3 Future Model Development

This section will discuss the methods used to determine future population levels, distribute them across the modeled area, and attribute sanitary flows to the new population.

3.1 Future Population Projections

All population estimates, current or future, were derived from 2010 United States census data as well as Section 4 of the Santa Rosa General Plan 2035. Table 3-1 displays the population trends for Santa Rosa City limits and the Urban Growth Boundary (UGB). The projected population in 2035 within the UGB is 233,520. This represents an annual growth rate between 2000 and 2035 of 1.2%. The 2010 census data showed that the population within the UGB was 184,000. This is an additional population of 49,520 people that were accounted for in the updated model.

Table 3-1: Projected 2035 Population and Employment for the City of Santa Rosa

<table>
<thead>
<tr>
<th>Area</th>
<th>1990</th>
<th>2000</th>
<th>2010</th>
<th>2035</th>
</tr>
</thead>
<tbody>
<tr>
<td>City</td>
<td>113,313</td>
<td>147,595</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Urban Growth Boundary</td>
<td>134,228</td>
<td>165,850</td>
<td>184,200</td>
<td>233,520</td>
</tr>
<tr>
<td>Annual Growth</td>
<td>NA</td>
<td>2.4%</td>
<td>1.1%</td>
<td>1.1%</td>
</tr>
</tbody>
</table>

Source: Santa Rosa General Plan 2035 (City of Santa Rosa, November 2009); 2010 United States Census

Figures 3-1 through 3-3 illustrate the population changes made to the model to accommodate for future conditions. As shown on these figures, two areas of the City that will receive the most growth are the 1000 Meter basin, around the intersection of Coffey Ln and W Steele Ln, and in the Downtown Station Area, near the intersection of Rt. 101 and 3rd St.
### Existing Population Distribution

#### Population Categories:
- **Less Than 250**
- **250 - 500**
- **500 - 1000**
- **1,000 - 2,000**
- **Greater Than 2,000**

The map illustrates the existing population distribution in Santa Rosa, California, with population counts categorized by the ranges mentioned above. The map includes a legend indicating the population density ranges and a scale for measuring distances.

**City of Santa Rosa, California**

**Master Plan Update**

**Figure 3-1**

The map is credited to Arcadis and City of Santa Rosa, Calif.
3.2 Future Flow Allocation

To allocate the sanitary flow, it was first necessary to distribute the population across the modeled network. The existing population was distributed across the modeled network by intersecting the 2010 census track data shapefile with a sewer basins shapefile. This distributed the 2010 census population of 184,200 across the modeled network.

The additional 49,520 people projected to be within the UGB by 2035 were distributed across the modeled network using the distributions and unit capacities provided on Tables 4-37 through 4-42 from the Santa Rosa General Plan 2035. These tables detail specific medium and medium-high density parcels that can be rezoned, as well as vacant residential land available for development in the UGB. In order to determine the location of these parcels, the specific parcel APN's found within the tables were matched directly to APN's found within the parcel shapefile provided by the City.

The minimum and maximum number of residential units per acre were determined by the parcel's General Plan land use code. These codes can be found in Table 2-1 of the General Plan. Multiplying the total parcel acreage by the land use code factor determined the total units added to each parcel.

Using the parcels detailed in the General Plan and their associated land use codes, resulted in 11,818 housing units being added within the UGB, but outside of the North Station Area and Downtown Area. These specific areas were attributed units based on separate planning documents. The Downtown Station Area Specific Plan (October 2007) calls for 3,409 residential units to be added between now and 2035 where the North Station Area calls for 2,680 (North Santa Rosa Station Area Specific Plan, Public Draft April 2012). These units were distributed across the acreage of the specific planning areas equally.

Between the UGB, Downtown Area, and North Station Area, a total 17,547 units were added to the model. The previously mentioned 49,520 estimated additional people between now and 2035 were distributed equally across the 17,547 units. Each parcel inside the model network therefore received 2.82 capita per unit.

Additionally, future build out of employee population for non-residential areas was calculated by multiplying the square foot/employee ratio by the area of non-residential parcels. These ratios can also be found in the General Plan Table 2-1. This resulted in
an additional 2,656 employees that were accounted for the model in non-residential areas.

In addition to distributing the projected population and employment, the increase in wastewater flow (base sanitary flow) was estimated for input into the model. Using the calibrated model results, which provided water consumption information and existing populations, wastewater generation rate (gallons per capita per day sanitary sewage generation) was estimated to be 50 gpcd. Non-residential (employee) sewage generation was estimated to be 30 gpcd based on experience from other studies. Table 3-2 summarizes the results, which indicate that an additional 2.5 MGD of sanitary flow is projected to be contributed by the increased residential and non-residential populations. Total flow to the Laguna Treatment Plant (LTP), including sanitary and estimated ground water infiltration (GWI) is 19.4 MGD. This does not include flows from Sebastopol, Rohnert Park, or Cotati.

<table>
<thead>
<tr>
<th></th>
<th>Population/Employment</th>
<th>DWF (MGD)</th>
<th>GWI (MGD)</th>
<th>Total Flow (MGD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modeled 2010 Population</td>
<td>184,200</td>
<td>9.2</td>
<td>7.7</td>
<td>16.9</td>
</tr>
<tr>
<td>Increase in UGB Population (2035)</td>
<td>49,320</td>
<td>2.5</td>
<td>NA</td>
<td>2.5</td>
</tr>
<tr>
<td>Additional Employees</td>
<td>2,656</td>
<td>0.1</td>
<td>NA</td>
<td>0.1</td>
</tr>
<tr>
<td>Total Santa Rosa</td>
<td>236,176</td>
<td>11.7</td>
<td>7.7</td>
<td>19.4</td>
</tr>
</tbody>
</table>

Sanitary flows from the three communities that feed into the LTP were increased to accommodate for expected future flows. 2010 census data was used to estimate the initial population of Rohnert Park, Sebastopol, and Cotati. Based on Rohnert Park and Cotati’s own growth plans and planning documents, it was assumed that the population in these communities would grow 1% each year. Sebastopol’s growth rate was estimated to be 0.5% over the buildout period. Sanitary flows were adjusted accordingly to reflect flows received at the LTP, as shown on Table 3-3.
Table 3-3: Projected 2035 Flows for Outside Community Contributors to the LTP

<table>
<thead>
<tr>
<th>Community</th>
<th>Existing (MGD)</th>
<th>Projected Future (MGD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DWF</td>
<td>GW</td>
</tr>
<tr>
<td>Rohnert Park¹</td>
<td>2.3</td>
<td>0.8</td>
</tr>
<tr>
<td>Sebastopol²</td>
<td>0.4</td>
<td>0</td>
</tr>
<tr>
<td>Cotati³</td>
<td>0.3</td>
<td>0.2</td>
</tr>
<tr>
<td>Total</td>
<td>3.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>

¹ Rohnert Park General Plan (July 2000). Page 2-25 notes a projected annual population increase of 1% between 1999 and 2020.
² Stadium Area Master Plan (October 2007). Page 13-1 confirms the 1% projected annual growth rate.
³ Downtown Specific Plan Draft EIR (July 2000). Page 4.10-1, Table 4.10-1-notes a projected annual population increase of 1% between 2010 and 2027.

Communication with City of Santa Rosa staff (October 10, 2010)

Figures 3-4 through 3-6 illustrate the projected changes in sanitary flows as a result of the increases in population in Santa Rosa.

3.3 Baseline Future Model Development

The baseline future conditions model incorporated additional changes other than population and sanitary flow increases. These changes include anticipated infrastructure, equipment, and operational updates to the West College Storage Facility (WCSF) and LTP. Below is a list of the modifications made to the existing conditions model that provided the baseline conditions for all future modeling completed as part of this master plan update:

- The treatment capacity of the LTP was based upon anticipated UV improvements #1, #2, #3 by the year 2027. These upgrades assume the addition of a new 18 MGD pump at the headworks of the plant to increase the total pumping capacity to 108 MGD.
- The WCSF includes the planned second connection recommended in the April 2010 study, allowing flow from the 1400 meter basin to be stored in the facility. This planned connection will divert flow from the Old Town Trunk Sewer (OTTS) via a high pipe and diversion gate just downstream the Cross Town Trunk Sewer (CTTS). Controlling flow from both CTTS and OTTS provides significant relief to the Llano trunk line.
Sanitary Flow (GPD)

- Less Than 25,000
- 25,000 - 50,000
- 50,000 - 100,000
- Greater Than 100,000

CITY OF SANTA ROSA
CALIFORNIA

MASTER PLAN UPDATE

EXISTING SANITARY FLOWS

FIGURE 3-4
Sanitary Flow (GPD)

- **Green**: Less Than 25,000
- **Yellow**: 25,000 - 50,000
- **Orange**: 50,000 - 100,000
- **Red**: Greater Than 100,000

**Figure 3-5**

**Future Sanitary Flows**

**City of Santa Rosa**

**California**

**Master Plan Update**
Sanitary Flow Percent Increase

- Less Than 50%
- 50 - 100%
- 100 - 200%
- Greater Than 200%

INCREASE IN SANITARY FLOWS
- Optimized RTC rules, based off meter 1010 to more efficiently utilize available storage at WCSF during large storm events. The recommended new RTCs control the operation of the WCSF based on flows in the Llano Trunk Sewer (as recorded at meter1010) rather than on conditions at the LTP. By moving the control point closer to WCSF, the storage facility can respond hours sooner to flow variations entering the Llano Trunk Sewer. This revised operation is designed to protect both the LTP and the Llano Trunk Sewer. When flow at meter 1010 reaches 45 MGD, a gate closes to divert flow through the planned second connection in conjunction with the existing gate and connection to the facility. When flow at meter 1010 gets below 27 MGD, the gates controlling both connections are slowly opened. Flow is drained from WCSF only when both connections are fully opened and flow at meter 1010 is less than 30.5 MGD.

- The WCSF also assumes the use of an emergency storage pond (Pond 1). This additional emergency pond is utilized only when the existing 4.0 MG concrete pond and 6.3 MG Pond 3 (earthen pond) reach their capacity.
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