

To: Ellen Vause, City of Hawthorne
From: Bryan McDonald, Water and Air Research, Inc.
Date: August 26, 2015
Subject: EA-Hawthorne Response to CPA Comments, Water and Wastewater



1. Please provide analysis for the potential demand for all utilities, recreation, and schools for the current (or adopted) future land use and the proposed future land use maximum buildout potential according to the City's adopted levels of service.

- a. In the case of water and wastewater, please provide the potential demand described above showing the delta between the adopted levels of service and the anticipated level of service.

Response:

Water Demand

City of Hawthorne Comprehensive Plan – Levels of Service Standards - Water

As part of the City of Hawthorne Comprehensive Plan, levels of service standards for planned water supply facilities are included. The adopted level of service for potable water is established as follows through Policy IV.2.8, which states that the level of service standard for the Hawthorne Community Potable Water System is 104 gallons per capita per day (gpcd) and 30 pounds per square inch of volume.

Considering the current (adopted) future land use and estimating water use, the estimated number of new residents under the adopted future land use plan is 680. This is assuming a five acre plot per household for the total area of 1,365 acres. For gpcd calculations, 2.49 residents per household are assumed. The total water use is therefore estimated at 70,720 gallons per day, which is 680 residents at 104 gpcd.

EA-Hawthorne Mixed Use (EA-HMU) - Projected Demand - Water

The projected water demands for EA-HMU are based on estimated land use and corresponding ranges of water use. The estimated demands for the year 2030 (buildout) are shown in the table below. This table below is also included as exhibit 3-1 in the Water and Wastewater Technical Memorandum that is included in the Comprehensive Plan Amendment application.

Analysis - Water

The adopted level of service for the City of Hawthorne is 104 gallons per capita per day (gpcd) for water. The anticipated level of service for EA-Hawthorne Mixed Use (residential) is 78 gpcd. The reasons for the reduction are primarily due to the use of water conservation principles that prohibit the use of residential automatic landscape irrigation systems and the addition of Florida-friendly landscaping. As shown in the table below, the estimated average total daily water use for EA-Hawthorne Mixed Use including manufacturing, office facilities, retail, common area irrigation and residential is 729,000 gallons per day. Note that the estimated water use for manufacturing is 61% of this total. (See table on the following page).

**Build Out Year (2030) Projected Potable Water Demand
EA-Hawthorne Mixed Use Water and Wastewater Data and Analysis**

Land Use	Water Demand, gal/unit-d		Number of Units ^a		Total Demand, mgd			
	Unit	Low	Average	High	Low	Average	High	
EA Hawthorne Mixed Use								
Advanced Manufacturing								
General Manufacturing	Square feet	0.172 ^b	0.315 ^c	0.522 ^b	1,425,000	0.245	0.449	0.744
Distribution Centers	Square feet	0.008 ^d	0.025 ^e	0.051 ^f	1,425,000	0.011	0.036	0.073
R&D, Office Facilities	Square feet	-	-	-	0	0	0	0
Retail ^g	Square feet	0.02	0.025	0.04	150,000	0.003	0.0037	0.0055
Residential								
Single Family ^h	Capita	40	78	95	1,494	0.060	0.116	0.142
Multi Family ⁱ	Capita	35	58	77	350	0.012	0.020	0.027
Estimated Irrigation Demand ^j					0.1044	0.1044	0.1044	
Total Water Demand					0.436	0.729	1.10	

^a Information provided by Plum Creek.

^b The following no or little wet-process type industry and domestic wastewater flows are assumed for estimating low and high water demand, respectively: 1,000 gal/ac-d and 8 gpcd, 3,000 gal/ac-d and 25 gpcd *Wastewater Engineering – Treatment, Disposal, and Reuse* (Metcalf & Eddy, Inc., Fourth Edition, 2003). All water demand estimates assume 2,850 employees and wastewater flow accounts for 90% of water flows. It was assumed that the unit industrial wastewater flows from Metcalf & Eddy are for gross manufacturing area; a floor-to-area ratio of 20% was assumed to convert the unit wastewater flow from gross manufacturing (property) area to floor area.

^c Estimated for general manufacturing using internal CH2M HILL data.

^d Low unit water demand determined using water use data from multiple distribution centers in Alachua County, FL from May 2014 – April 2015.

^e Average unit water demand estimated for warehouse type facilities using internal CH2M HILL data.

^f High unit water demand determined using water use data from multiple distribution centers in Alachua County, FL from May 2014 – April 2015.

^g The following is assumed for low, average and high water use, respectively: 8 gpcd, 10 gpcd, 15 gpcd *Wastewater Engineering – Treatment, Disposal, and Reuse* (Metcalf & Eddy, Inc., Third Edition, 1991). All water use estimates assume 333 employees.

^h Estimated total usage assumes 2.49 people per household. Low water use is from *Wastewater Engineering – Treatment, Disposal, and Reuse* (Metcalf & Eddy, Inc., Third Edition, 1991). Average water use is based on an average wastewater flow of 70 gpcd and 90% capture of water flows. High water use from Envision Alachua Water Consumption Baselines, assumes maximum of non-irrigated residence and 3 people per household.

ⁱ Estimated total usage assumes 1.75 people per household. Per capita water use from apartment and condo water consumption from Envision Alachua Water Consumption Baselines.

^j Highest projected annual average irrigation demand from Exhibit 3-3.

Wastewater Demand

City of Hawthorne Comprehensive Plan – Levels of Service Standards - Wastewater

As part of the City of Hawthorne Comprehensive Plan, levels of service standards for planned sanitary sewer (wastewater) facilities are included. The adopted level of service for sanitary sewer is established as follows through Policy IV.2.1, which states that the level of service standard for the Hawthorne Community Sanitary Sewer System is 100 gallons per capita per day (gpcd).

Considering the current (adopted) future land use, the estimated number of new residents under the adopted future land use plan is 680. This is assuming a five acre plot per household for the total area of 1,365 acres. For gpcd calculations, 2.49 residents per household are assumed. The total wastewater use is therefore estimated at 68,000 gallons per day, which is 680 residents at 100 gpcd.

EA-Hawthorne Mixed Use - Projected Demand - Wastewater

The table below shows the estimated flows for wastewater treatment in 2030 (buildout). Wastewater flows were determined by assuming approximately 90% of the water demand will reach the wastewater treatment system. The 90% capture rate assumes that minimal potable water is used for landscape irrigation in the EA-Hawthorne area. The table below is also included as exhibit 4-1 in the Water and Wastewater Technical Memorandum that is included in the Comprehensive Plan Amendment application.

Build Out Year (2030) Projected Wastewater Flows EA-Hawthorne Mixed Use– Water and Wastewater Data and Analysis

Land Use	Total Wastewater Flow, mgd		
	Low	Average	High
Advanced Manufacturing			
General Manufacturing	0.22	0.40	0.67
Distribution Centers	0.01	0.03	0.07
R&D, Office Facilities	-	-	-
Retail	0.003	0.003	0.005
Residential			
Single Family	0.05	0.10	0.13
Multi Family	0.01	0.02	0.02
Total Wastewater Flow	0.30	0.56	0.90

Analysis - Wastewater

The adopted level of service for the City of Hawthorne is 100 gallons per capita per day (gpcd) for wastewater. The anticipated level of service for EA-Hawthorne Mixed Use (residential) is 70 gpcd (90% of water use). As shown in the table above, the estimated average total daily wastewater use for EA-Hawthorne Mixed Use including manufacturing, office facilities, retail and residential is 560,000 gallons per day. Note that the estimated water use for manufacturing is 71% of this total.