

Direct Potable Water Reuse Standard Operating Procedure

Wichita Falls, Texas

SWMOR Procedure

This SOP supersedes any previous SOP on this topic.

INTRODUCTION

The direct potable reuse project has a great deal of information required for monthly reporting to the TCEQ. This procedure will explain where to find the data that is required to complete the report.

OBJECTIVE

To provide the locations of forms and log sheets to complete the SWMOR, SWMOR-alt, and which data is reported.

PROCEDURE

For a detailed description of how to set up the SWMOR for reporting, refer to the TCEQ guidance documents: "How to Create, Customize and Save Your SWMOR-Alt" and RG-211, "Monthly Testing and Reporting at Surface Water Treatment Plants."

The forms required for completing the reports are the SWMOR, TCEQ form 00102C, and the SWMOR-Alt, TCEQ form 00102D.

Both documents and the form can be found on the TCEQ website at tceq.texas.gov.

The Operations and Maintenance Supervisor is responsible for completing the reports. In the case the Operations and Maintenance Supervisor is absent, the Water Purification Superintendent will complete the reports.

Beginning on P.2, Turbidity Data (SWMOR and SWMOR-alt):

- Enter the PWS ID, Plant ID, current month and year at the top.
- The number of connections will be provided by Utility Collections (761-7414).
- For the SWMOR, the Raw Water Pumpage will be the Secondary Reservoir raw flow from the Cypress WTP Flow Records daily form. For the SWMOR-Alt, the Raw Water Pumpage will be the RRWWTP raw flow from the Cypress WTP Flow Records daily form.
- The Treated Water Pumpage will be found on the End of Shift Report, printed each day by the SCADA.
- For the SWMOR, the Raw Water Analysis NTU and Alkalinity will be taken from the highest of the 3 8-hour samples located on the Operations Laboratory bench form, splitter

box effluent (TCEQ-28J). For the SWMOR-alt, the Raw Water Analysis NTU and Alkalinity will be taken from the highest of the 3 8-hour samples located on the Operations Laboratory bench form, raw flow control vault (TCEQ-3J).

- The Settled Water Turbidity will be found:
 - #1 will be the highest recorded 8-hour turbidity reading on the Operations Laboratory bench form for the microfiltration/RO clarifier settled turbidity (SWMOR-alt only).
 - #2 will be the highest recorded 8-hour turbidity reading on the Operations Laboratory bench form for the 2010 clarifier settled turbidity (recorded on SWMOR and SWMOR-alt).
- The 6 Combined Filter Effluent Turbidity values will be taken from the 6 samples collected at the 2010 clearwell (TCEQ-38J). These values can be found on the Operations Laboratory bench form.
- The Lowest Residual will be the lowest daily chlorine residual, reported on the End of Shift Report.

Page 3, Filter Data (SWMOR and SWMOR-alt):

- The daily maximum filter turbidity values for the 2010 filters are entered on this page. They are found on the End of Shift Report, Cypress Plant, 2010 Filter NTU, Filters 10 A through 10 E.
 - Any day a 2010 filter is started, the turbidity value 4-hours after starting will be recorded in the cell next to the maximum turbidity value. The turbidity 4-hours after starting the filter are found on the Cypress WTP Filter Records Turbidity page.

Pages 4 and 5, Disinfection Data (SWMOR and SWMOR-alt):

- The CT's recorded and printed each shift by the Operators will be reported on these pages. There are three CT's recorded each day by the Operators. The values for the LOWEST inactivation ratio for the three sample sets will be reported for the day on the SWMOR (See CT Calculation SOP). The Secondary Reservoir CTs are used for the SWMOR, and the RRWWTP CTs are used for the SWMOR-alt.

Page 6, TOCMOR (SWMOR and SWMOR-alt):

- The TOCMOR will be supplied by the Laboratory Supervisor. The data may be copied and pasted into the SWMOR and SWMOR-alt accordingly.

Page 7, TOC ACC and Page 8, Step2 Jar Test (SWMOR only):

- If needed, the alternative compliance criteria or Step 2 jar test will also be supplied by the Laboratory Supervisor. This data may also be copied and pasted to the SWMOR.

Enhanced IFE (SWMOR-alt only):

- The conventional filter data used to calculate the enhanced IFE credit will be found in an excel file recorded by the Lookout software package. The file can be accessed by the back-right Operations work station.
 - The file is located on the desktop, file name: "current year" on Server 6, example: "2014 on Server 6".

- Select the folder for the month.
- The turbidity data for conventional filters is "log_filterntu_15min_monthly".

Membrane-PBT (SWMOR-alt only):

- The Daily Pumpage, Normalized Filtrate Flux, TMP, DIT Initial Test Pressure and Pressure Drop are all printed on the Cypress WTP Reverse Osmosis Report printed each day by the SCADA.
- The Daily Max mNTU is also printed each day by SCADA on the Microfiltration Daily Max NTU Report. If the Max value is greater than or equal to 100 mNTU, the value must be "confirmed". Confirming a turbidity value greater than or equal to 100 mNTU requires the next turbidity value after the Max. If the second value is less than 100 mNTU, the original value is not confirmed, and may be dropped (the next Max value may be used). If the second value is also greater than or equal to 100 mNTU, the original value is "confirmed" and the second value is recorded.

Page 1, Summary (SWMOR and SWMOR-alt):

- In the Distribution System box, the Total Number of Readings for the Month, the Average Disinfectant Residual Value, the Number of Readings With a Low Residual and the Number of Readings with No Detectable Residual are all provided by the Laboratory Supervisor at the end of the month.
- The Percentage of Readings with a Low Residual Last Month will be taken from the previous month's SWMOR and SWMOR-alt, box 6A on the Summary page.

Once all of the pages are filled out completely, check each page for missing or incorrect data by pressing the Circle Errors button on Data Validation at the top of the page. This will circle any missing or incorrect data in red.

See attached pages:

Cypress WTP Reverse Osmosis Report
 Microfiltration Daily Max NTU Report
 End of Shift Report
 Cypress WTP Flow Record
 Operations Laboratory Bench form
 Cypress WTP Filter Record, Turbidity
 CT Calculator

See Associated SOP:

CT Calculation SOP

Cypress WTP Reverse Osmosis Report

RESET

PRINT

Test

MicroFiltration System						0.000	0.000
	Cell A	Cell B	Cell C	Cell D	Cell E	0.000	0.000
State	100	100	100	100	100	0.000	0.000
RunTime	00:00	00:00	00:00	00:00	00:00	0.000	0.000
Max ^L aseNTU	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Post PDT NTU	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Max ^O theNTU	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Post PDT NTU	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Start PSI	17.62	17.18	17.71	17.97	17.82		
PSI Drop	0.56	0.70	0.44	0.44	0.52		
PDT Time	22:46	22:46	22:46	22:46	22:46	0.886	
PDT Date	01/01/14	01/01/14	01/01/14	01/01/14	01/01/14	0.647	
Production	0	0	0	0	0		
Backwash	0	0	0	0	0		
Flux	0.00	0.00	0.00	0.00	0.00		
TMP	0.00	0.00	0.00	0.00	0.00		

Feed Water Temp 13.24

Reverse Osmosis System						
	Skid #1	Skid #2	Skid #3	Skid #4	Skid #5	Skid #6
State	OFF	OFF	OFF	OFF	OFF	OFF
RunTime	00:00	00:00	00:00	00:22	00:00	00:00
Stage 1 DP	0.0	0.0	0.0	26.3	0.0	0.0
Stage 2 DP	0.0	0.0	0.0	51.6	0.0	0.0
Permeate Flow	0.00	0.00	0.00	1.53	0.00	0.00
Concentrate Flow	0.00	0.00	0.00	1.78	0.00	0.00

HQRPS Level 10.52 RO Raw Total 0.000

Brine Discharge 0.047

RO Chemicals	Ferric	Sodium Hydroxide	Scale Inhibitor	Sulfuric Acid
Gallons	6568	3560	507	648
Pounds	29578	39188	5076	9916

Totalizers	287 East	North Beverly	287 West
MGD	1.26555	12.58293	13.21587
	441.59	907.48	528.60
	662.56	1121.33	1097.63
	58,333/hr	1139.13	1477.95
	55860	204,167/hr	208,333/hr
		197541	188329

Reset

Kickapoo Totalizer 23.522

Cypress WTP Reverse Osmosis Report

RO_Report

SERVER06 01/09/14 23:59

Date: 1/9/2014

Microfiltration Daily Max NTU Report

	Cell # 1	Cell # 2	Cell # 3	Cell # 4	Cell # 5
Max Value	0	0	0	0	0
"Confirmation" Value	0	0	0	0	0
2nd Max Value	0	0	0	0	0
"Confirmation" Value	0	0	0	0	0
3rd Max Value	0	0	0	0	0
"Confirmation" Value	0	0	0	0	0
4th Max Value	0	0	0	0	0
"Confirmation" Value	0	0	0	0	0
5th Max Value	0	0	0	0	0
Confirmation Value	0	0	0	0	0

Data extracted from: C:\Program Files\National Instruments\Lookout 5.1\2014\jan09\allcells.csv

05/09/14 00:00

PRINT

Reset2

Administrator

City of Wichita Falls
Cypress Water Treatment Plant

End of Shift Report

Description	Levels			Flow		Totalizers
	A	B	C			
Lake Arrowhead				12.500		
Lake Kickapoo				0.003	0.0	
Lake Wichita	970.4			allow	outflow	
Secondary Reservoir	20.0	18.5	13.3	12.503	12.440	
Headquarters Road	9.794			0.000	0.000	
Jasper Plant	1951			5.877		
2005				7.876		
MF				0.000		
Cypress Plant	1961			0.000		
1987				0.000		
2010				0.000		
North Beverly PS				0.000	22.5	
287 West PS				0.000	27.9	
287 East PS				0.000	2.3	

Reverse Osmosis System

State	Skid #1	Skid #2	Skid #3	Skid #4	Skid #5	Skid #6
	OFF	OFF	OFF	OFF	OFF	OFF
RunTime	00:00	00:00	00:00	00:00	00:00	00:00
Stage 1 DP	0.0	0.0	0.0	0.0	0.0	0.0
Stage 2 DP	0.0	0.0	0.0	0.0	0.0	0.0
Permeate Flow	0.00	0.00	0.00	0.00	0.00	0.00
Concentrate Flow	0.00	0.00	0.00	0.00	0.00	0.00

Kickapoo Totalizer

HORPS Level

9.79

RO Raw Total

0.000

Brine Discharge	1.825	Feed Water Temp	24.15
RO Chemicals	Ferric	Sodium Metasilicate	Sulfuric Acid
Gallons	4923	5248	861
Pounds	22173	65787	12030

Totals	287 East	North Beverly	287 West
MGD	2.25494	22.47162	27.85174

Jasper Plant

RESET		Jasper Plant												Cypress Plant																				
		Flow					Chlorine Analyzers		Filterer NTU												2010 Filterer NTU													
Raw		Discharge					GS level																											
		1951	2005	20'	30'	PSI	North	South	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	10 A	10 B	10 C	10 D	10 E									
Current		5.877	7.876	2.845	7.796	79.3	12.2	3.5	3.3	0.168	0.000	0.000	0.000	0.000	0.065	0.114	0.098	0.000	0.070	0.120	0.000	0.000	0.000	0.000	0.000									
Maximum		5.877	7.876	2.845	7.796	79.3	12.2	3.5	3.3	0.168	0.000	0.000	0.000	0.000	0.065	0.114	0.098	0.000	0.070	0.120	0.000	0.000	0.000	0.000	0.000									
Minimum		5.877	7.876	2.845	7.796	79.3	12.2	3.5	3.3	0.168	0.000	0.000	0.000	0.000	0.065	0.114	0.098	0.000	0.070	0.120	0.000	0.000	0.000	0.000	0.000									
Average		5.877	7.876	2.845	7.796	79.3	12.2	3.5	3.3	0.168	0.000	0.000	0.000	0.000	0.065	0.114	0.098	0.000	0.070	0.120	0.000	0.000	0.000	0.000	0.000									

Cypress Plant

RESET	Cypress Plant																									
	Flow												Tank Levels				Chlorine Analyzers				Filterer NTU					
	Raw				Discharge																					
	RO	1961	1987	2010	307	367	PSI	61CW	87CW	G S	1987 PS	2010 PS	61A(a)	61A(b)	61B(a)	61B(b)	61C(a)	61C(b)	61D(a)	61D(b)	87 A	87 B	87 C	87 D		
Current	0.000	0.000	0.000	0.000	0.000	0.065	0.000	36.3	7.3	6.9	28.2	2.43	2.20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
Maximum	1.643	7.013	0.000	0.000	0.000	0.171	0.000	41.9	7.4	14.9	28.2	2.43	2.20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
Minimum	0.000	0.000	0.000	0.000	0.000	-0.007	-0.006	32.2	7.3	6.4	28.1	2.43	2.20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
Average	0.000	0.000	0.000	0.000	0.000	0.058	0.000	36.2	7.3	17.8	28.3	2.43	2.20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		

Panel_End_Of_Shift

CSV Logs for the above can be found @ I:Server061 C:\Program Files\National Instruments\lookout 5.1\2012

SERVER06 05/09/14 00:00



City of Wichita Falls
Cypress Water Treatment Plant
Flow Records

Date: 3 / 2 / 2014

Time	Lake Flows		Raw Flows in MGD				Discharge Flows in MGD				Clearwell Levels in ft.			Ground Storage
	Arrowhead	Kickapoo	RO	1961	1987	2010	Total	1987 30"	2010 30"	2010 36"	1961	1987	2010	
12A	15.6		2.0		4.0						10.3	10.5	15.0	27.9
1A	15.3		2.0		4.0						10.3	10.7	15.0	27.9
2A	11.2		2.0		4.0						10.3	11.0	15.0	27.9
3A	12.7		2.0		4.0						10.3	11.1	15.0	27.9
4A	12.2		2.0		4.0						10.3	11.3	15.0	27.9
5A	12.6		2.0		4.0						10.3	11.6	15.0	27.9
6A	12.7		2.0		4.0						10.3	11.7	15.0	27.9
7A	11.4		2.0		4.0						10.3	11.9	15.0	27.9
8A	12.1		2.0		4.0						10.3	12.1	15.0	27.9
9A	9.9		2.0		4.0						10.3	12.3	15.0	27.9
10A	10.2		2.0		4.0						10.3	12.4	15.0	27.9
11A	9.9		2.0		4.0						10.3	12.6	15.0	27.9
12P	8.3		2.0		4.0						10.3	12.5	15.0	27.9
1P	8.3		2.0		4.0						10.3	12.7	15.0	27.9
2P	9.0		2.0		4.0						10.3	12.8	15.0	27.9
3P	11.6		2.0		4.0						10.3	12.9	15.0	27.9
4P	8.8		2.0		4.0						10.3	13.0	15.0	27.9
5P	8.8		2.0		4.0						10.3	13.1	15.0	27.9
6P	9.3		2.0		4.0						10.3	13.2	15.0	27.9
7P	9.4		2.0		4.0						10.3	13.3	15.0	27.9
8P	9.2		2.0		4.0						10.3	13.4	15.0	27.9
9P	10.2		2.0		4.0						10.3	13.5	15.0	27.9
10P	12.1		2.0		4.0						10.3	13.6	15.0	27.9
11P	9.0		2.0		4.0						10.3	13.7	15.0	27.9
Totals:	10.8		1.0		4.0						10.3	13.8	15.0	27.9

Total Treated Flow		14.702
Calculated Discharge Flow		14.702
G.S. Delta		0.47
Total WashWater		0.45
Combined Raw		0.02

From Filter Records Sheet

City of Wichita Falls - Water Purification

Date: 3-2-14

Cypress Water Treatment Plant Lab Analysis



	12 M	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 N	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Av.
2010 Mixed																									
Total Alk																									
Phenol Alk																									
Mono Carb																									
Mono-Total																									
pH	4.9					10.1												10.0							10.1
% Solids	7					7												70.6							8.9
2010 Filter																									
pH																									
Cl ₂ Res																									
Turbidity																									
pH																									
Cl ₂ Res																									
Turbidity																									
Free Cl ₂																									
NH ₃																									
Fluoride																									
2010 Xfr																									
Turbidity																									
Cl ₂ Res																									
pH																									
Fluoride																									
Total Hard																									
Total Alk																									
Mono-Cl ₂																									
Di-Cl ₂																									
Tri-Cl ₂																									
in Lagoon (yn)?																									

Comments:

Operator Initials:

Morning Shift: 54/50

Day Shift:

Evening Shift:



City of Wichita Falls
Cypress Water Treatment Plant

Filter Records Turbidity

Date: 3/2/2014

Start Hrs:	1961						1987				2010							
	Filter # 1		Filter # 2		Filter # 3		Filter # 4		1	2	3	4	1	2	3	4	5	
	Side A	Side B	Side A	Side B	Side A	Side B	Side A	Side B										
12 AM																		
1 AM														.069	.076			
2 AM														.070	.076			
3 AM														.074	.082			
4 AM														.072	.079			
5 AM														.071	.078			
6 AM														.070	.078			
7 AM														.069	.078			
Average														.071	.078			
8 AM														.077	.079			
9 AM														.073	.079			
10 AM														.071	.079			
11 AM														.048	.073			
12 PM														.051	.073			
1 PM														.054	.073			
2 PM														.063	.073			
3 PM														.067	.073			
Average														.071	.073			
4 PM														.069	.074			
5 PM														.076	.072			
6 PM														.072	.074			
7 PM														.076	.076			
8 PM														.077	.079			
9 PM														.076	.077			
10 PM														.076	.076			
11 PM														.075	.075			
Average														.084	.075			
Daily Max														.078	.073			
4 Hrs.																		

Quality Reference Check																		
Morning																		
Day																		
Evening																		

Enclosure H1: CT STUDY
 FOR PUBLIC WATER SYSTEMS THAT ARE USING SURFACE WATER SOURCES
 OR GROUND WATER SOURCES UNDER THE INFLUENCE OF SURFACE WATER (cont.)
CT Calculator Worksheet

PUBLIC WATER SYSTEM NAME: City of Wichita Falls Reuse Project PLANT NAME OR NUMBER: 3RWWTP to Cypress through MF/RO/Conventional
 PWS ID No.: 2430001 Date: _____

DISINFECTION PROCESS PARAMETERS							
APPROVED CT STUDY PARAMETERS					PERFORMANCE STANDARDS		
Parameters	Disinfection Zones					Log Inactivations	
	D1	D2	D3	D4	D5	Giardia lamblia Cysts	Viruses
Flow Rate (MGD)	7.500	7.500	3.308	10.000	10.000	1.0	5.0
T ₁₀ (minutes)	357.0	223.2	5.6	67.1	223.3		

DISINFECTION PROCESS DATA												
INDIVIDUAL DISINFECTION ZONES										PLANT TOTAL		
Disinfectant	C (mg/L)	Flow (MGD)	Temp (°C)	pH	CT _{CALC}	Giardia CT _{REQD}	Virus CT _{REQD}	Giardia Log	Virus Log	Giardia Log	Virus Log	Inact. Ratio
CLA D1					missing	missing	missing	missing	missing			
CLA D2					missing	missing	missing	missing	missing			
CLA D3					missing	missing	missing	missing	missing			
CLA D4					missing	missing	missing	missing	missing			
CLA D5					missing	missing	missing	missing	missing			

SUBMITTED BY: _____ Certificate No. _____ and Grade: _____ Date: _____
 TCEQ - (05-01-13) CT STUDY

H1-11

Prepared by: _____ Date: _____

Approved by: _____ Date: _____

*This SOP is considered effective on the date it is approved. SOP's are to be reviewed and/or updated annually or any time this process has changed.

Reviewed by:_____ Date:_____

Reviewed by:_____ Date:_____

Reviewed by:_____ Date:_____

Reviewed by:_____ Date:_____

Reviewed by:_____ Date:_____

Sign below and date that you have read this SOP. By signing you are stating that you understand and will defer to this SOP when applicable.

Printed Name	Signature	Date	Printed Name	Signature	Date