.2	1.04	80	1.02	**11**	22
6/11/2003	108	1650	1850	96.875	81.14035088	11	11	50.0%	54	50.0%	54	1750	94.01	0.5	6.2	1.06	20	0.97	**11**	0.5	6.2	1.06	80	0.97	**11**	21
6/12/2003	103	1700	2000	97.05882353	82.5	11	11	50.0%	52	50.0%	52	1850	94.78	0.5	6.2	1.06	21	1.00	**11**	0.5	6.2	1.06	79	1.00	**11**	22
6/13/2003	93	1800	2100	86.22291022	85.71428571	11	11	50.0%	47	50.0%	47	1950	90.97	0.5	6.2	1.10	22	0.91	**10**	0.5	6.2	1.10	78	0.91	**10**	20
6/14/2003	90	1800	2050	88.88888889	87.85714286	11	11	50.0%	45	50.0%	45	1925	93.37	0.5	6.2	1.07	22	0.90	**10**	0.5	6.2	1.07	78	0.90	**10**	20
6/15/2003	85	1600	1750	90.625	85.62091503	11	11	50.0%	43	50.0%	43	1675	93.12	0.5	6.2	1.07	18	0.71	**8**	0.5	6.2	1.07	82	0.71	**8**	16
6/16/2003	86	1650	1650	84.92647059	81.80147059	11	11	50.0%	43	50.0%	43	1650	88.36	0.5	6.2	1.13	17	0.67	**7**	0.5	6.2	1.13	83	0.67	**7**	15
6/17/2003	86	1500	1600	91.07142857	95.23809524	11	10	47.6%	41	52.4%	45	1552.380952	98.25	0.5	6.2	1.02	18	0.67	**7**	0.5	6.2	1.02	82	0.81	**8**	15
6/18/2003	84	1500	1850	87.5	80.99415205	11	10	47.6%	40	52.4%	44	1683.333333	89.09	0.5	6.2	1.12	18	0.64	**7**	0.5	6.2	1.12	82	0.78	**8**	15
6/19/2003	82	1550	1800	70.83333333	77.77777778	11	10	47.6%	39	52.4%	43	1680.952381	79.47	0.5	6.2	1.26	15	0.55	**6**	0.5	6.2	1.26	85	0.66	**7**	13
6/20/2003	81	1550	1850	77.91666667	78.23529412	11	10	47.6%	39	52.4%	42	1707.142857	83.08	0.5	6.2	1.20	17	0.58	**6**	0.5	6.2	1.20	83	0.70	**7**	13
6/21/2003	79	1400	1650	85.71428571	81.61764706	11	11	50.0%	40	50.0%	40	1525	88.67	0.5	6.2	1.13	16	0.56	**6**	0.5	6.2	1.25	84	0.50	**6**	12
6/22/2003	77	1550	1700	67.91666667	76.47058824	11	11	50.0%	39	50.0%	39	1625	77.19	0.5	6.2	1.30	14	0.50	**6**	0.5	6.2	1.30	86	0.50	**6**	11
6/23/2003	79	1500	1650	70.53571429	81.61764706	11	11	50.0%	40	50.0%	40	1575	81.08	0.5	6.2	1.23	15	0.53	**6**	0.5	6.2	1.29	85	0.50	**6**	11
6/24/2003	89	1500	1550	66.96428571	83.95833333	11	11	50.0%	45	50.0%	45	1525	80.46	0.5	6.2	1.24	14	0.57	**6**	0.5	6.2	1.39	86	0.50	**6**	12
6/25/2003	89	1550	1550	76.8907563	90.20833333	11	11	50.0%	45	50.0%	45	1550	88.55	0.5	6.2	1.13	16	0.64	**7**	0.5	6.2	1.13	84	0.64	**7**	14
6/26/2003	92	1750	1900	74.34210526	79.44444444	11	11	50.0%	46	50.0%	46	1825	81.89	0.5	6.2	1.22	18	0.73	**8**	0.5	6.2	1.22	82	0.73	**8**	16
6/27/2003	89	1800	1800	72.13622291	88.88888889	11	11	50.0%	45	50.0%	45	1800	85.51	0.5	6.2	1.17	18	0.74	**8**	0.5	6.2	1.17	82	0.74	**8**	16
6/28/2003	95	1750	1750	66.0130719	88.7254902	11	11	50.0%	48	50.0%	48	1750	82.37	0.5	6.2	1.21	17	0.73	**8**	0.5	6.2	1.21	83	0.73	**8**	16
6/29/2003	85	1650	1500	72.79411765	103.3333333	11	11	50.0%	43	50.0%	43	1575	93.06	0.5	6.2	1.07	17	0.66	**7**	0.5	6.2	1.07	83	0.66	**7**	15
6/30/2003	79	1700	1650	70.58823529	88.05147059	11	11	50.0%	40	50.0%	40	1675	84.32	0.5	6.2	1.19	16	0.59	**6**	0.5	6.2	1.19	84	0.59	**6**	13
7/1/2003	78	1650	1700	84.92647059	94.09722222	11	11	50.0%	39	50.0%	39	1675	94.51	0.5	6.2	1.06	19	0.67	**7**	0.5	6.2	1.06	81	0.67	**7**	15
7/2/2003	77	1550	1650	90.41666667	96.875	11	11	50.0%	39	50.0%	39	1600	98.65	0.5	6.2	1.01	19	0.66	**7**	0.5	6.2	1.01	81	0.66	**7**	14
7/3/2003	77	1650	1650	63.60294118	87.86764706	11	11	50.0%	39	50.0%	39	1650	80.74	0.5	6.2	1.24	15	0.54	**6**	0.5	6.2	1.32	85	0.50	**6**	11
7/4/2003	81	1650	1500	66.91176471	90.625	11	11	50.0%	41	50.0%	41	1575	83.77	0.5	6.2	1.19	15	0.56	**6**	0.5	6.2	1.32	85	0.50	**6**	12
7/5/2003	88	1500	1600	80	84.375	11	11	50.0%	44	50.0%	44	1550	87.19	0.5	6.2	1.15	16	0.63	**7**	0.5	6.2	1.15	84	0.63	**7**	14
7/6/2003	92	1450	1500	81.25	85.29411765	10	11	52.4%	48	47.6%	44	1473.809524	88.18	0.5	6.2	1.13	15	0.72	**7**	0.5	6.2	1.13	85	0.59	**7**	14
7/7/2003	117	1450	1450	97.59615385	90.625	10	11	52.4%	61	47.6%	56	1450	99.28	0.5	6.2	1.01	17	1.03	**10**	0.5	6.2	1.01	83	0.85	**9**	20
7/8/2003	102	1450	1550	86.19047619	90.20833333	10	11	52.4%	53	47.6%	49	1497.619048	93.10	0.5	6.2	1.07	16	0.87	**9**	0.5	6.2	1.07	84	0.72	**8**	17
7/9/2003	98	1650	1700	91.66666667	85.41666667	10	11	52.4%	51	47.6%	47	1673.809524	93.69	0.5	6.2	1.07	19	0.95	**10**	0.5	6.2	1.07	81	0.79	**9**	18
7/10/2003	90	1800	1800	83.33333333	83.59133127	10	11	52.4%	47	47.6%	43	1800	88.46	0.5	6.2	1.13	19	0.89	**9**	0.5	6.2	1.13	81	0.74	**8**	17
7/11/2003	85	1700	1750	88.23529412	85.78431373	10	11	52.4%	45	47.6%	40	1723.809524	92.07	0.5	6.2	1.09	19	0.84	**8**	0.5	6.2	1.09	81	0.69	**8**	16
7/12/2003	82	1550	1700	91.17647059	85.29411765	10	11	52.4%	43	47.6%	39	1621.428571	93.38	0.5	6.2	1.07	18	0.77	**8**	0.5	6.2	1.07	82	0.63	**7**	15
7/13/2003	78	1450	1600	96.66666667	85.31746032	9	11	55.0%	43	45.0%	35	1517.5	96.56	0.5	6.2	1.04	17	0.82	**7**	0.5	6.2	1.12	83	0.50	**6**	13
7/14/2003	79	1550	1550	90.41666667	90.20833333	9	11	55.0%	43	45.0%	36	1550	95.32	0.5	6.2	1.05	17	0.84	**8**	0.5	6.2	1.16	83	0.50	**6**	13
7/15/2003	98	1750	1650	91.50326797	100.1838235	9	11	55.0%	54	45.0%	44	1705	100.41	0.5	6.2	1.00	21	1.24	**11**	0.5	6.2	1.00	79	0.83	**9**	20
7/16/2003	90	1600	1600	94.11764706	94.11764706	10	11	52.4%	47	47.6%	43	1600	99.12	0.5	6.2	1.01	19	0.89	**9**	0.5	6.2	1.01	81	0.73	**8**	17
7/17/2003	82	1350	1450	107.4175824	96.66666667	11	11	50.0%	41	50.0%	41	1400	107.04	0.5	6.2	0.93	18	0.66	**7**	0.5	6.2	0.93	82	0.66	**7**	14
7/18/2003	79	1400	1500	100.5128205	96.66666667	12	11	47.8%	38	52.2%	41	1452.173913	103.51	0.5	6.2	0.97	18	0.56	**7**	0.5	6.2	0.97	82	0.66	**7**	14
7/19/2003	72	1400	1400	100	104.8128342	12	11	47.8%	34	52.2%	38	1400	107.51	0.5	6.2	0.93	18	0.51	**6**	0.5	6.2	0.93	82	0.61	**7**	13
7/20/2003	72	1350	1400	107.6923077	97.17948718	12	11	47.8%	34	52.2%	38	1376.086957	107.21	0.5	6.2	0.93	17	0.50	**6**	0.5	6.2	0.93	83	0.59	**7**	13
7/21/2003	80	1400	1550	97.17948718	96.875	12	11	47.8%	38	52.2%	42	1478.26087	102.02	0.5	6.2	0.98	18	0.57	**7**	0.5	6.2	0.98	82	0.67	**7**	14
7/22/2003	77	1600	1550	100	109.5833333	12	11	47.8%	37	52.2%	40	1573.913043	110.00	0.5	6.2	0.91	21	0.64	**8**	0.5	6.2	0.91	79	0.76	**8**	16
7/23/2003	75	1450	1800	100.7211538	88.88888889	11	11	50.0%	38	50.0%	38	1625	99.81	0.5	6.2	1.00	19	0.66	**7**	0.5	6.2	1.00	81	0.66	**7**	15
7/24/2003	74	1350	1750	110.5113636	85.78431373	12	11	47.8%	35	52.2%	39	1558.695652	102.61	0.5	6.2	0.97	19	0.56	**7**	0.5	6.2	0.97	81	0.67	**7**	14
7/25/2003	74	1550	1600	96.875	95.23809524	12	11	47.8%	35	52.2%	39	1576.086957	101.02	0.5	6.2	0.99	19	0.56	**7**	0.5	6.2	0.99	81	0.66	**7**	14
7/26/2003	72	1500	1550	93.33333333	96.875	12	11	47.8%	34	52.2%	38	1526.086957	100.18	0.5	6.2	1.00	18	0.52	**6**	0.5	6.2	1.00	82	0.62	**7**	13
7/27/2003	67	1600	1400	93.7254902	100	12	10	45.5%	30	54.5%	37	1490.909091	102.15	0.5	6.2	0.91	20	0.50	**6**	0.5	6.2	0.98	80	0.66	**7**	13
7/28/2003	72	1450	1600	100.2380952	93.75	12	10	45.5%	33	54.5%	39	1531.818182	101.70	0.5	6.2	0.98	18	0.50	**6**	0.5	6.2	0.98	82	0.72	**7**	13
7/29/2003	72	1600	1600	96.875	97.05882353	12	11	47.8%	34	52.2%	38	1600	101.97	0.5	6.2	0.98	19	0.56	**7**	0.5	6.2	0.98	81	0.67	**7**	14
7/30/2003	74	1600	1500	93.75	93.33333333	12	11	47.8%	35	52.2%	39	1547.826087	98.53	0.5	6.2	1.01	18	0.53	**6**	0.5	6.2	1.01	82	0.63	**7**	13
7/31/2003	86	1500	1500	103.5714286	100.4464286	12	11	47.8%	41	52.2%	45	1500	106.94	0.5	6.2	0.94	19	0.65	**8**	0.5	6.2	0.94	81	0.78	**9**	16
8/1/2003	98	1650	1600	103.125	103.3333333	12	11	47.8%	47	52.2%	51	1623.913043	108.23	0.5	6.2	0.92	21	0.83	**10**	0.5	6.2	0.92	79	0.99	**11**	21
8/2/2003	92	1700	1700	102.9411765	106.25	12	11	47.8%	44	52.2%	48	1700	109.67	0.5	6.2	0.91	23	0.84	**10**	0.5	6.2	0.91	77	1.00	**11**	21
8/3/2003	94	1750	1850	120.2614379	110.8187135	12	11	47.8%	45	52.2%	49	1802.173913	120.33	0.5	6.2	0.83	28	1.04	**12**	0.5	6.2	0.83	72	1.23	**14**	26
8/4/2003	97	1750	1650	109.8684211	106.4338235	12	11	47.8%	46	52.2%	51	1697.826087	113.08	0.5	6.2	0.88	24	0.92	**11**	0.5	6.2	0.88	76	1.09	**12**	23
8/5/2003	93	1850	1750	108.1871345	100	12	11	47.8%	44	52.2%	49	1797.826087	108.92	0.5	6.2	0.92	24	0.90	**11**	0.5	6.2	0.92	76	1.07	**12**	23
8/6/2003	72	1850	1650	108.1871345	96.875	12	11	47.8%	34	52.2%	38	1745.652174	107.29	0.5	6.2	0.93	23	0.66	**8**	0.5	6.2	0.93	77	0.79	**9**	17
8/7/2003	115	1750	1700	120.3947368	105.8823529	12	11	47.8%	55	52.2%	60	1723.913043	117.82	0.5	6.2	0.85	25	1.17	**14**	0.5	6.2	0.85	75	1.39	**15**	29
8/8/2003	82	1800	1700	111.1111111	111.7647059	12	11	47.8%	39	52.2%	43	1747.826087	116.45	0.5	6.2	0.86	26	0.84	**10**	0.5	6.2	0.86	74	0.99	**11**	21
8/9/2003	76	1700	1700	111.7647059	102.9411765	12	11	47.8%	36	52.2%	40	1700	112.16	0.5	6.2	0.89	24	0.71	**9**	0.5	6.2	0.89	76	0.85	**9**	18
8/10/2003	72	1700	1750	111.7647059	105.7189542	11	11	50.0%	36	50.0%	36	1725	113.74	0.5	6.2	0.88	24	0.80	**9**	0.5	6.2	0.88	76	0.80	**9**	18
8/11/2003	74	1550	1600	106.4583333	98.01587302	11	11	50.0%	37	50.0%	37	1575	107.24	0.5	6.2	0.93	20	0.68	**8**	0.5	6.2	0.93	80	0.68	**8**	15
8/12/2003	75	1550	1650	106.4583333	96.875	12	11	47.8%	36	52.2%	39	1602.173913	106.46	0.5	6.2	0.94	21	0.61	**7**	0.5	6.2	0.94	79	0.73	**8**	15
8/13/2003	74	1400	1400	114.2857143	107.1428571	12	11	47.8%	35	52.2%	39	1400	115.56	0.5	6.2	0.87	19	0.57	**7**	0.5	6.2	0.87	81	0.68	**7**	14
8/14/2003	74	1450	1450	103.3333333	100	11	11	50.0%	37	50.0%	37	1450	106.67	0.5	6.2	0.94	18	0.62	**7**	0.5	6.2	0.94	82	0.62	**7**	14
8/15/2003	73	1350	1300	105.8333333	107.6923077	11	11	50.0%	37	50.0%	37	1325	111.76	0.5	6.2	0.89	17	0.58	**6**	0.5	6.2	1.01	83	0.50	**6**	12
8/16/2003	74	1400	1450	100	86.9047619	11	11	50.0%	37	50.0%	37	1425	98.45	0.5	6.2	1.02	16	0.55	**6**	0.5	6.2	1.10	84	0.50	**6**	12
8/17/2003	72	1650	1500	81.80147059	90.17857143	11	10	47.6%	34	52.4%	38	1571.428571	91.19	0.5	6.2	1.10	17	0.52	**6**	0.5	6.2	1.10	83	0.63	**6**	12
8/18/2003	72	1300	1300	111.5384615	119.2307692	11	10	47.6%	34	52.4%	38	1300	120.57	0.5	6.2	0.83	19	0.58	**6**	0.5	6.2	0.83	81	0.70	**7**	13
8/19/2003	73	1500	1450	100	103.5714286	11	11	50.0%	37	50.0%	37	1475	106.79	0.5	6.2	0.94	19	0.62	**7**	0.5	6.2	0.94	81	0.62	**7**	14
8/20/2003	73	1350	1350	104.1208791	111.6666667	11	11	50.0%	37	50.0%	37	1350	112.89	0.5	6.2	0.89	18	0.60	**7**	0.5	6.2	0.89	82	0.60	**7**	13
8/21/2003	83	1500	1500	103.3333333	96.42857143	11	11	50.0%	42	50.0%	42	1500	104.88	0.5	6.2	0.95	19	0.70	**8**	0.5	6.2	0.95	81	0.70	**8**	15
8/22/2003	80	1450	1500	96.875	104.7511312	11	11	50.0%	40	50.0%	40	1475	105.81	0.5	6.2	0.95	18	0.67	**7**	0.5	6.2	0.95	82	0.67	**7**	15
8/23/2003	71	1700	1700	85.76388889	91.31944444	11	11	50.0%	36	50.0%	36	1700	93.54	0.5	6.2	1.07	19	0.61	**7**	0.5	6.2	1.07	81	0.61	**7**	13
8/24/2003	69	1800	1700	77.77777778	102.9411765	11	11	50.0%	35	50.0%	35	1750	95.36	0.5	6.2	1.05	20	0.63	**7**	0.5	6.2	1.05	80	0.63	**7**	14
8/25/2003	72	1800	1600	75	93.75	10	11	52.4%	38	47.6%	34	1704.761905	88.93	0.5	6.2	1.12	18	0.67	**7**	0.5	6.2	1.23	82	0.50	**6**	12
8/26/2003	84	1700	1550	79.41176471	96.875	10	11	52.4%	44	47.6%	40	1628.571429	92.73	0.5	6.2	1.08	18	0.78	**8**	0.5	6.2	1.08	82	0.65	**7**	15
8/27/2003	76	1750	1700	85.78431373	96.875	10	11	52.4%	40	47.6%	36	1726.190476	96.07	0.5	6.2	1.04	20	0.79	**8**	0.5	6.2	1.04	80	0.65	**7**	15

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TABLE 4F-56 SHEET 3 OF 5

SSWWTP UNIT PROCESS NO. 5: RAS PUMPING CALCULATIONS

2020 TREATMENT REPORT

6/04/07 TR_4-A.T4F56.07.06.04.cdr

	Given from 2003 DWOR							Calculated from 2002 Plant Schematic						EAST PLANT						WEST PLANT						
1	2	5	6	9	10	15	16									Based on SVI						Based on SVI				
DATE	Infl Flow (mgd)	MLSS East (mg/l)	MLSS West mg/L	SVI East	SVI West	# CLARIF. IN East.	# CLARIF. IN West.	% Split to EP	EP Flow MGD	% Split to WP	WP Flow MGD	Ave MLSS mg/L	Stirred SVI	Given Min RAS flow / clarifier MGD	Given Max RAS flow / clarifier MGD	RAS concentration %	RAS return rate %	RAS flow / clarifier MGD	EP RAS flow MGD	Given Min RAS flow / clarifier MGD	Given Max RAS flow / clarifier MGD	RAS concentration %	RAS return rate %	RAS flow / clarifier MGD	WP RAS flow MGD	TOTAL RAS FLOW
8/28/2003	71	1850	1700	81.14035088	88.54166667	10	11	52.4%	37	47.6%	34	1778.571429	89.66	0.5	6.2	1.12	19	0.71	**7**	0.5	6.2	1.27	81	0.50	**6**	13
8/29/2003	82	1850	1750	83.91812865	88.7254902	10	11	52.4%	43	47.6%	39	1802.380952	91.21	0.5	6.2	1.10	20	0.85	**8**	0.5	6.2	1.10	80	0.70	**8**	16
8/30/2003	72	1700	1650	91.17647059	90.99264706	11	11	50.0%	36	50.0%	36	1675	96.08	0.5	6.2	1.04	19	0.63	**7**	0.5	6.2	1.04	81	0.63	**7**	14
8/31/2003	64	1800	1650	83.33333333	87.86764706	11	11	50.0%	32	50.0%	32	1725	90.60	0.5	6.2	1.10	19	0.54	**6**	0.5	6.2	1.18	81	0.50	**6**	11
9/1/2003	64	1500	1500	97.9638009	90.17857143	11	11	50.0%	32	50.0%	32	1500	99.07	0.5	6.2	1.01	17	0.51	**6**	0.5	6.2	1.02	83	0.50	**6**	11
9/2/2003	70	1550	1500	90.41666667	90	11	11	50.0%	35	50.0%	35	1525	95.21	0.5	6.2	1.05	17	0.54	**6**	0.5	6.2	1.12	83	0.50	**6**	11
9/3/2003	68	1750	1500	85.78431373	90.625	11	11	50.0%	34	50.0%	34	1625	93.20	0.5	6.2	1.07	18	0.55	**6**	0.5	6.2	1.17	82	0.50	**6**	12
9/4/2003	68	1550	1300	94.74789916	100	11	11	50.0%	34	50.0%	34	1425	102.37	0.5	6.2	0.98	17	0.53	**6**	0.5	6.2	1.02	83	0.50	**6**	11
9/5/2003	68	1600	1350	103.125	92.85714286	11	11	50.0%	34	50.0%	34	1475	102.99	0.5	6.2	0.97	18	0.55	**6**	0.5	6.2	1.06	82	0.50	**6**	12
9/6/2003	65	1450	1350	106.9047619	96.42857143	11	11	50.0%	33	50.0%	33	1400	106.67	0.5	6.2	0.94	18	0.52	**6**	0.5	6.2	0.97	82	0.50	**6**	11
9/7/2003	57	1550	1400	103.5416667	90	11	11	50.0%	29	50.0%	29	1475	101.77	0.5	6.2	0.91	19	0.50	**6**	0.5	6.2	0.91	81	0.50	**6**	11
9/8/2003	69	1500	1350	110	92.85714286	11	11	50.0%	35	50.0%	35	1425	106.43	0.5	6.2	0.94	18	0.56	**6**	0.5	6.2	1.04	82	0.50	**6**	12
9/9/2003	69	1550	1250	97.68907563	100	11	11	50.0%	35	50.0%	35	1400	103.84	0.5	6.2	0.96	17	0.53	**6**	0.5	6.2	1.02	83	0.50	**6**	11
9/10/2003	69	1500	1400	100.4464286	92.85714286	11	11	50.0%	35	50.0%	35	1450	101.65	0.5	6.2	0.98	17	0.54	**6**	0.5	6.2	1.05	83	0.50	**6**	11
9/11/2003	69	1600	1400	96.875	96.42857143	10	11	52.4%	36	47.6%	33	1504.761905	101.66	0.5	6.2	0.98	18	0.65	**7**	0.5	6.2	1.05	82	0.50	**6**	12
9/12/2003	70	1700	1450	88.23529412	93.0952381	10	11	52.4%	37	47.6%	33	1580.952381	95.55	0.5	6.2	1.05	18	0.65	**7**	0.5	6.2	1.12	82	0.50	**6**	12
9/13/2003	81	1750	1600	91.33986928	87.84313725	10	11	52.4%	42	47.6%	39	1678.571429	94.67	0.5	6.2	1.06	19	0.80	**8**	0.5	6.2	1.06	81	0.66	**7**	15
9/14/2003	90	1800	1700	102.7777778	85.76388889	10	11	52.4%	47	47.6%	43	1752.380952	99.68	0.5	6.2	1.00	21	1.00	**10**	0.5	6.2	1.00	79	0.82	**9**	19
9/15/2003	88	1800	1650	105.5555556	90.99264706	10	11	52.4%	46	47.6%	42	1728.571429	103.62	0.5	6.2	0.97	22	1.01	**10**	0.5	6.2	0.97	78	0.83	**9**	19
9/16/2003	66	1850	1600	100	93.75	10	11	52.4%	35	47.6%	31	1730.952381	102.02	0.5	6.2	0.98	21	0.74	**7**	0.5	6.2	0.98	79	0.61	**7**	14
9/17/2003	77	1800	1550	105.8823529	96.875	10	11	52.4%	40	47.6%	37	1680.952381	106.59	0.5	6.2	0.94	22	0.88	**9**	0.5	6.2	0.94	78	0.73	**8**	17
9/18/2003	73	1700	1500	105.8823529	96.66666667	10	11	52.4%	38	47.6%	35	1604.761905	106.49	0.5	6.2	0.94	21	0.79	**8**	0.5	6.2	0.94	79	0.65	**7**	15
9/19/2003	68	1750	1400	103.6184211	101.025641	10	11	52.4%	36	47.6%	32	1583.333333	107.38	0.5	6.2	0.93	20	0.73	**7**	0.5	6.2	0.93	80	0.60	**7**	14
9/20/2003	66	1750	1350	106.25	101.6666667	10	11	52.4%	35	47.6%	31	1559.52381	109.07	0.5	6.2	0.92	20	0.71	**7**	0.5	6.2	1.05	80	0.50	**6**	13
9/21/2003	65	1800	1500	97.36842105	83.48214286	10	11	52.4%	34	47.6%	31	1657.142857	95.76	0.5	6.2	1.04	19	0.64	**6**	0.5	6.2	1.10	81	0.50	**6**	12
9/22/2003	84	1850	1500	100.1461988	83.92857143	10	11	52.4%	44	47.6%	40	1683.333333	97.42	0.5	6.2	1.03	20	0.86	**9**	0.5	6.2	1.03	80	0.71	**8**	16
9/23/2003	83	1600	1450	115.4901961	90	10	11	52.4%	43	47.6%	40	1528.571429	108.35	0.5	6.2	0.92	20	0.86	**9**	0.5	6.2	0.92	80	0.71	**8**	16
9/24/2003	71	1700	1500	136.1111111	94.19642857	10	11	52.4%	37	47.6%	34	1604.761905	121.15	0.5	6.2	0.83	24	0.90	**9**	0.5	6.2	0.83	76	0.74	**8**	17
9/25/2003	68	1650	1550	151.8382353	91.17647059	10	11	52.4%	36	47.6%	32	1602.380952	127.95	0.5	6.2	0.78	26	0.92	**9**	0.5	6.2	0.78	74	0.76	**8**	18
9/26/2003	71	1600	1450	143.75	100	10	11	52.4%	37	47.6%	34	1528.571429	127.92	0.5	6.2	0.78	24	0.90	**9**	0.5	6.2	0.78	76	0.75	**8**	17
9/27/2003	80	1350	1450	167.032967	101.4423077	10	11	52.4%	42	47.6%	38	1397.619048	140.80	0.5	6.2	0.71	24	1.03	**10**	0.5	6.2	0.71	76	0.85	**9**	20
9/28/2003	70	1500	1650	140	84.92647059	10	11	52.4%	37	47.6%	33	1571.428571	118.77	0.5	6.2	0.84	23	0.84	**8**	0.5	6.2	0.84	77	0.70	**8**	16
9/29/2003	74	1350	1400	152.1978022	100	10	11	52.4%	39	47.6%	35	1373.809524	132.34	0.5	6.2	0.76	22	0.86	**9**	0.5	6.2	0.76	78	0.71	**8**	16
9/30/2003	69	1300	1400	150	96.15384615	10	11	52.4%	36	47.6%	33	1347.619048	129.36	0.5	6.2	0.77	21	0.76	**8**	0.5	6.2	0.77	79	0.63	**7**	15
10/1/2003	68	1300	1400	123.0769231	92.85714286	10	11	52.4%	36	47.6%	32	1347.619048	113.69	0.5	6.2	0.88	18	0.64	**6**	0.5	6.2	0.93	82	0.50	**6**	12
10/2/2003	68	1350	1550	115.3846154	86.875	10	11	52.4%	36	47.6%	32	1445.238095	106.81	0.5	6.2	0.94	18	0.65	**7**	0.5	6.2	1.00	82	0.50	**6**	12
10/3/2003	74	1200	1500	137.4125874	83.48214286	10	11	52.4%	39	47.6%	35	1342.857143	116.73	0.5	6.2	0.86	19	0.72	**7**	0.5	6.2	0.86	81	0.60	**7**	14
10/4/2003	76	1300	1600	169.2307692	84.50980392	10	11	52.4%	40	47.6%	36	1442.857143	133.89	0.5	6.2	0.75	24	0.95	**10**	0.5	6.2	0.75	76	0.79	**9**	18
10/5/2003	69	1500	1650	159.8214286	84.92647059	10	11	52.4%	36	47.6%	33	1571.428571	129.16	0.5	6.2	0.77	25	0.92	**9**	0.5	6.2	0.77	75	0.76	**8**	18
10/6/2003	71	1450	1500	186.6666667	90.17857143	10	11	52.4%	37	47.6%	34	1473.809524	145.72	0.5	6.2	0.69	27	1.02	**10**	0.5	6.2	0.69	73	0.84	**9**	19
10/7/2003	71	1550	1600	173.125	87.45098039	10	11	52.4%	37	47.6%	34	1573.809524	137.33	0.5	6.2	0.73	28	1.03	**10**	0.5	6.2	0.73	72	0.85	**9**	20
10/8/2003	70	1500	1500	120	90	10	11	52.4%	37	47.6%	33	1500	110.71	0.5	6.2	0.90	20	0.73	**7**	0.5	6.2	0.90	80	0.60	**7**	14
10/9/2003	70	1550	1550	106.25	93.54166667	10	11	52.4%	37	47.6%	33	1550	105.20	0.5	6.2	0.95	19	0.71	**7**	0.5	6.2	1.09	81	0.50	**6**	13
10/10/2003	70	1500	1500	103.3333333	96.66666667	10	11	52.4%	37	47.6%	33	1500	105.16	0.5	6.2	0.95	19	0.69	**7**	0.5	6.2	1.06	81	0.50	**6**	12
10/11/2003	68	1600	1650	97.05882353	87.86764706	10	11	52.4%	36	47.6%	32	1623.809524	97.68	0.5	6.2	1.02	19	0.67	**7**	0.5	6.2	1.12	81	0.50	**6**	12
10/12/2003	73	1700	1800	94.44444444	83.59133127	10	11	52.4%	38	47.6%	35	1747.619048	94.28	0.5	6.2	1.06	20	0.75	**8**	0.5	6.2	1.06	80	0.62	**7**	14
10/13/2003	69	1550	1650	100.2083333	87.86764706	10	11	52.4%	36	47.6%	33	1597.619048	99.33	0.5	6.2	1.01	19	0.68	**7**	0.5	6.2	1.11	81	0.50	**6**	12
10/14/2003	92	1500	1650	100	84.92647059	11	11	50.0%	46	50.0%	46	1575	97.46	0.5	6.2	1.03	18	0.76	**8**	0.5	6.2	1.03	82	0.76	**8**	17
10/15/2003	96	1600	1750	106.25	79.90196078	11	11	50.0%	48	50.0%	48	1675	98.08	0.5	6.2	1.02	20	0.86	**9**	0.5	6.2	1.02	80	0.86	**9**	19
10/16/2003	81	1550	1550	113.125	90.54621849	11	11	50.0%	41	50.0%	41	1550	106.84	0.5	6.2	0.94	20	0.73	**8**	0.5	6.2	0.94	80	0.73	**8**	16
10/17/2003	69	1700	1800	108.8235294	86.22291022	11	11	50.0%	35	50.0%	35	1750	102.52	0.5	6.2	0.98	22	0.69	**8**	0.5	6.2	0.98	78	0.69	**8**	15
10/18/2003	68	1650	1750	111.9485294	85.62091503	11	11	50.0%	34	50.0%	34	1700	103.78	0.5	6.2	0.96	21	0.66	**7**	0.5	6.2	0.96	79	0.66	**7**	15
10/19/2003	67	1700	1700	103.125	85.76388889	11	11	50.0%	34	50.0%	34	1700	99.44	0.5	6.2	1.01	20	0.62	**7**	0.5	6.2	1.01	80	0.62	**7**	14
10/20/2003	76	1600	1750	109.6078431	83.00653595	11	11	50.0%	38	50.0%	38	1675	101.31	0.5	6.2	0.99	20	0.71	**8**	0.5	6.2	0.99	80	0.71	**8**	16
10/21/2003	67	1750	1650	102.9411765	88.05147059	11	11	50.0%	34	50.0%	34	1700	100.50	0.5	6.2	1.00	21	0.63	**7**	0.5	6.2	1.00	79	0.63	**7**	14
10/22/2003	67	1750	1700	100.1633987	85.29411765	11	11	50.0%	34	50.0%	34	1725	97.73	0.5	6.2	1.02	20	0.62	**7**	0.5	6.2	1.02	80	0.62	**7**	14
10/23/2003	73	1800	1750	102.7777778	85.62091503	11	11	50.0%	37	50.0%	37	1775	99.20	0.5	6.2	1.01	21	0.71	**8**	0.5	6.2	1.01	79	0.71	**8**	16
10/24/2003	68	1850	1850	102.6315789	78.50877193	11	11	50.0%	34	50.0%	34	1850	95.57	0.5	6.2	1.05	21	0.66	**7**	0.5	6.2	1.05	79	0.66	**7**	15
10/25/2003	124	1750	1950	114.379085	76.97368421	11	11	50.0%	62	50.0%	62	1850	100.68	0.5	6.2	0.99	23	1.29	**14**	0.5	6.2	0.99	77	1.29	**14**	28
10/26/2003	91	1900	1850	105.5555556	84.55882353	11	11	50.0%	46	50.0%	46	1875	100.06	0.5	6.2	1.00	23	0.96	**11**	0.5	6.2	1.00	77	0.96	**11**	21
10/27/2003	72	1800	1900	108.3333333	84.21052632	11	11	50.0%	36	50.0%	36	1850	101.27	0.5	6.2	0.99	23	0.75	**8**	0.5	6.2	0.99	77	0.75	**8**	17
10/28/2003	70	1800	1750	108.8235294	83.22368421	11	11	50.0%	35	50.0%	35	1775	101.02	0.5	6.2	0.99	22	0.70	**8**	0.5	6.2	0.99	78	0.70	**8**	15
10/29/2003	77	1800	1800	111.4551084	86.22291022	11	11	50.0%	39	50.0%	39	1800	103.84	0.5	6.2	0.96	23	0.80	**9**	0.5	6.2	0.96	77	0.80	**9**	18
10/30/2003	68	1800	1700	106.1919505	88.77192982	11	11	50.0%	34	50.0%	34	1750	102.48	0.5	6.2	0.98	22	0.68	**7**	0.5	6.2	0.98	78	0.68	**7**	15
10/31/2003	68	1800	1800	111.4551084	83.59133127	11	11	50.0%	34	50.0%	34	1800	102.52	0.5	6.2	0.98	23	0.70	**8**	0.5	6.2	0.98	77	0.70	**8**	15
11/1/2003	73	1650	1750	113.3333333	86.34868421	11	11	50.0%	37	50.0%	37	1700	104.84	0.5	6.2	0.95	22	0.72	**8**	0.5	6.2	0.95	78	0.72	**8**	16
11/2/2003	135	1700	1300	105.8823529	100	11	11	50.0%	68	50.0%	68	1500	107.94	0.5	6.2	0.93	19	1.19	**13**	0.5	6.2	0.93	81	1.19	**13**	26
11/3/2003	179	1700	1900	108.6805556	86.94444444	11	11	50.0%	90	50.0%	90	1800	102.81	0.5	6.2	0.97	23	1.85	**20**	0.5	6.2	0.97	77	1.85	**20**	41
11/4/2003	207	1950	2100	92.36842105	74.09090909	11	11	50.0%	104	50.0%	104	2025	88.23	0.5	6.2	1.13	22	2.05	**23**	0.5	6.2	1.13	78	2.05	**23**	45
11/5/2003	193	1900	2150	97.5	79.45652174	11	11	50.0%	97	50.0%	97	2025	93.48	0.5	6.2	1.07	23	2.05	**23**	0.5	6.2	1.07	77	2.05	**23**	45
11/6/2003	121	1750	2250	108.496732	77.66798419	11	11	50.0%	61	50.0%	61	2000	98.08	0.5	6.2	1.02	24	1.34	**15**	0.5	6.2	1.02	76	1.34	**15**	30
11/7/2003	107	1650	2100	103.125	78.57142857	11	11	50.0%	54	50.0%	54	1875	95.85	0.5	6.2	1.04	22	1.07	**12**	0.5	6.2	1.04	78	1.07	**12**	23
11/8/2003	88	1600	1950	115.625	81.97368421	11	11	50.0%	44	50.0%	44	1775	103.80	0.5	6.2	0.96	23	0.90	**10**	0.5	6.2	0.96	77	0.90	**10**	20
11/9/2003	81	1650	1900	109.1911765	89.72222222	11	11	50.0%	41	50.0%	41	1775	104.46	0.5	6.2	0.96	23	0.84	**9**	0.5	6.2	0.96	77	0.84	**9**	18
11/10/2003	84	1600	1850	112.5	91.95906433	11	11	50.0%	42	50.0%	42	1725	107.23	0.5	6.2	0.93	23	0.87	**10**	0.5	6.2	0.93	77	0.87	**10**	19
11/11/2003	88	1600	1700	112.5	100.3472222	11	11	50.0%	44	50.0%	44	1650	111.42	0.5	6.2	0.90	23	0.90	**10**	0.5	6.2	0.90	77	0.90	**10**	20
11/12/2003	79	1650	2050	103.125	80.38277512	11	11	50.0%	40	50.0%	40	1850	96.75	0.5	6.2	1.03	22	0.78	**9**	0.5	6.2	1.03	78	0.78	**9**	17
11/13/2003	76	1700	1800	103.125	88.88888889	11	11	50.0%	38	50.0%	38	1750	101.01	0.5	6.2	0.99	21	0.74	**8**	0.5	6.2	0.99	79	0.74	**8**	16
11/14/2003	76	1750	1800	100	97.22222222	11	11	50.0%	38	50.0%	38	1775	103.61	0.5	6.2	0.97	23	0.78	**9**	0.5	6.2	0.97	77	0.78	**9**	17
11/15/2003	79	1800	1800	100.3095975	89.375	11	11	50.0%	40	50.0%	40	1800	99.84	0.5	6.2	1.00	22	0.79	**9**	0.5	6.2	1.00	78	0.79	**9**	17

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TABLE 4F-56 SHEET 4 OF 5

SSWWTP UNIT PROCESS NO. 5: RAS PUMPING CALCULATIONS

2020 TREATMENT REPORT

6/04/07 TR_4-A.T4F56.07.06.04.cdr

	Given from 2003 DWOR							Calculated from 2002 Plant Schematic						EAST PLANT						WEST PLANT						
1	2	5	6	9	10	15	16																			
DATE	Infl Flow (mgd)	MLSS East (mg/l)	MLSS West mg/L	SVI East	SVI West	# CLARIF. IN East.	# CLARIF. IN West.	% Split to EP	EP Flow MGD	% Split to WP	WP Flow MGD	Ave MLSS mg/L	Stirred SVI	Given Min RAS flow / clarifier MGD	Given Max RAS flow / clarifier MGD	Based on SVI RAS concentration %	RAS return rate %	RAS flow / clarifier MGD	EP RAS flow MGD	Given Min RAS flow / clarifier MGD	Given Max RAS flow / clarifier MGD	Based on SVI RAS concentration %	RAS return rate %	RAS flow / clarifier MGD	WP RAS flow MGD	TOTAL RAS FLOW
11/16/2003	84	1600	1750	115.625	100.1633987	11	11	50.0%	42	50.0%	42	1675	112.89	0.5	6.2	0.89	23	0.89	**10**	0.5	6.2	0.89	77	0.89	**10**	20
11/17/2003	85	1750	1900	105.7189542	94.72222222	11	11	50.0%	43	50.0%	43	1825	105.22	0.5	6.2	0.95	24	0.92	**10**	0.5	6.2	0.95	76	0.92	**10**	20
11/18/2003	145	1700	1950	112.1527778	92.36842105	11	11	50.0%	73	50.0%	73	1825	107.26	0.5	6.2	0.93	24	1.60	**18**	0.5	6.2	0.93	76	1.60	**18**	35
11/19/2003	131	1800	1850	111.4551084	106.9940476	11	11	50.0%	66	50.0%	66	1825	114.22	0.5	6.2	0.88	26	1.57	**17**	0.5	6.2	0.88	74	1.57	**17**	35
11/20/2003	101	1800	2050	108.8235294	92.61904762	11	11	50.0%	51	50.0%	51	1925	105.72	0.5	6.2	0.95	26	1.17	**13**	0.5	6.2	0.95	74	1.17	**13**	26
11/21/2003	87	1850	2050	105.4093567	92.82296651	11	11	50.0%	44	50.0%	44	1950	104.12	0.5	6.2	0.96	25	1.01	**11**	0.5	6.2	0.96	75	1.01	**11**	22
11/22/2003	86	1850	1900	108.1871345	95	11	11	50.0%	43	50.0%	43	1875	106.59	0.5	6.2	0.94	25	0.98	**11**	0.5	6.2	0.94	75	0.98	**11**	21
11/23/2003	117	1850	1950	105.4093567	95	11	11	50.0%	59	50.0%	59	1900	105.20	0.5	6.2	0.95	25	1.33	**15**	0.5	6.2	0.95	75	1.33	**15**	29
11/24/2003	99	1750	2000	111.4379085	94.98746867	11	11	50.0%	50	50.0%	50	1875	108.21	0.5	6.2	0.92	25	1.15	**13**	0.5	6.2	0.92	75	1.15	**13**	25
11/25/2003	90	1700	2000	117.6470588	100	11	11	50.0%	45	50.0%	45	1850	113.82	0.5	6.2	0.88	27	1.09	**12**	0.5	6.2	0.88	73	1.09	**12**	24
11/26/2003	88	1750	1850	114.379085	108.1871345	11	11	50.0%	44	50.0%	44	1800	116.28	0.5	6.2	0.86	26	1.06	**12**	0.5	6.2	0.86	74	1.06	**12**	23
11/27/2003	91	1750	2050	114.379085	97.61904762	11	11	50.0%	46	50.0%	46	1900	111.00	0.5	6.2	0.90	27	1.11	**12**	0.5	6.2	0.90	73	1.11	**12**	24
11/28/2003	75	1800	2000	111.1111111	100	11	11	50.0%	38	50.0%	38	1900	110.56	0.5	6.2	0.90	27	0.91	**10**	0.5	6.2	0.90	73	0.91	**10**	20
11/29/2003	76	1750	1800	120.2614379	111.7647059	11	11	50.0%	38	50.0%	38	1775	121.01	0.5	6.2	0.83	27	0.95	**10**	0.5	6.2	0.83	73	0.95	**10**	21
11/30/2003	76	1650	1850	112.1323529	102.7777778	11	11	50.0%	38	50.0%	38	1750	112.46	0.5	6.2	0.89	25	0.85	**9**	0.5	6.2	0.89	75	0.85	**9**	19
12/1/2003	78	1700	1950	114.7058824	100	11	11	50.0%	39	50.0%	39	1825	112.35	0.5	6.2	0.89	26	0.91	**10**	0.5	6.2	0.89	74	0.91	**10**	20
12/2/2003	77	1750	1850	117.1568627	105.4093567	11	11	50.0%	39	50.0%	39	1800	116.28	0.5	6.2	0.86	26	0.93	**10**	0.5	6.2	0.86	74	0.93	**10**	20
12/3/2003	75	1650	1850	121.3235294	111.3235294	11	11	50.0%	38	50.0%	38	1750	121.32	0.5	6.2	0.82	27	0.92	**10**	0.5	6.2	0.82	73	0.92	**10**	20
12/4/2003	75	1650	1900	133.6397059	105.2631579	11	11	50.0%	38	50.0%	38	1775	124.45	0.5	6.2	0.80	28	0.97	**11**	0.5	6.2	0.80	72	0.97	**11**	21
12/5/2003	78	1650	1800	121.3235294	111.1111111	11	11	50.0%	39	50.0%	39	1725	121.22	0.5	6.2	0.82	26	0.94	**10**	0.5	6.2	0.82	74	0.94	**10**	21
12/6/2003	74	1700	1750	117.6470588	114.379085	11	11	50.0%	37	50.0%	37	1725	121.01	0.5	6.2	0.83	26	0.89	**10**	0.5	6.2	0.83	74	0.89	**10**	20
12/7/2003	72	1700	1950	144.1176471	107.7631579	11	11	50.0%	36	50.0%	36	1825	130.94	0.5	6.2	0.76	31	1.03	**11**	0.5	6.2	0.76	69	1.03	**11**	23
12/8/2003	74	1600	1850	159.375	116.2280702	11	11	50.0%	37	50.0%	37	1725	142.80	0.5	6.2	0.70	33	1.10	**12**	0.5	6.2	0.70	67	1.10	**12**	24
12/9/2003	81	1500	1650	150	133.0882353	10	11	52.4%	42	47.6%	39	1571.428571	146.95	0.5	6.2	0.68	30	1.27	**13**	0.5	6.2	0.68	70	1.05	**12**	24
12/10/2003	179	1400	1550	143.5897436	130.2521008	11	11	50.0%	90	50.0%	90	1475	141.92	0.5	6.2	0.70	26	2.15	**24**	0.5	6.2	0.70	74	2.15	**24**	47
12/11/2003	184	1400	1600	121.4285714	125.4901961	11	11	50.0%	92	50.0%	92	1500	128.46	0.5	6.2	0.78	24	2.00	**22**	0.5	6.2	0.78	76	2.00	**22**	44
12/12/2003	135	1450	1700	113.5714286	114.9305556	11	11	50.0%	68	50.0%	68	1575	119.25	0.5	6.2	0.84	23	1.42	**16**	0.5	6.2	0.84	77	1.42	**16**	31
12/13/2003	132	1350	1600	137.6373626	128.125	11	11	50.0%	66	50.0%	66	1475	137.88	0.5	6.2	0.73	26	1.53	**17**	0.5	6.2	0.73	74	1.53	**17**	34
12/14/2003	121	1350	1600	115.1098901	121.875	11	11	50.0%	61	50.0%	61	1475	123.49	0.5	6.2	0.81	22	1.22	**13**	0.5	6.2	0.81	78	1.22	**13**	27
12/15/2003	92	1300	1650	126.9230769	124.0808824	11	11	50.0%	46	50.0%	46	1475	130.50	0.5	6.2	0.77	24	1.00	**11**	0.5	6.2	0.77	76	1.00	**11**	22
12/16/2003	93	1500	1700	110	117.7083333	11	11	50.0%	47	50.0%	47	1600	118.85	0.5	6.2	0.84	23	0.99	**11**	0.5	6.2	0.84	77	0.99	**11**	22
12/17/2003	101	1300	1650	123.0769231	108.8235294	11	11	50.0%	51	50.0%	51	1475	120.95	0.5	6.2	0.83	22	1.00	**11**	0.5	6.2	0.83	78	1.00	**11**	22
12/18/2003	93	1350	1500	122.2527473	150	11	11	50.0%	47	50.0%	47	1425	141.13	0.5	6.2	0.71	25	1.06	**12**	0.5	6.2	0.71	75	1.06	**12**	23
12/19/2003	94	1500	1700	104.0178571	132.3529412	11	11	50.0%	47	50.0%	47	1600	123.19	0.5	6.2	0.81	25	1.05	**12**	0.5	6.2	0.81	75	1.05	**12**	23
12/20/2003	94	1400	1600	110.7142857	165.625	11	11	50.0%	47	50.0%	47	1500	143.17	0.5	6.2	0.70	27	1.17	**13**	0.5	6.2	0.70	73	1.17	**13**	26
12/21/2003	94	1400	1500	100	243.3333333	11	11	50.0%	47	50.0%	47	1450	176.67	0.5	6.2	0.57	34	1.47	**16**	0.5	6.2	0.57	66	1.47	**16**	32
12/22/2003	90	1400	1600	93.33333333	203.125	11	11	50.0%	45	50.0%	45	1500	153.23	0.5	6.2	0.65	30	1.22	**13**	0.5	6.2	0.65	70	1.22	**13**	27
12/23/2003	89	1450	1550	89.52380952	207.7083333	11	11	50.0%	45	50.0%	45	1500	153.62	0.5	6.2	0.65	30	1.21	**13**	0.5	6.2	0.65	70	1.21	**13**	27
12/24/2003	88	1550	1600	83.95833333	160.5882353	11	11	50.0%	44	50.0%	44	1575	127.27	0.5	6.2	0.79	25	1.00	**11**	0.5	6.2	0.79	75	1.00	**11**	22
12/25/2003	82	1600	1650	84.375	142.7777778	11	11	50.0%	41	50.0%	41	1625	118.58	0.5	6.2	0.84	24	0.89	**10**	0.5	6.2	0.84	76	0.89	**10**	20
12/26/2003	78	1700	1700	82.35294118	160.0694444	11	11	50.0%	39	50.0%	39	1700	126.21	0.5	6.2	0.79	27	0.97	**11**	0.5	6.2	0.79	73	0.97	**11**	21
12/27/2003	83	1800	1650	75	177.9411765	11	11	50.0%	42	50.0%	42	1725	131.47	0.5	6.2	0.76	29	1.11	**12**	0.5	6.2	0.76	71	1.11	**12**	24
12/28/2003	86	1850	1500	73.0994152	140	11	11	50.0%	43	50.0%	43	1675	111.55	0.5	6.2	0.90	23	0.90	**10**	0.5	6.2	0.90	77	0.90	**10**	20
12/29/2003	97	1650	1450	84.92647059	133.8095238	11	11	50.0%	49	50.0%	49	1550	114.37	0.5	6.2	0.87	22	0.95	**10**	0.5	6.2	0.87	78	0.95	**10**	21
12/30/2003	86	1900	1600	73.68421053	121.4285714	11	11	50.0%	43	50.0%	43	1750	102.56	0.5	6.2	0.98	22	0.86	**9**	0.5	6.2	0.98	78	0.86	**9**	19
12/31/2003	86	2050	1800	80.83333333	100	11	11	50.0%	43	50.0%	43	1925	95.42	0.5	6.2	1.05	23	0.88	**10**	0.5	6.2	1.05	77	0.88	**10**	19
Max	251	2250	2250	186.6666667	243.3333333	12	11	55.0%	125.5	54.5%	125.5	2175	176.6666667			1.30	35	2.22	24			1.40	87	2.22	24	49
Min	53	1050	1200	63.60294118	67.70833333	9	10	45.5%	26.5	45.0%	26.5	1150	77.19362745			0.57	13	0.50	6			0.57	65	0.50	6	11
AVG	88.05205	1635.479452	1680.273973	101.3400629	99.48711202	10.9205479	10.9780822	50.2%	44.1416	49.8%	43.910459	1658.054651	105.4747693			0.97	21	0.86	9			0.98	79	0.84	9	19

NOTES:
1) 2002 Plant Schematic from UWS, *Daily/Weekly Operating Report* (2002)
2) 2003 Data from UWS, *Daily/Weekly Operating Report* (2003)

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TABLE 4F-56 SHEET 5 OF 5
SSWWTP UNIT PROCESS NO. 5: RAS PUMPING CALCULATIONS
2020 TREATMENT REPORT
6/04/07 TR_4-A.T4F56.07.06.04.cdr

Design Peak Hourly Surface Overflow Rate (SOR) Estimation

Secondary Clarifier Total Area: 248000 sf

Peak Hourly Design Flow: 300 MGD

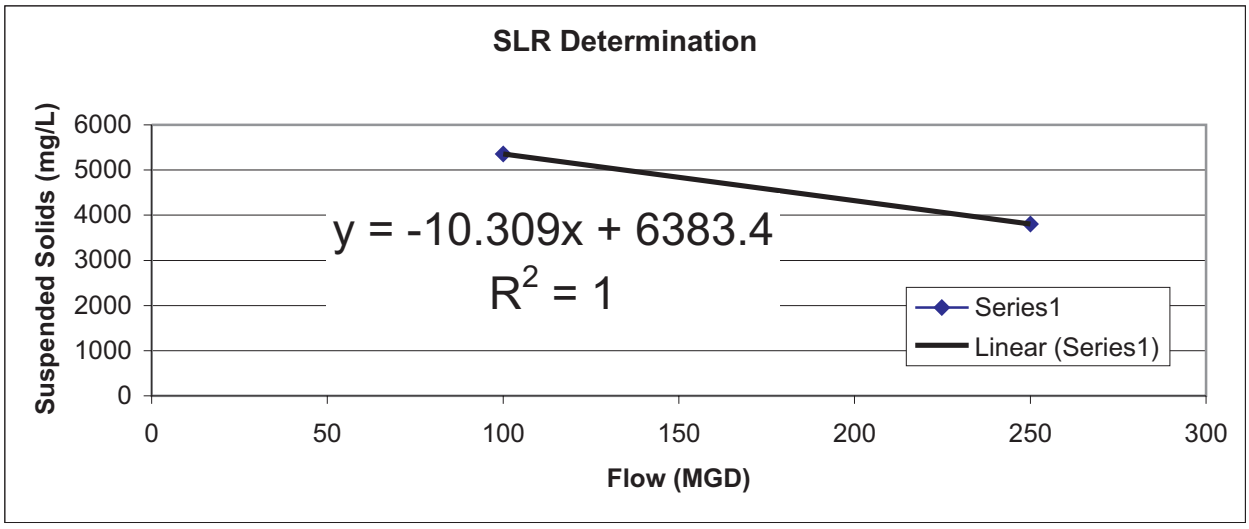
Calculated Peak Hourly SOR: 1250 gpd/sf

NOTE: Assumed 10 MGD Recycle flow as was done for the average and maximum day SORs when SSWWTP O&M Manual values were checked

Design Peak Hourly Solids Loading Rate (SLR) Estimation

	Flow	SLR (lb/d/sf)	Calculated Suspended Solids Concentration (mg/L)
Ave Day	100	18	5353
Max Day	250	32	3806
Peak Hour*	300	33.2	3291

* Peak Hour Suspended Solids Concentration was estimated based on straight-line trend line below



Source: South Shore O&M Manual, 1986

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TABLE 4F-57
SSWWTP UNIT PROCESS NO. 6: SECONDARY CLARIFICATION CALCULATIONS
2020 TREATMENT REPORT
6/04/07 TR_4-A.T4F57.07.06.04.cdr

DATE	NaOCL Used Gal	CL_2 Dose mg/l	$NaHSO_3$ Used Gal	SO_2 Dose mg/l
1-Jan	1099	2.2	425	1.9
2-Jan	837	1.7	476	2.1
3-Jan	773	1.5	370	1.6
4-Jan	811	1.6	353	1.5
5-Jan	837	1.6	376	1.6
6-Jan	727	1.8	318	1.7
7-Jan	769	1.3	329	1.3
8-Jan	794	1.4	335	1.3
9-Jan	684	1.3	400	1.7
10-Jan	651	1.3	270	1.2
11-Jan	752	1.5	259	1.1
12-Jan	718	1.4	229	1.0
13-Jan	676	1.3	247	1.1
14-Jan	676	1.4	229	1.0
15-Jan	659	1.4	218	1.0
16-Jan	465	0.9	246	1.1
17-Jan	913	1.9	326	1.5
18-Jan	693	1.4	270	1.2
19-Jan	431	0.9	265	1.2
20-Jan	769	1.6	270	1.2
21-Jan	887	1.8	241	1.1
22-Jan	980	2.5	365	2.0
23-Jan	355	0.8	153	0.7
24-Jan	1496	2.9	382	1.6
25-Jan	169	0.3	47	0.2
26-Jan	718	1.5	235	1.0
27-Jan	701	1.4	259	1.1
28-Jan	642	1.3	141	0.6
29-Jan	524	1.1	194	0.9
30-Jan	820	1.6	182	0.8
31-Jan	693	1.4	188	0.8
1-Feb	659	1.4	188	0.8
2-Feb	701	1.4	212	0.9
3-Feb	718	1.4	206	0.9
4-Feb	734	1.4	200	0.9
5-Feb	644	1.3	547	2.4
6-Feb	718	1.5	259	1.2
7-Feb	710	1.4	294	1.3
8-Feb	684	1.4	376	1.7
9-Feb	659	1.4	500	2.3
10-Feb	701	1.5	259	1.2
11-Feb	684	1.5	229	1.1
12-Feb	583	1.2	176	0.8
13-Feb	887	1.9	429	2.0
14-Feb	684	1.4	165	0.7
15-Feb	668	1.4	212	1.0
16-Feb	684	1.5	306	1.4
17-Feb	313	0.7	389	1.8
18-Feb	1622	3.4	334	1.5
19-Feb	1479	3.1	341	1.5
20-Feb	2062	4.4	253	1.2
21-Feb	2267	4.8	159	0.7
22-Feb	1842	3.9	159	0.7
23-Feb	1411	3.0	159	0.7
24-Feb	1301	3.5	176	1.0
25-Feb	1403	2.6	206	0.8
26-Feb	2459	4.7	182	0.7
27-Feb	2921	6.0	282	1.3
28-Feb	1738	3.6	206	0.9

DATE	NaOCL Used Gal	CL_2 Dose mg/l	$NaHSO_3$ Used Gal	SO_2 Dose mg/l
1-Mar	803	1.7	176	0.8
2-Mar	499	1.1	223	1.0
3-Mar	600	1.2	182	0.8
4-Mar	651	1.4	194	0.9
5-Mar	659	1.4	206	0.9
6-Mar	613	1.2	294	1.3
7-Mar	609	1.3	153	0.7
8-Mar	668	1.5	194	1.0
9-Mar	608	1.3	212	1.0
10-Mar	625	1.3	200	0.9
11-Mar	625	1.3	188	0.9
12-Mar	651	1.3	182	0.8
13-Mar	625	1.3	194	0.9
14-Mar	608	1.2	188	0.8
15-Mar	651	1.1	206	0.8
16-Mar	617	0.9	200	0.6
17-Mar	701	1.0	218	0.7
18-Mar	727	1.1	235	0.8
19-Mar	735	1.1	241	0.8
20-Mar	769	1.0	235	0.7
21-Mar	691	0.9	171	0.5
22-Mar	710	1.0	323	1.0
23-Mar	608	0.9	171	0.6
24-Mar	921	1.4	425	1.4
25-Mar	1022	1.6	365	1.2
26-Mar	913	1.6	306	1.1
27-Mar	870	1.6	277	1.1
28-Mar	985	1.7	376	1.4
29-Mar	1048	1.7	365	1.3
30-Mar	972	1.7	347	1.3
31-Mar	820	1.4	323	1.2
1-Apr	744	1.4	259	1.0
2-Apr	794	1.4	253	1.0
3-Apr	727	1.3	241	1.0
4-Apr	887	1.5	288	1.0
5-Apr	879	1.2	294	0.8
6-Apr	955	1.4	312	1.0
7-Apr	777	1.1	282	0.9
8-Apr	659	1.0	235	0.8
9-Apr	718	1.0	241	0.7
10-Apr	861	1.0	282	0.7
11-Apr	729	0.8	370	0.9
12-Apr	701	0.9	159	0.4
13-Apr	651	0.9	218	0.7
14-Apr	591	0.8	188	0.6
15-Apr	676	1.0	206	0.7
16-Apr	777	1.2	241	0.8
17-Apr	735	1.2	247	0.9
18-Apr	684	1.1	229	0.8
19-Apr	634	1.0	223	0.7
20-Apr	634	0.8	194	0.5
21-Apr	684	1.0	200	0.6
22-Apr	676	1.0	206	0.7
23-Apr	676	1.1	229	0.8
24-Apr	701	1.2	304	1.1
25-Apr	665	1.1	218	0.8
26-Apr	642	1.1	212	0.8
27-Apr	558	1.0	159	0.6
28-Apr	617	1.1	188	0.7
29-Apr	651	1.2	194	0.8
30-Apr	870	1.4	276	0.9

DATE	NaOCL Used Gal	CL_2 Dose mg/l	$NaHSO_3$ Used Gal	SO_2 Dose mg/l
1-May	1910	1.4	623	1.0
2-May	1022	1.0	429	0.9
3-May	684	0.9	276	0.8
4-May	684	0.9	218	0.6
5-May	1901	1.4	553	0.9
6-May	1268	1.1	459	0.8
7-May	1234	1.2	347	0.7
8-May	1539	1.2	570	1.0
9-May	2820	1.6	788	1.0
10-May	2408	1.4	906	1.2
11-May	2011	1.4	741	1.1
12-May	1969	1.3	782	1.1
13-May	1191	1.1	376	0.7
14-May	1138	1.1	329	0.7
15-May	989	1.0	170	0.4
16-May	897	1.0	319	0.8
17-May	828	1.0	235	0.6
18-May	701	0.9	206	0.6
19-May	625	0.8	206	0.6
20-May	744	0.9	206	0.5
21-May	744	0.9	194	0.5
22-May	656	0.8	147	0.4
23-May	627	0.9	171	0.5
24-May	668	1.0	159	0.5
25-May	718	1.1	141	0.5
26-May	651	1.0	118	0.4
27-May	625	1.0	147	0.5
28-May	701	1.1	141	0.5
29-May	693	1.0	171	0.5
30-May	684	1.0	165	0.5
31-May	929	1.1	194	0.5
1-Jun	659	0.9	135	0.4
2-Jun	668	1.0	176	0.6
3-Jun	1031	1.5	182	0.6
4-Jun	1208	1.9	206	0.7
5-Jun	1200	1.9	200	0.7
6-Jun	1191	1.9	194	0.7
7-Jun	1158	1.9	188	0.7
8-Jun	1944	2.4	306	0.8
9-Jun	1960	2.0	459	1.0
10-Jun	1561	2.0	282	0.8
11-Jun	1275	1.7	294	0.8
12-Jun	1246	1.7	235	0.7
13-Jun	1040	1.6	135	0.5
14-Jun	1006	1.6	129	0.4
15-Jun	887	1.5	147	0.5
16-Jun	938	1.6	194	0.7
17-Jun	938	1.6	153	0.6
18-Jun	879	1.5	147	0.5
19-Jun	861	1.5	277	1.1
20-Jun	702	1.2	169	0.7
21-Jun	617	1.1	106	0.4
22-Jun	676	1.3	141	0.6
23-Jun	684	1.2	129	0.5
24-Jun	693	1.1	123	0.4
25-Jun	693	1.1	76	0.3
26-Jun	887	1.4	141	0.5
27-Jun	1031	1.7	129	0.5
28-Jun	1141	1.7	176	0.6
29-Jun	887	1.5	118	0.4
30-Jun	887	1.6	129	0.5

DATE	NaOCL Used Gal	CL_2 Dose mg/l	$NaHSO_3$ Used Gal	SO_2 Dose mg/l
1-Jul	718	1.3	118	0.5
2-Jul	642	1.2	94	0.4
3-Jul	712	1.3	100	0.4
4-Jul	659	1.2	118	0.5
5-Jul	735	1.2	135	0.5
6-Jul	710	1.1	129	0.4
7-Jul	887	1.1	159	0.4
8-Jul	997	1.4	182	0.6
9-Jul	1056	1.6	153	0.5
10-Jul	1175	1.9	159	0.5
11-Jul	1284	2.2	176	0.6
12-Jul	1276	2.2	159	0.6
13-Jul	1191	2.2	229	0.9
14-Jul	1234	2.2	100	0.4
15-Jul	1411	2.1	171	0.5
16-Jul	1335	2.1	223	0.8
17-Jul	1293	2.3	182	0.7
18-Jul	1259	2.3	171	0.7
19-Jul	1141	2.3	159	0.7
20-Jul	811	1.6	100	0.4
21-Jul	1242	2.2	141	0.5
22-Jul	1250	2.3	118	0.5
23-Jul	1022	2.0	112	0.5
24-Jul	853	1.7	159	0.7
25-Jul	668	1.3	100	0.4
26-Jul	735	1.5	112	0.5
27-Jul	887	1.9	135	0.6
28-Jul	803	1.6	129	0.6
29-Jul	781	1.6	100	0.4
30-Jul	764	1.5	123	0.5
31-Jul	727	1.2	106	0.4
1-Aug	1031	1.5	182	0.6
2-Aug	997	1.6	147	0.5
3-Aug	1065	1.6	176	0.6
4-Aug	1175	1.7	176	0.6
5-Aug	930	1.4	135	0.5
6-Aug	1124	2.2	247	1.1
7-Aug	1259	1.6	212	0.6
8-Aug	1066	1.9	147	0.6
9-Aug	904	1.7	112	0.5
10-Aug	811	1.6	129	0.6
11-Aug	853	1.7	141	0.6
12-Aug	803	1.5	88	0.4
13-Aug	668	1.3	112	0.5
14-Aug	710	1.4	129	0.5
15-Aug	617	1.2	312	1.3
16-Aug	752	1.5	118	0.5
17-Aug	752	1.5	123	0.5
18-Aug	938	1.9	147	0.6
19-Aug	963	1.9	176	0.8
20-Aug	1032	2.0	129	0.6
21-Aug	1173	2.0	106	0.4
22-Aug	989	1.8	153	0.6
23-Aug	828	1.7	123	0.5
24-Aug	752	1.6	106	0.5
25-Aug	845	1.7	141	0.6
26-Aug	896	1.5	91	0.3
27-Aug	904	1.7	129	0.5
28-Aug	783	1.6	118	0.5
29-Aug	830	1.5	118	0.4
30-Aug	575	1.1	147	0.6
31-Aug	879	2.0	118	0.6

DATE	NaOCL Used Gal	CL_2 Dose mg/l	$NaHSO_3$ Used Gal	SO_2 Dose mg/l
1-Sep	710	1.6	118	0.6
2-Sep	718	1.5	123	0.5
3-Sep	684	1.4	94	0.4
4-Sep	735	1.6	112	0.5
5-Sep	870	1.8	141	0.6
6-Sep	803	1.8	106	0.5
7-Sep	786	2.0	106	0.6
8-Sep	929	1.9	118	0.5
9-Sep	904	1.9	112	0.5
10-Sep	997	2.1	112	0.5
11-Sep	1127	2.3	147	0.7
12-Sep	1318	2.7	159	0.7
13-Sep	1563	2.8	194	0.7
14-Sep	1546	2.5	194	0.7
15-Sep	1639	2.7	200	0.7
16-Sep	1166	2.5	153	0.7
17-Sep	1318	2.5	141	0.6
18-Sep	1298	2.6	182	0.8
19-Sep	1325	2.8	194	0.9
20-Sep	1006	2.2	147	0.7
21-Sep	1039	2.3	153	0.7
22-Sep	1310	2.2	171	0.6
23-Sep	1123	1.9	176	0.7
24-Sep	939	1.9	171	0.7
25-Sep	972	2.1	165	0.8
26-Sep	2003	4.1	159	0.7
27-Sep	2603	4.7	206	0.8
28-Sep	2535	5.2	206	0.9
29-Sep	2755	5.4	200	0.8
30-Sep	1369	2.9	171	0.8
1-Oct	865	1.8	147	0.7
2-Oct	748	1.6	165	0.8
3-Oct	633	1.2	165	0.7
4-Oct	701	1.3	182	0.7
5-Oct	710	1.5	171	0.8
6-Oct	1656	3.4	153	0.7
7-Oct	2298	4.7	112	0.5
8-Oct	2510	5.2	118	0.5
9-Oct	2045	4.2	159	0.7
10-Oct	980	2.0	135	0.6
11-Oct	659	1.4	135	0.6
12-Oct	760	1.5	153	0.7
13-Oct	651	1.4	100	0.5
14-Oct	788	1.2	153	0.5
15-Oct	744	1.1	165	0.5
16-Oct	744	1.3	135	0.5
17-Oct	659	1.4	118	0.5
18-Oct	625	1.3	100	0.5
19-Oct	710	1.5	135	0.6
20-Oct	566	1.1	88	0.4
21-Oct	744	1.6	129	0.6
22-Oct	676	1.5	147	0.7
23-Oct	782	1.5	171	0.7
24-Oct	667	1.4	159	0.7
25-Oct	938	1.1	241	0.6
26-Oct	727	1.1	135	0.5
27-Oct	701	1.4	141	0.6
28-Oct	634	1.3	220	1.0
29-Oct	693	1.3	182	0.7
30-Oct	608	1.3	153	0.7
31-Oct	735	1.6	147	0.7

DATE	NaOCL Used Gal	CL_2 Dose mg/l	$NaHSO_3$ Used Gal	SO_2 Dose mg/l
1-Nov	701	1.4	171	0.7
2-Nov	1411	1.5	288	0.7
3-Nov	1977	1.6	388	0.7
4-Nov	2273	1.6	441	0.7
5-Nov	1952	1.5	400	0.6
6-Nov	1059	1.3	276	0.7
7-Nov	764	1.0	200	0.6
8-Nov	718	1.2	165	0.6
9-Nov	642	1.1	171	0.7
10-Nov	671	1.2	159	0.6
11-Nov	691	1.1	159	0.6
12-Nov	676	1.2	141	0.6
13-Nov	693	1.3	147	0.6
14-Nov	739	1.4	171	0.7
15-Nov	668	1.2	176	0.7
16-Nov	600	1.0	135	0.5
17-Nov	608	1.0	141	0.5
18-Nov	1690	1.7	288	0.6
19-Nov	980	1.1	212	0.5
20-Nov	583	0.8	123	0.4
21-Nov	669	1.1	100	0.4
22-Nov	701	1.2	165	0.6
23-Nov	896	1.1	200	0.5
24-Nov	786	1.1	223	0.7
25-Nov	515	0.8	265	0.9
26-Nov	848	1.4	182	0.6
27-Nov	693	1.1	171	0.6
28-Nov	727	1.4	135	0.6
29-Nov	642	1.2	153	0.6
30-Nov	693	1.3	129	0.5
1-Dec	634	1.2	135	0.5
2-Dec	676	1.3	153	0.6
3-Dec	651	1.2	141	0.6
4-Dec	668	1.3	129	0.5
5-Dec	676	1.2	88	0.4
6-Dec	735	1.4	153	0.6
7-Dec	634	1.3	123	0.5
8-Dec	718	1.4	153	0.6
9-Dec	701	1.2	147	0.6
10-Dec	2062	1.7	329	0.6
11-Dec	2121	1.7	341	0.6
12-Dec	989	1.1	417	1.0
13-Dec	963	1.1	253	0.6
14-Dec	938	1.1	247	0.6
15-Dec	677	1.1	159	0.5
16-Dec	689	1.1	147	0.5
17-Dec	723	1.0	182	0.6
18-Dec	659	1.0	147	0.5
19-Dec	684	1.0	141	0.5
20-Dec	651	1.0	94	0.3
21-Dec	684	1.0	135	0.4
22-Dec	592	0.9	135	0.5
23-Dec	718	1.2	176	0.6
24-Dec	676	1.1	182	0.6
25-Dec	676	1.2	141	0.5
26-Dec	634	1.2	147	0.6
27-Dec	659	1.1	159	0.6
28-Dec	684	1.1	147	0.5
29-Dec	659	1.0	153	0.5
30-Dec	723	1.2	141	0.5
31-Dec				
Total	339055	574.1	76037	272.2
Average	931	1.6	209	0.7
Max	2921	6.0	906	2.4

NOTE:
Data from UWS, Daily/ Weekly Operating Report (2003).

	FT153100 TOTAL FROM BLOWERS 1-4 KCFM
Maximum	64
Minimum	39
AVERAGE	50

NOTES:

1) Raw Blower flow data provided by UWS.

2) Data provided:

start time	8/15/04 9:00 AM
end time	6/7/05 10:00 AM
interval	120 min

3) UWS only keeps for a 12 month period but felt that this data was representative.

4) Hourly data was too extensive to provide all data.

DATE	PL Flow FA180501 gpm
1-Jan	-0
2-Jan	-0
3-Jan	6.24
4-Jan	5.43
5-Jan	-0
6-Jan	-0
7-Jan	5.81
8-Jan	13.8
9-Jan	0.94
10-Jan	-0
11-Jan	-0
12-Jan	-0
13-Jan	-0
14-Jan	6.7
15-Jan	3.14
16-Jan	-0
17-Jan	-0
18-Jan	-0
19-Jan	-0
20-Jan	-0
21-Jan	-0
22-Jan	-0
23-Jan	-0
24-Jan	3.49
25-Jan	7.06
26-Jan	7.34
27-Jan	7.01
28-Jan	7
29-Jan	3.33
30-Jan	-0
31-Jan	-0
1-Feb	-0
2-Feb	-0
3-Feb	-0.05
4-Feb	-0.19
5-Feb	-0.19
6-Feb	-0.19
7-Feb	-0.19
8-Feb	-0.19
9-Feb	-0.19
10-Feb	-0.19
11-Feb	-0.19
12-Feb	-0.19
13-Feb	-0.19
14-Feb	-0.19
15-Feb	-0.19
16-Feb	-0.19
17-Feb	-0.19
18-Feb	-0.19
19-Feb	-0.19
20-Feb	-0.19
21-Feb	-0.19
22-Feb	
23-Feb	
24-Feb	-0.21
25-Feb	-0.2
26-Feb	-0.2
27-Feb	-0.2
28-Feb	-0.2

DATE	PL Flow FA180501 gpm
1-Mar	-0.2
2-Mar	-0.2
3-Mar	-0.2
4-Mar	-0.2
5-Mar	-0.2
6-Mar	-0.2
7-Mar	-0.2
8-Mar	-0.2
9-Mar	-0.2
10-Mar	-0.2
11-Mar	-0.2
12-Mar	-0.2
13-Mar	-0.2
14-Mar	-0.2
15-Mar	-0.2
16-Mar	-0.2
17-Mar	2.72
18-Mar	6
19-Mar	5.99
20-Mar	6.1
21-Mar	6.97
22-Mar	5.98
23-Mar	5.99
24-Mar	5.89
25-Mar	5.37
26-Mar	5.97
27-Mar	5.97
28-Mar	5.53
29-Mar	-0
30-Mar	-0
31-Mar	-0
1-Apr	-0
2-Apr	-0
3-Apr	-0
4-Apr	-0
5-Apr	-0
6-Apr	-0
7-Apr	3.13
8-Apr	6.91
9-Apr	6.88
10-Apr	5.83
11-Apr	5.92
12-Apr	6.07
13-Apr	6
14-Apr	6.09
15-Apr	6.26
16-Apr	6.2
17-Apr	2.11
18-Apr	2.97
19-Apr	5.99
20-Apr	6
21-Apr	5.95
22-Apr	6.06
23-Apr	6.26
24-Apr	5.99
25-Apr	5.82
26-Apr	-0
27-Apr	-0
28-Apr	-0
29-Apr	-0
30-Apr	-0.01

DATE	PL Flow FA180501 gpm
1-May	-0
2-May	-0
3-May	-0
4-May	-0
5-May	-0
6-May	4.12
7-May	6.06
8-May	6.07
9-May	8.68
10-May	9.71
11-May	9.49
12-May	3.83
13-May	-0
14-May	0.21
15-May	-0
16-May	4.01
17-May	6
18-May	2.01
19-May	-0
20-May	-0
21-May	-0
22-May	4.12
23-May	6.28
24-May	6.62
25-May	1.29
26-May	-0
27-May	-0
28-May	2
29-May	6.21
30-May	6.99
31-May	6.88
1-Jun	4.26
2-Jun	-0
3-Jun	-0
4-Jun	6.33
5-Jun	8.98
6-Jun	11.62
7-Jun	12.29
8-Jun	5.18
9-Jun	-0
10-Jun	5.26
11-Jun	6.33
12-Jun	8.08
13-Jun	7.96
14-Jun	4.12
15-Jun	-0
16-Jun	-0
17-Jun	1.87
18-Jun	6
19-Jun	9.56
20-Jun	2.22
21-Jun	-0
22-Jun	-0
23-Jun	-0
24-Jun	2.79
25-Jun	8.99
26-Jun	9.53
27-Jun	2.27
28-Jun	-0
29-Jun	-0
30-Jun	4.62

DATE	PL Flow FA180501 gpm
1-Jul	10.04
2-Jul	11.79
3-Jul	7.25
4-Jul	-0
5-Jul	-0
6-Jul	-0
7-Jul	-0
8-Jul	0.05
9-Jul	0.01
10-Jul	-0
11-Jul	-0
12-Jul	-0
13-Jul	-0
14-Jul	-0
15-Jul	0.1
16-Jul	-0
17-Jul	-0
18-Jul	-0
19-Jul	-0
20-Jul	-0
21-Jul	-0
22-Jul	3.52
23-Jul	2.61
24-Jul	-0
25-Jul	-0
26-Jul	-0
27-Jul	2.27
28-Jul	6.97
29-Jul	2.54
30-Jul	-0
31-Jul	-0
1-Aug	-0
2-Aug	-0
3-Aug	-0
4-Aug	0.06
5-Aug	7
6-Aug	4.05
7-Aug	2.75
8-Aug	11.37
9-Aug	9.91
10-Aug	2.86
11-Aug	-0
12-Aug	-0
13-Aug	-0
14-Aug	-0
15-Aug	7.7
16-Aug	10.01
17-Aug	-0
18-Aug	-0
19-Aug	-0
20-Aug	-0
21-Aug	-0
22-Aug	0
23-Aug	0.01
24-Aug	0.01
25-Aug	0
26-Aug	0
27-Aug	4.15
28-Aug	8.23
29-Aug	0.73
30-Aug	-0
31-Aug	-0

DATE	PL Flow FA180501 gpm
1-Sep	-0
2-Sep	-0
3-Sep	-0
4-Sep	-0
5-Sep	-0
6-Sep	-0
7-Sep	-0
8-Sep	-0
9-Sep	-0
10-Sep	-0
11-Sep	-0
12-Sep	7.67
13-Sep	10.73
14-Sep	4.89
15-Sep	-0
16-Sep	-0
17-Sep	-0
18-Sep	-0
19-Sep	-0
20-Sep	8.34
21-Sep	8.55
22-Sep	-0
23-Sep	-0
24-Sep	-0
25-Sep	-0
26-Sep	-0
27-Sep	-0
28-Sep	-0
29-Sep	2.14
30-Sep	8.02
1-Oct	-0
2-Oct	-0
3-Oct	-0
4-Oct	-0
5-Oct	-0
6-Oct	1.75
7-Oct	-0
8-Oct	-0
9-Oct	-0
10-Oct	-0
11-Oct	-0
12-Oct	-0
13-Oct	-0
14-Oct	-0
15-Oct	8.05
16-Oct	12.39
17-Oct	12.42
18-Oct	11.98
19-Oct	-0
20-Oct	-0
21-Oct	2.15
22-Oct	10.06
23-Oct	6.16
24-Oct	-0
25-Oct	-0
26-Oct	-0
27-Oct	2.36
28-Oct	11.96
29-Oct	5.36
30-Oct	-0
31-Oct	-0

DATE	PL Flow FA180501 gpm
1-Nov	-0
2-Nov	-0
3-Nov	-0
4-Nov	-0
5-Nov	-0
6-Nov	-0
7-Nov	-0
8-Nov	-0
9-Nov	-0
10-Nov	-0
11-Nov	-0
12-Nov	6.41
13-Nov	11.5
14-Nov	3.6
15-Nov	-0
16-Nov	-0
17-Nov	-0
18-Nov	-0
19-Nov	-0
20-Nov	8.28
21-Nov	4.51
22-Nov	-0
23-Nov	-0
24-Nov	-0
25-Nov	-0
26-Nov	7.05
27-Nov	13.91
28-Nov	13.97
29-Nov	13.97
30-Nov	13.97
1-Dec	4.49
2-Dec	-0
3-Dec	-0
4-Dec	-0
5-Dec	2.43
6-Dec	7.98
7-Dec	1.61
8-Dec	-0
9-Dec	-0
10-Dec	-0
11-Dec	-0
12-Dec	-0
13-Dec	-0
14-Dec	-0
15-Dec	-0
16-Dec	-0
17-Dec	-0
18-Dec	9.28
19-Dec	4.81
20-Dec	-0
21-Dec	-0
22-Dec	-0
23-Dec	3.57
24-Dec	16.06
25-Dec	15.09
26-Dec	7.27
27-Dec	-0
28-Dec	-0
29-Dec	4.81
30-Dec	11.2
31-Dec	9.98
Total	920
Average	3
Max	16

NOTE:
Data from UWS, Daily/ Weekly Operating Report (2003).

Raw Data[2]

DATE	14 WAS Flow KGD	14 Calc WAS Flow gpm	WAS E TS % > 0.6	WAS W TS % > 0.6	17 WAS to JI Flow gpm	Calc WAS to DAF flow gpm	Calc WAS to DAF %	Calc WAS to DAF lb/d	DAF TWAS SOILDS % 3.5 ~ 5.5	Calc DAF TWAS Flow (90% Red Assumed) gpm	15 PSD Flow KGD	15 Calc PSD Flow gpm	19 PSD from JI Flow KGD	19 Calc PSD from JI Flow gpm	Digester Feed TPD	DSD TPD	Solids Destruction %	16 DSD Flow KGD	16 Calc DSD Flow gpm	18 DSD to JI Flow KGD	18 Calc DSD to JI Flow gpm	Calculated DSD to JI %	DSD to JI TPD	Calculated DSD to Centrifuge & Agrilife Program Flow gpm	Flow gpd	Total Solids TPD
1/1/2003	1571.000	1090.972	0.58	0.46	1084	6.972	0.6%	52.2			396.00	275.000	169.388	117.630	82.2533962	25.44	69.07%	244.000	169.444	244	169.444	100.0%	25.437	0.0	0	0.00
1/2/2003	1542.000	1070.833	0.51	0.42	1066	4.833	0.5%	32.4			374.00	259.722	166.790	115.827	63.36988639	21.55	65.99%	304.000	211.111	304	211.111	100.0%	21.5506	0.0	0	0.00
1/3/2003	1125.000	781.250	0.51	0.42	778	3.250	0.4%	21.8			403.00	279.861	177.587	123.325	88.12677055	41.8	52.57%	716.000	497.222	357	247.917	49.9%	20.8417	249.3	359000	20.96
1/4/2003	670.000	465.278	0.61	0.41	462	3.278	0.7%	24.1			373.00	259.028	237.736	165.094	89.43099955	39.91	55.37%	563.000	390.972	416	288.889	73.9%	29.4902	102.1	147000	10.42
1/5/2003	1085.000	753.472	0.56	0.52	445	308.472	40.9%	2398.7			365.00	253.472	240.840	167.250	92.62124552	31.69	65.78%	400.000	277.778	400	277.778	100.0%	31.692	0.0	0	0.00
1/6/2003	1151.000	799.306	0.42	0.48	435	364.306	45.6%	2360.7	3.50	5.05	356.00	247.222	216.907	150.630	89.9790771	35.26	60.82%	445.000	309.028	445	309.028	100.0%	35.2574	0.0	0	0.00
1/7/2003	1582.000	1098.611	0.49	0.53	861	237.611	21.6%	1745.0	3.20	4.09	402.00	279.167	204.367	141.921	90.6184015	22.47	75.21%	449.000	311.806	449	311.806	100.0%	22.468	0.0	0	0.00
1/8/2003	1609.000	1117.361	0.5	0.55	1113	4.361	0.4%	33.0			373.00	259.028	203.425	141.267	68.92369916	34.72	49.63%	362.000	251.389	362	251.389	100.0%	34.7194	0.0	0	0.00
1/9/2003	1537.000	1067.361	0.535	0.6	1060	7.361	0.7%	60.2			360.00	250.000	204.730	142.174		21.89		375.000	260.417	374	259.722	99.7%	21.8341	0.7	1000	0.06
1/10/2003	1587.000	1102.083	0.48	0.58	1095	7.083	0.6%	54.1			365.00	253.472	173.136	120.233	81.05533309	59.87	26.13%	387.000	268.750	387	268.750	100.0%	59.8716	0.0	0	0.00
1/11/2003	1636.000	1136.111	0.43	0.48	974	162.111	14.3%	1062.2			348.00	241.667	134.425	93.351	76.9299483	25.68	66.62%	344.000	238.889	344	238.889	100.0%	25.6772	0.0	0	0.00
1/12/2003	1458.000	1012.500	0.45	0.5	893	119.500	11.8%	817.4	3.63	1.69	421.00	292.361	175.419	121.819	89.30002154	55.88	37.43%	335.000	232.639	335	232.639	100.0%	55.878	0.0	0	0.00
1/13/2003	1234.000	856.944	0.45	0.49	852	4.944	0.6%	33.5			423.00	293.750	167.345	116.212	105.4106496	30.26	71.29%	216.000	150.000	215	149.306	99.5%	30.1241	0.7	1000	0.14
1/14/2003	920.000	638.889	0.49	0.47	629	9.889	1.5%	68.4			378.00	262.500	180.212	125.147	74.08705159	16.47	77.77%	182.000	126.389	182	126.389	100.0%	16.469	0.0	0	0.00
1/15/2003	640.000	444.444	0.5	0.52	434	10.444	2.4%	76.7			283.00	196.528	190.811	132.507	74.76275431	15.61	79.12%	288.000	200.000	254	176.389	88.2%	13.7693	23.6	34000	1.84
1/16/2003	598.000	415.278	0.53	0.51	406	9.278	2.2%	69.5			386.00	268.056	171.320	118.972	72.43720952	11.91	83.56%	204.000	141.667	204	141.667	100.0%	11.9095	0.0	0	0.00
1/17/2003	629.000	436.806	0.53	0.46	426	10.806	2.5%	77.0			354.00	245.833	153.762	106.779	88.03342145	16.88	80.83%	176.000	122.222	178	123.611		17.072			
1/18/2003	649.000	450.694	0.62	0.5	440	10.694	2.4%	86.2			313.00	217.361	158.942	110.376	77.95862182	23.42	69.96%	208.000	144.444	171	118.750	82.2%	19.2529	25.7	37000	4.17
1/19/2003	659.000	457.639	0.61	0.52	447	10.639	2.3%	86.6			329.00	228.472	134.838	93.638	75.16299048	7.084	90.58%	137.000	95.139	137	95.139	100.0%	7.084	0.0	0	0.00
1/20/2003	734.000	509.722	0.59	0.54	500	9.722	1.9%	79.1			333.00	231.250	151.467	105.185	71.39229555	8.752	87.74%	151.000	104.861	151	104.861	100.0%	8.75241	0.0	0	0.00
1/21/2003	794.000	551.389	0.56	0.62	542	9.389	1.7%	79.8			289.00	200.694	203.914	141.607	83.10369502	13.15	84.17%	166.000	115.278	163	113.194	98.2%	12.9145	2.1	3000	0.24
1/22/2003	838.000	581.944	0.55	0.61	574	7.944	1.4%	66.4			283.00	196.528	240.507	167.019	79.09162124	13.12	83.41%	171.000	118.750	163	113.194	95.3%	12.5067	5.6	8000	0.61
1/23/2003	1093.000	759.028	0.44	0.49	579	180.028	23.7%	1205.5			284.00	197.222	252.722	175.501	83.3855322	12.88	84.55%	132.000	91.667	131	90.972	99.2%	12.7827	0.7	1000	0.10
1/24/2003	837.000	581.250	0.49	0.58	568	13.250	2.3%	102.1			285.00	197.917	224.223	155.710	76.03505478	14.37	81.10%	161.000	111.806	161	111.806	100.0%	14.3673	0.0	0	0.00
1/25/2003	736.000	511.111	0.55	0.62	501	10.111	2.0%	85.2			196.00	136.111	221.907	154.102	66.81150007	10.96	83.60%	174.000	120.833	174	120.833	100.0%	10.9563	0.0	0	0.00
1/26/2003	822.000	570.833	0.64	0.68	562	8.833	1.5%	84.0			207.00	143.750	194.673	135.190	61.8511646	10.11	83.66%	166.000	115.278	166	115.278	100.0%	10.1064	0.0	0	0.00
1/27/2003	812.000	563.889	0.64	0.68	558	5.889	1.0%	56.0			264.00	183.333	160.187	111.241	61.12522531	13.85	77.34%	192.000	133.333	191	132.639	99.5%	13.7789	0.7	1000	0.07
1/28/2003	820.000	569.444	0.71	0.81	561	8.444	1.5%	92.4			311.00	215.972	196.018	136.124	91.14665255	16.47	81.94%	265.000	184.028	219	152.083	82.6%	13.6071	31.9	46000	2.86
1/29/2003	841.000	584.028	0.76	0.88	575	9.028	1.5%	106.6			360.00	250.000	221.573	153.870	70.75594825	23.32	67.04%	233.000	161.806	233	161.806	100.0%	23.3186	0.0	0	0.00
1/30/2003	825.000	572.917	0.76	0.82	563	9.917	1.7%	112.8			468.00	325.000	255.906	177.713	107.1445727	14.55	86.42%	171.000	118.750	171	118.750	100.0%	14.5466	0.0	0	0.00
1/31/2003	950.000	659.722	0.7	0.8	650	9.722	1.5%	105.0			455.00	315.972	225.923	156.891	55.7621128	16.9	69.69%	121.000	84.028	121	84.028	100.0%	16.9031	0.0	0	0.00
2/1/2003	934.000	648.611	0.63	0.72	639	9.611	1.5%	93.4			295.00	204.861	205.568	142.756	70.250266	12.51	82.19%	100.000	69.444	100	69.444	100.0%	12.51	0.0	0	0.00
2/2/2003	797.000	553.472	0.6	0.74	544	9.472	1.7%	91.4			222.00	154.167	215.612	149.731	65.86034934	11.38	82.71%	91.000	63.194	91	63.194	100.0%	11.3841	0.0	0	0.00
2/3/2003	797.000	553.472	0.57	0.74	540	13.472	2.4%	127.1			113.00	78.472	234.585	162.906	52.69146189	12.51	76.26%	100.000	69.444	100	69.444	100.0%	12.51	0.0	0	0.00
2/4/2003	888.000	616.667	0.62	0.7	603	13.667	2.2%	129.9			131.00	90.972	246.832	171.411	64.49661732	12.76	80.22%	102.000	70.833	102	70.833	100.0%	12.7602	0.0	0	0.00
2/5/2003	825.000	572.917	0.65	0.76	561	11.917	2.1%	121.0			202.00	140.278	281.975	195.816	83.40642586	16.28	80.48%	162.000	112.500	161	111.806	99.4%	16.18	0.7	1000	0.10
2/6/2003	1080.000	750.000	0.63	0.77	605	145.000	19.3%	1461.6			156.00	108.333	261.991	181.938	73.45345297	14.34	80.47%	172.000	119.444	172	119.444	100.0%	14.3448	0.0	0	0.00
2/7/2003	1200.000	833.333	0.5	0.91	559	274.333	32.9%	2785.0	2.08	10.03	149.00	103.472	240.451	166.980	76.48708876	12.82	83.23%	161.000	111.806	161	111.806	100.0%	12.8232	0.0	0	0.00
2/8/2003	1138.000	790.278	0.41	0.87	523	267.278	33.8%	2463.2	4.15	4.45	215.00	149.306	220.483	153.113	83.34305147	13.24	84.11%	145.000	100.694	145	100.694	100.0%	13.2418	0.0	0	0.00
2/9/2003	1016.000	705.556	0.39	0.81	587	118.556	16.8%	1024.3	3.93	1.95	172.00	119.444	177.405	123.198	48.37911578	10.76	77.76%	129.000	89.583	129	89.583	100.0%	10.7586	0.0	0	0.00
2/10/2003	853.000	592.361	0.43	0.86	578	14.361	2.4%	133.4	3.90	0.26	170.00	118.056	175.589	121.937	64.08839653	19.64	69.35%	157.000	109.028	157	109.028	100.0%	19.6407	0.0	0	0.00
2/11/2003	834.000	579.167	0.45	0.85	563	16.167	2.8%	151.3			167.00	115.972	223.226	155.018	78.19137848	16.2	79.28%	150.000	104.167	150	104.167	100.0%	16.2005	0.0	0	0.00
2/12/2003	934.000	648.611	0.46	0.77	634	14.611	2.3%	129.4			182.00	126.389	225.503	156.599	77.86294655	12.8	83.57%	134.000	93.056	135	93.750		12.8916			
2/13/2003	894.000	620.833	0.58	0.8	609	11.833	1.9%	117.6			207.00	143.750	237.869	165.187	88.84654193	12.22	86.24%	128.000	88.889	127	88.194	99.2%	12.1276	0.7	1000	0.10
2/14/2003	1054.000	731.944	0.67	0.87	612	119.944	16.4%	1329.9			244.00	169.444	220.484	153.114	88.09387826	14.13	83.96%	148.000	102.778	148	102.778	100.0%	14.133	0.0	0	0.00
2/15/2003	1422.000	987.500	0.62	0.86	683	304.500	30.8%	3244.8	4.14	5.87	336.00	233.333	294.316	204.386	136.9897967	11.31	91.75%	145.000	100.694	145	100.694	100.0%	11.307	0.0	0	0.00
2/16/2003	1548.000	1075.000	0.53	0.89	670	405.000	37.7%	4140.7	3.64	8.52	295.00	204.861	293.337	203.707	121.9566672	12.09	90.08%	116.000	80.556	116	80.556	100.0%	12.093	0.0	0	0.00
2/17/2003	1468.000	1019.444	0.54	0.82	691	328.444	32.2%	3216.1	4.92	4.90	352.00	244.444	204.329	141.895	100.273754	9.041	90.98%	99.000	68.750	99	68.750	100.0%	9.04098	0.0	0	0.00
2/18/2003	1311.000	910.417	0.53	0.75	710	200.417	22.0%	1847.0	3.93	3.52	358.00	248.611	195.491	135.758	94.552456	49.04	48.14%	392.000	272.222	101	70.139	25.8%	12.6351	202.1	291000	36.40
2/19/2003	1226.000	851.389	0.53	0.73	715	136.389	16.0%	1237.3	3.82	2.43	379.00	263.194	190.266	132.129	92.57522033	66.68	27.97%	533.000	370.139	113	78.472	21.2%	14.1363	291.7	420000	52.54
2/20/2003	1271.000	882.639	0.51	0.61	734	148.639	16.8%	1198.6	3.11	2.89	395.00	274.306	203.900	141.597	103.9008741	72.18	30.53%	577.000	400.694	127	88.194	22.0%	15.8877	312.5	450000	56.30
2/21/2003	1313.000	911.806	0.47	0.55	836	75.806	8.3%	556.7	3.67	1.14	331.00	229.861	219.758	152.610	95.44592516	72.62	23.91%	631.000	438.194	156	108.333	24.7%	17.9544	329.9	475000	54.67
2/22/2003	1406.000	976.389	0.53	0.55	961	15.389	1.6%	119.7	3.58	0.25	405.00	281.250	252.343	175.238	115.9214665	106.5	8.11%	683.000	474.306	165	114.583	24.2%	25.7331	359.7	518000	80.79
2/23/2003	1345.000	934.028	0.55	0.5	919	15.028	1.6%	113.6			402.00	279.167	250.160	173.722	114.4075839	61.33	46.39%	502.000	348.611	154	106.944	30.7%	18.8159	241.7	348000	42.52
2/24/2003	1130.000	784.722	0.52	0.5	753	31.722	4.0%	233.0			226.00	156.944	175.878	122.138	52.15684941	18.13	65.24%	176.000	122.222	176	122.222	100.0%	18.1278	0.0	0	0.00
2/25/2003	1336.000	927.778	0.51	0.5	912	15.778	1.7%	114.7			325.00	225.694	186.368	129.422	62.43891156	32.46	48.02%	181.000	125.694	180	125.000	99.4%	32.2758	0.7	1000	0.18
2/26/2003	1291.000	896.528	0.51	0.52	886	10.528	1.2%	78.1			315.00	218.750	225.806	156.810	73.78510765	17.47	76.33%	154.000	106.944	154	106.944	100.0%	17.4673	0.0	0	0.00
2/27/2003	1330.000	923.611	0.6	0.52	877	46.611	5.0%	375.9			212.00	147.222	229.214	159.176	73.10863872	57.24	21.71%	602.000	418.056	238	165.278	39.5%	22.6281	252.8	364000	34.61
2/28/2003	1380.000	958.333	0.6	0.45	948	10.333	1.1%	78.1			158.00	109.722	187.807	130.421	55.4230829	17.86	67.77%	354.000	245.833	236	163.889	66.7%	11.9079	81.9	118000	5.95

Preserving The Environment • Improving Water Quality

TABLE 4F-61 SHEET 1 OF 7
AGRI-LIFE PROCESS CALCULATIONS
2020 TREATMENT REPORT
6/04/07 TR_4-A.T4F61.07.06.04.cdr

Raw Data[2]

DATE	14 WAS Flow KGD	14 Calc WAS Flow gpm	WAS E TS % > 0.6	WAS W TS % > 0.6	17 WAS to JI Flow gpm	Calc WAS to DAF flow gpm	Calc WAS to DAF %	Calc WAS to DAF lb/d	DAF TWAS SOILDS % 3.5 ~ 5.5	Calc DAF TWAS Flow (90% Red Assumed) gpm	15 PSD Flow KGD	15 Calc PSD Flow gpm	19 PSD from JI Flow KGD	19 Calc PSD from JI Flow gpm	Digester Feed TPD	DSD TPD	Solids Destruction %	16 DSD Flow KGD	16 Calc DSD Flow gpm	18 DSD to JI Flow KGD	18 Calc DSD to JI Flow gpm	Calculated DSD to JI %	Calculated DSD to Centrifuge & Agrilife Program DSD to JI TPD	Flow gpm	Flow gpd	Total Solids TPD
3/1/2003	1333.000	925.694	0.58	0.54	914	11.694	1.3%	94.3			211.00	146.528	209.111	145.216	63.02722993	21.27	66.26%	170.000	118.056	170	118.056	100.0%	21.267	0.0	0	0.00
3/2/2003	1383.000	960.417	0.69	0.43	949	11.417	1.2%	92.1			263.00	182.639	219.972	152.758	74.43572672	22.64	69.58%	181.000	125.694	181	125.694	100.0%	22.6431	0.0	0	0.00
3/3/2003	1300.000	902.778	0.67	0.37	890	12.778	1.4%	95.7			264.00	183.333	172.476	119.775	73.65420261	27.27	62.97%	218.000	151.389	218	151.389	100.0%	27.2718	0.0	0	0.00
3/4/2003	1265.000	878.472	0.61	0.37	864	14.472	1.6%	102.1			275.00	190.972	186.792	129.717	75.11382304	28.04	62.67%	269.000	186.806	270	187.500		28.1475			
3/5/2003	1341.000	931.250	0.68	0.37	918	13.250	1.4%	100.2			258.00	179.167	259.533	180.231	87.1080806	18.18	79.13%	218.000	151.389	206	143.056	94.5%	17.1804	8.3	12000	1.00
3/6/2003	1380.000	958.333	0.69	0.4	946	12.333	1.3%	96.8			277.00	192.361	279.665	194.212	108.6192081	27.55	74.63%	169.000	117.361	169	117.361	100.0%	27.5549	0.0	0	0.00
3/7/2003	1331.000	924.306	0.66	0.45	704	220.306	23.8%	1760.7			308.00	213.889	282.915	196.469	113.1459991	22.41	80.19%	215.000	149.306	215	149.306	100.0%	22.4138	0.0	0	0.00
3/8/2003	1287.000	893.750	0.63	0.52	598	295.750	33.1%	2448.8	2.41	7.61	394.00	273.611	303.395	210.691	127.9191475			146.000	101.389	146	101.389	100.0%		0.0	0	
3/9/2003	1256.000	872.222	0.64	0.54	578	294.222	33.7%	2499.7	3.57	5.25	241.00	167.361	254.149	176.492	79.0436675	24.76	68.67%	147.000	102.083	147	102.083	100.0%	24.7648	0.0	0	0.00
3/10/2003	1195.000	829.861	0.68	0.52	427	402.861	48.5%	3480.7	3.35	7.79	189.00	131.250	270.842	188.085	67.97738194	16.08	76.35%	324.000	225.000	199	138.194	61.4%	9.87498	86.8	125000	6.20
3/11/2003	1328.000	922.222	0.64	0.56	289	633.222	68.7%	5471.0	3.53	11.61	154.00	106.944	285.726	198.421	84.99669185	74.02	12.92%	710.000	493.056	215	149.306	30.3%	22.4138	343.8	495000	51.60
3/12/2003	1332.000	925.000	0.63	0.6	276	649.000	70.2%	5747.5	3.55	12.13	261.00	181.250	308.782	214.432	110.9746052	71.92	35.19%	616.000	427.778	173	120.139	28.1%	20.1995	307.6	443000	51.72
3/13/2003	1304.000	905.556	0.65	0.59	282	623.556	68.9%	5567.1	3.58	11.65	367.00	254.861	281.397	195.415	122.3167257	46.45	62.02%	511.000	354.861	140	97.222	27.4%	12.7268	257.6	371000	33.73
3/14/2003	1403.000	974.306	0.62	0.6	268	706.306	72.5%	6204.2	3.64	12.77	323.00	224.306	398.260	276.570	126.7396897	51.52	59.35%	731.000	507.639	197	136.806	26.9%	13.8832	370.8	534000	37.63
3/15/2003	1610.000	1118.056	0.64	0.59	277	841.056	75.2%	7448.4	3.45	16.18	281.00	195.139	491.902	341.599	139.1681018	50.74	63.54%	624.000	433.333	192	133.333	30.8%	15.6125	300.0	432000	35.13
3/16/2003	1990.000	1381.944	0.63	0.59	263	1118.944	81.0%	9828.8	3.18	23.16	330.00	229.167	416.607	289.311	154.102638	66.76	56.68%	731.000	507.639	202	140.278	27.6%	18.4472	367.4	529000	48.31
3/17/2003	2023.000	1404.861	0.61	0.54	266	1138.861	81.1%	9429.8	3.68	19.20	328.00	227.778	313.394	217.635	130.8969762	86.52	33.90%	728.000	505.556	203	140.972	27.9%	24.1255	364.6	525000	62.39
3/18/2003	2049.000	1422.917	0.61	0.62	275	1147.917	80.7%	10166.0	3.88	19.63	327.00	227.083	281.011	195.147	128.1934533	75.88	40.81%	725.000	503.472	211	146.528	29.1%	22.0847	356.9	514000	53.80
3/19/2003	1931.000	1340.972	0.64	0.66	262	1078.972	80.5%	10099.2	3.85	19.66	310.00	215.278	328.348	228.019	120.9595555	66.37	45.13%	647.000	449.306	169	117.361	26.1%	17.3364	331.9	478000	49.03
3/20/2003	2018.000	1401.389	0.67	0.67	256	1145.389	81.7%	11050.7	3.90	21.23	311.00	215.972	503.615	349.733	151.1996114	71.53	52.69%	703.000	488.194	192	133.333	27.3%	19.5356	354.9	511000	51.99
3/21/2003	2055.000	1427.083	0.69	0.72	265	1162.083	81.4%	11797.5	4.17	21.20	272.00	188.889	371.108	257.714	146.9286809	56.31	61.68%	696.000	483.333	162	112.500	23.3%	13.1055	370.8	534000	43.20
3/22/2003	1912.000	1327.778	0.67	0.66	242	1085.778	81.8%	10397.4	4.10	19.00	279.00	193.750	340.996	236.803	141.0114678	75.21	46.67%	691.000	479.861	169	117.361	24.5%	18.3935	362.5	522000	56.81
3/23/2003	1623.000	1127.083	0.69	0.66	167	960.083	85.2%	9332.0	4.19	16.69	365.00	253.472	225.766	156.782	128.3646836	77.06	39.97%	600.000	416.667	62	43.056	10.3%	7.96303	373.6	538000	69.10
3/24/2003	1473.000	1022.917	0.68	0.72	323	699.917	68.4%	7055.2	4.22	12.53	365.00	253.472	222.366	154.421	121.5733983	69.18	43.09%	706.000	490.278	163	113.194	23.1%	15.9732	377.1	543000	53.21
3/25/2003	1334.000	926.389	0.81	0.8	304	622.389	67.2%	7214.7	4.38	12.34	355.00	246.528	253.845	176.281	112.9358188	82.11	27.29%	732.000	508.333	186	129.167	25.4%	20.8642	379.2	546000	61.25
3/26/2003	1101.000	764.583	0.91	0.8	285	479.583	62.7%	5904.6	4.56	9.70	388.00	269.444	235.456	163.511	118.8604211	27.23	77.09%	371.000	257.639	174	120.833	46.9%	12.7702	136.8	197000	14.46
3/27/2003	1046.000	726.389	0.85	0.78	431	295.389	40.7%	3466.7	3.69	7.04	268.00	186.111	287.374	199.565	93.2360542	21.04	77.44%	177.000	122.917	177	122.917	100.0%	21.0356	0.0	0	0.00
3/28/2003	1170.000	812.500	0.86	0.84	634	178.500	22.0%	2184.8	3.70	4.43	427.00	296.528	311.793	216.523	114.0550865	73.56	35.51%	490.000	340.278	117	81.250	23.9%	17.564	259.0	373000	55.99
3/29/2003	1166.000	809.722	0.75	0.81	704	105.722	13.1%	1187.5			253.00	175.694	337.452	234.341	88.38848264	74.7	15.49%	676.000	469.444	172	119.444	25.4%	19.0069	350.0	504000	55.69
3/30/2003	1218.000	845.833	0.72	0.79	721	124.833	14.8%	1357.2			216.00	150.000	289.188	200.825	72.70471325	98.84	-35.94%	689.000	478.472	183	127.083	26.6%	26.251	351.4	506000	72.58
3/31/2003	885.000	614.583	0.72	0.76	717						288.00	200.000	285.515	198.274	74.81724544	36.89	50.69%	582.000	404.167	108	75.000	18.6%	6.84547	329.2	474000	30.04
4/1/2003	1118.000	776.389	0.75	0.77	759	17.389	2.2%	190.3			345.00	239.583	289.530	201.063	102.8894854	93.48	9.15%	773.000	536.806	286	198.611	37.0%	34.586	338.2	487000	58.89
4/2/2003	1156.000	802.778	0.67	0.65	807						361.00	250.694	258.134	179.259	97.16914892	69.18	28.81%	466.000	323.611	276	191.667	59.2%	40.9728	131.9	190000	28.21
4/3/2003	1477.000	1025.694	0.59	0.58	1012	13.694	1.3%	115.4			341.00	236.806	264.302	183.543	93.70783264	31.19	66.71%	176.000	122.222	176	122.222	100.0%	31.1916	0.0	0	0.00
4/4/2003	1566.000	1087.500	0.54	0.61	1080	7.500	0.7%	62.1			223.00	154.861	276.024	191.683	80.77822474	48.38	40.11%	739.000	513.194	362	251.389	49.0%	23.6998	261.8	377000	24.68
4/5/2003	1212.000	841.667	0.52	0.62	1057						465.00	322.917	298.570	207.340	110.1475623	63.78	42.09%	761.000	528.472	326	226.389	42.8%	27.3243	302.1	435000	36.46
4/6/2003	1295.000	899.306	0.55	0.66	890	9.306	1.0%	81.1			327.00	227.083	326.512	226.745	97.18445679	22.92	76.42%	279.000	193.750	279	193.750	100.0%	22.9196	0.0	0	0.00
4/7/2003	1045.000	725.694	0.57	0.68	751						231.00	160.417	274.276	190.470	70.46234759	26.26	62.73%	255.000	177.083	255	177.083	100.0%	26.2647	0.0	0	0.00
4/8/2003	1111.000	771.528	0.58	0.67	762	9.528	1.2%	85.7			255.00	177.083	266.824	185.294	76.60006647	18.74	75.54%	328.000	227.778	328	227.778	100.0%	18.7383	0.0	0	0.00
4/9/2003	1191.000	827.083	0.58	0.68	819	8.083	1.0%	73.3			253.00	175.694	264.633	183.773	79.87473309	28.16	64.75%	331.000	229.861	331	229.861	100.0%	28.1575	0.0	0	0.00
4/10/2003	1233.000	856.250	0.64	0.73	722	134.250	15.7%	1324.2			282.00	195.833	286.186	198.740	92.88246779	51.9	44.12%	331.000	229.861	325	225.694	98.2%	50.9574	4.2	6000	0.94
4/11/2003	1168.000	811.111	0.65	0.73	390	421.111	51.9%	4184.2	4.32	7.26	286.00	198.611	262.766	182.477	101.9016417	48.19	52.71%	374.000	259.722	218	151.389	58.3%	28.09	108.3	156000	20.10
4/12/2003	1370.000	951.389	0.72	0.65	610	341.389	35.9%	3367.5	4.17	6.05	313.00	217.361	256.666	178.240	98.18739527	58.5	40.42%	681.000	472.917	302	209.722	44.3%	25.9424	263.2	379000	32.56
4/13/2003	1362.000	945.833	0.71	0.64	641	304.833	32.2%	2963.0	5.13	4.33	393.00	272.917	225.060	156.292	101.1423069	63	37.71%	706.000	490.278	207	143.750	29.3%	18.4723	346.5	499000	44.53
4/14/2003	1480.000	1027.778	0.73	0.69	667	360.778	35.1%	3688.6	4.45	6.21	179.00	124.306	73.546	51.074	45.00448384	74.04	-64.51%	476.000	330.556	8	5.556	1.7%	1.24433	325.0	468000	72.79
4/15/2003	1255.000	871.528	0.71	0.73	604	267.528	30.7%	2773.7	4.08	5.09	198.00	137.500	155.434	107.940	64.74180773	77.69	-20.00%	663.000	460.417	204	141.667	30.8%	23.9041	318.8	459000	53.78
4/16/2003	1229.000	853.472	0.68	0.73	587	266.472	31.2%	2705.2	4.05	5.01	240.00	166.667	444.751	308.855	123.3653597	56.29	54.37%	931.000	646.528	520	361.111	55.9%	31.4418	285.4	411000	24.85
4/17/2003	963.000	668.750	0.68	0.71	610	58.750	8.8%	588.0	4.00	1.10	235.00	163.194	320.823	222.794	84.82177574	55.32	34.78%	733.000	509.028	583	404.861	79.5%	44.0031	104.2	150000	11.32
4/18/2003	1213.000	842.361	0.7	0.68	480	362.361	43.0%	3600.4	4.00	6.75	295.00	204.861	268.508	186.464	100.1634681	38.41	61.65%	714.000	495.833	714	495.833	100.0%	38.4082	0.0	0	0.00
4/19/2003	1221.000	847.917	0.72	0.65	362	485.917	57.3%	4793.1	4.50	7.98	348.00	241.667	322.435	223.913	116.4262604	61.31	47.34%	605.000	420.139	605	420.139	100.0%	61.3053	0.0	0	0.00
4/20/2003	1221.000	847.917	0.68	0.63	370	477.917	56.4%	4507.7	4.11	8.22	333.00	231.250	335.434	232.940	122.2389644	49.95	59.14%	442.000	306.944	443	307.639		50.0621			
4/21/2003	1320.000	916.667	0.77	0.68	340	576.667	62.9%	6020.4	4.08	11.06	358.00	248.611	310.742	215.793	122.5201217	54.07	55.87%	421.000	292.361	421	292.361	100.0%	54.0716	0.0	0	0.00
4/22/2003	1268.000	880.556	0.72	0.6	261	619.556	70.4%	5888.3	4.17	10.58	344.00	238.889	256.459	178.097	98.99895858	97.13	1.88%	795.000	552.083	440	305.556	55.3%	53.7596	246.5	355000	43.37
4/23/2003	1237.000	859.028	0.72	0.64	275	584.028	68.0%	5718.8	4.35	9.85	211.00	146.528	324.600	225.416	96.41848111	98.88	-2.55%	912.000	633.333	462	320.833	50.7%	50.09	312.5	450000	48.79
4/24/2003	1275.000	885.417	0.74	0.64	274	611.417	69.1%	6075.0	4.76	9.56	184.00	127.778	353.474	245.468	105.9104344	86.87	17.98%	978.000	679.167	526	365.278	53.8%	46.7198	313.9	452000	40.15
4/25/2003	1235.000	857.639	0.69	0.69	270	587.639	68.5%	5838.8	4.50	9.72	181.00	125.694	303.479	210.749	104.8180649	94.58	9.77%	1080.000	750.000	559	388.194	51.8%	48.9516	361.8	521000	45.62
4/26/2003	1180.000	819.444	0.73	0.68	265	554.444	67.7%	5628.7	4.58	9.21	266.00	184.722	271.340	188.431	104.692202	53.75	48.66%	821.000	570.139	651	452.083	79.3%	42.6203	118.1	170000	11.13
4/27/2003	1198.000	831.944	0.7	0.65	271	560.944	67.4%	5452.4	4.90	8.34	267.00	185.417	218.991	152.077	102.3631911	56.23	45.07%	661.000	459.028	640	444.444	96.8%	54.4435	14.6	21000	1.79
4/28/2003	1218.000	845.833	0.67	0.63	276	569.833	67.4%	5333.6	4.10	9.75	301.00	209.028	224.066	155.601	106.5270888	58.8	44.81%	470.000	326.389	470	326.389	100.0%	58.797	0.0	0	0.00
4/29/2003	1198.000	831.944	0.62	0.57	288	543.944	65.4%	4660.5	4.20	8.32	327.00	227.083	261.555	181.635	116.0971838	88.36	23.89%	815.000	565.972	459	318.750	56.3%	49.7648	247.2	356000	38.60
4/30/2003	1125.000	781.250	0.64	0.57	274	507.250	64.9%	4419.2	4.41	7.51	301.00	209.028	380.172	264.008	119.6097709	74.3	37.88%	768.000	533.333	446	309.722	58.1%	43.1478	223.6	322000	31.15

Raw Data[2]

DATE	14 WAS Flow KGD	14 Calc WAS Flow gpm	WAS E TS % > 0.6	WAS W TS % > 0.6	17 WAS to JI Flow gpm	Calc WAS to DAF flow gpm	Calc WAS to DAF %	Calc WAS to DAF lb/d	DAF TWAS SOILDS % 3.5 ~ 5.5	Calc DAF TWAS Flow (90% Red Assumed) gpm	15 PSD Flow KGD	15 Calc PSD Flow gpm	19 PSD from JI Flow KGD	19 Calc PSD from JI Flow gpm	Digester Feed TPD	DSD TPD	Solids Destruction %	16 DSD Flow KGD	16 Calc DSD Flow gpm	18 DSD to JI Flow KGD	18 Calc DSD to JI Flow gpm	Calculated DSD to JI %	Calculated DSD to Centrifuge & Agrilife Program DSD to JI TPD	Flow gpm	Flow gpd	Total Solids TPD
5/1/2003	1207.000	838.194	0.54	0.49	354	484.194	57.8%	3590.8	3.69	7.29	285.00	197.917	507.940	352.736	117.6435983	82.04	30.26%	787.000	546.528	464	322.222	59.0%	48.372	224.3	323000	33.67
5/2/2003	1279.000	888.194	0.61	0.58	414	474.194	53.4%	4062.9	4.27	7.13	306.00	212.500	347.501	241.320	122.7251139	96.65	21.25%	946.000	656.944	452	313.889	47.8%	46.1786	343.1	494000	50.47
5/3/2003	1319.000	915.972	0.58	0.59	452	463.972	50.7%	3908.5	4.41	6.64	349.00	242.361	305.346	212.046	138.845759	67.19	51.61%	760.000	527.778	579	402.083	76.2%	51.1859	125.7	181000	16.00
5/4/2003	1360.000	944.444	0.59	0.57	426	518.444	54.9%	4330.0	3.85	8.43	389.00	270.139	384.790	267.215	163.6031725	52.52	67.90%	550.000	381.944	550	381.944	100.0%	52.5212	0.0	0	0.00
5/5/2003	1230.000	854.167	0.52	0.53	447	407.167	47.7%	3078.2	4.50	5.13	377.00	261.806	319.759	222.055	124.0700202	110.6	10.87%	884.000	613.889	514	356.944	58.1%	64.3014	256.9	370000	46.29
5/6/2003	1147.000	796.528	0.56	0.62	684	112.528	14.1%	956.0	3.40	2.11	311.00	215.972	295.288	205.061	100.2919542	75.06	25.16%	720.000	500.000	470	326.389	65.3%	48.9975	173.6	250000	26.06
5/7/2003	1042.000	723.611	0.7	0.61	719	4.611	0.6%	43.5	4.10	0.08	251.00	174.306	244.327	169.672	76.34642331	47.19	38.19%	492.000	341.667	492	341.667	100.0%	47.1877	0.0	0	0.00
5/8/2003	1072.000	744.444	0.73	0.68	738	6.444	0.9%	65.4			162.00	112.500	350.405	243.337	97.34415609	49.56	49.09%	519.000	360.417	518	359.722	99.8%	49.4654	0.7	1000	0.10
5/9/2003	1210.000	840.278	0.63	0.6	835	5.278	0.6%	46.7			280.00	194.444	407.191	282.771	110.6097379	78.41	29.11%	807.000	560.417	521	361.806	64.6%	50.6209	198.6	286000	27.79
5/10/2003	1315.000	913.194	0.62	0.64	910	3.194	0.3%	29.0			377.00	261.806	341.407	237.088	104.0659705	65.4	37.16%	583.000	404.861	443	307.639	76.0%	49.6926	97.2	140000	15.70
5/11/2003	1242.000	862.500	0.73	0.77	680	182.500	21.2%	1971.0			311.00	215.972	368.044	255.586	115.7582675	49.17	57.53%	457.000	317.361	457	317.361	100.0%	49.1668	0.0	0	0.00
5/12/2003	1244.000	863.889	0.82	0.85	665	198.889	23.0%	2391.4	4.28	4.19	211.00	146.528	304.987	211.796	77.14179788	97.22	-26.03%	793.000	550.694	427	296.528	53.8%	52.3493	254.2	366000	44.87
5/13/2003	1076.000	747.222	0.8	0.93	568	179.222	24.0%	2232.4	4.40	3.80	142.00	98.611	460.705	319.934	140.1162082	62.45	55.43%	720.000	500.000	512	355.556	71.1%	44.4088	144.4	208000	18.04
5/14/2003	1073.000	745.139	0.78	0.79	546	199.139	26.7%	2251.1	3.96	4.26	245.00	170.139	388.474	269.773	140.0150809	49.54	64.62%	540.000	375.000	540	375.000	100.0%	49.5396	0.0	0	0.00
5/15/2003	918.000	637.500	0.8	0.78	570	67.500	10.6%	767.9	3.68	1.56	342.00	237.500	347.138	241.068	130.8847055	113.6	13.20%	854.000	593.056	481	334.028	56.3%	63.9841	259.0	373000	49.62
5/16/2003	935.000	649.306	0.79	0.81	643	6.306	1.0%	72.6	3.48	0.16	302.00	209.722	387.779	269.291	142.4268469	108.8	23.62%	847.000	588.194	355	246.528	41.9%	45.5948	341.7	492000	63.19
5/17/2003	923.000	640.972	0.78	0.82	635	5.972	0.9%	68.8	3.66	0.14	281.00	195.139	286.493	198.953	105.9717868	99.12	6.47%	803.000	557.639	301	209.028	37.5%	37.153	348.6	502000	61.96
5/18/2003	864.000	600.000	0.81	0.79	594	6.000	1.0%	69.1			284.00	197.222	257.585	178.878	91.58712545	86.31	5.76%	877.000	609.028	372	258.333	42.4%	36.6093	350.7	505000	49.70
5/19/2003	956.000	663.889	0.78	0.75	658	5.889	0.9%	64.9			321.00	222.917	294.926	204.809	87.53993971	77	12.04%	847.000	588.194	358	248.611	42.3%	32.5443	339.6	489000	44.45
5/20/2003	899.000	624.306	0.75	0.75	619	5.306	0.8%	57.3			324.00	225.000	355.272	246.717	112.5835681	82.07	27.10%	907.000	629.861	404	280.556	44.5%	36.5576	349.3	503000	45.52
5/21/2003	870.000	604.167	0.72	0.76	598	6.167	1.0%	65.7			340.00	236.111	275.844	191.558	114.037856	85.52	25.00%	851.000	590.972	393	272.917	46.2%	39.4953	318.1	458000	46.03
5/22/2003	875.000	607.639	0.79	0.81	601	6.639	1.1%	76.5			317.00	220.139	266.486	185.060	83.36732223	40.72	51.16%	377.000	261.806	377	261.806	100.0%	40.7171	0.0	0	0.00
5/23/2003	854.000	593.056	0.76	0.79	587	6.056	1.0%	67.6			301.00	209.028	255.736	177.595	94.83677339	96	-1.23%	629.000	436.806	329	228.472	52.3%	50.2126	208.3	300000	45.79
5/24/2003	851.000	590.972	0.84	0.78	584	6.972	1.2%	81.3			226.00	156.944	250.365	173.865	86.9445883	53.08	38.95%	442.000	306.944	287	199.306	64.9%	34.4676	107.6	155000	18.61
5/25/2003	941.000	653.472	0.79	0.74	647	6.472	1.0%	71.3			299.00	207.639	248.388	172.492	88.18369953	74.36	15.68%	617.000	428.472	288	200.000	46.7%	34.7077	228.5	329000	39.65
5/26/2003	840.000	583.333	0.71	0.7	577	6.333	1.1%	64.3			354.00	245.833	218.586	151.796	84.49401521	40.71	51.82%	522.000	362.500	404	280.556	77.4%	31.5035	81.9	118000	9.20
5/27/2003	744.000	516.667	0.7	0.68	510	6.667	1.3%	66.2			395.00	274.306	219.857	152.679	93.91550527	46.27	50.74%	402.000	279.167	402	279.167	100.0%	46.267	0.0	0	0.00
5/28/2003	694.000	481.944	0.69	0.7	474	7.944	1.6%	79.5			366.00	254.167	261.058	181.290	103.6984769	80.32	22.54%	738.000	512.500	381	264.583	51.6%	41.4669	247.9	357000	38.85
5/29/2003	726.000	504.167	0.73	0.74	496	8.167	1.6%	86.4			205.00	142.361	288.767	200.532	91.22071537	99.36	-8.93%	920.000	638.889	430	298.611	46.7%	46.4413	340.3	490000	52.92
5/30/2003	799.000	554.861	0.75	0.74	548	6.861	1.2%	73.6			250.00	173.611	299.454	207.954	103.3571522	70.58	31.71%	910.000	631.944	435	302.083	47.8%	33.7395	329.9	475000	36.84
5/31/2003	1265.000	878.472	0.65	0.63	577	301.472	34.3%	2778.4			242.00	168.056	399.698	277.568	101.9723986	43.45	57.39%	624.000	433.333	501	347.917	80.3%	34.8891	85.4	123000	8.57
6/1/2003	1310.000	909.722	0.77	0.79	552	357.722	39.3%	4017.9	5.17	5.82	258.00	179.167	311.716	216.470	100.0788773	38.96	61.07%	408.000	283.333	408	283.333	100.0%	38.9611	0.0	0	0.00
6/2/2003	998.000	693.056	0.75	0.76	509	184.056	26.6%	2001.1	4.23	3.55	318.00	220.833	278.216	193.206	111.1196534	99.68	10.29%	683.000	474.306	294	204.167	43.0%	42.9093	270.1	389000	56.77
6/3/2003	918.000	637.500	0.74	0.73	563	74.500	11.7%	788.5	3.82	1.55	400.00	277.778	242.600	168.472	106.1826819	91.64	13.69%	805.000	559.028	282	195.833	35.0%	32.1032	363.2	523000	59.54
6/4/2003	935.000	649.306	0.69	0.68	645	4.306	0.7%	42.5	3.20	0.10	416.00	288.889	228.536	158.705	105.9122453	70.12	33.79%	845.000	586.806	347	240.972	41.1%	28.7951	345.8	498000	41.33
6/5/2003	1047.000	727.083	0.72	0.75	648	79.083	10.9%	837.0			247.00	171.528	195.711	135.911	74.43499622	20.42	72.56%	316.000	219.444	196	136.111	62.0%	12.6685	83.3	120000	7.76
6/6/2003	1270.000	881.944	0.61	0.77	705	176.944	20.1%	1758.1			188.00	130.556	228.897	158.956	77.34050434	91.07	-17.76%	800.000	555.556	471	327.083	58.9%	53.6191	228.5	329000	37.45
6/7/2003	1308.000	908.333	0.61	0.79	905	3.333	0.4%	33.6	3.27	0.08	239.00	165.972	272.431	189.188	84.91832231	72.36	14.79%	872.000	605.556	419	290.972	48.1%	34.7699	314.6	453000	37.59
6/8/2003	1432.000	994.444	0.54	0.69	991	3.444	0.3%	30.5			322.00	223.611	406.689	282.423	97.06044566	45.05	53.59%	671.000	465.972	533	370.139	79.4%	35.784	95.8	138000	9.26
6/9/2003	1425.000	989.583	0.51	0.62	991						257.00	178.472	321.448	223.228	93.43885432	49.76	46.74%	540.000	375.000	493	342.361	91.3%	45.4334	32.6	47000	4.33
6/10/2003	1181.000	820.139	0.58	0.68	817	3.139	0.4%	28.5			379.00	263.194	273.856	190.178	107.5911719	46.94	56.37%	379.000	263.194	359	249.306	94.7%	44.4618	13.9	20000	2.48
6/11/2003	1166.000	809.722	0.59	0.72	807	2.722	0.3%	25.7			403.00	279.861	251.773	174.842	110.6046333	73.19	33.82%	591.000	410.417	242	168.056	40.9%	29.9715	242.4	349000	43.22
6/12/2003	1236.000	858.333	0.62	0.74	856	2.333	0.3%	22.8			290.00	201.389	229.469	159.354	89.83610649	81.55	9.22%	877.000	609.028	315	218.750	35.9%	29.2922	390.3	562000	52.26
6/13/2003	1342.000	931.944	0.64	0.76	930	1.944	0.2%	19.6			325.00	225.694	283.217	196.678	99.95798873	64.73	35.24%	817.000	567.361	392	272.222	48.0%	31.0582	295.1	425000	33.67
6/14/2003	1276.000	886.111	0.71	0.79	884	2.111	0.2%	22.8			289.00	200.694	276.903	192.294	91.34103605	63.45	30.53%	951.000	660.417	470	326.389	49.4%	31.3584	334.0	481000	32.09
6/15/2003	1237.000	859.028	0.65	0.73	857	2.028	0.2%	20.1			240.00	166.667	239.552	166.355	73.14787349	50.64	30.77%	646.000	448.611	488	338.889	75.5%	38.2572	109.7	158000	12.39
6/16/2003	1122.000	779.167	0.62	0.7	777	2.167	0.3%	20.6			267.00	185.417	217.961	151.362	79.41401769	47.01	40.81%	501.000	347.917	416	288.889	83.0%	39.0312	59.0	85000	7.98
6/17/2003	1083.000	752.083	0.56	0.62	750	2.083	0.3%	17.7			279.00	193.750	223.158	154.971	85.72601769	50.84	40.69%	445.000	309.028	381	264.583	85.6%	43.5323	44.4	64000	7.31
6/18/2003	1006.000	698.611	0.6	0.66	697	1.611	0.2%	14.6			311.00	215.972	311.998	216.665	124.1488746	39.98	67.80%	340.000	236.111	340	236.111	100.0%	39.982	0.0	0	0.00
6/19/2003	1041.000	722.917	0.59	0.66	720	2.917	0.4%	26.2			325.00	225.694	298.112	207.022	126.1088144	39.59	68.60%	332.000	230.556	332	230.556	100.0%	39.595	0.0	0	0.00
6/20/2003	1053.000	731.250	0.57	0.71	729	2.250	0.3%	20.7			314.00	218.056	300.353	208.579	121.7858266	86.22	29.20%	713.000	495.139	321	222.917	45.0%	38.8185	272.2	392000	47.40
6/21/2003	848.000	588.889	0.55	0.65	583	5.889	1.0%	50.9			340.00	236.111	338.979	235.402	119.9633679	74.6	37.81%	856.000	594.444	384	266.667	44.9%	33.4668	327.8	472000	41.14
6/22/2003	806.000	559.722	0.54	0.64	553	6.722	1.2%	57.1			336.00	233.333	342.297	237.706	107.2738328	79.2	26.17%	969.000	672.917	537	372.917	55.4%	43.8901	300.0	432000	35.31
6/23/2003	800.000	555.556	0.52	0.63	549	6.556	1.2%	54.3			396.00	275.000	330.419	229.457	123.0772514	55.81	54.65%	792.000	550.000	574	398.611	72.5%	40.4515	151.4	218000	15.36
6/24/2003	943.000	654.861	0.56	0.62	651	3.861	0.6%	32.8			431.00	299.306	360.670	250.465	130.670993	50.16	61.62%	620.000	430.556	568	394.444	91.6%	45.9501	36.1	52000	4.21
6/25/2003	790.000	548.611	0.61	0.64	611						284.00	197.222	315.206	218.893	98.84287483	82.27	16.77%	802.000	556.944	532	369.444	66.3%	54.5736	187.5	270000	27.70
6/26/2003	615.000	427.083	0.67	0.71	302	125.083	29.3%	1242.8			232.00	161.111	277.585	192.767	86.8225042	12.67	85.41%	124.000	86.111	73	50.694	58.9%	7.45805	35.4	51000	5.21
6/27/2003	992.000	688.889	0.71	0.74	688	0.889	0.1%	9.3			231.00	160.417	103.166	71.643	49.89951319			638.000	443.056	279	193.750	43.7%		249.3	359000	
6/28/2003	1063.000	738.194	0.66	0.68	736	2.194	0.3%	21.2			366.00	254.167	434.300	301.598	127.8383494	80.01	37.41%	984.000	683.333	549	381.250	55.8%	44.6419	302.1	435000	35.37
6/29/2003	1087.000	754.861	0.59	0.59	753	1.861	0.2%	15.8			332.00	230.556	341.908	237.436	108.9533708	84.89	22.09%	974.000	676.389	535	371.528	54.9%	46.6269	304.9	439000	38.26
6/30/2003	1123.000	779.861	0.6	0.54	778	1.861	0.2%	15.3			287.00	199.306	337.046	234.060	123.7218962	59.92	51.57%	781.000	542.361	583	404.861	74.6%	44.7324	137.5	198000	15.19

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Raw Data[2]

DATE	14 WAS Flow KGD	14 Calc WAS Flow gpm	WAS E TS % > 0.6	WAS W TS % > 0.6	17 WAS to JI Flow gpm	Calc WAS to DAF flow gpm	Calc WAS to DAF %	Calc WAS to DAF lb/d	DAF TWAS SOILDS % 3.5 ~ 5.5	Calc DAF TWAS Flow (90% Red Assumed) gpm	15 PSD Flow KGD	15 Calc PSD Flow gpm	19 PSD from JI Flow KGD	19 Calc PSD from JI Flow gpm	Digester Feed TPD	DSD TPD	Solids Destruction %	16 DSD Flow KGD	16 Calc DSD Flow gpm	18 DSD to JI Flow KGD	18 Calc DSD to JI Flow gpm	Calculated DSD to JI %	Calculated DSD to Centrifuge & Agrilife Program DSD to JI TPD	Flow gpm	Flow gpd	Total Solids TPD
7/1/2003	1224.000	850.000	0.65	0.57	848	2.000	0.2%	17.6			299.00	207.639	316.326	219.678	115.5431961	47.74	58.68%	564.000	391.667	559	388.194	99.1%	47.3199	3.5	5000	0.42
7/2/2003	1049.000	728.472	0.65	0.67	727	1.472	0.2%	14.0			318.00	220.833	346.079	240.333	123.5071733	41.2	66.64%	520.000	361.111	520	361.111	100.0%	41.1996	0.0	0	0.00
7/3/2003	1017.000	706.250	0.65	0.66	705	1.250	0.2%	11.8			340.00	236.111	351.726	244.254	121.7797647	48.54	60.14%	487.000	338.194	487	338.194	100.0%	48.5359	0.0	0	0.00
7/4/2003	949.000	659.028	0.64	0.67	658	1.028	0.2%	9.7			327.00	227.083	388.653	269.898	111.7535053	55.73	50.13%	495.000	343.750	495	343.750	100.0%	55.7321	0.0	0	0.00
7/5/2003	981.000	681.250	0.61	0.65	680	1.250	0.2%	11.3			396.00	275.000	368.276	255.747	103.3501491	80.69	21.93%	774.000	537.500	460	319.444	59.4%	47.955	218.1	314000	32.73
7/6/2003	1019.000	707.639	0.57	0.6	706	1.639	0.2%	13.8			327.00	227.083	352.670	244.910	91.12271435	61.61	32.39%	803.000	557.639	497	345.139	61.9%	38.1338	212.5	306000	23.48
7/7/2003	796.000	552.778	0.53	0.51	551	1.778	0.3%	13.3			282.00	195.833	314.916	218.692	82.26541056	87.19	-5.99%	1020.000	708.333	593	411.806	58.1%	50.6926	296.5	427000	36.50
7/8/2003	571.000	396.528	0.61	0.52	392	4.528	1.1%	36.8			309.00	214.583	358.641	249.057	107.2564288	55.59	48.17%	828.000	575.000	611	424.306	73.8%	41.0207	150.7	217000	14.57
7/9/2003	614.000	426.389	0.64	0.62	416	10.389	2.4%	94.2			301.00	209.028	417.867	290.186	127.3147466	53.17	58.24%	616.000	427.778	616	427.778	100.0%	53.1725	0.0	0	0.00
7/10/2003	1108.000	769.444	0.71	0.67	769	0.444	0.1%	4.4			252.00	175.000	391.003	271.530	117.8035809	53.1	54.92%	561.000	389.583	561	389.583	100.0%	53.1037	0.0	0	0.00
7/11/2003	1199.000	832.639	0.7	0.66	833						283.00	196.528	314.598	218.471	111.7748422	45.08	59.67%	378.000	262.500	353	245.139	93.4%	42.0995	17.4	25000	2.98
7/12/2003	1072.000	744.444	0.66	0.65	744	0.444	0.1%	4.2			228.00	158.333	310.574	215.676	96.58460239	34.83	63.93%	454.000	315.278	454	315.278	100.0%	34.8345	0.0	0	0.00
7/13/2003	1042.000	723.611	0.67	0.62	723	0.611	0.1%	5.7			247.00	171.528	281.585	195.545	92.24453509	48.87	47.02%	503.000	349.306	503	349.306	100.0%	48.872	0.0	0	0.00
7/14/2003	911.000	632.639	0.69	0.64	612	20.639	3.3%	197.6			380.00	263.889	240.044	166.698	113.8452431	92.28	18.94%	782.000	543.056	430	298.611	55.0%	50.7447	244.4	352000	41.54
7/15/2003	859.000	596.528	0.7	0.7	595	1.528	0.3%	15.4			392.00	272.222	312.215	216.816	124.9830101	65.49	47.60%	994.000	690.278	563	390.972	56.6%	37.0938	299.3	431000	28.40
7/16/2003	946.000	656.944	0.67	0.67	657						408.00	283.333	288.265	200.184	119.6373716	72.82	39.14%	801.000	556.250	660	458.333	82.4%	59.998	97.9	141000	12.82
7/17/2003	1054.000	731.944	0.56	0.6	733						308.00	213.889	334.512	232.300	97.52738508	54.32	44.30%	682.000	473.611	637	442.361	93.4%	50.7351	31.3	45000	3.58
7/18/2003	1136.000	788.889	0.48	0.53	789						281.00	195.139	295.992	205.550	94.72128304	65.48	30.87%	701.000	486.806	580	402.778	82.7%	54.1766	84.0	121000	11.30
7/19/2003	923.000	640.972	0.52	0.55	640	0.972	0.2%	7.5			349.00	242.361	253.777	176.234	97.87181979	52.71	46.15%	790.000	548.611	658	456.944	83.3%	43.9018	91.7	132000	8.81
7/20/2003	815.000	565.972	0.51	0.58	565	0.972	0.2%	7.6			315.00	218.750	204.925	142.309	53.27637918	63.34	-18.90%	783.000	543.750	687	477.083	87.7%	55.5769	66.7	96000	7.77
7/21/2003	913.000	634.028	0.54	0.6	632	2.028	0.3%	16.6			295.00	204.861	282.655	196.288	65.34218962	71.02	-8.70%	731.000	507.639	618	429.167	84.5%	60.0455	78.5	113000	10.98
7/22/2003	928.000	644.444	0.58	0.61	387	257.444	39.9%	2205.8			222.00	154.167	302.644	210.170	94.97998485	30.5	67.89%	328.000	227.778	300	208.333	91.5%	27.8973	19.4	28000	2.60
7/23/2003	952.000	661.111	0.6	0.64	659	2.111	0.3%	18.8			280.00	194.444	265.228	184.186	93.63461395	86.31	7.82%	838.000	581.944	483	335.417	57.6%	49.7485	246.5	355000	36.56
7/24/2003	971.000	674.306	0.58	0.65	673	1.306	0.2%	11.6			289.00	200.694	274.853	190.870	109.54863	86.69	20.87%	976.000	677.778	502	348.611	51.4%	44.5881	329.2	474000	42.10
7/25/2003	1075.000	746.528	0.53	0.63	746	0.528	0.1%	4.4			360.00	250.000	288.855	200.594	109.6547099	55.5	49.39%	679.000	471.528	503	349.306	74.1%	41.1112	122.2	176000	14.38
7/26/2003	998.000	693.056	0.56	0.59	692	1.056	0.2%	8.7			307.00	213.194	258.402	179.446	96.3598815	55.7	42.19%	506.000	351.389	506	351.389	100.0%	55.7045	0.0	0	0.00
7/27/2003	953.000	661.806	0.52	0.58	661	0.806	0.1%	6.4			291.00	202.083	196.845	136.698	49.80806828	53.22	-6.85%	424.000	294.444	424	294.444	100.0%	53.2192	0.0	0	0.00
7/28/2003	825.000	572.917	0.55	0.59	566	6.917	1.2%	56.8			285.00	197.917	200.015	138.899	78.81221738	90.58	-14.93%	749.000	520.139	411	285.417	54.9%	49.7022	234.7	338000	40.87
7/29/2003	714.000	495.833	0.59	0.59	491	4.833	1.0%	41.1			266.00	184.722	235.845	163.781	99.7700515	68.05	31.80%	796.000	552.778	451	313.194	56.7%	38.5537	239.6	345000	29.49
7/30/2003	767.000	532.639	0.58	0.62	434	98.639	18.5%	852.2			339.00	235.417	347.156	241.081	139.2109328	55.8	59.92%	756.000	525.000	531	368.750	70.2%	39.1926	156.3	225000	16.61
7/31/2003	812.000	563.889	0.57	0.63	459	104.889	18.6%	906.2			372.00	258.333	352.686	244.921	145.2408344	59.55	59.00%	510.000	354.167	500	347.222	98.0%	58.38	6.9	10000	1.17
8/1/2003	800.000	555.556	0.62	0.64	553	2.556	0.5%	23.2			354.00	245.833	299.668	208.103	124.7854049	93.42	25.14%	762.000	529.167	393	272.917	51.6%	48.181	256.3	369000	45.24
8/2/2003	923.000	640.972	0.62	0.65	588	52.972	8.3%	484.4			256.00	177.778	270.379	187.763	101.0164726	85.06	15.80%	883.000	613.194	390	270.833	44.2%	37.5675	342.4	493000	47.49
8/3/2003	1008.000	700.000	0.67	0.64	560	140.000	20.0%	1320.5	2.70	3.67	383.00	265.972	308.013	213.898	132.4324106	79.69	39.83%	980.000	680.556	475	329.861	48.5%	38.6246	350.7	505000	41.06
8/4/2003	946.000	656.944	0.63	0.61	526	130.944	19.9%	1169.1	2.85	3.07	363.00	252.083	346.426	240.573	121.9497694	74.06	39.27%	759.000	527.083	506	351.389	66.7%	49.3745	175.7	253000	24.69
8/5/2003	977.000	678.472	0.65	0.62	584	94.472	13.9%	863.9	3.58	1.81	349.00	242.361	246.104	170.905	98.49221291	51.5	47.71%	380.000	263.889	380	263.889	100.0%	51.4995	0.0	0	0.00
8/6/2003	743.000	515.972	0.63	0.62	513	2.972	0.6%	26.7	2.78	0.07	341.00	236.806	175.126	121.615	93.68531436	108.8	-16.17%	580.000	402.778	308	213.889	53.1%	57.7962	188.9	272000	51.04
8/7/2003	1236.000	858.333	0.63	0.59	859						278.00	193.056	234.220	162.653	87.41536218	49.98	42.83%	705.000	489.583	397	275.694	56.3%	28.1433	213.9	308000	21.83
8/8/2003	1441.000	1000.694	0.61	0.64	1002						306.00	212.500	320.700	222.708	117.72397	56.55	51.96%	832.000	577.778	589	409.028	70.8%	40.0349	168.8	243000	16.52
8/9/2003	1343.000	932.639	0.58	0.59	934						233.00	161.806	318.073	220.884	94.67479178	61.74	34.79%	943.000	654.861	600	416.667	63.6%	39.2814	238.2	343000	22.46
8/10/2003	1365.000	947.917	0.56	0.63	949						253.00	175.694	292.291	202.980	96.5426457	50.68	47.51%	494.000	343.056	494	343.056	100.0%	50.6755	0.0	0	0.00
8/11/2003	1205.000	836.806	0.56	0.57	838						394.00	273.611	289.071	200.744	119.7364254	49.63	58.55%	409.000	284.028	409	284.028	100.0%	49.6309	0.0	0	0.00
8/12/2003	1057.000	734.028	0.57	0.57	735						446.00	309.722	482.328	334.950	161.9938803	52.87	67.36%	339.000	235.417	339	235.417	100.0%	52.8698	0.0	0	0.00
8/13/2003	1083.000	752.083	0.5	0.47	752	0.083	0.0%	0.6			340.00	236.111	423.430	294.048	133.9551301	106	20.86%	570.000	395.833	258	179.167	45.3%	47.9834	216.7	312000	58.03
8/14/2003	971.000	674.306	0.51	0.5	675						358.00	248.611	444.468	308.659	152.3069436	151.2	0.72%	1039.000	721.528	286	198.611	27.5%	41.6224	522.9	753000	109.59
8/15/2003	837.000	581.250	0.49	0.46	581	0.250	0.0%	1.7			447.00	310.417	399.682	277.557	144.2985568	134.3	6.95%	1215.000	843.750	352	244.444	29.0%	38.8978	599.3	863000	95.37
8/16/2003	634.000	440.278	0.6	0.55	434	6.278	1.4%	52.0			356.00	247.222	366.105	254.240	142.2248432	95.65	32.75%	1024.000	711.111	452	313.889	44.1%	42.2204	397.2	572000	53.43
8/17/2003	794.000	551.389	0.65	0.57	465	86.389	15.7%	758.8			454.00	315.278	332.551	230.938	129.0771928	60.85	52.86%	629.000	436.806	502	348.611	79.8%	48.5655	88.2	127000	12.29
8/18/2003	824.000	572.222	0.5	0.48	573						478.00	331.944	303.703	210.905	106.915881	62.84	41.22%	414.000	287.500	414	287.500	100.0%	62.8402	0.0	0	0.00
8/19/2003	694.000	481.944	0.53	0.5	478	3.944	0.8%	29.3			475.00	329.861	313.583	217.766	120.6636033	98.15	18.66%	663.000	460.417	323	224.306	48.7%	47.8153	236.1	340000	50.33
8/20/2003	646.000	448.611	0.47	0.47	443	5.611	1.3%	38.0			339.00	235.417	370.802	257.501	99.15702553	110.8	-11.74%	929.000	645.139	391	271.528	42.1%	46.6314	373.6	538000	64.16
8/21/2003	616.000	427.778	0.54	0.47	423	4.778	1.1%	34.7			315.00	218.750	302.178	209.846	94.41124899	87.74	7.07%	931.000	646.528	470	326.389	50.5%	44.2937	320.1	461000	43.45
8/22/2003	688.000	477.778	0.55	0.55	461	16.778	3.5%	132.9			373.00	259.028	279.064	193.794	109.0437446	83.3	23.61%	984.000	683.333	543	377.083	55.2%	45.9655	306.3	441000	37.33
8/23/2003	672.000	466.667	0.57	0.55	463	3.667	0.8%	29.6			317.00	220.139	274.129	190.367	97.52709519	79.6	18.39%	802.000	556.944	475	329.861	59.2%	47.1419	227.1	327000	32.45
8/24/2003	751.000	521.528	0.66	0.62	518	3.528	0.7%	32.5			399.00	277.083	216.433	150.301	107.4390076	61.5	42.75%	612.000	425.000	449	311.806	73.4%	45.1232	113.2	163000	16.38
8/25/2003	814.000	565.278	0.68	0.62	566						505.00	350.694	280.473	194.773	135.8925718	46.83	65.54%	451.000	313.194	451	313.194	100.0%	46.8287	0.0	0	0.00
8/26/2003	788.000	547.222	0.78	0.67	543	4.222	0.8%	44.1			411.00	285.417	300.099	208.402	125.9389403	99.97	20.62%	701.000	486.806	399	277.083	56.9%	56.903	209.7	302000	43.07
8/27/2003	785.000	545.139	0.78	0.69	543	2.139	0.4%	22.6			343.00	238.194	304.064	211.156	105.7951361	99.33	6.11%	781.000	542.361	367	254.861	47.0%	46.6769	287.5	414000	52.65
8/28/2003	828.000	575.000	0.76	0.74	574	1.000	0.2%	10.8			331.00	229.861	315.736	219.261	119.0067901	83.01	30.25%	858.000	595.833	401	278.472	46.7%	38.7943	317.4	457000	44.21
8/29/2003	840.000	583.333	0.73	0.69	583	0.333	0.1%	3.4			358.00	248.611	247.728	172.033	114.4975976	83.05	27.46%	986.000	684.722	517	359.028	52.4%	43.549	325.7	469000	39.51
8/30/2003	885.000	614.583	0.72	0.7	614	0.583	0.1%	6.0			395.00	274.306	233.899	162.430	100.7421714	67.44	33.06%	1057.000	734.028	585	406.250	55.3%	37.3236	327.8	472000	30.11
8/31/2003	867.000	602.083	0.7	0.65	600	2.083	0.3%	20.3			307.00	213.194	224.901	156.182	71.95377391	63.99	11.07%	679.000	471.528	531	368.750	78.2%	50.0425	102.8	148000	13.95

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TABLE 4F-61 SHEET 4 OF 7
AGRI-LIFE PROCESS CALCULATIONS
2020 TREATMENT REPORT
6/04/07 TR_4-A.T4F61.07.06.04.cdr

Raw Data[2]

DATE	14 WAS Flow KGD	14 Calc WAS Flow gpm	WAS E TS % > 0.6	WAS W TS % > 0.6	17 WAS to JI Flow gpm	Calc WAS to DAF flow gpm	Calc WAS to DAF %	Calc WAS to DAF lb/d	DAF TWAS SOILDS % 3.5 ~ 5.5	Calc DAF TWAS Flow (90% Red Assumed) gpm	15 PSD Flow KGD	15 Calc PSD Flow gpm	19 PSD from JI Flow KGD	19 Calc PSD from JI Flow gpm	Digester Feed TPD	DSD TPD	Solids Destruction %	16 DSD Flow KGD	16 Calc DSD Flow gpm	18 DSD to JI Flow KGD	18 Calc DSD to JI Flow gpm	Calculated DSD to JI %	Calculated DSD to Centrifuge & Agrilife Program DSD to JI TPD	Flow gpm	Flow gpd	Total Solids TPD
9/1/2003	837.000	581.250	0.62	0.66	471	110.250	19.0%	1016.1			250.00	173.611	240.723	167.169	86.76166066	49.5	42.95%	438.000	304.167	438	304.167	100.0%	49.4971	0.0	0	0.00
9/2/2003	776.000	538.889	0.63	0.58	492	46.889	8.7%	408.5			290.00	201.389	252.091	175.063	95.95241206	54.14	43.58%	407.000	282.639	407	282.639	100.0%	54.1404	0.0	0	0.00
9/3/2003	771.000	535.417	0.61	0.54	533	2.417	0.5%	20.0			343.00	238.194	267.348	185.658	103.0610728	49.66	51.81%	371.000	257.639	371	257.639	100.0%	49.6609	0.0	0	0.00
9/4/2003	718.000	498.611	0.58	0.53	496	2.611	0.5%	20.9			334.00	231.944	240.071	166.716	88.62853906	105.5	-19.02%	744.000	516.667	415	288.194	55.8%	58.8387	228.5	329000	46.65
9/5/2003	681.000	472.917	0.62	0.54	468	4.917	1.0%	41.1			289.00	200.694	272.710	189.382	98.33677031	87.75	10.76%	866.000	601.389	405	281.250	46.8%	41.0391	320.1	461000	46.71
9/6/2003	687.000	477.083	0.61	0.53	472	5.083	1.1%	41.7			445.00	309.028	243.646	169.198	117.4799982	84.02	28.49%	964.000	669.444	457	317.361	47.4%	39.8289	352.1	507000	44.19
9/7/2003	696.000	483.333	0.58	0.47	480	3.333	0.7%	25.2			512.00	355.556	217.803	151.252	109.3728127	53.86	50.76%	687.000	477.083	521	361.806	75.8%	40.8443	115.3	166000	13.01
9/8/2003	773.000	536.806	0.61	0.49	535	1.806	0.3%	14.3			516.00	358.333	220.050	152.813	78.28354159	82.63	-5.55%	771.000	535.417	440	305.556	57.1%	47.1544	229.9	331000	35.47
9/9/2003	671.000	465.972	0.57	0.51	462	3.972	0.9%	30.9			419.00	290.972	255.294	177.287	77.5138788	74.17	4.32%	738.000	512.500	420	291.667	56.9%	42.2087	220.8	318000	31.96
9/10/2003	684.000	475.000	0.59	0.48	472	3.000	0.6%	23.1			289.00	200.694	321.288	223.116	89.33961717	82.73	7.40%	874.000	606.944	425	295.139	48.6%	40.2301	311.8	449000	42.50
9/11/2003	655.000	454.861	0.54	0.52	451	3.861	0.8%	29.5			254.00	176.389	324.591	225.410	102.6259888	70.19	31.60%	1014.000	704.167	518	359.722	51.1%	35.857	344.4	496000	34.33
9/12/2003	658.000	456.944	0.66	0.53	430	26.944	5.9%	230.9			283.00	196.528	318.552	221.217	115.9416941	55.29	52.31%	663.000	460.417	475	329.861	71.6%	39.615	130.6	188000	15.68
9/13/2003	749.000	520.139	0.67	0.57	288	232.139	44.6%	2072.5			290.00	201.389	462.123	320.919	161.7103967	51.29	68.29%	444.000	308.333	444	308.333	100.0%	51.286	0.0	0	0.00
9/14/2003	725.000	503.472	0.69	0.63	331	172.472	34.3%	1639.2	3.44	3.57	266.00	184.722	431.232	299.467	134.0760337	44.48	66.82%	373.000	259.028	373	259.028	100.0%	44.4847	0.0	0	0.00
9/15/2003	841.000	584.028	0.68	0.62	440	144.028	24.7%	1348.1	3.45	2.93	342.00	237.500	321.461	223.237	142.8026146	94.35	33.93%	632.000	438.889	304	211.111	48.1%	45.3829	227.8	328000	48.97
9/16/2003	876.000	608.333	0.69	0.62	491	117.333	19.3%	1106.7	3.11	2.67	437.00	303.472	283.347	196.769	164.2425204	116.5	29.07%	922.000	640.278	290	201.389	31.5%	36.6418	438.9	632000	79.85
9/17/2003	848.000	588.889	0.65	0.63	403	185.889	31.6%	1713.2	3.06	4.20	460.00	319.444	333.039	231.277	148.7218413	131	11.94%	1061.000	736.806	361	250.694	34.0%	44.559	486.1	700000	86.40
9/18/2003	858.000	595.833	0.68	0.6	403	192.833	32.4%	1777.2	3.29	4.05	424.00	294.444	364.832	253.355	130.085787	105.2	19.12%	931.000	646.528	390	270.833	41.9%	44.0727	375.7	541000	61.14
9/19/2003	845.000	586.806	0.62	0.56	389	197.806	33.7%	1680.6	3.29	3.83	292.00	202.778	383.050	266.007	124.3092135	85.82	30.97%	872.000	605.556	398	276.389	45.6%	39.168	329.2	474000	46.65
9/20/2003	857.000	595.139	0.61	0.55	354	241.139	40.5%	2014.0	3.92	3.85	316.00	219.444	375.030	260.437	116.3118159	94.52	18.73%	914.000	634.722	440	305.556	48.1%	45.503	329.2	474000	49.02
9/21/2003	908.000	630.556	0.63	0.61	379	251.556	39.9%	2245.9	3.39	4.96	352.00	244.444	300.321	208.556	120.8201358	86.91	28.07%	872.000	605.556	409	284.028	46.9%	40.7622	321.5	463000	46.14
9/22/2003	843.000	585.417	0.68	0.63	349	236.417	40.4%	2229.9	3.28	5.09	379.00	263.194	372.767	258.866	114.7437533	93.73	18.31%	892.000	619.444	426	295.833	47.8%	44.7658	323.6	466000	48.97
9/23/2003	789.000	547.917	0.66	0.65	349	198.917	36.3%	1876.2	3.43	4.10	379.00	263.194	312.936	217.317	127.0288141	89.5	29.55%	898.000	623.611	427	296.528	47.6%	42.5561	327.1	471000	46.94
9/24/2003	811.000	563.194	0.67	0.64	347	216.194	38.4%	2039.1	3.55	4.30	375.00	260.417	335.665	233.100	125.3839228	62.37	50.26%	608.000	422.222	430	298.611	70.7%	44.1103	123.6	178000	18.26
9/25/2003	1020.000	708.333	0.52	0.65	569	139.333	19.7%	1173.7	3.01	2.92	348.00	241.667	294.582	204.571	115.7992922	49.44	57.31%	416.000	288.889	416	288.889	100.0%	49.4395	0.0	0	0.00
9/26/2003	1222.000	848.611	0.46	0.57	899				3.55	0.00	309.00	214.583	333.323	231.474	125.5556461	95.4	24.02%	755.000	524.306	363	252.083	48.1%	45.8654	272.2	392000	49.53
9/27/2003	1170.000	812.500	0.47	0.61	814						269.00	186.806	363.661	252.542	129.2374316	80.39	37.80%	918.000	637.500	421	292.361	45.9%	36.867	345.1	497000	43.52
9/28/2003	1176.000	816.667	0.43	0.58	818						305.00	211.806	279.170	193.868	91.6000245	84.91	7.31%	965.000	670.139	464	322.222	48.1%	40.826	347.9	501000	44.08
9/29/2003	1254.000	870.833	0.39	0.63	872						301.00	209.028	201.761	140.112	80.21452611	87.25	-8.78%	987.000	685.417	492	341.667	49.8%	43.4948	343.8	495000	43.76
9/30/2003	1019.000	707.639	0.39	0.6	708						311.00	215.972	236.707	164.380	97.08075318	56.14	42.17%	601.000	417.361	467	324.306	77.7%	43.6215	93.1	134000	12.52
10/1/2003	915.000	635.417	0.4	0.6	635	0.417	0.1%	3.0			336.00	233.333	248.182	172.349	104.4578677	47.59	54.45%	418.000	290.278	418	290.278	100.0%	47.5855	0.0	0	0.00
10/2/2003	815.000	565.972	0.43	0.62	529	36.972	6.5%	279.5			332.00	230.556	274.182	190.404	114.7126253	92.32	19.52%	677.000	470.139	334	231.944	49.3%	45.5439	238.2	343000	46.77
10/3/2003	756.000	525.000	0.42	0.61	522	3.000	0.6%	22.2			316.00	219.444	306.444	212.808	105.9780087	92.93	12.31%	841.000	584.028	364	252.778	43.3%	40.2238	331.3	477000	52.71
10/4/2003	823.000	571.528	0.4	0.62	570	1.528	0.3%	11.2			310.00	215.278	281.200	195.278	95.11289148	79.62	16.29%	884.000	613.889	401	278.472	45.4%	36.1189	335.4	483000	43.50
10/5/2003	781.000	542.361	0.41	0.6	538	4.361	0.8%	31.7			353.00	245.139	198.000	137.500	93.1628212	60.29	35.28%	583.000	404.861	428	297.222	73.4%	44.262	107.6	155000	16.03
10/6/2003	932.000	647.222	0.42	0.61	646	1.222	0.2%	9.1			349.00	242.361	222.291	154.369	101.2824438	41.13	59.39%	427.000	296.528	427	296.528	100.0%	41.1316	0.0	0	0.00
10/7/2003	991.000	688.194	0.36	0.6	688	0.194	0.0%	1.3			340.00	236.111	244.022	169.460	103.9104472	50.39	51.51%	380.000	263.889	356	247.222	93.7%	47.2077	16.7	24000	3.18
10/8/2003	849.000	589.583	0.45	0.64	589	0.583	0.1%	4.6			392.00	272.222	261.376	181.511	120.6080844	77.43	35.80%	599.000	415.972	319	221.528	53.3%	41.2371	194.4	280000	36.20
10/9/2003	728.000	505.556	0.5	0.72	504	1.556	0.3%	13.7			376.00	261.111	286.047	198.644	101.4893152	102.9	-1.39%	796.000	552.778	314	218.056	39.4%	40.5908	334.7	482000	62.31
10/10/2003	722.000	501.389	0.59	0.56	498	3.389	0.7%	28.1			337.00	234.028	284.784	197.767	109.4576537	79.61	27.27%	830.000	576.389	376	261.111	45.3%	36.0622	315.3	454000	43.54
10/11/2003	640.000	444.444	0.62	0.69	436	8.444	1.9%	79.6			315.00	218.750	363.376	252.345	125.2913801	93.35	25.50%	925.000	642.361	420	291.667	45.4%	42.3839	350.7	505000	50.96
10/12/2003	680.000	472.222	0.64	0.7	468	4.222	0.9%	40.7			316.00	219.444	361.024	250.711	105.3239637	80.62	23.45%	848.000	588.889	417	289.583	49.2%	39.6467	299.3	431000	40.98
10/13/2003	675.000	468.750	0.61	0.73	464	4.750	1.0%	45.8			313.00	217.361	291.256	202.261	85.34316678	59.6	30.17%	505.000	350.694	371	257.639	73.5%	43.7821	93.1	134000	15.81
10/14/2003	673.000	467.361	0.57	0.68	462	5.361	1.1%	48.3			321.00	222.917	322.952	224.273	98.27185044	39.65	59.65%	318.000	220.833	318	220.833	100.0%	39.6492	0.0	0	0.00
10/15/2003	738.000	512.500	0.61	0.7	508	4.500	0.9%	42.4			312.00	216.667	372.539	258.708	146.8368782	85.62	41.69%	626.000	434.722	309	214.583	49.4%	42.2638	220.1	317000	43.36
10/16/2003	717.000	497.917	0.55	0.71	495	2.917	0.6%	26.5			311.00	215.972	326.916	227.025	123.9944374	82.31	33.62%	723.000	502.083	262	181.944	36.2%	29.8263	320.1	461000	52.48
10/17/2003	669.000	464.583	0.64	0.75	459	5.583	1.2%	55.9			347.00	240.972	291.065	202.129	105.7290562	84.43	20.15%	764.000	530.556	315	218.750	41.2%	34.8091	311.8	449000	49.62
10/18/2003	658.000	456.944	0.64	0.8	452	4.944	1.1%	51.3			331.00	229.861	270.782	188.043	119.1055317	80.16	32.69%	801.000	556.250	350	243.056	43.7%	35.028	313.2	451000	45.14
10/19/2003	640.000	444.444	0.67	0.82	439	5.444	1.2%	58.4			350.00	243.056	221.934	154.121	100.3451698	83.35	16.93%	847.000	588.194	383	265.972	45.2%	37.6918	322.2	464000	45.66
10/20/2003	680.000	472.222	0.61	0.77	469	3.222	0.7%	32.0			364.00	252.778	203.545	141.351	94.65896871	53.83	43.13%	683.000	474.306	443	307.639	64.9%	34.9142	166.7	240000	18.92
10/21/2003	684.000	475.000	0.6	0.89	471	4.000	0.8%	42.9			357.00	247.917	258.881	179.778	105.7785994	46.45	56.09%	474.000	329.167	468	325.000	98.7%	45.8617	4.2	6000	0.59
10/22/2003	676.000	469.444	0.64	0.8	467	2.444	0.5%	25.3			381.00	264.583	252.200	175.139	110.1953868	98.48	10.63%	738.000	512.500	402	279.167	54.5%	53.6429	233.3	336000	44.84
10/23/2003	674.000	468.056	0.66	0.84	472						291.00	202.083	259.774	180.399	76.41860191	84.73	-10.88%	800.000	555.556	377	261.806	47.1%	39.9311	293.8	423000	44.80
10/24/2003	644.000	447.222	0.66	0.83	443	4.222	0.9%	45.3			297.00	206.250	326.846	226.976	84.82020139	88.62	-4.48%	953.000	661.806	462	320.833	48.5%	42.9618	341.0	491000	45.66
10/25/2003	843.000	585.417	0.65	0.82	496	89.417	15.3%	946.4			320.00	222.222	319.902	222.154	127.9188067	73.57	42.48%	1014.000	704.167	522	362.500	51.5%	37.8753	341.7	492000	35.70
10/26/2003	958.000	665.278	0.64	0.81	499	166.278	25.0%	1735.9	2.60	5.00	349.00	242.361	189.209	131.395	90.11446494	55.82	38.05%	653.000	453.472	515	357.639	78.9%	44.0248	95.8	138000	11.80
10/27/2003	722.000	501.389	0.66	0.79	499	2.389	0.5%	24.9	3.57	0.05	367.00	254.861	196.191	136.244	97.12982875	52.87	45.57%	448.000	311.111	448	311.111	100.0%	52.8689	0.0	0	0.00
10/28/2003	717.000	497.917	0.63	0.78	494	3.917	0.8%	39.8			285.00	197.917	278.470	193.382	95.47417654	55.86	41.49%	448.000	311.111	403	279.861	90.0%	50.2472	31.3	45000	5.61
10/29/2003	750.000	520.833	0.63	0.77	518	2.833	0.5%	28.6			221.00	153.472	296.223	205.710	81.06455136	58.95	27.28%	459.000	318.750	356	247.222	77.6%	45.7232	71.5	103000	13.23
10/30/2003	734.000	509.722	0.64	0.87	507	2.722	0.5%	29.6			276.00	191.667	253.362	175.946	92.89702321	91.59	1.41%	760.000	527.778	378	262.500	49.7%	45.5539	265.3	382000	46.04
10/31/2003	733.000	509.028	0.64	0.76	506	3.028	0.6%	30.5			310.00	215.278	206.870	143.660	99.0086464	90.29	8.81%	891.000	618.750	442	306.944	49.6%	44.7883	311.8	449000	45.50

Preserving The Environment • Improving Water Quality

Raw Data[2]

DATE	14 WAS Flow KGD	14 Calc WAS Flow gpm	WAS E TS % > 0.6	WAS W TS % > 0.6	17 WAS to JI Flow gpm	Calc WAS to DAF flow gpm	Calc WAS to DAF %	Calc WAS to DAF lb/d	DAF TWAS SOILDS % 3.5 ~ 5.5	Calc DAF TWAS Flow (90% Red Assumed) gpm	15 PSD Flow KGD	15 Calc PSD Flow gpm	19 PSD from JI Flow KGD	19 Calc PSD from JI Flow gpm	Digester Feed TPD	DSD TPD	Solids Destruction %	16 DSD Flow KGD	16 Calc DSD Flow gpm	18 DSD to JI Flow KGD	18 Calc DSD to JI Flow gpm	Calculated DSD to JI %	Calculated DSD to Centrifuge & Agrilife Program: DSD to JI TPD	Flow gpm	Flow gpd	Total Solids TPD
11/1/2003	704.000	488.889	0.65	0.74	485	3.889	0.8%	38.9			302.00	209.722	202.611	140.702	89.30228644	87.36	2.17%	927.000	643.750	439	304.861	47.4%	41.3722	338.9	488000	45.99
11/2/2003	685.000	475.694	0.64	0.74	471	4.694	1.0%	46.6			285.00	197.917	251.034	174.329	76.7180282	51.93	32.31%	652.000	452.778	509	353.472	78.1%	40.5403	99.3	143000	11.39
11/3/2003	717.000	497.917	0.59	0.64	460	37.917	7.6%	335.8			294.00	204.167	278.937	193.706	98.6398143	45.48	53.89%	498.000	345.833	498	345.833	100.0%	45.4789	0.0	0	0.00
11/4/2003	974.000	676.389	0.55	0.65	677						329.00	228.472	321.844	223.503	84.7160079	44.88	47.02%	375.000	260.417	375	260.417	100.0%	44.8796	0.0	0	0.00
11/5/2003	1187.000	824.306	0.58	0.71	743	81.306	9.9%	755.2			306.00	212.500	329.288	228.672	123.0101591	81.51	33.74%	674.000	468.056	318	220.833	47.2%	38.4557	247.2	356000	43.05
11/6/2003	1286.000	893.056	0.67	0.81	713	180.056	20.2%	1918.7	2.58	5.57	350.00	243.056	263.146	182.740	132.0104465	90.85	31.18%	816.000	566.667	324	225.000	39.7%	36.0738	341.7	492000	54.78
11/7/2003	1036.000	719.444	0.6	0.77	634	85.444	11.9%	842.8	4.60	1.37	378.00	262.500	300.666	208.796	147.1709077	93	36.81%	811.000	563.194	337	234.028	41.6%	38.6455	329.2	474000	54.36
11/8/2003	809.000	561.806	0.68	0.7	557	4.806	0.9%	47.7	4.18	0.09	404.00	280.556	221.659	153.930	109.4771897	90.88	16.99%	835.000	579.861	349	242.361	41.8%	37.9841	337.5	486000	52.89
11/9/2003	831.000	577.083	0.65	0.68	572	5.083	0.9%	48.7			350.00	243.056	215.931	149.952	89.98541413	89.01	1.09%	882.000	612.500	378	262.500	42.9%	38.1455	350.0	504000	50.86
11/10/2003	821.000	570.139	0.65	0.68	565	5.139	0.9%	49.2			266.00	184.722	216.950	150.659	82.9813722	56.01	32.50%	579.000	402.083	394	273.611	68.0%	38.1171	128.5	185000	17.90
11/11/2003	785.000	545.139	0.65	0.68	541	4.139	0.8%	39.6			264.00	183.333	229.594	159.440	77.05608249	39.29	49.01%	349.000	242.361	348	241.667	99.7%	39.1813	0.7	1000	0.11
11/12/2003	797.000	553.472	0.66	0.67	549	4.472	0.8%	42.8			297.00	206.250	274.638	190.721	104.857981	46.24	55.91%	352.000	244.444	334	231.944	94.9%	43.8726	12.5	18000	2.36
11/13/2003	822.000	570.833	0.65	0.68	567	3.833	0.7%	36.7			286.00	198.611	259.468	180.186	94.19245796	92.06	2.26%	659.000	457.639	319	221.528	48.4%	44.5627	236.1	340000	47.50
11/14/2003	853.000	592.361	0.66	0.69	588	4.361	0.7%	42.4			234.00	162.500	285.197	198.054	88.43309385	83.77	5.28%	794.000	551.389	333	231.250	41.9%	35.1318	320.1	461000	48.64
11/15/2003	827.000	574.306	0.66	0.7	572	2.306	0.4%	22.6			272.00	188.889	235.545	163.573	76.75222351	74.34	3.15%	814.000	565.278	385	267.361	47.3%	35.1594	297.9	429000	39.18
11/16/2003	737.000	511.806	0.65	0.68	507	4.806	0.9%	46.0			222.00	154.167	189.012	131.258	59.29920192	75.12	-26.67%	883.000	613.194	431	299.306	48.8%	36.6643	313.9	452000	38.45
11/17/2003	746.000	518.056	0.66	0.66	513	5.056	1.0%	48.0			240.00	166.667	264.668	183.797	72.8668974	50.72	30.40%	571.000	396.528	451	313.194	79.0%	40.0583	83.3	120000	10.66
11/18/2003	900.000	625.000	0.63	0.68	621	4.000	0.6%	37.7			332.00	230.556	283.581	196.931	92.52940361	37.47	59.50%	389.000	270.139	389	270.139	100.0%	37.4712	0.0	0	0.00
11/19/2003	940.000	652.778	0.69	0.59	650	2.778	0.4%	25.6			283.00	196.528	273.395	189.858	89.30444356	39.83	55.40%	326.000	226.389	323	224.306	99.1%	39.4645	2.1	3000	0.37
11/20/2003	1060.000	736.111	0.69	0.62	735	1.111	0.2%	10.5			302.00	209.722	275.610	191.396	98.07638191	87.78	10.50%	572.000	397.222	273	189.583	47.7%	41.8935	207.6	299000	45.88
11/21/2003	989.000	686.806	0.71	0.65	685	1.806	0.3%	17.7			305.00	211.806	255.872	177.689	116.3653351	79.02	32.09%	752.000	522.222	271	188.194	36.0%	28.4778	334.0	481000	50.55
11/22/2003	975.000	677.083	0.7	0.66	590	87.083	12.9%	852.7			310.00	215.278	258.321	179.389	106.7473531	70.57	33.89%	802.000	556.944	344	238.889	42.9%	30.2675	318.1	458000	40.30
11/23/2003	1100.000	763.889	0.67	0.65	372	391.889	51.3%	3724.5			294.00	204.167	272.152	188.994	108.6619369	76.94	29.20%	820.000	569.444	324	225.000	39.5%	30.3993	344.4	496000	46.54
11/24/2003	1081.000	750.694	0.69	0.6	404	346.694	46.2%	3220.1	3.53	6.84	259.00	179.861	214.309	148.826	89.65846918	82.78	7.67%	807.000	560.417	310	215.278	38.4%	31.8004	345.1	497000	50.98
11/25/2003	920.000	638.889	0.66	0.62	382	256.889	40.2%	2367.5	3.45	5.14	307.00	213.194	224.148	155.658	104.7349282	79.18	24.40%	808.000	561.111	313	217.361	38.7%	30.6724	343.8	495000	48.51
11/26/2003	924.000	641.667	0.65	0.61	518	123.667	19.3%	1121.9	3.63	2.32	325.00	225.694	249.025	172.934	109.7044294	69.05	37.06%	858.000	595.833	364	252.778	42.4%	29.2951	343.1	494000	39.76
11/27/2003	935.000	649.306	0.65	0.63	650				3.59	0.00	245.00	170.139	227.313	157.856	80.97122321	38.28	52.72%	553.000	384.028	401	278.472	72.5%	27.758	105.6	152000	10.52
11/28/2003	939.000	652.083	0.67	0.58	536	116.083	17.8%	1044.8			264.00	183.333	189.027	131.269	85.78640249	37.13	56.71%	325.000	225.694	325	225.694	100.0%	37.1339	0.0	0	0.00
11/29/2003	939.000	652.083	0.63	0.59	379	273.083	41.9%	2398.8	2.88	6.24	263.00	182.639	192.979	134.013	92.35296792	72.5	21.50%	545.000	378.472	186	129.167	34.1%	24.7423	249.3	359000	47.76
11/30/2003	939.000	652.083	0.6	0.57	0	652.083	100.0%	5493.2	2.81	14.65	248.00	172.222	85.674	59.496	86.12072571	45.69	46.95%	498.000	345.833	0	0.000	0.0%	0	345.8	498000	45.69
12/1/2003	946.000	656.944	0.6	0.53	0	656.944	100.0%	5344.9	4.47	8.96	269.00	186.806	133.181	92.487	94.31456178			705.000	489.583	0	0.000	0.0%		489.6	705000	
12/2/2003	981.000	681.250	0.62	0.58	0	681.250	100.0%	5886.0	3.70	11.92	293.00	203.472	145.374	100.954	108.7641304	75.14	30.92%	780.000	541.667	0	0.000	0.0%	0	541.7	780000	75.14
12/3/2003	921.000	639.583	0.59	0.57	0	639.583	100.0%	5341.8	3.69	10.85	285.00	197.917	167.210	116.118	106.7895046	83.02	22.25%	905.000	628.472	0	0.000	0.0%	0	628.5	905000	83.02
12/4/2003	950.000	659.722	0.55	0.54	0	659.722	100.0%	5177.5	3.79	10.24	369.00	256.250	307.746	213.712	159.0857661	77.18	51.48%	1017.000	706.250	0	0.000	0.0%	0	706.3	1017000	77.18
12/5/2003	940.000	652.778	0.54	0.53	0	652.778	100.0%	5029.0	3.89	9.69	369.00	256.250	261.843	181.835	135.1697297	76.02	43.76%	844.000	586.111	0	0.000	0.0%	0	586.1	844000	76.02
12/6/2003	1158.000	804.167	0.55	0.53	0	804.167	100.0%	6253.2	4.85	9.66	377.00	261.806	285.782	198.460	142.1099216	82.84	41.71%	903.000	627.083	0	0.000	0.0%	0	627.1	903000	82.84
12/7/2003	1330.000	923.611	0.54	0.54	0	923.611	100.0%	7182.0	3.41	15.78	362.00	251.389	235.805	163.754	119.1967916	79.76	33.09%	966.000	670.833	0	0.000	0.0%	0	670.8	966000	79.76
12/8/2003	1406.000	976.389	0.46	0.48	0	976.389	100.0%	6608.2	4.45	11.13	365.00	253.472	120.560	83.722	74.99102151	45.54	39.28%	975.000	677.083	0	0.000	0.0%	0	677.1	975000	45.54
12/9/2003	1523.000	1057.639	0.42	0.47	221	836.639	79.1%	5361.2	6.27	6.41	395.00	274.306	31.053	21.565	77.28789855	58.53	24.27%	767.000	532.639	110	76.389	14.3%	8.39421	456.3	657000	50.14
12/10/2003	1708.000	1186.111	0.36	0.42	1135	51.111	4.3%	287.0	3.77	0.57	361.00	250.694	249.219	173.068	93.66563721	66.64	28.85%	704.000	488.889	469	325.694	66.6%	44.3951	163.2	235000	22.24
12/11/2003	2066.000	1434.722	0.35	0.36	1320	114.722	8.0%	586.5			369.00	256.250	351.486	244.087	118.0356083	73.11	38.06%	693.000	481.250	385	267.361	55.6%	40.6179	213.9	308000	32.49
12/12/2003	1905.000	1322.917	0.37	0.36	1254	68.917	5.2%	362.2			376.00	261.111	268.015	186.121	99.65529214	86.59	13.11%	851.000	590.972	344	238.889	40.4%	35.0013	352.1	507000	51.59
12/13/2003	1480.000	1027.778	0.39	0.45	1027	0.778	0.1%	4.7			381.00	264.583	202.775	140.816	90.44859121	86.98	3.84%	831.000	577.083	365	253.472	43.9%	38.2035	323.6	466000	48.77
12/14/2003	1420.000	986.111	0.44	0.43	984	2.111	0.2%	13.2			353.00	245.139	223.097	154.929	93.7409035	82.65	11.83%	809.000	561.806	359	249.306	44.4%	36.6772	312.5	450000	45.97
12/15/2003	1228.000	852.778	0.52	0.41	849	3.778	0.4%	25.3			228.00	158.333	261.720	181.750	70.60456301	51.73	26.74%	569.000	395.139	421	292.361	74.0%	38.2714	102.8	148000	13.45
12/16/2003	1061.000	736.806	0.46	0.42	733	3.806	0.5%	24.1			257.00	178.472	255.420	177.375	77.13027367	39.3	49.05%	396.000	275.000	352	244.444	88.9%	34.9346	30.6	44000	4.37
12/17/2003	1136.000	788.889	0.48	0.41	785	3.889	0.5%	24.9			288.00	200.000	261.993	181.939	83.07597621	42.91	48.34%	384.000	266.667	374	259.722	97.4%	41.7967	6.9	10000	1.12
12/18/2003	1066.000	740.278	0.45	0.44	736	4.278	0.6%	27.4			261.00	181.250	302.528	210.089	107.5707423	91.74	14.72%	679.000	471.528	317	220.139	46.7%	42.8292	251.4	362000	48.91
12/19/2003	882.000	612.500	0.49	0.44	733						296.00	205.556	307.352	213.439	101.6726905	75.67	25.57%	848.000	588.889	354	245.833	41.7%	31.5903	343.1	494000	44.08
12/20/2003	1227.000	852.083	0.52	0.4	762	90.083	10.6%	596.7			0.00	0.000	276.560	192.056	45.31251768	61.93	-36.68%	790.000	548.611	496	344.444	62.8%	38.8844	204.2	294000	23.05
12/21/2003	1403.000	974.306	0.56	0.42	762	212.306	21.8%	1498.0			0.00	0.000	239.430	166.271	35.9664519	57.98	-61.20%	790.000	548.611	496	344.444	62.8%	36.4024	204.2	294000	21.58
12/22/2003	1165.000	809.028	0.58	0.41	739	70.028	8.7%	499.2			205.00	142.361	240.759	167.194	70.25763612	56.64	19.38%	653.000	453.472	517	359.028	79.2%	44.8425	94.4	136000	11.80
12/23/2003	975.000	677.083	0.61	0.37	685						323.00	224.306	261.704	181.739	92.32922622	70.39	23.76%	800.000	555.556	523	363.194	65.4%	46.0172	192.4	277000	24.37
12/24/2003	978.000	679.167	0.68	0.37	671	8.167	1.2%	61.7			289.00	200.694	263.077	182.692	80.11466591	51.81	35.33%	702.000	487.500	536	372.222	76.4%	39.5616	115.3	166000	12.25
12/25/2003	914.000	634.722	0.78	0.37	625	9.722	1.5%	80.5			230.00	159.722	216.035	150.024	68.03125374	51.18	24.77%	503.000	349.306	503	349.306	100.0%	51.1792	0.0	0	0.00
12/26/2003	899.000	624.306	0.84	0.4	647						146.00	101.389	220.328	153.006	49.22512208	39.34	20.08%	445.000	309.028	445	309.028	100.0%	39.3398	0.0	0	0.00
12/27/2003	934.000	648.611	0.83	0.4	639	9.611	1.5%	85.1			240.00	166.667	239.875	166.580	73.23275202	53.6	26.81%	451.000	313.194	451	313.194	100.0%	53.5991	0.0	0	0.00
12/28/2003	881.000	611.806	0.84	0.4	628						265.00	184.028	323.716	224.803	100.714168	39.64	60.64%	408.000	283.333	408	283.333	100.0%	39.6417	0.0	0	0.00
12/29/2003	823.000	571.528	0.78	0.39	564	7.528	1.3%	63.4			273.00	189.583	285.975	198.594	88.70840636	44.12	50.27%	460.000	319.444	460	319.444	100.0%	44.1186	0.0	0	0.00
12/30/2003	600.000	416.667	0.81	0.44	407	9.667	2.3%	87.0			256.00	177.778	230.734	160.232	79.25356328	63.11	20.36%	603.000	418.750	532	369.444	88.2%	55.6828	49.3	71000	7.43
12/31/2003	652.000	452.778	0.86	0.47	446	6.778	1.5%	64.9			212.00	147.222	239.678	166.443	72.23616027	48.91	32.29%	634.000	440.278	633	439.583	99.8%	48.8328	0.7	1000	0.08
Ave	1038.671	721.3	0.62	0.63	589.085	146.428	17.01%	1330	3.816	6.780	309.745	215.101	273.231	189.744	100.0639897	60.43	39.18%	603.4	419.062	353.970	245.812	66.87%	35.3384	175	252258	25.370
Max	2066.00	1434.7	0.91	0.93	1320.00	1162.08	100.00%	11797	6.27	23.16	516.00	358.33	507.94	352.74	164.24	151.21	91.75%	1215.0	843.75	714.00	495.83	100.00%	35.3658	706	1017000	109.59

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TABLE 4F-61 SHEET 6 OF 7
AGRI-LIFE PROCESS CALCULATIONS
2020 TREATMENT REPORT
6/04/07 TR_4-A.T4F61.07.06.04.cdr

Agri-Life Processes

Unit Process No. 10: Sludge Thickening

Dissolved Air Flotation (DAF) Feed

Average Day Feed:	150	GPM
	1340	lb/d
Maximum Day Feed:	1170	GPM
	11800	lb/d

Thickened Sludge Solids Concentration

Average Day:	3.8	%
Maximum Day:	6.3	%

Unit Process No. 11: Anaerobic Digestion

% Volatile Solids in Digester Feed

Average for 2003[5]: 77.4 %

Digester Feed

Average Day (Total Solids):	200,200	lb/d
Maximum Day (Total Solids):	328,500	lb/d

Volatile Solids Destruction:

Average for 2003[6]: 55.2 %

Volatile Solids Loading:

Effective Volume (6 digesters):

Average Day:	76	lb VS/1000 cf/d
Maximum Day:	125	lb VS/1000 cf/d

Average Day (Volatile Solids):	155,000	lb/d
Maximum Day (Volatile Solids):	254,300	lb/d

Hydraulic Detention Time

Digester Capacity[7]:	15.26
Yearly Average Digester Effluent Flow:	603
Detention Time:	25.3

Unit Process No. 12: Centrifuge Thickening

Centrifuge Feed

Average Day Feed:	180	GPM
	25	tpd
Maximum Day Feed:	710	GPM
	110	tpd

Unit Process No. 14: Filter Press Dewatering

No daily data on Filter Press Operation

Filter Cake Production 2003

Total for the Year: 1570 Dry Tons

Unit Process No. 20: Agri-Life Storage

Agri-Life Storage 2003[8]

Average	4.4	MG
Maximum	7.3	MG

Agri-Life Production 2003

Average Day[9]:	0.0553	MGD
	55400	gpd
	14	tpd
Total Production:	5300	Tons for the year

At average day production and subtracting the amount land applied (assumed to be half of the yearly total),
6-mo storage required: 4.6 MG which is less than the 9 MG[10] available so storage capacity is adequate.

Agri-Life Production[3]

Filter Cake

Year	Land Applied (MG)	Land Applied (Dry Tons)	Acreage Utilized	Minergy[4] (Dry Tons)	Land Applied (Dry Tons)	Landfill (Dry Tons)
1998	16.9	5,943	1,966	2,669	0	0
1999	20.1	8,186	2,255	2,797	0	0
2000	16.7	5,774	1,664	1,713	0	0
2001	12.2	4,241	1,134	0	1,540	0
2002	16.6	5,729	1,670	0	455	0
2003	11.1	4,503	1,476	0	1,563	0

NOTES:

1) Sludge Processes used to produce Milorganite and Agri-Life are interconnected. However to simplify the analysis, only the sludge processes at SSWWTP are discussed in the Agri-Life Process Calculations since Agri-Life is produced at SSWWTP.

2) Data from UWS, Daily/ Weekly Operating Reports (2003).

3) Data shown is from the Biosolids Section of MMSD Contract Compliance Office, *Annual Summary of United Water Service Performance* (2003).

4) "Minergy" is the term used in the 2003 CCO Annual Summary referenced in Note 3 for the WE Energies Lightweight Aggregate Program.

5) % Volatile Solids in Digester Feed were determined by using the percent volatile solids measurement data provided in the MMSD Laboratory Information Management System (LIMS).

6) Average Volatile Solids Destruction for 2003 taken from Appendix 4G, *SSWWTP Volatile Solids Reduction Analysis*

7) Digester capacity is listed in Table 4F-44, Unit Process No. 11: Anaerobic Digestion, in this Appendix

8) Average and Maximum storage volumes taken from Appendix 4H, *UWS Storage Digester Inventory Review*

9) Average flow to Agri-Life was calculated from the flows provided in the South Shore Mass Balances included in Section 2, Operations in UWS, *Monthly Report for Milwaukee Metropolitan Sewerage District* (2003):

		To Agri-Life Q MGD	TSS lbs	BOD lbs	
1	January	0.0066046	3360	2336	
2	February	0	0	0	
3	March	0	0	0	Did not include #s in average because of apparent error
4	April	0.05	22254	13507	
5	May	0.09	54342	34615	
6	June	0.07	33996	19529	
8	August	0.001132209	576	278	
9	September	0.11	56906	35262	
10	October	0.05	27064	16053	
11	November	0.085620646	43727	23495	
12	December	0.09	45933	30748	
2003	Average	0.055335746	28815.8	17582.3	

10) Available storage capacity is listed in Table 4F-51, Unit Process No. 20: Agri-Life Storage, in this Appendix.

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Unit Process No. 13: IPS Pumping (JIWWTP)

JIWWTP Primary Sludge TO SSWWTP:		
Average Day:	190	GPM
Maximum Day	360	GPM

Unit Process No. 13: IPS Pumping (SSWWTP)

SSWWTP Waste Activated Sludge (WAS) TO JIWWTP:		
Average Day:	590	GPM
Maximum Day	1320	GPM

SSWWTP Digested Sludge (DSDS) TO JIWWTP:		
Average Day:	250	GPM
Maximum Day	500	GPM

NOTES:

1) The IPS Pumping Process connects the Milorganite® and Agri-Life operations at JIWWTP and SSWWTP. Pumping data to SSWWTP is taken from daily data provided in Table 4F-32, Milorganite® Process Calculations, and the pumping data from SSWWTP is taken from daily data provided in Table 4F-61, Agri-Life Process Calculations.