City of Washington Est. 1825

# Memo

TO: Committee of the Whole

FROM: Ed Andrews, PE Public Works Director

DATE: May 8, 2019

SUBJECT: Water Tower #3 Design

The City of Washington has undertaken a comprehensive evaluation of its water and sewer system in support of rate structure both as a sustainability of its existing system and its ability to support continued growth. The City water system has an approximate replacement value $60Million dollars consisting of:

- 2 Water Treatment Facilities (WTP#1 = 1960 and WTP#2 = 1993)
- 2 Water Towers (500,000 gallons each)
- 85 Miles of watermain ranging in size from 4-inches to 16-inches

One items of focus has been on the need for a third water tower. Current regulatory guidelines would have us make this consideration under:

Section 604.1300 General Storage Requirements

a) Storage facilities shall have sufficient capacity to meet domestic demands, and where fire protection is provided, fire flow demands.

Section 604.1340 Elevated Storage

a) The minimum storage capacity shall:
   1) be equal to the average daily usage or be based on an engineering study of the distribution system hydraulic conditions, anticipated domestic water demands of the system, and where fire protection is provided, fire flow demands; and
   2) be capable of maintaining adequate pressures as described in Section 604.1415(a);

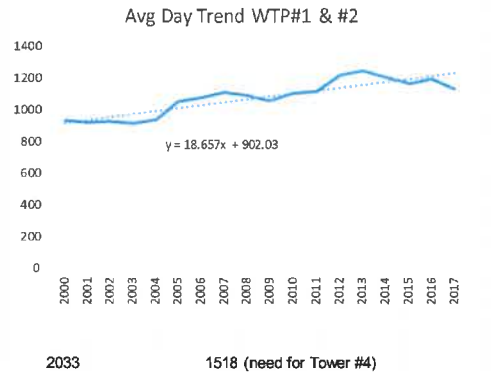
Since the City of Washington's water system operates as two largely separate (but interconnected zones) a review of average day from the combined system and water treatment plant, WTP#2 was conducted. Average day exceeding elevated storage capacity first occurred between 2005 and 2007 and shows a forecasted need of forth tower in 2033.

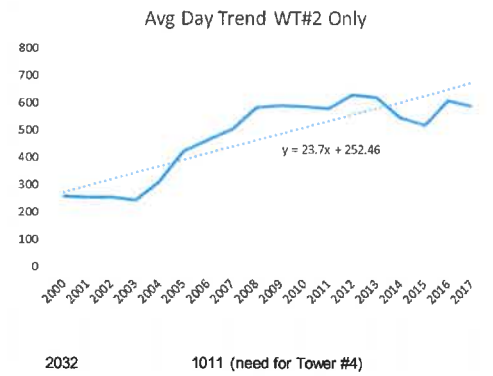
WTP#1&#2 w/ WT#1&#2 and future #3

| Year | Avg Day WTP#1 & WTP#2 | | Capc WT#1 & WT#2 | Avg Day as % of WT#1 & #2 | Capc WT#1, #2 & #3 | Avg Day as % of all 3 WTwrs |
|---|---|---|---|---|---|---|
| 2000 | 931 | 902 | 1000 | 93% | 1,500 | 62% |
| 2001 | 922 | 921 | 1000 | 92% | 1,500 | 61% |
| 2002 | 926 | 939 | 1000 | 93% | 1,500 | 62% |
| 2003 | 915 | 958 | 1000 | 92% | 1,500 | 61% |
| 2004 | 941 | 977 | 1000 | 94% | 1,500 | 63% |
| 2005 | 1051 | 995 | 1000 | 105% | 1,500 | 70% |
| 2006 | 1078 | 1014 | 1000 | 108% | 1,500 | 72% |
| 2007 | 1111 | 1033 | 1000 | 111% | 1,500 | 74% |
| 2008 | 1093 | 1051 | 1000 | 109% | 1,500 | 73% |
| 2009 | 1058 | 1070 | 1000 | 106% | 1,500 | 71% |
| 2010 | 1103 | 1089 | 1000 | 110% | 1,500 | 74% |
| 2011 | 1120 | 1107 | 1000 | 112% | 1,500 | 75% |
| 2012 | 1220 | 1126 | 1000 | 122% | 1,500 | 81% |
| 2013 | 1248 | 1145 | 1000 | 125% | 1,500 | 83% |
| 2014 | 1209 | 1163 | 1000 | 121% | 1,500 | 81% |
| 2015 | 1170 | 1182 | 1000 | 117% | 1,500 | 78% |
| 2016 | 1197 | 1201 | 1000 | 120% | 1,500 | 80% |
| 2017 | 1134 | 1219 | 1000 | 113% | 1,500 | 76% |

WTP#2 w/ WT#2 and future #3

| Year | Avg Day WTP#2 | | Capc WT#2 | Avg Day as % of WT#2 | % Use of WT#3 |
|---|---|---|---|---|---|
| 2000 | 259 | 252 | 500 | 52% | |
| 2001 | 255 | 276 | 500 | 51% | |
| 2002 | 254 | 300 | 500 | 51% | |
| 2003 | 246 | 324 | 500 | 49% | |
| 2004 | 311 | 347 | 500 | 62% | |
| 2005 | 424 | 371 | 500 | 85% | |
| 2006 | 464 | 395 | 500 | 93% | |
| 2007 | 504 | 418 | 500 | 101% | 1% |
| 2008 | 586 | 442 | 500 | 117% | 17% |
| 2009 | 593 | 466 | 500 | 119% | 19% |
| 2010 | 589 | 489 | 500 | 118% | 18% |
| 2011 | 581 | 513 | 500 | 116% | 16% |
| 2012 | 632 | 537 | 500 | 126% | 26% |
| 2013 | 621 | 561 | 500 | 124% | 24% |
| 2014 | 550 | 584 | 500 | 110% | 10% |
| 2015 | 523 | 608 | 500 | 105% | 5% |
| 2016 | 613 | 632 | 500 | 123% | 23% |
| 2017 | 592 | 655 | 500 | 118% | 18% |




2033 1518 (need for Tower #4)

2032 1011 (need for Tower #4)

At the Public Works Committee meeting of May 6th, the committee asked that this be presented to the Committee of the Whole for contract considerations. The City has a master services agreement with CMT (Crawford Murphy & Tilly) for engineering support for the water system and have the prepared quote for their services supporting this.

The current budget anticipates this effort and it is the recommendation of staff to undertake the design of tower to help insure that we demonstrate good faith effort to meet Agency requirements.

cc: File