

City of Estevan
WT/WWT Service Division
2014
Annual Report on Drinking Water

Annual notice to consumers

44(1) At least once each year, every permittee of a waterworks supplying water intended or used for human consumptive use or hygienic use shall provide consumers supplied by the waterworks with a notification of:

- (a) the quality of water produced or supplied by the waterworks in comparison with the levels set out in these regulations; and
- (b) the permittee's compliance with sample submission requirements described in the permittee's permit.

(2) As soon as possible after complying with subsection (1), the permittee shall provide the minister with written notice of the permittee's compliance.

13 Dec 2002 cE-10.21 Reg 1 s44.

This report has been developed to meet this regulation and is available for the public to review.

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CITY OF ESTEVAN



MEMORANDUM

DATE: January 26, 2015
TO: Amber Smale, City Manager
FROM: Kevin Sutter, AScT - WTP/WWTP Manager

RE: 2014 Annual Water Quality Report

The Environmental Management and Protection Act, 2002 and the related Water Regulations, 2002, state in section 44 that at least once each year, every permittee of a waterworks intended or used for human consumptive use shall provide consumers supplied by the waterworks with a notification of:

- (a) the quality of water produced or supplied by the waterworks in comparison to the levels set out in the regulations, and
- (b) the permittee's compliance with sample submission requirements

The attached is a copy of the 2014 Annual Report and a copy of the 2014 Notice to the consumers. The 2014 Annual Report will be available at City Hall and at the Estevan Public Library as well as on a PDF format on the City Web Site. The Notice to consumers will be placed in two consecutive editions of the City Page and will also be placed on the City Web Site. The Water Security Agency will be notified that the requirements of the Act and Regulations for the notification will be met in this fashion.

Our annual average Total Trihalomethanes (TTHM) is above the Maximum Acceptable Concentration (MAC) set by the Water Security Agency for 2014. The limit is 100 parts per billion and 2013's average was 113 ppb leaving the plant. TTHM's are created when free chlorine comes into contact with carbon based organics and are regulated because of the possible carcinogenic properties these compounds hold. In 2012 the Water Security Agency and the environmental protection officer stipulated that the City must develop a plan by September 2013 on how it plans to lower the TTHM's. The City hired a consultant to study the possibility of using Rafferty water as our raw water source as it contains lower amounts of dissolved organic carbons. In doing this and utilizing the WTP improvements we have put in place over the last 8 years the study found that the TTHM levels can be reduced meeting the regulatory requirements. TTHM's were the only constituent that never met the regulatory guidelines in 2014. The City has applied for grant funding under the Canada Builds Grant to help finance this project. If it is accepted we could hope for a new intake to be completed by the end of 2016.

The Wellock Reservoir has increased the stored treated water in the City to 2 days of average use. It also allows us to increase the pressure to the North side of the city where it can be lower than required. This project also enables the development of the city to the North with a sufficient and secure water supply.

The Waterline Replacement Program has been limited in the past few years while the City reduces its overall debt, but it will need to continue to keep both the quality and quantity of the water supplied to an optimal level in the coming years.

The design has been completed for the Water Treatment Plant Residuals Management Area. This project was also included in the grant application. The residuals management would include stilling ponds to de-water the solids removed during water treatment and allow us to discharge the WTP backwash and blowdown water into the river without impact to the environment.

We received a few consumer complaints at the WTP over the year and each of them was rectified when a closed valve was found which created a dead end. These dead ends allow for the residual chlorine levels to drop which quickly reduces the water quality. When we received the complaint the area was flushed and the valve(s) opened which remedied the situation.

A major fire in the Electrical Room at the WTP that occurred in September 2013, has caused significant damage. The fire has destroyed the switch gear in this room which distributes the power to the equipment treating the water and pumping it to the City. A temporary matrix of new and used equipment was quickly assembled by the help of Bob's Electric and we were able to get all equipment operational except for the 2 largest high lift pumps, and the Genset transfer switch. This temporary switch gear has kept us going over the year that it has taken to get the electrical room rebuilt. It is now ready to be operated again, and the cost of this work which was in excess of \$700,000 has been sent to insurance.

The WTP roof has outlived its life expectancy and leaks are now occurring. The roof membrane will be replaced in 215. All other capital projects for the WTP are awaiting the Canada Builds Infrastructure Grant process.

Included in this report is the inspection documents given to the City by the Environmental Protection Officer. It stipulates that the City was out of compliance in the amount of TTHM's created during disinfection. It also stipulates that the City needs to put in place a method of treating the WTP residuals prior to discharging them to the Souris river.

City of Estevan - 2014 Notice to consumers for Water Quality Estevan Waterworks

Call 634-1822 for further explanation

Parameter	Required Testing by Permit each year	Number of Tests Completed in 2014	Number of Tests Not Meeting the Permit in 2014
1. Bacteriological A harmless form of bacteria called Total Coliform is routinely monitored in the distributed water. If found, coliform show a break down in the disinfection process or possible outside contamination. Positive results require additional testing to test for pathogens	154 Regular Samples	158	0
	A sample after each main repair or construction	40	0
2. Turbidity (on-site) - Turbidity is a measure of the clarity of the water. - For our water supply, turbidity shall not exceed 0.3 NTU from any filter.	1. After each filter on a continuous basis.	1. Continuous	0
	2. Daily from the storage reservoir before entering the distribution system	2. Every 2 hours	0
	3. At the same frequency and locations as for bacteriological samples.	3. Completed for the bacteriological samples	0
3. Fluoride (on-site) - Fluoride is added as a dental aid - Levels not to exceed 1.5 mg/l	365	365	0
4. Fluoride (off-site testing) Levels not to exceed 1.5 mg/l	52	52	0
5. Chlorine Residual (on-site) - Chlorine is added to disinfect the water and the levels must be maintained at: - a chloramine residual of not less than 0.5 mg/l throughout the distribution system. - free ammonia of >0.1 mg/l < 0.5 mg/l	1. Every four (4) hours per day for treated water entering the distribution system	1. Every 2 hours operators perform an analysis and also monitored continuous with on-line instruments	0
	2. At the same frequency and locations as for bacteriological sampling, for free and total residuals.	2. Completed for the bacteriological samples 196 samples and 296 spot checks	0
6. Chemical & Health Panel alkalinity; bicarbonate; calcium; carbonate; chloride; conductivity; hardness; magnesium; nitrate; pH; sodium; sulphate; and total dissolved solids; aluminium; arsenic; barium; boron; cadmium; chromium; copper; iron; lead; manganese; selenium; uranium; and zinc	4	4	0
7. Pesticides and Organics	1 every 2 years	1	0
8. Total Trihalomethanes (TTHM's) THM's are a disinfection by-product and are not an immediate risk but over time THM ingestion is a suspected carcinogen. Each individual sample is not to exceed 350 ppb and annual average not to exceed 100ppb	4	4	3 exceeding 100 ppb The levels of TTHM's have been reduced by switching to Chloramination but the annual average is still above 100 ppb. We are working toward another raw water source in Rafferty that contains less organics and therefore less TTHM's will be formed during disinfection.
9. Cyanide and Mercury	1 every 2 years	1	0

The City of Estevan Water Treatment Plant is a surface water plant that focuses on the removal of suspended solids and the inactivation of pathogenic organisms through a multiple barrier approach, i.e. chemical aided settling, filtration, disinfection. All limits that each parameter must be within, comes from the Environmental Protection Act 2002 and associated Regulations to that Act. Go to www.saskh2o.ca for details and a complete listing of all levels throughout the province. A full detailed listing of all the levels of these parameters as well as the Waterworks Annual Report is located at www.estevan.ca or is available at the Estevan Library and City Hall.

**CITY OF ESTEVAN
TREATED DRINKING WATER ANALYSIS
SUMMARY
2014**

NOTES:

- A value given in box denotes a calculated average over the given time period. All other values indicate the latest one time grab sample.
- All values in mg/l unless indicated otherwise.
- MAC is the Maximum Acceptable Concentration as per the Department of Environment
- IMAC is the Interim Maximum Acceptable Concentration as per the Department of Environment
- AO is the Aesthetic Objective set by the Department of Environment and Resource management
- PO is our Plant Objective.
- * Indicates a problem constituent, see comments at the end of the report for explanation.

PHYSICAL PARAMETERS:

	<u>2014</u>	<u>2013</u>	RECOMMENDED OBJECTIVE
Colour, units	6	8	15 AO
Temperature, deg C	12.9	15.3	15.0 AO
pH	7.02	0.39	6.5-9.0 AO
*Turbidity, NTU	0.08	158.85	0.30 MAC
Chlorine Free Residual leaving plant, mg/l	2.12	13.49	2.5<>1.5 PO
Fluoride, mg/l	0.6	201.5	1.5 MAC
Total Dissolved Solids, mg/l			1500 AO

HEALTH AND TOXICITY AND OTHER METALS: (mg/l)

	<u>2014</u>	<u>2013</u>	RECOMMENDED OBJECTIVE
Boron	0.40	0.22	5 IMAC
Cyanide Total	<0.002	<0.002	0.2 MAC
Mercury	<0.00002	<0.00002	0.001 MAC
Selenium	0.00245	0.00188	0.01 MAC
Aluminium	0.0532	0.0341	0.2 PO
Arsenic	0.00241	0.00172	0.025 MAC
Barium	0.0953	0.0848	1 MAC
Calcium	82.2	70	
Cadmium	0.000027	0.000018	0.005 MAC
Chromium	0.00031	<0.00020	0.05 MAC
Copper	0.0081	0.00524	1 MAC
Iron	<0.02	<0.02	0.3 MAC
Potassium	19.7	16.9	
Magnesium	60.7	34	500 MAC
Sodium	179	131	300 AO
Lead	0.00017	0.00013	0.01 MAC
Zinc	<0.0050	<0.0050	5 AO
Uranium	0.00286	0.00198	0.02 MAC
* Total Trihalomethanes In Distribution System	113	123	Sample to be < 0.35 One year ave < 0.10 MAC

BACTERIOLOGICAL:

	<u>2014</u>	<u>2013</u>	RECOMMENDED OBJECTIVE
Total Samples Taken	158	160	
<200 Background	0	0	No sample to contain >200 background
*>200 Background			0 MAC
Positive Coliform Bacteria			
Giardia			
Cryptosporidium			

OTHER IN-HOUSE LAB RESULTS:

	<u>2014</u>	<u>2013</u>	RECOMMENDED OBJECTIVE
Alkalinity	221	1191	500 AO
Conductivity	1391	0	
Iron	0.02	0.03	0.3 AO
Chlorides	11	366	250 AO
Hardness	434	2	800 AO
Nitrates	1.9	321.0	45 MAC
Sulphates	376	0	500 MAC
Manganese	0.037	9.492	0.05 AO

PESTICIDES and OTHER ORGANICS:

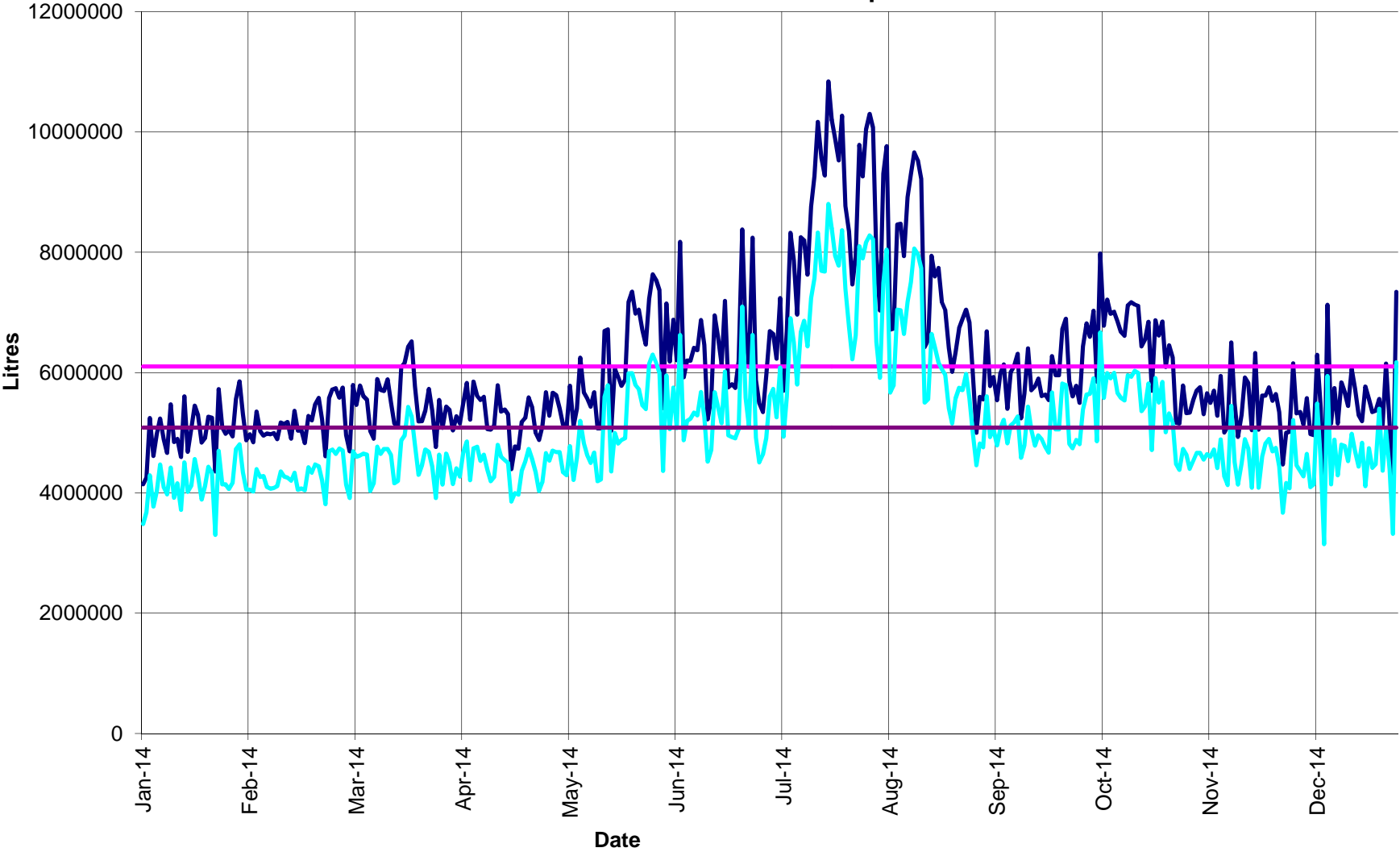
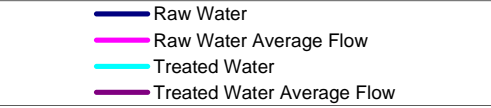
	<u>2014</u>	<u>2013</u>	RECOMMENDED OBJECTIVE
2,4-D	<0.00015	<0.00015	0.1 IMAC
1,1-Dichloroethylene	<0.001	<0.001	0.014 MAC
1,2-Dichlorobenzene	<0.001	<0.001	0.02 MAC
1,2-Dichloroethane	<0.001	<0.001	
1,4-Dichlorobenzene	<0.001	<0.001	
2,3,4,6-Tetrachlorophenol	<0.0005	<0.0005	0.1 MAC
2,4-Dichlorophenol	<0.0005	<0.0005	0.9 MAC
2,4,6-Trichlorophenol	<0.0005	<0.0005	0.005 MAC
Atrazine	<0.0001	<0.0001	0.009 IMAC
Benzene	<0.0005	<0.0005	0.005 MAC
Benzo (a) pyrene	<0.00001	<0.00001	0.00001 MAC
Bromoxynil	<0.00010	<0.00010	0.005 IMAC
Carbon Tetrachloride	<0.00010	0.0016	0.005 MAC
Chlorobenzene	<0.001	<0.001	0.08 MAC
Chlorpyrifos	<0.00010	<0.00010	0.09 MAC
Carbofuran	<0.00010	<0.00010	0.09 MAC
Dichloromethane/Methylene chloride	<0.0010	<0.0010	0.05 MAC
Dimethoate	<0.00010	<0.00010	0.2 IMAC
Dicamba	<0.00010	<0.00010	0.12 MAC
Diclofop-methyl	<0.00010	<0.00010	0.009 MAC
Ethylbenzene	<0.00050	<0.00050	
Malathion	<0.00010	<0.00010	0.19 MAC
Pentachlorophenol (PCP)	<0.0001	<0.0001	0.06 MAC
Picloram	<0.0001	<0.0001	0.19 IMAC
Trifluralin	<0.00010	<0.00010	0.045 IMAC
Toluene	<0.0005	<0.0005	0.024 AO
Tetrachloroethylene	<0.0010	<0.0010	0.05 MAC
Vinyl chloride	<0.0005	<0.0005	0.002 MAC
Xylene	<0.0005	<0.0005	0.3 AO

COMMENTS:

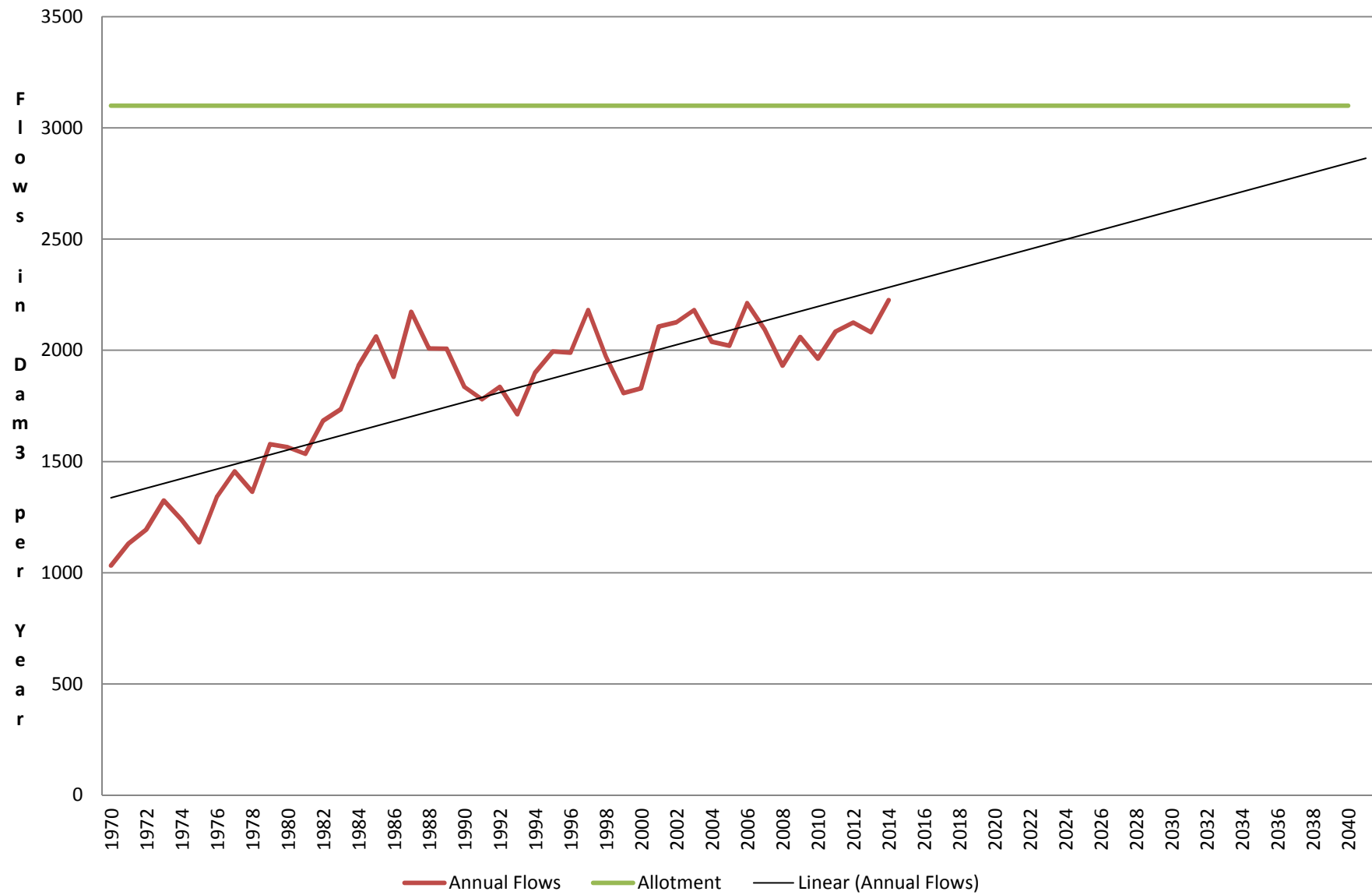
Total Trihalomethanes (THM)

The maximum concentration of THMs in any one sample is 0.35 mg/l, which we are under. Over the long term, the average concentration in the samples collected throughout the year should be below 0.10 mg/l. We will not be able to achieve this. Until an alternate water source is found or the City uses a different treatment technology.

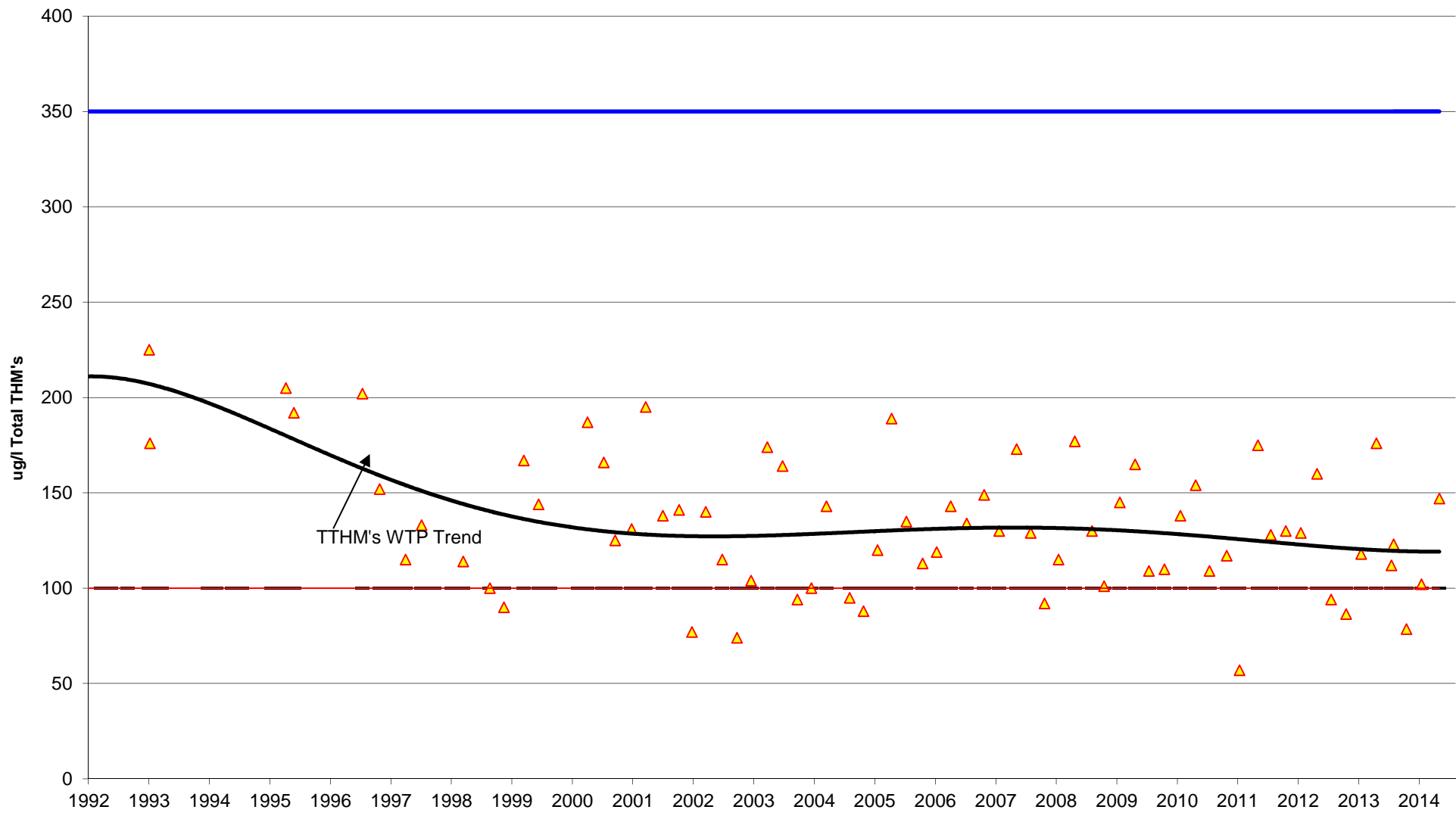
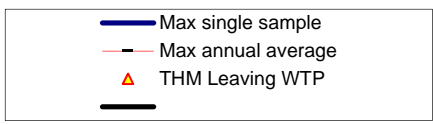
City of Estevan Water Treatment Plant 2014 Water Consumption



City of Estevan Water Usage From Boundary Dam



City of Estevan Water Distribution System 1992 to 2014



**CITY OF ESTEVAN
RAW WATER ANALYSIS
SUMMARY**

2014

NOTES:

- A sample of Boundary Dam water is sent away to an independent lab 4 times a year as is required by permit. The following chart lists these results.
- Many other analysis are completed in house on the raw water for operation reasons, but this is the testing that we are required to report.
- All values in mg/l unless indicated otherwise.

Parameter	3-Feb-2014	5-May-2014	11-Aug-2014	17-Nov-2014
Suspended Solids (fixed)	5	0	9	4
Suspended Solids (volatile)	2	2	3	1
Suspended Solids (Total)	7	2	12	5
Conductivity	1260	1171	1487	1599
Sulphate	413	383	520	564
pH	8.3	8.2	8.1	8.5
Total Alkalinity	232	213	261	286
Bicarbonate	283	260	318	333
Sodium	143	132	179	185
Magnesium	48	45	59	60
Calcium	75	71	79	85
Total Hardness	385	363	440	459
Chloride	16.5	17	22	24
Potassium	16	16	18	17
BOD	0.0	0.0	0.0	0.0
Dissolved Organic Carbon	13.8	13.3	15.4	21.3
Total Nitrogen	1.70	1.70	1.60	1.60
TKN	1.1	1.0	1.0	1.0
Phosphorus (Total)	0.36	1.44	0.54	0.48
Phosphorus (Ortho)	0.33	0.33	0.48	0.45
E.Coli	0	0	0	41
MPN Coliforms (Total)	0	98	117800	63
TDS	995	924	1196	1279
% UV Transmittance	40	40	31	37

2014 Average
4.5 mg/l
2 mg/l
7 mg/l
1379 uS/cm
470 mg/l
8.3 units
248 mg/l
299 mg/l
159.75 mg/l
53 mg/l
77.5 mg/l
411.75 mg/l
20 mg/l
17 mg/l
0.0 mg/l
16.0 mg/l
1.65 mg/l
1.0 mg/l
0.71 mg/l
0.40 mg/l
10.25 orgs/100ml
29490 orgs/100ml
1099 mg/l
37 %

2013Average
6 mg/l
2.25 mg/l
8 mg/l
1247.25 uS/cm
409 mg/l
8.3 units
243.75 mg/l
295 mg/l
142 mg/l
48.75 mg/l
74.25 mg/l
386.25 mg/l
17.875 mg/l
15.75 mg/l
1.05 mg/l
13.5 mg/l
1.35 mg/l
1.0 mg/l
0.40 mg/l
0.35 mg/l
18.25 orgs/100ml
1360 orgs/100ml
1004 mg/l
38.25 %

**City of Estevan
Water Treatment Plant
2014 Quarterly Summary
January - March**

Daily Flows	Daily Maximum (l)	Daily Minimum (l)	Daily Average (l)
Raw Water	6,519,400	4,142,700	5,244,426
Treated Water	5,428,700	3,299,400	4,332,301

Physical Parameters	Daily Maximum	Daily Minimum	Daily Average
Treated Water			
Temperature (Deg C)	8.1	4.1	6.2
Turbidity (NTU)	0.13	0.07	0.09
Colour (Units)	9	2	7
Ph	7.09	6.83	6.99

General Chemical Composition	Daily Maximum	Daily Minimum	Daily Average
Treated Water			
Chlorine residual (mg/l)	2.34	1.53	2.14
Fluoride (mg/l)	1.12	0.22	0.53
Alkalinity (mg/l)	220	182	202
Conductivity (microohms/cm3)	1320	1240	1287
Iron (mg/l)	0.04	0.01	0.02
Manganese (mg/l)	0.075	0.020	0.041
Chlorides (mg/l)	17	3.2	9
Hardness (mg/l)	456	366	406
Nitrates (mg/l)	1.7	1.5	1.6
Sulfates (mg/l)	390	270	332

Outside lab analysis

One time grab samples treated water	February 3, 2014
Trihalomethanes (ug/l) @ Dist. System	78.6
Calcium (mg/l)	74
Magnesium (mg/l)	47
Sodium (mg/l)	143
Sulphate (mg/l)	449
TDS (mg/l)	988

City of Estevan
Water Treatment Plant
2014 Quarterly Summary
April - June

Daily Flows	Daily Maximum (l)	Daily Minimum (l)	Daily Average (l)
Raw Water	8,380,000	4,394,200	5,935,738
Treated Water	7,097,300	3,855,200	4,950,920

Physical Parameters	Daily Maximum	Daily Minimum	Daily Average
Treated Water			
Temperature (Deg C)	18.4	7.8	13.2
Turbidity (NTU)	0.16	0.08	0.10
Colour (Units)	10	1	6
pH	7.04	6.80	6.89

General Chemical Composition	Daily Maximum	Daily Minimum	Daily Average
Treated Water			
WTP Chlorine residual (mg/l)	4.00	1.88	2.15
Fluoride (mg/l)	0.89	0.05	0.48
Alkalinity (mg/l)	228	168	200
Conductivity (microohms/cm3)	1370	1140	1238
Iron (mg/l)	0.02	0.01	0.01
Manganese (mg/l)	0.066	0.017	0.033
Chlorides (mg/l)	28.5	4.0	11
Hardness (mg/l)	428	352	383
Nitrates (mg/l)	2.2	1.4	1.9
Sulfates (mg/l)	440	250	315

Outside lab analysis

One time grab samples treated water	May 5, 2014
Trihalomethanes (ug/l) @ Dist. System	102
Calcium (mg/l)	70
Magnesium (mg/l)	45
Sodium (mg/l)	131
Sulphate (mg/l)	418
TDS (mg/l)	920

**City of Estevan
Water Treatment Plant
2014 Quarterly Summary
July - September**

Daily Flows	Daily Maximum (l)	Daily Minimum (l)	Daily Average (l)
Raw Water	10,840,100	4,998,400	7,345,502
Treated Water	8,802,200	4,459,800	6,145,774

Physical Parameters	Daily Maximum	Daily Minimum	Daily Average
Treated Water			
Temperature (Deg C)	24.2	18.0	21.2
Turbidity (NTU)	0.11	0.05	0.08
Colour (Units)	11	2	6
Ph	7.17	6.87	6.98

General Chemical Composition	Daily Maximum	Daily Minimum	Daily Average
Treated Water			
Chlorine residual (mg/l)	2.31	1.70	2.04
Fluoride (mg/l)	1.18	0.23	0.70
Alkalinity (mg/l)	252	208	231
Conductivity (microohms/cm3)	1520	1420	1474
Iron (mg/l)	0.06	0.01	0.02
Manganese (mg/l)	0.051	0.013	0.031
Chlorides (mg/l)	22.4	4.0	12
Hardness (mg/l)	476	440	456
Nitrates (mg/l)	2.2	1.9	2.1
Sulfates (mg/l)	420	330	379

Outside lab analysis

One time grab samples treated water	August 20, 2014
Trihalomethanes (ug/l) @ Dist. System	147
Calcium (mg/l)	78
Magnesium (mg/l)	59
Sodium (mg/l)	179
Sulphate (mg/l)	552

**City of Estevan
Water Treatment Plant
2014 Quarterly Summary
October - December**

Daily Flows	Daily Maximum (l)	Daily Minimum (l)	Daily Average (l)
Raw Water	7,979,600	3,831,100	5,852,768
Treated Water	6,667,600	3,147,200	4,887,934

Physical Parameters	Daily Maximum	Daily Minimum	Daily Average
Treated Water			
Temperature (Deg C)	19.5	4.6	11.0
Turbidity (NTU)	0.08	0.04	0.06
Colour (Units)	10	1	6
Ph	7.33	7.06	7.21

General Chemical Composition	Daily Maximum	Daily Minimum	Daily Average
Treated Water			
Chlorine residual (mg/l)	2.42	1.89	2.14
Fluoride (mg/l)	1.29	0.20	0.64
Alkalinity (mg/l)	276	227	252
Conductivity (microohms/cm3)	1640	1380	1567
Iron (mg/l)	0.04	0.01	0.02
Manganese (mg/l)	0.069	0.019	0.044
Chlorides (mg/l)	20.1	5.6	11
Hardness (mg/l)	540	460	491
Nitrates (mg/l)	2.3	1.5	2.0
Sulfates (mg/l)	780	360	476

Outside lab analysis

One time grab samples treated water	November 17, 2014
Trihalomethanes (ug/l) @ Dist. System	123
Calcium (mg/l)	86
Magnesium (mg/l)	64
Sodium (mg/l)	199
Sulphate (mg/l)	597
TDS (mg/l)	1293



Government of
Saskatchewan

**Waterworks Compliance Inspection -
Human Consumptive Use (Part I)**

System Name: ESTEVAN WATERWORKS Remote Inspection ID: 241912
 Approval No: 00002474-04-00
 Population: 12000 Announced: No
 Date: 12/9/2014 8:00 Person interviewed: SUTTER, KEVIN

General Section
 Water Supplies in Service: SURFACE WATER System Classification: FOUR, WT TWO, WD
 # of Service Connections: 3850 System Type: MUNICIPAL SYSTEM
 Service Connection Metering: Yes
 Comments: N/A

Contacts

Name	Position	Phone / Fax	Email
GALLAGHER, MIKE	OPERATOR	Business: (306) 634-1822 Phone: (306) 388-2545	N/A
SUTTER, KEVIN	MANAGER	Business: (306) 634-1822 Cell: (306) 421-0114	N/A
MARCOTTE, NICOLE	CERTIFIED OPERATOR	Business: (306) 634-1822	N/A
VELESTUK-FICHTER, TRACY	CERTIFIED OPERATOR	Business: (306) 634-1822	N/A
MESSNER, TYSON	CERTIFIED OPERATOR	Business: (306) 634-1822	N/A
Complaints:			
PERIODIC DISCOLORED WATER COMPLAINTS			
Information Delivered to Operator:			
NONE			

Operator Certification Section

Operator Name	Certification Levels		Expiry Date	Operator is a Supervisor	Certification Exam Written	Taken Training	
	Water Distribution	Water Treatment				# of CEUs	Plans to Test or Take Training
SUTTER, KEVIN	TWO	FOUR	15-Sep-15	Yes	Yes	0	Yes
MARCOTTE, NICOLE	TWO	FOUR	15-Sep-15	No	Yes	0	Yes
VELESTUK-FICHTER, TRACY	TWO	FOUR	15-Sep-15	No	Yes	0	Yes
MESSNER, TYSON	TWO	THREE	15-Apr-16	No	Yes	0.6	Yes
GALLAGHER, MIKE	IN PROGRESS	IN PROGRESS	N/A	No	No	0	Yes

Test Results

Station #	Sample ID	Location/Comments	Variable	Flag	Measurement	Qualifier
SK05NB0007	2014065259	WATER PLANT	N/A	N/A	N/A	N/A
"	2014065260	WELLOCK RESERVOIR	CHLORINE (FREE)	N/A	990 mg/l	N/A
"	"	"	CHLORINE (TOTAL)	N/A	2,050 mg/l	N/A
"	"	"	TURBIDITY	N/A	201 NTU	N/A
"	2014065261	JOHNSON PLUMBING	CHLORINE (FREE)	N/A	100 mg/l	N/A
"	"	"	CHLORINE (TOTAL)	N/A	1,560 mg/l	N/A
"	"	"	TURBIDITY	N/A	352 NTU	N/A
"	2014065262	SHELL	CHLORINE (FREE)	N/A	140 mg/l	N/A
"	"	"	CHLORINE (TOTAL)	N/A	2,920 mg/l	N/A
"	"	"	TURBIDITY	N/A	198 NTU	N/A
"	2014065263	GMR	CHLORINE (FREE)	N/A	120 mg/l	N/A
"	"	"	CHLORINE (TOTAL)	N/A	1,700 mg/l	N/A
"	"	"	TURBIDITY	N/A	265 NTU	N/A
SK05NB0029	2014065264	AFTER FILTER 1	TURBIDITY	N/A	.113 NTU	N/A
SK05NB0007	2014065265	AFTER FILTER 2	TURBIDITY	N/A	.117 NTU	N/A
"	2014065266	AFTER FILTER 3	TURBIDITY	N/A	.097 NTU	N/A
"	2014065267	AFTER FILTER 4	TURBIDITY	N/A	.102 NTU	N/A

Equipment Validation

Turbidity							
Equipment Type	Equipment Name/Number	STD1 (Expected, Test)	STD2 (Expected, Test)	STD3 (Expected, Test)	STD4 (Expected, Test)	Result	Gel Standard

Chlorine					
Equipment Type	Equipment Name/Number	STD1 (Expected, Test)	STD2 (Expected, Test)	STD3 (Expected, Test)	Result

Human Consumptive Regulatory Section

C-Compliant	NC=Non-Compliant	N/A=Not Applicable	General	Comments
X			Approved system EMPA 21(1)	
X			Certified operator 63	
			Distribution System	
X			Common trenching 26(1,2,3)	
X			Inspection of new and repaired pipelines 30(4)	
			Water Storage Reservoirs	
X			Water tight cover 27(2)a	
X			In good repair 27(2)b	
X			Manholes 27(3,4)	
X			Pipe entries installed to prevent contamination 27(5)	
X			Vents 27(6)	
			Water Treatment Plants and Pumphouses	
X			Floor drainage 28(a)	
X			Drain lines to sanitary sewers have trap 28(b)	
X			Backflow prevention device 28(c)	
X			Water meter(s) installed 28(d)	
X			Adjustable chemical feeder 28(e)	
X			Facility is clean and in orderly condition 28(f)	
X			Approved chemicals being used 30(3)	
X			Proper fluoride chemical dosage 30(7)	
			Disinfection	
X			Continuous disinfection 30(5)	
X			A free chlorine residual as required in the Permit to Operate a Waterworks - EMPA2002 Section 23(1)(a) and 34(1)(2)	FREE CHLORINE REQUIRED PRIOR TO AMMONIA ADDITION.
X			A total chlorine residual of not less than 0.5 mg/L OR a free chlorine residual of not less than 0.1 mg/L in water throughout the distribution system 30(6)b	
			Standards	
X			Bacteriological 32	
			Turbidity	
			Surface	
			Chemically Assisted Filtration	
			Source Water Greater than or equal to 1.5	
X			Less than or equal to 0.3 NTU discrete measurements (95%) 33(2)(a)(i)(A)	
X			Less than or equal to 0.3 NTU continuous measurements (95%) 33(2)(a)(i)(B) (2)(a)(ii)	
X			Not to exceed 1.0 NTU 33(2)(a)(ii)(C)	
			Source Water less than 1.5	
			Membrane Filtration	
			Slow Sand/Diatomaceous Earth Filtration	
X			3-log reduction of Giardia lamblia and Cryptosporidium parvum 33(2)(d)	
X			4-log reduction of viruses 33(2)(e)	
X			Waterworks turbidity levels meet the standards (Effective Dec 2006 2008)	
	X		Chemical standards 29(4,5) and 34	THE TREATMENT PLANT PROJECT SHOWS A 20-40% REDUCTION IN THMS. THE CITY IS ALSO INVESTIGATING THE USE OF AIR TO OFF GAS THE THMS. THE RESULT SEEMS PROMISING. THE AVG FOR 2014 WAS 120UG/L. THIS ISSUE MUST BE RECTIFIED.
	X		Waterworks meets the chemical health and pesticide related standards (Effective Dec 2008 2010)	SEE ABOVE
			Assessment	
X			Proper waterworks assessment 35	ASSESSMENT IS IN THE DRAFT STAGE. RECEIVED HARD COPY TODAY. FINAL COPY DUE BY DECEMBER 31, 2015
			Operational Anomalies	
X			Reported upset condition 37(1)	
X			Reported chlorine upset 37(2)	
			Testing	
X			Bacteriological testing 39(1)	
X			Bacteriological follow-up 39(4) (9)	
X			Bacteriological sample after completion, alteration, extension or repair 40	
X			Chlorine monitoring 39(1)	
X			Fluoride monitoring 41	
			Other Constituents 39(1)a	
X			General chemical sampling conducted	DONE AS REQUIRED
X			Health and toxicity sampling conducted	DONE AS REQUIRED
X			Trihalomethane sampling conducted	DONE AS REQUIRED
X			Pesticides sampling conducted	DONE AS REQUIRED
X			On-site turbidity tests conducted	
X			Accredited laboratory 39(2)	
			Operational Records	
X			Daily water meter reading 42(1)a	
X			Types, storages and total amounts of chemical 42(1)b	
X			Samples - locations, sampler and results 42(1)c	
X			Abnormal operating procedures 42(1)d (1)e	
X			Upset conditions 42(1)f	
X			Chlorine upsets 42(1)g	
X			Calibration of equipment 42(1)h	
X			Maintenance 42(1)i	
X			Chronological order 42(2)a	
X			Permittee recorder 42(2)b	
X			Identification of recorder 42(2)c	
X			Five year history of log 42(2)d	
X			Explanatory notes 42(2)e	
X			Factual data entry 42(2)f	
X			No default values used 42(2)g	
			QA/QC and Recordkeeping	
X			QA/QC in place 43(1)	
X			Monthly review 43(2)	
X			Report abnormal records 43(3)	
			Annual Notice To Customers	
X			Quality 44(1)a	
X			Compliance 44(1)b	
X			Notification of consumer report to Minister 44(2)	2014 NOTICE DUE BY JUNE 30, 2015
			General	
				THE CITY HAS A DESIGN COMPLETED FOR BACKWASH WATER REMEDIATION. THE PROJECT WAS PROPOSED FOR 2013 BUT IT WAS CUT FROM THE BUDGET AND IS NOW SCHEDULED FOR 2014. THE MANAGER REPORTS THIS WAS CUT FOR 2014 NOW AS WELL. THE CITY MUST FINALIZE THIS PROJECT TO ENSURE THE RESIDUALS DO NOT ENTER THE RIVER. TENDER PACKAGES COMPLETED AND THE CITY IS APPLYING FOR GRANT MONEY. ALSO THE CITY SHOULD INVESTIGATE WITH THE CHEMICAL MANUFACTURERS TO ENSURE THE CHEMICAL ROOM SET BACK DISTANCES FOR EACH CHEMICAL IS ACCURATE. NOT COMPLETED. WILL QUERY MANUFACTURERS ASAP.
			General comments	
X			Split sampling with the operator was completed	
X			Operator's test equipment is performing adequately	
X			Representative of the waterworks signature was obtained	YES
X			Representative of the waterworks agreed with the inspection statements	YES

 2/15

Water Treatment Plant Monthly Operating Record

Date	Flows		Chemical Use & Costs								Daily Water Analysis										Weekly Water Analysis								Filter Operation					
											Residual Cl2 (mg/l)		Temperature (C)		Turbidity (NTU)		Color (units)		pH		Fluoride (mg/l)		Constituent (mg/l)								Hours Between Wash			
	Raw Water	Treated Water	Chlorine Tonners (kgs)	Chlorine Cylinder (kgs)	KMnO4 (kegs)	Ammonia (bags)	Alum (cm)	Caustic (kgs)	Fluoride (drums)	Polymer (bags)	Clarifier #1 / #2	Chlorine Residual	Raw Water Temp	Treated Water Temp	Raw Water Turbidity	Treated Water Turbidity	Raw Water Color	Treated Water Color	Raw Water pH	Treated Water pH	Raw Water Fluoride	Treated Water Fluoride	Alkalinity	Conductivity	Iron	Manganese	Chlorides	Hardness	Nitrates	Sulfates	Filter #1	Filter #2	Filter #3	Filter #4
1-Nov-14	5333200	4399700	31.00	2.7			7.0			.35\39	1.89	14.9	16.0	7.25	0.06	85	5	8.42	7.28		0.39													
2-Nov-14	5547100	4535400	33.00	3.0	1.0		7.0			.42\42	2.29	14.0	14.3	5.06	0.05	85	7	8.42	7.20		0.48													
3-Nov-14	5697300	4664200	33.00	2.3			8.0			.41\37	2.28	13.5	14.2	4.35	0.07	78	8	8.44	7.21	0.20	0.38	252	1570											
4-Nov-14	5756000	4663800	33.00	2.9	1.0		7.0			.72\51	2.21	12.9	13.7	4.28	0.06	75	8	8.47	7.22		0.50													
5-Nov-14	5306700	4554100	31.00	2.9			7.0			.66\54	2.24	12.3	13.1	3.80	0.05	68	4	8.48	7.22		0.31													
6-Nov-14	5657600	4645100	33.00	1.1		5	8.0		1	.52\50	2.20	12.0	13.1	4.11	0.05	72	8	8.55	7.21		0.53													
7-Nov-14	5495400	4600400	29.00	1.6	1.0		7.0			.44	2.10	12.2	12.7	6.71	0.05	93	5	8.48	7.21		0.49													
8-Nov-14	5699600	4718900	33.00	1.6			7.0			.39\42	2.17	12.5	13.3	8.15	0.05	80	3	8.49	7.23		0.50													
9-Nov-14	5283800	4412800	30.00	1.0	1.0		7.0			.48\47	2.12	12.0	12.4	6.52	0.04	84	4	8.45	7.23		0.41	276												
10-Nov-14	5941900	4889300	35.00	2.5			7.0			.40\54	2.22	10.8	12.0	4.73	0.05	82	9	8.50	7.22	0.21	0.52		1560											
11-Nov-14	5003700	4270100	29.00	2.2	1.0		7.0			.38\54	2.23	11.3	11.5	4.34	0.05	76	7	8.47	7.17		0.55													
12-Nov-14	5100300	4127100	32.00	2.5			6.0			.57\59	2.19	9.7	11.0	4.77	0.05	78	7	8.49	7.21		0.98													
13-Nov-14	6501800	5444400	38.00	3.9	1.0		8.0			.58\51	2.08	9.2	10.3	5.02	0.05	87	9	8.51	7.19		0.79													
14-Nov-14	5493800	4511100	32.00	0.7			7.0			.45\47	2.12	10.1	10.4	6.62	0.06	72	6	8.45	7.17		0.55													
15-Nov-14	4932300	4135400	28.00	1.5		5	7.0			.44\49	2.07	9.7	10.4	7.49	0.05	98	3	8.45	7.18		0.43													
16-Nov-14	5295100	4483200	31.00	0.9			7.0			.52\43	1.95	9.2	9.3	6.50	0.05	86	6	8.42	7.19		0.54	260												
17-Nov-14	5917900	4892200	35.00	0.9	1.0		7.0			.39\41	2.14	7.6	9.0	7.50	0.04	70	3	8.49	7.20	0.49	0.69		1580											
18-Nov-14	5828300	4741700	34.00	1.6			7.0			.45\39	2.18	7.6	7.8	4.54	0.05	92	6	8.44	7.19		0.64			0.02	0.05									
19-Nov-14	5042700	4086500	31.00	2.0			6.0			.39\44	1.97	8.9	7.7	7.09	0.07	90	6	8.37	7.23		0.36													
20-Nov-14	6324300	5079400	40.00	1.3	1.0		8.0			.46\52	2.14	6.1	7.5	6.53	0.06	96	6	8.60	7.28		0.28													
21-Nov-14	5052900	4085700	30.00	2.7			7.0			.64\62	2.20	5.9	6.9	5.86	0.07	78	2	8.59	7.28		0.71													
22-Nov-14	5616300	4605800	35.00	1.0		5	7.0			.57\52	2.12	6.4	6.8	8.09	0.07	62	4	8.59	7.26		0.43													
23-Nov-14	5618400	4823800	34.00	2.3	1.0		7.0			.56\54	2.00	7.0	7.5	8.20	0.05	135	2	8.32	7.27		0.63	252												
24-Nov-14	5753000	4896600	36.00	2.2			8.0			.57	2.13	6.2	7.0	7.35	0.06	69	1	8.54	7.27	0.58	0.73		1580											
25-Nov-14	5529700	4688600	34.00	2.0			7.0		1	.49\50	2.19	6.0	6.7	5.30	0.04	80	6	8.52	7.25		0.73													
26-Nov-14	5640600	4744800	36.00	2.7	1.0		7.0			.42\44	2.19	5.6	7.0	6.04	0.04	91	6	8.54	7.27		0.72													
27-Nov-14	5341800	4438900	33.00	2.7			7.0			.50\57	2.11	5.4	6.5	6.14	0.05	88	3	8.59	7.28		0.85													
28-Nov-14	4470600	3668500	27.00	1.4			6.0			.39\57	2.16	5.3	6.9	5.74	0.06	84	3	8.64	7.32		0.82													
29-Nov-14	4998300	4162600	30.00	2.2	1.0		6.0			.37\50	2.10	6.5	6.0	5.59	0.06	79	4	8.54	7.28		0.64													
30-Nov-14	5015500	4078300	31.00	1.4			7.0			.79\69	2.11	5.4	6.3	9.44	0.07	103	2	8.53	7.27		0.45	256												
Totals	liters imp gal	164195900 36118763	136048400 29927056	977	59.52	550	337.5	211 14,907	0	2	0																							
		Costs	\$840.22	\$122.02	\$2,200.00	\$637.88	\$4,621.22	\$0.00	\$380.80	\$0.00																								

