

Posted: December 2, 2019



NOTICE AND CALL OF A MEETING OF THE
TRINIDAD PLANNING COMMISSION

The Trinidad Planning Commission will hold a specially scheduled meeting on
THURSDAY DECEMBER 5TH, 2019, AT 5:00 P.M.
in Town Hall at 409 Trinity Street.

The following items will be discussed:

- I. ROLL CALL
- II. APPROVAL OF AGENDA
- III. ITEMS FROM THE FLOOR
- IV. AGENDA ITEMS

Discussion / Decision / Public Hearing / Action

- 1. General Plan Update: Discussion of water related policies. *Continued from the October 16, 2019 and November 20, 2019 meetings.*

- V. STAFF REPORT
- VI. ADJOURNMENT

The meeting packets can be accessed at the following link:
<http://trinidad.ca.gov/document-library/pc-meeting-packets-2019>



MEMORANDUM

TO: Trinidad Planning Commission

FROM: Trever Parker, City Planner

DATE: December 2, 2019

RE: General Plan Update – Water Policies

Please bring the memo regarding the general plan update from the November 20 meeting, which was continued to the special December 5 meeting. In addition, please bring any materials from other previous meetings that you feel are relevant to the discussion, such as the various water reports (available at the following link: <http://trinidad.ca.gov/document-library/plans-and-studies>). The fifth and final water report from GHD is now available and included in this packet. That report memo is regarding a City of Trinidad drinking water system model. In addition to the new report, I have compiled all the water related policies from the Land Use and Circulation Elements into one document without all the comments and track changes. (The comments and edits are available in the October 16, 2019 packet.) Hopefully that will make your review and discussion of these policies easier.

I have spoken with the Chair, the Mayor and the City Manager regarding moving forward with this discussion. The City Council is hoping to have some guidance from the Planning Commission by February. That is a tall order, and the Planning Commission is not likely to be totally done with their discussion by then. But hopefully we can provide them some preliminary policies and direction. One of the ideas that was discussed for the general plan would be to consolidate the water related policies into one location in the general plan, or even its own element, in recognition of its importance. That could be expanded to include other development limitations as well (e.g. septic, slope stability) in order to emphasize these limitations that must frame all of Trinidad's development policies.

Attachments

There are no additional attachments.

- City of Trinidad drinking water system model, memo dated October 29, 2019, prepared by GHD (5 pages)
- Water-related draft general plan policies (11 pages)



Memorandum

October 29, 2019

To:	Eli Naffah, City Manager	Ref. No.:	11198797
From:	Patrick Sullivan, Steve Allen	Tel:	7074438326
Subject:	City of Trinidad drinking water system model		

Introduction

The City of Trinidad serves treated water to approximately 1,000 people within the City service area. Currently, the City's water is pumped from Luffenholtz Creek by the City's water treatment plant, located at 1313 Westhaven Dr. Trinidad CA, adjacent to Luffenholtz Creek. The treated water is pumped from the treatment plant directly into the City's distribution and storage system. That system includes conveyance pipes, valves, fire hydrants, customer service meters and storage tanks. The system has been operated and maintained by the City since the early 1970's. The City's water delivery and storage system has served the City for close to 50 years. While the City's public works staff have working knowledge of how the City's system functions and how to operate it, staff have not necessarily had the ability to forecast how potential system modifications, maintenance activities, or future demands may affect system operation and performance. To address this issue the City requested that GHD develop a computer model of the water distribution and storage system to provide a better understanding of the system under current conditions and to provide a framework for evaluating future changes as well.

The purpose of the memorandum is to summarize the development of the computer model of the City's water distribution and storage system. The model was developed to simulate the water flow through the City's distribution pipes and storage tanks. It provides information about the dynamic characteristics of how the system generally functions, which primarily encompasses the water pressure, flow rates, and capacity of major pipes throughout the system. The development of the model allows for the evaluation of how current and future demands on the system can affect system operational characteristics and can suggest the need for infrastructure improvements. System characteristics may be considered under a variety of water demand scenarios such as average day, maximum day, and fire flow conditions.

Water System Model

The City's water distribution and storage model was developed using Bentley Systems Water CAD V8i. The software allows for analysis of the basic design and function of the major components of system, performance under a variety of water demand scenarios including fire flow capacity, and consideration of water quality within the distribution as may be characterized by chlorine residual. The model was developed by identifying the major piping networks, storage tanks, and anticipated demands throughout the system. digitizing the City's pipe system into the model. The information was derived from the original As-Built drawings and the operator's service records. The modeled system consists of pipes, valves, storage tanks, and fire hydrants. As is typical water system modeling practice, the model focused on the major system components to provide insights into overall operations. Individual service connections were not included in



this analysis, as this would require considerably more engineering effort and does not appreciably increase the usefulness of modeling results. The digitized water system is shown in Figure 1. The development of the water system framework shown in Figure 1 is based on including the major pipes and tanks as further described in the following sections.

Pipes

The City's distribution pipes are primarily constructed of asbestos cement (AC). This type of pipe was in common use for many years because it is relatively lightweight, is resistant to corrosion, and is generally durable. However, AC pipe may become brittle and is prone to leaks as the pipe ages. AC pipe remains in service for water systems throughout the world, but as it reaches the end of its useful life it will need to be replaced with modern materials as AC pipe is no longer widely manufactured and installed due in part to concerns over the potential for airborne dust in the manufacturing process as well as from field cutting during installation. In Trinidad, AC pipe has been replaced by PVC pipe in some locations of the system when repairs were made or line extensions were required.

The system is comprised of approximately 40,700 feet of pipe of various diameters (2-in, 3-in, 4-in, 6-in, 8-in, and 10-in). Table 1 summarizes the pipe lengths by diameter and the location of the pipes is shown Figure 1.

Table 1. Pipe length by Size

Pipe Size (in)	Length (ft)
2	382
3	1,381
4	8,463
6	12,947
8	10,979
10	6,566
Total	40,718

The water model was developed to simulate flow rates and pressure throughout the system. The calculation of pressure is based in part on evaluating pressure losses loss due to friction losses in the pipes and fittings. Fittings include gate valves, check valves, air release valves, and bends such as elbows and tees. Friction loss in the pipes was calculated using the Hazen-Williams equation with coefficient of 150 for PVC and 140 for AC pipe.

Storage Tanks

The City's water distribution system is sustained by two water storage tanks that are located on the east side of Westhaven Drive near Lark Lane. The tanks are each approximately 36 ft 8 in in diameter and 20 ft tall, with a maximum storage height in the tanks at 18 ft. The location of the water tanks is shown on Figure 1. When both tanks are filled to the maximum storage height of 18 ft they store 285,650 gallons of water.

The tanks provide two main functions. The first function is to provide stored water to balance the variations in water demands by customers with the supply from the water treatment plant. The second function is to provide a free water surface at the appropriate elevation to maintain desired static pressure in the distribution



system. Both tanks are connected to the distribution system and water flows back and forth between the tanks and the distribution piping.

The City manages water production at the treatment plant by the amount of water in the storage tanks. When the water level in the tanks drops below 16 feet, the treatment plant starts the pumps and supplies water to the system. The plant continues to produce water until the water level in the tanks reaches 18 ft. The amount of time it takes to fill the tanks depends upon the City water demand and the water treatment plant production rate. The demand for water varies throughout the day and daily demand varies from month to month with the highest demands in August. In the past 5 years the daily average flows have ranged from 50,000 gal to 160,000 gal, with an average of 80,000 gallons per day. It should be noted that these figures included water that is lost due to leaks in the system. For modeling purposes, it is assumed that the leaks are equally spread out through the system.

The water treatment plant can produce potable filtered water at a rate of between 60 and 120 gallons per minute (gpm). Currently, the treatment plant produces water at an optimal rate of 68 gpm. The treatment plant typically pumps for between 12 and 20 hours per day. During peak demand periods (such as weekends during tourist season in August or a major pipe failure or fire) the treatment plant may operate continually. A more detailed review of water production rates may be found in the City of Trinidad water demand and loss analysis memorandum (GHD September 6, 2019). Typically, the water level in the tanks cycles daily between 14 and 18 feet. As a general rule the City keeps the water level in the tanks at or above 12 feet (120,000 gallons of storage remaining in the tanks). This allows some flexibility for providing water during emergency situations such for a fire or to serve customers during brief interruptions of water supply or during repair of distribution system breaks.

System Pressure Analysis Under Maximum Day Demand

The model was used to simulate the piping and storage system under peak demand operating condition. The water demand was proportioned to each water line based upon the number service on each pipe line. The total water demand was applied the end of the water line in cases where the pipe ended or at the center of the pipe segment in cases where there was a loop connection. The water pressures in the system were evaluated for water delivered at a rate of 90,000 gallons per day. This was based upon the Trinidad water demand and loss analysis memorandum (GHD September 6, 2019) and accounts for normal peak demands rather than demands due to line breaks. This value is also consistent with what the operators observe on peak vacation weekends in August. The demand and subsequent flows in the system fluctuate throughout the day with the peak hour demand typically occurring during morning hours. The peak hour demand, based on typical peaking factors for similar sized communities, is 3.5 times the average daily demand. Using a high flow month (August), this yielded a peak hour demand of 218.75 gpm.

Water pressure in various areas of a water system is a key parameter for evaluating system performance. Water pressure varies throughout the system and is a function of several factors, including: size, age and type of conveyance pipes, length of pipe, flow in the system, elevation of the service, water supply pumping rate and level of water in the storage tanks. The City's water system was simulated based on a peak hour demand flow rate of 218.75 gpm. The results from the simulation indicate that pressures throughout the



system were predominately between 40 and 80 psi. There were sections at the north end of Mill Creek Lane that were below 40 psi but above 30 psi. Water pressure above 80 psi may damage pipes or fixtures in and so pressure reducing valves may be used. Water pressure below 30 psi is considered too low.

Fire Water Demand

Part of the water stored by the City is reserved for fighting fires. Water stored in the tanks is conveyed through the distribution system pipes and is available to fire fighters through fire hydrants throughout the City. The locations of fire hydrants is shown on Figure 1. The required fire demand is typically specified by the municipality or in concurrence with the fire marshal. The determination of the required flow is a function of a building area and the calculation is defined by the California Fire Code, Appendix B The calculations defined in the Code consider the type of structure (residential or commercial), inhabitancy (single family or multiple family), and building area. The Code then specifies a flow rate and a duration for providing the flow rate. The City of Trinidad does not have a specified fire demand and has used a value of 1,500 gpm for two hours but a common fire demand used throughout the County is the ability to supply water at 500 gpm for three hours. At the 500 gpm, this equates to 90,000 gallons of water, which is 5.67 feet of water in the City's storage tank. At 1500 gpm for two hour, this equates to 180,000 gallons of water, which is 11.34 feet of water in the City's storage tank. It is possible to lessen the drain on the tanks during a fire event by operating the pumps at a higher pumping rate, up to 120 gpm. This would decrease the drain on the storage to approximately 71,000 gallons (~4.5 ft of storage in the tanks). While it would be beneficial to run the treatment plant pumps during an emergency event, it should not be counted upon to decrease the fire storage requirement. This means 5.67 feet of storage in the tanks is required to meet the minimum fire demand.

Because there is a wide range of potential fire demand flow and it is the jurisdiction of the City's fire department to determine the fire flows it is recommended that the City work with the City's fire department and with CalFire to clarify the required fire flows for the City's fire hydrants.

Fire Supply Analysis

In addition to having the firefighting water available in the storage tanks, the ability to of the system to convey the water to the fire hydrants should be considered. Friction losses in the delivery system increase as the velocity of the water in the pipes increases and as the size of the pipes decreases. Smaller diameter pipes with higher water velocities have much higher friction losses. Higher friction losses result in lower operating pressure in portions of the system. During a fire event, fire pumper trucks may connect to fire hydrants and pump water from the system. The design and sizing of the conveyance pipes is typically performed such that the fire demand is met at the point of delivery (fire hydrant) without lowering the water pressure in the system below a specified threshold. This is typically 30 pounds per square inch (psi). If the system cannot supply water at this pressure the fire pumper truck could cause pressures to drop in portions of the system. If the pressure drop is severe enough, there is the potential for cross contamination caused by impurities being sucked into the water system through pipe leaks and service connections. Therefore, minimizing the potential for low pressure during fire flow conditions is important for maintaining proper and healthy operation of the distribution system.



While the City's goal is to operate the water storage with sufficient capacity to meet basic fire demands, the ability to supply water to fire hydrants needs to be evaluated. To evaluate the existing water system, each fire hydrant was individually analyzed using the model. The simulated flow at the hydrant was held at 500 gpm for 3 hours and the pressure throughout the system was evaluated. Three conditions were observed:

- sufficient water quantity and pressure above 30 psi throughout the system,
- sufficient water quantity but pressure below 30 psi in the system,
- insufficient water quantity and pressure below 20 psi in the system.

The analysis resulted in 27 hydrants that met the fire requirements (shown in green in Figure 2), 5 hydrants that met the fire demand requirements but resulted in low pressures in the system (shown in yellow in Figure 2), and 1 hydrants that did not meet the fire demand requirements (shown in red in Figure 2). While this is a preliminary assessment made to provide a methodology and provide an idea of the sufficiency of the system, it is recommended that the fire flow capacity be updated once the City and the fire department determine the required fire flow for each fire hydrant.

Conclusion

This memorandum summarizes the development of the City of Trinidad's WaterCAD distribution model of the trunk water distribution system and storage tanks. It evaluated the function of the distribution pipe network and found that the system is functioning adequately under peak demand conditions. While no new connections were evaluated under this effort, the model could be modified to evaluate future water demands and the potential impacts on the existing system.

The evaluation of the City's two 142,500 gallon water storage tanks (total of 285,000 gallons) indicate that there is sufficient storage to meet the City's existing average and peak water demand while maintaining sufficient fire suppression water assuming sufficient supply from the treatment system. The current storage tanks provide between one and two days' of water to meet regular demands without the treatment plant in operation and with the minimal fire flow demand requirements.

The evaluation of the City's fire hydrant capacity indicate that there is adequate capacity for almost all of the hydrants. While this is a preliminary assessment made to provide a methodology and provide an idea of the sufficiency of the system, it is recommended that the fire flow capacity be updated once the City and the fire department determine the required fire flow for each fire hydrant. There are a few locations that would result in low pressure conditions in the system. There was one location that did not meet the fire flow requirement. That hydrant is located on Van Wycke Street. This condition is due to a damaged pipe that runs from Edward Street west down Van Wycke Street. The broken and capped pipe causes flow to this section to be routed through a smaller pipe. While there is sufficient capacity for normal flow conditions, fire flow conditions cause pressure conditions to drop below threshold levels. This situation could be resolved by repairing the broken/capped pipeline.

LAND USE ELEMENT

D. DEVELOPMENT OUTSIDE OF CITY LIMITS

1. Sphere of Influence

As defined in Government Code § 56076, the Sphere of Influence (SOI) “means a plan for the probable physical boundaries and service area of a local agency.” Spheres of Influence are determined by the Local Agency Formation Commission (LAFCo) based on various studies, including a Municipal Service Review (MSR). LAFCo also has responsibility for approving boundary changes and service connections with a mandate of fostering orderly growth and development that promotes the efficient delivery of services, and encourages the preservation of open space and agricultural lands. The SOI, after adoption, shall be used by LAFCo as a factor in making decisions on proposals over which it has jurisdiction. An MSR for the City of Trinidad was prepared by LAFCo in 2008 without City review or input. Both the MSR and SOI Report need updating in order to be used to formulate SOI boundaries and dictate how and when land is developed around the City.

LAFCo adopted an SOI for Trinidad in 1984, but only a very small portion has actually been annexed into City Limits since that time. In the past, there has been a strong indicated desire on the part of Trinidad residents to maintain the compact urban form of Trinidad. Some residents outside City limits have also expressed an aversion to being annexed into City limits. Benefits to the City from annexation include additional land use control, and potential increase in tax revenues, including property, sales and transient occupancy. In particular, annexation would allow the City to expand its OWTS management program and increase protection of the Trinidad Head ASBS. It has also been suggested that annexation would benefit the City by increasing the population base for running a City government. In addition, annexation could help the City meet State requirements such as provision of housing and accommodation of visitor services. One of the main advantages to residents of being annexed would be the provision of City services, particularly water. At this time, Trinidad’s SOI is relatively small, only including a small portion of the water Service Area. The policies contained herein are based on the most current data and are intended to preserve the community’s character.

Goal LU-7: To provide and maintain clear boundaries and policies for considering the future expansion of Trinidad

Sphere of Influence Policies

LU-7.1 Depending on service capacity, define the City’s Sphere of Influence to include the City’s water service connections, as well as all properties adjacent to the City’s trunk line and those properties that are not zoned for timber production within the Luffenholtz and Mill Creek watersheds. The watersheds are to be included to provide

direction and oversight on land use decisions that affect the City's Water Supply, including OWTS management. (CIRC-12.6)

LU-7.2 The City supports annexation as a positive means of City expansions, but shall evaluate annexation proposals on a case-by-case basis. The City shall support/pursue only those annexations that:

- Promote orderly development and redevelopment of land within the Sphere of Influence;
- Promote efficiency in service delivery;
- Are supported by the affected residents and property owners;
- Are beneficial to the City.

LU-7.3 Avoid annexations of individual parcels or groups of parcels that are not contiguous with the City.

2. City Service Area

The "Service Area" refers to those areas that do, or may in the future, receive water service from the City. Water supply and distribution, and the absence of sewage collection and disposal facilities, are the major determinants of the urban form and density of development in the Service Area. The City has a substantial water right on Luffenholtz Creek, but the creek is small, and has only limited capacity to provide additional domestic water, particularly during droughts; climate change adds to the uncertainty. The City's water plant also has limited storage and treatment capacity but is periodically upgraded as funding allows.

The Service Area boundary is based on the areas currently connected to City water. In addition, a commercial area to the north has been included based on potential future need of City water in order to support commercial uses to serve residents of and visitors to Trinidad. The Service Area could become a Service District in the future, with greater powers, and separate governing board. Please see the Public Services section of the Circulation Element for additional information.

Goal LU-8: Manage City services to the maximum efficiency and benefit for residents as well as those outside City limits where appropriate.

City Service Area Policies

LU-8.1 The City is responsible for periodically assessing the capacity of Luffenholtz Creek to provide domestic water, including existing and potential riparian and appropriative rights and groundwater wells.

LU-8.2 Upgrades to the City's water plant to improve efficiency, water quality and storage capacity will be completed as needed and as funding allows.

LU-8.3 Consider expanding City services to areas outside City limits only if it can be done without significantly increasing the costs to residents within City limits, or if it is a public health emergency; annexation is a prerequisite for any service expansions.

LU-8.4 The existing commercial area on the west side of Patrick's Point Drive south of Anderson Lane and the area on the east side of Patrick's Point Drive north to the CalFire (CDF) station property should be included in the City service area / water district to allow for future consideration of water service. Annexation, or an annexation agreement, is a requirement for water service expansion, unless it is already part of a services district. (CIRC-12.6)

LU-8.5 If capacity and / or storage is adequate, study the feasibility of forming a Water District that includes the area to the east and southeast of the City on either side of the freeway, where some properties are already connected to the system, to allow for additional connections outside the City, as the system allows. Eventual annexation should be considered. Areas to the north of the City should be part of such a district if services are to be provided there in the future. (CIRC-12.4)

3. Planning Area

Government Code § 65300 provides that a City consider areas outside the City limits that have a bearing on planning for the City. The City of Trinidad has determined that activity affecting twelve coastal watersheds is the area of critical importance; therefore, it is in the interest of Trinidad to play a more active role in the decision-making processes involving land located within these watersheds, and to include them in the planning area. Trinidad has adopted this watershed based approach to planning due to particular concerns about water supply, pollution, and impacts on coastal resources; activities that occur in the upper watershed can affect downstream resources.

The designated Planning Area delineated in the previous General Plan defines an area in which the City has interests outside of its City limits and its Sphere of Influence boundary. The Planning Area might affect the City in ways such as increased circulation, impacts on water quality, or economic provisions. The designation of a planning area may be in the interest of establishing cooperation efforts with other surrounding jurisdictions, landowners or interest groups, including Humboldt County, State Parks, Trinidad Rancheria, Green Diamond Resource Co. Westhaven Community Services District, etc... This area also includes the area of interest of the Trinidad Bay Watershed Council. By adopting this specific Planning Area, the City defines the area where land use decisions affect Trinidad. Figure 3 shows the existing and proposed Planning Area.

The proposed Planning Area is more centered on the greater Trinidad-Westhaven community. The Luffenholtz Creek drainage basin was included because it is the watershed for the City water supply and serves parcels adjacent to it and along the main line extension. Residential areas west of the freeway up to the Seawood

interchange are included because they rely on the Trinidad area for commercial services and include visitor accommodations and facilities that support the local tourist and fishing activity. The forest area east of the freeway is included to ensure consideration of the potential impacts of activities to these coastal watersheds. The entire Planning Area, outside of City limits, is within Humboldt County jurisdiction.

The County has recently revised its General Plan and a revision of the County Zoning Ordinance Map will follow. The Trinidad Area LCP will also need to be updated for the coastal zone. The current County General Plan provides for specific designations throughout the planning area. Most of the Trinidad General Plan land use recommendations are consistent with present county designations (1984 Framework Plan). The reader is also referred to the County's current General Plan and LCP for discussion of the Urban / Rural areas and policies or findings that apply for development in the areas outside the City but within the City's Planning Area.

Goal LU-9: Ensure the protection of the coastal watersheds, natural and community resources and the quality of life in and around Trinidad.

Planning Area Policies

LU-9.1 Assess impacts of development within the entire planning area when considering large projects and regional issues

Program LU-9.1.1: Adopt a watershed based approach to land use planning that accounts for the impacts of development on an entire watershed, not only the individual parcel or activity. Respond to County application referrals based on watershed impacts and encourage the County to do the same for City projects. (CONS Principle A)

LU-9.2 Request referrals from the County for projects within the Trinidad Planning Area and comment on relevant projects that could impact the City based primarily on goals and policies found throughout this General Plan and any specific or unusual circumstances.

Program LU-9.2.1: Provide comments and input during any revisions of the County's General Plan that may affect the Planning Area any future adoption of implementing ordinances, and any other agency's or organization's long range plan for that includes land within the City's Planning Area. Seek to have such plans recognize impacts that could occur to the City as a result of inappropriate changes that occur in the City's Planning Area.

Program LU-9.2.2: Review development projects in the County, including timber harvest plans, that may affect Luffenholtz Creek, Mill Creek and other Planning Area watersheds and provide comments to regulatory agencies emphasizing the need to protect water quality and quantity. Consider consistency with all relevant policies in the City's General Plan, particularly those found under Planning Area,

Conservation and Water Quality, and the objectives of the Trinidad-Westhaven Integrated Coastal Watershed Plan.

Program LU-9.2.3: Monitor land use activities and development projects within the Luffenholtz Creek watershed and oppose those activities and projects that may have adverse impacts on creek water quality and quantity. (CIRC-12.10)

LU-9.3 Encourage coordination efforts between Trinidad officials and surrounding jurisdictions and landowners in order to address concerns about development projects that affect the Trinidad Planning Area and the Trinidad Head Area of Special Biological Significance / State Water Quality Protection Area.

Program LU-9.3.1: Request notification from responsible agencies (CDF for THPs, ACOE for fill or discharge permits, CALFIRE, PG&E, etc.) whenever possible regarding activities that will occur within the City's Planning Area. Inform responsible agencies of the types of projects that could have impacts on the water quality of the water resources of the Planning Area.

Program LU-9.3.2: Maintain open communication with the Trinidad Rancheria, and encourage the Rancheria to keep the City informed of upcoming projects by providing pertinent background information and studies related to such projects and allowing the City to provide early input on development proposals that could impact the City.

LU-9.4 The City designates both the Luffenholtz Creek and Mill Creek watersheds as "Critical Water Supply Areas," recognizing that these watersheds areas are primary water sources and limited in area so that current development makes the streams susceptible to a potential risk of contamination to the water supply from development activities. (see CONS-1e.3)

Program LU-9.4.1: Work with the County to ensure that the County designates Luffenholtz Creek and Mill Creek watersheds as "Critical Water Supply Areas" thereby providing increased scrutiny of and special protections from land use activities as defined in the Humboldt County Framework Plan and the Trinidad General Plan.

Program LU-9.4.2: Designate properties within a "Critical Water Supply Area" "Special Environment" to minimize further subdivision and reduce potential adverse land use densities until such time that improvements are made to the water supply system so that it is not so sensitive to land use impacts. Existing lots within the watershed may be considered suitable for single-family residence provided the septic tank system is carefully designed and installed to preclude pollution of the stream, and requires periodic inspection by and fees paid to the County Environmental Health Department.

LU-9.5 Develop and maintain an open relationship with landowners within the Planning Area, particularly those in Luffenholtz Creek, in order to facilitate landowner awareness of the need for water quality protection.

Program LU-9.5.1: Pursue adoption of a public education program regarding pesticides and other hazardous chemical, and when feasible, enter into a non-binding Memorandum of Understanding, or other agreement with property owners within the “Critical Water Supply Area” to minimize the use of these chemicals and reduce contamination of water supplies.

Program LU-9.5.2: Support the efforts of the Trinidad Bay Watershed Council to improve water quality in the Planning Area. Designate a City representative to participate in the Watershed Council meetings and other activities to the extent practicable.

LU-9.6 Encourage responsible septic system use and installation within the Planning Area.

Program LU-9.6.1: Pursue grant funding to monitor and implement projects within the City’s entire Planning Area to reduce pollution from onsite wastewater treatment systems. Encourage Humboldt County to participate to the maximum extent possible. Project goals include determining what areas and which onsite wastewater treatment systems are contributing the most pollution and offering financial incentives or other assistance to help landowners fix problems. Consider the feasibility and desirability of forming a Septic Maintenance District with the County that encompasses the area from Trinidad to Moonstone. (PUBL-18, CIRC-11.2)

LU-9.7 Preserve economically viable timber stands for use as commercial timber while protecting water quality, special status species and sensitive habitats (Goal CONS-8).

LU-9.8 Provide a geographically distributed inventory of mining sites protected from incompatible land uses, permitted and operated to prevent significant environmental impacts and to satisfy long-term demand for mineral resources and construction materials (Goal CONS-11).

CIRCULATION ELEMENT

I. PUBLIC SERVICES

5. Water Service

The City of Trinidad operates a municipal water supply system that services the occupied parcels within the City and a number of properties outside City limits. Potable water for the City system is currently supplied from Luffenholtz Creek. The City’s water

system includes an infiltration gallery, water treatment plant and several storage tanks. The City's water rights, dating from the late 1970's, allow the City to divert up to 251 gallons per minute (gpm) from the creek, or 361,440 gallons per day (gpd). However, the City's treatment plant currently has the capacity to treat approximately 105 gpm (but not necessarily 24 hours per day), equating to approximately 140,000 gpd. The City also has an unused water right on Mill Creek.

The City has a designated water Service Area (City Service Limit as designated in the previously certified Local Coastal Program (LCP)) that extends well outside of City limits (Figure 14). Prior to about the year 2000, the City provided water to users outside City limits, but within the service area, when requested, without much oversight or decision-making, in order to benefit from the increased revenue. However, around 2000, the policies of the Humboldt County Local Agency Formation Commission (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. On the other hand, water supply has also become a more critical issue.

The Trinidad water system is now serving 322 metered connections, 221 inside and 101 outside of City limits, including the Trinidad Rancheria. Currently, demand is approximately 2/3 of treatment capacity. The flow rate and quality of water is highly dependent on the weather. In the winter the water can be difficult to treat at times due to the high turbidity, but that is when demand is lower. Several water treatment issues, including, bacterial contamination, water turbidity and chlorine contact time are important issues that City staff at the treatment plant must constantly balance. The City continues to monitor and upgrade the water plant as feasible. Recent upgrades improved treatment for turbidity and chlorine contact time to meet current drinking water standards.

To address current water system needs, the City's engineering firm recently completed a Water Treatment Plant Production Rate Test and Analysis (GHD Memo dated May 1, 2019). Based on that report, which included limited testing and analysis, some current characteristics of the City's water plant are as follows:

- Turbidity is the primary limiting factor for overall water production. The highest turbidity tends to occur during early season storm events, which is not during the peak demand period of late summer.
- Current demand, topping out at an average of 85,000 gpd, can be met with existing staffing. Increasing production may necessitate additional staff and other increased costs.
- Current storage capacity is limited and may not meet today's standards for fire protection flows.

- Changes in operations at the water plant can have unanticipated impacts on other operations at the water plant, and on other aspects of the supply and delivery system.
- There may be some minor corrections / improvements that can be made to existing equipment to increase the efficiency of the water plant.
- There is a theoretical surplus in production capacity of up to approximately 48,000 gpd.

Demand for water is expected to increase due to new development in the Trinidad area in the upcoming years; hence, a plan needs to be developed for this increase in demand. The City's planning firm recently completed a Water Demand Assessment (SHN, August 2019) that looked at potential build-out within the City's Service Area, both within and outside of City limits. The findings of that report can be summarized as follows:

- The City's water plant has the existing capacity to meet the demands of build-out within the City as well as some additional ADUs.
- Even after accommodating build-out in the City, there is capacity to serve some areas of the Service Area outside of City limits, but not all.
- The City should prioritize how and where water service will be extended outside of City limits.
- Build-out is not expected to occur for decades, and conditions can and will change within that time frame.

Based on previous estimates of low flows (e.g. 100-year return low flow) on Luffenholtz Creek, the creek is almost fully allocated in terms of water rights. In fact, it may be over-allocated in a dry year. The City recently started monitoring flows on the creek just below the intake for the water plant to ensure that required bypass flows are met. Initial results indicate that the flows were less than would be anticipated in a non-drought year (2018). In addition, climate change is likely to alter rainfall patterns and affect flows in the creek. Therefore, the City's Engineering firm completed a "Conceptual Hydrologic Assessment of the Luffenholtz Creek Watershed" (GHD memo dated October 2, 2019). That report included the following findings:

- The City has a water right that allows extraction of almost three times the current demand.
- The water right includes minimum bypass flow requirements.
- Low creek flows negatively impact the City's ability to withdraw water from the existing infiltration gallery.
- Other users, withdrawals and water rights exist upstream of the City's water plant, but limited information exists regarding these.
- Limited reliable data exists for estimating low return flows on Luffenholtz Creek. However, the existing data does show that levels have dropped below the City's water right plus the required bypass flows.
- Climate change, drought and upstream users all increase the risks and uncertainties regarding the ability of Luffenholtz Creek to meet the City's needs in the future.

In addition to the assessments summarized above, the City Engineer's office also recently completed a "City of Trinidad water demand and loss analysis" (GHD memo dated October 2, 2019), which found that the water loss from the City's water system exceeds what would normally be expected for such a system. The losses are likely due to failing pipes and connections, and it was recommended that the City test various sections for pressure loss and prioritize replacement. Finally, the Engineer's office completed a "City of Trinidad alternative raw water source evaluation" (GHD memo dated October 2, 2019) to investigate alternative water sources to Luffenholtz Creek. The alternative sources considered were recycled/reclaimed water, desalination, rainwater catchment, spring catchment, other local creeks (Mill, Parker, McConnahas Mill), and Humboldt Bay Municipal Water District (HBMWD). The most feasible of these alternatives was found to be hooking into the HBMWD system via the McKinleyville CSD. This option has been considered in the past as well, but the idea has been controversial, primarily due to the potential for growth inducement in the area. This option is technically simple, since the MCSD was constructed to accommodate northward expansion, and it could be hooked directly into the City's existing water system. However, the permitting, agency coordination, community character considerations and public buy-in are much more complex.

In addition to the information above, there are several other water supply issues that have been considered in the development of the following policies:

- The Luffenholtz Creek watershed is located entirely outside of City limits. The City needs to coordinate with the County to ensure the creek is protected from development. Commercial cannabis operations are of particular concern due to their high water demands.
- In several areas, groundwater supply is highly variable. Wells in the area do not produce enough volume of water to meet the demand. Other concerns include contamination of wells from failed septic systems and use of pesticides and other chemicals.
- If they have riparian water rights, many property owners in the area outside the City use coastal streams as a water source, which raises the same concerns as wells.
- Additional water use in the Planning Area may overburden soil capacity septic tanks and increase ground and surface water pollution.
- The Trinidad Rancheria has plans for substantial development; they anticipate using the City's water supply.
- The lack of water has acted as a development constraint along with the use of septic systems.

Goal CIRC-12: Ensure that the City's water system, supply, and demand are managed for sustainability and the health and needs of users.

Water Service Policies

CIRC-12.1 Periodically assess the capacity of Luffenholtz Creek to provide domestic water; include variables such as existing and potential water (riparian and appropriative)

rights, groundwater wells, proposed developments, particularly commercial cannabis, and impacts to water supply due to climactic change. (LU-8.1)

Program CIRC-12.1.1: Prepare an annual water report to be presented to the City Council to keep the City up to date on the condition of the water system, need for improvements, level of use and capacity of the system.

CIRC-12.2 Upgrade the City's water plant to improve efficiency, water quality and storage capacity as funding becomes available. (LU-8.2)

Program CIRC-12.2.1: Develop a program for periodically upgrading existing distribution lines, including fire hydrants to current standards. Top priorities are repairing leaking lines and improving storage capacity at the treatment plant.

CIRC-12.3 Develop and implement an effective water conservation program to minimize water consumption. Extend the City's conservation program to properties outside the City that are hooked up to the City's water system. Encourage the County and/or Watershed Council to provide water education. Encourage the County to implement a similar program in the Trinidad-Westhaven area. (CONS-4.1)

Program CIRC-12.3.1: Pursue implementation of a water rate structure that encourages water conservation. Periodically review and amend the water rate structure to ensure that it promotes water conservation. (CONS-1d.1.1)

Program CIRC-12.3.2: Adopt a water efficiency landscape ordinance in accordance with AB 1881 and Department of Water Resources (DWR) requirements. (CONS-1d.1.2)

Program CIRC-12.3.3: Promote the use of rainwater collection and greywater systems. (CIRC-11.3)

CIRC-12.4 If capacity and / or storage is adequate, study the feasibility of forming a Water District that includes the area to the east and southeast of the City on either side of the freeway, where some properties are already connected to the system, to allow for additional connections outside the City, as the system allows. Eventual annexation should be considered. An 'annexation agreement' (agreeing not to object to future annexation) with the City is a minimum requirement for providing any new connections outside of City limits. Areas to the north of the City should be part of such a district if services are to be provided there in the future. (LU-8.5)

CIRC-12.5 The existing commercial area on the west side of Patrick's Point Drive south of Anderson Lane and the area on the east side of Patrick's Point Drive north to the CalFire (CDF) station, should be included in the City service area / water district to allow for future consideration of water service. Annexation, or an annexation agreement, is a requirement for water service expansion, unless it is already part of a services district. (LU-8.4)

CIRC-12.6 Depending on service capacity, the City's Sphere of Influence should be defined to include the City's water service connections, as well as all properties adjacent to the City's trunk line and those properties that are not zoned for timber production within the Luffenholtz and Mill Creek watersheds (refer to Fig. 4). The watersheds are to be included to provide directions and oversight on land use decisions that affect the City's Water Supply, including OWTS management. (LU-7.1)

CIRC-12.7 Consider expanding City services to areas outside City limits only if it can be done without significantly increasing the costs to residents within City limits, or if it is a public health emergency; annexation is a prerequisite for any service expansions. (LU-8.3)

Program CIRC-12.7.1: In the event of a proposal to expand the City water system, prospective customers shall provide the necessary funds in whole or in part to defer the cost of system improvements through an agreement with the City. This policy shall be implemented by provisions of the City Water System Service Ordinance.

CIRC-12.8 Do not allow connection to Humboldt Bay Municipal Water District unless there is a compelling public necessity and only when enforceable measures are included to assure that the general small-town community characteristic of the service area around the City does not adversely change.