

Water Demand Assessment

Projections for Build-out Within the City's Service Area
City of Trinidad, California



Prepared for:

City of Trinidad



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Abbreviations and Acronyms

cu. ft.	cubic feet
gpd	gallons per day
sq. ft.	square foot
ADU	Accessory Dwelling Unit
CZ	Coastal Zone
LAFCo	Local Agency Formation Commission
LCP	Local Coastal Program
OS	Open Space
PD	Planned Development
PR	Public and Religious
RA	Rural Residential Agriculture
SE	Special Environment
SR	Suburban Residential
STR	short-term rental
TCLT	Trinidad Coastal Land Trust
UR	Urban Residential
VS	Visitor Services

Introduction

Background

The City has a designated water service area (City Service Limit as designated in the certified Local Coastal Program [LCP]) that extends outside of City limits (Appendix 1). While the City is generally obligated to provide water to users within City limits, provision of water connections within the service area outside of City limits is discretionary on the part of the City and requires approval by the Humboldt County Local Agency Formation Commission (LAFCo); the City is not allowed to serve users outside the service area. Prior to about the year 2000, the City provided water to users within the service area outside City limits when requested, without much oversight or decision-making, in order to benefit from the increased revenue. However, around 2000, the policies of LAFCo changed, and they no longer allowed service extensions to properties outside the City without annexation into the City, except in cases of emergencies. Therefore, the City stopped connecting users outside City limits. But the dynamics are again changing. During the recent drought, the number of requests for City water from property owners outside of the City increased substantially. In addition, LAFCo has recently relaxed its policy requiring annexation prior to providing water if certain conditions are met. On the other hand, water supply has also become a more important issue with Trinidad Rancheria's request for a substantial amount of water to serve a proposed hotel, as well as increased uncertainties and risks related to climate change.

Purpose

This report is being prepared by SHN in their role as the City's contracted planning staff. It is being funded in part by a Local Coastal Program Update grant from the California Coastal Commission. City staff requested grant funding for this water demand assessment for several reasons. As part of the comprehensive update of the General Plan, the City will assess the boundaries of the service area to ensure that they are still reasonable in the current context. In addition, the City may want to consider annexation of some of these areas in the future. Depending on the area, annexation could potentially provide additional tax revenue, or it could also be a revenue loss. But there are other potential benefits, such as land use control and increasing the City population and pool of people to serve on councils, commissions and committees. Further, LAFCo is in the process of updating the City's Sphere of Influence, which is also related to the potential for annexation and future service provisions.

With the Rancheria's request for City water to serve their proposed hotel, issues of water supply and future demand have become more critical. The City needs to develop policies by which they will evaluate and prioritize requests for water service from outside City limits and consider when annexation may be required or sought. In order to do that, the City needs to understand how much water is available and what the future demand for water may be within the service area, both inside and outside the City.

These are major, broad-scope issues that City staff are currently working towards addressing. The City's contracted engineering staff (GHD) recently completed a preliminary assessment of the production capacity of the City's water plant on Luffenholtz Creek. In addition, GHD will also be working on a flow assessment of Luffenholtz Creek with an emphasis on low-flows and the potential risks from future droughts and climate change. Planning staff (SHN) have prepared this build-out demand assessment that includes potential development within the service area, both within and outside of City limits. City staff will also be analyzing the storage and distribution characteristics and limitations of the physical water system, inventorying water rights on Luffenholtz Creek, and assessing potential alternative water sources. All of this information will take time to develop, but this build-out demand assessment, along with the water plant production capacity memo from engineering staff should provide a good starting point for General Plan policy discussions.

Water Demand Within City Limits

Methods

City staff exported monthly water use data for all the accounts in the City for the 12-month period from April 2018 to March 2019 and provided the data to SHN in a spreadsheet. Because the meters are read monthly, peak hourly or daily usage cannot be ascertained. However, the data does represent actual rather than assumed water use. The City's water accounting software presents water use in cubic feet, which was converted into gallons per day (gpd) to compare with the water system capacity information presented in GHD's May 1, 2019 'Water Treatment Plant Production Rate Test and Analysis' memo. The water accounts were then separated by rate code, or inside versus outside City limits; closed accounts (Rate 2) were eliminated. For the accounts within the City, the water use data was merged with APN and zoning data, and then further separated by zoning designation. The average annual and peak monthly (July) water use were calculated for each zone.

Very little clean-up or manipulation of the data occurred. When a property changed hands, and there were multiple accounts for the same address, the water usage from these accounts were combined into one line/account. There were accounts with no water use, which were assumed to be vacant. And there were accounts with large, noticeable water leaks. However, it was determined that this represented the most realistic picture of actual water use available. There was one exception where a leak was so large (60 to 70 times the normal water use) that it skewed the data and was therefore removed from the calculation of average water use in the SR zone.

The data was generally analyzed on a "per account" basis rather than per property. Many of the properties that contain multiple units or businesses have separate water accounts for each user, but not all (e.g. the 4-plex at 651 Parker Street). These multi-user accounts were not divided by the number of users (except when calculating the average water use for Accessory Dwelling Units [ADUs]), because it was determined to be better to overestimate the average water use per account for the purposes of this analysis. On the other hand, when there were multiple accounts on a single parcel, which tends to occur on larger parcels, the usage was not combined to determine the per-parcel water use. This situation primarily impacts the Commercial (C) Zone, of which there are no vacant parcels to calculate build-out. And for the Planned Development (PD) zone, build-out demand was estimated based on the potential number of units, not the number of parcels.

Existing Water Use

Water use varies substantially between users. However, the vast majority of accounts in the City (89.5%) use less than 300 gpd, which is considered the design flow for sizing a septic system for a two-bedroom house. The biggest users in town, using almost twice as much water as the next highest users, are the Harbor property and Hidden Creek RV Park (1,798 and 1,786 gpd respectively). The next highest users are Trinidad Union School (959 gpd), a mostly unoccupied vacation home (not a short-term rental [STR]; 956 gpd) and the Eatery (890 gpd). Murphy's Market (881 gpd) and the Lighthouse Grill (794 gpd) are also high users. The volume of use drops off substantially with the remaining accounts.

Although requiring water conservation and considering methods to limit water use are outside the scope of this particular report and discussion, evaluating the water data in detail brings attention to high water users and associated concerns. For example, three of the top 10 water users in town (the Eatery, 570 Trinity St., and the four-plex) are located in the same block behind the active slide on Edwards Street. In addition, there are several residences located near bluffs that use a significant amount of water. This information is

pertinent to the discussion of water policies. The City could benefit from adoption of a water rate structure that encourages conservation and requirements for drought tolerant or native landscaping, as just two examples of measures that can be used to reduce water use.

The month of peak metered water use in the City is July for the data set used in this analysis (July also had the peak metered water usage in 2017). The second highest month was September. The peak metered usage in July is slightly different than the peak production at the water plant, which occurs in August. July and September were the peak usage months outside of City limits as well. The reason for this discrepancy is unknown. However, for the purposes of this review, this discrepancy is not relevant.

For projecting build-out demand, water use by land use is the best predictor. Table 1 shows total and average water use (gpd) by zoning designation in the City. It should be noted that anomalous data, such as a large water leak, can skew the results for some zones or months. Other factors can also affect the results. For example, the highest water user in the Public and Religious (PR) zone is Trinidad Elementary School. Since school is not in session in the summer, their water use is lower than average during that time, and, the peak usage in the PR zone is in September (274 gpd) when the school year begins. Note that the average shown for the Visitor Services (VS) zone divides the total volume by two, because there are two RV parks. However, Trinidad Bay Trailer Courts has three accounts, so average water use by account would be much lower.

Table 1. Average and Peak (July) Daily Water Use by Land Use Zone.

Zone	Total gpd ¹ (annual avg.)	Avg. gpd (per account)	Total Peak gpd (July average)	Avg. Peak gpd (per account)
C	6,047	403	10,511	692
VS	2,717	1,358	3,145	1,572
PD	3,361	140 ²	5,643	235
PR	1,490	166	1,475	191
SR	6,045	163 ²	7,653	211
UR	16,665	128	29,364	226
Total	36,325		57,779	
1. gpd: gallons per day 2. Removing one anomalous water user or large leak would substantially change this average.				

Trends

Water data from 2017 and 2013 was compared to the 2018 data to determine if water use has been changing over time. In 2018, the total metered water use in the City was 1,788,162 cubic feet (cu. ft.), or an average of 36,645 gpd. In 2017, the total metered water use in the City was 1,722,263 cu. ft., or 35,295 gpd. In 2013, the total metered water use in the City was 1,786,244 cu. ft., or an average of 36,606 gpd. Based on that data, water use has remained fairly steady over the past few years. Previous water studies indicate that water use in Trinidad has been much higher in the past. However, increases in efficiency and awareness of conservation have resulted in less water use nationally and in California over the past 35 years, so the current data is appropriate for this analysis.

Build-out Demand

The City analyzed development potential of vacant lands in its draft Housing Element (December 2013), which was updated for this report. For the purposes of this study, the vacant, developable lots in the City fall into only three zoning designations, which are PD, Suburban Residential (SR), and Urban Residential (UR).

Other vacant lots are zoned Open Space (OS) and Special Environment (SE) and most are publicly-owned or held by the Trinidad Coastal Land Trust (TCLT), and so are not considered developable. One of the two privately-held SE parcels could potentially be developed but was considered too speculative to include in this analysis. There are no vacant C, PR, or VS zoned parcels in the City. Trinidad has no industrial or agricultural zoning designations.

Underdeveloped parcels that are large enough to be subdivided or accommodate additional development were also analyzed. For both vacant and developed parcels, the potential number of new units/parcels was calculated based on the gross parcel area and minimum lot size for the zone (assigning the primary zone to the whole parcel if it had two zoning designations). However, many parcels have limitations such as riparian corridors and steep slopes, which are areas that are generally zoned SE. Therefore, a conservative “net” development potential was estimated based on the approximate developable area. This net development potential likely overestimates the potential number of new units, because there will be other, unknown limitations. However, for this study, it is better to over-estimate future water demand than to under-estimate it. It should be noted that Trinidad has averaged less than one new house built per year over the last few decades, so build-out would be expected to occur over a long period of time. Over that same period of time, changes to the water plant, production capacity, and water availability are also likely to change.

Table 2 presents projected build-out demand under the current land use/zoning designations. Although the estimated potential number of units in the PD zone was reduced from the gross potential of one unit per 8,000 sq. ft. for these calculations, build-out potential is likely substantially less now, since the TCLT acquired two of those four parcels. In addition, there is one single-family residence that substantially affects the average water use in the PD zone (140 gpd versus 105 gpd annual average with and without the residence respectively, and 235 gpd versus 173 gpd in July). Using the lower average would likely be more realistic for estimating future demand, but as previously mentioned, it is better to be conservative in this analysis. In addition, the PD zone allows a mix of uses, some of which could have high water demands. The difference equates to approximately 1,000 gpd for the potential average annual daily demand and 2,000 gpd for the peak demand.

Table 2. Estimated Maximum Additional Water Use After Build-Out in Trinidad

Zoning	Potential Number of New Units After Build-out	Average Daily Water Use Per Unit (gpd ¹)	Potential Additional Average Daily Water Use (gpd)	Average Peak Daily Water Use Per Unit (gpd)	Potential Additional Peak Daily Water Use (gpd)
UR	20	128	2,560	226	4,520
SR	39	143 ²	5,577	211	8,229
PD	32	140	4,480	235	7,520
Total			12,617		20,269
<ol style="list-style-type: none"> 1. gpd: gallons per day 2. In general, leaks were not removed from the dataset, because they are a normal occurrence. However, there was one that was so large and obvious (8,300 gpd) that it substantially skewed the data, and therefore was not used in calculating the average for the SR zone. The leak did not affect the July average. 					

Accessory Dwelling Units

The State requires cities to provide their fair share of housing, and generally requires accessory dwelling units (ADUs) to be allowed by right in zones that allow single-family residences. However, because Trinidad is in the Coastal Zone, its land use ordinances are governed by the California Coastal Act and the Coastal Commission, and the requirements are more nuanced. In addition, development in Trinidad is limited by the use of septic systems and possibly, water availability. The City has expressed interest in allowing ADUs and passed an ADU ordinance, but it was not certified by the Coastal Commission. One of the reasons was because Coastal Commission staff requested significantly more information to substantiate that the City has the water available to serve potential ADUs, which the City did not have at the time. Therefore, the City withdrew the ordinance from consideration by the Coastal Commission, and it is not in effect.

It is difficult to find information from other jurisdictions related to how much water an ADU would be expected to use, due to the variability in regulations and site conditions. The City doesn't have a complete record of all the existing ADUs in town, and many don't have separate water meters. However, water use was evaluated for those ADUs that are known, and the use is generally very low. The highest per unit residential use in the City was the four-plex at 651 Parker St. at 140 gpd average per unit (one of the units operates as an STR, which may be part of the reason for the higher water use). 461 Ocean Ave. had a higher average water use due to an obvious leak one month, and 308 Ocean Ave, also had a higher per unit water use, but that unit operates as a day care. On average, multi-unit residential properties utilized approximately 80 gpd per unit and 138 gpd in July.

It is also difficult to estimate the development potential for ADUs, because the number, size and type vary significantly depending on market conditions and local regulations. Trinidad should carefully regulate the establishment of ADUs in order to minimize wastewater, groundwater, and water supply impacts. This was indicated in the 2019 Groundwater Model Addendum (Trinidad ASBS Stormwater Project) prepared by GHD. When the model was run with assumed build-out of the City, there was an increase in groundwater levels in the area of the horse pasture (that was based on the gross potential build-out, without correcting for known site limitations). GHD also ran the model infiltrating all stormwater onsite. That model indicated eventual saturated conditions and slope instability, showing that there is a limit to the amount of water that can be infiltrated within Trinidad.

At this time, it is unknown how ADUs will be regulated in Trinidad; currently, they are not allowed on most parcels due to regulations in the City's LCP and septic limitations. The ADU ordinance that was passed by the City in 2010 (but not certified by the Coastal Commission) does not include a minimum parcel size for ADUs, though it does require an OWTS built to current code, which necessarily limits the lot size that can accommodate an ADU. However, with better information regarding water, groundwater, and slope stability limitations, there is a basis to limit ADUs based on lot size and/or location (e.g. GHDs January 2019 Groundwater Model Addendum for LID Zoning).

As a starting point for estimating potential water demand from ADUs, SHN calculated the number of parcels that are large enough to meet the current minimum lot size for their zone. There are 87 UR zoned parcels that are at least 8,000 sq. ft., 44 SR zoned parcels that are at least 20,000 sq. ft., and 12 PD zoned parcels that are at least 8,000 sq. ft. If one quarter (generally, ADUs do not exceed 10% of the housing stock, so this is a high, but potentially plausible percentage) of those parcels meeting the minimum lot size constructed ADUs, that would result in 36 new ADUs. As noted above, parcels with ADUs use approximately 80 gpd of water on average, and 138 gpd in July. That equates to an additional 2,880 gpd of water use on average, or 4,968 gpd during the peak month of July. Again, that is a conservative estimate intended to overestimate potential water use, but a conservative approach is appropriate in this case due to uncertainties in the data

and the potential for droughts, illegal water diversions, and climate change that may reduce the available supply of water in Luffenholtz Creek. Adding the ADU demand to the build-out demand would equate to an additional average daily demand of 15,497 gpd and a peak demand of 25,237 gpd within City limits.

Water Demand Outside City Limits

In the sections below, a brief summary of the characteristics is provided for each area and subarea within the service area, outside of City limits, as shown in Appendix 1. This information is provided to aid in the discussion of which portions of the service area, if any, should be a priority for future service and annexation, and which areas could be eliminated from the service area. For example, some areas may have physical or geographical limitations that make them difficult to serve. In addition, the more development potential there is in an area, the more financial sense it would make for annexation, because a portion of the property tax revenue from existing development is retained by the County.

Methods

A spreadsheet of all the parcels within the existing service area outside of City limits (henceforth “service area” in this section) was created. Data from the County Assessor’s office and the County GIS was added to the spreadsheet. This information includes such things as the existing use, improvement value, lot size, zoning, and general plan designations. Whether the property is currently served by City water was also included in the spreadsheet.

The service area was then divided into smaller areas, designated by letters A-F, and some were broken into smaller subareas (e.g. B1 and B2). These divisions are areas that might make sense as future annexation units if the City wants to expand. In addition, it is not likely that the City will be able to provide water service to the entire service area. With this break-down, the characteristics of each area can be reviewed, and the merits of including it in the service area can be considered separately.

A few parcels that are within the existing service area were eliminated from the analysis due to several reasons. The parcels removed east of Area B and north of Area D are owned by the company that operates the quarry and/or are zoned or proposed to be zoned Agricultural Exclusive (AE) or Timber Production Zone (TPZ), which are very restrictive resource production zones that should not be provided community water so as not to encourage development. A couple of large parcels that stick out from the bulk of Area E were eliminated because they were not adjacent to a main line, and there were no other apparent reasons to include them. In Area F, the parcels seaward of Scenic Drive were eliminated from the analysis due to the substantial development limitations on those parcels.

Both existing zoning and the proposed zoning updates currently being discussed by the County were reviewed. Those zoning changes will only affect properties outside of the Coastal Zone (CZ). The development potential of each property was estimated based on the minimum lot size according to zoning and subdivision potential. There is minimal subdivision potential on properties within the service area. And it is likely that there are physical constraints and other factors that would limit the subdivision potential more than the minimum lot size, but again, this is a conservative estimate where it is better to overestimate potential demand. In addition, ADUs are allowed on almost every lot in the service area either by right or with Humboldt County approval of a special permit.

Water use data for accounts within the service area outside City limits was treated and analyzed similarly to the water use data for properties within City limits. The primary difference is that all the existing users are

residential except for some of the Rancheria connections. The Rancheria parcels were reviewed separately for the purposes of calculating average water use. This is because there are connections for commercial and office uses, mixed in with connections serving individual parcels and/or homes.

The service area property characteristics spreadsheet was not merged with the City’s water account spreadsheet, because the intent is to forecast potential future water use. Because owners, family characteristics, landscaping, number of bedrooms, etc. can all change in the future, an average water use is a better predictor than actual current water use.

Overall, average water use within the service area outside the City and Rancheria is substantially lower than residential water use (Table 3) in the City, with an annual average of 94 gpd and 158 gpd in July. Average water use per account on the Rancheria is closer to the City residential account averages, at 144 gpd annually and 172 gpd during July (without the casino). Therefore, all the accounts were averaged, including the Rancheria parcels, but excluding the casino, to use in the calculations for potential build-out demand for the service area outside City limits. This equated to an average of 109 gpd, with a peak of 166 gpd in July (not included in Table 3). See Table 3 for additional information regarding existing water use within the service area and Rancheria, outside City limits.

Table 3. Existing (2018) Water Use Outside City limits

Area	Annual Average Daily Water Use Per Account (gpd)	Annual Average Total Daily Water Use (gpd)	Average Peak (July) Daily Water Use Per Account (gpd)	Average Total Peak (July) Daily Water Use (gpd)
Rancheria (w/out Casino)	144	3,457	172	4,133
Casino	2,644	2,644	2,724 ¹	2,724 ¹
Service Area (not including Rancheria)	94.2	7,156	158	12,000
Water Truck	1,158	1,158	929 ¹	929 ¹
Total		14,328		19,786

1. Peak water use for both the casino and the water truck were actually in October, therefore, would not contribute to the usage in July. Peak (October) usage for the casino and water truck was 6,341 gpd and 2,064 gpd respectively.

For potential ADUs in the service area, a multiplier of 0.25 was used to account for up to a quarter of properties constructing ADUs (not accounting for existing ones) for parcels where a special permit is required and 0.5 where they are allowed by right (another likely overestimate). The same average water demand was used for both primary residences and ADUs, since the average is already low. A multiplier was applied to each parcel based on whether they are already served by City water or not, whether the parcel has subdivision potential and whether an ADU is allowed by right or special permit. A potential average and peak water demand were calculated for each parcel and totaled for the subarea. The full potential for subdivision was included in the water demand calculations, though, as mentioned above, approval of all those subdivisions is unlikely.

For Area C, a different approach was necessary. The potential water demand for this area is difficult to estimate, because different commercial and recreational uses can vary significantly in their water requirements. For example, one parcel contains a mini-storage business, which likely uses very little water. On the other hand, the RV parks use a significant amount of water, particularly in the summer. Restaurants

use a lot of water, but a hardware store would not. Therefore, a simple average is not an adequate approach. However, for comparison purposes, the average water use from the RV parks in Trinidad were applied to the parcels in Area C, multiplying it based on lot size and subdivision potential. As expected, the resulting totals seemed unreasonably high.

For this reason, several of the businesses that operate within the area were contacted directly, including all three of the RV parks and Ocean Grove. The owners or operators of these businesses provided information regarding the amount of water they actually use. They primarily gave ranges of estimates from their highest to lowest daily use as well as an annual average. The stated highest peak day usage (e.g. 4th of July), which would be substantially more than the daily average over the entire month, was scaled back for estimating water demand over the entire month or year. Despite this, it became clear that to serve this entire area would require a significant amount of water (see more below). There is potential for using a combination of City water and existing onsite sources of water to serve this area, but that is outside the scope of this report.

A Note About Zoning

Areas A, B, D, E, and F include almost exclusively residential zoning designations, whereas Area C is exclusively commercial zoning. The vast majority of parcels within the service area are zoned RA (rural residential agriculture), or are proposed to be RA in the County's zoning update. Many are also zoned RS (residential single-family in the coastal zone). The number after the zoning designation (e.g. RA-2.5) indicates the minimum lot size, usually in acres, and an X means no additional subdivision is allowed. Although these zoning designations are primarily residential, they do allow a wide variety of uses with approval of a use permit. Such uses include neighborhood commercial, public and private recreation, bed and breakfasts, stables, agriculture, and timber production. However, City staff is not aware of many of these other types of uses having been established, likely because most of the lots are relatively small and would have septic limitations. There are also several combining zones (such as for wetlands, riparian areas, fault hazards, design review requirements, etc.) used in the area that limit development.

Trinidad Rancheria

Based on the Rancheria's Comprehensive Community-based Plan (Plan; June, 2011), there are not plans for additional residential development within the main Rancheria boundaries. Instead, the Rancheria has, and will continue to, purchase individual parcels to provide housing for Rancheria members. For example, the Rancheria has purchased several parcels on the east side of Hwy 101 along Westhaven Drive, as well as parcels in McKinleyville. In general, these parcels are already residential, and most have been, or eventually will be, transferred into Tribal Trust status. The Rancheria's community plan calls for additional commercial and institutional development, possibly replacing existing housing. The potential development envisioned in the Plan includes the hotel, an RV park, gas station, mini-mart, retail and incubator space, and a cultural/community center. However, most of the development is currently speculative, and it is outside the scope of this report to assess the potential water demand from the additional development proposed on the Rancheria. The currently proposed hotel has been estimated to have a peak demand of 14,184 gpd and an average demand of approximately 9,500 gpd.

Area A

Area A consists of 15 parcels covering an area of 24.1 acres, all within the Coastal Zone (CZ). The average parcel size is 1.61 acres, ranging from 0.44 acres to 6.21 acres. Nine of the parcels are currently served by City water, and six parcels are unserved. Four of the parcels are vacant, and one is minimally developed (< \$30,000 improvement value). All the parcels are residentially zoned; one parcel has a mobile home and one has multiple units. The parcels are all zoned Residential Single-family, 20,000 square foot minimum lot size

(RS-20). However, the County's minimum lot size when OWTS are used (and community water) is one acre. At that size (one acre), there is potential for four parcels to be subdivided into a total of 13 parcels. ADUs are allowed with a Special Permit. This area is estimated to have a maximum potential additional average annual demand of 2,226 gpd and a peak demand of 3,382 gpd during the month of July.

Area B

Area B consists of 43 parcels covering an area of 59.4 acres. The average parcel size is 1.41 acres, ranging from 0.19 acres (8,276 square feet) to 4.14 acres. Twenty-three of the parcels are outside the CZ, 15 are inside the CZ, and five are split. Twenty-two of the parcels are served by City water, and 21 are unserved. At least 13 parcels are vacant, with five more that have minimal improvement value (< \$30,000). All the parcels are zoned residential (RA-2.5 inland and RS/SM or RA-2 and RA-2.5 coastal). Three of the parcels could be subdivided into a total of six parcels. Twenty-four of the parcels can have an ADU by right, and the other 19 would require a special permit. This area is estimated to have a maximum potential additional average annual demand of 4,399 gpd and a peak demand of 6,682 gpd during the month of July.

Area B1 contains 28 parcels totaling 30.59 acres, averaging 1.13 acres, and ranging in size from 0.19 acres to 1.27 acres. There is no subdivision potential in this subarea. None of the parcels are in the CZ, but one is split by it. Eleven of the parcels are currently served by City water, and 17 are unserved. Eight of the parcels are vacant, and three have minimal improvement value. All 28 parcels can have an ADU by right. This subarea is estimated to have a maximum potential additional average annual demand of 2,624 gpd and a peak demand of 3,985 gpd during July.

Area B2 contains 15 parcels totaling 28.78 acres, averaging 1.92 acres, and ranging in size from 0.33 (14,375 sq. ft.) acres to 4.14 acres. Three of the parcels could be subdivided into a total of six parcels. Twelve of the parcels are in the CZ, two are outside, and one is split by the CZ boundary. Five of the parcels are currently served by City water, and 10 are unserved. Five of the parcels are vacant, and two have minimal improvement value. Two of parcels can have an ADU by right and 13 would require a special permit. This subarea is estimated to have a maximum potential additional average annual demand of 1,776 gpd and a peak demand of 2,697 gpd during July.

Area C

Area C consists of 12.5 parcels (one parcel is split by the service area boundary) covering an area of approximately 56 acres. The average parcel size is 4.54 acres, with a range of 0.73 acres to 11.23 acres. Ten of the parcels are within the CZ, and three are split by the CZ boundary. None of the parcels in this area are currently served with City water. Only one parcel is wholly vacant, but three other parcels are mostly vacant (either with minimal improvements or unused). All of the parcels have commercial land use designations; 4.5 are zoned Commercial General, and the other eight are zoned Commercial Recreation. However, three parcels are currently utilized for residential purposes. In addition, one of the three RV parks caters to long-term residents (minimum 30-day stay). As mentioned in the Methods section, estimating demand in this area is difficult, because it can be highly variable. The estimated maximum potential water demand of this area is estimated to be on the order of 15,000 to 20,000 gpd average during the low season and an average of 35,000 to 40,000 gpd during the peak season.

Area D

Area D consists of 49 parcels covering an area of 121.4 acres. The average parcel size is 2.48 acres, with parcels ranging from 0.23 acres (10,019 sq. ft.) to 11.74 acres. Thirty-six of the parcels are in the CZ, two are outside the CZ, and 11 are split by the CZ boundary. Sixteen of the parcels are served by City water, and 33

are unserved. At least nine parcels are vacant, with six more that have minimal improvement value (< \$30,000). All the parcels are zoned residential (generally RA-2.5, RA-2 and RA-X). Six of the parcels could be subdivided into a total of 14 parcels. Only two of the parcels can have an ADU by right, and the other 47 would require a special permit. This area is estimated to have a maximum potential additional average annual demand of 5,910 gpd and a peak demand of 8,976 gpd during the month of July.

Area D1 contains 16 parcels totaling 35.19 acres, averaging 2.20 acres, and ranging in size from 0.25 acres to 6.89 acres. There is one parcel that could potentially be split into two parcels within this subarea. All of the parcels are in the CZ. Seven of the parcels are currently served by City water, and nine are unserved. Four of the parcels are vacant, and three have minimal improvement value. All 16 parcels can have an ADU with approval of a special permit. This subarea is estimated to have a maximum potential additional average annual demand of 1,511 gpd and a peak demand of 2,294 gpd during July.

Area D2 contains 17 parcels totaling 25.51 acres, averaging 1.50 acres, and ranging in size from 0.23 acres to 6.67 acres. There is one parcel that could potentially be split into two parcels within this subarea. Fifteen of the parcels are in the CZ and two are split. Seven of the parcels are currently served by City water, and 10 are unserved. Three of the parcels are vacant, and one has minimal improvement value. All 17 parcels can have an ADU with approval of a special permit. This subarea is estimated to have a maximum potential additional average annual demand of 1,643 gpd and a peak demand of 2,496 gpd during July.

Area D3 contains 16 parcels totaling 60.67 acres, averaging 3.79 acres, and ranging in size from 1.01 acres to 11.74 acres. There are four parcels that could potentially be split into 10 parcels within this subarea. Four of the parcels are in the CZ, three are outside and nine are split by the CZ boundary. Only two of the parcels are currently served by City water, and 14 are unserved. Two of the parcels are vacant, and one has minimal improvement value. Two of the parcels can have an ADU by right, and the other 14 would require approval of a special permit. This subarea is estimated to have a maximum potential additional average annual demand of 2,756 gpd and a peak demand of 4,186 gpd during July.

Area E

Area E consists of 36 parcels covering an area of 99.54 acres. The average parcel size is 2.77 acres, ranging from 0.14 acres (6,098 sq. ft.) to 6.64 acres. All 36 parcels are in the CZ. Eighteen of the parcels are served by City water, and 18 are unserved. At least five parcels are vacant, with three more that have minimal improvement value (< \$30,000). All the parcels are zoned residential (the vast majority are RA-2.5, with one RA-X and one RA-5). Six of the parcels could be subdivided into a total of 15 parcels. All of the parcels would require a special permit to have an ADU. This area is estimated to have a maximum potential additional average annual demand of 3,528 gpd and a peak demand of 5,360 gpd during the month of July.

Area F

Area F consists of 25 parcels covering 80.78 acres. The average parcel size is 3.51 acres, ranging from 0.47 acres to 15.8 acres. All 25 parcels are in the CZ. This area is not currently served with City water. There are three vacant parcels in this area. All the parcels are zoned residential (RA-2.5, with numerous special combining zones). Four of the parcels could be subdivided into a total of 11 parcels. All of the parcels would require a special permit to construct an ADU. This area is estimated to have a maximum potential additional average annual demand of 3,975 gpd and a peak demand of 6,038 gpd during the month of July. Because this area currently has no water lines, and it would be undesirable for the City to annex this area, staff is proposing that it be eliminated from the City's service area, regardless of whether the City has the capacity to serve that area.

Summary and Conclusions

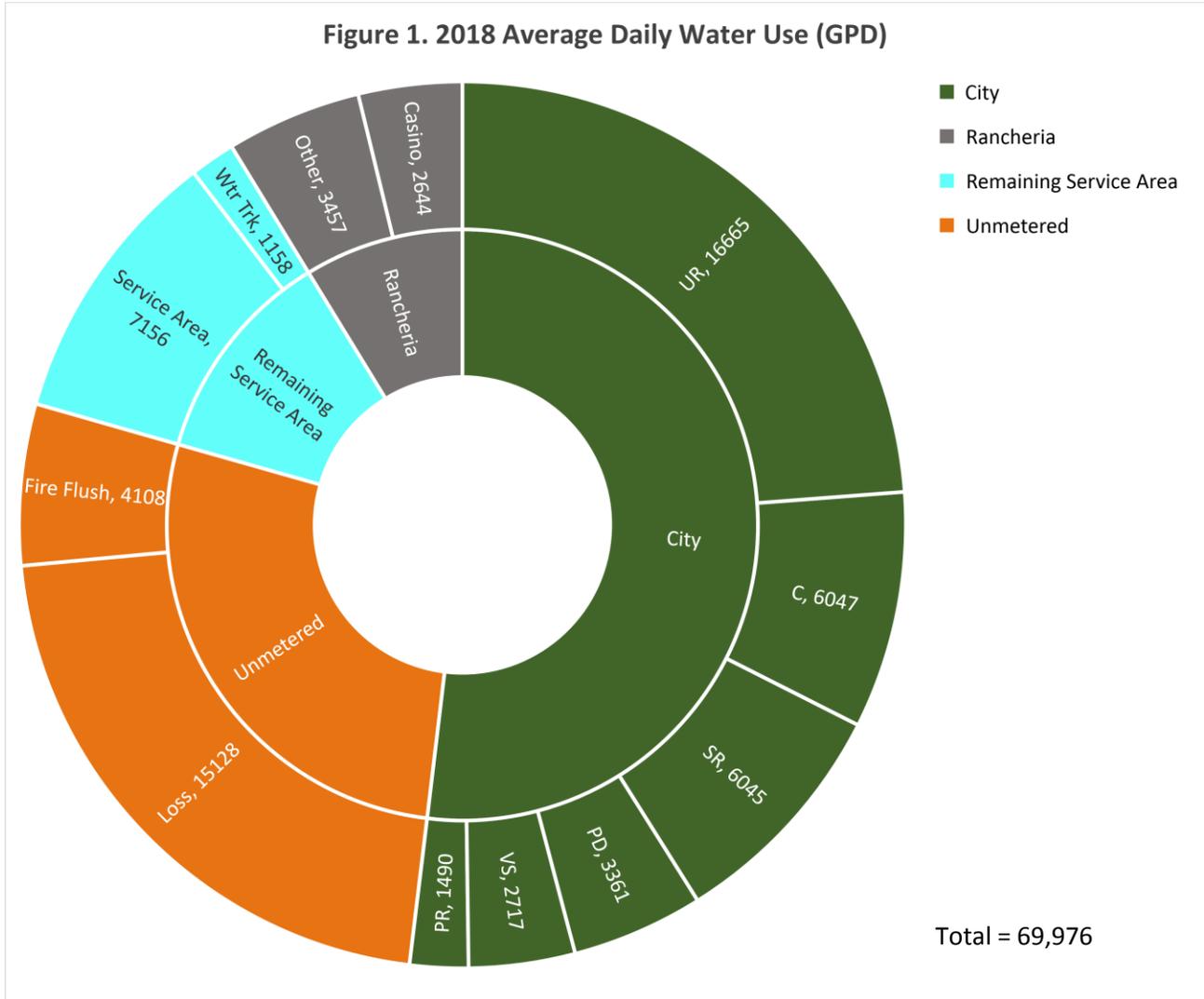
Table 4 provides a summary of additional potential build-out demand within various parts of the City's service area, including within City limits. Note that these numbers do not include the existing water use within the City or the service area. Therefore, the totals should be compared to the surplus production estimate in the GHD memo, which equate to the existing additional capacity of the water plant (approximately 48,000 gpd).

Table 4. Potential Additional Build-out Water Demand within the Entire City Service Area

Area	Average Demand (gpd ¹)	Peak Demand (gpd)
City build-out	12,617	20,269
ADUs w/in City	2,880	4,968
Area A	2,226	3,382
Area B1	2,624	3,985
Area B2	1,776	2,697
Area B	4,399	6,682
Area C	20,000	35,000
Area D1	1,511	2,294
Area D2	1,643	2,496
Area D3	2,756	4,186
Area D	5,910	8,976
Area E	3,528	5,360
Area F	3,975	6,038
Total	52,655	85,707
1. gpd: gallons per day		

Figure 1 shows a breakdown of the allocation of the water produced at the water plant per day on an average annual basis. It includes 36,325 gpd in the City, 6,101 gpd at the Rancheria, 8,314 gpd in the service area, and 19,236 gpd that is unmetered.

Figure 1. 2018 Average Daily Water Use (GPD)



Figures 2 and 3 present various service scenarios with peak and average daily demand, and how build-out in those areas would compare to the water plant's available capacity should the City decide to serve those areas. According to GHD's 'Water Treatment Plant Production Rate Test and Analysis' (memo dated May 1, 2019), there is approximately 48,000 gpd of unused capacity at the City's water plant in its current configuration. As can be seen in Table 4 and Figure 2, the City only has about half the capacity needed to serve build-out in the City and the remainder of the service area during peak usage, not including the Rancheria's hotel. Therefore, the City should prioritize future service and consider adjusting the service area boundaries. All of the scenarios in Figures 2 and 3 include build-out within City limits, since the City is obligated to serve users inside the City. Not every possible combination of service areas are included, and most were organized to stay within the remaining plant capacity, but it does provide a visual illustration of some potential options.

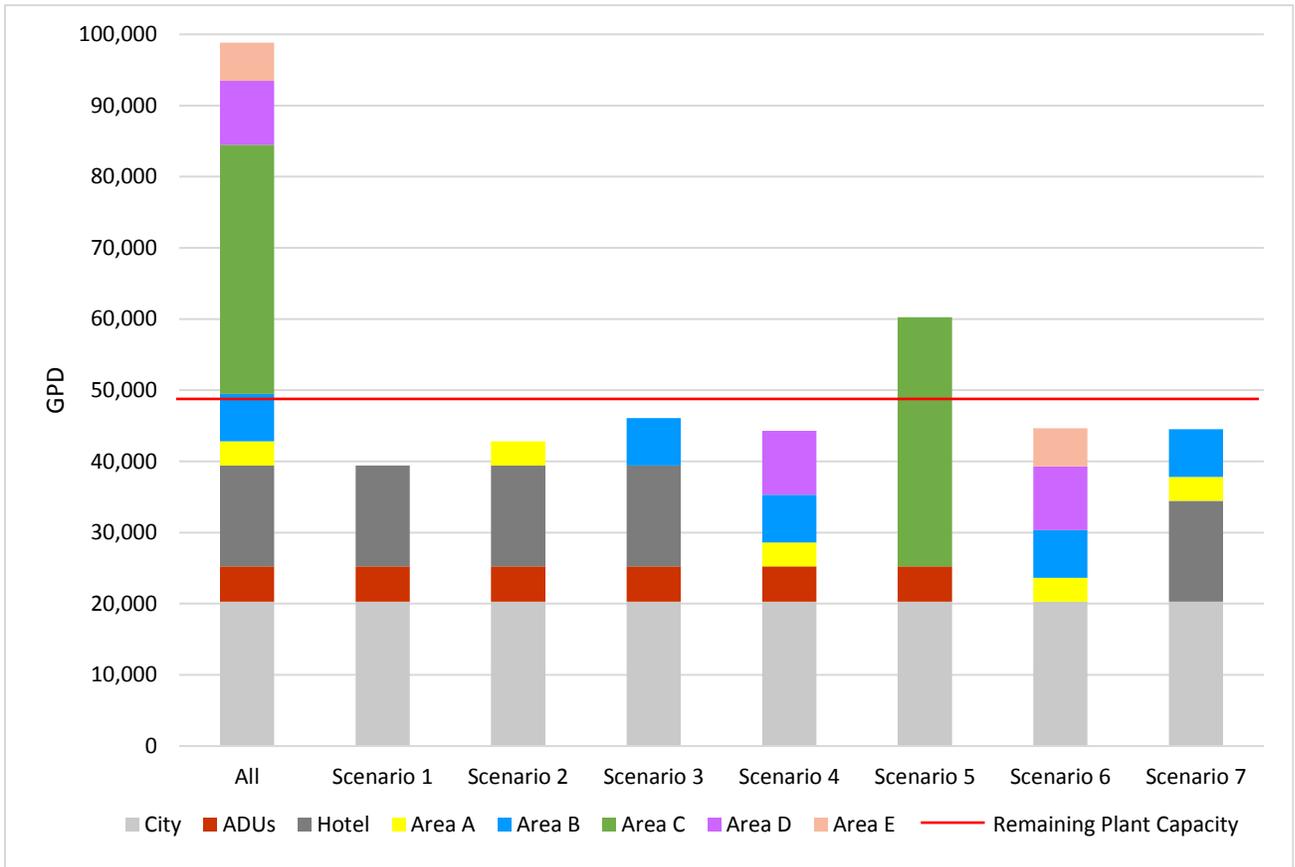


Figure 2. Additional July Demand Build-Out Scenarios

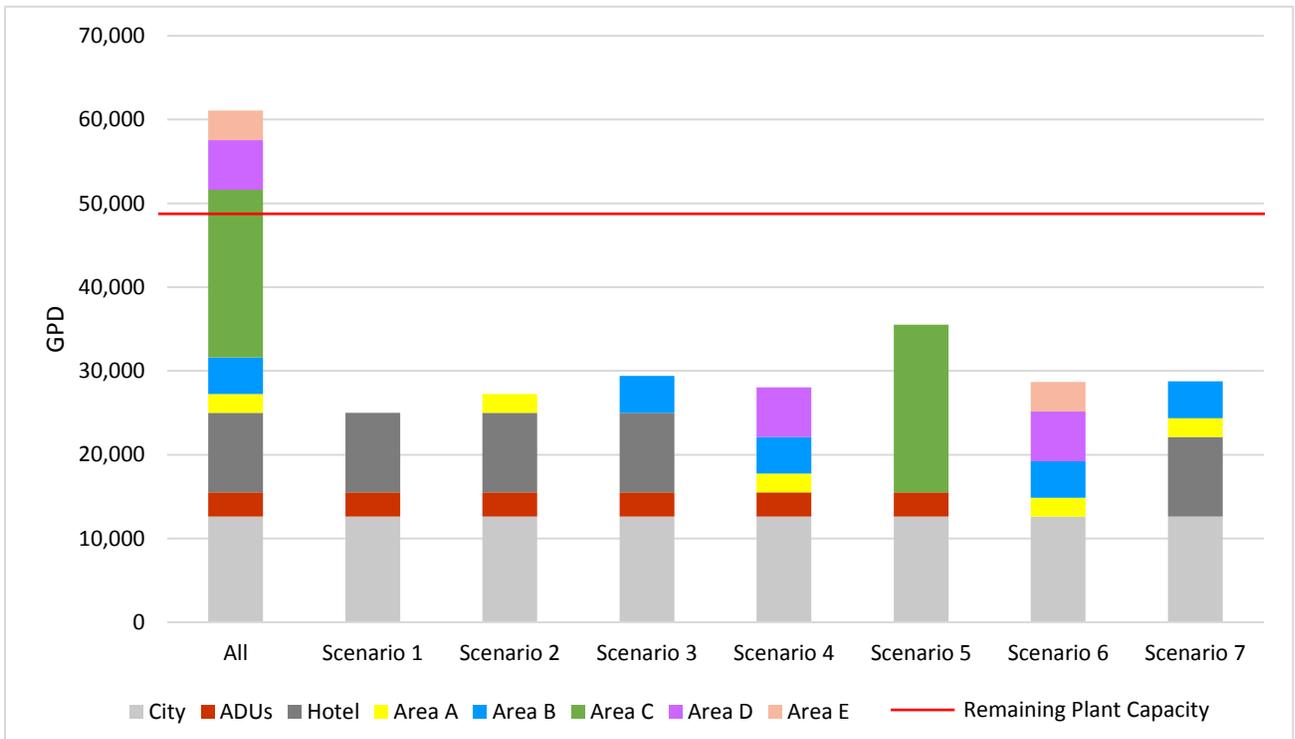


Figure 3. Additional Average Daily Demand Build-Out Scenarios

This report analyzes water demand of the City's service area under maximum potential build-out and compares that demand to the current capacity of the City's water plant to treat water. It should be recognized that build-out is not likely to occur inside or outside the City within the next 20 years, or the planning horizon of the updated General Plan. Trinidad has averaged about one new house every two years over the last 10 years. Allowing ADUs could spur development inside the City, and annexing and/or providing water service within the service area could also spur additional development on water-limited properties. But this is anticipated to be a minor increase in the rate of development. Consequently, this level of water demand would be expected to occur in the distant future, if ever.

In addition, the current limiting factor for water supply is the treatment capacity of the water plant. The City's water right, as long as there is enough water in the creek, is more than double the existing treatment capacity of the water plant. Therefore, improvements could be made to the City's water plant to increase the production capacity and be planned to coincide with additional development as it occurs. Therefore, just because the existing treatment capacity cannot meet the maximum build-out demand, does not mean that the City cannot eventually serve those areas. However, that will depend on the amount of water available in Luffenholtz Creek, which City staff is currently studying.



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