



**SANTA CLARA CITY, UTAH  
WASTEWATER SYSTEM IMPACT FEE FACILITIES  
PLAN & IMPACT FEE ANALYSIS**

Sunrise Engineering, Inc.  
March 2022 Update

# SANTA CLARA CITY, UTAH

## Wastewater System Impact Fee Facilities Plan & Impact Fee Analysis

### March 2022 Update

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# **SECTION I INTRODUCTION**

## **A. PREFACE**

*In 2013 Sunrise Engineering, Inc. completed a Wastewater Impact Fee Facilities Plan and Impact Fee Analysis for Santa Clara City's wastewater system. This plan identified improvements to be undertaken by the city to prepare for future demands on the system due to growth and development. Since that time, additional demands on the system due to growth have been identified and previous recommendations have been implemented. Sunrise Engineering, Inc. has again been contracted to update the plan based on current market conditions and other related occurrences since 2013.*

## **B. INTRODUCTION**

This Wastewater Impact Fee Facilities Plan and Impact Fee Analysis has been prepared for Santa Clara City, located west of St. George, Utah in Washington County along Old Highway 91. An area and location map showing the location of Santa Clara City, has been provided as Exhibit I.B.1.

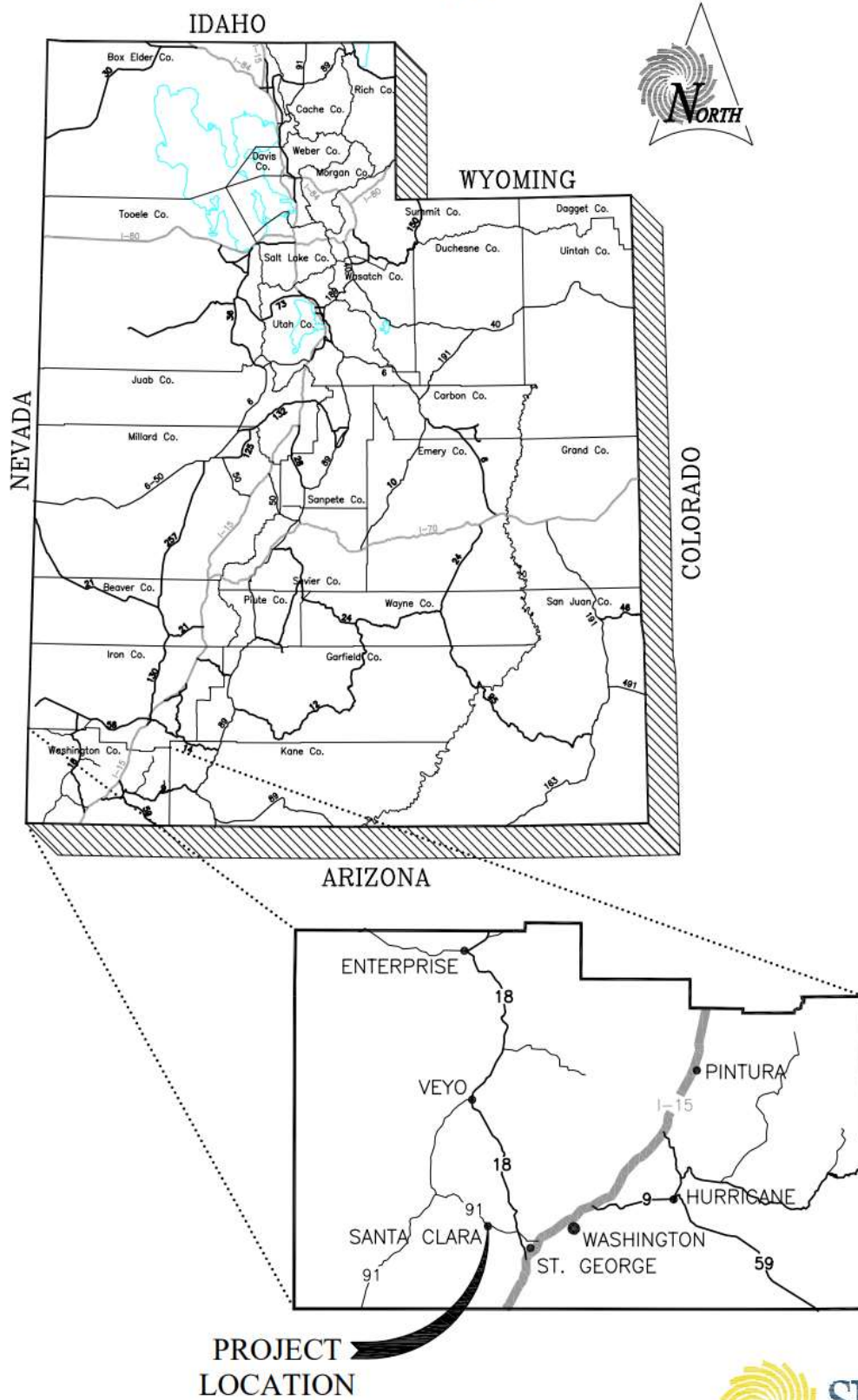
Santa Clara City has experienced significant growth over the past 30 years. At times, this growth has been somewhat rapid and has required improvements and upgrades to much of the city's public infrastructure to meet the increased demands. This growth did slow as the economy went into a recession several years ago, however, the Southern Utah housing market has started to gain momentum again. It is projected that growth rates will increase over the next several years.

In addition, it was previously believed that a large portion of future growth in the city would occur in the area south of the Santa Clara River, known as the "South Hills". This area is owned by the Federal Government and is under the control of the Bureau of Land Management (BLM). The area had previously been identified in a land bill as an area of potential disposal. However, due to change in politics and the discovery of threatened and/or endangered plants in the South Hills area, it is no longer anticipated that the BLM will be disposing of this land any time soon. Consequently, the city has requested that this area be excluded from the plan.

To help ensure that the city is prepared to meet the needs of anticipated growth and to ensure up-to-date information is considered in planning efforts, the City of Santa Clara has contracted with Sunrise Engineering, Inc. to update their existing Impact Fee Facilities Plan and to perform an updated Impact Fee Analysis.



# EXHIBIT 1.B.1 AREA MAP



**PROJECT  
LOCATION**



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## SECTION II USER ANALYSIS

### A. PROJECTED GROWTH RATE

An important element in any community plan is the projection of the city's population growth rate. This projection gives the planner an idea of the future demands the city should plan for throughout the planning period.

Projecting the future population can be a subjective process. The table below shows the city's historic growth rates based on official Census data from 1970 to 2010, and the latest population data the city had on record for 2020.

**Table II.A-1: Historic Growth**

| Year | Source   | Population | Growth Rate |       | ERUs |
|------|----------|------------|-------------|-------|------|
| 1970 | Census   | 271        | -           | -     | -    |
| 1980 | Census   | 1,091      | 1970-1980   | 14.9% | -    |
| 1990 | Census   | 2,311      | 1980-1990   | 7.8%  | -    |
| 2000 | Census   | 4,630      | 1990-2000   | 7.2%  | -    |
| 2010 | Census   | 6,003      | 2000-2010   | 2.6%  | -    |
| 2020 | City     | 8,685      | 2010-2020   | 3.8%  | 2713 |
| 2021 | Estimate | 9,206      | 2019-2021   | 6.0%  | 2826 |

The City of Santa Clara has grown significantly since 1970. During the 1970's it grew at almost 15% per year. During the 1980's and 1990's the city grew at over 7% per year. Despite this rapid population growth, there has been very little commercial development in Santa Clara. The city is primarily a residential community supporting the St. George area. Because it is bounded by lava flows, flood plains, environmentally sensitive areas, and other municipalities, it is not expected to grow as fast as it historically has.

As shown in Table II.A-1 above, a 2020 population was provided by Santa Clara City. This indicated a growth rate of 3.8% since 2010. Sunrise Engineering, Inc. projected the current 2021 population as 9,206 assuming a 6.0% average annual growth rate since 2020 based on the high growth rate recently experienced in the community.

Recent housing market trends in Southern Utah indicate that Santa Clara is only expected to grow rapidly for a short period. After which, growth will continue at a steady rate. The recent 2020 Santa Clara Public Safety IFFP used a growth rate of 4.0% and to remain consistent, the city chose to use the same growth rate projection for this report, with a slight adjustment to 2021-2022 being at 6.0%. A growth rate of 4.0% is projected through the end of the planning period after 2022.

A large development in the northern region of the city limits known as Black Desert is planned to occur in the near future. The Impact Fee Analysis included in this report will be beneficial for the city to reference when determining the impact fees for this planned development.

As mentioned previously, the city is no longer expecting to see development occur in the BLM portion of the South Hills area anytime soon. Prior to the discovery of threatened and/or endangered plant life in the area, it was anticipated that the BLM would be disposing of 1,000 to 1,500 acres of land in this area. Based on current communication with the BLM, the city believes that considering this area to remain as open space throughout the planning period may be the most accurate representation. If things with the BLM change and this area is “disposed of” a new IFFP would be recommended.

Because the City of Santa Clara will eventually develop all its available land, build-out projections have been considered in this study. As indicated, this build-out projection is based on all property within the existing city limits, excluding the BLM portion of the South Hills area.

To determine build-out projections, several samples of existing densities were taken from established areas of the city. These samples were then utilized to estimate densities for other zoning types which are not as prevalent in the community, or which have not yet been utilized. Table II.A-2 below indicates the densities assumed for each zoning type. The zones marked by an asterisk (\*) represent the zoning types for which a sample was taken.

**Table II.A-2: Zoning Types and Densities**

| <b>Zone</b> | <b>Description</b>                 | <b>Density (DU/Acre)</b> |
|-------------|------------------------------------|--------------------------|
| R1-10       | *Single Family Residential         | 2.85                     |
| PDR         | *Planned Development (Residential) | 3.99                     |
| R-A         | *Residential Agricultural          | 1.41                     |
| MR          | *Multi-Family Residential          | 8.49                     |
| COM         | Commercial                         | 0                        |
| MU          | Mixed Use                          | 1.4                      |
| OS          | Open Space                         | 0                        |
| PD-MU       | Planned Development (Mixed Use)    | 3.99                     |
| PDC         | Planned Development (Commercial)   | 0                        |
| HD          | Historic District (overlay)        | 0                        |
| PDR-STR     | Short Term Rentals (overlay)       | 0                        |

These densities were utilized in conjunction with a current zoning map provided by Santa Clara City (see Appendix B). Total areas of each zoning type were calculated and multiplied by the densities to calculate a projected number of dwelling units (DUs) at build-out. This process resulted in 6,789 total projected DUs. Multiplying this number by 3.36 people per unit according to the 2015-2019 Census figure, provides a total build-out population projection of 22,812 residents.

It is important to understand that projected growth rates are not the corner stone of this plan. If the projected population is reached earlier or later than anticipated, then future improvements to support growth may either come earlier or later. Impact Fees should not be significantly affected if the actual rate of growth varies from the rate used in the plan.

## B. LENGTH OF PLANNING PERIOD

It is typical for a Master Plan to use a 20-year planning period and this method was used for this IFFP. For example, beginning in year 2021, and running through year 2041. Based on the forecasted growth rate the number of people the city will need to plan for in 20 years can be calculated based on the compound interest formula as follows:

$$F = P(1 + i)^N$$

F = Future Population      P = Present Population  
i = Projected Growth Rate      N = Years

### 20-Year Projected Population

2020 Population: 8,685  
2021 Population: 8,685 (1+0.06)<sup>1</sup> = 9,206  
2022 Population: 9,206 (1+0.06)<sup>1</sup> = 9,758  
2041 Population: 9,758 (1+0.04)<sup>19</sup> = **20,560**

As shown above, the total number of people projected for the end of a 20-year planning period is 20,560. The projected build-out population of 22,812 is slightly higher than the 20-year projection, suggesting build-out will occur shortly after the planning period ends if growth rates are not significantly affected. According to the projected growth rates, the build-out population will be reached between years 2043 and 2044.

It is understood that the likelihood of growth staying consistent to the end of the planning period is minimal. It is possible factors influencing Santa Clara's growth could change before the end of the planning period that influence the build-out date. As such, the build-out projection of 22,812 people will be utilized in further analysis.

## C. EQUIVALENT RESIDENTIAL UNITS

Based on the sewer connection data provided by Santa Clara, 2,826 sewer connections are assumed to be in the system. For this report, we will assume this number to be the amount of existing Equivalent Residential Units (ERUs). By definition, a residential unit is a home or other single-family dwelling.

Based on the build-out projections explained above, it is estimated that there will be approximately 3,963 additional DUs at build-out. By assuming that the current number of ERUs will grow at the same rates as the population, we can approximate the future number of ERUs over the next 20 years. Following this assumption results in a total of 7,099 ERUs in 2044, the anticipated year of build-out. The difference between the 7,099 ERUs in 2044 and the existing number of 2,826 ERUs is 4,273. This number is slightly higher than the 3,963 additional DUs projected above but will account for commercial and other ERUs not accounted for in the DU projections. A table showing the population and build-out projections has been included in Appendix A.

By dividing the current population by the build-out population estimate, or by dividing the current number of ERUs by the build-out ERU estimate, it can be found that 39.8% of the projected build-out population is existing.

# **SECTION III**

## **WASTEWATER SYSTEM**

### **IMPACT FEE FACILITIES PLAN**

#### **A. IMPACT FEE FACILITIES PLAN**

This Wastewater System Impact Fee Facilities Plan identifies the demands which will be placed on existing Santa Clara City wastewater infrastructure due to growth development and outlines how the city will meet those demands. The plan focuses on five main interceptor lines including the “Valley Line”, the “Lava Flow Wash Line”, the “Tuacahn Wash Line”, the “Lava Cove Line”, and the “Canyon View Dr. Line”. Each of these lines ultimately connect into St. George City sewer mains, which deliver the raw sewage to the regional treatment plant owned and operated by St. George City. The plan assumes that smaller collector lines serving specific areas of the city are all installed per standard slopes and diameter (minimum of 8-inch) and as such are adequately sized to meet the demands of the areas for which they were designed. A description of each of the four main interceptor lines has been included below:

#### **Valley Line**

The Valley Line, which runs along the Santa Clara River, collects wastewater for much of the existing developed area in the city including the Historic Valley District, and a portion of the Heights area.

#### **Lava Flow Wash Line**

The Lava Flow Wash Line is a shared line with Ivins City and extends southeast through Santa Clara from 800 South in Ivins to the intersection of Pioneer Parkway and N. Red Mountain Drive. From there the line generally follows Tuacahn Wash until it leaves the Santa Clara City boundary near Snow Canyon High School.

#### **Tuacahn Wash Line**

The Tuacahn Wash Line is also shared by Ivins City and Santa Clara. The line extends into Santa Clara near the south end of Cordero Drive in Ivins. From there, the line generally follows Tuacahn Wash until it meets up with the Lava Flow Wash Line at the intersection of Pioneer Parkway and N. Red Mountain Drive.

#### **Lava Cove Line**

The Lava Cove Line is found on the east side of Santa Clara and flows south to tie into the existing Lava Flow Wash Line near Snow Canyon High School. It follows Lava Cove Drive and provides service to the new development in that area. This line also allows a development from St. George City to tie into the Santa Clara System.

#### **Canyon View Dr. Line**

This line travels along Canyon View Drive and ultimately connects into the Valley Line in Vineyard. This line has been considered a smaller collector line feeding into the Valley

line in the past. However, the city requested further analysis based on the age of the line and the potential for high-capacity flow. After further analysis, it was determined to be sufficient until build-out and in need of no further improvements. Calculations can be seen in Appendix C.

## **B. FUTURE DEMAND CALCULATIONS**

To determine the future demands placed on each of the main interceptor lines, Sunrise obtained shapefile data from the city for the existing Santa Clara wastewater system. Using this data, the city was broken down into wastewater basins defined by identifying areas believed to discharge sewage to a common pipe (see Exhibit III.B-1). In previous plans this data was supplemented by a field investigation of some locations and manholes to provide a more accurate representation and has been used again in this plan.

By utilizing the existing zoning map along with the density samples mentioned previously, a projected number of build-out ERUs was obtained for each basin. The number of ERUs in each basin was multiplied by 3.36 to represent the number of projected people within the basin and then by an average daily flow estimate of 80 gallons per capita per day based on the metered flow data collected and finally by a peaking factor of 2.5 according to the Utah Division of Water Quality guidelines. The wastewater basin flow calculations have been included in Appendix C.

Most of the Black Desert development currently planned will be Multi-Family Residential (MR) units in an area of Santa Clara currently zoned as Planned Development Residential (PDR). To account for the difference in population density, approximately 1,518 additional ERU's have been incorporated in the analysis. Should more developers show interest in MR units it may be beneficial to reevaluate the assigned zoning type in this area to better account for the increased density.

Because the Lava Flow Wash and Tuacahn Wash lines are shared with Ivins City, an estimate of the number of ERUs from Ivins City that influence the capacity of each line were also calculated. 2015-2019 Census estimates and the Master Plan for the Black Desert development were used to estimate 3,450 ERUs from Ivins currently contribute to the flow in these lines and approximately 6,194 ERUs will contribute at build-out. Combining these estimates, and assuming Ivins has the same flow as Santa Clara of 80 gallons per capita per day resulted in a current flow of 1,332 gpm and build-out flow of 2,392 gpm. These calculations have been included in Appendix A.

As-built drawings showing the slopes, sizes and approximate locations of the Valley Line, upper Lava Flow Wash Line, and Tuacahn Wash Line were used to estimate flow capacities using Manning's equation for full flowing pipes. The slopes and locations of the section of the Lava Flow line from the intersection of the Tuacahn Wash Line to Snow Canyon High School were determined using recent survey data.

Calculated flows from each of the sewer basins, the flow in the system from Ivins City, and Black Desert Master Plan flow projections have been combined at stations along each

of the interceptor lines to determine the required build-out capacity of those lines. Exhibit III.B-1 shows the lines and stations used in these calculations. The wastewater basin flow calculations and required build-out capacity calculations have been included in Appendix C.

## **C. EXISTING DEMAND CALCULATIONS**

To determine the existing demands placed on existing wastewater facilities and to establish an existing level of service, each wastewater basin was evaluated and assigned a percentage representing the portion of that basin that has already been developed. This percentage was then multiplied by the total projected build-out flow for each basin to determine the existing wastewater flow. The existing calculated flows from each basin were then combined at stations along the interceptors as was done in the build-out calculations to determine the total existing flow for each interceptor. The calculations showing the percent developed and existing wastewater flow demands have been included in Appendix C.

The existing level of service for each ERU has been determined based on the 2015-2019 Census estimate of 3.36 people per household and 80 gallons per person per day and multiplied by a peaking factor of 2.5 for interceptor lines as required by the Utah Division of Water Quality guidelines. This calculation results in an existing level of service of 672 gallons per ERU per day, which has been used in this plan.

## **D. RECOMMENDED IMPROVEMENTS**

### **Valley Line Extension**

As shown in the build-out capacity calculations included in Appendix C, the Valley Line has adequate existing capacity to support build-out conditions. However, the city has requested additional improvements at both ends of the line to increase service. It is recommended that the northern end of the line be extended to reach an existing service yard that is currently using a septic system. This improvement would add approximately 1,000 additional feet of 8-inch line. While this facility is already existing, adding this line will create more opportunity for new development in the area to join the system. Excluding the existing service yard and agricultural land nearby suggests there is approximately 33.3 acres of the existing 50.8 acres that remain undeveloped, making this project 65.5% impact fee eligible.

### **Valley Line Replacement**

On the southern end of the line, it has been requested that approximately 1,000 feet of the existing 15-inch line be replaced with 21-inch line. This will make all the line after the tie-in with the Canyon View Drive line 21-inch. After this tie-in the Valley Line is servicing 15 of the 27 wastewater basins, or approximately 56% of the total city area. Because of this, this replacement will increase the system capacity for future growth for much of the community. It is also 100% impact fee eligible because it would not be necessary without new growth.



It should be noted that if the South Hills area does end up being developed, these calculations will need to be re-visited as it is likely that the Valley Line would also carry wastewater generated in the South Hills.

### **Lava Flow Wash Line Improvement**

The Lava Flow Line does not have adequate capacity to support Ivins and Santa Clara until build-out. In some areas of the system the flow is already nearing capacity, which was assumed to be 80% full for this analysis. It is recommended that a parallel line ranging from 15-inch to 18-inch be constructed to accommodate future flow of both cities. Exhibit III.D-1 shows the recommended pipe sizes and stationing for the system.

It is recognized that numerous options exist to address the deficiency in the line and that the flow in the pipeline is greatly influenced by Ivins City. However, for the purposes of this plan, the proposed improvements mentioned above will be used to determine a reasonable cost for the additional required capacity. Because additional capacity would not be required if no future growth were to occur, costs associated with the additional capacity will be borne solely by future growth. The build-out capacity calculations, included in Appendix C, show that at build-out conditions Santa Clara will require 58.0% of the line capacity on average if no improvements are made. Because of this, cost has also been calculated under the assumption that Santa Clara will pay for 58.0% of the improvements because that is the capacity they require. If Ivins is to pay the remaining 42.0% an agreement between the two cities will need to be discussed. An Engineer's Opinion of Probable Cost for these improvements has been included in Appendix D.

### **Tuacahn Wash Line Improvement**

This line will be insufficient for Santa Clara and Ivins at build-out without any improvements. As new developments are constructed, the existing 10-inch line is expected to be replaced with a 12-inch line by the developer. This improvement has already been discussed with current developers and portions of the line are already being improved.

With the anticipated multi-family development in the northern area of Santa Clara, 12-inch line will not be adequate with such a high population density feeding into the line. It is recommended that a parallel line ranging from 12-inch to 15-inch be constructed alongside part of the Tuacahn Wash line and a 12-inch connector line be installed between the Lava Flow Wash Line and Tuacahn line. Exhibit III.D-1 shows the recommended pipe sizes and stationing for these improvements. Calculations are shown in Appendix C.

To estimate Santa Clara City's share of the Tuacahn Wash Line cost, an Engineer's Opinion of Probable Cost was prepared to estimate the total cost to replace the line. The share was calculated by multiplying the average percent of the pipeline's capacity required by Santa Clara at build-out (31.6%) by the total estimated cost of the line. The entire cost is impact fee eligible since this line would not be needed if development and growth did not occur. The Engineer's Opinion of Probable Cost has been included in Appendix D.

## **E. TIMING OF IMPROVEMENTS**

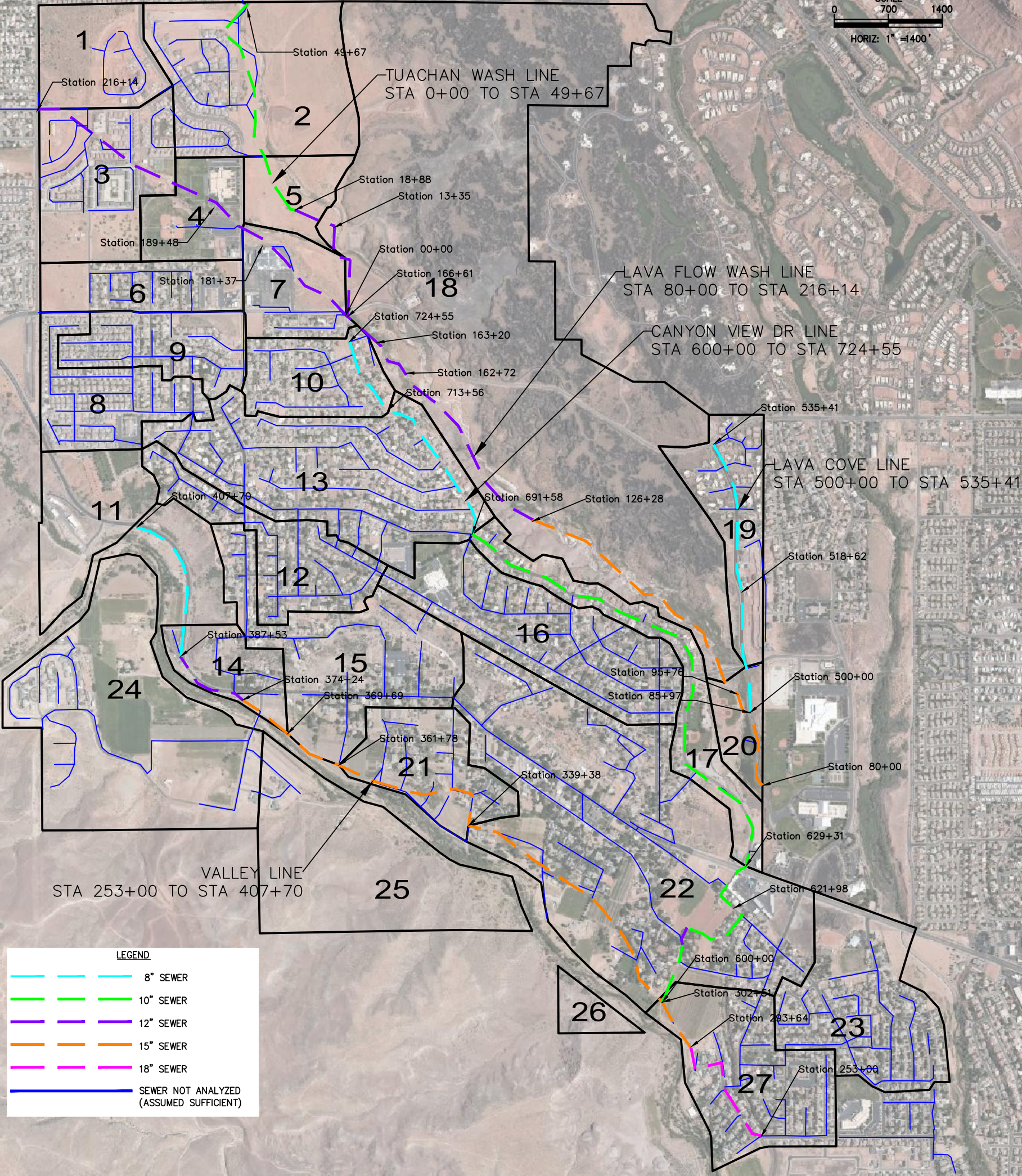
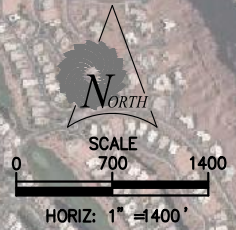
Current provisions of the Impact Fee Act found in Section 11-36a-602 of the Utah Code, require that a municipality shall expend or encumber impact fees for a permissible use within six years of their receipt. The provisions also allow a municipality to hold the fees longer than six years if it identifies in writing, an extraordinary and compelling reason why the fees should be held longer than six years, and an absolute date by which the fees will be expended. It is imperative that the city plan to expend or encumber collected impact fees within six years of the date they are collected.

Based on the list of recommended improvements previously mentioned, the city should be able to meet this requirement without too much difficulty. The Valley Line Extension is an improvement that will meet a present need. The only recommended improvement that is projected to be needed near the end of the planning period is the Lava Flow Wash Line Additional Capacity.

It is projected that impact fees collected during the first half of the planning period will be expended on projects already completed or currently needed. Unless affected by future growth patterns or other unanticipated changes, it is projected that only impact fees collected in the final third of the planning period will be utilized for the additional capacity needed in the Lava Flow Wash Line.



EXHIBIT III.B-1  
SANTA CLARA SEWER BASINS & PIPELINES



| LEGEND |                                            |
|--------|--------------------------------------------|
|        | 8" SEWER                                   |
|        | 10" SEWER                                  |
|        | 12" SEWER                                  |
|        | 15" SEWER                                  |
|        | 18" SEWER                                  |
|        | SEWER NOT ANALYZED<br>(ASSUMED SUFFICIENT) |

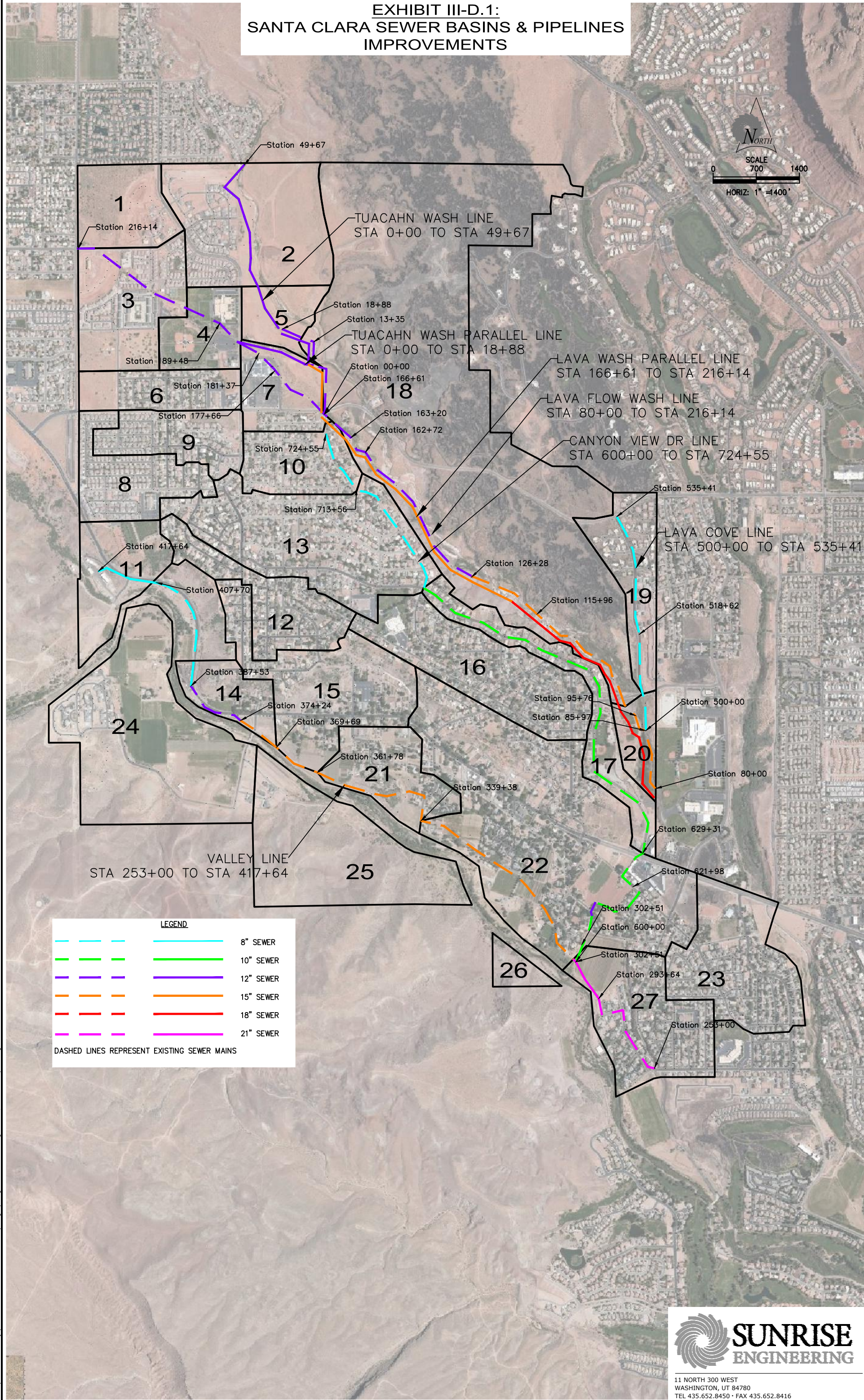


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EXHIBIT III-D.1:  
SANTA CLARA SEWER BASINS & PIPELINES  
IMPROVEMENTS





## SECTION IV WASTEWATER SYSTEM IMPACT FEE ANALYSIS

### A. EXISTING IMPACT FEE

Existing Wastewater System Impact Fees for Santa Clara City are set at \$358.61 per ERU. This value was set by the city based on the projections used in the 2013 Wastewater Impact Fee Analysis. In addition to the amount charged by Santa Clara City, there is also an impact fee charged by St. George City to cover impacts to the regional collection and treatment facilities.

### B. PROPOSED IMPACT FEE

The Wastewater System Impact Fee Facilities Plan, included as Section III, outlined demands to be placed on the Santa Clara wastewater system by growth and development. The plan also provides recommended improvements or means whereby the city will be able to meet those demands and maintain the existing level of service relating to wastewater facilities.

Table IV.B-1 summarizes the recommendations outlined in the Impact Fee Facilities Plan along with total costs for each recommendation, percentages of the costs considered to be Impact Fee Eligible, and the Impact Fee Eligible Costs. The detailed breakdown of costs for each project is included in Appendix D – Opinions of Probable Cost.

**Table IV.B-1: Recommendations and Impact Fee Eligible Costs**

| <b>Project</b>                  | <b>Total Cost</b>   | <b>% Eligible</b> | <b>Eligible Cost</b> |
|---------------------------------|---------------------|-------------------|----------------------|
| Valley Line Extension           | \$ 333,080          | 65.5%             | \$ 218,167           |
| Valley Line Replacement         | \$ 413,480          | 100.0%            | \$ 413,480           |
| Lava Flow Wash Line Improvement | \$ 1,504,507        | 100.0%            | \$ 1,504,507         |
| Tuacahn Wash Line Improvement   | \$ 558,238          | 100.0%            | \$ 558,238           |
| <b>Total</b>                    | <b>\$ 2,809,305</b> | <b>95.9%</b>      | <b>\$ 2,694,392</b>  |

The total remaining amount that is impact fee eligible is found by subtracting the amount of wastewater impact fees presently held by the city from the total impact fee eligible costs shown in Table IV.B-1. The proposed impact fee per ERU is found by dividing this number by the total number of future ERUs. This method is demonstrated in Table IV.B-2.

**Table IV.B-2: Proposed Impact Fee**

| <b>TABLE IV.B-2</b>                                                                                                              |       |           |             |
|----------------------------------------------------------------------------------------------------------------------------------|-------|-----------|-------------|
| <b>CITY OF SANTA CLARA</b>                                                                                                       |       |           |             |
| <b>IMPACT FEE ANALYSIS</b>                                                                                                       |       |           |             |
| <b>WASTEWATER SYSTEM FACILITY PLAN</b>                                                                                           |       |           |             |
|                                                                                                                                  |       |           | Mar-22      |
| <b>IMPACT FEE CALCULATIONS</b>                                                                                                   |       |           |             |
| Total Estimated Project Cost                                                                                                     | \$    | 2,809,305 |             |
| % of New Project Cost Due to New Growth                                                                                          | 95.9% | \$        | 2,694,392   |
| Previously Collected Impact Fees                                                                                                 |       | \$        | -           |
| Impact Fee Eligible Cost                                                                                                         |       | \$        | 2,694,392   |
| No. of ERUs (2021)                                                                                                               |       |           | 2,826       |
| Buildout ERU's                                                                                                                   |       |           | 6,789       |
| No. of New ERU's Due to Growth                                                                                                   |       |           | 3,963       |
| Maximum Impact Fee = Total Eligible Cost / New ERU's                                                                             |       | \$        | 679.89 /ERU |
| Proposed Impact Fee for Santa Clara City (FY2021) =                                                                              |       | \$        | 679 /ERU    |
| P:\Santa Clara City\08073 Wastewater IFFP and IFA\Design\Santa Clara WW Impact Fee Facilities Plan- BD.xlsx\Tuachan Improvements |       |           |             |

The number above represents the maximum amount that can be charged per ERU. This value of \$679.89 is \$321.28 more than the current Impact Fee. It is up to the city council to determine the actual rate that will be charged.

# **APPENDIX A**

## **POPULATION & BUILD-OUT PROJECTIONS**

### Santa Clara Population & Growth Projections

| Year   | Source   | Population | Growth Rate |       | ERUs |
|--------|----------|------------|-------------|-------|------|
| 1970   | Census   | 271        | -           | -     | -    |
| 1980   | Census   | 1,091      | 1970-1980   | 14.9% | -    |
| 1990   | Census   | 2,311      | 1980-1990   | 7.8%  | -    |
| 2000   | Census   | 4,630      | 1990-2000   | 7.2%  | -    |
| 2010   | Census   | 6,003      | 2000-2010   | 2.6%  | -    |
| 2020   | City     | 8,685      | 2010-2020   | 3.8%  | 2713 |
| 2021   | Estimate | 9,206      | 2019-2021   | 6.0%  | 2826 |
| 2022   | Estimate | 9,758      |             | 6.0%  | 2996 |
| 2023   | Estimate | 10,149     |             | 4.0%  | 3115 |
| 2024   | Estimate | 10,555     |             | 4.0%  | 3240 |
| 2025   | Estimate | 10,977     |             | 4.0%  | 3370 |
| 2026   | Estimate | 11,416     |             | 4.0%  | 3504 |
| 2027   | Estimate | 11,873     |             | 4.0%  | 3645 |
| 2028   | Estimate | 12,348     |             | 4.0%  | 3790 |
| 2029   | Estimate | 12,841     |             | 4.0%  | 3942 |
| 2030   | Estimate | 13,355     |             | 4.0%  | 4100 |
| 2031   | Estimate | 13,889     |             | 4.0%  | 4264 |
| 2032   | Estimate | 14,445     |             | 4.0%  | 4434 |
| 2033   | Estimate | 15,023     |             | 4.0%  | 4612 |
| 2034   | Estimate | 15,624     |             | 4.0%  | 4796 |
| 2035   | Estimate | 16,249     |             | 4.0%  | 4988 |
| 2036   | Estimate | 16,899     |             | 4.0%  | 5187 |
| 2037   | Estimate | 17,574     |             | 4.0%  | 5395 |
| 2038   | Estimate | 18,277     |             | 4.0%  | 5611 |
| 2039   | Estimate | 19,009     |             | 4.0%  | 5835 |
| 2040   | Estimate | 19,769     |             | 4.0%  | 6068 |
| 2041   | Estimate | 20,560     |             | 4.0%  | 6311 |
| 2042   | Estimate | 21,382     |             | 4.0%  | 6564 |
| 2043   | Estimate | 22,237     |             | 4.0%  | 6826 |
| ~2044~ | Estimate | 23,127     |             | 4.0%  | 7099 |
| 2045   | Estimate | 24,052     |             | 4.0%  | 7383 |



## **Santa Clara Build-Out Projections**

| Zone     | R1-10  | PDR    | R-A   | MR   | COM | MU   | OS     | PD-MU | PDC  | HD                   | PDR-STR |        |
|----------|--------|--------|-------|------|-----|------|--------|-------|------|----------------------|---------|--------|
| Dus/Acre | 2.8    | 4.0    | 1.4   | 8.5  | 0.0 | 1.4  | 0.0    | 4.0   | 0.0  | 0.0                  | 0.0     |        |
| Acres    | 1046.5 | 714.2  | 386.0 | 2.4  | 8.7 | 11.7 | 1519.2 | 95.5  | 29.6 | 115.2                | 61.4    |        |
| Dus      | 2980.0 | 2848.0 | 544.0 | 20.0 | 0.0 | 16.4 | 0.0    | 380.9 | 0.0  | 0.0                  | 0.0     | 6,789  |
|          |        |        |       |      |     |      |        |       |      | Build-Out Population |         | 22,812 |

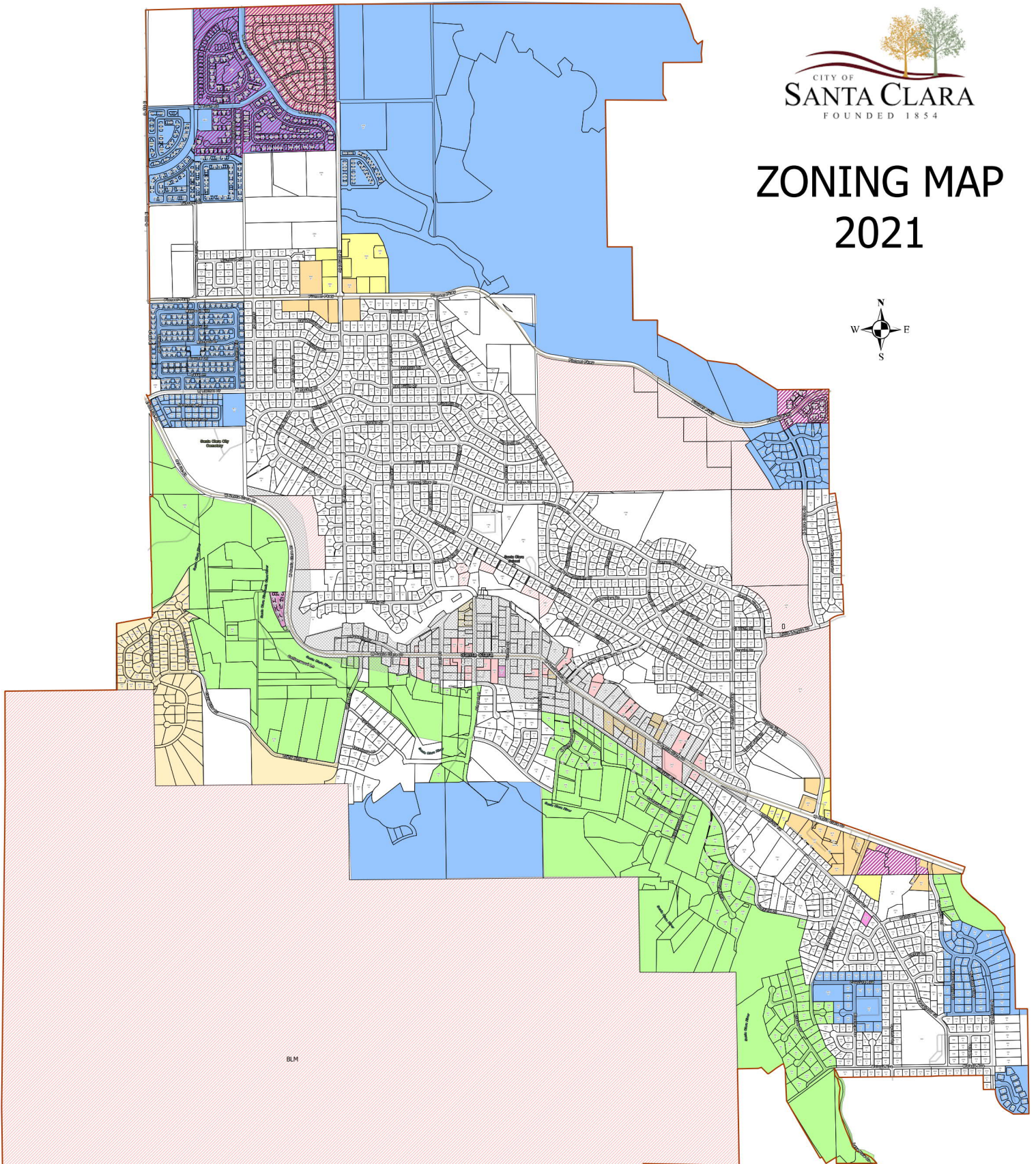
### Ivins Population & Growth Projections

| Year | Source   | Population | Growth Rate |       | ERUs |
|------|----------|------------|-------------|-------|------|
| 1970 | Census   | 137        | -           | -     | -    |
| 1980 | Census   | 600        | 1970-1980   | 15.9% | -    |
| 1990 | Census   | 1,630      | 1980-1990   | 10.5% | -    |
| 2000 | Census   | 4,450      | 1990-2000   | 10.6% | -    |
| 2010 | Census   | 6,753      | 2000-2010   | 4.3%  | -    |
| 2016 | Estimate | 6,921      | 2010-2016   | 2.5%  | 3079 |
| 2021 | Estimate | 8,831      | 2016-2021   | 2.3%  | 3450 |
| 2022 | Estimate | 9,034      |             | 2.3%  | 3529 |
| 2023 | Estimate | 9,242      |             | 2.3%  | 3610 |
| 2024 | Estimate | 9,454      |             | 2.3%  | 3693 |
| 2025 | Estimate | 9,672      |             | 2.3%  | 3778 |
| 2026 | Estimate | 9,894      |             | 2.3%  | 3865 |
| 2027 | Estimate | 10,122     |             | 2.3%  | 3954 |
| 2028 | Estimate | 10,355     |             | 2.3%  | 4045 |
| 2029 | Estimate | 10,593     |             | 2.3%  | 4138 |
| 2030 | Estimate | 10,837     |             | 2.3%  | 4233 |
| 2031 | Estimate | 11,086     |             | 2.3%  | 4331 |
| 2032 | Estimate | 11,341     |             | 2.3%  | 4430 |
| 2033 | Estimate | 11,602     |             | 2.3%  | 4532 |
| 2034 | Estimate | 11,868     |             | 2.3%  | 4636 |
| 2035 | Estimate | 12,141     |             | 2.3%  | 4743 |
| 2036 | Estimate | 12,421     |             | 2.3%  | 4852 |
| 2037 | Estimate | 12,706     |             | 2.3%  | 4964 |
| 2038 | Estimate | 12,999     |             | 2.3%  | 5078 |
| 2039 | Estimate | 13,298     |             | 2.3%  | 5195 |
| 2040 | Estimate | 13,603     |             | 2.3%  | 5314 |
| 2041 | Estimate | 13,916     |             | 2.3%  | 5436 |
| 2042 | Estimate | 14,236     |             | 2.3%  | 5561 |
| 2043 | Estimate | 14,564     |             | 2.3%  | 5689 |
| 2044 | Estimate | 14,899     |             | 2.3%  | 5820 |

**APPENDIX B**

**SANTA CLARA CITY**  
**ZONING MAP**

# ZONING MAP 2021



## Legend

- |                                  |                                 |
|----------------------------------|---------------------------------|
| Parcels                          | Planned Development Residential |
| Open Space                       | Short Term Rentals              |
| Commercial                       | Residential - Agricultural      |
| Historical District Overlay Zone | Residential - Single Family     |
| Multi Family - Residential       | Mixed Lot Size                  |
| Mixed Use                        | Municipal Boundary              |
| Planned Development Commercial   |                                 |



# **APPENDIX C**

## **WASTEWATER BASIN FLOW CALCULATIONS**

Santa Clara Sewer Basin Build-Out & Flow Calculations

| Basin | ERUs/Acre  | 1.4                | 1.4 | 8.5   | 1.4    | 0       | 4.00    | 1.4    | 4        | 1.4     | 2.8     | Σ A*ERU/Acre | Weighted<br>Basin ERU | Basin<br>Area<br>(Acre) | Build-Out<br>ERUs | Build-Out<br>WW Flow<br>(gpm) |
|-------|------------|--------------------|-----|-------|--------|---------|---------|--------|----------|---------|---------|--------------|-----------------------|-------------------------|-------------------|-------------------------------|
|       | Basin Area | COM                | HD  | MR    | MU     | OS      | PD-MU   | PDC    | PDR      | R-A     | R1-10   |              |                       |                         |                   |                               |
|       | (sf)       | Area (Square Feet) |     |       |        |         |         |        |          |         |         |              |                       |                         |                   |                               |
| 1     | 1991521    |                    |     |       |        |         |         |        | 1294489  |         | 697031  | 7129643      | 3.58                  | 45.7                    | 163.7             | 76.4                          |
| 2     | 4875559    |                    |     |       |        |         | 1218890 |        | 3656669  |         |         | 19502236     | 4.00                  | 111.9                   | 447.7             | 208.9                         |
| 3     | 3179950    |                    |     |       |        |         |         |        | 2066968  |         | 1112983 | 11384224     | 3.58                  | 73.0                    | 261.3             | 122.0                         |
| 4     | 1565653    |                    |     |       |        |         |         |        |          |         | 1565653 | 4383828      | 2.80                  | 35.9                    | 100.6             | 47.0                          |
| 5     | 1171787    |                    |     |       |        |         |         |        | 1171787  |         |         | 4687148      | 4.00                  | 26.9                    | 107.6             | 50.2                          |
| 6     | 1716677    | 72959              |     |       |        |         |         | 51500  |          |         | 1592218 | 4632453      | 2.70                  | 39.4                    | 106.3             | 49.6                          |
| 7     | 1756802    |                    |     |       |        |         |         | 140544 | 1317602  |         | 298656  | 6303406      | 3.59                  | 40.3                    | 144.7             | 67.5                          |
| 8     | 2197653    |                    |     |       |        |         |         |        | 1758122  |         | 439531  | 8263175      | 3.76                  | 50.5                    | 189.7             | 88.5                          |
| 9     | 1888818    |                    |     |       |        |         |         | 151105 | 604422   |         | 1133291 | 5802450      | 3.07                  | 43.4                    | 133.2             | 62.2                          |
| 10    | 1854967    |                    |     |       |        |         |         |        |          |         | 1854967 | 5193908      | 2.80                  | 42.6                    | 119.2             | 55.6                          |
| 11    | 3574165    |                    |     |       |        | 178708  |         |        |          | 2680624 | 893541  | 6254788      | 1.75                  | 82.1                    | 143.6             | 67.0                          |
| 12    | 2372603    |                    |     |       |        |         |         |        |          |         | 2372603 | 6643288      | 2.80                  | 54.5                    | 152.5             | 71.2                          |
| 13    | 5701607    |                    |     |       |        |         |         |        |          |         | 5701607 | 15964500     | 2.80                  | 130.9                   | 366.5             | 171.0                         |
| 14    | 1312325    |                    |     |       |        |         |         |        |          | 196849  | 1115476 | 3398921      | 2.59                  | 30.1                    | 78.0              | 36.4                          |
| 15    | 4220224    |                    |     | 10551 | 126607 |         |         |        |          | 917899  | 3165168 | 10414462     | 2.47                  | 96.9                    | 239.1             | 111.6                         |
| 16    | 4055777    |                    |     |       |        |         |         |        |          |         | 4055777 | 11356176     | 2.80                  | 93.1                    | 260.7             | 121.7                         |
| 17    | 2410442    | 60261              |     |       |        |         |         | 60261  |          |         | 2289920 | 6580507      | 2.73                  | 55.3                    | 151.1             | 70.5                          |
| 18    | 22651275   |                    |     |       |        | 4686831 |         | 499471 | 12771560 |         | 4693413 | 64927056     | 2.87                  | 520.0                   | 1490.5            | 695.6                         |
| 19    | 3165990    |                    |     |       |        |         |         |        | 2312213  |         | 853777  | 11639428     | 3.68                  | 72.7                    | 267.2             | 124.7                         |
| 20    | 860627     |                    |     |       |        | 860627  |         |        |          |         | 0       | 0            | 0.00                  | 19.8                    | 0.0               | 0.0                           |
| 21    | 2199813    |                    |     | 21998 | 87993  |         |         |        |          | 1099907 | 989916  | 4621808      | 2.10                  | 50.5                    | 106.1             | 49.5                          |
| 22    | 11522684   | 172840             |     |       | 288067 |         |         | 518521 |          | 5242821 | 5300435 | 23552367     | 2.04                  | 264.5                   | 540.7             | 252.3                         |
| 23    | 3538202    | 35411              |     | 35411 |        |         |         | 177053 | 920676   | 885265  | 1487245 | 9684801      | 2.74                  | 81.2                    | 222.3             | 103.8                         |
| 24    | 7163303    |                    |     |       |        |         | 2936954 |        |          | 3151853 | 1074495 | 19168996     | 2.68                  | 164.4                   | 440.1             | 205.4                         |
| 25    | 5117491    |                    |     |       |        |         |         |        | 2558746  | 1228198 | 1330548 | 15679996     | 3.06                  | 117.5                   | 360.0             | 168.0                         |
| 26    | 487465     |                    |     |       |        |         |         |        |          | 487465  |         | 682451       | 1.40                  | 11.2                    | 15.7              | 7.3                           |
| 27    | 3688451    | 36856              |     | 36856 |        |         |         | 184280 | 958254   | 921398  | 1547949 | 10080099     | 2.73                  | 84.7                    | 231.4             | 108.0                         |

| Percent   |             | Current<br>WW Flow<br>(gpm) |
|-----------|-------------|-----------------------------|
| Developed | Undeveloped |                             |
| 17.7%     | 82.3%       | 13.5                        |
| 3.3%      | 96.7%       | 6.9                         |
| 51.1%     | 48.9%       | 62.3                        |
| 94.6%     | 5.4%        | 44.4                        |
| 3.7%      | 96.3%       | 1.8                         |
| 65.9%     | 34.1%       | 32.7                        |
| 28.4%     | 71.6%       | 19.2                        |
| 95.3%     | 4.7%        | 84.4                        |
| 90.4%     | 9.6%        | 56.2                        |
| 95.6%     | 4.4%        | 53.2                        |
| 45.4%     | 54.6%       | 30.4                        |
| 95.0%     | 5.0%        | 67.6                        |
| 98.6%     | 1.4%        | 168.7                       |
| 36.9%     | 63.1%       | 13.4                        |
| 72.9%     | 27.1%       | 81.4                        |
| 95.4%     | 4.6%        | 116.1                       |
| 90.3%     | 9.7%        | 63.7                        |
| 0.0%      | 100.0%      | 0.0                         |
| 68.7%     | 31.3%       | 85.6                        |
| 17.7%     | 82.3%       | 0.0                         |
| 53.8%     | 46.2%       | 26.6                        |
| 57.4%     | 42.6%       | 144.8                       |
| 89.1%     | 10.9%       | 92.4                        |
| 13.8%     | 86.2%       | 28.3                        |
| 10.7%     | 89.3%       | 18.0                        |
| 0.0%      | 100.0%      | 0.0                         |
| 89.1%     | 10.9%       | 96.2                        |

Blue indicates Shared Line Basins  
Red indicates Valley Line Basins

| Existing Sewer Capacity - Valley Outfall Line |                |           |              |                 |                 |           |                |                | Contributing Basins                     | SC Buildout<br>Peak Flow | % of Capacity | Pipe Size | SC Current<br>Flow (gpm) | % of Capacity |
|-----------------------------------------------|----------------|-----------|--------------|-----------------|-----------------|-----------|----------------|----------------|-----------------------------------------|--------------------------|---------------|-----------|--------------------------|---------------|
| Station                                       | Pipe Size (in) | Slope (%) | Mannings "n" | Hyd Radius (ft) | Velocity (ft/s) | Area (sf) | Capacity (cfs) | Capacity (gpm) |                                         |                          |               |           |                          |               |
| 387+53                                        | 12             | 0.60%     | 0.013        | 0.250           | 3.51            | 0.79      | 2.8            | 1239           | 14                                      | 36                       | 3%            | OK        | 13                       | 1.1%          |
| 383+36                                        | 12             | 0.90%     | 0.013        | 0.250           | 4.30            | 0.79      | 3.4            | 1517           |                                         | 146                      | 10%           | OK        |                          |               |
| 381+54                                        | 12             | 0.80%     | 0.013        | 0.250           | 4.06            | 0.79      | 3.2            | 1430           |                                         | 193                      | 14%           | OK        |                          |               |
| 378+28                                        | 12             | 0.66%     | 0.013        | 0.250           | 3.69            | 0.79      | 2.9            | 1299           |                                         | 279                      | 21%           | OK        |                          |               |
| 376+98                                        | 12             | 0.66%     | 0.013        | 0.250           | 3.69            | 0.79      | 2.9            | 1299           |                                         | 313                      | 24%           | OK        |                          |               |
| 374+24                                        | 15             | 0.25%     | 0.013        | 0.313           | 2.63            | 1.23      | 3.2            | 1450           |                                         | 385                      | 27%           | OK        |                          |               |
| 369+69                                        | 15             | 0.26%     | 0.013        | 0.313           | 2.68            | 1.23      | 3.3            | 1478           | 8,9,14,15,24                            | 504                      | 34%           | OK        | 264                      | 17.8%         |
| 365+85                                        | 15             | 0.68%     | 0.013        | 0.313           | 4.34            | 1.23      | 5.3            | 2391           |                                         | 528                      | 22%           | OK        |                          |               |
| 361+78                                        | 15             | 0.75%     | 0.013        | 0.313           | 4.56            | 1.23      | 5.6            | 2511           | 8,9,14,15,24,21                         | 554                      | 22%           | OK        | 290                      | 11.6%         |
| 356+90                                        | 15             | 0.82%     | 0.013        | 0.313           | 4.77            | 1.23      | 5.8            | 2625           |                                         | 643                      | 24%           | OK        |                          |               |
| 351+45                                        | 15             | 0.68%     | 0.013        | 0.313           | 4.34            | 1.23      | 5.3            | 2391           |                                         | 743                      | 31%           | OK        |                          |               |
| 349+82                                        | 15             | 1.21%     | 0.013        | 0.313           | 5.79            | 1.23      | 7.1            | 3189           |                                         | 773                      | 24%           | OK        |                          |               |
| 346+03                                        | 15             | 0.84%     | 0.013        | 0.313           | 4.82            | 1.23      | 5.9            | 2657           |                                         | 842                      | 32%           | OK        |                          |               |
| 343+48                                        | 15             | 0.48%     | 0.013        | 0.313           | 3.65            | 1.23      | 4.5            | 2009           |                                         | 889                      | 44%           | OK        |                          |               |
| 339+38                                        | 15             | 1.45%     | 0.013        | 0.313           | 6.34            | 1.23      | 7.8            | 3491           | 8,9,14,15,24,21,12,13,25                | 964                      | 28%           | OK        | 545                      | 15.6%         |
| 335+53                                        | 15             | 1.45%     | 0.013        | 0.313           | 6.34            | 1.23      | 7.8            | 3491           |                                         | 1007                     | 29%           | OK        |                          |               |
| 320+57                                        | 15             | 1.45%     | 0.013        | 0.313           | 6.34            | 1.23      | 7.8            | 3491           |                                         | 1174                     | 34%           | OK        |                          |               |
| 314+19                                        | 15             | 1.16%     | 0.013        | 0.313           | 5.67            | 1.23      | 7.0            | 3122           |                                         | 1245                     | 40%           | OK        |                          |               |
| 310+64                                        | 15             | 1.16%     | 0.013        | 0.313           | 5.67            | 1.23      | 7.0            | 3122           |                                         | 1284                     | 41%           | OK        |                          |               |
| 308+27                                        | 15             | 1.16%     | 0.013        | 0.313           | 5.67            | 1.23      | 7.0            | 3122           |                                         | 1311                     | 42%           | OK        |                          |               |
| 306+06                                        | 15             | 0.50%     | 0.013        | 0.313           | 3.72            | 1.23      | 4.6            | 2050           |                                         | 1335                     | 65%           | OK        |                          |               |
| 303+29                                        | 15             | 0.50%     | 0.013        | 0.313           | 3.72            | 1.23      | 4.6            | 2050           |                                         | 1366                     | 67%           | OK        |                          |               |
| 302+51                                        | 15             | 0.50%     | 0.013        | 0.313           | 3.72            | 1.23      | 4.6            | 2050           | 8,9,14,15,24,21,12,13,25,16,17,23,26,27 | 1375                     | 67%           | OK        | 817                      | 39.8%         |
| 296+22                                        | 15             | 1.00%     | 0.013        | 0.313           | 5.26            | 1.23      | 6.5            | 2899           |                                         | 1375                     | 47%           | OK        |                          |               |
| 293+64                                        | 21             | 0.25%     | 0.013        | 0.438           | 3.29            | 2.41      | 7.9            | 3556           |                                         | 1375                     | 39%           | OK        |                          |               |
| 290+91                                        | 21             | 0.25%     | 0.013        | 0.438           | 3.29            | 2.41      | 7.9            | 3556           |                                         | 1375                     | 39%           | OK        |                          |               |
| 287+38                                        | 21             | 0.25%     | 0.013        | 0.438           | 3.29            | 2.41      | 7.9            | 3556           |                                         | 1375                     | 39%           | OK        |                          |               |
| 283+83                                        | 21             | 0.25%     | 0.013        | 0.438           | 3.29            | 2.41      | 7.9            | 3556           |                                         | 1375                     | 39%           | OK        |                          |               |
| 277+13                                        | 21             | 0.37%     | 0.013        | 0.438           | 4.01            | 2.41      | 9.6            | 4326           |                                         | 1375                     | 32%           | OK        |                          |               |
| 276+00                                        | 21             | 0.37%     | 0.013        | 0.438           | 4.01            | 2.41      | 9.6            | 4326           |                                         | 1375                     | 32%           | OK        |                          |               |
| 266+18                                        | 21             | 0.435%    | 0.013        | 0.438           | 4.34            | 2.41      | 10.5           | 4690           |                                         | 1375                     | 29%           | OK        |                          |               |
| 263+65                                        | 21             | 0.250%    | 0.013        | 0.438           | 3.29            | 2.41      | 7.9            | 3556           |                                         | 1375                     | 39%           | OK        |                          |               |
| 259+00                                        | 21             | 0.250%    | 0.013        | 0.438           | 3.29            | 2.41      | 7.9            | 3556           |                                         | 1375                     | 39%           | OK        |                          |               |
| 256+00                                        | 21             | 0.250%    | 0.013        | 0.438           | 3.29            | 2.41      | 7.9            | 3556           |                                         | 1375                     | 39%           | OK        |                          |               |
| 253+00                                        | 21             | 0.250%    | 0.013        | 0.438           | 3.29            | 2.41      | 7.9            | 3556           |                                         | 1375                     | 39%           | OK        |                          |               |





| Existing Sewer Capacity - Lava Flow Wash Sewer Outfall Line Without Ivins Flow |                |           |              |                 |                 |           |                |                | Contributing Basins                                              | SC Buildout<br>Peak Flow | % of<br>Capacity | Pipe Size | SC Current<br>Flow (gpm) | % of Capacity |
|--------------------------------------------------------------------------------|----------------|-----------|--------------|-----------------|-----------------|-----------|----------------|----------------|------------------------------------------------------------------|--------------------------|------------------|-----------|--------------------------|---------------|
| Station                                                                        | Pipe Size (in) | Slope (%) | Mannings "n" | Hyd Radius (ft) | Velocity (ft/s) | Area (sf) | Capacity (cfs) | Capacity (gpm) |                                                                  |                          |                  |           |                          |               |
| 216+14                                                                         | 12             | 1.25%     | 0.009        | 0.25            | 7.35            | 0.79      | 5.8            | 2589           | 1,3                                                              | 198                      | 8%               | OK        | 76                       | 2.9%          |
| 213+23                                                                         | 12             | 1.25%     | 0.009        | 0.25            | 7.35            | 0.79      | 5.8            | 2589           |                                                                  | 203                      | 8%               | OK        |                          |               |
| 201+36                                                                         | 12             | 1.31%     | 0.009        | 0.25            | 7.52            | 0.79      | 5.9            | 2651           |                                                                  | 224                      | 8%               | OK        |                          |               |
| 189+48                                                                         | 12             | 1.21%     | 0.009        | 0.25            | 7.23            | 0.79      | 5.7            | 2547           | 1,3,4                                                            | 245                      | 10%              | OK        | 120                      | 4.7%          |
| 185+41                                                                         | 12             | 1.81%     | 0.009        | 0.25            | 8.84            | 0.79      | 6.9            | 3116           |                                                                  | 304                      | 10%              | OK        |                          |               |
| 181+37                                                                         | 12             | 2.11%     | 0.009        | 0.25            | 9.53            | 0.79      | 7.5            | 3360           | 1,3,4,6,7                                                        | 362                      | 11%              | OK        | 172                      | 5.1%          |
| 177+66                                                                         | 12             | 1.23%     | 0.009        | 0.25            | 7.29            | 0.79      | 5.7            | 2568           |                                                                  | 612                      | 24%              | OK        |                          |               |
| 173+60                                                                         | 12             | 1.20%     | 0.009        | 0.25            | 7.20            | 0.79      | 5.7            | 2537           |                                                                  | 886                      | 35%              | OK        |                          |               |
| 170+27                                                                         | 12             | 1.32%     | 0.009        | 0.25            | 7.55            | 0.79      | 5.9            | 2661           |                                                                  | 1110                     | 42%              | OK        |                          |               |
| 167+78                                                                         | 12             | 1.80%     | 0.009        | 0.25            | 8.81            | 0.79      | 6.9            | 3107           |                                                                  | 1278                     | 41%              | OK        |                          |               |
| 167+19                                                                         | 12             | 1.20%     | 0.009        | 0.25            | 7.20            | 0.79      | 5.7            | 2537           |                                                                  | 1318                     | 52%              | OK        |                          |               |
| 166+61                                                                         | 12             | 1.38%     | 0.009        | 0.25            | 7.72            | 0.79      | 6.1            | 2721           | 1,3, 4,6,7,2,5,18, 77 Black Desert Conn.                         | 1357                     | 50%              | OK        | 181                      | 6.6%          |
| 163+20                                                                         | 12             | 2.16%     | 0.009        | 0.25            | 9.66            | 0.79      | 7.6            | 3404           | 1,3,4,6,7,2,5,18, 10, 987 Black Desert Conn.                     | 1874                     | 55%              | OK        | 234                      | 6.9%          |
| 160+88                                                                         | 12             | 2.06%     | 0.009        | 0.25            | 9.43            | 0.79      | 7.4            | 3324           | 1,3, 4,6,7,2,5,18, 10, 1,518 Black Desert Conn.                  | 2140                     | 64%              | OK        | 234                      | 7.0%          |
| 158+71                                                                         | 12             | 2.16%     | 0.009        | 0.25            | 9.66            | 0.79      | 7.6            | 3404           |                                                                  | 2152                     | 63%              | OK        |                          |               |
| 157+19                                                                         | 12             | 1.66%     | 0.009        | 0.25            | 8.46            | 0.79      | 6.6            | 2984           |                                                                  | 2161                     | 72%              | OK        |                          |               |
| 153+93                                                                         | 12             | 1.71%     | 0.009        | 0.25            | 8.59            | 0.79      | 6.7            | 3028           |                                                                  | 2179                     | 72%              | OK        |                          |               |
| 149+91                                                                         | 12             | 1.50%     | 0.009        | 0.25            | 8.05            | 0.79      | 6.3            | 2836           |                                                                  | 2201                     | 78%              | OK        |                          |               |
| 145+92                                                                         | 12             | 1.31%     | 0.009        | 0.25            | 7.52            | 0.79      | 5.9            | 2651           |                                                                  | 2223                     | 84%              | Too Small |                          |               |
| 141+92                                                                         | 12             | 1.18%     | 0.009        | 0.25            | 7.14            | 0.79      | 5.6            | 2516           |                                                                  | 2245                     | 89%              | Too Small |                          |               |
| 137+92                                                                         | 12             | 1.24%     | 0.009        | 0.25            | 7.32            | 0.79      | 5.7            | 2579           |                                                                  | 2267                     | 88%              | Too Small |                          |               |
| 136+13                                                                         | 12             | 1.26%     | 0.009        | 0.25            | 7.37            | 0.79      | 5.8            | 2600           |                                                                  | 2276                     | 88%              | Too Small |                          |               |
| 133+94                                                                         | 12             | 1.31%     | 0.009        | 0.25            | 7.52            | 0.79      | 5.9            | 2651           |                                                                  | 2288                     | 86%              | Too Small |                          |               |
| 129+94                                                                         | 12             | 1.38%     | 0.009        | 0.25            | 7.72            | 0.79      | 6.1            | 2721           |                                                                  | 2310                     | 85%              | Too Small |                          |               |
| 126+28                                                                         | 15             | 1.50%     | 0.009        | 0.3125          | 9.34            | 1.23      | 11.5           | 5143           |                                                                  | 2330                     | 45%              | OK        |                          |               |
| 122+50                                                                         | 15             | 0.58%     | 0.009        | 0.3125          | 5.81            | 1.23      | 7.1            | 3198           |                                                                  | 2351                     | 74%              | OK        |                          |               |
| 121+36                                                                         | 15             | 1.50%     | 0.009        | 0.3125          | 9.34            | 1.23      | 11.5           | 5143           |                                                                  | 2357                     | 46%              | OK        |                          |               |
| 118+83                                                                         | 15             | 1.17%     | 0.009        | 0.3125          | 8.25            | 1.23      | 10.1           | 4542           |                                                                  | 2371                     | 52%              | OK        |                          |               |
| 115+96                                                                         | 15             | 0.56%     | 0.009        | 0.3125          | 5.71            | 1.23      | 7.0            | 3142           |                                                                  | 2387                     | 76%              | OK        |                          |               |
| 112+30                                                                         | 15             | 0.46%     | 0.009        | 0.3125          | 5.17            | 1.23      | 6.3            | 2848           |                                                                  | 2407                     | 85%              | Too Small |                          |               |
| 110+41                                                                         | 15             | 0.75%     | 0.009        | 0.3125          | 6.60            | 1.23      | 8.1            | 3636           |                                                                  | 2418                     | 66%              | OK        |                          |               |
| 107+16                                                                         | 15             | 0.94%     | 0.009        | 0.3125          | 7.39            | 1.23      | 9.1            | 4071           |                                                                  | 2435                     | 60%              | OK        |                          |               |
| 104+26                                                                         | 15             | 1.01%     | 0.009        | 0.3125          | 7.66            | 1.23      | 9.4            | 4220           |                                                                  | 2451                     | 58%              | OK        |                          |               |
| 102+55                                                                         | 15             | 1.15%     | 0.009        | 0.3125          | 8.18            | 1.23      | 10.0           | 4503           |                                                                  | 2461                     | 55%              | OK        |                          |               |
| 101+11                                                                         | 15             | 1.11%     | 0.009        | 0.3125          | 8.03            | 1.23      | 9.9            | 4424           |                                                                  | 2469                     | 56%              | OK        |                          |               |
| 99+54                                                                          | 15             | 0.61%     | 0.009        | 0.3125          | 5.95            | 1.23      | 7.3            | 3279           |                                                                  | 2477                     | 76%              | OK        |                          |               |
| 95+76                                                                          | 15             | 0.56%     | 0.009        | 0.3125          | 5.71            | 1.23      | 7.0            | 3142           | 1,3, 4,6,7,2,5,18,10,19,20, Conn. From St. George & Black Desert | 2498                     | 79%              | OK        | 320                      | 10.2%         |
| 93+36                                                                          | 15             | 0.80%     | 0.009        | 0.3125          | 6.82            | 1.23      | 8.4            | 3756           |                                                                  | 2498                     | 67%              | OK        |                          |               |
| 91+03                                                                          | 15             | 0.54%     | 0.009        | 0.3125          | 5.602           | 1.23      | 6.9            | 3086           |                                                                  | 2498                     | 81%              | Too Small |                          |               |
| 85+97                                                                          | 15             | 0.46%     | 0.009        | 0.3125          | 5.171           | 1.23      | 6.3            | 2848           |                                                                  | 2498                     | 88%              | Too Small |                          |               |
| 81+35                                                                          | 15             | 0.50%     | 0.009        | 0.3125          | 5.391           | 1.23      | 6.6            | 2969           |                                                                  | 2498                     | 84%              | Too Small |                          |               |
| 80+00                                                                          | 15             | 0.75%     | 0.009        | 0.3125          | 6.602           | 1.23      | 8.1            | 3636           |                                                                  | 2498                     | 69%              | OK        |                          |               |

58.0% Average

| Existing Sewer Capacity - Tuacahn Wash Outfall Line |                |           |              |                 |                 |           |                |                | Contributing Basins                                     | SC Buildout<br>Peak Flow | % of<br>Capacity | Pipe Size |
|-----------------------------------------------------|----------------|-----------|--------------|-----------------|-----------------|-----------|----------------|----------------|---------------------------------------------------------|--------------------------|------------------|-----------|
| Station                                             | Pipe Size (in) | Slope (%) | Mannings "n" | Hyd Radius (ft) | Velocity (ft/s) | Area (sf) | Capacity (cfs) | Capacity (gpm) |                                                         |                          |                  |           |
| 49+67                                               | 10             | 1.25%     | 0.009        | 0.208           | 6.50            | 0.55      | 3.5            | 1592           | 2, 25% of Ivins Flow                                    | 807                      | 51%              | OK        |
| 44+84                                               | 10             | 1.25%     | 0.009        | 0.208           | 6.50            | 0.55      | 3.5            | 1592           |                                                         | 883                      | 55%              | OK        |
| 41+87                                               | 10             | 1.25%     | 0.009        | 0.208           | 6.50            | 0.55      | 3.5            | 1592           |                                                         | 930                      | 58%              | OK        |
| 36+15                                               | 10             | 1.25%     | 0.009        | 0.208           | 6.50            | 0.55      | 3.5            | 1592           |                                                         | 1020                     | 64%              | OK        |
| 31+97                                               | 10             | 1.25%     | 0.009        | 0.208           | 6.50            | 0.55      | 3.5            | 1592           |                                                         | 1086                     | 68%              | OK        |
| 30+14                                               | 10             | 1.25%     | 0.009        | 0.208           | 6.50            | 0.55      | 3.5            | 1592           |                                                         | 1114                     | 70%              | OK        |
| 27+11                                               | 10             | 1.25%     | 0.009        | 0.208           | 6.50            | 0.55      | 3.5            | 1592           |                                                         | 1162                     | 73%              | OK        |
| 23+57                                               | 10             | 1.25%     | 0.009        | 0.208           | 6.50            | 0.55      | 3.5            | 1592           |                                                         | 1218                     | 76%              | OK        |
| 19+45                                               | 10             | 1.25%     | 0.009        | 0.208           | 6.50            | 0.55      | 3.5            | 1592           |                                                         | 1283                     | 81%              | Too Small |
| 18+88                                               | 12             | 1.25%     | 0.009        | 0.250           | 7.35            | 0.79      | 5.8            | 2589           |                                                         | 1292                     | 50%              | OK        |
| 13+35                                               | 12             | 1.25%     | 0.009        | 0.250           | 7.35            | 0.79      | 5.8            | 2589           | 2,5, 25% of Ivins Flow,75% of 18                        | 1379                     | 53%              | OK        |
| 9+58                                                | 12             | 0.70%     | 0.009        | 0.250           | 5.50            | 0.79      | 4.3            | 1938           | 2,5, 25% of Ivins Flow,75% of 18, 77 Black Desert Conn. | 1418                     | 73%              | OK        |
| 7+34                                                | 12             | 0.70%     | 0.009        | 0.250           | 5.50            | 0.79      | 4.3            | 1938           |                                                         | 1418                     | 73%              | OK        |
| 0+00                                                | 12             | 0.70%     | 0.009        | 0.250           | 5.50            | 0.79      | 4.3            | 1938           |                                                         | 1418                     | 73%              | OK        |

| SC Current<br>Flow (gpm) | % of<br>Capacity |
|--------------------------|------------------|
| 340                      | 21.3%            |
|                          |                  |
|                          |                  |
|                          |                  |
|                          |                  |
|                          |                  |
|                          |                  |
|                          |                  |
|                          |                  |
| 342                      | 13.2%            |
| 342                      | 17.6%            |
|                          |                  |

| Existing Sewer Capacity - Tuacahn Wash Outfall Line Without Ivins Flow |                |           |              |                 |                 |           |                |                | Contributing Basins                  | SC Buildout<br>Peak Flow | % of<br>Capacity | Pipe Size |
|------------------------------------------------------------------------|----------------|-----------|--------------|-----------------|-----------------|-----------|----------------|----------------|--------------------------------------|--------------------------|------------------|-----------|
| Station                                                                | Pipe Size (in) | Slope (%) | Mannings "n" | Hyd Radius (ft) | Velocity (ft/s) | Area (sf) | Capacity (cfs) | Capacity (gpm) |                                      |                          |                  |           |
| 49+67                                                                  | 10             | 1.25%     | 0.009        | 0.208           | 6.50            | 0.55      | 3.5            | 1592           | 2                                    | 209                      | 13%              | OK        |
| 44+84                                                                  | 10             | 1.25%     | 0.009        | 0.208           | 6.50            | 0.55      | 3.5            | 1592           |                                      | 285                      | 18%              | OK        |
| 41+87                                                                  | 10             | 1.25%     | 0.009        | 0.208           | 6.50            | 0.55      | 3.5            | 1592           |                                      | 332                      | 21%              | OK        |
| 36+15                                                                  | 10             | 1.25%     | 0.009        | 0.208           | 6.50            | 0.55      | 3.5            | 1592           |                                      | 422                      | 26%              | OK        |
| 31+97                                                                  | 10             | 1.25%     | 0.009        | 0.208           | 6.50            | 0.55      | 3.5            | 1592           |                                      | 488                      | 31%              | OK        |
| 30+14                                                                  | 10             | 1.25%     | 0.009        | 0.208           | 6.50            | 0.55      | 3.5            | 1592           |                                      | 516                      | 32%              | OK        |
| 27+11                                                                  | 10             | 1.25%     | 0.009        | 0.208           | 6.50            | 0.55      | 3.5            | 1592           |                                      | 564                      | 35%              | OK        |
| 23+57                                                                  | 10             | 1.25%     | 0.009        | 0.208           | 6.50            | 0.55      | 3.5            | 1592           |                                      | 620                      | 39%              | OK        |
| 19+45                                                                  | 10             | 1.25%     | 0.009        | 0.208           | 6.50            | 0.55      | 3.5            | 1592           |                                      | 685                      | 43%              | OK        |
| 18+88                                                                  | 12             | 1.25%     | 0.009        | 0.250           | 7.35            | 0.79      | 5.8            | 2589           |                                      | 694                      | 27%              | OK        |
| 13+35                                                                  | 12             | 1.25%     | 0.009        | 0.250           | 7.35            | 0.79      | 5.8            | 2589           | 2,5,75% of 18                        | 781                      | 30%              | OK        |
| 9+58                                                                   | 12             | 0.70%     | 0.009        | 0.250           | 5.50            | 0.79      | 4.3            | 1938           | 2,5,75% of 18, 77 Black Desert Conn. | 820                      | 42%              | OK        |
| 7+34                                                                   | 12             | 0.70%     | 0.009        | 0.250           | 5.50            | 0.79      | 4.3            | 1938           |                                      | 820                      | 42%              | OK        |
| 0+00                                                                   | 12             | 0.70%     | 0.009        | 0.250           | 5.50            | 0.79      | 4.3            | 1938           |                                      | 820                      | 42%              | OK        |

| SC Current<br>Flow (gpm) | % of<br>Capacity |
|--------------------------|------------------|
| 7                        | 0.4%             |
|                          |                  |
|                          |                  |
|                          |                  |
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|                          |                  |
|                          |                  |
|                          |                  |
|                          |                  |
|                          |                  |
| 9                        | 0.3%             |
| 9                        | 0.5%             |
|                          |                  |
|                          |                  |

31.6% Average





| Existing Sewer Capacity - Canyon View Dr. Line |                |           |              |                 |                 |           |                |                | Contributing Basins | SC Buildout<br>Peak Flow | % of Capacity | Pipe Size | SC Current<br>Flow (gpm) | % of Capacity |
|------------------------------------------------|----------------|-----------|--------------|-----------------|-----------------|-----------|----------------|----------------|---------------------|--------------------------|---------------|-----------|--------------------------|---------------|
| Station                                        | Pipe Size (in) | Slope (%) | Mannings "n" | Hyd Radius (ft) | Velocity (ft/s) | Area (sf) | Capacity (cfs) | Capacity (gpm) |                     |                          |               |           |                          |               |
| 724+55                                         | 8              | 0.36%     | 0.013        | 0.167           | 2.08            | 0.35      | 0.7            | 325            | 10                  | 56                       | 17%           | OK        | 53                       | 16.3%         |
| 720+89                                         | 8              | 0.36%     | 0.013        | 0.167           | 2.08            | 0.35      | 0.7            | 325            |                     | 113                      | 35%           | OK        |                          |               |
| 717+22                                         | 8              | 0.36%     | 0.013        | 0.167           | 2.08            | 0.35      | 0.7            | 325            |                     | 170                      | 52%           | OK        |                          |               |
| 713+56                                         | 8              | 0.36%     | 0.013        | 0.167           | 2.08            | 0.35      | 0.7            | 325            | 10,13               | 227                      | 70%           | OK        | 222                      | 68.2%         |
| 709+90                                         | 8              | 0.82%     | 0.013        | 0.167           | 3.13            | 0.35      | 1.1            | 491            |                     | 238                      | 49%           | OK        |                          |               |
| 706+23                                         | 8              | 0.82%     | 0.013        | 0.167           | 3.13            | 0.35      | 1.1            | 491            |                     | 250                      | 51%           | OK        |                          |               |
| 702+57                                         | 8              | 0.82%     | 0.013        | 0.167           | 3.13            | 0.35      | 1.1            | 491            |                     | 262                      | 53%           | OK        |                          |               |
| 698+91                                         | 8              | 0.82%     | 0.013        | 0.167           | 3.13            | 0.35      | 1.1            | 491            |                     | 274                      | 56%           | OK        |                          |               |
| 695+24                                         | 8              | 0.82%     | 0.013        | 0.167           | 3.13            | 0.35      | 1.1            | 491            |                     | 285                      | 58%           | OK        |                          |               |
| 691+58                                         | 8              | 0.82%     | 0.013        | 0.167           | 3.13            | 0.35      | 1.1            | 491            | 10,13,17            | 297                      | 61%           | OK        | 286                      | 58.1%         |
| 687+92                                         | 10             | 1.86%     | 0.013        | 0.208           | 5.48            | 0.55      | 3.0            | 1341           |                     | 312                      | 23%           | OK        |                          |               |
| 684+25                                         | 10             | 1.86%     | 0.013        | 0.208           | 5.48            | 0.55      | 3.0            | 1341           |                     | 327                      | 24%           | OK        |                          |               |
| 680+59                                         | 10             | 1.86%     | 0.013        | 0.208           | 5.48            | 0.55      | 3.0            | 1341           |                     | 342                      | 25%           | OK        |                          |               |
| 676+93                                         | 10             | 1.86%     | 0.013        | 0.208           | 5.48            | 0.55      | 3.0            | 1341           |                     | 357                      | 27%           | OK        |                          |               |
| 673+27                                         | 10             | 1.86%     | 0.013        | 0.208           | 5.48            | 0.55      | 3.0            | 1341           |                     | 371                      | 28%           | OK        |                          |               |
| 669+60                                         | 10             | 1.86%     | 0.013        | 0.208           | 5.48            | 0.55      | 3.0            | 1341           |                     | 386                      | 29%           | OK        |                          |               |
| 665+94                                         | 10             | 1.86%     | 0.013        | 0.208           | 5.48            | 0.55      | 3.0            | 1341           |                     | 401                      | 30%           | OK        |                          |               |
| 662+28                                         | 10             | 1.86%     | 0.013        | 0.208           | 5.48            | 0.55      | 3.0            | 1341           |                     | 416                      | 31%           | OK        |                          |               |
| 658+61                                         | 10             | 1.86%     | 0.013        | 0.208           | 5.48            | 0.55      | 3.0            | 1341           |                     | 431                      | 32%           | OK        |                          |               |
| 654+95                                         | 10             | 1.86%     | 0.013        | 0.208           | 5.48            | 0.55      | 3.0            | 1341           |                     | 446                      | 33%           | OK        |                          |               |
| 651+29                                         | 10             | 1.86%     | 0.013        | 0.208           | 5.48            | 0.55      | 3.0            | 1341           |                     | 460                      | 34%           | OK        |                          |               |
| 647+62                                         | 10             | 1.86%     | 0.013        | 0.208           | 5.48            | 0.55      | 3.0            | 1341           |                     | 475                      | 35%           | OK        |                          |               |
| 643+96                                         | 10             | 1.86%     | 0.013        | 0.208           | 5.48            | 0.55      | 3.0            | 1341           |                     | 490                      | 37%           | OK        |                          |               |
| 640+30                                         | 10             | 1.86%     | 0.013        | 0.208           | 5.48            | 0.55      | 3.0            | 1341           |                     | 505                      | 38%           | OK        |                          |               |
| 636+63                                         | 10             | 1.86%     | 0.013        | 0.208           | 5.48            | 0.55      | 3.0            | 1341           |                     | 520                      | 39%           | OK        |                          |               |
| 632+97                                         | 10             | 1.86%     | 0.013        | 0.208           | 5.48            | 0.55      | 3.0            | 1341           |                     | 535                      | 40%           | OK        |                          |               |
| 629+31                                         | 10             | 1.86%     | 0.013        | 0.208           | 5.48            | 0.55      | 3.0            | 1341           | 10,13,17,22         | 549                      | 41%           | OK        | 430                      | 32.1%         |
| 625+64                                         | 10             | 0.95%     | 0.013        | 0.208           | 3.92            | 0.55      | 2.1            | 958            |                     | 646                      | 67%           | OK        |                          |               |
| 621+98                                         | 10             | 0.95%     | 0.013        | 0.208           | 3.92            | 0.55      | 2.1            | 958            | 10,13,17,22,12,16   | 742                      | 77%           | OK        | 614                      | 64.1%         |
| 618+32                                         | 12             | 1.68%     | 0.013        | 0.250           | 5.88            | 0.79      | 4.6            | 2073           |                     | 742                      | 36%           | OK        |                          |               |
| 614+65                                         | 10             | 1.68%     | 0.013        | 0.208           | 5.21            | 0.55      | 2.8            | 1275           |                     | 742                      | 58%           | OK        |                          |               |
| 610+99                                         | 10             | 1.68%     | 0.013        | 0.208           | 5.21            | 0.55      | 2.8            | 1275           |                     | 742                      | 58%           | OK        |                          |               |
| 607+33                                         | 10             | 1.68%     | 0.013        | 0.208           | 5.21            | 0.55      | 2.8            | 1275           |                     | 742                      | 58%           | OK        |                          |               |
| 603+66                                         | 10             | 1.68%     | 0.013        | 0.208           | 5.21            | 0.55      | 2.8            | 1275           |                     | 742                      | 58%           | OK        |                          |               |
| 600+00                                         | 10             | 1.68%     | 0.013        | 0.208           | 5.21            | 0.55      | 2.8            | 1275           |                     | 742                      | 58%           | OK        |                          |               |





| Existing Sewer Capacity - Lava Flow Wash Sewer Outfall Line Taking No Future Flow |                |           |              |                 |                 |           |                |                | Contributing Basins                                                  | SC Current Peak Flow | % of Capacity | Pipe Size | SC Additional Flow Before Reaching Capacity (80%) | Equivalent Number of Connections |
|-----------------------------------------------------------------------------------|----------------|-----------|--------------|-----------------|-----------------|-----------|----------------|----------------|----------------------------------------------------------------------|----------------------|---------------|-----------|---------------------------------------------------|----------------------------------|
| Station                                                                           | Pipe Size (in) | Slope (%) | Mannings "n" | Hyd Radius (ft) | Velocity (ft/s) | Area (sf) | Capacity (cfs) | Capacity (gpm) |                                                                      |                      |               |           |                                                   |                                  |
| 216+14                                                                            | 12             | 1.25%     | 0.009        | 0.25            | 7.35            | 0.79      | 5.8            | 2589           | 1,3, 75% of Ivins Flow                                               | 1075                 | 42%           | OK        | 997                                               | 2135                             |
| 213+23                                                                            | 12             | 1.25%     | 0.009        | 0.25            | 7.35            | 0.79      | 5.8            | 2589           |                                                                      | 1080                 | 42%           | OK        |                                                   |                                  |
| 201+36                                                                            | 12             | 1.31%     | 0.009        | 0.25            | 7.52            | 0.79      | 5.9            | 2651           |                                                                      | 1099                 | 41%           | OK        |                                                   |                                  |
| 189+48                                                                            | 12             | 1.21%     | 0.009        | 0.25            | 7.23            | 0.79      | 5.7            | 2547           | 1,3,75% of Ivins Flow,4                                              | 1119                 | 44%           | OK        | 919                                               | 1969                             |
| 185+41                                                                            | 12             | 1.81%     | 0.009        | 0.25            | 8.84            | 0.79      | 6.9            | 3116           |                                                                      | 1145                 | 37%           | OK        |                                                   |                                  |
| 181+37                                                                            | 12             | 2.11%     | 0.009        | 0.25            | 9.53            | 0.79      | 7.5            | 3360           | 1,3,75% of Ivins Flow,4,6,7                                          | 1171                 | 35%           | OK        | 1517                                              | 3251                             |
| 177+66                                                                            | 12             | 1.23%     | 0.009        | 0.25            | 7.29            | 0.79      | 5.7            | 2568           |                                                                      | 1257                 | 49%           | OK        |                                                   |                                  |
| 173+60                                                                            | 12             | 1.20%     | 0.009        | 0.25            | 7.20            | 0.79      | 5.7            | 2537           |                                                                      | 1351                 | 53%           | OK        |                                                   |                                  |
| 170+27                                                                            | 12             | 1.32%     | 0.009        | 0.25            | 7.55            | 0.79      | 5.9            | 2661           |                                                                      | 1428                 | 54%           | OK        |                                                   |                                  |
| 167+78                                                                            | 12             | 1.80%     | 0.009        | 0.25            | 8.81            | 0.79      | 6.9            | 3107           |                                                                      | 1486                 | 48%           | OK        |                                                   |                                  |
| 167+19                                                                            | 12             | 1.20%     | 0.009        | 0.25            | 7.20            | 0.79      | 5.7            | 2537           |                                                                      | 1499                 | 59%           | OK        |                                                   |                                  |
| 166+61                                                                            | 12             | 1.38%     | 0.009        | 0.25            | 7.72            | 0.79      | 6.1            | 2721           | 1,3,100% of Ivins Flow,4,6,7,2,5,18                                  | 1513                 | 56%           | OK        | 664                                               | 1422                             |
| 163+20                                                                            | 12             | 2.16%     | 0.009        | 0.25            | 9.66            | 0.79      | 7.6            | 3404           | 1,3,100% of Ivins Flow,4,6,7,2,5,18, 10                              | 1566                 | 46%           | OK        | 1157                                              | 2479                             |
| 160+88                                                                            | 12             | 2.06%     | 0.009        | 0.25            | 9.43            | 0.79      | 7.4            | 3324           |                                                                      | 1832                 | 55%           | OK        |                                                   |                                  |
| 158+71                                                                            | 12             | 2.16%     | 0.009        | 0.25            | 9.66            | 0.79      | 7.6            | 3404           |                                                                      | 1587                 | 47%           | OK        |                                                   |                                  |
| 157+19                                                                            | 12             | 1.66%     | 0.009        | 0.25            | 8.46            | 0.79      | 6.6            | 2984           |                                                                      | 1594                 | 53%           | OK        |                                                   |                                  |
| 153+93                                                                            | 12             | 1.71%     | 0.009        | 0.25            | 8.59            | 0.79      | 6.7            | 3028           |                                                                      | 1610                 | 53%           | OK        |                                                   |                                  |
| 149+91                                                                            | 12             | 1.50%     | 0.009        | 0.25            | 8.05            | 0.79      | 6.3            | 2836           |                                                                      | 1629                 | 57%           | OK        |                                                   |                                  |
| 145+92                                                                            | 12             | 1.31%     | 0.009        | 0.25            | 7.52            | 0.79      | 5.9            | 2651           |                                                                      | 1648                 | 62%           | OK        |                                                   |                                  |
| 141+92                                                                            | 12             | 1.18%     | 0.009        | 0.25            | 7.14            | 0.79      | 5.6            | 2516           |                                                                      | 1666                 | 66%           | OK        |                                                   |                                  |
| 137+92                                                                            | 12             | 1.24%     | 0.009        | 0.25            | 7.32            | 0.79      | 5.7            | 2579           |                                                                      | 1685                 | 65%           | OK        |                                                   |                                  |
| 136+13                                                                            | 12             | 1.26%     | 0.009        | 0.25            | 7.37            | 0.79      | 5.8            | 2600           |                                                                      | 1694                 | 65%           | OK        |                                                   |                                  |
| 133+94                                                                            | 12             | 1.31%     | 0.009        | 0.25            | 7.52            | 0.79      | 5.9            | 2651           |                                                                      | 1704                 | 64%           | OK        |                                                   |                                  |
| 129+94                                                                            | 12             | 1.38%     | 0.009        | 0.25            | 7.72            | 0.79      | 6.1            | 2721           |                                                                      | 1723                 | 63%           | OK        |                                                   |                                  |
| 126+28                                                                            | 15             | 1.50%     | 0.009        | 0.3125          | 9.34            | 1.23      | 11.5           | 5143           |                                                                      | 1740                 | 34%           | OK        |                                                   |                                  |
| 122+50                                                                            | 15             | 0.58%     | 0.009        | 0.3125          | 5.81            | 1.23      | 7.1            | 3198           |                                                                      | 1758                 | 55%           | OK        |                                                   |                                  |
| 121+36                                                                            | 15             | 1.50%     | 0.009        | 0.3125          | 9.34            | 1.23      | 11.5           | 5143           |                                                                      | 1764                 | 34%           | OK        |                                                   |                                  |
| 118+83                                                                            | 15             | 1.17%     | 0.009        | 0.3125          | 8.25            | 1.23      | 10.1           | 4542           |                                                                      | 1776                 | 39%           | OK        |                                                   |                                  |
| 115+96                                                                            | 15             | 0.56%     | 0.009        | 0.3125          | 5.71            | 1.23      | 7.0            | 3142           |                                                                      | 1789                 | 57%           | OK        |                                                   |                                  |
| 112+30                                                                            | 15             | 0.46%     | 0.009        | 0.3125          | 5.17            | 1.23      | 6.3            | 2848           |                                                                      | 1806                 | 63%           | OK        |                                                   |                                  |
| 110+41                                                                            | 15             | 0.75%     | 0.009        | 0.3125          | 6.60            | 1.23      | 8.1            | 3636           |                                                                      | 1815                 | 50%           | OK        |                                                   |                                  |
| 107+16                                                                            | 15             | 0.94%     | 0.009        | 0.3125          | 7.39            | 1.23      | 9.1            | 4071           |                                                                      | 1831                 | 45%           | OK        |                                                   |                                  |
| 104+26                                                                            | 15             | 1.01%     | 0.009        | 0.3125          | 7.66            | 1.23      | 9.4            | 4220           |                                                                      | 1844                 | 44%           | OK        |                                                   |                                  |
| 102+55                                                                            | 15             | 1.15%     | 0.009        | 0.3125          | 8.18            | 1.23      | 10.0           | 4503           |                                                                      | 1852                 | 41%           | OK        |                                                   |                                  |
| 101+11                                                                            | 15             | 1.11%     | 0.009        | 0.3125          | 8.03            | 1.23      | 9.9            | 4424           |                                                                      | 1859                 | 42%           | OK        |                                                   |                                  |
| 99+54                                                                             | 15             | 0.61%     | 0.009        | 0.3125          | 5.95            | 1.23      | 7.3            | 3279           |                                                                      | 1867                 | 57%           | OK        |                                                   |                                  |
| 95+76                                                                             | 15             | 0.56%     | 0.009        | 0.3125          | 5.71            | 1.23      | 7.0            | 3142           | 1,3 100% oF Ivins Flow, 4,6,7,2,5,18,10,19,20, Conn. From St. George | 1884                 | 60%           | OK        | 629                                               | 1349                             |
| 93+36                                                                             | 15             | 0.80%     | 0.009        | 0.3125          | 6.82            | 1.23      | 8.4            | 3756           |                                                                      | 1884                 | 50%           | OK        |                                                   |                                  |
| 91+03                                                                             | 15             | 0.54%     | 0.009        | 0.3125          | 5.602           | 1.23      | 6.9            | 3086           |                                                                      | 1884                 | 61%           | OK        |                                                   |                                  |
| 85+97                                                                             | 15             | 0.46%     | 0.009        | 0.3125          | 5.171           | 1.23      | 6.3            | 2848           |                                                                      | 1884                 | 66%           | OK        |                                                   |                                  |
| 81+35                                                                             | 15             | 0.50%     | 0.009        | 0.3125          | 5.391           | 1.23      | 6.6            | 2969           |                                                                      | 1884                 | 63%           | OK        |                                                   |                                  |
| 80+00                                                                             | 15             | 0.75%     | 0.009        | 0.3125          | 6.602           | 1.23      | 8.1            | 3636           |                                                                      | 1884                 | 52%           | OK        |                                                   |                                  |

| Improved Sewer Capacity - Tuacahn Parallel Line |                |           |              |                 |                 |           |                |                | Contributing Basins                                                            | New Growth<br>Peak Flow | % of<br>Capacity | Pipe Size |
|-------------------------------------------------|----------------|-----------|--------------|-----------------|-----------------|-----------|----------------|----------------|--------------------------------------------------------------------------------|-------------------------|------------------|-----------|
| Station                                         | Pipe Size (in) | Slope (%) | Mannings "n" | Hyd Radius (ft) | Velocity (ft/s) | Area (sf) | Capacity (cfs) | Capacity (gpm) |                                                                                |                         |                  |           |
| 18+88                                           | 12             | 1.25%     | 0.009        | 0.250           | 7.35            | 0.79      | 5.8            | 2589           | 2, 25% of Ivins Flow                                                           | 467                     | 18%              | OK        |
| 13+35                                           | 12             | 1.25%     | 0.009        | 0.250           | 7.35            | 0.79      | 5.8            | 2589           | 2,5, 25% of Ivins Flow,75% of 18                                               | 1037                    | 40%              | OK        |
| 9+58                                            | 15             | 0.70%     | 0.009        | 0.313           | 6.38            | 1.23      | 7.8            | 3513           | 2,5, 100% of Ivins Flow,75% of 18, 77 Black Desert Conn., 1,3,4,6,7, Silverton | 2084                    | 59%              | OK        |
| 7+34                                            | 15             | 0.70%     | 0.009        | 0.313           | 6.38            | 1.23      | 7.8            | 3513           |                                                                                | 2084                    | 59%              | OK        |
| 0+00                                            | 15             | 0.70%     | 0.009        | 0.313           | 6.38            | 1.23      | 7.8            | 3513           |                                                                                | 2084                    | 59%              | OK        |

| SC Current<br>Flow (gpm) | % of<br>Capacity |
|--------------------------|------------------|
| 340                      | 18.0%            |
| 342                      | 40.1%            |
| 1513                     | 59.3%            |
|                          |                  |



| Improved Sewer Capacity - Tuacahn Wash Outfall Line |                |           |              |                 |                 |           |                |                | Contributing Basins                          | SC Current<br>Peak Flow | % of<br>Capacity | Pipe Size |
|-----------------------------------------------------|----------------|-----------|--------------|-----------------|-----------------|-----------|----------------|----------------|----------------------------------------------|-------------------------|------------------|-----------|
| Station                                             | Pipe Size (in) | Slope (%) | Mannings "n" | Hyd Radius (ft) | Velocity (ft/s) | Area (sf) | Capacity (cfs) | Capacity (gpm) |                                              |                         |                  |           |
| 49+67                                               | 12             | 1.25%     | 0.009        | 0.250           | 7.35            | 0.79      | 5.8            | 2589           | 2, 25% of Ivins Flow                         | 340                     | 13%              | OK        |
| 44+84                                               | 12             | 1.25%     | 0.009        | 0.250           | 7.35            | 0.79      | 5.8            | 2589           |                                              | 340                     | 13%              | OK        |
| 41+87                                               | 12             | 1.25%     | 0.009        | 0.250           | 7.35            | 0.79      | 5.8            | 2589           |                                              | 340                     | 13%              | OK        |
| 36+15                                               | 12             | 1.25%     | 0.009        | 0.250           | 7.35            | 0.79      | 5.8            | 2589           |                                              | 341                     | 13%              | OK        |
| 31+97                                               | 12             | 1.25%     | 0.009        | 0.250           | 7.35            | 0.79      | 5.8            | 2589           |                                              | 341                     | 13%              | OK        |
| 30+14                                               | 12             | 1.25%     | 0.009        | 0.250           | 7.35            | 0.79      | 5.8            | 2589           |                                              | 341                     | 13%              | OK        |
| 27+11                                               | 12             | 1.25%     | 0.009        | 0.250           | 7.35            | 0.79      | 5.8            | 2589           |                                              | 341                     | 13%              | OK        |
| 23+57                                               | 12             | 1.25%     | 0.009        | 0.250           | 7.35            | 0.79      | 5.8            | 2589           |                                              | 341                     | 13%              | OK        |
| 19+45                                               | 12             | 1.25%     | 0.009        | 0.250           | 7.35            | 0.79      | 5.8            | 2589           |                                              | 341                     | 13%              | OK        |
| 18+88                                               | 12             | 1.25%     | 0.009        | 0.250           | 7.35            | 0.79      | 5.8            | 2589           |                                              | 341                     | 13%              | OK        |
| 13+35                                               | 12             | 1.25%     | 0.009        | 0.250           | 7.35            | 0.79      | 5.8            | 2589           | 2,5, 25% of Ivins Flow,75% of 18             | 342                     | 13%              | OK        |
| 9+58                                                | 12             | 0.70%     | 0.009        | 0.250           | 5.50            | 0.79      | 4.3            | 1938           | 2,5, 100% of Ivins Flow,75% of 18, 1,3,4,6,7 | 1513                    | 78%              | OK        |
| 7+34                                                | 12             | 0.70%     | 0.009        | 0.250           | 5.50            | 0.79      | 4.3            | 1938           |                                              | 1513                    | 78%              | OK        |
| 0+00                                                | 12             | 0.70%     | 0.009        | 0.250           | 5.50            | 0.79      | 4.3            | 1938           |                                              | 1513                    | 78%              | OK        |

| SC Current<br>Flow (gpm) | % of<br>Capacity |
|--------------------------|------------------|
| 340                      | 13.1%            |
|                          |                  |
|                          |                  |
|                          |                  |
|                          |                  |
|                          |                  |
|                          |                  |
|                          |                  |
| 342                      | 13.2%            |
| 1513                     | 78.1%            |
|                          |                  |
|                          |                  |

# **APPENDIX D**

## **OPINIONS OF PROBABLE COST**

# SUNRISE ENGINEERING, INC.

11 North 300 West, Washington, Utah 84780

Tel: (435) 652-8450 Fax: (435) 652-8416

## Engineer's Opinion of Probable Cost

### Valley Line Extension

Santa Clara City, Utah

10-Mar-22

MCG/mjw

| NO. | DESCRIPTION                                                  | Estimated Quantity | Units  | Unit Price   | TOTAL COST        |
|-----|--------------------------------------------------------------|--------------------|--------|--------------|-------------------|
| 1   | Mobilization                                                 | 1                  | LS     | \$ 7,000.00  | \$ 7,000          |
| 2   | 8" PVC SDR-35 Sewer Main                                     | 1,000              | LF     | \$ 75.00     | \$ 75,000         |
| 3   | 48" Precast Concrete Manhole                                 | 6                  | EA     | \$ 7,500.00  | \$ 45,000         |
| 4   | Connect into Existing Manhole                                | 1                  | LS     | \$ 5,000.00  | \$ 5,000          |
| 5   | Shoring/Trench Boxes                                         | 1                  | LS     | \$ 30,000.00 | \$ 30,000         |
| 6   | Imported Pipe Bedding                                        | 30                 | CY     | \$ 50.00     | \$ 1,500          |
| 7   | Imported Drain Rock                                          | 120                | CY     | \$ 65.00     | \$ 7,800          |
| 8   | Untreated Base Course                                        | 10                 | CY     | \$ 70.00     | \$ 700            |
| 9   | Bituminous Surfacing                                         | 10                 | CY     | \$ 800.00    | \$ 8,000          |
| 10  |                                                              |                    |        |              |                   |
| 11  |                                                              |                    |        |              |                   |
| 12  | <b>Sub-Total</b>                                             |                    |        |              | \$ 180,000        |
| 13  | <b>Contingency</b>                                           | 20%                |        |              | \$ 36,080         |
| 14  | <b>Total Construction</b>                                    |                    |        |              | <b>\$ 216,080</b> |
| 15  | <b>INCIDENTALS</b>                                           |                    |        |              |                   |
| 16  | Funding & Administrative Services                            | 2.4%               | LS     |              | \$ 8,000          |
| 17  | Civil Engineering Design                                     | 4.5%               | LS     |              | \$ 15,000         |
| 18  | Engineering Construction Services (No Full Time Observation) | 12.0%              | Hourly |              | \$ 40,000         |
| 19  | <b>Studies, Permitting, and Compliance</b>                   |                    |        |              |                   |
| 20  | SWPPP (Storm Water Pollution Protection Plan)                |                    | Est.   |              | \$ 5,000          |
| 21  | Environmental Assistance (Not EA or ER)                      |                    | Est.   |              | \$ -              |
| 22  | <b>Geotechnical Engineering</b>                              |                    |        |              |                   |
| 23  | Geotechnical Report                                          |                    | Est.   |              | \$ 6,000          |
| 24  | Geotechnical and Materials Testing                           |                    | Est.   |              | \$ 5,000          |
| 25  | <b>Survey and Mapping</b>                                    |                    |        |              |                   |
| 26  | Construction Staking                                         |                    | Est.   |              | \$ 5,000          |
| 27  | Property Surveys                                             |                    | Est.   |              | \$ -              |
| 28  | Land & ROW Acquisition                                       |                    | Est.   |              | \$ -              |
| 29  | Land & ROW Research & Documents                              |                    | Est.   |              | \$ 10,000         |
| 30  | GIS Mapping                                                  |                    | Est.   |              | \$ 5,000          |
| 31  | Aerial Photography                                           |                    | Est.   |              | \$ -              |
| 32  | <b>Legal and Fiscal</b>                                      |                    |        |              |                   |
| 33  | Bonding & Attorney Fees                                      |                    | Est.   |              | \$ 8,000          |
| 34  | Loan Origination Fee                                         |                    | Est.   |              | \$ -              |
| 35  | Interim Financing Costs                                      |                    | Est.   |              | \$ -              |
| 36  | <b>Miscellaneous</b>                                         |                    |        |              |                   |
| 37  | Miscellaneous Engineering Services                           |                    | Est.   |              | \$ 10,000         |
| 38  |                                                              |                    |        |              |                   |
| 39  | <b>TOTAL PROJECT COST</b>                                    |                    |        |              | <b>\$ 333,080</b> |

In providing opinions of probable construction cost, the Client understands that the Engineer has no control over costs or the price of labor, equipment or materials, or over the Contractor's method of pricing, and that the opinion of probable construction cost provided herein is made on the basis of the Engineer's qualifications and experience. The Engineer makes no warranty, expressed or implied, as to the accuracy of such opinions compared to bid or actual costs.

# SUNRISE ENGINEERING, INC.

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## Engineer's Opinion of Probable Cost

### Valley Line Replacement

Santa Clara City, Utah

10-Mar-22

MCG/mjw

| NO. | DESCRIPTION                                                  | Estimated Quantity | Units  | Unit Price   | TOTAL COST        |
|-----|--------------------------------------------------------------|--------------------|--------|--------------|-------------------|
| 1   | Mobilization                                                 | 1                  | LS     | \$ 9,000.00  | \$ 9,000          |
| 2   | 21" PVC SDR-35 Sewer Main                                    | 1,000              | LF     | \$ 130.00    | \$ 130,000        |
| 3   | 48" Precast Concrete Manhole                                 | 6                  | EA     | \$ 7,500.00  | \$ 45,000         |
| 4   | Connect into Existing Manhole                                | 1                  | LS     | \$ 5,000.00  | \$ 5,000          |
| 5   | Shoring/Trench Boxes                                         | 1                  | LS     | \$ 30,000.00 | \$ 30,000         |
| 6   | Imported Pipe Bedding                                        | 60                 | CY     | \$ 50.00     | \$ 3,000          |
| 7   | Imported Drain Rock                                          | 240                | CY     | \$ 65.00     | \$ 15,600         |
| 8   | Untreated Base Course                                        | 20                 | CY     | \$ 70.00     | \$ 1,400          |
| 9   | Bituminous Surfacing                                         | 10                 | CY     | \$ 800.00    | \$ 8,000          |
| 10  |                                                              |                    |        |              |                   |
| 11  |                                                              |                    |        |              |                   |
| 12  | <b>Sub-Total</b>                                             |                    |        |              | \$ 247,000        |
| 13  | <b>Contingency</b>                                           | 20%                |        |              | \$ 49,480         |
| 14  | <b>Total Construction</b>                                    |                    |        |              | <b>\$ 296,480</b> |
| 15  | <b>INCIDENTALS</b>                                           |                    |        |              |                   |
| 16  | Funding & Administrative Services                            | 1.9%               | LS     |              | \$ 8,000          |
| 17  | Civil Engineering Design                                     | 3.6%               | LS     |              | \$ 15,000         |
| 18  | Engineering Construction Services (No Full Time Observation) | 9.7%               | Hourly |              | \$ 40,000         |
| 19  | <b>Studies, Permitting, and Compliance</b>                   |                    |        |              |                   |
| 20  | SWPPP (Storm Water Pollution Protection Plan)                |                    | Est.   |              | \$ 5,000          |
| 21  | Environmental Assistance (Not EA or ER)                      |                    | Est.   |              | \$ -              |
| 22  | <b>Geotechnical Engineering</b>                              |                    |        |              |                   |
| 23  | Geotechnical Report                                          |                    | Est.   |              | \$ 6,000          |
| 24  | Geotechnical and Materials Testing                           |                    | Est.   |              | \$ 5,000          |
| 25  | <b>Survey and Mapping</b>                                    |                    |        |              |                   |
| 26  | Construction Staking                                         |                    | Est.   |              | \$ 5,000          |
| 27  | Property Surveys                                             |                    | Est.   |              | \$ -              |
| 28  | Land & ROW Acquisition                                       |                    | Est.   |              | \$ -              |
| 29  | Land & ROW Research & Documents                              |                    | Est.   |              | \$ 10,000         |
| 30  | GIS Mapping                                                  |                    | Est.   |              | \$ 5,000          |
| 31  | Aerial Photography                                           |                    | Est.   |              | \$ -              |
| 32  | <b>Legal and Fiscal</b>                                      |                    |        |              |                   |
| 33  | Bonding & Attorney Fees                                      |                    | Est.   |              | \$ 8,000          |
| 34  | Loan Origination Fee                                         |                    | Est.   |              | \$ -              |
| 35  | Interim Financing Costs                                      |                    | Est.   |              | \$ -              |
| 36  | <b>Miscellaneous</b>                                         |                    |        |              |                   |
| 37  | Miscellaneous Engineering Services                           |                    | Est.   |              | \$ 10,000         |
| 38  |                                                              |                    |        |              |                   |
| 39  | <b>TOTAL PROJECT COST</b>                                    |                    |        |              | <b>\$ 413,480</b> |

In providing opinions of probable construction cost, the Client understands that the Engineer has no control over costs or the price of labor, equipment or materials, or over the Contractor's method of pricing, and that the opinion of probable construction cost provided herein is made on the basis of the Engineer's qualifications and experience. The Engineer makes no warranty, expressed or implied, as to the accuracy of such opinions compared to bid or actual costs.

# SUNRISE ENGINEERING, INC.

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## Engineer's Opinion of Probable Cost

### Lava Flow Wash Line Improvement

10-Mar-22

Santa Clara City, Utah

Parallel Line

MCG/mjw

| NO. | DESCRIPTION                                   | Estimated Quantity | Units  | Unit Price   | TOTAL COST   |
|-----|-----------------------------------------------|--------------------|--------|--------------|--------------|
| 1   | Mobilization                                  | 1                  | LS     | \$ 59,000.00 | \$ 59,000    |
| 3   | 15" PVC SDR-35 Sewer Main                     | 4,500              | LF     | \$ 110.00    | \$ 495,000   |
| 4   | 18" PVC SDR-35 Sewer Main                     | 4,300              | LF     | \$ 115.00    | \$ 494,500   |
| 5   | 48" Precast Concrete Manhole                  | 35                 | EA     | \$ 7,500.00  | \$ 262,500   |
| 6   | Shoring/Trench Boxes                          | 1                  | LS     | \$ 45,000.00 | \$ 45,000    |
| 7   | Imported Pipe Bedding                         | 1,800              | CY     | \$ 50.00     | \$ 90,000    |
| 8   | Imported Drain Rock                           | 3,000              | CY     | \$ 65.00     | \$ 195,000   |
| 9   | Untreated Base Course                         | 100                | CY     | \$ 70.00     | \$ 7,000     |
| 10  | Bituminous Surfacing                          | 50                 | CY     | \$ 800.00    | \$ 40,000    |
| 11  | Bypass Pumping                                | 1                  | LS     | \$ 30,000.00 | \$ 30,000    |
| 12  |                                               |                    |        |              |              |
| 13  | <b>Sub-Total</b>                              |                    |        |              | \$ 1,718,000 |
| 14  | <b>Contingency</b>                            | 20%                |        |              | \$ 343,677   |
| 15  | <b>Total Construction</b>                     |                    |        |              | \$ 2,061,677 |
| 16  | <b>INCIDENTALS</b>                            |                    |        |              |              |
| 17  | Funding & Administrative Services             | 0.4%               | LS     |              | \$ 10,000    |
| 18  | Civil Engineering Design                      | 11.9%              | LS     |              | \$ 309,300   |
| 19  | Engineering Construction Services             | 3.9%               | Hourly |              | \$ 100,000   |
| 20  | <b>Studies, Permitting, and Compliance</b>    |                    |        |              |              |
| 21  | SWPPP (Storm Water Pollution Protection Plan) |                    | Est.   |              | \$ 10,000    |
| 22  | Environmental Assistance (Not EA or ER)       |                    | Est.   |              | \$ 15,000    |
| 23  | <b>Geotechnical Engineering</b>               |                    |        |              |              |
| 24  | Geotechnical Report                           |                    | Est.   |              | \$ 10,000    |
| 25  | Geotechnical and Materials Testing            |                    | Est.   |              | \$ 20,000    |
| 26  | <b>Survey and Mapping</b>                     |                    |        |              |              |
| 27  | Construction Staking                          |                    | Est.   |              | \$ 10,000    |
| 28  | Property Surveys                              |                    | Est.   |              | \$ -         |
| 29  | Land & ROW Acquisition                        |                    | Est.   |              | \$ -         |
| 30  | Land & RoW Research & Documents               |                    | Est.   |              | \$ 15,000    |
| 31  | GIS Mapping                                   |                    | Est.   |              | \$ 15,000    |
| 32  | Aerial Photography                            |                    | Est.   |              | \$ -         |
| 33  | <b>Legal and Fiscal</b>                       |                    |        |              |              |
| 34  | Bonding & Attorney Fees                       |                    | Est.   |              | \$ 8,000     |
| 35  | Loan Origination Fee                          |                    | Est.   |              | \$ -         |
| 36  | Interim Financing Costs                       |                    | Est.   |              | \$ -         |
| 37  | <b>Miscellaneous</b>                          |                    |        |              |              |
| 38  | Miscellaneous Engineering Services            |                    | Est.   |              | \$ 10,000    |
| 39  |                                               |                    |        |              |              |
| 40  | <b>Total Project Cost</b>                     |                    |        |              | \$ 2,593,977 |
| 42  | <b>SANTA CLARA SHARE</b>                      |                    |        |              |              |
| 43  | Average Percent of Capacity Required          | 58.0%              |        |              | \$ 1,504,507 |

In providing opinions of probable construction cost, the Client understands that the Engineer has no control over costs or the price of labor, equipment or materials, or over the Contractor's method of pricing, and that the opinion of probable construction cost provided herein is made on the basis of the Engineer's qualifications and experience. The Engineer makes no warranty, expressed or implied, as to the accuracy of such opinions compared to bid or actual costs.



# SUNRISE ENGINEERING, INC.

11 North 300 West, Washington, Utah 84780

Tel: (435) 652-8450 Fax: (435) 652-8416

## Engineer's Opinion of Probable Cost

### Tuacahn Wash Line Improvement

10-Mar-22

Santa Clara City, Utah

MCG/mjw

| NO. | DESCRIPTION                                   | Estimated Quantity | Units  | Unit Price   | TOTAL COST   |
|-----|-----------------------------------------------|--------------------|--------|--------------|--------------|
| 1   | Mobilization                                  | 1                  | LS     | \$ 38,000.00 | \$ 38,000    |
| 2   | 12" PVC SDR-35 Sewer Main                     | 5,300              | LF     | \$ 95.00     | \$ 503,500   |
| 3   | 15" PVC SDR-35 Sewer Main                     | 1,000              | LF     | \$ 110.00    | \$ 110,000   |
| 4   | 48" Precast Concrete Manhole                  | 22                 | EA     | \$ 7,500.00  | \$ 165,000   |
| 5   | Shoring/Trench Boxes                          | 1                  | LS     | \$ 45,000.00 | \$ 45,000    |
| 6   | Imported Pipe Bedding                         | 1,000              | CY     | \$ 50.00     | \$ 50,000    |
| 7   | Imported Drain Rock                           | 2,000              | CY     | \$ 65.00     | \$ 130,000   |
| 8   | Untreated Base Course                         | 100                | CY     | \$ 70.00     | \$ 7,000     |
| 9   | Bituminous Surfacing                          | 50                 | CY     | \$ 800.00    | \$ 40,000    |
| 10  | Bypass Pumping                                | 1                  | LS     | \$ 30,000.00 | \$ 30,000    |
| 11  |                                               |                    |        |              |              |
| 12  | <b>Sub-Total</b>                              |                    |        |              | \$ 1,118,500 |
| 13  | <b>Contingency</b>                            | 20%                |        |              | \$ 223,777   |
| 14  | <b>Total Construction</b>                     |                    |        |              | \$ 1,342,277 |
| 15  | <b>INCIDENTALS</b>                            |                    |        |              |              |
| 16  | Funding & Administrative Services             | 0.6%               | LS     |              | \$ 10,000    |
| 17  | Civil Engineering Design                      | 11.4%              | LS     |              | \$ 201,300   |
| 18  | Engineering Construction Services             | 5.7%               | Hourly |              | \$ 100,000   |
| 19  | <b>Studies, Permitting, and Compliance</b>    |                    |        |              |              |
| 20  | SWPPP (Storm Water Pollution Protection Plan) |                    | Est.   |              | \$ 10,000    |
| 21  | Environmental Assistance (Not EA or ER)       |                    | Est.   |              | \$ 15,000    |
| 22  | <b>Geotechnical Engineering</b>               |                    |        |              |              |
| 23  | Geotechnical Report                           |                    | Est.   |              | \$ 10,000    |
| 24  | Geotechnical and Materials Testing            |                    | Est.   |              | \$ 20,000    |
| 25  | <b>Survey and Mapping</b>                     |                    |        |              |              |
| 26  | Construction Staking                          |                    | Est.   |              | \$ 10,000    |
| 27  | Property Surveys                              |                    | Est.   |              | \$ -         |
| 28  | Land & ROW Acquisition                        |                    | Est.   |              | \$ -         |
| 29  | Land & RoW Research & Documents               |                    | Est.   |              | \$ 15,000    |
| 30  | GIS Mapping                                   |                    | Est.   |              | \$ 15,000    |
| 31  | Aerial Photography                            |                    | Est.   |              | \$ -         |
| 32  | <b>Legal and Fiscal</b>                       |                    |        |              |              |
| 33  | Bonding & Attorney Fees                       |                    | Est.   |              | \$ 8,000     |
| 34  | Loan Origination Fee                          |                    | Est.   |              | \$ -         |
| 35  | Interim Financing Costs                       |                    | Est.   |              | \$ -         |
| 36  | <b>Miscellaneous</b>                          |                    |        |              |              |
| 37  | Miscellaneous Engineering Services            |                    | Est.   |              | \$ 10,000    |
| 38  |                                               |                    |        |              |              |
| 39  | <b>Total Project Cost</b>                     |                    |        |              | \$ 1,766,577 |
| 42  | <b>SANTA CLARA SHARE</b>                      |                    |        |              |              |
| 43  | Average Percent of Capacity Required          | 31.6%              |        |              | \$ 558,238   |

In providing opinions of probable construction cost, the Client understands that the Engineer has no control over costs or the price of labor, equipment or materials, or over the Contractor's method of pricing, and that the opinion of probable construction cost provided herein is made on the basis of the Engineer's qualifications and experience. The Engineer makes no warranty, expressed or implied, as to the accuracy of such opinions compared to bid or actual costs.

**APPENDIX E**

**PUBLIC NOTICE FOR  
IMPACT FEE ANALYSIS**

# Entity: Santa Clara

## Body: City Council

|                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Subject:</b>                                         | Business                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Notice Title:</b>                                    | Public Notice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Meeting Location:</b>                                | 2603 Santa Clara Dr.<br><br>Santa Clara UT 84765                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Event Date &amp; Time:</b>                           | February 3, 2021<br>February 3, 2021 09:30 AM - February 17, 2021 05:00 PM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Description/Agenda:</b>                              | <div>February 3, 2021</div> <div>Public Notice of the Impact Fees</div> <p>Pursuant to the requirements of Utah Code Section 11-36a, this notice is hereby given that Santa Clara City intends to contract to prepare, and then prepare, a Wastewater Impact Fee Facilities Plan &amp; Impact Fee Analysis according to the requirements of the State of Utah. The impact fee service area for this analysis includes the entire city limits.</p> <p>Pursuant to the requirements of Utah Code Section 11-36a, this notice is hereby given that Santa Clara City intends to contract to prepare, and then prepare, a Stormwater Impact Fee Facilities Plan &amp; Impact Fee Analysis according to the requirements of the State of Utah. The impact fee service area for this analysis includes the entire city limits.</p> <p>Pursuant to the requirements of Utah Code Section 11-36a, this notice is hereby given that Santa Clara City intends to contract to prepare, and then prepare, a Power Impact Fee Facilities Plan &amp; Impact Fee Analysis according to the requirements of the State of Utah. The impact fee service area for this analysis includes the entire city limits.</p> |
| <b>Notice of Special Accommodations:</b>                | NOTICE OF SPECIAL ACCOMMODATION DURING PUBLIC MEETINGS In compliance with the Americans with Disabilities Act, individuals needing special accommodations (including auxiliary communicative aids and services) during this meeting should notify Chris Shelley at 435-673-6712 ext. 203.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Notice of Electronic or telephone participation:</b> | Not available                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Other information:</b>                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

**Contact Information:** Chris Shelley  
4356736712  
cshelley@sccity.org

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**Posted on:** February 03, 2021 09:08 AM

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**Last edited on:** February 03, 2021 09:08 AM

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Printed from Utah's Public Notice Website (<http://pmn.utah.gov/>)

# **APPENDIX F**

## **IMPACT FEE CERTIFICATION**

## **CERTIFICATION OF IMPACT FEE ANALYSIS BY CONSULTANT**

In accordance with Utah Code Annotated § 11-36a-306, Joseph Phillips, P.E., on behalf of Sunrise Engineering, Inc., make the following certification:

I certify that the attached impact fee facilities plan and impact fee analysis:

1. Includes only the costs of public facilities that are:
  - a. Allowed under the Impact Fees Act; and
  - b. Actually incurred; or
  - c. Projected to be incurred or encumbered within six years after the day on which each impact fee is paid;
2. Does not include:
  - a. costs of operation and maintenance of public facilities;
  - b. costs for qualifying public facilities that will raise the level of service for the facilities, through impact fees, above the level of service that is supported by existing residents; or
  - c. an expense for overhead, unless the expense is calculated pursuant to a methodology that is consistent with generally accepted cost accounting practices and that methodological standards set forth by the Federal Office of Management and Budget for federal grant reimbursement;
3. Offsets costs with grants or other alternate sources of payment; and
4. Complies in each and every relevant respect with the Impact Fees Act.

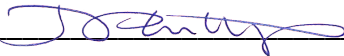
Joseph Phillips, P.E., makes this certification with the following qualifications:

1. All of the recommendations for implementation of the Impact Fee Facilities Plan ("IFFP") made in the IFFP documents or in the Impact Fee Analysis documents are followed in their entirety by the Santa Clara City, Utah, staff, and elected officials.
2. If all or a portion of the IFFP or Impact Fee Analyses are modified or amended, this certification is no longer valid.
3. All information provided to Sunrise Engineering, Inc., its contractors or suppliers, is assumed to be correct, complete and accurate. This includes information provided by Santa Clara City, Utah, and outside sources.



4. The undersigned is trained and licensed as a professional engineer and has not been trained or licensed as a lawyer. Nothing in the foregoing certification shall be deemed an opinion of law or an opinion of compliance with law which under applicable professional licensing laws or regulations or other laws or regulations must be rendered by a lawyer licensed in the State of Utah.
5. The foregoing Certification is an expression of professional opinion based on the undersigned's best knowledge, information and belief and shall not be construed as a warranty or guaranty of any fact or circumstance.
6. The foregoing certification is made only to Santa Clara City, Utah, and may not be used or relied upon by any other person or entity without the expressed written authorization of the undersigned.

Sunrise Engineering, Inc.

By: 

Dated: June 3, 2022



[www.sunrise-eng.com](http://www.sunrise-eng.com)