



# **Regional Wastewater Flow Forecast Model (RWFFM) & Wastewater Flow Projections for the COG Region**

*(as of 5/10/12)*

COG's RWFFM is a model that correlates demographic projections and flow assumptions to project wastewater flows for the COG region. COG has been actively using the model for the Blue Plains Service Area wastewater flow projections for many years, and is in the process of updating it for the entire COG Region.

## **HISTORY OF USE & APPLICATION**

In 1992 and 1993, the Blue Plains Flow Projection Model (BPFPM) was developed to formally project future wastewater flows for the Blue Plains Service Area (BPSA) on behalf of the Blue Plains Users. In 2001, Metcalf and Eddy (M&E) updated the model to support COG's use of the RWFFM for the BPSA. In 2010, DC Water contracted Black and Veatch to update the Base Year Flow, Unit Flow Factors (UFFs) and I/I (Inflow/Infiltration) assumptions for the BPSA. The Year 2009 flow for each BPSA jurisdiction was selected as a conservative Base Year and correlated to an average hydrologic year. Base Year 2009 flows are actual, not calculated, and reflect flow measurements and methodologies that were investigated and verified by the BPSA parties.

## **COG'S COOPERATIVE FORECAST PROCESS**

The demographical data derived from the MWCOG Cooperative Forecast is the driver behind the RWFFM. The Cooperative Forecast Model projects employment, population, and household data for the metro region based on national economic trends and local demographic factors. Concurrently, local jurisdictions, while taking into account the preliminary regional projections, develop their own projections based on pipeline development, market conditions, planned transportation improvements, and adopted land use plans and zoning. These demographic projections are done for 5 year increments and are currently projected out until Year 2040. Generally 'intermediate' projections are utilized for regional planning purposes, and the data is aggregated into Transportation Analysis Zones (TAZs). These TAZs are basic elements for the Cooperative Forecast and Regional Transportation Planning.

All projections are reviewed by COG's Cooperative Forecasting and Data Subcommittee and must be within three percent of each other for the new set of Cooperative Forecasts to be reconciled. Each of these forecasts is identified as a 'Round'. Significant changes to the projections are done periodically and are designated as say Round 7.0, with generally annual updates being designated as Round 7.2. There have been twenty three Cooperative Forecasts (Rounds and Sub-rounds) adopted since 1976. In November 2010, Round 8.0 Cooperative Forecast became official. It is expected that the COG Board will approve and adopt Round 8.1 Cooperative Forecast in July of 2012.

## **REGIONAL WASTEWATER FLOW FORECAST MODEL (RWFFM)**

Wastewater projections calculated by the RWFFM are based on demographic information (employment and households) from the Cooperative Forecast Model – which is linked to the appropriate flow factors to derive wastewater flows. Population data is not used in this process, because employment and households are more directly related to generating wastewater. The 'intermediate' series of demographic projections (i.e., employment and household) from the TAZs are then reallocated to the appropriate service areas for each WWTP in the COG region (by sewersheds and sub-sewersheds where available).

In 2010 the Blue Plains Regional Committee (BPRC) endorsed unit flow factors (UFF) and I/I factors for the BPSA (which were updated by Black and Veatch in 2009) – for use in the RWFFM.

<b>2009 Recommended Flow Factors</b>			
	Unit Flow Factor		Unit I/I Factor
	gpd/unit	gped (1)	
			1.44
District	170	25	1.44
WSSC	180	28	1.44
Loudoun Water	185	25	1.44
Fairfax County	150	30	1.44
Vienna	170	21-50	1.44
Dulles (2)	NA	48	1.44
(1) gallons per employee per day			
(2) No residences contribute to Dulles flows			

While the inputs and service area maps for the BPSA were updated, the same information for the rest of the COG region needs to be updated. COG staff recently obtained service area maps from the Chesapeake Bay Program and is working to verify and incorporate that regional data.

**COG REGION WASTEWATER FLOW PROJECTIONS**

The COG region includes 35 WWTPs, of which 21 are considered 'Major' (equal to or greater than 2 mgd). The Blue Plains WWTP's flow capacity is half of the COG Region's wastewater flow capacity, the BPSA is approximately half of COG's Region's sewer service area, and it geographically spans a wide geographic range within the COG Region. Therefore, for regional planning purposes, COG staff proposes to use the BPSA's adopted Base Year Flow, Unit Flow Factors (UFFs) and I/I assumptions for the rest of the WWTPs in the COG Region (see above table).

COG staff will be contacting the region's jurisdictions/agencies to confirm the use of these inputs, or to identify more appropriate numbers; as well as to verify service area maps for the WWTPs and versus septic service areas.

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