3 EXISTING CONDITIONS AND PROJECTIONS

3.1 LAND PLANNING
This Wastewater Master Plan projects the needs of the City for two planning periods. First, an evaluation of wastewater needs for the period of Year 2006 through 2015 is considered, approximately 9 years. Second, the ultimate build-out of the City is evaluated. It is anticipated that this planning period is approximately 40 years.

3.2 LAND USE
Current and anticipated future land uses for the City are shown in the City’s Comprehensive Plan, adopted by the Planning Commission in 2005. City staff worked with Archer/CH2M HILL during wastewater master planning workshops to further define these land uses as well as project land uses in areas outside of the current City Limits. In addition, Archer/CH2M HILL met with representatives of Unity Village to define land uses anticipated within the village limits. The Unity Village Land Use Plan was adopted in 2006.

3.2.1 EXISTING LAND USE
Figure 3-1 depicts property that is currently developed or in the process of being developed. This existing land use map for the City also shows the holdings of a major land holder, Property Reserve Incorporated (PRI), which is a real estate division of the Latter Day Saints (LDS) Church. PRI owns 1,100 acres of vacant property on the east side of I-470 north of Colbern Road. For the purpose of this master plan, this area will be referred to as PRI North. PRI also owns property in the south part of Lee’s Summit, including over 3,000 acres of vacant land south of Longview Road. This area will be referred to as PRI South. PRI has stated to the City that they have no plans for development of either PRI North or PRI South within the next 25 years.

3.2.2 YEAR 2015 LAND USE
Figure 3-2 shows the anticipated developed properties and projected land use in the Year 2015. The land use and development projects added to the existing land use map, Figure 3-1, are primarily associated with the continuation of existing projects such as New Longview, Winterset Valley, Park Ridge, Arborwalk, Kensington Farm, and the areas around Legacy Park. It also includes the development of several new commercial areas such as the Summit Fair and City Walk projects. Growth into areas outside of the current city limits was not anticipated prior to 2015.

3.2.3 ULTIMATE LAND USE
Figure 3-3 depicts the ultimate land use plan included with the Comprehensive Plan. This plan anticipates the full development of the City, including the PRI property. The City commissioned a market study that recommended commercial-dominant mixed land use for the PRI North property. During the completion of the Comprehensive Plan, City staff and the Planning commission adopted a mix of land uses that should be allowed or required in the south/central area of the City, including the PRI South property. This mixed use is shown in Figure 3-3.

This ultimate land use plan also anticipates the growth of the City east along US 50 Highway and in the area south of County Line Road and west of Ward Road, as shown in Figure 3-3.
Wastewater planning is dependent upon the land uses and density of those land uses for the watershed service area. The projection of wastewater flows from a fully-developed city obviously requires improvements to the City’s wastewater infrastructure. For the purpose of planning wastewater capital improvements, this master plan also considers the impact on the wastewater infrastructure if the PRI property does not develop. Figure 3-4 depicts the anticipated ultimate land use plan without the PRI property being developed.

Finally, Figure 3-5 shows the ultimate land use anticipated by Unity Village. The City of Lee’s Summit provides facilities for conveyance of wastewater generated in Unity Village to the Little Blue Valley Sewer District’s Interceptor.

### 3.3 DEMOGRAPHIC AND ECONOMIC DATA

#### 3.3.1 Population and Commercial Uses

Population projections were prepared by the City’s Planning and Development (P&D) Department and provided to the consultant’s completing the City’s water and wastewater master plans. The population projections are summarized in Table 3-1. In addition, the P&D Department provided projections of commercial uses, including retail, office, and industrial, to the consultants. Based on a FAR (floor area ratio) of 0.20, estimated building square footages of commercial uses were estimated for the various study periods.

<table>
<thead>
<tr>
<th>Scenario/Study Period</th>
<th>Population</th>
<th>Estimated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>88,700</td>
<td>34,100</td>
</tr>
<tr>
<td>Year 2015</td>
<td>111,600</td>
<td>42,900</td>
</tr>
<tr>
<td>Ultimate Buildout (without PRI)</td>
<td>163,600</td>
<td>62,900</td>
</tr>
<tr>
<td>Ultimate Buildout (with PRI)</td>
<td>191,100</td>
<td>73,500</td>
</tr>
</tbody>
</table>

#### 3.3.2 Economic Data

General demographic information for the City of Lee’s Summit was obtained from the Lee’s Summit Economic Development Council and from the Mid-America Regional Council and is tabulated as follows:

- 66.5% of the population is 15 – 64, with 12% over the age of 65
- The median age is 36.1
- The median household income is $67,800
- The average number of people per household is 2.6
3.3.3 Forecasts of Flow

The population and commercial use projections provide the basis for projecting wastewater flows. Projected populations, along with projected residential density, were used to project the number of residential acres that will be developed in the 2006-2015 study period. Similar projections of commercial growth were completed for the same study period.

Section 6500 of the City of Lee’s Summit’s Design and Construction Manual, includes the methodology for converting residentially and commercially developed acreage into wastewater flows. Appendix 9.2 includes a copy of this methodology.

This methodology for flow projections was adopted by the City several years ago. Comparisons were completed between the City’s methodology and the methodologies and projections utilized by the City of Independence, and the Johnson County Unified Wastewater Districts (JCUWWD). It was concluded that the City of Lee’s Summit flow projection methodology was consistent with these other empirically-derived formulas.

The City’s flow projection methodology requires sewer system design be completed on a watershed basis, with sewers sized for ultimate development. It recognizes the need to size these systems for the impact of extraneous flows that come from infiltration and inflow. As systems become older and/or flows from private systems increase, the peak flow in the sewer system can exceed the system capacities required by the Missouri Department of Natural Resources.

Under the City’s methodology, peak base flow for residential land is equal to 1500 gal/day/acre plus peak infiltration of 500 gpd/acre plus a calculated value for peak inflow. The peak base flow for non-residential land is calculated using the equivalent dwelling unit (EDU) methodology. An EDU is a ratio of the flow produced by a single residential housing unit, which is 1.0 EDU and produces 300 gpd of peak daily flow. For different types of commercial and institutional developments, an EDU is assigned based on the parameters of the building, and the peak base flow is calculated based on the total number of EDUs for the site.

Finally, the largest peak rate component of the projected wastewater flow entering the City’s wastewater collection system is from inflow. Inflow is rainfall-related flow entering the system through public and private sources. Public sources include sources such as manhole tops, creek crossings, and lateral connections. Private property inflow sources include leaking building sewers, foundation drains, sump pumps, yard drains, and downspouts. It is estimated that private sector inflow is the major source of inflow in the Lee’s Summit collection system. Many of these sources are present at the time the sewer is initially constructed and provide the explanation as to why peak flows are excessive in new as well as older sewer systems.

The projection of the inflow component of the projected flows is based on a 50-year (2%) frequency storm event.