

**NEW MEXICO OFFICE OF THE STATE ENGINEER
GALLONS PER CAPITA PER DAY CALCULATOR**

INSTRUCTION MODULE

For 2.04 Beta Version

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DRAFT



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EXECUTIVE SUMMARY

Gallons per capita per day (GPCD) is a method utilized internationally to measure water use by drinking water suppliers. It is most commonly used to describe historical and current water uses. It provides a baseline of water use that is not as susceptible to changes in population. GPCD is also used for planning purposes, allowing estimates of future demand requirements based on localized population projections. More sophisticated planning efforts utilize GPCD to determine conservation potential, track the results of program implementation, and calculate projections based on conservation adjusted GPCD.

The New Mexico Office of the State Engineer (NMOSE) has developed a consistent and reproducible methodology that will standardize GPCD calculations in New Mexico. This methodology will be used by NMOSE to track water use over time and manage the State's water resources into the future. The methodology will provide the drinking water supplier with a categorized baseline of historical and current water use. This data will assist the supplier in planning, tracking, programming and reporting water uses.

The NMOSE method uses specific attributes pulled from the most recent U.S. Census and data provided by the drinking water supplier. Data from the US Census includes number of persons per household, vacancy rates, and group quarters' population. This is combined with the drinking water suppliers' data on the number of single-family residential connections and multi-family residential units to determine a population served. The drinking water supplier also provides the total volume of water diverted and the volume delivered to specific sectors. Sector GPCDs are calculated by dividing that sector use into that sector population (i.e. single family residential populations into single-family residential gallons delivered). Sectors without a defined population (i.e. industrial) use the system total population. The system total GPCD is calculated by dividing total supplied to the system by total population.

Examples:

Single-family GPCD = (SFR Consumption gal per year/ (number of SFR connections x vacancy rate* x persons per household) /365 days

System Total GPCD = Annual Water Production / {(number of SFR connections x vacancy rate* x persons per household) + (number of MF units x vacancy rate x persons per household) + group quarters population} / 365 days

To assist with the calculations, the NMOSE has developed a NMOSE GPCD Calculator (Calculator) using an ExcelTM spreadsheet. The NMOSE GPCD Instruction Module provides the details on how to work the Calculator. There are multiple data entry options depending on what data is available from the drinking water suppliers. With each option, the Instruction Module outlines how the Calculator will respond and when default values might be used.

Below is a list of the data that the drinking water supplier will need to collect in order to utilize the Calculator. Not all data will be required for each case. Check the Instruction Module to determine how the Calculator will respond if specific information is not available. Data can be collected on a monthly or annual basis.

* There are multiple options for determining vacancy rate in SFR populations. See Section 3.2 , 3.3 and 3.11 for details.

- Total gallons of water diverted to the system
- Volume of water imported and/or exported by system
- Total gallons of water delivered to sectors: single-family residential, multi family residential, ICI and other metered
- Number of single family connections (total or active) served by drinking water supplier
- Number of multi-family units served by drinking water supplier
- Data retrieved from the most recent US Census
 - Number of persons per household for area of state serviced by supplier
 - Occupied status of housing units (Occupied and Vacant)
 - Group Quarters' population
 - Total gallons of water reused

For questions regarding the Instruction Module or Calculator, please call 800-WATERNM (800-928-3766) or waternm@state.nm.us.

NMOSE GPCD CALCULATOR

TABLE OF CONTENTS

I.	NMOSE GPCD Calculator	6
II.	NMOSE GPCD Methodology	6
III.	Introduction to NMOSE Excel™ Calculator	7
IV.	Data Entry Sheets	9
	1. Instructions and Utility Information (Sheet 1)	9
	2. Census Information (Sheet 2)	10
	3. Single-Family Residential (Sheet 3)	11
	4. Multi-Family Residential (Sheet 4)	16
	5. Industrial, Commercial, Institutional and Other Metered (Sheet 5)	20
	6. Reuse (Sheet 6)	22
	7. Total Water Diverted and Supplied (Sheet 7)	24
V.	Graphical Analysis Sheets	27
	8. GPCD Reported Data – Summary (Sheet 8)	28
	9. Annual Reporting Performance (Sheet 9)	29
	10. Monthly Reporting Performance (Sheet 10)	30
VI.	Definitions	31
VII.	Comments	35
VIII.	Appendix A: Census Bureau Website Details	36

In addition to the NMOSE GPCD Calculator, it should be noted that all parties are allowed to show other methods and explanations of calculating GPCD for their systems.

I. NMOSE GPCD Calculator

The New Mexico Office of the State Engineer (NMOSE) GPCD Calculator is designed to aid drinking water suppliers within the State of New Mexico in calculating their GPCD. It uses a Microsoft Excel™ structure to record the data and to develop the results.

This methodology and the supporting NMOSE GPCD Calculator (Calculator) are designed to give NMOSE and drinking water suppliers within New Mexico a tool to standardize water use reporting. These calculations aid in tracking trends and changes over time, water use programming and planning, and projecting future per capita needs.

The methodology was developed by NMOSE in cooperation with leading water engineers and conservation experts in the nation. The methodology and the Calculator have been reviewed by state agencies, municipalities, university and other water experts across the country. It was pilot tested by six water suppliers within the state. The NMOSE GPCD Calculator v2.04 Beta will remain in a testing phase through 2009 or until necessary. Drinking water suppliers are welcome to submit their own methodologies along with the Calculator v2.04 Beta until further notice.

II. NMOSE GPCD Methodology

The NMOSE Methodology breaks down GPCD into the following **sectors**:

- Single-Family Residential
- Multi-Family Residential
- Industrial, Commercial, and Institutional (ICI)
- Other Metered (to allow users to include their own categories)
- Reuse
- Non-revenue
- System Total

The NMOSE Methodology calculates **populations** using:

- Persons per Household from the most recent US Census
- Vacancy Rate from the most recent US Census
- Group Quarters from the most recent US Census
- Number of single-family residential connections
- Number of multi-family housing units

The populations are calculated by using active number of connections or housing units multiplied by the average persons per household for the service area of the drinking water system. There are several options for calculating active connections. These methods are outlined in Section IV. 3. Single-Family Residential. There are also several options regarding calculation of multi-family units. These options are outlined in Section IV. 4. Multi-Family Residential.

- SFR Population = number of active SFR connections x persons per household
- MFR Population = number of MFR units x vacancy rate x persons per household
- System Total Population = SFR Population + MFR Population + Group Quarters

Sector GPCDs are calculated by dividing gallons billed divided by population in sector when available. When sector populations are not available the delivered water is divided by the total population.

- $\text{SFR GPCD} = \text{SFR water delivered} / \text{SFR populations}$
- $\text{MFR GPCD} = \text{MFR water delivered} / \text{MFR populations}$
- $\text{ICI GPCD} = \text{ICI water delivered} / \text{System Total Population}$
- $\text{Other Metered GPCD} = \text{Other Metered water delivered} / \text{System Total Population}$
- $\text{Reuse GPCD} = \text{Reuse diversions} / \text{System Total Population}$

Non-revenue water is calculated in both GPCD and total volume. It does not have a data entry sheet but is included in the Graphical Analysis Worksheets. Non-revenue water is water that has been diverted but is not included in billed or metered water. It includes authorized uses such as firefighting and line flushing and unauthorized uses such as leaks and theft.

- $\text{Non-revenue Volume} = \text{Total Water Diverted} - \text{SFR Metered} - \text{MFR Metered} - \text{ICI Metered} - \text{Other Metered}$
- $\text{Non-revenue GPCD} = (\text{Total Water Diverted} - \text{SFR Metered} - \text{MFR Metered} - \text{ICI Metered} - \text{Other Metered}) / \text{System Total Population}$

The System Total GPCD is calculated by dividing System Total Population into the system's total water diversions, both groundwater and surface water. Any water exported from the system or imported into the system are accounted for with the total diversions.

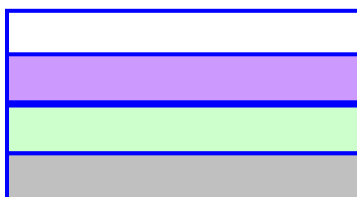
- $\text{System Total GPCD} = (\text{Total Water Diverted} - \text{Exported Water} + \text{Imported Water}) / \text{System Total Population}$

III. Introduction to the Excel™ Calculator

The Calculator is a stand-alone piece of software designed by the NMOSE to calculate GPCD using a standardized methodology (developed in Microsoft Excel™). It is currently available at: www.nmose.state.nm.us/. The Calculator is free to download for use on personal or work computers. Do not try to enter data while still on NMOSE website. This Instruction Module provides detailed instructions on how to use the Calculator.

General Information

The white boxes are data entry cells and are used for inputting data. The purple boxes are dropdown menus requiring user selection. The white and purple boxes are the only boxes that the user has access to change. The light green boxes are values that have been calculated based on inputs. Gray boxes are no longer available for input. These are usually annual boxes where monthly data has been completed. All drop down boxes and calculated cells are protected.



There are information “info” cells, which allow the user to be linked to the definitions page in the Calculator where an explanation of this specific item is discussed. These are dark green boxes are located right next to the item of interest. Once in the definitions’ section, there are reverse-links to get the user back to the original location.

A small green rectangular box with the word "Info" in white text.

Instruction boxes are located at the top of critical data entry pages. Roll the mouse over these boxes to read important information regarding the data entry and calculations on that page.

A small red rectangular box with the word "Instructions" in white text and a red triangle pointing to the right.

Monthly or Annual Data Options

The data cells are provided for input of both monthly and annual data. The user has the choice of which data to enter. When it is available, monthly data is the preferred option. It will provide the most informative output information. The annual data should only be entered when a complete year of monthly data is not available. If monthly data is complete, the annual data cell will be grayed out and not available for data entry. If used, the annual data will always default over the monthly data in the equations. If the calculation fields are recording either “N/A”, or “No Data” check the monthly and annual input fields to see if the appropriate data has been entered.

Comments

The Comments box has been provided on each main data enter sheet to allow the utility to explain or clarify data entry. This should include any problems, anomalies, or confusion encountered while completing the NMOSE GPCD calculator. It should also include decisions made regarding the data entries.

NOTE:

The term utility is used throughout this document as a generic term. It refers to all drinking water suppliers.

Worksheet Structure

Data Entry Sheets

Sheet 1.	Instructions and Utility Information
Sheet 2.	Census Information
Sheet 3.	Single-Family Residential (SFR)
Sheet 4.	Multi-Family Residential (MFR)
Sheet 5.	Industrial, Commercial & Institutional (ICI) and Other Metered
Sheet 6.	Reuse
Sheet 7.	Total Water Diverted and Supplied

Graphical Analysis Sheets

Sheet 8.	GPCD Reported Data - Summary
Sheet 9.	Annual Reporting Performance
Sheet 10.	Monthly Reporting Performance

Definitions

Sheet 11.	Definitions
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IV. Data Entry Sheets

Step-by-Step Instructions

The following Subchapters of the Instruction Module detail the NMOSE GPCD Calculator data needs and data outputs. They will provide a step-by-step approach to the Calculator including alternatives for each section.

1. Instructions and Utility Information: Data Collection (Sheet 1)

The Instructions and Utility Information worksheet is an introduction to the GPCD Calculator's navigation and organization and requires the first data entry. Navigation can be conducted using either hyperlinks on the left side of the sheet, or through the tabs at the bottom of the Excel spreadsheet. The data inputs necessary on this worksheet are administrative items: utility name, reporting years, the name and contact details for the preparer of the spreadsheet and reporting units (gallons or cubic feet). The reporting years and the reporting units will automatically be entered into all relevant tables and calculations throughout the Calculator.

The Calculator allows the option of either cubic feet or gallons as the reporting units. **The Calculator will not function appropriately until the reporting units selection has been made.** All output values will be in gallons per capita per day regardless of reporting units selected.

Questions can be addressed to waternm@state.nm.us or call 800-WATERNM (800-928-3766).

2. *Census Information Data Table 2.1 (Sheet 2)*

The information provided on Sheet 2 will be used in calculations to define populations served. Details on how to find the data on the U.S. Census website are described in Appendix A and in Definitions (Sheet 11) within the Calculator. It is highly recommended that the results of the US Census data search is printed and kept on file.

Use information from the following data sets:

- The most recent US Census available (2000, 2010).
- Summary File 1 (SF1)
- Geographic Type as “Place”

After choosing Geographic area, a drop down list on New Mexico locations will be provided on the website. Choose the location that most closely represents the area served by the drinking water supplier. The Calculator is set up to only accept one set of information from the US Census. A Comment box has been provided at the bottom of the sheet for additional information. This can be used to explain any anomalies or disagreements regarding the US Census data.

The Census Year will be used in certain calculations within the spreadsheet to normalize data dependant upon growth trends.

The **Group Quarters** (found on Table P37, U.S. Census, SF1) is a population including, but not limited to those in prisons, nursing homes, hospitals for the chronically ill, college quarters off campus, military quarters and emergency and transitional shelters. Group Quarters is included in system total population and system total GPCD.

Occupancy status (found on Table H3, U.S. Census, SF1) includes all the other population housed in single- and multi-family units. This is split into “Occupied” and “Vacant”. This data is used to calculate an overall vacancy rate percentage. The vacancy percentage is used in single-family residential and multi-family residential to calculate population served.

The **Average Household** size (found on Table H12, U.S. Census, SF1) is calculated in the Census 2000 methodology by dividing the total population (minus any group quarters population) by the number of occupied housing units. This unit, measured in persons per household, is then used by the Calculator to determine a residential population served by the utility. See sections 3. Single-Family Residential and 4. Multi-Family Residential for specific information on how persons per household is used.

NOTE:

Check the box in the top right corner of Sheet 2. This should contain the years that are being evaluated, with the most recent year first. If they are not showing, go back to Sheet 1 and enter Reporting Years.

3. *Single-Family Residential – (Sheet 3)*

The Single-Family Residential (SFR) worksheet has multiple input and calculation tables. This is so that a GPCD value can be calculated using either monthly or annual data. Monthly data should be used where it is available, as this will provide the most detailed analysis. If monthly data is not available, annual data can be used. When input, the annual data will override monthly data in the calculations. It should only be used when monthly data is not available.

The definition of SFR varies by drinking water suppliers. If the category is defined by connections with fewer than three (3) units, then population served will be underrepresented. To further refine the single-family residential number, duplex (2-units) and triplex (3-units) connections should be identified and moved to a multi-family residential billing category. If the change is not possible at this time, make a note in the Comments box of the multi-family residential spreadsheet and add the missing populations to the multi-family units.

Single-Family Residential – Sheet 3		
<u>Table Number</u>	<u>Table Name</u>	<u>Data Type</u>
TABLE 3.1	SFR Billed Water Consumption	INPUT - Monthly
TABLE 3.2	Number of SFR Connections	INPUT - Monthly
TABLE 3.3	Inactive (“Zero” Use) SFR Connections	INPUT - Monthly
TABLE 3.4	SFR Population	CALCULATION - Monthly
TABLE 3.5	SFR GPCD Calculation	CALCULATION - Monthly
TABLE 3.6	Annual Consumption	INPUT - Annual
TABLE 3.7	Annual Calculation	CALCULATION - Annual/Average
TABLE 3.8	Average Annual Connections	INPUT - Annual
TABLE 3.9	Average Connection Calculations	CALCULATION - Annual/Average
TABLE 3.10	Calculated Growth Rate	CALCULATION - Percentage
TABLE 3.11	No. of Vacant SFR Connections	CALCULATION - Annual
TABLE 3.12	Size of Average Household	TRANSFERRED - Sheet 2
TABLE 3.13	SFR Population	CALCULATION - Annual/Average
TABLE 3.14	Annual SFR GPCD	CALCULATION - Annual/Average

(1) **Billed Consumption - Table 3.1**

The first column of Table 3.1 will already include the years to be evaluated. These were transferred from the Reporting Years on Instructions and Utility Information (Sheet 1). If the years are not in place, return to Sheet 1 and enter Reporting Years. The Calculator will accept up to seven years worth of data. However, any range from one year to seven years will work. If using less than seven years, just leave the irrelevant data input fields blank.

Input the amount of water used by all SFR connections, monthly by year in Table 3.1. If using annual totals proceed to Table 3.6 Annual Consumption. Incomplete years will not be calculated. The Calculator will allow both monthly and annual data entries for separate years or annual data can be entered when only partial monthly data has been entered. If complete monthly data is

entered, Table 3.6 Annual Consumption will be grayed out and Table 3.7 Annual Calculations will show the annual monthly totals.

Table 3.1 will be utilized to calculate Table 3.5 SFR GPCD Calculation (Monthly).

NOTE:

If an AWWA water audit has been completed, the utility should enter the adjusted SFR billed consumption that accounts for meter errors (a portion of apparent losses). An explanation of

(2) Number of SFR Connections (Monthly) - Table 3.2

Table 3.2 includes a drop down list (in purple) with two choices: Total Connections or Active Connections Only. Select Total Connections if all active and inactive SFR connections is included in the monthly or annual data. If Total Connections is selected, review options for calculating inactive connections in Table 3.3 Inactive (Zero Use) SFR Connections and Table 3.11 No. Vacant SFR Connections. Select Active Connections Only if only the active or billed accounts are included in the total. If Active Connections Only is used, the “zero” analysis (Table 3.3) or Number of Vacant SFR Connections (Table 3.11) will not be used.

After selecting Total or Active, provide the appropriate number of SFR connections monthly, by year (partial year data is acceptable, and should be included) in Table 3.2. The Calculator will allow both monthly and annual data entries for separate years or when only partial monthly data has been entered. If complete monthly data is entered, Table 3.8 Avg. Annual Connections will be grayed out and Table 3.9 Avg. Connections Calculation will show the average monthly connections.

This data will be used along with Table 3.12 Size of Average Household (and Table 3.3 Inactive Connections or Table 3.11 Number of Vacant SFR Connections if Total Connections was selected) to develop Table 3.4 SFR Population (monthly).

(3) Inactive (“Zero” Use) Accounts - Table 3.3

If Active Connections Only was selected in Table 3.2, skip to Table 3.4.

If Active Connections Only was selected, Table 3.3 will be grayed out. If Total Connections was selected in Table 3.2, a message will appear above this box prompting data entry. Either provide a “zero” analysis to quantify inactive accounts or the system will automatically default to the calculated vacant connections (Table 3.11). To complete a “zeros” analysis review the system’s billing records for SFR for in-active accounts. These usually show up as zeros or non-readings. Record the number of in-active accounts by month in Table 3.3. These accounts are subtracted from total connections for that month (Table 3.2) and are removed from further analysis.

The utility has the option of defining an inactive or “zero” account as no usage or a volume defined by the utility such as under 500 gallons per month. An explanation of the “zero” analysis must be provided in the Comments box at the bottom of Sheet 3. If using a volume other than zero, place any amount of water removed with the connection from the single-family category into either Table 5.1 ICI Water or 5.2 Other Metered Consumption. This ensures that this water is counted as part of the billed water and not applied towards non-revenue water.

The inactive connections will be subtracted from 3.2 Number of SFR Connections prior to multiplying by Table 3.12 Size of Household to calculate population.

(4) SFR Population (Monthly) – Table 3.4

Monthly population for SFR connections is calculated using Table 3.2 Number of SFR Connections Table 3.3 Inactive SFR Connections, Table 3.11 Number Vacant SFR Connections and Table 3.12 Size of Household.

When Total Connections is chosen one of the following equations will be used:

- Monthly SFR Population (Table 3.4) = (Monthly Number of SFR Connections (Table 3.2) – Monthly Inactive SFR Connections (Table 3.3)) x Size of Household (Table 3.12)
- Monthly SFR Population (Table 3.4) = (Monthly Number of SFR Connections (Table 3.2) – Number Vacant SFR Connections (Table 3.11)) x Size of Household (Table 3.12)

When Active Connection Only is chosen the following equation will be used:

- Monthly SFR Population (Table 3.2) = Monthly Number of SFR Connections (Table 3.2) x Size of Household (Table 3.12)

(5) SFR GPCD Calculation (Monthly) – Table 3.5

The monthly SFR GPCD figures are calculated in Table 3.5.

$$\text{SFR GPCD (Monthly)} = (\text{SFR Billed Water Consumption (Table 3.1)} / \text{SFR Population (Monthly) (Table 3.4)}) / \text{number of days in the month}$$

(6) Annual Consumption – Table 3.6

If monthly data has been provided, this box will be grayed out. If monthly data is not available, input the annual SFR consumption figures into Table 3.6. The Calculator will allow both monthly and annual data entries for separate years or annual data can be entered when only partial monthly data has been entered. For example, 2005-2007 is entered monthly and 2001 –2004 is entered annually. Table 3.7 Annual Calculations will show the annual consumption totals whether the data was entered by month or annually.

If monthly consumption data was not complete (Table 3.1), this data will be moved to Table 3.7 and used with Table 3.13 SFR Population to develop Table 3.14 Annual SFR GPCD.

(7) Annual Calculation – Table 3.7

This is the annual billed consumption. It either sums the monthly data from Table 3.1, or uses the annual data input from Table 3.6. This is used for calculation in Table 3.14 Annual Single-Family GPCD.

(8) Average Annual Connections – Table 3.8

Like Annual Consumption (Table 3.6), Table 3.8 allows the utility to provide annual numbers where monthly numbers are not available. If monthly data has been provided, this box will be grayed out. Use annual number only when monthly data is not available. If monthly connection data was not complete (Table 3.2), the annual data will be moved to Table 3.9 and used with Table 3.7 Annual Calculation to develop Table 3.14 Annual Single-Family GPCD.

(9) Average Connection Calculation – Table 3.9

This is the annual number of connections. It either averages the monthly data from Table 3.2, or uses the annual data input from Table 3.8. This is used for calculation in Table 3.13 SFR Population.

(10) Calculated Growth Rate – Table 3.10

The growth rate is determined by calculating the percentage change in the number of SFR connections on an annual basis, Table 3.9 Average Connection Calculation. This will only be calculated if there is more than one years' data.

Table 3.10 allows utilities to check the growth percentage calculated against their own estimates. It is also used in Table 4.8 Annual (MF) Unit Calculation if only the current number of multi-family units can be provided.

(11) Number of Vacant SFR Connections – Table 3.11

The number of vacant connections for each year is calculated only when Total Connections is selected in Table 3.2. When monthly data is provided for Inactive SFR Connections Table 3.3 then 3.11 is the monthly average. When inactive connections are not provided, Average Connection Calculation in Table 3.9 is multiplied by the vacancy rate percentage calculated from US Census figures in Table 2.1. If you are using Active Connections Only from Table 3.2, then 3.11 will be grayed out.

The annual average for Number of Vacant SFR Connections is then subtracted from Table 3.2 prior to calculating 3.4 SFR Population (Monthly) or when using annual, from Table 3.9 to calculate Table 3.13 SFR Population.

(12) Size of Average Household – Table 3.12

This Table is transferred from the US Census data input into Table 2.1, Sheet 2. This data is used to determine a total SFR population for both the monthly and annual data (Tables 3.4 and 3.13 respectively).

(13) SFR Population – Table 3.13

The population average is calculated for SFR in Table 3.13. When monthly connection data is provided, Table 3.13 is the average of all the monthly population data from Table 3.4 SFR Population (Monthly). When only annual data is provided and Total Connections is selected, Table 3.13 is (Average Connections (Table 3.9) – Number of Vacant SFR Connections (Table 3.11)) times Size of Average Household (Table 3.12). If Active Connections only is selected, then Table 3.13 is Average Connections (Table 3.9) times Size of Average Household (Table 3.12).

Table 3.13 is used in the calculation of Table 3.14 Annual SFR GPCD.

(14) Annual Single-Family GPCD – Table 3.14

The Annual SFR GPCD is calculated by the following:

(Annual Calculated (Table 3.7)/SFR Population (Table 3.13))/365 days

NOTE:

This SFR GPCD is not the same number as the SFR (System Total) GPCD in the Reported Data section (Sheet 9) of the Calculator. In Table 3.14 the GPCD is divided by the SFR Population only (Table 3.13) and is considered a Sector GPCD. In the System Total calculation the SFR GPCD is divided by the System Total Population (Table 7.13). This is a portion of the System Total GPCD.

4. Multi-Family Residential (Sheet 4)

The multi-family residential (MFR) sheet is meant to include all populations living in multiple housing units that have not been identified in the SFR population. This can include apartment complexes, trailer parks, and condos or townhouses which have multiple units serviced by a single connection or even neighborhood associations that have multiple connections to one meter. Duplexes and triplexes should also be included in this data. Each unit is counted separately. A triplex counts as three units and an apartment complex may have as many as 500 units or more. Institutionalized or group quarters populations (prisons, nursing homes) should not be included in MFR. They are counting in Table 2.1 and will be added to the System Total Population.

In many drinking water suppliers this may not be reflective of the current billing classification. The MFR units may be spread out in SFR and commercial classifications. If definitive billing data for the number of units is not available, then the volume of water should be left in the ICI Water Consumption (Table 5.1) or Other Metered (Table 5.2) and a MFR GPCD will not be calculated. **The number of MFR units must be entered regardless of whether billing data is compiled.** The number of units will be used in conjunction with SFR Population (Table 3.13) and Group Quarters (Table 2.1) to compile total population.

Multi-Family Residential – Sheet 4		
Table Number	Table Name	Data Type
TABLE 4.1	MFR Billed Water Consumption	INPUT - Monthly
TABLE 4.2	Number of MFR Units	INPUT - Monthly
TABLE 4.3	MFR Population	CALCULATION - Monthly
TABLE 4.4	MFR GPCD Calculation	CALCULATION - Monthly
TABLE 4.5	Annual Consumption	INPUT - Annual
TABLE 4.6	Annual Calculation	CALCULATION - Annual/Average
TABLE 4.7	Number of Annual/Current Units	INPUT /CALC
TABLE 4.8	Annual Units Calculation	CALCULATION - Annual
TABLE 4.9	MFR Population	CALCULATION - Annual/Average
TABLE 4.10	Vacant MFR Connections	CALCULATION - Annual
TABLE 4.11	Annual MFR GPCD	CALCULATION - Annual

(1) MF Billed Water Consumption (Monthly) - Table 4.1

Provide the amount of water used for MFR connections monthly, by year in Table 4.1. If MFR is not available as a separate category, provide an explanation in the Comment section of this sheet and include the monthly usage in the Industrial, Commercial and Institutional (Table 5.1) or Other Metered (Table 5.2) on Sheet 5.

Table 4.2 Number of MFR Units or 4.7 Number of Annual/Current Units must be completed for population calculations regardless of the availability of gallons used.

Table 4.1 MFR Billed Consumption (Monthly) will be used in conjunction with 4.3 MFR Population (Monthly) to calculate Table 4.4 MFR GPCD Calculation (Monthly)

(2) Number of MFR Units (Monthly) - Table 4.2

Provide the total number of MFR units served by the utility monthly by year where available. If monthly numbers are not available provide the current number of units in the first line of Table 4.7 Annual Number Current Units.

At a minimum, the current MFR units must be provided in Table 4.7 to calculate a population. See Section 4.7 for more information on how the back calculations for MFR are determined.

Table 4.2 is used along with Average Size of Occupied Housing from Table 2.1 to calculate Table 4.9 MFR Population (Monthly).

(3) MFR Population (Monthly) – Table 4.3

The population for monthly MFR is calculated only if monthly unit data has been provided in Table 4.2. MFR is calculated using the following equation:

$$\text{MFR Population} = (\text{Number of MFR Units (Monthly) (Table 4.2)} - \text{Vacant MFR Connections (Table 4.10)}) \times \text{Size of Average Household (Table 2.1)}$$

(4) MF GPCD Calculation (Monthly) – Table 4.4

The GPCD for monthly MFR is calculated only if monthly consumption and monthly unit data has been provided in Table 4.1 and 4.2. The monthly GPCD calculation is determined by the following equation:

$$\text{MFR GPCD Calculation (Monthly)} = (\text{MFR Billed Water Consumption (Monthly) Table 4.1} / \text{MFR Population (Monthly) Table 4.3}) / \text{days per month}$$

(5) Annual Consumption – Table 4.5

If monthly data has been provided, this box will be grayed out. If monthly data is not available, input the annual MFR consumption figures into Table 4.5. The Calculator will allow both monthly and annual data entries for separate years or annual data can be entered when only partial monthly data has been entered. For example, 2005-2007 is entered monthly and 2001 –2004 is entered annually. Table 4.6 Annual Calculations will show the annual consumption totals whether the data was entered by month or annually.

If monthly consumption data was not complete (Table 4.1), the annual data will be moved to Table 4.6 and used with Table 4.9 MFR Population to develop Table 4.11 Annual MFR GPCD.

(6) Annual Calculation (Multi-family only) – Table 4.6

This is the annual billed consumption. It either sums the monthly data from Table 4.1, or uses the annual data input from Table 4.5.

Table 4.6 is used to calculate Table 4.11 Annual MFR GPCD.

(7) Number of Current Units – Table 4.7

Like Annual Consumption (Table 4.6), Table 4.7 allows the utility to provide annual numbers where monthly numbers are not available. Use annual number only when monthly data is not available.

If only the current number of MFR units is available, provide it in the top line of Table 4.7. The previous MFR populations will be back calculated (in Table 4.8) based on a regressive population growth rate. The growth rate is calculated from the annual number of SFR connections provided on Table 3.2. Data entered into Table 4.7 will override the top row (or most current year) only when calculating Table 4.8 Annual Unit Calculation. Any data entered into previous years on Table 4.2 Number of MFR Units (Monthly) will provide more accurate data than the regression and will take precedent. The growth rate will be back calculated from the latest entry (either monthly or annual) in Table 4.8.

Enter zero “0” if there are no multi-family units in the system. A value must be entered into either 4.2 or 4.7 in order for populations to be calculated.

(8) Annual Unit Calculation – Table 4.8

This is the annual number of connections. It either averages the monthly data from Table 4.2, or uses the annual data input from Table 4.7. If only the current number of MFR units is available and provided in the top space of Table 4.7 then previous MFR populations will be back calculated (in Table 4.8) based on a regressive population growth rate. The growth rate is calculated from the number of SFR connections provided on Table 3.2.

Table 4.8 is used for calculating Table 4.9 MFR Population.

(9) MFR Population– Table 4.9

The population average is calculated for MFR in Table 4.9. When monthly connection data is provided, Table 4.9 is the average of all the monthly population data from Table 4.4 MFR Population (Monthly). When only annual data is provided then the equation below is used.

MFR Population (Table 4.9) = (Annual Unit Calculation (Table 4.8) – Vacant MFR Connections (Table 3.10)) x Size of Average Household (Table 2.1).

Table 4.9 is used in the calculation of Table 4.11 Annual MFR GPCD.

(10) Vacant MRF Connections

This Table is uses the Vacancy Rate percentage from Table 2.1 multiplied by the number of units from Table 4.8. It is used to calculate Table 4.9 MFR Population.

(11) Annual Multi-Family GPCD – Table 4.11

The Annual MFR GPCD is calculated by the following;

**Annual Multi-Family GPCD =
(Annual Calculation (Table 4.6)/ MFR Population (Table 4.9))/ 365 days**

NOTE:

If either the volume of water or the number of units has not been provided, a MFR GPCD will not be calculated. If the utility has a MFR population, the number of **MFR units must be entered** in either Table 4.2 or 4.7 for the System Total Population to include this population.

5. Industrial, Commercial and Institutional (ICI) and Other Metered - (Sheet 5)

ICI can include all commercial facilities (e.g., restaurants and retail shops), schools, universities, and prisons as well as industrial users in a single category. To look at one of these categories separately, move the billed amount into Other Metered Table 5.2 and make a note in the Comments section of this sheet. Other Metered includes all other metered water (billed or unbilled). Any metered water that is not included in SFR, MFR or ICI. If metered water is not accounted for it will show up in the non-revenue water on System Total Annual Reporting Performance (Sheet 9).

Industrial, Commercial & Institutional (ICI) and Other Metered – Sheet 5		
<u>Table Number</u>	<u>Table Name</u>	<u>Data Type</u>
TABLE 5.1	ICI Water Consumption	INPUT - Monthly
TABLE 5.2	Other Metered Consumption	INPUT - Monthly
TABLE 5.3	ICI Annual Consumption	INPUT - Annual
TABLE 5.4	ICI GPCD	CALCULATION - Annual
TABLE 5.5	ICI Annual Calculated	CALCULATION - Annual
TABLE 5.6	Other Annual Consumption	INPUT - Annual
TABLE 5.7	Other Metered GPCD	CALCULATION - Annual
TABLE 5.8	Other Annual Calculated	CALCULATION - Annual

(1) ICI Water Consumption - Table 5.1

Provide the amount of water used for all Industrial, Commercial and Institutional (ICI) categories in Table 5.1.

The total volume of water used by customers in this group will be divided by the total population including single-family (SFR Population Table 3.13), multi-family (MFR Population Table 4.9), and resident institutional population (Group Quarters Table 2.1).

In some cases this sector may also include MFR consumption. In many water supplier's billing systems these are classified as "Commercial", or "Commercial Apartments". If this is the case, make a note in the Comment section. An effort should be made in future reporting to separate these into a specific MFR classification.

Table 5.1 will be used with Table 7.13 Total Population to calculate Table 5.4 ICI GPCD.

(2) Other Metered Consumption - Table 5.2

The Other category is a catch-all for any other billed metered usage that does not fall easily into any of the three categories above. The utility should explain the classifications of any group in this category. The total volume of water used by customers in this group will be divided by the total population (Table 7.13).

(3) ICI Annual Consumption - Table 5.3

If monthly data has been provided, this box will be grayed out. If monthly data is not available, input the annual ICI consumption figures into Table 5.3. The Calculator will allow both monthly and annual data entries for separate years or annual data can be entered when only partial monthly data has been entered. For example, 2005-2007 is entered monthly and 2001 –2004 is entered annually. Table 5.5 ICI Annual Calculated will show the annual consumption totals whether the data was entered by month or annually.

(4) ICI GPCD – Table 5.4

ICI GPCD = (ICI Annual Calculated (Table 5.5)/ Total Population (Table 7.13))/ 365 days.

(5) ICI Annual Calculated – Table 5.5

This is the annual billed consumption. It either sums the monthly data from Table 5.1, or uses the annual data input from Table 5.3.

Table 5.5 is used to calculate Table 5.4 ICI GPCD.

(6) Other Annual Consumption – Table 5.6

If monthly data has been provided, this box will be grayed out. If monthly data is not available, input the annual Other Metered consumption figures into Table 5.6. The Calculator will allow both monthly and annual data entries for separate years or annual data can be entered when only partial monthly data has been entered. For example, 2005-2007 is entered monthly and 2001 –2004 is entered annually. Table 5.8 Other Annual Calculated will show the annual consumption totals whether the data was entered by monthly or annually.

(7) Other Metered GPCD – Table 5.7

Other Metered GPCD = (Other Metered Calculated (Table 5.8)/ Total Population (Table 7.13))/ 365 days

(8) Other Annual Calculated

This is the annual billed consumption. It either sums the monthly data from Table 5.2, or uses the annual data input from Table 5.6.

Table 5.8 is used to calculate Table 5.7 Other Metered GPCD.

NOTE:

Monthly GPCD data for ICI or Other Metered is available in Sheet 10: Monthly Reporting Performance.

6. Reuse (Sheet 6)

Reuse, or Recycled water is former wastewater (sewage) that has been treated to remove solids and certain impurities and reused by a water supplier. In most locations, it is only intended to be used for nonpotable uses, such as irrigation, and dust control. This data is not included in any other calculation; it is designed as a stand only worksheet. It is provided as a tracking tool for the user. The GPCD numbers on this data sheet are derived from the Total Population (Table 7.13) and are provided as a means of tracking efforts over time.

Reuse – Sheet 6		
Table Number	Table Name	Data Type
TABLE 6.1	Reuse Diversions	INPUT – Monthly
TABLE 6.2	Reuse Annual Diversions	INPUT – Annual
TABLE 6.3	Reuse GPCD	CALCULATIONS – Annual
GRAPH 6.1	Reuse Volume	CALCULATIONS – Monthly
GRAPH 6.2	Reuse GPCD	CALCULATIONS – Annual

(1). Reuse Diversions - Table 6.1

Input the amount of reuse water monthly by year in Table 6.1. If using annual totals proceed to Table 6.2 Reuse Annual Diversions. The Calculator will allow both monthly and annual data entries for separate years or annual data can be entered when only partial monthly data has been entered.

(2). Reuse Annual Diversions - Table 6.2

If monthly data has been provided, this box will be grayed out. If monthly data is not available, input the annual reuse figures into Table 6.2. The Calculator will allow both monthly and annual data entries for separate years or annual data can be entered when only partial monthly data has been entered. For example, 2005-2007 is entered monthly and 2001 –2004 is entered annually.

(3). Reuse GPCD - Table 6.3

If monthly data was provided:

$$\text{Reuse GPCD} = (\text{Reuse Diversion (Monthly) (Table 6.1)/Total Population (Table 7.13)}) / 365$$

If annual data was provided:

$$\text{Reuse GPCD} = (\text{Reuse Annual Diversion (Table 6.2)/Total Population (Table 7.13)}) / 365$$

(4). Reuse Volume - Graph 6.1

The Reuse Volume Graph 6.1 is provided as a graphical analysis of Table 6.1. It provides a season look at the water reuse as well as a progression over time. If monthly data is not provided, this graph will remain blank.

(5). Reuse GPCD - Graph 6.2

The Reuse GPCD Graph 6.2 is provided as a graphical analysis of Table 6.3. It provides an annual review of reuse water based on Total Population (Table 7.13). This is the GPCD that is saved from System Total GPCD due to the reuse.

7. Total Production - Total Water Diverted and Supplied (Sheet 7)

The total production is all water supplied to the system prior to treatment or delivery. It includes all ground water and surface water diversions at the master meters.

Total Water Diverted – Sheet 7		
<u>Table Number</u>	<u>Table Name</u>	<u>Data Type</u>
TABLE 7.1	Total Water Diverted	INPUT – Monthly
TABLE 7.2	Imported Water	INPUT – Monthly
TABLE 7.3	Exported Water	INPUT – Monthly
TABLE 7.4	Total Water Supplied	CALCULATION – Monthly
TABLE 7.5	System Total GPCD	CALCULATION – Monthly
TABLE 7.6	Annual Total Diverted	INPUT – Annual
TABLE 7.7	Annual Total Diverted Calculated	CALCULATION – Annual/Average
TABLE 7.8	Annual Total Imported	INPUT – Annual
TABLE 7.9	Annual Total Import Calculated	CALCULATION – Annual/Average
TABLE 7.10	Annual Total Exported	INPUT – Annual
TABLE 7.11	Annual Total Export Calculated	CALCULATION – Annual/Average
TABLE 7.12	Annual Total Water Supplied	CALCULATION – Annual
TABLE 7.13	Total Population Estimate	CALCULATION – Annual
TABLE 7.14	System Total GPCD	CALCULATION – Annual

(1) Total Water Diverted (Monthly) - Table 7.1

Input the amount of water diverted for use by the system, monthly by year in Table 7.1. If using annual totals proceed to Table 7.6 Annual Total Diverted. Incomplete years will not be calculated. The Calculator will allow both monthly and annual data entries for separate years or annual data can be entered when only partial monthly data has been entered. If complete monthly data is entered, Table 7.6 Annual Total Diverted will be grayed out and Table 7.7 Annual Total Diverted Calculations will show the annual totals.

This data will be used for Table 7.4 Total Water Supplied.

NOTE:

If an AWWA water audit has been completed, the utility should enter the adjusted water diverted that accounts for meter errors. An explanation of the adjustments should be provided in the Comment section on this sheet.

(2) Imported Water (Monthly) - Table 7.2

Enter all water imported from the system, monthly by year. If using annual totals proceed to Table 7.8 Annual Total Imported. This will include any retail contracts with other drinking water suppliers where this utility is not the permit holder and has purchased water from another water supplier.

This data will be added to Table 7.1 Total System Diverted to determine 7.4 Total Water Supplied.

(3) Exported Water (Monthly) - Table 7.3

Enter all water exported to other systems, monthly by year. If using annual totals proceed to Table 7.6 Annual Total Exported. This will include any pass-through arrangements or wholesale contracts to other drinking water suppliers, where the reporting utility is the water rights permit holder.

This data will be subtracted from Table 7.1 Total Water Diverted to determine 7.4 Total Water Supplied.

(4) Total Water Supplied (Monthly) - Table 7.4

Calculation of total water used is determined by the following:

Total Water Supplied =
Total Water Diverted (Table 7.1) + Imported Water (Table 7.2) - Exported Water (Table 7.3)

(5) System Total GPCD (Monthly) – Table 7.5

The monthly system total GPCD figures are calculated in Table 7.5.

System Total GPCD (Monthly) (Table 7.5) =
(Total Water Supplied (monthly) (Table 7.4) / Total Population (Table 7.13)) / number of days in the month.

(6) Annual Total Diverted – Table 7.6

If monthly data has been provided, this box will be grayed out. If monthly data is not available, input the annual diversion figures into Table 7.6. The Calculator will allow both monthly and annual data entries for separate years or annual data can be entered when only partial monthly data has been entered. For example, 2005-2007 is entered monthly and 2001 –2004 is entered annually. Annual Total Diverted (Table 7.7) will show the annual diversion totals whether the data was entered by month or annually.

(7) Annual Total Diverted Calculated – Table 7.7

This is the annual diversions calculated. It either sums the monthly data from Table 7.1, or uses the annual data input from Table 7.6.

Table 7.7 is used to calculate Table 7.12 Annual Total Water Supplied.

(8) Annual Total Imported – Table 7.8

If monthly data has been provided, this box will be grayed out. If monthly data is not available, input the annual imported figures into Table 7.8. The Calculator will allow both monthly and annual data entries for separate years or annual data can be entered when only partial monthly data has been entered. For example, 2005-2007 is entered monthly and 2001 –2004 is entered annually. Annual Total Import Calculated (Table 7.9) will show the annual import totals whether the data was entered by month or annually.

(9) Annual Total Import Calculated – Table 7.9

This is the annual imported water. It either sums the monthly data from Table 7.2, or uses the annual data input from Table 7.8.

Table 7.9 is used to calculate Table 7.12 Annual Total Water Supplied.

(10) Annual Total Exported – Table 7.10

If monthly data has been provided, this box will be grayed out. If monthly data is not available, input the annual exported figures into Table 7.10. The Calculator will allow both monthly and annual data entries for separate years or annual data can be entered when only partial monthly data has been entered. For example, 2005-2007 is entered monthly and 2001 –2004 is entered annually. Annual Total Export Calculated (Table 7.11) will show the annual exported totals whether the data was entered by month or annually.

(11) Annual Total Exported Calculated – Table 7.11

This is the annual exported water. It either sums the monthly data from Table 7.3, or uses the annual data input from Table 7.10.

Table 7.11 is used to calculate Table 7.12 Annual Total Water Supplied.

(12) Annual Total Water Supply – Table 7.12

This is the annual total water supplied.

Annual Total Water Supply (Table 7.12) = Annual Total Diverted Calculated (Table 7.7) + Annual Total Import Calculated (Table 7.9) - Annual Total Exported Calculated (Table 7.11).

Table 7.12 is used to calculate Table 7.14 System Total GPCD.

(13) Total Population Estimate - Table 7.13

Total population is calculated using the three main annual population tables: SFR Population (Annual Table 3.13), MFR Population (Annual Table 4.11), and Group Quarters Population (Table 2.1).

Table 7.13 is used to calculate Table 7.14 System Total GPCD.

(14) System Total GPCD - Table 7.14

This is the calculation of the annual System Total GPCD.

System Total GPCD (Table 7.14) = Total Water Supplied (Table 7.12) / Total Population (Table 7.13)

NOTE:

Each drinking water supplier represents large differences in population, customer water uses, and economic conditions. This GPCD should not be used to compare drinking water suppliers. It is recommended that the GPCD be used as a benchmark to track the system's own use over time.

V. Graphical Analysis Worksheets

The GPCD data is reported through the charts and graphs pages in the reporting section of the Calculator, Sheets 8-10.

The NMOSE GPCD Calculator allows numerous combinations for graphing of data. Each sector can be viewed either on a yearly or monthly basis. A summary of the results is provided on Sheet 8: Reported Data. Sheet 9: Annual Reporting Performance provides both a table and a graph of the annual results. Sheet 10: Monthly Reporting Performance provides both a table and a graph of the monthly results. If monthly data was not provided, Sheet 10 will remain blank.

How to Use GPCD Results

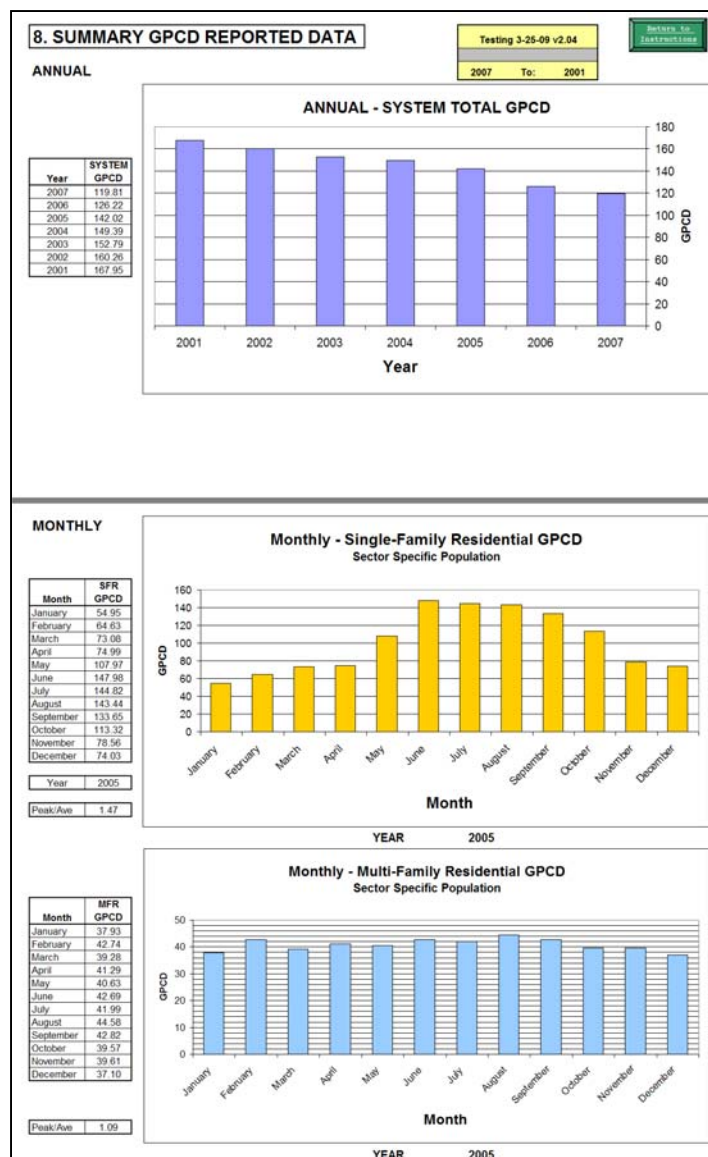
Data for up to seven years can be entered into the NMOSE GPCD Calculator. With this data, trends can be identified to estimate upper and lower boundaries for to each sector. These boundaries provide goals for both annual and monthly use. Drinking water suppliers can now use this data to implement targeted water conservation programs for reductions in specific sectors. The upper and lower boundaries will provide a baseline water use by which the effectiveness of implemented programs can be measured. For example, the monthly data can show the variations in uses between summer and winter. The winter data provides insight into indoor uses and can be used to assess conservation programs such as low-flow retrofits. Summer months show spikes in outdoor uses. Changes over time could be the results of summer peak programs such as watering schedules or irrigation improvements.

In addition to tracking water conservation programs, the baseline boundaries provide information for water use projections. The baseline information can be used in combination with localized population projections to project water needs by sector and by season. The projections should include any savings from planned water conservation programs.

8. GPCD Reported Data Summary (Sheet 8)

Reported Data Summary combines three of the main graphical outputs; System Total GPCD – annual data (from Table 7.14), Single-family residential – monthly data (from Table 3.5), and multi-family residential – monthly data (from Table 4.4). For the second and third graphs, monthly data is being shown for a selected year. To change the reporting year, go to Sheet 10: Monthly Reporting Performance. Select the desired year in the first drop down box “Choose Year for Monthly Analysis”. If monthly data was not provided, the bottom two graphs will be blank.

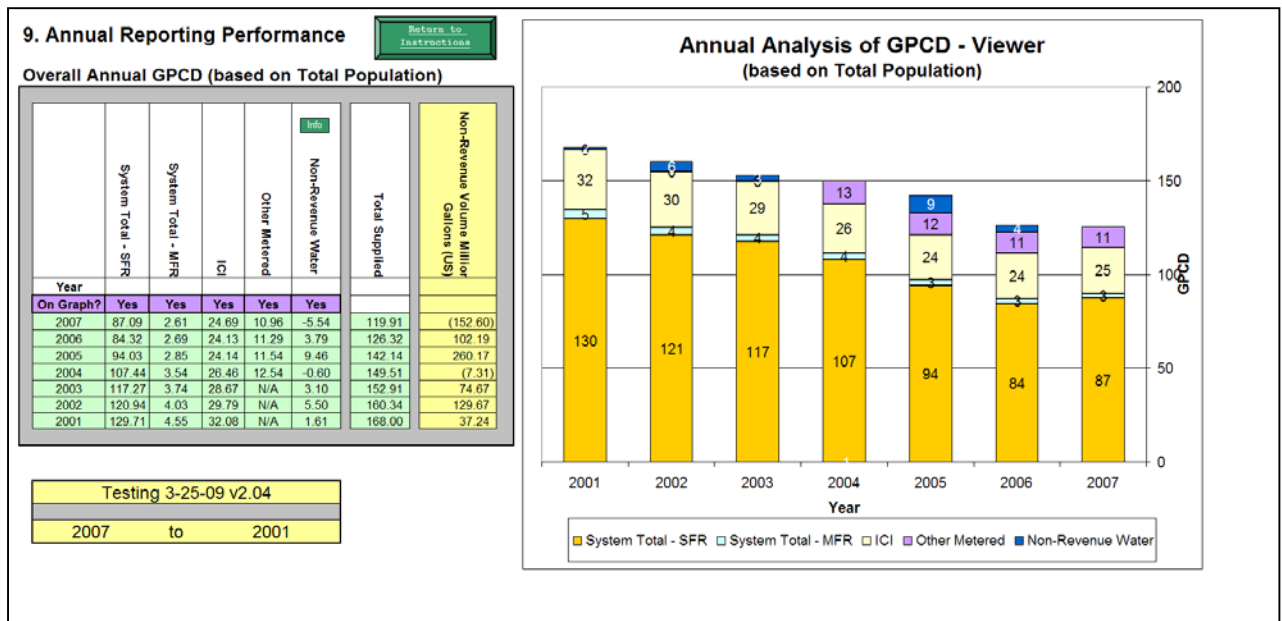
An example output is shown below.



9. System Total Annual Reporting Performance (Sheet 9)

The System Total Annual Reporting Sheet breaks down the System Total GPCD into the main sectors. All of these data are calculated against the total population. This is a different calculation than SFR GPCD (Table 3.14) and MFR GPCD (Table 4.11) which use their respective populations to make the calculation. SFR GPCD (Table 3.14) and MFR GPCD (Table 4.11) and the remaining sector GPCDs are represented on Sheet 10 Monthly Reporting Performance.

As shown below there are two parts to this worksheet – the data table and the graphical output. The data table is for reference and records the data shown graphically. Also, within the data table are five dialog dropdown boxes. These are the only unlocked cells on this worksheet. When the cursor is clicked on one of these cells a dropdown list showing “yes” or “no” pops up. By choosing “yes” the user gets the chart to show this value. By selecting more than one “yes” the annual data will be stacked, by selecting only one “yes” it will show individual graphs. By choosing “no” the chart will not use this data in its graph.



NOTE:

The SFR GPCD and the MFR GPCD in the graphs above are calculated using the System Total GPCD. **This is not the same** as the Sector GPCDs calculated on Sheet 3 and 4. The Sector GPCDs use the Sector population only and are more representative of the use by that sector.

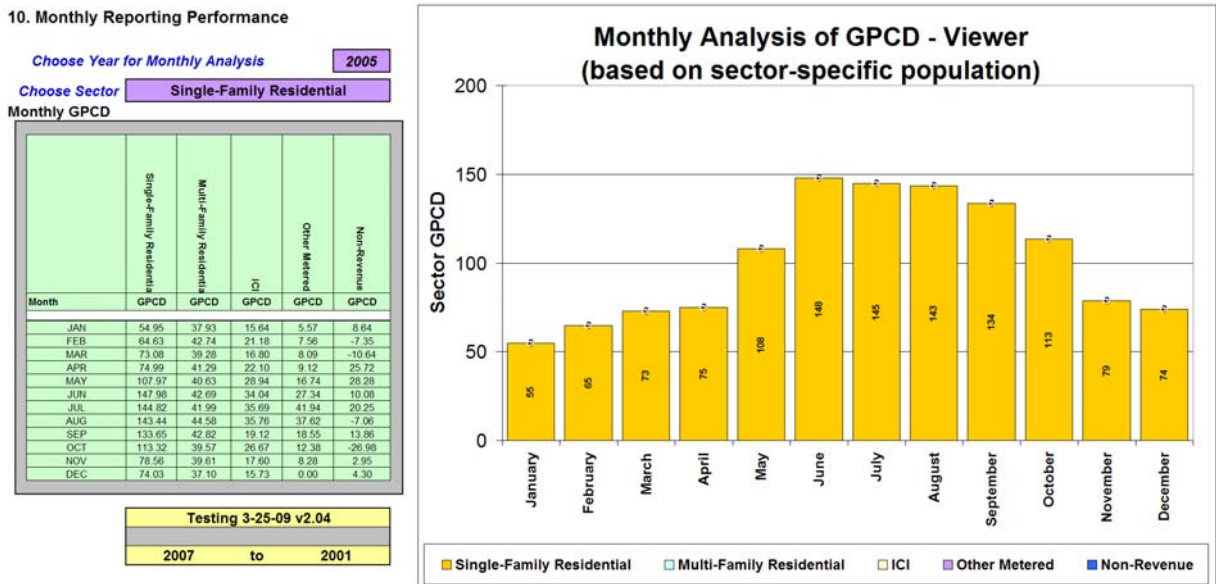
NOTE:

Reuse water is not be included in the calculation for NMOSE GPCD. This is a non-potable use and therefore is not connected with the NMOSE water permit amount.

10. Monthly Reporting Performance (Sheet 10)

The Monthly Reporting Performance (Sheet 10) is the monthly GPCD analysis using Table 3.5, 4.4, 5.1 and 5.2. Non-revenue water has also been calculated (see below for explanation of Non-revenue).

The figure below shows an example screen shot for this worksheet. There are two parts to this worksheet – the data table and the graphical output. The data table is for reference and records the data shown graphically. Also, within the data table are two dialog dropdown boxes. These are the only unlocked cells on this worksheet. When the cursor is clicked on the first dropdown list the user chooses a year for review. When the second drop down list is selected, the user chooses the classifications (single-family residential, multi-family residential, ICI, Other metered, and Non-revenue) for review. A selection from each list must be made for the graphs to be populated. For example, choosing 2007 and single-family residential would make the graph show the monthly data for single-family residential for the year of 2007. Whichever year is chosen on Sheet 10 will show up on the monthly graphs on Sheet 8.



Non-Revenue

Non-revenue water is all the water the utility diverts and/or produces, **but does not get paid for**. Non-revenue water includes apparent losses such as meter inaccuracies, theft, and database errors, real losses such as leaks. It also includes unbilled authorized uses such as fire-fighting, line flushing and disinfection.

The Calculator does not provide data entry for unmetered billed water. This might include bulk sales or monthly fees not based on usage. The non-revenue water in the Calculator includes all water **that is not metered**.

Non-Revenue = Total Water Supplied (Table 7.4) - Table 3.1 - Table 4.1 - Table 5.1 - Table 5.2

Non-revenue can be calculated in more detail through an AWWA water audit. Non-revenue is calculated as part of the GPCD Calculator to provide an extra performance measure for the utility.

11. Definitions (Sheet 11)

Active Connections	All active Single Family Residential connections within the utility. Connections that are not occupied or show zero activity are not counted in this category.
Annual Multi-Family Residential GPCD Calculation	The MFR GPCD is Annual MF Calculation (4.6) divided by the annual MFR Population (4.9).
Annual Single Family Residential GPCD Calculation	The SFR GPCD is Annual SFR Calculation (3.7) divided by the annual SFR Population average (3.13).
Billed Water Consumption (Multi-Family Residential)	This is the total billed consumption for Multi-Family Residential uses only. Provide the amount of water used (gallons) for multi-family residential connections by month in Table 4.1, or by year in Table 4.5. If multi-family residential is not available as a separate category, provide an explanation in the Comments Box and include usage in the Industrial, Commercial and Institutional Table 5.1 or Other Metered Table 5.2 on Sheet 5.
Billed Water Consumption (Single-Family Residential)	This is the total billed consumption for Single-Family residential uses only.
Calculated Growth Rate	The calculated growth rate is a calculation developed to normalize the data to the growth in the utility. The growth is determined by evaluating the percentage change in the number of connections within the utility on an annual basis, provided in Table 3.9 Average Connections Calculated. If there are no more than one years' data, then this will not be calculated. This Table is for the utilities use in checking the growth percentage calculated against their own estimates. It is also used in Table 4.8 Number of (Multi-Family) Units if only the current number of multi-family units can be provided.
Census Data	The Census data is used to standardize the calculation of population by utilizing numbers of people per household. It also records information on the vacancy rate within each city which enables calculation of the number of households actually being used. There is a link to a pdf document in Definitions showing the user how to find and record the relevant data.

Converter	The user may develop a GPCD Analysis based on one of two input unit selections: 1) Gallons (US) 2) Cubic feet Select the units from the Instructions and Utility Information worksheet. An interactive unit converter is also provided in the Calculator in Definition (Sheet 11). The conversion rates are provided below.			
	1	Cubic Feet	=	7.481 Gallons
	1	Gallon	=	0.134 Cubic Feet

Exported Water	Enter all water exported from the system. This will include any pass-through arrangements or wholesale contracts to other drinking water suppliers, where the reporting utility is the water rights permit holder.
----------------	--

GPCD	Gallons per capita per day (GPCD) is a method utilized internationally to measure water use by drinking water suppliers. It is most commonly used to describe historical and current water uses, providing a baseline of water use that is not as susceptible to changes in population. GPCD is also used for planning purposes, allowing estimates of future demand requirements based on localized population projections. More sophisticated planning efforts utilize GPCD to determine conservation potential, track the results of program implementation, and calculate projections based on conservation adjusted GPCD.
------	--

General Information	The white boxes are data entry cells and are used for inputting data. All other cells except dropdown menus (purple boxes) are protected for the user's benefit to stop any overwriting of formulas and calculated cells. The green boxes are values that have been calculated based on inputs.
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Graphing Results	Datasets will automatically be graphed when using the graphing data tools in both the Annual and Monthly Performance worksheets. For example, choosing the year and the use sector from the purple dropdown boxes will allow these variables to be graphed.
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Imported Water	Enter all water imported from other systems. This will include any retail contracts with other drinking water suppliers where this utility purchases water from another utility and is not the permit holder.
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Inactive and Zero Connections		The inactive and zero connections are recorded in Table 3.3 so that unused single family residential connections will be removed from the calculation of single family population when Total Units is chosen from the drop down list in Table 3.2.
Industrial, Commercial and Institutional (ICI)		Includes industrial properties, such as manufacturing, commercial properties such as restaurants, shopping malls, and institutional customers such as schools, universities and prisons.
Multi-Family Residential Connections		A multifamily unit is living units in an apartment complex, duplexes, triplexes, trailer parks, and condo or town houses that have multiple units serviced by a single connection. They are not counted in the single-family residential category.
Multi-Family Residential Population		Multi-family population is calculated from number of MFR units in the Annual Unit Calculation (4.8) minus Vacant MFR Connections (4.10). That number is then multiplied by Average Size of Occupied Housing Units from the US Census (2.1).
Non-Revenue Water		Non-revenue water is all the water the utility diverts and/or produces, but does not get paid for. Non-revenue water includes apparent losses such as meter inaccuracies, theft, and database errors, real losses such as leaks. It also includes unbilled authorized uses such as fire-fighting, line flushing and disinfection. The Calculator does not provide data entry for unmetered billed water. This might include bulk sales or monthly fees not based on usage. The non-revenue water in the Calculator includes all water that is not metered.
Other Metered		All categories of billed metered use that is not otherwise classified in SFR, MFR or ICI. This provides the user the opportunity to track alternative categories. Examples included irrigation only, stand pipes, and fire hydrant/construction meters. Everything not included in SFR, MFR, ICI or Other will end up in non-revenue water.
Reuse		Reuse, or Recycled water is former wastewater (sewage) that has been treated to remove solids and certain impurities and reused by a water supplier. In most locations, it is only intended to be used for nonpotable uses, such as irrigation, and dust control. This data is not included in any other calculation. It is provided as a tracking tool for the user.

Single Family Residential Connections		SFR Connection is a stand alone or independently metered housing unit. The number used in the Calculator can be Total Connections or Active Connections only.
Single Family Residential Population		Single Family Population (3.13) is calculated from number of active connections times size of average household (3.12). It can be calculated monthly or annually depending on the data provided. If Total Connections is chosen (3.2), then inactive connections are subtracted prior to multiplying by size of average household (3.12). If Active Connections is chosen (3.2), then number of connections are multiplied by size of average household (3.12) without any subtractions.
Size of Average Household		This Table is determined from the US Census data in Table 2.1, Sheet 2. This data is used to determine a total single-family population and total multi-family population for both the monthly and annual data (Tables 3.4 and 3.13, Tables 4.3 and 4.9 respectively).
Total Connections		All active and inactive Single Family Residential connections within the utility.
System Total GPCD		The System Total GPCD is calculated by dividing the quantity of Total Water Diverted (plus imports minus exports) by the System Total Population
Total Population		The Total Population estimate is the sum of the single-family population + multi-family population + group quarters population.
Vacant Single-Family Residential Connections		This is a calculated field using either i) the average of the monthly vacant SFR connections, if monthly data are available or ii) an estimated value based on the Census data vacancy rate multiplied by the number of Total SFR connections. When Total Connections is chosen in Table 3.2, vacant single family residential connections are subtracted from Total Connections prior to calculating a population (based on household size) and a single family GPCD.

VI Comments

The Comments box has been provided on each main data enter sheet to allow the utility to explain or clarify data entry. This should include any problems, anomalies, or confusion encountered while completing the NMOSE GPCD calculator. It should also include decisions made regarding the data entries. For example:

- When or why was annual data used over monthly data?
- Was current or historical multi-family units provided or were the default values used?
- Is multi-family gallons consumed its own category (provided in Table 4.1) or was it combined with ICI in Table 5.1?
- What sectors or customer groups are included in “Other Metered,” Table 5.2?

If the drinking water supplier has chosen to provide any additional methods and explanations for calculating their GPCD, these can be attached as a separate piece. An explanation must be included as to why the supplier uses this method, details on how the populations are calculated, and at least a single-family and system total GPCD.

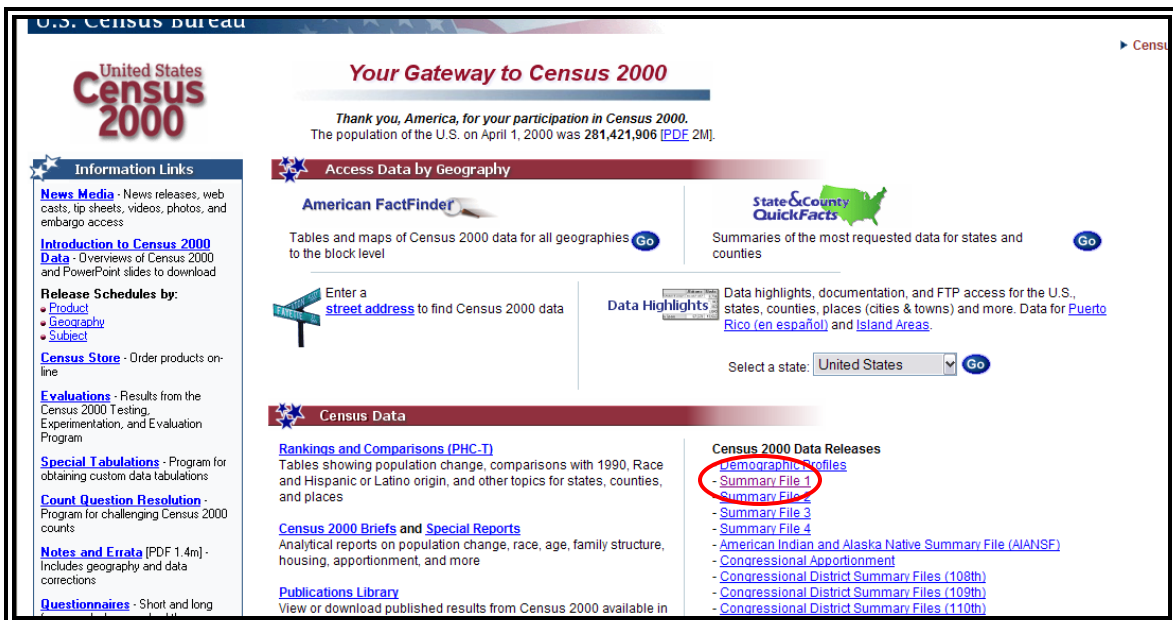
VII. APPENDIX A: Census Bureau Details

HOW TO FIND THE DATA REQUIRED FOR THIS SECTION



www.census.gov

click on [Census 2000]



Click on [Summary File 1]

U.S. Census Bureau Census 2000 Gateway | Glossary

United States Census 2000 Summary File 1 (SF 1)

Summary File 1 (SF 1) contains 286 [detailed tables](#) focusing on age, sex, households, families, and housing units. These tables provide in-depth figures by race and Hispanic origin; some tables of nine race/Latino groups. Counts also are provided for over forty American Indian and Alaska Native tribes and for groups within race categories. The race categories include eighteen Asian or Hawaiian and Other Pacific Islander groups. Counts of persons of Hispanic origin by country of origin (twenty-eight groups) are also shown.

Summary File 1 presents data for the United States, the 50 states, and the District of Columbia in a hierarchical sequence down to the block level for many tabulations, but only to the census tract level for areas include barrios, barrios-pueblo, subbarrios, places, census tracts, block groups, and blocks. Summaries also are included for other geographic areas such as ZIP Code Tabulation Areas (ZCTAs) and Congressional districts.

Geographic coverage for Puerto Rico is comparable to the 50 states. Data are presented in a hierarchical sequence down the block level for many tabulations, but only to the census tract level for areas include barrios, barrios-pueblo, subbarrios, places, census tracts, block groups, and blocks. Summaries also are included for other geographic areas such as ZIP Code Tabulation Areas (ZCTAs) and Congressional districts.

Summary File 1 detailed tables are identified according to geographic coverage:

- **Population tables (Pn)** are available to the block level
- **Housing tables (Hn)** available to the block level
- **Population Census Tract tables (PCTn)** are available to the census tract level only

Additional tables and maps have been derived from the detailed tables. For fast, easy access to all tables and maps in Summary File 1, go to the [Data Sets](#) page.

- **1 Demographic Profile (DP)** covering many population *and* housing characteristics for a single geography at a time.
- **15 Quick Tables (QTn)** that focus on a few population or housing characteristics for a single geography.
- **15 Geographic Comparison Tables (GCTn)** that focus on a few population or housing characteristics for many related geographic areas.
- **Over 100 Thematic Maps** that focus on a single characteristic for many geographic areas.

Data: [Access to all tables and maps in American FactFinder](#)

Purchase Products: [Summary Files for sale through the Customer Services Center](#)

Product Support: [Summary File 1 Disc Product Support](#)

Tutorial: [Summary File 1 DVD](#)

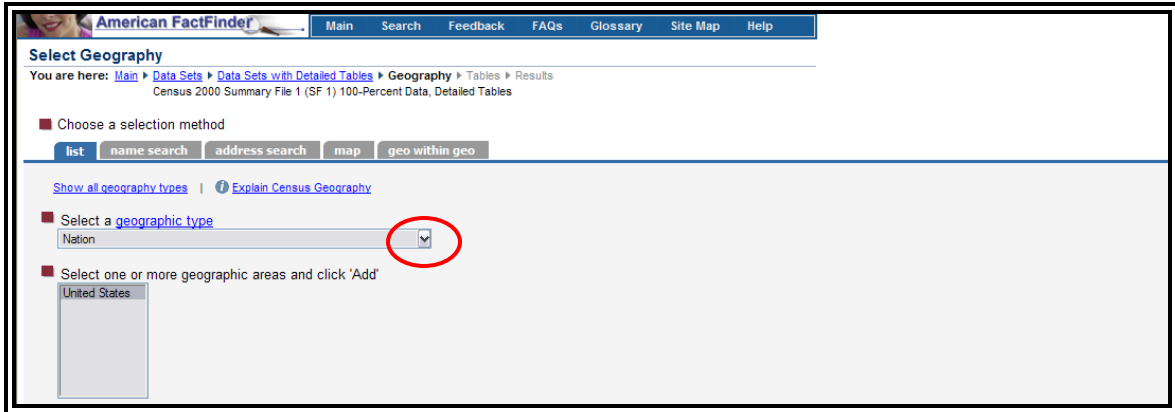
FTP Download: [All Files](#) FTP Read me: [MS Word](#) | [WordPerfect](#) | [Text](#)

Documentation: [Technical Documentation](#) (PDF)
 - [Comparing SF 3 Estimates with Corresponding Values in SF 1 and SF 2](#)
 - [Comparing SF 3 Estimates with Corresponding Values in SF 1 and SF 2](#)

Click on [**Access to all tables and maps in American FactFinder**]

The screenshot shows the American FactFinder interface. The left sidebar contains navigation menus for 'POPULATION FINDER', 'FACT SHEET', 'PEOPLE', 'HOUSING', 'BUSINESS AND GOVERNMENT', 'ABOUT THE DATA', 'DATA SETS', 'DOWNLOAD CENTER', 'MAPS', and 'TOOLS AND REFERENCES'. The 'DATA SETS' menu is expanded to show 'Decennial Census' and 'Annual Population Estimates'. The main content area is titled 'DECENNIAL' and includes a description of the Decennial Census. Below the description, there are two radio button options for '2000' data: 'Census 2000 Summary File 1 (SF 1) 100-Percent Data' (selected) and 'Census 2000 Summary File 2 (SF 2) 100-Percent Data'. To the right of these options, a section titled 'Select from the following:' lists several options: 'Detailed Tables' (circled in red), 'Geographic Comparison Tables', 'Quick Tables', 'Thematic Maps', 'Reference Maps', 'Custom Table', 'Enter a table number', and 'List all tables'. There is also an 'Other Resources' section with links to 'Census 2000 Gateway', 'Count Question Resolution (PDF - 45 KB)', 'Census 2000 Notes and Errata (PDF - 2.2 MB)', 'Census 2000 SF 1 - SF 4 Data Corrections in American FactFinder', 'Download Center', and 'Download data sets via FTP'.

Click on [**Detailed tables**]



Click on the dropdown boxes and

Select [**Place**]

When “Select a State” box appears

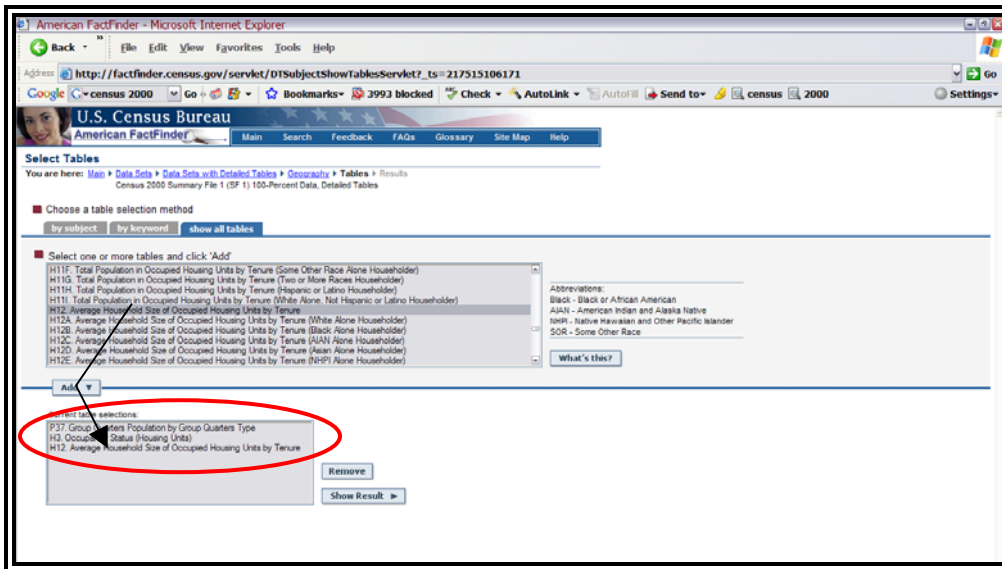
Select [**New Mexico**] (or appropriate state)

Select Geographic area (Place) from drop down list that is the closest description of your service area

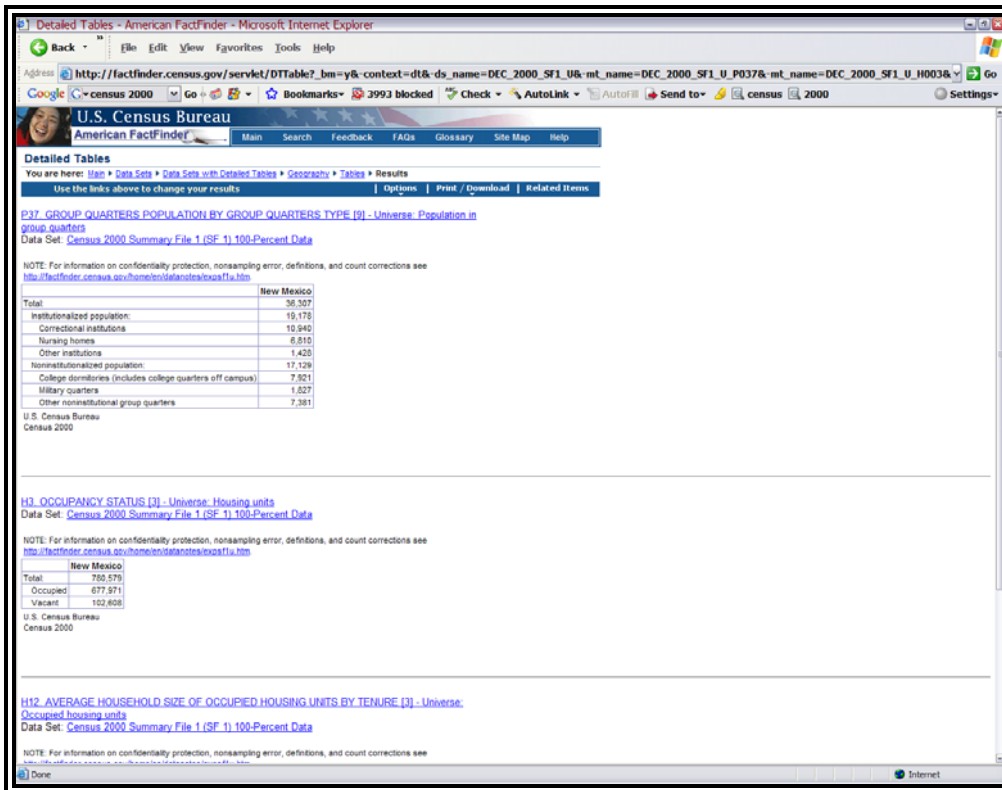
Add this to the base box as shown below



Click [**Next**]



Add boxes P37, H3, and H12 to the base box by highlighting them and then click **[Add]**
 Once all the tables show in the base box click **[Show Result]**



Transfer results to spreadsheet
 Print results for future reference.

END