

CITY OF ST. JOSEPH WATER FILTRATION PLANT

OPERATIONAL REPORT

JUNE 2014



Mission Statement

WSJOB- The City and Authority working together to provide safe drinking water of the highest quality to all of our customers at the lowest possible price.

WATER PLANT REPORT-JUNE 2014

Water demand in June was up by 2,803,000 gallons from last year which represents a 1.8% increase. This year 161,534,590 gallons were delivered which compares to 158,731,916 gallons delivered in June of 2013. The 2014 June pumpage ranked 26th in the 30 year tabulation dating back to 1985.

GENERAL ACTIVITIES

Water Plant Security

Simplex Grinnell was approved to install security cameras and card access at the water plant. The equipment is on order and is expected by sometime in July. The plan is for Mead & White and water plant staff to route and run conduit and for Simplex Grinnell to furnish and install the equipment.

Lead & Copper Monitoring

Lead and copper enter drinking water primarily through plumbing materials. Exposure to lead and copper may cause health problems ranging from stomach distress to brain damage. On June 7, 1991, EPA published a regulation to control lead and copper in drinking water. This regulation is known as the Lead and Copper Rule (also referred to as the LCR or 1991 Rule).

The treatment technique for the rule requires systems to monitor drinking water at customer taps. If lead concentrations exceed an action level of 15 ppb or copper concentrations exceed an action level of 1.3 ppm in more than 10% of customer taps sampled, the system must undertake a number of additional actions to control corrosion. If the action level for lead is exceeded, the system must also inform the public about steps they should take to protect their health and may have to replace lead service lines under their control.

On June 3rd sample bottles were distributed to customer homes served by the City of St. Joseph. Customers were asked to fill the bottles with first draw samples taken after the water had been allowed to sit in the pipe for a minimum of six hours. The samples were then picked up and will be shipped to the MDEQ laboratory. The results were received and forwarded to those who participated in the monitoring group. MDEQ will review the results and determine the system compliance. The City of St. Joseph has been in full compliance with the Lead & Copper Rule since its inception in 1991. Based upon staff preliminary and unofficial review of the results, the lead found in 90% of the homes was 2 parts per billion (ppb) or below and the highest result was 7 ppb.

2013 Consumer Confidence Report (To Issue June 2014)

The 2013 Consumer Confidence Report was mailed to all residents residing in the St. Joseph and Stevensville zip codes on June 27th. The feature articles and format were identical to last year. The lead article was the Odd-Even Sprinkling Ordinance which was followed by the article on the background and make up of the area water and wastewater authorities. The color format was changed. We are pleased to report that water quality has been excellent and the City of St. Joseph remains in full compliance with the Safe Drinking Water Act. Please note that we did correct the version included in

last month's report. The monitoring results for nitrates and UCMR III contaminants were not included in that copy.

Strategic Capital Improvement Plan

Plant staff met with Tony Myers of CH2M Hill at the water plant on April 30th for the On-site Facility Review and Assessment phase of the SCIP. Staff completed an Asset Hierarchy that was forwarded to Hill and was discussed and further developed in phone conference meeting on May 12th and May 21st. The asset hierarchy is part of an extensive database developed by Hill that will include asset rankings based on a number of criteria such as regulatory compliance, consequence of failure and water quality. Hill was back in June for the Process Assessment. A condition assessment is scheduled for July and we are in the process of forwarding water demand, GIS and water conservation information to them. The anticipated completion date is in October.

MDEQ Sanitary Survey-City of St. Joseph WSSN#6310

Gary Wozniak, MDEQ District Engineer completed the 2013 Sanitary Survey which was forwarded to City staff for review. This is a time consuming but vital task for Mr. Wozniak and we thank him for his effort and dedication. The primary purpose of a sanitary survey is to evaluate and document the capabilities of the water system's sources, treatment, storage, distribution network, operation and maintenance, and overall management to continually provide safe drinking water and to provide a safe reliable water supply. In addition, sanitary surveys also aid in the process of evaluating a public water system's progress in complying with federal and state regulations which require the improvement of the capabilities of the system to provide safe drinking water. Sanitary surveys provide the water system with technical and management information regarding the operation of the system from the water source, through the water plant and the distribution system. The MDEQ conducts sanitary surveys every three years. The completed survey was formally presented to the City on June 5th. Mr. Wozniak presented the report to Mr. Lewis and City staff in person on June 4th.

Benton Harbor Emergency Interconnect

Work is currently underway on the rehabilitation of the M63 Interconnect. Staff has ordered replacement bolts for all of the pipe flanges and valve housings located inside of the vault. Air Therm is replacing the bolts by cutting out the old ones with a welder and installing new. Staff is looking into the replacement of the roof slab and reinforcement of the walls. The City of Benton Harbor has expressed interest in contributing to this effort.

In addition, the Cities of St. Joseph and Benton Harbor are working together to draft an emergency interconnect agreement. The City Managers and Mr. Alimenti met on May 6th to review the draft document. That draft is currently under review by the City Attorney.

UCMR III Monitoring

Plant staff is now collecting samples for both the City and Authority under the Unregulated Contaminant Monitoring Rule. EPA is funding the City monitoring costs since it is a community water supply serving a population under 10,000. The monitoring period is one year.

Unregulated Contaminant Monitoring (UCMR) III – 2013 Testing Results

As part of the federal drinking water program, USEPA issues a list of currently unregulated contaminants to be tested by Public Water Systems throughout the nation. This process occurs every five years pursuant to the Unregulated Contaminant Monitoring Rule (UCMR). The purpose of the UCMR program is to determine the prevalence of unregulated contaminants in drinking water. Results of this testing help USEPA determine whether or not to regulate new contaminants for protection of public health.

There have been three cycles of monitoring: UCMR 1 (2001-2003), UCMR 2 (2008-2010), and UCMR 3 (2013-2015). The City of St. Joseph was not required to participate in UCMR 1 and of the 37 contaminants tested in UCMR 2 none were detected. The City also participated in the current UCMR 3 in 2013. The City tested 21 contaminants on USEPA's List 2 (Screening Survey). Of the 21 contaminants tested, 17 were non-detected and five had results. The detected contaminants and results appear on the Water Quality Data table under *Special Monitoring and Unregulated Contaminants* in our 2013 CCR issued on June 27th.

Stage 2 D/DBP Monitoring Results-Authority

The Stage 2 DBP rule is one part of the Microbial and Disinfection Byproducts Rules (MDBPs), which are a set of interrelated regulations that address risks from microbial pathogens and disinfectants/disinfection byproducts. The stage 2 DBP rule focuses on public health protection by limiting exposure to DBP's, specifically total trihalomethanes (TTHM) and five haloacetic acids (HAA5) which can form in water through disinfectants used to control microbial pathogens. The St. Joseph Water Plant utilizes chlorine as a disinfectant.

In April the HAA5 level recorded was elevated at 72 ppb. This was likely due to high organics from Spring runoff and the lack of mixing in the lake given the unusually long ice cover. Community water supplies cannot exceed 60 ppb as a running annual average. Given the seasonal nature of HAA5, production, we expect the running annual average to remain well below the limit. The HAA5 running annual average is now 38 ppb. The last time the system recorded elevated HAA5 numbers was in April of 2008 in the City. In June of that year levels returned to normal.

Intake Inspections

Both the north and south St. Joseph Water Plant intakes were inspected in May. Seebrex Diving recorded 1.5 ft of accumulated sand in the bottom of intake structures and in the pipe extending past the Y. A full report and video was presented to plant staff. Upon completion of the raw water sample line modifications it was discovered that the sand had accumulated to 2.5 ft. This material was removed

while as part of the modification project. Cleaning of the pipe will be done in July/August as weather permits and competitive bids will be sought for that work.

Intake Raw Water Sample Line

The raw water sample line is a ¾" HDPE pipe that extends from the low service pumping station to the north intake structure. The line provides plant staff with the capability of obtaining real time raw water data which is unaffected by the chlorine feed in the intake. The line must be periodically backflushed with tap water which contains chlorine. The current setup as designed is set to backflush to an end point wherein no chlorinated water reaches the lake. Plant staff is concerned however that the chlorine residual is weakened to such an extent by the time the stream reaches the intake that no protection against mussel growth in the line is achieved. Staff has been in discussion with DEQ Lansing regarding acceptable NPDES chlorine discharge limits and sampling protocols. Given the stringent limits an alternate design has been developed wherein the installation of a check valve and bypass inside of the intake structure has been devised and will be installed by Seebrex Divers. This bypass and check will redirect the backflush water into the intake which will then be drawn into the intake pipe and not discharged to the lake. A screen dome will be fabricated and placed on the existing sample line strainer located outside of the intake (on the 'roof') which will be cleaned by divers semi-annually.

Monthly Maintenance Notes

JUNE 2014

Normal PM Maint. done Monthly	Check all High Service and Low Service Pumps, BPS pumps, Service BPS Chlorinators, Change out air filters on VFD Drives and Air Handlers. Mow and Grounds Maintenance at Plant, Booster Stations and Towers
06/04/14	Installed Battery Backup units on CL17 and Chlorinator at Hilltop BPS.
06/06/14	Changed oil in vacuum primer pumps
06/09/14	Installed Battery Backup units on CL17 and Chlorinator at Cleveland BPS.
06/09/14	Installed New Water Level Prox switch on Hilltop Chlorinator
06/16/14	ABCS - Installed Flow Transmitter on Filter # 1
06/18/14	Boelcke Heating - Spring Maintenance and Inspection of Trane Roof Top HVAC units
6/16 to 6/19/14	Mead & White - Installed Fluoride Interlock System for North Low Service Pumps per Sanitary Survey recommendations
06/19/14	Airtherm - Installed New AC unit for Maintenance office and shop
06/20/14	Mead & White - Installed Electric power to new Maintenance AC unit
06/20/14	Bridgeway Cummins - Service call for Low Service Generator, Started but would not come up to speed. Possible fuel solenoid problem.
06/25/14	Installed new supply line for filter # 1 Flow Meter
06/30/14	Installed new ballast on outside security light for east drive

ST. JOSEPH WATER FILTRATION PLANT
1701 LIONS PARK DRIVE
SAINT JOSEPH, MI. 49085

By: Greg Alimenti
St. Joseph Water Plant
700 Broad St.
Saint Joseph, MI. 49085-1276
(269) 983-1240

JUNE 2014

DISTRIBUTION:	
Total Gallons	161,534,590
Average Day	5,384,486
Maximum Day	6,917,391
Minimum Day	3,804,617

TREATMENT:	
Total Low Service	165,829,506
Wash Water Gals.	2,379,157
Wash Water %	1.45%
Plant Use Gals.	1,572,867
Plant Use %	0.97%

FILTRATION:		
Ave. Filter Run	121.2	hours
Ave. Filter Rate	1.95	g/sqft/min
Filter Eff. Index	380.6	
Ave. Loss of Head	1.8	feet
Plant Sewer Useage \$ 2,322.27		

LABRATORY REPORT		
Average of	Raw	Tap
Chlorides mg/L	19.8	19.5
Fluoride mg/L	0.13	0.92
Alkalinity mg/L	108	96
Hardness mg/L	131	130
pH	7.9	7.2
Calcium mg/L	37	37
Magnesium mg/L	9	9
Turbidity NTU	1.71	0.03
Temperature °F	61	
Total Coliform		0.0
Chlorine Residual mg/L Free		
Mixing Basin		1.51
Applied		1.58
Tap		1.44
Distribution		1.04

TREATMENT CHEMICAL SUMMARY:					
	Applied mg/L	Total Lbs.	Cost	Inventory lbs.	Days Supply
		CHEMICAL			
Alum (Al ⁺³)	1.58	2,145	\$6,240.58	6,164	86
Chlorine (Cl ₂)	2.80	3,873	\$1,006.98	7,559	59
Fluoride (F ₂)	0.69	944	\$2,832.90	1,487	47

		REMARKS:			
Total Cost all Chemicals	\$10,080.46				
Chemical Cost per Mil. Gallon Treated	\$60.79				
Chemical Cost per Mil. Gallon Delivered	\$62.40				
PLANT UTILITIES SUMMARY					
Electric:					
Total KWH	5,440	***includes measure of melted snow			
Total Power Cost	\$426.06	visit the City of Saint Joseph's Home page at www.sjcity.com			
Power Cost per Million Gallon Treated	\$108.10	e-mail comments to either: operator@sjcity.com or galimenti@sjcity.com			
Power Cost per Million Gallon Delivered	\$125.40	WEATHER CONDITIONS AT THE PLANT		Air Temp. °F	
Gallons Pumped per KWH	29694	SJWW Weather Computer		Avg.	69.4
		Rain Guage, Inches	6.24	Max.	85.0
		days it rained***	13	Min.	56.2
Natural Gas:		Wind Speed, Avg	4.6	Lake Temp. °F	
Metered Cubic Feet	185767	Wind Speed, Max	71	Avg.	61.2
Natural Gas Cost	\$1,606.20	Prevailing Wind Dir.	NNE	Max	75.9
Emergency Power Diesel Fuel Inv., Gals. (2400N+826S) Full	3226	Lake Level (USACE)	578.9	Min	48.1

DISTRIBUTION REPORT
For the Month of June 2014

Activity	Number	Description
Water Main Breaks	3	
MISS DIGS	427	
Delinquent Shut Off	29	St. Joseph Charter Township
Hydrants (Repaired/Replaced)	0	
Valves	0	
Taps (1")	4	1419 Wilshire Terrace (LCT) 953 Miners Road (RCT) 1481 Kristen Path (SJCT) 4453 Chapparel Dr. (RCT)
Service Work	1	Replaced 1 service (address?) on Jerrico Rd.
Water Service Repairs	1	626 Grant Avenue (SJCT) Service leak
Repair of Curb box/Shut-Off Valves	0	
Water Quality Complaint(s)	1	5320 Cleveland
Hydrant Flushing to maintain water quality	0	North side of river
Staff Education/Training	0	
Overtime-Total	67	(inc. San and Storm)
Turn Off	8	(Note: This number does not include delinquent Shut off)
Turn On	10	
Finals	140	
Meter Repair		
Meter Repair/Replacement	53	Verify Read
Per detail		New Installation 13
Meter leaking		New Installation-Benton Harbor 1
Stopped Meter		Replaced/various reasons
Faulty Register		Rockwell Replacement
Frozen Meter		Mxu Replaced
Move Meter Inside		Sprinkler meter removed/line capped
Hard to read		Removals 2
Replace/Adding Sprinkler Meter		Curb box location
Damage to Trt		Broken Remote
New Plumbing		Noisy Meter
New siding		Upgrade 5/8" to 3/4"
Meter sent out for testing		Meter Change/Benton Harbor

CITY OF ST. JOSEPH WATER MAIN BREAK REPORT
For the Month/Year of: June 2014

#	Date	Location	Main Size	Gallons Lost	Break Type	Valves Turned	City Twp	Labor	Remarks
1	6/11/2014	Lester	6	90,000	Hole	2	City	12	Between Niles & Willa, tennis ball size hole
2	6/13/2014	420 Main St.	6	5,000	Circumferential	4	City	20	Crack w/ little evidence of corrosion caused failure
3									
4									
5									
6									
		Total Gallons Lost		95,000					

CLEVELAND BOOSTER STATION

HILLTOP BOOSTER STATION

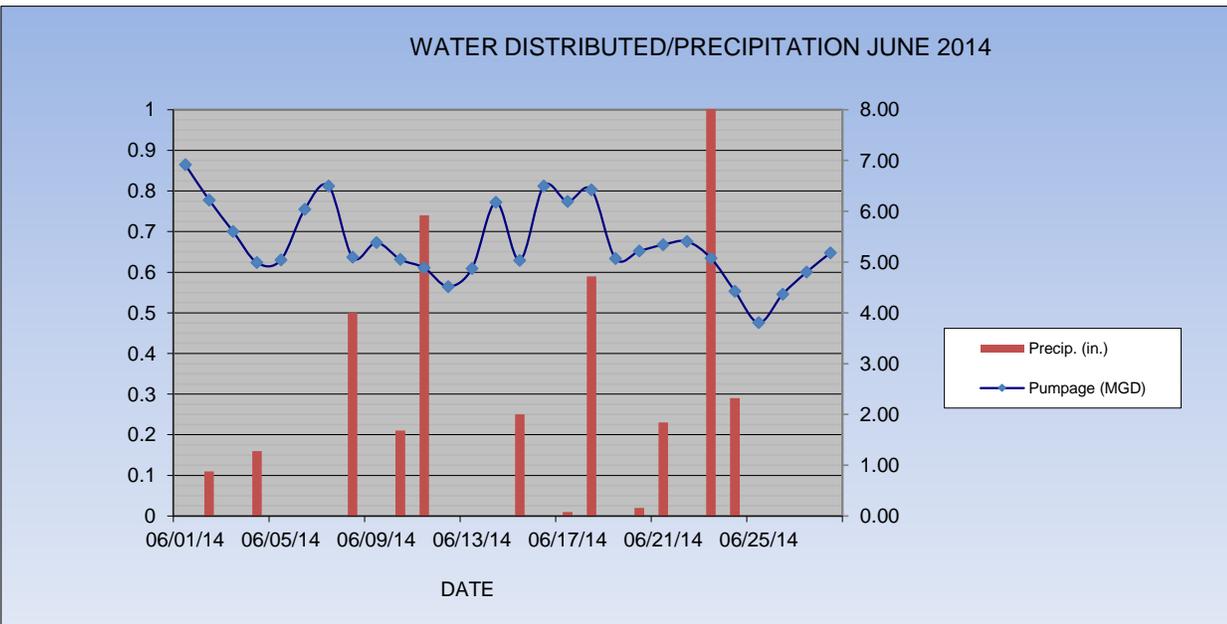
BOTH

DATE	MGD TREATED	FEED METER GAL	CHL LBS/DAY	CHLORINE APPLIED mg/l	Cl ₂ RES PRE mg/l	Cl ₂ RES POST mg/l	Cl ₂ RES MON mg/l	MGD TREATED	FEED METER GAL	CHL LBS/DAY	CHLORINE APPLIED mg/l	Cl ₂ RES PRE mg/l	Cl ₂ RES POST mg/l	Cl ₂ RES MON mg/l	MGD TREATED BOTH
1-Jun	4.092	122	17.30	0.51				0.340	10	1.42	0.50				4.432
2-Jun	4.092	122	17.30	0.51	1.98	1.54	1.54	0.340	10	1.42	0.50	2.03	1.73	1.84	4.432
3-Jun	3.807	24	3.40	0.11	1.44	1.45	1.41	0.489	13	1.84	0.45	2.16	1.71	1.75	4.296
4-Jun	3.609	57	8.08	0.27	1.33	1.36	1.46	0.256	7	0.99	0.46	2.07	1.87	2.07	3.865
5-Jun	2.792	48	6.81	0.29	1.38	1.44	1.54	0.481	10	1.42	0.35	1.97	1.76	1.95	3.274
6-Jun	2.522	45	6.38	0.30	1.47	1.51	1.53	0.970	0	0.00	0.00	1.36	1.24	1.26	3.492
7-Jun	3.182	32	4.54	0.17				1.009	1	0.14	0.02				4.191
8-Jun	3.182	32	4.54	0.17				1.009	1	0.14	0.02				4.191
9-Jun	3.182	32	4.54	0.17	1.42	1.55	1.56	1.009	1	0.14	0.02	1.08	1.21	1.14	4.191
10-Jun	3.523	42	5.95	0.20	1.37	1.48	1.54	0.292	15	2.13	0.87	1.37	1.32	1.43	3.815
11-Jun	1.423	17	2.41	0.20	1.41	1.53	1.60	1.966	1	0.14	0.01	1.41	1.39	1.44	3.389
12-Jun	1.118	0	0.00	0.00	1.38	1.40	1.40	1.314	22	3.12	0.28	2.18	1.99	2.05	2.432
13-Jun	3.250	81	11.48	0.42	1.27	1.50	1.52	0.000	0	0.00	0.00	2.19	1.70	1.82	3.250
14-Jun	2.655	26	3.69	0.17				0.978	12	1.70	0.21				3.633
15-Jun	2.655	26	3.69	0.17				0.978	12	1.70	0.21				3.633
16-Jun	2.655	26	3.69	0.17	1.33	1.28	1.28	0.978	12	1.70	0.21	1.26	1.52	1.63	3.633
17-Jun	1.710	2	0.23	0.02	1.41	1.71	1.65	1.964	31	4.40	0.27	1.39	1.71	1.74	3.674
18-Jun	2.824	100	14.18	0.60	1.23	1.69	1.60	1.551	22	3.12	0.24	2.07	1.79	1.85	4.375
19-Jun	2.146	49	6.95	0.39	1.49	1.47	1.37	2.041	28	3.97	0.23	1.48	1.60	1.62	4.187
20-Jun	1.427	46	6.52	0.55	1.31	1.74	1.84	1.993	4	0.57	0.03	1.36	1.66	1.79	3.420
21-Jun	2.235	58	8.22	0.44				1.245	15	2.13	0.20				3.479
22-Jun	2.235	58	8.22	0.44				1.245	15	2.13	0.20				3.479
23-Jun	2.235	58	8.22	0.44	1.21	1.91	2.06	1.245	15	2.13	0.20	1.24	1.31	1.30	3.479
24-Jun	1.460	41	5.81	0.48	1.41	1.65	1.62	1.459	20	2.84	0.23	2.09	1.71	1.98	2.919
25-Jun	0.854	0	0.00	0.00	1.34	1.38	1.34	1.742	24	3.40	0.23	2.01	1.73	1.69	2.596
26-Jun	1.582	66	9.36	0.71	2.17	1.82	1.81	0.826	11	1.56	0.23	2.13	1.84	2.08	2.407
27-Jun	2.207	70	9.92	0.54	1.83	1.23	1.25	0.451	7	0.99	0.26	1.50	1.33	1.40	2.658
28-Jun	2.314	88	12.48	0.65				1.437	17	2.41	0.20				3.750
29-Jun	2.314	88	12.48	0.65				1.437	17	2.41	0.20				3.750
30-Jun	2.314	88	12.48	0.65	1.24	1.23	1.27	1.437	17	2.41	0.20	1.28	1.26	1.34	3.750
TOTAL	75.592	1,544	218.86					32.481	370	52.46					108.073
AVE DAY	2.520		7.29529	0.35	1.4486	1.5176	1.5329	1.0827		1.74862	0.24	1.70	1.59	1.67	3.602
MAX	4.092		17.2972	0.71	2.17	1.91	2.06	2.0408		4.39518	0.87	2.19	1.99	2.08	4.432
MIN	0.854		0	0.00	1.21	1.23	1.25	0.0000		0	0.00	1.08	1.21	1.14	2.407
MONTHLY TOTALS:	Cleveland	Total MG Treated	75.592	SJCT EAST				Hilltop	Total MG Treated	32.481	Cleveland Pump Station:				73.62
		Untreated	73.620	AVE DAY		0.244				32.481	Hilltop Pump Station:				32.48
Total Authority Flow:	112.16		1.972	TOTAL JUNE		7.333			Untreated	31.511	TOTAL AUTHORITY (Trted.)				106.1

**ST JOSEPH WATER PLANT PUMPAGE-WATER DELIVERED/RAINFALL
JUNE 2014**

DATE	PUMPAGE (gallons)	PUMPAGE (MGD)	RAINFALL (in)	Day to Day Comparison 2013/2012	
				2014	2013
06/01/14	6,917,391	6.92	0	6,917,391	4,199,169
06/02/14	6,221,382	6.22	0.11	6,221,382	3,631,587
06/03/14	5,602,506	5.60	0	5,602,506	4,724,902
06/04/14	4,989,555	4.99	0.16	4,989,555	4,567,130
06/05/14	5,042,400	5.04	0	5,042,400	5,404,967
06/06/14	6,040,875	6.04	0	6,040,875	4,915,243
06/07/14	6,496,560	6.50	0	6,496,560	5,369,945
06/08/14	5,094,698	5.09	0.5	5,094,698	5,540,765
06/09/14	5,385,372	5.39	0	5,385,372	5,757,249
06/10/14	5,051,207	5.05	0.21	5,051,207	4,938,130
06/11/14	4,886,727	4.89	0.74	4,886,727	5,285,286
06/12/14	4,516,590	4.52	0	4,516,590	5,344,683
06/13/14	4,874,465	4.87	0	4,874,465	4,349,387
06/14/14	6,178,673	6.18	0	6,178,673	5,086,629
06/15/14	5,033,294	5.03	0.25	5,033,294	4,676,859
06/16/14	6,495,215	6.50	0	6,495,215	4,900,326
06/17/14	6,193,649	6.19	0.01	6,193,649	5,845,905
06/18/14	6,423,288	6.42	0.59	6,423,288	5,562,134
06/19/14	5,071,547	5.07	0	5,071,547	6,185,604
06/20/14	5,217,582	5.22	0.02	5,217,582	6,901,550
06/21/14	5,341,929	5.34	0.23	5,341,929	7,402,744
06/22/14	5,405,247	5.41	0	5,405,247	5,482,684
06/23/14	5,074,495	5.07	1.79	5,074,495	6,172,548
06/24/14	4,426,550	4.43	0.29	4,426,550	7,524,443
06/25/14	3,804,617	3.80	0	3,804,617	4,859,829
06/26/14	4,367,149	4.37	0	4,367,149	4,993,623
06/27/14	4,801,722	4.80	0	4,801,722	4,899,014
06/28/14	5,182,075	5.18	0	5,182,075	4,933,006
06/29/14	5,720,253	5.72	0	5,720,253	4,471,185
06/30/14	5,677,577	5.68	1.34	5,677,577	4,805,392
TOTAL	161,534,590	161.53	6.24	161,534,590	158,731,916

Average Day	5,384,486
Maximum Day	6,917,391
Minimum Day	3,804,617

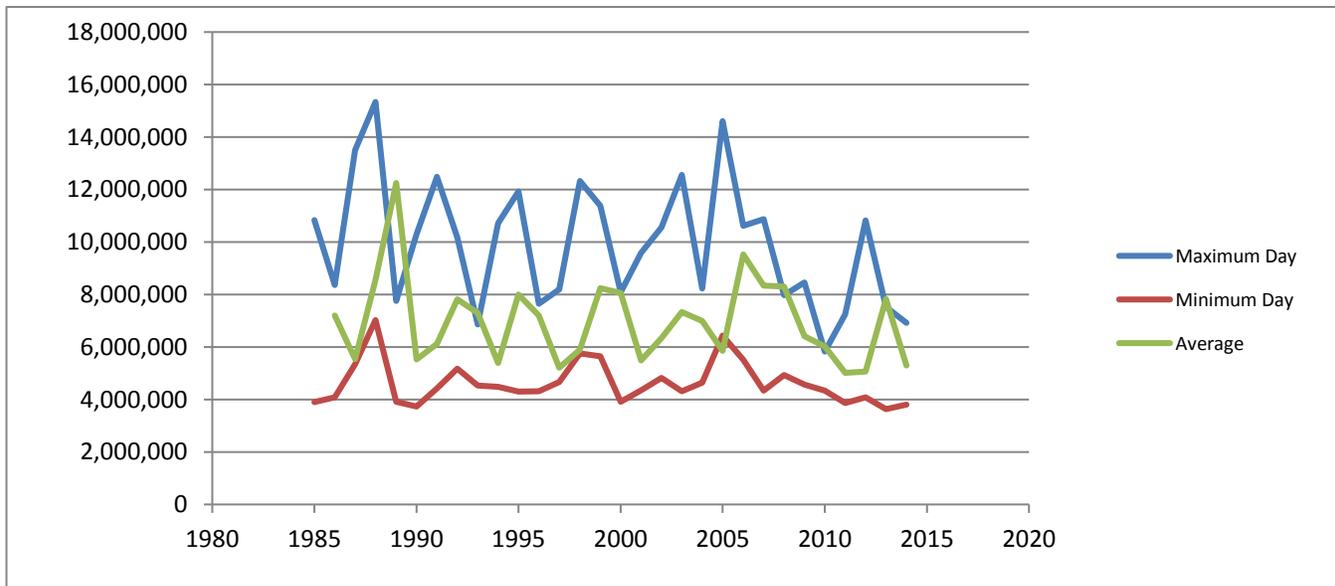


ST JOSEPH WATER PLANT PUMPAGE-WATER DELIVERED

JUNE 2014

Year	Average	Maximum Day	Minimum Day	Monthly Total
1985	7,203,780	10,838,700	3,897,600	216,113,400
1986	5,536,993	8,361,200	4,083,100	166,109,800
1987	8,558,823	13,500,700	5,341,700	256,765,700
1988	12,250,440	15,336,400	7,024,700	367,513,200
1989	5,518,973	7,756,300	3,907,000	165,569,200
1990	6,114,560	10,296,200	3,732,200	183,436,800
1991	7,822,020	12,489,000	4,416,100	234,660,600
1992	7,294,707	10,167,700	5,176,200	218,841,200
1993	5,393,460	6,855,200	4,530,100	161,803,800
1994	7,998,343	10,718,900	4,478,600	239,950,300
1995	7,198,127	11,928,500	4,300,200	215,943,800
1996	5,213,475	7,647,600	4,314,450	156,404,250
1997	5,904,247	8,197,900	4,666,500	177,127,400
1998	8,245,142	12,326,050	5,760,800	247,354,250
1999	8,054,910	11,383,350	5,645,950	241,647,300
2000	5,492,322	8,084,500	3,917,500	164,769,650
2001	6,333,114	9,586,150	4,343,000	189,993,420
2002	7,326,472	10,561,700	4,826,500	219,794,150
2003	6,994,901	12,554,770	4,311,750	209,847,020
2004	5,847,159	8,226,140	4,644,750	175,141,780
2005	9,527,567	14,599,440	6,436,750	285,827,000
2006	8,336,510	10,615,250	5,508,500	250,095,310
2007	8,299,610	10,869,000	4,339,000	248,988,310
2008	6,408,335	7,971,500	4,935,500	192,250,040
2009	6,022,007	8,461,750	4,564,750	180,660,240
2010	5,013,884	5,824,610	4,342,220	150,416,523
2011	5,064,754	7,249,460	3,858,296	151,942,626
2012	7,827,161	10,828,342	4,079,686	234,814,831
2013	5,291,064	7,524,443	3,631,587	158,731,916
2014	5,384,486	6,917,391	3,804,617	161,534,590

Rank	Year	Monthly Total
1	1988	367,513,200
2	2005	285,827,000
3	1987	256,765,700
4	2006	250,095,310
5	2007	248,988,310
6	1998	247,354,250
7	1999	241,647,300
8	1994	239,950,300
9	2012	234,814,831
10	1991	234,660,600
11	2002	219,794,150
12	1992	218,841,200
13	1985	216,113,400
14	1995	215,943,800
15	2003	209,847,020
16	2008	192,250,040
17	2001	189,993,420
18	1990	183,436,800
19	2009	180,660,240
20	1997	177,127,400
21	2004	175,141,780
22	1986	166,109,800
23	1989	165,569,200
24	2000	164,769,650
25	1993	161,803,800
26	2014	161,534,590
27	2013	158,731,916
28	1996	156,404,250
29	2011	151,942,626
30	2010	150,416,523



WEEKLY GREAT LAKES WATER LEVEL UPDATE

July 04, 2014

WEATHER CONDITIONS

The Great Lakes region experienced warmer temperatures earlier this past week, followed by cooler temperatures later on in the week. Several inches of precipitation fell this past week throughout the entire Great Lakes Basin. This weekend, temperatures will remain near average with a possibility of some precipitation heading into next week.

LAKE LEVEL CONDITIONS

Lakes Superior and Michigan-Huron are 13 and 14 inches, respectively, above their levels of a year ago. Lakes St. Clair and Erie are 7 and 5 inches, respectively, above what they were at this time last year, while Lake Ontario is 1 inch below its level of a year ago. Lakes Superior and Michigan-Huron are both expected to rise an inch over the next month. Lake St. Clair is predicted to drop 2 inches from its current level over the next thirty days, while Lakes Erie and Ontario are projected to fall 3 and 5 inches, respectively. See our [Daily Levels web page](#) for more water level information.

FORECASTED MONTHLY OUTFLOWS/CHANNEL CONDITIONS

Lake Superior's outflow through the St. Mary's River is forecasted to be above average for the month of July. Lake Michigan-Huron's outflow into the St. Clair River and Lake St. Clair's outflow into the Detroit River is predicted to be near average in July. In addition, the outflow of Lake Erie into the Niagara River and Lake Ontario's outflow into the St. Lawrence River are projected to be above average in July.

ALERTS

Official records are based on monthly average water levels and not daily water levels. Users of the Great Lakes, connecting channels and St. Lawrence River should keep informed of current conditions before undertaking any activities that could be affected by changing water levels. Mariners should utilize navigation charts and refer to current water level readings.

	SUPERIOR	MICH-HURON	ST. CLAIR	ERIE	ONTARIO
Forecasted Water Level for Jul 4, 2014 (feet)	602.49	578.90	575.00	572.24	246.52
Chart Datum (feet)	601.10	577.50	572.30	569.20	243.30
Difference from chart datum (inches)	+17	+17	+32	+36	+39
Difference from average water level for Jun 4, 2014 (inches*)	+2	+4	+3	+1	-2
Difference from average water level for Jul 4, 2013 (inches*)	+13	+14	+7	+5	-1
Difference from long-term monthly average of Jul (inches)	+6	-5	+3	+4	+6
Difference from highest monthly average of record for Jul (inches)	-7	-37	-26	-24	-20
Year of highest recorded monthly mean	1950	1986	1986	1986	1947
Difference from lowest monthly average of record for Jul (inches)	+27	+26	+30	+38	+39
Year of lowest recorded monthly mean	1926	1964	1934	1934	1934
Projected change in levels by Aug 4, 2014 (inches)	+1	+1	-2	-3	-5

ALL DATA SHOWN IN THIS SUMMARY ARE REFERENCED TO IGLD 1985
 *VALUES FOR SPECIFIC DAY ARE BASED ON 3-DAY DAILY AVERAGE AROUND SPECIFIED DATE
 LONG TERM AVERAGE PERIOD OF RECORD, 1918-2013

FORECASTED INFORMATION PROVIDED BY
 Department of the Army
 Detroit District, Corps of Engineers
[Detroit District Home](#)
 1-888-694-8318 ext. 1

RECORDED DATA (1918 – present)
 provided by
[NOAA, Great Lakes Online](#)
 (301) 713-9596

FOR MORE INFORMATION VISIT
[Detroit District Great Lakes Homepage](#)
[International Joint Commission](#)
[Great Lakes Information Network](#)