

## SUPPLEMENTAL INFORMATION #1

For Zoning Administrator Agenda of:  
May 16, 2019

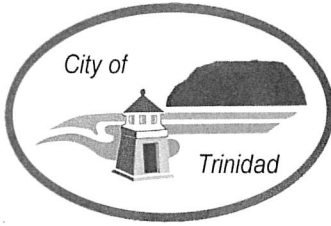
<input checked="" type="checkbox"/>	Consent Agenda Item	}	
<input type="checkbox"/>	Continued Hearing Item	}	
<input type="checkbox"/>	Public Hearing Item	}	No. <u>6</u>
<input type="checkbox"/>	Department Report	}	
<input type="checkbox"/>	Old Business	}	

**Re: CalFire Trinidad – Domestic Water Supply Project**

Coastal Development Permit  
Case Number PLN-2019-15312  
Assessor's Parcel Number (APN) 515-241-011  
923 Patrick's Point Drive, Trinidad Area

Attached for the Zoning Administrator's record and review is (are) the following:

1. Staff report and attachments of the City of Trinidad for that portion of the project within their jurisdictional area.



Filed: January 15, 2019  
Staff: Trever Parker  
Staff Report: March 12, 2019  
Hearing Date: March 20, 2019  
Commission Action:

### **STAFF REPORT: CITY OF TRINIDAD**

APPLICATION NO: 2019-03

APPLICANT (S): CAL FIRE

AGENT: Stein Coriell, SHN

PROJECT LOCATION: NA

PROJECT DESCRIPTION: Grading and Coastal Development Permit for installation of approximately 5,400 linear feet (approximately 600 ft. of which is within City limits) of 1.5-in. diameter water line from the City of Trinidad to the CAL FIRE Trinidad Station.

ASSESSOR'S PARCEL NUMBER: Patricks Point Drive right-of-way

ZONING: NA

GENERAL PLAN DESIGNATION: NA

ENVIRONMENTAL REVIEW: Categorically Exempt from CEQA per § 15303 of the CEQA Guidelines exempting new construction of small structures, including "water main, sewage, electrical, gas, and other utility extensions, including street improvements, of reasonable length to serve such construction."

#### **APPEAL STATUS:**

Planning Commission action on a Coastal Development Permit, Variance, Conditional Use Permit, and/or Design Review approval application will become final 10 working days after the date that the Coastal Commission receives a "Notice of Action Taken" from the City unless an appeal to the City Council is filed in the office of the City Clerk at that time. Furthermore, this project is        / **is not** **X** appealable to the Coastal Commission per the City's certified LCP, but may be appealable per Section 30603 of the Coastal Act.

## BACKGROUND:

The history of this project goes back several years. The CAL FIRE Trinidad Station previously obtained its potable water through a collection and treatment system on Martin Creek. However, possibly due to upstream development, that source has become polluted and unreliable. CAL FIRE attempted several solutions, including expansion of the collection cistern, improvements to the filtration system and even digging a new well. None of these actions worked, and the station has had to rely on trucked and bottled water for domestic use ever since.

Therefore, CAL FIRE applied to the Humboldt Local Agency Formation Commission (LAFCo) in 2009 for a service extension from the City of Trinidad water system. CAL FIRE then approached the City for approval of the water line extension. The City Council approved the request, "subject to successful negotiation of a services agreement, payment of any required fees and assumption of all financial responsibility, as well as CAL Fire's ability to secure all necessary permits and rights of way," at their October 2012 meeting.

After obtaining their funding authorization, CAL FIRE again approached the City in 2014 to start discussions about the required design, engineering, environmental analysis and permitting. At this point, Coastal Commission staff became involved, and it was determined that amendments to both the County and City LCPs would be required. It took time to develop language that everyone could agree on that would allow the extension but limit it to prevent growth-inducement and other impacts. The Planning Commission approved the LCP amendment on August 16, 2017, the City Council approved on September 13, 2017 and it was submitted to the Coastal Commission as an application to amend the City's LCP. The County conducted a similar and concurrent process. The Coastal Commission ended up making some modifications to the approved amendments, which were accepted by the City Council on December 12, 2018. And the amendment became effective on February 8, 2019.

### Need for the Project

There is a clear, documented need for potable water service at the Fire Station. CAL FIRE has documented the water quality problems with their existing system, including sedimentation and contamination related to homeless encampments nearby. Water conservation measures are already in place. Three test borings for wells were drilled onsite in 2007 but came up dry. Sand filtration and other water treatment options have been attempted with unsatisfactory results. Currently, bottled and/or trucked-in water is used for drinking and the existing, questionable water is used for everything else, including showers.

The CAL FIRE Trinidad Station provides an essential public service. The Station has an initial attack direct protection area of over 375,000 acres and interfaces with numerous

state, federal and local agencies. The Trinidad State Fire Station is the only “Amador” station in the Humboldt Del Norte Unit, which requires it to be open year-round. The station is contracted to serve as the primary fire department for Humboldt County Service Area 4. The station also provides emergency services to the City of Trinidad and the Trinidad Rancheria properties at no cost. The Cal Fire Engine is routinely first to the scene to calls in the City of Trinidad, often by several minutes, due to its close proximity and being professionally staffed 24 hours per day.

## PROPOSED PROJECT

The entire project includes installation of approximately 5,400 linear feet of new 1.5-inch diameter HDPE water pipe beneath Patricks Point Drive. Only the first 600 feet or so of water line is within City limits. The County will be permitting the remainder of the line, which is within their jurisdiction. The water line will be installed using horizontal directional drilling to minimize ground disturbance. Access pits of approximately 4 feet by 6 feet by 5 feet deep are needed every approximately 1000 feet for the drill rig. Excess materials removed by drilling will be temporarily stockpiled and then transported to an approved off-site disposal site. The project includes a variety of industry standard safety provisions as well as BMPs to minimize erosion and dust generation and to implement a traffic control plan. A detailed project description and construction plans are attached.

Project referrals were sent to Public Works, the City Engineer, Building Inspector, County Community Development Department and California Coastal Commission. The Building Inspector noted that no building permit is required for the project. The County recommended approval and is processing a concurrent application. Public Works staff requested clarification as to the meter location and noted that a meter and backflow prevention device would be required at the tie-in the existing water main at Main Street. The City Engineer had a number of comments and requests for additional details on the plans, which were revised and resubmitted. The City Engineer had only a few minor comments on the revision. A condition has been included that all the City Engineer’s requirements will need to be met prior to construction and that construction can not begin until sigh-off from the City Engineer.

## LCP/GENERAL PLAN CONSISTENCY

The approved LCP amendment added language to specifically allow a water connection to the Trinidad Fire Station, even though it is outside the City’s service area, as long as certain conditions are met. Policy 26b was added, which states:

*“Water service may be extended to the CAL FIRE Trinidad Fire Station located at 923 Patrick’s Point Drive if the service line extension (i) is sized so as not to exceed provision of the minimum*



*amount of water needed to serve the fire station for domestic water use; (ii) will not remove capacity necessary to serve future development within the City; (iii) will not impair fire protection services in the City; (iv) is designed and conditioned in such a way that it will not service additional parcels/be growth inducing; and (v) is found to be in conformance with the resource protection policies of this plan."*

In addition, policy 27(a) was added, which states:

*Water service extensions shall not remove water system capacity needed to serve Coastal Act priority uses within the North Trinidad Service Area described in policy 26.*

Each of the limitations and requirements is addressed further below.

*26b.(i): sized so as not to exceed provision of the minimum amount of water needed to serve the fire station for domestic water use.*

The 2009 'Preliminary Feasibility of Connecting' report prepared by Winzler and Kelly for the LAFCo approval of the water line included an assessment of the size of the water line that would be needed for the project. It was determined that a 1-inch line would suffice. LAFCo ended up approving a 1.5-inch water line to provide more leeway for error. A 1.5-inch water line was not considered large enough to serve additional connections. The current California Water Code (§64573) requires new water mains, serving multiple parcels, to be a minimum of 4 inches. The proposed water line meets the definition of a "user service line," not a "water main."

In addition, the applicant's agent has recently provided a more detailed assessment regarding the water line sizing that takes into account the variability in water pressure at the connection to the City's water main and the length of time it would take to fill up CAL FIRE's water tank. That report shows that the 1" is not adequate to supply the peak or average daily demand of the fire station at the lower range of water pressures. Therefore, the 1.5" line is needed.

*26b.(ii): will not remove capacity necessary to serve future development within the City.*

Several water supply assessments have been completed for this project. In addition to the feasibility study conducted by Winzler and Kelly in 2009 for LAFCo, GHD (formerly Winzler and Kelly) prepared an updated report in March 2017. That report included current City water use and supply information and accounted for the increased staffing at the Trinidad Fire Station. The station will continue to use their existing water source for irrigation, fire suppression and truck maintenance; the City's water will only be used for domestic, indoor use.

GHD's 2017 water assessment shows that the City has ample capacity to serve the Trinidad Fire Station. That report indicated that the small percent of water that will be used by the Station would not impact the City's ability to supply water to vacant lots in the City when they are developed in the future. The City Engineer also found that it would not affect the City's storage capacity or ability to fight fires. Since that memo was written however, it has been recognized that the maximum production capacity of that was used was based on theoretical maximums based on the pump specifications, and the actual treatment capacity of the water plant is substantially less.

GHD recently conducted a Water Treatment Plant Production Rate Test and Analysis, and their findings are detailed in a May 1, 2019 memo. It was found that maximum production rates are affected by a number of factors. Production is particularly limited when turbidity is high, but that is in the winter when demand is lower. Overall, the analysis found that there is a monthly surplus production capacity of approximately 48,000 gpd (gallons per day) to 62,000 gpd, depending on the month. There are a number of limitations and caveats on these numbers though. For example, increasing production would require increased staff time and maintenance costs. And because of the age of the plant, how it's been pieced together and improved over the years, and its complexity, increases in production can impact other components of the system in somewhat unpredictable ways. However, there are also some minor and larger improvements that could be made to the system to potentially increase capacity as well.

A preliminary assessment of potential water use with build-out within City limits was presented to the Coastal Commission in a letter dated January 17, 2018 (attached) in response to their request for additional information to process the LCP amendment. That assessment estimated that, with maximum build-out under the City's existing land use regulations, there would be an additional demand of an average of 10,167 gpd, or 15,087 gpd peak daily usage. Because the maximum production rate is higher in the summer, during peak demands, the remaining production capacity year-round after City build-out would be around 38,000 gpd. The estimated peak daily demand for the CAL FIRE station is estimated to be 2,000 gpd, with an average daily demand of 1,000 gpd, which equates to approximately 3.8% of the City's remaining peak daily capacity, and only 2.1% of the average daily capacity in the winter.

The City Engineer has submitted a written finding that the City's provision of water to the CALFIRE station will not remove capacity necessary to serve future development within the City as long as certain conditions are included in the approval (see email from Steve Allen, dated May 8, 2019). All of the City Engineer's suggested conditions have been included at the end of this staff report.

*26b.(iii): will not impair fire protection services in the City.*

According to the March 2017 water supply assessment by GHD: “The City currently operates two 150,000 gallon storage tanks, for a total of 300,000 gallons of storage. Out of the total storage, approximately 180,000 gallons is reserved for fire flows (estimated as 2 hours of supply at 1500 gpm). Ideally, this volume would be kept in storage for availability during a fire. During peak water use in the summer, demands can be met by the maximum feed rate supplied by the pumps. It is not anticipated that storage would be a limiting factor to connection of the fire station to the City’s water system.” An assessment of whether the City’s current capacity for fire flows would meet current standards has not been done. However, because the fire flows are based on storage capacity, and the provision of water to the CALFIRE station will not affect the City’s storage capacity, then the proposed connection to the CAL FIRE station would not impair existing fire protection flows in the City.

In addition, the City Engineer has submitted a written finding that the City’s provision of water to the CALFIRE station will not impair fire protection services within the City as long as certain conditions are included in the approval (see email from Steve Allen, dated May 8, 2019). All of the City Engineer’s suggested conditions have been included at the end of this staff report.

*26b.(iv): is designed and conditioned in such a way that it will not service additional parcels/be growth inducing.*

As described under (i) above, the proposed 1.5-inch water line is the minimum necessary to provide potable water to the Trinidad Fire Station. It is not large enough to provide water to other users. In addition, it would not be legal for someone to hook-up to the new water line without approval. The project includes water meters both at the connection to the water main on Main Street, and a second meter at the Fire Station. Discrepancies in the readings would indicate if any illicit connections have been made, or if there is a leak in the pipe. A condition of approval has been included that CALFIRE shall sign an acknowledgment that no additional connections are allowed without City approval. Therefore, the proposed water connection will not be growth-inducing.

*26b.(v): is found to be in conformance with the resource protection policies of this plan.*

The project will take place within the already paved portion of Patricks Point Drive. The portion in the City is not within any mapped resource areas or areas of soils limitations, and will not cross any water courses. A horizontal directional drill feasibility evaluation (July 2016) was prepared for this project by a registered engineering geologist. No significant limitations or hazards were found, and the recommendations of that report have been included as a condition herein. Since the majority of the construction will take place within County jurisdiction, they were considered a Lead Agency for the purposes of CEQA. The County determined that the project was exempt per CEQA Guidelines §15303(d) exempting new construction of small structures including water connections.

*27(a) Water service extensions shall not remove water system capacity needed to serve Coastal Act priority uses within the North Trinidad Service Area described in policy 26.*

Staff does not interpret this as applying to the individual connection for the CAL FIRE station, because it was not included in the more specific criteria for the CAL FIRE connection. However, like for City build-out water demand, some rough calculations were made for the potential demand from the Commercial-Recreation zoned parcels within the City's northern (but as yet unserved) service area. These calculations are also presented in the letter to the Coastal Commission along with the build-out calculations and showed that demand would be a little under 10,000 gpd during peak usage. It should be noted that these were very rough calculations and should not be relied on for assessing future connection requests. However, that data shows that the amount of water used by CAL FIRE would not affect the City's ability to serve this northern area, even when considering build-out demand in the City.

#### **LCP / ZONING ORDINANCE CONSISTENCY**

The project will occur completely within the Patricks Point Drive right-of-way, and therefore has no associated zoning. Zoning Ordinance §17.60.030 requires Design Review approval for projects that will alter land contours; however, this project does not involve any new structures or changes in land contours. Therefore, Design Review is not required.

The City's grading ordinance requires a grading permit for any excavation or fill (or combination) that disturbs 1000 sq. ft. of area of 50 cu. yds. of material. It is not clear whether these thresholds would be reached within the City of Trinidad portion of the project, but they will for the entire project. And the project meets the definition of development in the Coastal Act and City's LCP. The City does not have a separate process for a CDP, so the grading permit process and standards are being used to process this application.

Grading Permits are issued by the Planning Commission, but it is up to the City Engineer to ensure that all the provisions have been met. The findings that are required to be made per (§15.16.070) are that *"the proposed grading will not adversely affect the drainage or lateral support of other properties in the area, and will not be detrimental to the public health, safety or the general welfare, or is not in conflict with the provisions of this chapter, the Trinidad zoning title and general plan."* As described above, the City Engineer did have several comments on the project. Therefore, a condition of approval has been included that the final plans must be approved by the City Engineer at the time of or prior to issuance of an Encroachment Permit. According to the Engineer, with the proposed conditions of approval, all applicable requirements will be met, and he has recommended approval.

The Trinidad General Plan and Zoning Ordinance protect importance public coastal views from roads, trails and vista points and private views from inside residences located uphill from a proposed project from significant obstruction. The project does not have the potential to block public or private views.

#### **SLOPE STABILITY:**

Although the right-of-ways are not mapped, the project does not pass through areas designated as unstable or questionable stability based on Plate 3 of the Trinidad General Plan within City limits. However, the Mill Creek drainage corridor, outside City limits, is mapped as being of questionable stability. Mill Creek runs through a culvert under Hwy 101 and Patricks Point Drive, so would not be affected by the proposed project. In addition, a feasibility report that included a geotechnical analysis was prepared for the project. The submitted plans have been designed in accordance with the recommendations of that report. In addition, any other applicable recommendations have been incorporated into the project through a condition of approval.

#### **ALQUIST PRIOLO ZONE:**

The project does fall within an Alquist-Priolo Fault Hazard Zone. However, the regulations do not apply to this project since it does not involve a subdivision, or human occupied structures.

#### **SEWAGE DISPOSAL:**

There is no sewage disposal associated with this project.

#### **LANDSCAPING AND FENCING:**

It is not anticipated that any vegetation removal will be required within the project area. There may be minor and temporary vegetation disturbance resulting from construction activities along the shoulder within the road right-of-way, but no major vegetation removal will occur.

#### **STAFF RECOMMEDATION:**

Based on the above analysis, the amendment can be found to be consistent with the City's Zoning Ordinance and General Plan and other policies and regulations of the LCP. The

amendment will serve to support an important public need and will not negatively impact the City's ability to provide water to users within the City, and all the necessary findings can be made. If the Planning Commission agrees with staff's analysis the amendment may be recommended to the City Council with the following motion:

Based on application materials, information included in this Staff Report, and based on public testimony, I move to adopt the information and findings in this staff report and approve the project as submitted and as conditioned herein:

## PLANNING COMMISSION ALTERNATIVES

If the Planning Commission does not agree with staff's analysis, or if information is presented during the hearing that conflicts with the information contained in the staff report, the Planning Commission has several alternatives.

- A. Add conditions of approval to address any specific concerns on the part of the Commission or the public.
- B. Delay action / continue the hearing to obtain further information.
  - In this case, the Planning Commission should specify any additional information required from staff or the applicant and / or suggestions on how to modify the project and / or conditions of approval.
- C. Denial of the project.
  - The Planning Commission should provide a motion that identifies the Finding(s) that cannot be made and giving the reasons for the inability to make said Finding(s).

## ATTACHMENTS

- Detailed Project Description (11 pages)
- Construction Plans (only including section within City limits) (4 pages)
- Water line sizing memo (w/out attachments) (3 pages)
- Email from Steve Allen, City Engineer, recommending approval (1 page)
- Excerpt from a letter to the Coastal Commission from the City showing build-out calculations and potential demand from the northern C-R zoned parcels (2 pages)
- Excerpt from the May 1, 2019 Water Treatment Plant Production Rate Test and Analysis memo showing surplus and conclusions (2 pages)

## CONDITIONS OF APPROVAL

1. The applicant is responsible for reimbursing the City for all costs associated with processing the application. *Responsibility: City Clerk to place receipt in conditions compliance folder prior to issuance of an encroachment permit.*



2. The applicant is responsible for negotiating a services agreement with the City, payment of any permit and hook-up fees and assumption of financial responsibility, and for securing all necessary approvals and permits needed to construct the water line, including from Humboldt County. *Responsibility: City Clerk prior to issuing an encroachment permit.*
3. The final plans must be approved by the City Engineer at the time of or prior to issuance of an Encroachment Permit. *City Clerk to verify prior to issuing an Encroachment Permit.*
4. An encroachment permit is required for any work within the City right-of-way. *City Clerk to verify prior to issuing an Encroachment Permit.*
4. Any and all applicable recommendations of the July 2016 Horizontal Directional Drill Feasibility Evaluation shall be met by the applicant and contractor. *City Engineer to verify prior to signing an Encroachment Permit.*
5. The applicant and contractor are responsible for ensuring all provisions of the City's grading ordinance are met to the satisfaction of the City Engineer and that any other requirements of the City Engineer are met to his satisfaction. *Responsibility: City Engineer to ensure prior to and during construction.*
6. CALFIRE shall sign an acknowledgement of the following:
  - a. Service is only to serve the fire station for domestic water use; it is not intended or sized for fire flows.
  - b. Recognize that the City has an obligation to prioritize service of parcels inside City limits. Should water availability be temporarily reduced due to drought, water line breaks, or other emergency situations, the supply to CALFIRE's line could be shut off until adequate capacity is available to serve all users within City limits, including storage capacity. The City shall attempt to notify CALFIRE of any such emergencies and potential interruptions to service as soon as possible. The City shall also attempt to restore service as soon as possible.
  - c. No other connections to the water line between its connection with Patrick's Point Drive and the CALFIRE station are allowed without City approval.

# **City of Trinidad Water Service Extension to CAL FIRE Trinidad Fire Station**

## **Project Description**

### **November 2018**

## **Introduction**

On behalf of CAL FIRE, SHN Engineers & Geologists has prepared this project description for the CAL FIRE Humboldt-Del Norte Unit Trinidad Fire Station, located at 923 Patrick's Point Drive (Assessor's parcel number 515-241-011), in the community of Trinidad, in Humboldt County, California (Figure 1). The fire station is located approximately ½ mile north of the City of Trinidad sphere of influence (SOI). It is within County Service Area Number Four (CSA4), which provides year-round fire protection service from McKinleyville to Orick. The proposed project is located within the California Coastal Zone and requires coastal development permits (CDPs) from both the City of Trinidad and the County of Humboldt.

## **Background**

CAL FIRE staffs the fire station year-round and responds to the City of Trinidad for all medical, traffic accident, structural, and wildland fire dispatches at the same time the Trinidad Volunteer Fire Department is dispatched. Because the fire station is very close to the City of Trinidad and is staffed, CAL FIRE's engine is usually on-scene faster than the Volunteer response. CAL FIRE is and has been providing this service at no cost to the City, clearly demonstrating a public service and public good to the City, as well as surrounding areas.

Existing site features at the CAL FIRE Trinidad Station (fire station) are shown on Figure 2. Currently, the fire station uses nearby surface water from Martin Creek to supply water for drinking, equipment cleaning, irrigation, and fire suppression. CAL FIRE has documented evidence that this water supply is unreliable and potentially unsafe, and therefore, the fire station is looking for an alternative potable water supply.

The proposed extension of City of Trinidad water service to the fire station was initiated as early as 2009, with a preliminary feasibility evaluation, conducted by Trinidad City Engineer Winzler & Kelly, and submitted to Humboldt Local Agency Formation Commission (LAFCo). The evaluation was to determine the potential water demand from the fire station, the available water supply from the City of Trinidad, and the infrastructure necessary to make the connection. Results found that the fire station's estimated peak demand of 800 gallons per day is less than 1% of the City of Trinidad's available capacity and that the City has available water supply and could provide the fire station with potable water.

In May 2010, Humboldt LAFCo determined that a Cortese-Knox-Hertzberg Act, Section 56133 exemption was applicable for the water service extension, given that the service in question involves a public service provider. Consequently, on May 19, 2010, Humboldt LAFCo approved CAL FIRE's application, and passed and adopted Resolution 10-07 determining that a LAFCo exemption applies for the water service extension from the City of Trinidad to serve the fire station; therefore, the proposed service extension does not require LAFCo approval.

However, in response to a CAL FIRE request, the California Coastal Commission (CCC) indicated in a summary email on July 11, 2014, that any such extension of water service would be inconsistent with the current Local Coastal Programs (LCP) of both the City of Trinidad and Humboldt County. The project parcel is outside of (directly adjacent to, on the north side of) the City of Trinidad's City service area/City service limit line (Figures 3



and 4). Therefore, amendments to the City of Trinidad's General Plan and Humboldt County's Trinidad Area Plan first need to be locally adopted and then certified by the CCC before CDPs for the proposed project could be found to be LCP-consistent and approved. The City and the County are almost finished updating their respective LCPs with the CCC to allow the extension of water service to the Humboldt-Del Norte Unit Trinidad Fire Station.

## **Proposed Project**

The proposed water line will serve only the fire station. Once potable water has been extended to the site from the City of Trinidad, the station will continue to use the existing surface water supply for equipment cleaning, irrigation, and fire suppression, thus limiting the potable water demand to indoor water use. Engineered plans have been prepared by SHN for the installation of a 1.5-inch diameter high density polyethylene (HDPE) water line beneath Patrick's Point Drive (approximately 5,400 linear feet), and for the connection to the existing 10,000-gallon tank at the facility (approximately 600 linear feet). It is proposed that the water line beneath Patrick's Point Drive will be installed using horizontal directional drilling (HDD) to a meter at the station, and the connection from the meter at Patrick's Point Drive to the existing facility water tank will be installed using open trenching.

## **Horizontal Directional Drilling**

Approximately 5,400 linear feet of 1.5-inch HDPE fused water pipe will be installed by HDD beneath Patrick's Point Drive. The typical depth of the new water line will be 5 feet minimum below ground level. HDD entry/exit pits will be located approximately every 300 to 700 feet along the new pipe alignment. HDD runs will vary between 300 and 700 feet in length, depending upon the contractor's equipment capabilities and suitable locations for the entry/exit pits. The contractor, in coordination with the City of Trinidad and the County of Humboldt as applicable, will determine the length of the individual runs and the exact locations of the HDD entry and exit pits based on materials, equipment used for the installation, proximity to underground utilities, and proximity to existing surface features such as driveways, signs, and vegetation. Approximately 10 HDD entry/exit pits will be needed. The pits will be approximately 4 feet by 6 feet in size, and approximately 5 feet deep (5 cubic yards each). Isolation valves and valve boxes will be installed approximately every 1,000 feet, at locations used for HDD entry/exit pits. Although the exact locations of HDD entry/exit pits are unknown, all entry/exit pits will be located in the paved roadway and/or on the shoulder, within the County right-of-way. Vegetation removal will be limited to the minimum necessary to accomplish the work and no substantial vegetation impact is anticipated. Soils excavated from the HDD entry and exit pits will be temporarily stockpiled in staging areas along Patrick's Point Drive (up to 4 feet by 8 feet area at each staging area) or offsite at a CAL FIRE-approved spoils stockpile area. The locations of the staging areas will correspond with the locations of the HDD entry/exit pits, to be determined by the contractor. The HDD process may be initiated from either direction, or both. Once the first drill pass has been completed, additional passes may be made to enlarge the borehole, until a borehole of sufficient size is made to accept the new pipe. As soon as each entry/exit pit is no longer needed, it will be backfilled and the ground surface will be restored to pre-project conditions. Valve boxes will be installed to provide access for operation of the isolation valves.

Cutting materials generated by the HDD operation will be removed from the borehole by pumping drilling fluid (bentonite) into the borehole. The return of these materials will be contained in the entry and exit pits and then pumped into a recovery unit. The recovery unit will remove cuttings from the drill fluid. The separated cuttings would then be transported offsite to an approved disposal site. Alternatively, the contractor may choose not to use a recovery unit, and would transport the drilling and cutting fluid offsite to an approved disposal site. Sediment controls will be implemented to prevent drilling fluids from migrating off site. There is a risk of

uncontrolled release of drilling fluids (hydraulic “frac-out”) during HDD. During drilling operations, the drilling mud fluid level will be monitored in the entry and exit pits to prevent overflow or loss of returns associated with frac-out. The entry and exit pits will be encircled with straw wattles and cleaned out with a vacuum truck to prevent the release of the drilling mud. This will be done during drilling, reaming, and pipe pull back.

As part of the HDD operation, tracer wire will be installed with the new pipe so that the HDD progress can be monitored from the surface and the installed pipe may be located from the surface in case future access is necessary.

Equipment to be used for HDD will consist of the following:

- A directional drilling rig of sufficient capacity to perform the bore, reaming, and pullback of the pipe
- A drilling fluid mixing, delivery, and recovery system (if fluid recycle is deemed appropriate by the contractor) of sufficient capacity to complete the installation.
- Drilling fluid storage and recycling system to remove solids from the drilling fluid when the fluid is reused (if fluid recycle is deemed appropriate by the contractor).
- A surface monitoring tracking system.
- Vacuum trucks of sufficient capacity to contain 150 percent of the drilling fluid volumes in use.
- Equipment and materials necessary and adequate to contain and clean unplanned drilling fluids release during hydraulic fractures at all times when drilling operations are underway.
- Trained and competent personnel to operate the systems.
- A tracking system with suitable technology for adding a down-hole pressure monitor for measuring drilling fluid pressures in the annulus of the borehole directly behind the cutting head (use of the down-hole pressure sub will be determined necessary if repeated incidental releases of drilling fluid to the environment occur.)

The following project requirements are included in the project specifications Section 33 05 23.13 Horizontal Directional Drilling:

- 1.3(A) Prior to beginning work, the contractor shall submit a comprehensive work plan detailing the procedure and schedule to be used to execute the project.... (B) The work plan shall include, at a minimum, the following elements:... (5) A proposed typical project site layout showing locations for drilling equipment and support systems; mud recovery equipment and tanks or pits, if included; sediment and environmental controls; source of water for construction operations; equipment trailers and support machinery; site security and boundary fencing; traffic control through the construction site for vehicles, bicycles, and pedestrians; and pipe storage, pipe staging during pull-in, fusion welding, and equipment storage areas.... (8) Environmental protection plan and hydraulic fracture contingency plan for preventing, responding to, correcting, and cleaning of fluids associated with hydraulic fracturing or unplanned drilling fluid release, including monitoring of fluid pressures and visual observations along the drill alignment for potential hydraulic fractures.... (11) Listing of proposed disposal sites for drilling fluids and cuttings; and methods of handling, transport, and disposal of drill fluids and cuttings.
- 2.2(B) All equipment shall be in good, safe condition with sufficient supplies, materials, and spare parts on hand to maintain the system in good working order for the duration of this project.
- 2.2(C) All stationary equipment shall be placed on and within a containment structure that will prevent the escape of fuel, oil, hydraulic fluid, and other potential contaminants that result from accidental equipment leaks or malfunctions.
- 3.2(A)(3) The required piping shall be assembled in a manner that does not obstruct adjacent roadways or public activities. The contractor shall erect temporary fencing to secure the entry and exit staging areas.

- 3.2(D)(1) During the drilling, reaming, or pullback operations, the contractor shall make adequate provisions for handling the drilling fluids, or cuttings at the entry and exit pits. Drilling fluids shall not be discharged into the surrounding environment. When the contractor's provisions for storage of cuttings on site are exceeded, these materials shall be hauled away to a suitable permitted disposal site. The contractor shall conduct directional drilling operation in such a manner that drilling fluids are not forced from the borehole into surrounding soil. After completion of the directional drilling work, the entry/exit pits, any access monitoring holes, and any accidental release of drilling fluids ("frac-out") locations shall be restored to original conditions as shown in the plans. The contractor shall comply with all permit provisions.
- 3.2(D)(2) Pits constructed at the entry or exit points and access areas shall be so constructed to completely contain the drill fluid and prevent its escape to the adjacent upland or waterways.
- 3.2(D)(7) Any accidental release of drilling fluids (such as, "frac-out") shall require an immediate stop of drilling and report to CAL FIRE and oversight agencies. The contractor shall control the fluid discharge and thoroughly clean up the released fluid to all permit requirements, before resuming drilling activities.
- 3.2(D)(8) All drilling fluid used shall comply with state, federal, and local environmental regulations; no exceptions.
- 3.2(G) After completion of the directional drilling work, the entry and exit pits, any accidental drilling discharge locations, and any access monitoring holes shall be backfilled and existing surfaces, restored. Equipment shall be de-mobilized, and the work site cleaned up and restored to the pre-project condition.
- 3.3(A) Contractor shall be responsible for complying with all local, state, and federal regulations pertaining to the project.
- 3.3(B) The HDD operation is to be conducted in a manner that eliminates the discharge of water, drilling mud, and cuttings to adjacent waterways or drainage features and land areas involved during the construction process. During the course of drilling operations, the construction site, the HDD alignment, and adjacent areas shall be checked frequently by the contractor for signs of unplanned leaks or seeps.
- 3.3(C) In the event that a hydraulic drilling fluid fracture, inadvertent returns, or return losses occurs during pilot hole drilling, reaming, or pull-back operations, contractor shall cease drilling, and implement the hydraulic fracturing (hydro-fracture) contingency plan. Equipment (vactors, shovels, etc.) and materials (such as, groundsheets, hay bales, booms, and absorbent pads) for cleanup and contingencies shall be provided in sufficient quantities by the contractor and maintained throughout HDD activities at all drill sites for use in the event of inadvertent leaks, seeps, or spills.

## Open Trenching

Open trenching will be used to install the approximately 600 linear feet of pipe at the fire station parcel. The trench would be approximately 1½ feet wide and 2½ feet deep (total 85 cubic yards). Following open trench pipe installation and connection to the existing facility water tank, the trench will be backfilled and the ground surface will be restored to pre-project conditions.

Equipment to be used for open trenching will consist of a backhoe or mini excavator, skid steer loader, dump truck, and service vehicles.

## BMPs and Contractor Requirements

The following project requirements are included in the General Notes on Sheet G-3 of the project plans:

- 3. The contractor shall prepare a detailed traffic control plan for all work areas and shall submit the plan to the City and County for discussion and approval at the preconstruction meeting. The traffic control plan shall comply with all required permits and other guidelines listed on these plans and in the specifications. The contractor shall clearly show on the traffic control plan how the contractor intends to position all signs and other traffic control devices throughout the work area during all phases of construction. The traffic control plan shall conform to the requirements of the Caltrans MUTCD (California Manual on Uniform Traffic Control Devices) Part 6 "Temporary Traffic Control."
- 13. The contractor shall take effective action to prevent the formation of an airborne dust nuisance. All construction shall be performed in such a manner as to comply with the standards established by the North Coast Unified Air Quality Management District for airborne particulates.
- 14. The contractor shall maintain all streets and sidewalks, and all other public right-of-way in clean, safe, and usable condition throughout the execution of the work. All spills of soil, rock, construction debris, etc. shall be removed immediately from publicly owned property. All adjacent property, public or private, shall also be maintained in a clean, safe, and usable condition. The contractor shall provide for safe, unobstructed access to private property adjacent to the work site, and safe passage of public traffic through the work zone during the construction period.
- 15. The contractor shall employ standard best management practices (BMPs) for erosion control, including but not limited to, implementing construction during the dry season, removal of the minimum amount of vegetation necessary to accomplish the work, and placement of straw bales or coir rolls downstream during construction.

## Timing of Construction

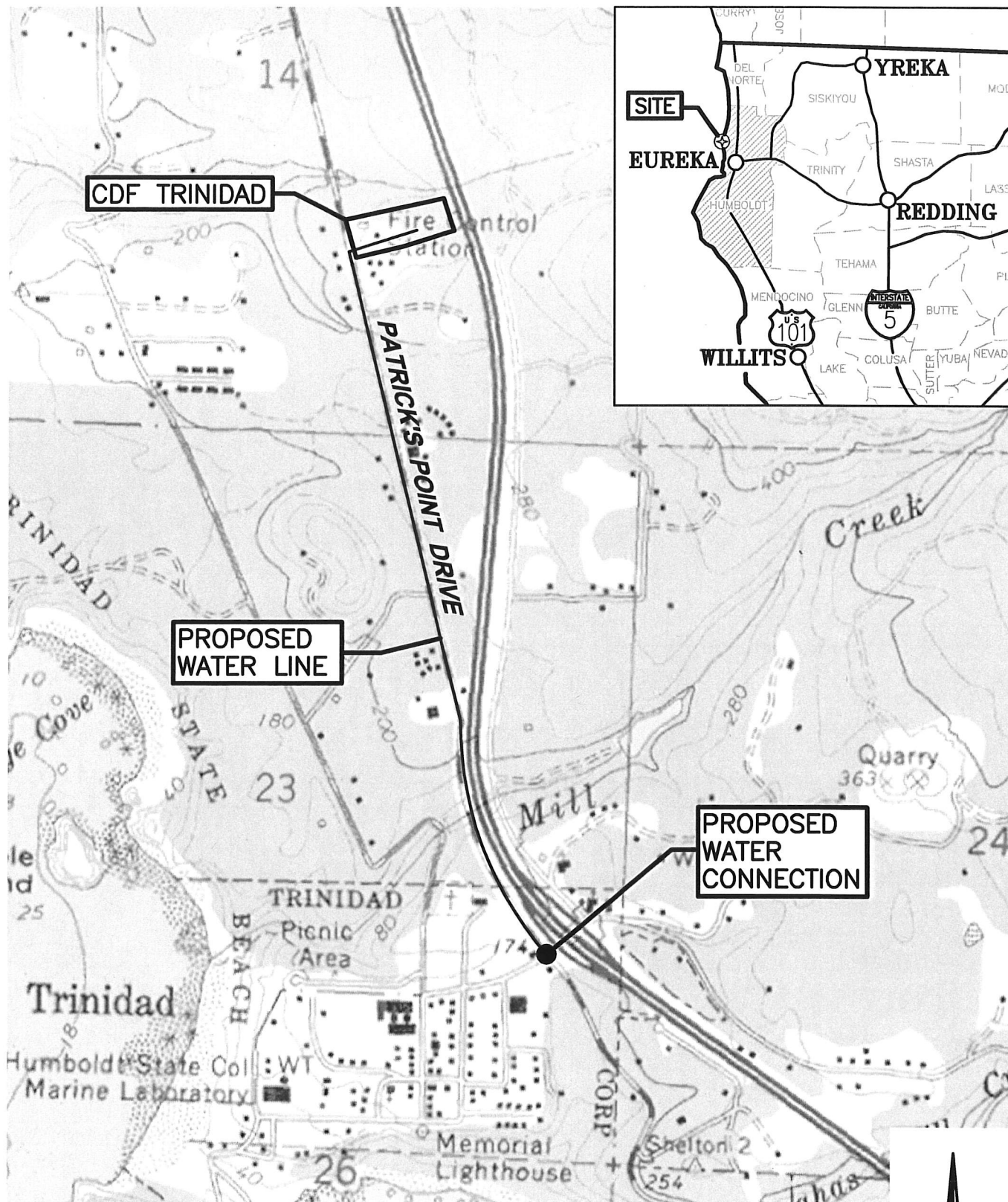
CAL FIRE plans to construct the project during the dry season. Construction is anticipated to take approximately 4-6 weeks.

Attachments: Figure 1: Site Location Map  
Figure 2: Enlarged Site Plan  
Figure 3: Trinidad General Plan Land Use  
Figure 4: Trinidad Area Plan Land Use Designations

# 1

## Site Location Map

\\Eureka\Projects\2015\015070-CDF-Trinidad\Drawings\SAVED: 8/18/2015 8:20 AM RRUEBER, PLOTTED: 8/25/2015 3:38 PM, NATHAN DOWNEY



SOURCE: TRINIDAD  
USGS 7.5 MINUTE QUADRANGLE



**SH**  
Consulting Engineers  
& Geologists, Inc.

CDF Trinidad Fire Station  
Trinidad, California

Site Location Map

SHN 015070

August 2015

015070-LCTN

Figure 1

PLN-2019-15312 CalFire Trinidad

ZA Supplemental #1 May 16, 2019

Page 18

# 2 Enlarged Site Map



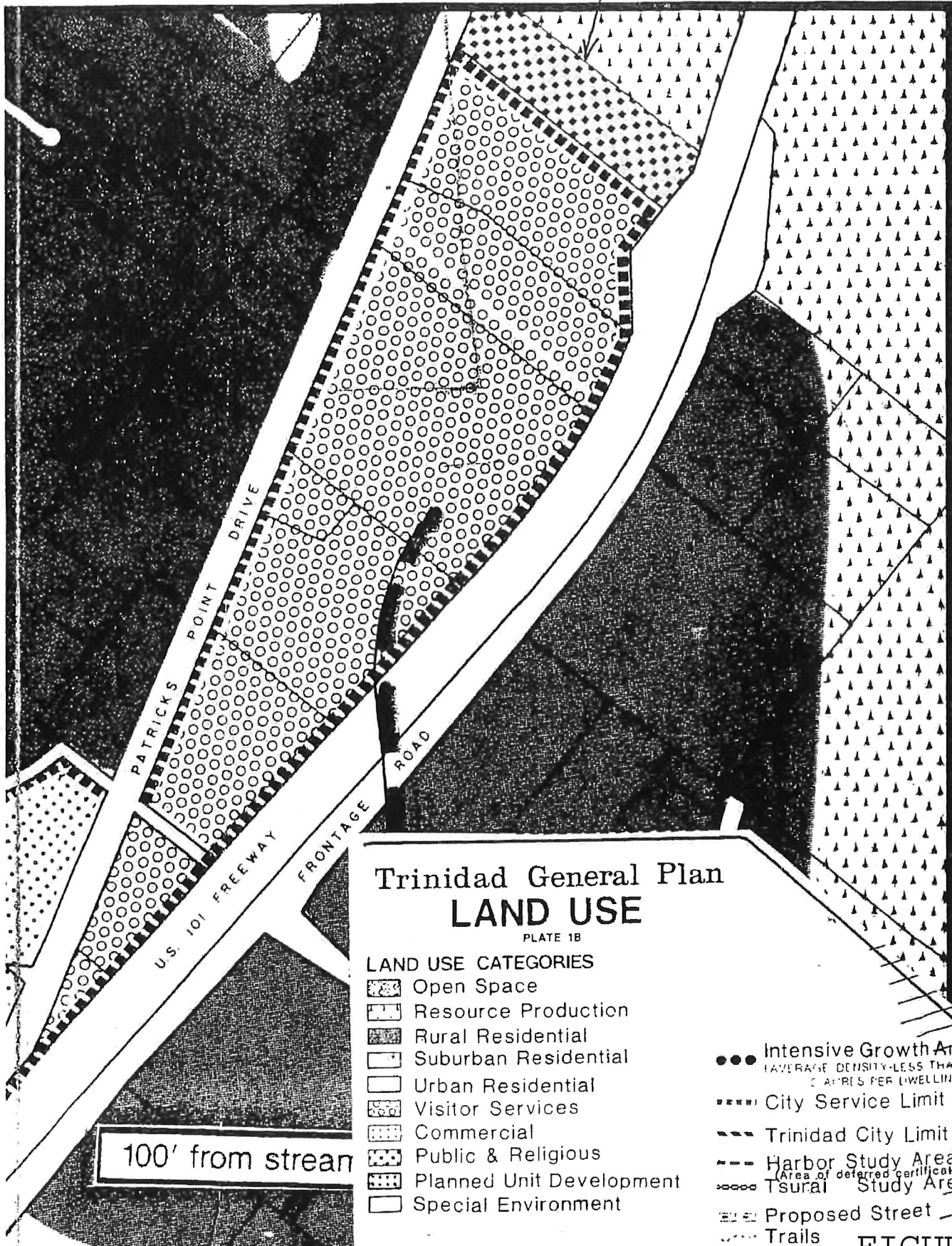






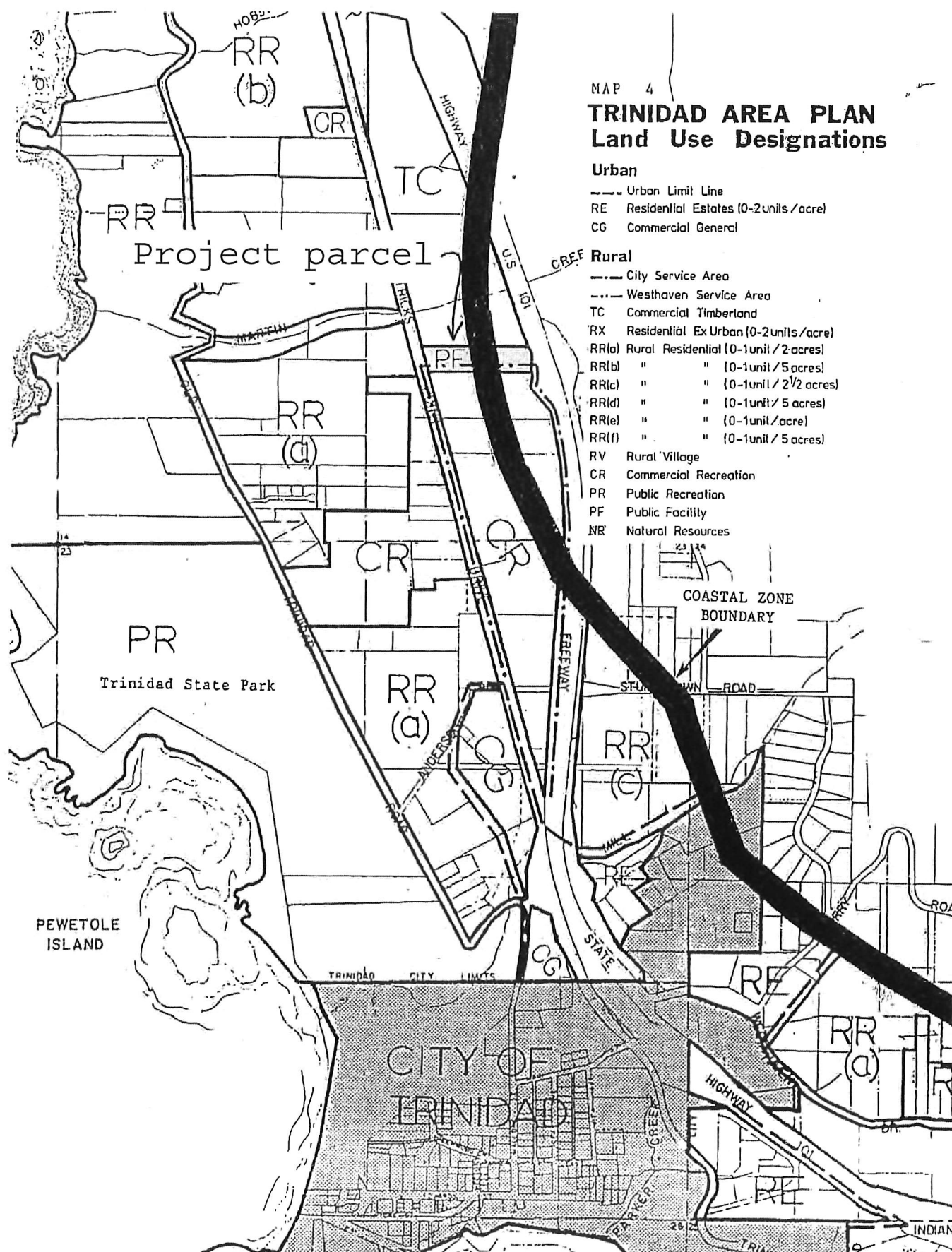
# Trinidad General Plan Land Use

Project parcel



# 4

## Trinidad Area Plan Land Use Designations



# CAL FIRE TRINIDAD FIRE STATION WATER SYSTEM UPGRADES TRINIDAD, CALIFORNIA



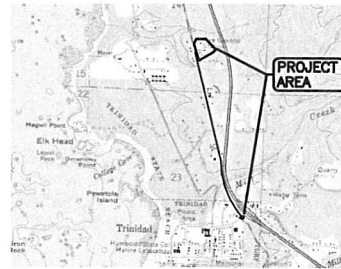
PREPARED BY:  
**SW**  
APRIL 2019

## APPROVALS

BOB BROWALL  
SUCITY ENGINEER  
COUNTY OF HUMBOLDT-DEPARTMENT OF PUBLIC WORKS

JOSE WOLF  
SUCITY ENGINEER  
CITY OF TRINIDAD-CITY ENGINEER

ANDREW STUBBS  
SW CONSULTING ENGINEERS & GEOLOGISTS, INC.  
PROJECT ENGINEER



## INDEX OF SHEETS

SEQ	SHEET	TITLE
1	G-1	COVER
2	G-2	STANDARD ABBREVIATIONS AND LEGENDS
3	G-3	NOTES AND SPECIFICATIONS
4	C-1	OVERALL SITE PLAN
5	C-2	PLAN AND PROFILE
6	C-2.1	ENLARGED PLAN
7	C-3	PLAN AND PROFILE
8	C-4	PLAN AND PROFILE
9	C-5	PLAN AND PROFILE
10	C-6	PLAN AND PROFILE
11	C-7	ENLARGED SITE PLAN
12	C-8	DETAILS
13	C-9	DETAILS



<b>SW CONSULTING ENGINEERS &amp; GEOLOGISTS, INC.</b> 1000 S. MAIN ST., SUITE 100 TRINIDAD, CA 95571 TEL: 707-441-1800 FAX: 707-441-1801 WWW.SW-ENG.COM	
PROJECT NO. TRINIDAD FIRE STATION WATER SYSTEM UPGRADES TRINIDAD, CALIFORNIA	SHEET G-1
DATE 04/2019	PROJECT NO. PLN-2019-15312

SW-ENG.COM  
PLN-2019-15312  
CAL FIRE TRINIDAD  
WATER SYSTEM UPGRADES  
TRINIDAD, CALIFORNIA  
APRIL 2019  
ANDREW STUBBS  
PROJECT ENGINEER  
41567

Page 26

1. ALL WORK BASED ON THESE PLANS SHALL CONFORM TO THE APPLICABLE SECTIONS OF THE FOLLOWING:

- a. CITY OF THUNDER STANDARD PLANS AND SPECIFICATIONS
- b. HUMBOLDT COUNTY STANDARD PLANS AND SPECIFICATIONS
- c. THE CONTRACT PLANS AND SPECIFICATION

IN THE ABSENCE OF PLAN AND SPECIFICATION DEFINITION, THE MORE STRINGENT SHALL GOVERN IN CASE OF CONFLICT

- OWNER: 4/9/2019 8:48 AM CREWELL, FLOTTED: 4/9/2019 11:21 AM CHRIS D. NEWELL

23. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW THE MANUFACTURER'S PRODUCT INFORMATION CUT SHEETS INDICATING DIMENSIONS FOR ALL MANUFACTURED AND PRECAST ITEMS PROPOSED FOR USE.

24. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURERS' RECOMMENDATIONS.

25. BIDDING HOURS SHALL BE:

26. THE CONTRACTOR SHALL SUBMIT AN ENDOCRICHMENT PERMIT APPLICATION, OBTAIN AND PAY FOR AN ENDOCRICHMENT PERMIT FROM THE CITY OF TOMBIGDO PRIOR TO BEGINNING CONSTRUCTION ACTIVITIES WITHIN THE CITY LIMITS.
27. THE CONTRACTOR SHALL SUBMIT AN ENDOCRICHMENT PERMIT APPLICATION, OBTAIN AND PAY FOR AN ENDOCRICHMENT PERMIT FROM HAMBURG COUNTY PRIOR TO BEGINNING CONSTRUCTION ACTIVITIES WITHIN HAMBURG COUNTY PORT OF WAY.
28. THE CONTRACTOR SHALL SUBMIT A COPY OF THE FINAL "AS-BUILT" PLANS AT THE CONCLUSION OF CONSTRUCTION TO THE OWNER, CAL FIRE TOMBIGDO FIRE STATION, STATE OF CALIFORNIA; TO THE PUBLIC WORKS DEPARTMENT OF HAMBURG COUNTY; AND TO THE PUBLIC WORKS DEPARTMENT OF THE CITY OF TOMBIGDO. THE FINAL "AS-BUILT" PLANS SHALL BE REVIEWED FOR COMPLETENESS BY THE ENGINEER PRIOR TO SUBMITTAL TO THESE AGENCIES.

THE CONTRACTOR SHALL SUBMIT PROPOSED INITIAL CONSTRUCTION SCHEDULE TO THE ENGINEER WITHIN 5 DAYS AFTER EXECUTION OF THE CONTRACT SHOWING THE ORDER AND INTENT TO CONSTRUCT ALL PORTIONS OF THIS PROJECT. THE ENGINEER SHALL PROVIDE OTHER INFORMATION AS NECESSARY TO THE CONTRACTOR TO PREPARE THE SCHEDULE. THE CONTRACTOR SHALL SUBMIT THE SCHEDULE TO THE ENGINEER WITHIN 10 DAYS AFTER EXECUTION OF THE CONTRACT. THE CONTRACTOR SHALL ADHERE BY THAT APPROVED SCHEDULE THROUGHOUT THE COURSE OF THE PROJECT UNLESS OTHERWISE AGREED TO BY THE ENGINEER.

IF, IF IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INDIVIDUALLY EXAMINE THE JOB SITES, THE CONTRACT SPECIFICATIONS, AND THESE PLANS PRIOR TO SUBMITTING HIS BID, NO ADDITIONAL PAYMENT SHALL BE MADE BY THE OWNER FOR ANY EXPENSE THE CONTRACTOR MAY INCUR IN EXAMINING THE JOB SITES, THE CONTRACT SPECIFICATIONS, AND THESE PLANS PRIOR TO SUBMITTING HIS BID. IN THE EVENT OF ANY DISCREPANCY, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE CORRECTIONS, OR THE REVISIONS OF THE PLANS, CONTRACT DOCUMENTS, GENERAL PROVISIONS, SPECIAL PROVISIONS, AND REFERENCED SPECIFICATIONS (PAVING, CULTIVATING, GRADE, ETC.)

I, PRIOR TO ANY PAYMENTS BEING MADE, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER A COMPLETE SCHEDULE OF "WELLS FOR ALL LAMP SITES AND ALL OTHER LAMP SITES" AS DESCRIBED IN THE APPROVED SCHEDULE OF THE PROJECT.

SURVEY INFORMATION FOR THIS PROJECT WAS PROVIDED BY THE TECHNICAL SERVICES DIVISION OF THE DEPARTMENT OF FORESTRY AND FIRE PROTECTION OF THE STATE OF CALIFORNIA, AND IS PRESENTED IN A PLAN SET NAMED PATRICK'S POINT DRIVE TOPOGRAPHIC SURVEY DRAWN BY G. JACKSON AND REVIEWED BY J. SHAWHON ON SHEET TWO DATED JANUARY 2015.

2. THE DATA FOR THIS PROJECT WAS OBTAINED FROM THE RECORDS OF THE COUNTY ENGINEER'S OFFICE CONTROL ON THE CALIFORNIA COORDINATE SYSTEM OF 1983, EPOCH 2004.86, ZONE 1, AS SHOWN ON SHEETS 2 AND 4 OF 14 OF "THE RECORD OF SURVEY; MONUMENT CONTROL MAP" AS FILED IN BOOK 7 OF SURVEYS AT PAGE 30 ON OCTOBER 8, 2008 IN THE RECORDS OF HUMBOLDT COUNTY.

3. THE DATA FOR THIS PROJECT WAS OBTAINED FROM THE RECORDS OF THE COUNTY ENGINEER'S OFFICE CONTROL OF 1903, ZONE 18B, ELEVATION MEASUREMENTS 1/4 MILE SOUTHERLY FROM TRINIDAD FIRE STATION ON WEST SIDE OF PATRICK'S POINT DRIVE, ELEVATION=2531.5 FEET ON THE NORTH AMERICAN VERTICAL DATUM OF 1988.

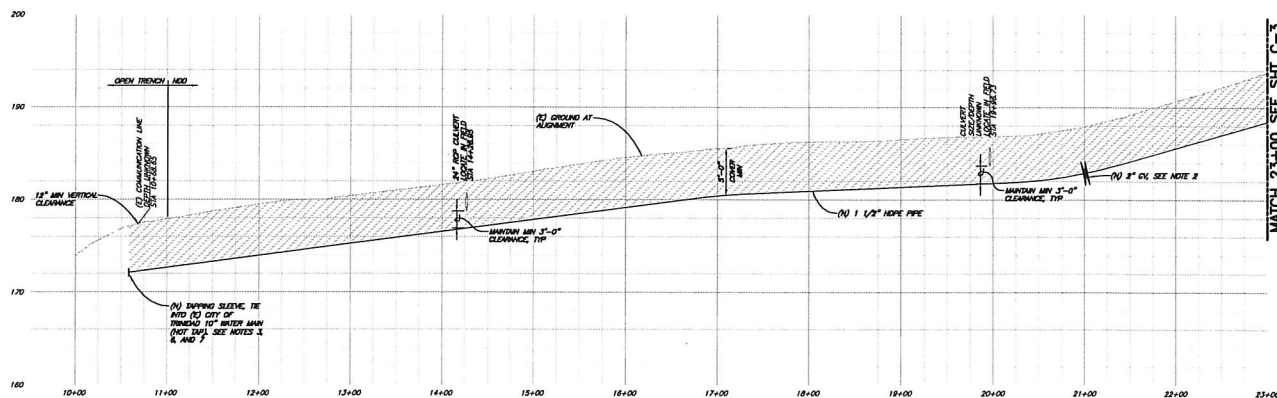
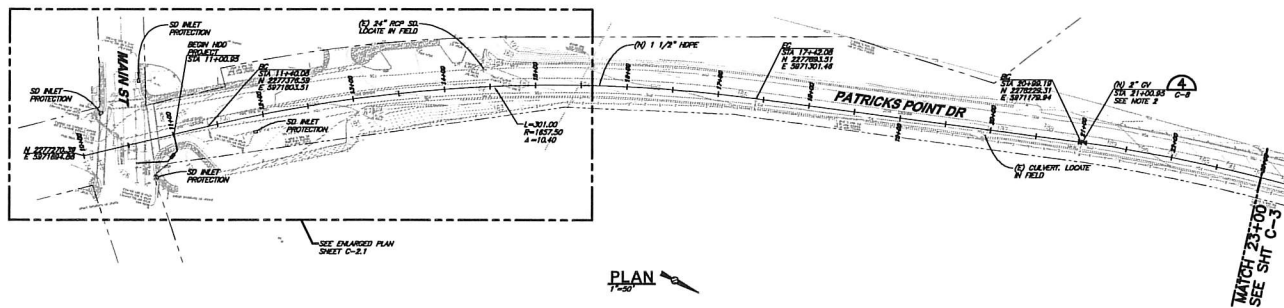
AUTHORS' NOTE: THERE ARE SEVERAL UNCERTAINTIES IN THIS REPORT. THESE UNCERTAINTIES OR CORRECTIONS RESULT FROM UNCERTAINTIES IN REFERENCE MONUMENTATION, RECORD DOCUMENTATION, PLATS, AND/OR DATA LOSS IN MEASUREMENT.





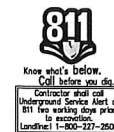


SHEET 4 OF 2019 CAL FIRE TRINIDAD 4/8/2019 8:48 AM CDR G. A. ARWELL  
 \\C:\projects\15312\15312.dwg - Trinidad\Drawings\15312-02-Plan.dwg



# NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR DETERMINING LENGTH OF RUN AND LOCATIONS OF ENTRY/EXIT PITS, SUBJECT TO ENGINEER'S APPROVAL. BASED ON MATERIALS, EQUIPMENT USED FOR THE INSTALLATION, PROXIMITY TO UNDERGROUND UTILITIES, AND PROXIMITY TO EXISTING SURFACE FEATURES SUCH AS DRAINAGE, SIGNS, AND VEGETATION. ALL ENTRY/EXIT PITS AND PIPELINE ALIGNMENT MUST BE WITHIN THE PROJECT'S POINT OF BEGINNING OF WORK.
2. GATE VALVES SHALL BE INSTALLED AT APPROXIMATELY EVERY 1,000 FEET. LOCATION SHOWN ON PLANS IS APPROXIMATE. FINAL LOCATION SHOULD BE COORDINATED TO OCCUR AT ENTRY/EXIT PIT LOCATIONS. CONTRACTOR SHALL FILL PIP AND SINGLE ENDING, COVER COATED STEEL, WITH BLUE INSULATION INTO BORE HOLE SMALLER THAN 1/2\"/>



<b>EVERY SCALE</b> 1" = 10' HORIZ. 1" = 10' VERT. 1" = 10' PLAN 1" = 10' ELEV.	
<b>STW CONSULTING ENGINEERS</b> 1111 N. MAIN ST., SUITE 100 SAN JOSE, CA 95128 TEL: 408.281.1111 FAX: 408.281.1112 WWW.STW-ENG.COM	
PROJECT NO. 15312	SHEET C-2
DATE 04/20/19	PROJECT CAL FIRE TRINIDAD 4/8/2019 8:48 AM CDR G. A. ARWELL





Reference: 015070

April 5, 2019

Ms. Trever Parker  
P.O. Box 390  
Trinidad, CA 95570

**Subject: Cal Fire Trinidad Water Line Sizing Justification**

Dear Ms. Parker:

This letter contains line sizing information for the Trinidad Cal Fire Station domestic water lateral.

The Cal Fire station is located at 923 Patrick's Point Drive. Domestic potable water for the station was historically supplied by a subsurface creek intake on the opposite side of U.S. Highway 101. The domestic water system was plagued with an unreliable supply of exceedingly poor quality. Therefore, Cal Fire has sought and obtained preliminary approval for potable water supply from the City of Trinidad's distribution system. Since the existing supply at the station is unsuitable for domestic use, the facility is temporarily being supplied with domestic water from a local water delivery service.

A 2009 Feasibility Analysis by the city engineer (Appendix A) concluded that the water system for the City of Trinidad has sufficient available capacity to meet the station's demands (peak of 2.2 gpm), and this additional demand was estimated at approximately 1% of the available supply. In the feasibility analysis, a preliminary pipe line sizing was presented, which concluded that a 1-inch supply line was sufficient to meet the potable water demand while complying with minimum residual pressure standards.

On May 19, 2010, the Humboldt Local Area Formation Commission (LAFCo) adopted resolution 10-07 (Appendix B) approving the extension of water service to the Cal Fire Trinidad Station. Item 3 of the resolution states: "The water line extension shall be a 1.5" diameter pipe size."

On September 28, 2016, Cal Fire prepared a memorandum that summarized the function and water use characteristics of the Trinidad State Fire Station (Appendix C).

In March 2017, the city engineer updated demand information from the Cal Fire station and estimated average day demands at 1,000 gpd and peak hour demands at 2.75 gpm (Appendix D); however, no additional assessment was completed for water line sizing.

The 2009 analysis assumed a pressure of 80 psi at the tie-in point with the city's distribution system. No calculation appendix was included in the analysis; however, it appears that minor losses in supply line were not considered.

Since the preliminary analysis was conducted by the city engineer, the design plans

for the water line extension have been completed, and additional installation details have been determined. With this design, flow calculations have been updated to include the pipe pressure class, quantity and type of fittings, and appurtenances. Additionally, supply pressures at the tie-in point were verified with the water treatment operator.

According to the operator, pressures at the tie-in location range from 55 psi to 94 psi; therefore, a range of supply scenarios was developed (Table 1). These scenarios consider the project design and the supply pressure range to estimate the maximum deliverable flow to the station's potable water storage tank. The pressure constraint is 20 psi at the station connection, according to California Water Works Standards Section 64602. Detailed calculations used for our analysis are provided in Appendix E.

**Table 1. Domestic Water Supply Scenarios  
 Trinidad Cal Fire Station  
 Trinidad, CA**

Pipe Diameter <sup>1</sup>	Pressure (psi) <sup>2</sup>	Maximum Deliverable Flow (gpm) <sup>3,4</sup>	Tank Refill Time While Supplying Average Demand (hours)
1-Inch	55	0.5	.5
	75	2.8	79
	94	3.9	52
1.5-Inch	55	1.4	236
	75	7.4	25
	94	10.1	18
1. DR9 pipe 2. psi: pounds per square inch 3. gpm: gallons per minute 4. maximum flow at station connection with 20 psi residual pressure 5. Supply rate is less than the average demand of 1,000 gallons per day			

From the updated calculations, the following conclusions are made:

- Neither the 1-inch or 1.5-inch line sizes can deliver the peak demand of 2.75 gpm at the low-pressure condition.
- The 1.5-inch line size can deliver the average day demand of 1,000 gpd at the low-pressure condition, whereas the 1-inch line cannot supply this demand at the low-pressure condition.
- Either line size can deliver the average and peak flows at the average and maximum tie-in pressures.

Reliable potable water supply is essential to the continued operation of the Cal Fire Facility.



Ms. Trever Parker

**Cal Fire Trinidad Water Line Sizing Justification**

April 5, 2019

Page 3

Draining of the 10,000-gallon potable water tank at the Cal Fire Station may occur on occasion for maintenance or for cleaning; therefore, refill times were calculated for each of the supply pressure and pipe diameter scenarios. The calculated times are presented in Table 1 and include filling coincident with supplying the station's average day demand of 1,000 gpd. At the lower supply pressure, the filling rate is either insufficient to meet demand or results in significantly long durations.

Based on the ability to supply the station's demands, the potential pressure range, and the time required to refill the potable water tank, it is recommended that the line size be no smaller than 1.5-inches in diameter.

Sincerely,

**SHN**



Jared O'Barr, PE  
Senior Civil Engineer

JXO:ame

- Appendices:
- A. 2009 Water Line Extension Analysis (Winzler & Kelly)
  - B. Humboldt Local Area Formation Commission Resolution 10-07
  - C. Trinidad State Fire Station Memorandum September 28, 2016
  - D. 2017 Water Line Extension Analysis (GHD)
  - E. Detailed Calculations



# Trinidad - CalFire water staff report

Steve Allen <Steve.Allen@ghd.com>

Wed 5/8/2019 5:04 PM

To: Trever Parker <tparker@shn-engr.com>;

Trever,

In our professional opinion, and based on the recent 'Water Treatment Plan Production Rate Test and Analysis' Memo (May 1, 2019), the City's provision of water to the CALFIRE station for domestic use will not remove capacity necessary to serve future development within the City and will not impair fire protection services in the City as long as the following conditions are incorporated into the approval:

1. CALFIRE shall sign an acknowledgment of the following:

- a. Service is only to serve the fire station for domestic water use; it is not intended or sized for fire flows.
- b. Recognize that the City has an obligation to prioritize service of parcels inside City limits. Should water availability be temporarily reduced due to drought, water line breaks, or other emergency situations, the supply to CALFIRE's line could be shut off until adequate capacity is available to serve all users within City limits, including storage capacity. The City shall attempt to notify CALFIRE of any such emergencies and potential interruptions to service as soon as possible. The City shall also attempt to restore service as soon as possible.

We support the following conditions also being included in the staff report:

1. The applicant is responsible for reimbursing the City for all costs associated with processing the application. Responsibility: City Clerk to place receipt in conditions compliance folder prior to issuance of an encroachment permit.
2. The applicant is responsible for negotiating a services agreement with the City, payment of any permit and hook-up fees and assumption of financial responsibility, and for securing all necessary approvals and permits needed to construct the water line, including Humboldt County. Responsibility: City Clerk prior to issuing an encroachment permit.
3. The final plans must be approved by the City Engineer at the time of or prior to issuance of an Encroachment Permit. City Clerk to verify prior to issuing an Encroachment Permit.
4. An encroachment permit is required for any work within the City right-of-way. City Clerk to verify prior to issuing an Encroachment Permit.
4. Any and all applicable recommendations of the July 2016 Horizontal Directional Drill Feasibility Evaluation shall be met by the applicant and contractor. City Engineer to verify prior to signing an Encroachment Permit.
5. The applicant and contractor are responsible for ensuring all provisions of the City's grading ordinance are met to the satisfaction of the City Engineer and that any other requirements of the City Engineer are met to his satisfaction. Responsibility: City Engineer to ensure prior to and during construction.

**Steven Allen, P.E.**  
**Senior Civil Engineer**

**GHD**

*Proudly employee owned*

T: +1 707 443-8326 | M: +1 707 599-6986 | E: [steve.allen@ghd.com](mailto:steve.allen@ghd.com)

718 Third Street Eureka CA 95501 USA | [www.ghd.com](http://www.ghd.com)

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reliable source of potable water as soon as possible. Therefore, a broad-scale approach was taken in addressing the requested information.

### City Build-Out Scenario

To start, the City exported monthly water use data for all the accounts in the City for December 2016 to November 2017. The meters are read monthly, so we cannot ascertain peak hourly or daily usage. However, the data does represent actual rather than assumed water use. The City analyzed development potential of vacant lands in its draft Housing Element (December 2013). Table 18—Inventory of Land Available for Residential Development by Land Use Designation and Zoning District—is attached to this letter along with Figure 20 from that document showing the vacant parcels in Trinidad. The vacant (developable) lots in the City fall into only three zoning designations – Planned Development (PD), Suburban Residential (SR), and Urban Residential (UR). The only other vacant lots are zoned Open Space and Special Environment and are publically owned or held by the Trinidad Coastal Land Trust, and so are not considered developable. There are no vacant Commercial, Public and Religious, or Visitor Service zoned parcels in the City. Trinidad has no industrial or agricultural zoning designations.

I then separated the water accounts by zoning designation and calculated the average annual and peak monthly (July) water use per account for each of the three zones. I did not do any “clean-up” or manipulation of the data, other than to ensure that there weren’t multiple accounts for the same unit or property due to a change in ownership. There were accounts with 0 water use, which are assumedly vacant. And there were accounts with large, noticeable water leaks. However, I figured this represented the most realistic picture of actual, average water use available. Many of the properties that have multiple units or business have separate water accounts for each user, but not all (e.g. the 4-plex at 651 Parker Street). I did not try to divide out those extra units, because I figured it was better to overestimate average water use for this analysis, the results of which are presented in Table 1 below. The City’s water billing and meter reading software present water use in cubic feet, but I converted it to gallons per day to compare with the water system capacity information presented in GHD’s report.

**Table 1 – Estimated Additional Water Use at Build-Out in Trinidad**

Zoning	Potential Number of New Units After Build-out <sup>1</sup>	Average Water Use			Peak Water Use		
		Average Annual Water Use Per Unit (c.f./yr.)	Average Daily Water Use Per Unit (gpd)	Potential Additional Average Daily Water Use (gpd)	Average Peak (July) Monthly Water Use Per Unit (c.f./yr.)	Average Peak Daily Water Use Per Unit (gpd)	Potential Additional Peak Daily Water Use (gpd)
UR	10 <sup>2</sup>	5650	115.8	1158	743	179.3	1793
SR	26 <sup>2</sup>	8113	166.3	4323	1160	279.9	7277
PD <sup>3</sup>	37	6181	126.7	4687	674	162.6	6017
<b>Total</b>				<b>10,167</b>			<b>15,087</b>



1. Based on the analysis conducted in the City's December 2013 Draft Housing Element. See attached Table and Figure from that document.
2. Since the analysis in the Draft Housing Element was done, two SR properties have been developed, and two developed UR properties have been merged with vacant UR properties, reducing the development potential in each of those zoned by two.
3. Includes both commercial and residential uses.

According to the recent analysis conducted by the City Engineer, GHD, and submitted as part of the LCPA application (memo dated 30 March 2017), the City's current available capacity under peak daily demand is 128,900 gpd. The average additional use after build-out would be 10,167 gpd, or 7.9% of the available peak day capacity. During the peak month, additional daily usage after build-out would be 15,087 gpd, or 11.7% of the available peak day capacity. With the additional build-out usage, the City's available capacity would be reduced to 113,813 gpd, during the peak month of July, and the peak daily demand from the Trinidad CALFIRE Station (1985 gpd) would utilize 1.74% of that available capacity.

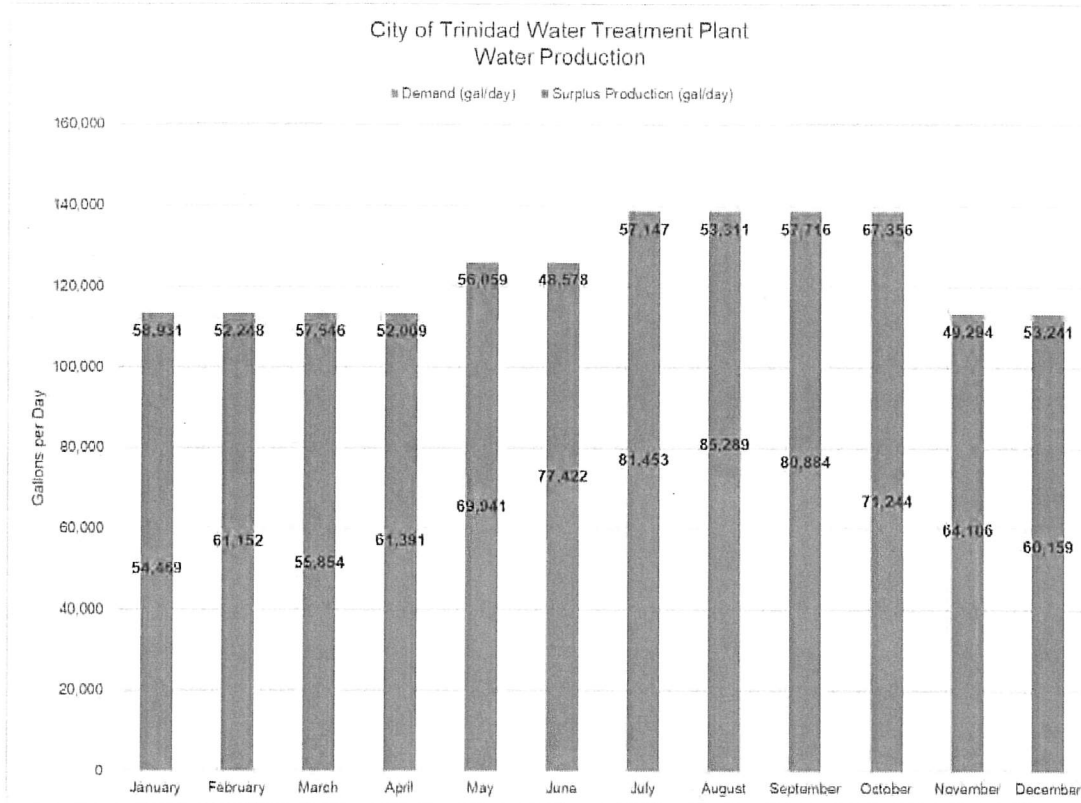
#### County Visitor Services Build-Out Scenario

The area being referred to in this request is a group of eight parcels designated CR—Commercial Recreation—in the Trinidad Area Plan, between Patrick's Point Drive and Hwy 101 just south of the CALFIRE parcel. These parcels range from 0.63 acres to 11.23 acres (Humboldt County GIS). The smallest one is already developed with a residence and two others are developed with RV parks, leaving five vacant or underdeveloped parcels. Using the same data as described above, the City calculated the average water use of the two RV Parks located within the City. This was applied to each of those five parcels in order to determine a potential future water demand. The results are presented in Table 2 below.

	Average Monthly Water Use Per R.V. Park (c.f./yr.)	Average Daily Water Use Per R.V. Park (gpd)	Potential New R.V. Parks / Visitor Serving Uses	Potential Additional Daily Water Use (gpd)
<b>Average</b>	5985	1472	5	<b>7359</b>
<b>Peak Month</b>	6784	1637	5	<b>8185</b>

Even during the peak month, the estimated potential additional water use after development of visitor serving uses on the five vacant or underdeveloped CR parcels in the County would be 6.3 of the City's existing peak day capacity. With the CALFIRE project and after build-out within the City, the potential additional 8,185 gpd peak usage would represent 7.3% of the City's remaining capacity of 111,828 gpd.

Based on the above analysis, it can be seen that the City has ample water supply capacity to serve the Trinidad CALFIRE Station and maximum build-out under the existing LCP with as well as priority visitor serving uses of the TAP planning area within the City's service area with a large margin of error. Please feel free to give me a call at 822-5785 or email me at



**Figure 6. Theoretical Daily Production Surplus by Month.**

It is important to keep in mind that these projected surplus capacities are approximate averages over typical months. Actual available surplus on any given day will depend on the actual characteristics at the time. The other factors evaluated (water right allocation, pump theoretical maximum rates, bypass flow rates, chlorine contact time, additive requirements, and pressure drop across the filter trains) do not appear to be limiting factors to water production rates.

## **8. Conclusions**

The Trinidad Water Treatment Plant and treatment process was evaluated under multiple production rates to identify factors limiting production and to determine the theoretical effective maximum water production capacity of Trinidad's drinking water production facility under current conditions. Of all the factors evaluated, turbidity breakthrough in the filters (and associated filter backwash) and decreases in the wetwell water elevations were limiting factors. Turbidity breakthrough on the filters stops the production of water and necessitates the backwashing of the filters. This condition is most noticeable during the winter storm period when the turbidity of the raw water from the creek is higher. Faster pumping rates cause the filter trains to foul quicker and shorten the runtimes of the filters before they need to be backwashed. The flow rate of 105



gpm allowed for sufficient runtime on the filter trains and allowed enough time between backwash cycles to process and discard the backwash water.

When turbid water from the creek is drawn into the creek bed the suspended sediments clog the void spaces between the gravels and causes a restriction to subsurface flow. The restriction of creek water migrating through the creek bed gravels and subsequently flowing into the wetwell leads to the lower water levels in the wetwell. This condition is exacerbated during the higher pumping rates. Restrictions on the flow into the wetwell is exacerbated by higher raw water turbidity from the creek, especially during storm events.

With a treatment plant production rate of 105 gpm and a maximum daily production run time that varied from 18 to 22 hours per day the daily maximum treatment plant production is between 48,578 and 67,356 gallons per day. This is much less than the City's annual allocation of water under the two appropriate permits of 337 acre-feet per year (just under 110 million gallons per year). Based upon a demand and production analysis, there is a theoretical surplus of up to approximately 48,000 gallons per day of supply to meet future service requests. How many and what type of service request can be accommodated will depend on how many and what type of requests there are as well as long term raw water supply characteristics, City water facilities characteristics, and operational practices.

It should be noted that current water demand are met with the existing water treatment plant staff and facilities. Increasing the pumping rates and total amounts of water produced will certainly require additional efforts in treatment plant staff time, pumping electrical costs, maintenance costs, monitoring costs, and chemical costs. While the increased water production rates are possible the increased costs associated with the increase should be considered. These impacts were not evaluated in this analysis.

The current City water system includes two water tanks. These tanks provide storage that allow the plant to be operated with minimal staffing and does not require multiple daily or night shifts to meet the daily demand. In the event of a break down at the plant or a break in a water line, there is typically capacity in the tanks to meet the existing daily demand while the problem is resolved. The existing surplus capacity may then be used to "catch up" and refill the storage tanks. This ability to handle emergency situations is decreased when the surplus supply is allocated to other customers and may make recovery difficult or limit service until the problem is resolved.

Future supply allocations should also consider the need for firefighting demand. The existing water tanks and supply lines currently serve the City's fire demand needs. It is not known if the existing system meets today's standards for fire protection flows. Any future supply allocations should include an analysis of storage and pipe system capacity to meet the fire demands of the new allocation.

Increased supply and demand through the existing system may impact the disinfection process of the water supply system. While the chlorine contact basin will certainly meet the chlorine contact time requirements, this evaluation did not consider the potential impacts on the chlorine residual or chlorine byproducts throughout the entire water delivery system. The operation of the water delivery system is very dynamic and City staff quite artfully operate the system to ensure a safe chlorine residual throughout the delivery system while minimizing the formation of chlorine byproducts. Any changes to the production, storage, and delivery of new water services should include an evaluation of the delivery and storage system with regards to disinfection and disinfection byproducts.