

# Technical Memorandum

**To:** Jay Schlosser – Development Services Director

**From:** Josh Nord, PE  
Diana Orozco, EIT

**Date:** February 6, 2020

**Re:** Water Entitlement Fee Study (DRAFT Rev. 1)

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## **Background**

The City of Tehachapi (City) relies upon both groundwater and imported surface water supplies to meet the demands of existing customers and future development. Groundwater pumping is subject to limitations under the terms of the 1971 Tehachapi Basin Adjudication and surface supplies (when available) are managed by the Watermaster Tehachapi-Cummings County Water District (TCCWD).

City ***Municipal Code Section 13.08.020 Water Rights and Water Entitlement Fee*** was established to protect the water supply available to existing customers from being impacted by future development. This Ordinance establishes the following:

- If property owner (developer) has sufficient water rights – property owner may transfer water rights to the City sufficient to accommodate the development
- If property owner does not have sufficient water rights – property owner may purchase unallocated water rights owned by the City at the current cost
- If property owner does not have sufficient water rights, purchases unallocated City rights, and the total is still not sufficient – property owner may pay a fee called the “Water Entitlement Fee” for the needed water to accommodate the development
- The supply is to be sufficient to accommodate development for 20 years (or other period as identified by City Council)
- The supply is to be no less than one-half acre foot (AF) of water for each equivalent dwelling unit
- The Water Entitlement Fee is to be revisited from time to time and may be established by the City Manager or his/her designee

The City is currently engaged in a comprehensive review and update to its water and sewer connection fees. Therefore, City management staff have determined that it is an appropriate time to evaluate the sufficiency of the Water Entitlement Fee. This fee study is intended to set forth the framework for the fee, summarize the existing fee structure, define options for obtaining additional supplies, and state the assumptions and methodology used in developing the recommended updated Water Entitlement Fee.

## **Framework**

The three primary paths available to the City for obtaining additional supply are:

- Option 1 - purchasing adjudicated basin groundwater rights on the open market,
- Option 2 - purchasing imported State Water Project (SWP) water from TCCWD, and
- Option 3 - implementing a project that will provide for additional groundwater allocation.

With regard to Option 1, the purchase of an available water right transfers the allowable pumping allocation from one user in the Tehachapi Basin to another and thus results in an annual increase in the pumping allocation for the purchaser. Note that 1 AF as an adjudicated right allows a maximum of 0.67 AF per year of allowable pumping allocation.

With regard to Option 2, the purchase of SWP water through TCCWD results in a stored water credit to the account of the purchaser in the Tehachapi Basin.

With regard to Option 3, the intent is to allow for projects resulting in an increase in allowable pumping allocation to be constructed in-lieu of obtaining water elsewhere. To that end, the City has begun development of the Groundwater Sustainability Project (GSP) in order to recharge highly treated effluent into the Tehachapi Basin, thereby resulting in a stored water credit for the recharger (equal to the recharge volume minus applicable losses).

All of the above options are consistent with the intent of the parameters defined in Tehachapi's Municipal Code and the California Government Code sections related to fees. Tehachapi's *Municipal Code Section 13.080.020 Part C* establishes that the Water Entitlement Fee should be based on the cost of obtaining the water supply from the Watermaster (TCCWD) and notes that if the Watermaster doesn't have sufficient water that the cost should be based upon purchasing the same supply on the open market. Furthermore, *California Government Code Section 66013*, requires that when a local agency is imposing a capacity charge for a new public facility to be constructed in the future, the amount of the fee is not to exceed the estimated reasonable cost of providing the service for which the fee is imposed.

## **Existing Water Entitlement Fee**

The existing water entitlement fee is not specified in the City's Municipal Code; however, the City established a water entitlement fee of \$500 per equivalent dwelling unit in 2007.

## Evaluation of Options

The components, capacity, and costs related to the three primary options for obtaining additional groundwater pumping allocation vary greatly as the methods are diverse and thus a brief discussion of each is presented below.

### **Option 1 – Purchase of Groundwater Rights**

**Components** - There are no components required for implementing a purchase of Tehachapi Basin groundwater rights. However, facilities will be required to extract, store, and convey the acquired water right. The construction of any needed facilities would be covered by the City's Water Connection Fee (see *Water and Sewer Connection Fee Study*, Lechowicz + Tseng 2020).

**Capacity** – The groundwater market in the Tehachapi Basin is illiquid in that the availability of adjudicated groundwater rights for sale on the market in any given year is not guaranteed. In addition, the pricing of said rights (when available) varies widely based on market conditions. The capacity of the groundwater market within the Tehachapi Basin cannot be determined as there is no mandate for any groundwater right holder to transfer those rights.

**Costs** - It is not practical to determine a typical price for an acre-foot of water within the Tehachapi Basin as the market is very limited and highly variable.

### **Option 2 – Purchase of Imported State Water**

**Components** – SWP water is imported using TCCWD's facilities, which include four pumping plants and thirty-one miles of 27- to 39-inch transmission main. Once the SWP water has reached the Tehachapi Basin, it is stored in the Jacobsen Reservoir. TCCWD's infrastructure was constructed in the 1970s and is operated and maintained by TCCWD using funds generated through TCCWD's Term M&I Water rates.

**Capacity** – TCCWD has two contracts with Kern County Water Agency for SWP water. The contracts provide TCCWD with a firm entitlement of 19,300 acre-feet per year (AFY) at 100% allocation (divided at 15,000 AFY municipal and industrial uses [M&I] and 4,300 AFY agricultural uses). It should be noted that the reliability of the SWP has historically averaged approximately 60% and thus the availability of SWP water can be and often is limited depending on hydrology. TCCWD has imported less than 2,000 AFY for M&I uses in each of the last 10 years and thus it would appear that TCCWD should have ability to import more SWP water when it is available.

**Costs** – TCCWD sets rates annually via Board resolution action. The current document (Resolution 3-19) establishes the rates by type of user (Ag and M&I) and by pressure zone. The City of Tehachapi falls within Pressure Zone 2. Pressure Zone 2 rates are set forth in Section 4 of Resolution 3-19:

- Non-potable water - \$ 436.00/AF
  - Recharge surcharge - \$ 15.00/AF
  - Spreading loss surcharge - \$ 26.00/AF
- Total - \$ 477.00/AF**

The noted recharge and spreading losses would be applicable as TCCWD would be importing water for artificial recharge. However, Resolution 3-19 also notes that customers in the Tehachapi Basin will be charged 106% of the water posted to their banked account in-lieu of the spreading surcharge.

### Option 3 – Implementation of GSP

**Components** - The *Indirect Potable Reuse Evaluation Technical Memorandum – Addendum to the Conceptual Study Summary Report (2018 TM)* developed by AECOM in July 2018, details the GSP components proposed for implementation. These components generally include treatment improvements, conveyance facilities, and spreading grounds as outlined in **Table 1-1**. The WWTP improvements consist of the addition of cloth disc filtration, UV disinfection, and chlorine injection thus producing tertiary level recycled water that will be fully oxidized and processed through multiple barriers. The conveyance facilities include improvements to the effluent pump station, construction of a new borrow pit pump station, and installation of a transmission main to Blackburn Dam. The spreading ground improvements will include piping and stabilization improvements at the Dam.

**Capacity** - Although the City intends to initially construct 1.25 million gallons per day (MGD) capacity as part of the GSP, the facilities will all be expandable to a foreseeable capacity of 2.0 MGD. Specifically, the initial phase of the GSP implementation is expected to include:

- 1.25 MGD tertiary improvements at the WWTP (designed for expansion to 2.0 MGD)
- 2.0 MGD conveyance facilities
- 2.0 MGD recharge facilities

The future phase of GSP implementation would include installing WWTP improvements required to expand from 1.25 to 2.0 MGD. The City's *Water and Sewer Systems Build-Out Evaluation Draft Rev. 1*, prepared by MKN in December 2019, indicates that the total allocation available to the City once GSP is implemented is estimated to surpass demands in the year 2048. In 2048, the available allocation is estimated to be 3,654 AFY. Subtracting the current water consumption of 1,878 AFY from the projected allocation yields a usable additional allocation of 1,776 AFY (or 1.585 MGD). This additional allocation (or capacity) is used in this study to develop an updated fee.

**Costs** - The original Opinion of Probable Cost for the GSP with a 1.25 MGD capacity was generated in the 2018 TM. Elements of this cost opinion have been increased to account for the future expansion to 2.0 MGD. The opinion of probable cost was updated using the Engineering News-Record Construction Cost Index (ENR CCI).

ENR CCI values for July 2018 and December 2019 were used to establish the ratio (1.0239 or 2.4% increase) that was applied to update the Opinion of Probable Cost from the 2018 TM. The updated costs are shown below in **Table 1-1**. Also shown is the estimated cost at the mid-point of construction, assuming an escalation of three percent per year and five years to reach the mid-point of construction (a 15% increase).

<b>Table 1-1. Updated GSP Opinion of Probable Cost</b>			
	<b>2018 TM Cost</b>	<b>Escalated 2019 Cost</b>	<b>Mid-Point Cost (5 years)</b>
<b>Mobilization (5% of construction cost)</b>	\$261,000	\$268,000	\$309,000
<b>Treatment Components</b>			
Site Work and Concrete	\$300,000	\$615,000	\$708,000
Canopy	\$110,000	\$113,000	\$130,000
Cloth Disc Filters	\$550,000	\$1,127,000	\$1,297,000
UV Disinfection with Chlorine Addition for Residual Maintenance and Additional Virus Credit	\$850,000	\$1,741,000	\$2,003,000
Electrical Improvements	\$100,000	\$205,000	\$236,000
SCADA Improvements	\$100,000	\$103,000	\$119,000
Treatment Subtotal	\$2,010,000	\$3,904,000	\$4,493,000
<b>Conveyance Components</b>			
Effluent Pump Station Upgrade	\$550,000	\$564,000	\$649,000
Borrow Pit Pump Station	\$1,275,000	\$1,306,000	\$1,502,000
Borrow Pit Bypass Pipeline	\$150,000	\$154,000	\$178,000
Transmission Pipeline	\$1,200,000	\$1,229,000	\$1,414,000
Conveyance Subtotal	\$3,175,000	\$3,253,000	\$3,743,000
<b>Spreading Grounds Components</b>			
Spreading Grounds Improvements	\$40,000	\$41,000	\$48,000
Subtotal Spreading Grounds	\$40,000	\$41,000	\$48,000
GSP Improvements Subtotal	5,486,000	\$7,466,000	\$8,593,000
Contractor Markups (15%)	\$823,000	\$1,120,000	\$1,288,000
Subtotal with Markup	\$6,309,000	\$8,586,000	\$9,874,000
Contingency (25%)	\$1,577,000	\$2,147,000	\$2,470,000
<b>Opinion of Construction Cost</b>	<b>\$7,886,000</b>	<b>\$10,733,000</b>	<b>\$12,343,000</b>
Permitting, Design, and Engineering (25%)	\$1,972,000	\$2,684,000	\$3,087,000
<b>Total Cost</b>	<b>\$9,858,000</b>	<b>\$13,417,000</b>	<b>\$15,430,000</b>
Notes:			
1. The ENR CCI value for July 2018 is 11116.40.			
2. The ENR CCI value for December 2019 is 11381.48.			
3. All costs are rounded up to the nearest thousand.			
4. 2018 TM Costs for cloth disc filters, UV disinfection, and electrical improvements were increased.			

## **Fee Calculation Methodology**

The calculation of a fee for each option varies slightly as the components and capacity are different. For Option 1, the calculation of an accurate fee is not practical as previously noted. For Option 2, the calculation of a fee required establishing the current usage per single-family residence (SFR) and the resulting cost for a 20-year supply at a projected TCCWD rate. For Option 3, the calculation of a fee required establishing the additional capacity resulting from GSP implementation, identifying current usage per SFR, and determining the total number of potential SFRs that may be served by the project. The following sections summarize the methodology employed for Options 2 and 3.

### **Assumptions**

In the evaluation of the updated Water Entitlement Fee for new developments, Option 2 losses are handled via the fee structure while in Option 3 in-plant losses and recharge losses were not considered. In the case of GSP implementation, it was presumed that these losses are relatively small. Additional analyses would be required to achieve an accurate loss estimate.

### **Existing Water Usage**

According to *Technical Memorandum No. 2 – Existing Water Demand and Sewer Flow Analysis* prepared by MKN in June 2019, the average demand per residential capita is 118 gallons per day (gpd). Assuming 2.5 persons per SFR, the estimated water usage per SFR is 295 gpd or 0.33 AFY.

### **Development of Updated Fee**

#### **Option 2**

Based on the current SFR usage of 0.33 AFY, the 20-year supply total would be 6.6 AF. At the current rate of \$477/AF, the total cost would be \$3,148 per SFR to provide a 20-year supply in accordance with State and City code.

#### **Option 3**

As previously noted, the GSP components will generate an additional capacity of 1.585 MGD. Based on an average day demand of 295 gpd per SFR, the equivalent number of SFRs that can be served by the GSP supply is 5,373. Dividing the updated total mid-point of construction GSP cost from **Table 1-1** by the future number of potential SFRs to be served, results in a Water Entitlement Fee of \$2,872 per SFR.

### **Scaling of Fees**

The updated Water Entitlement Fee is based on an SFR, or SFR equivalent. Thus, it is necessary to identify the scaling of fees for non-SFR development. The *Water and Sewer Connection Fee Study (Lechowicz + Tseng 2020)* includes Table 13, which lays out multipliers that are appropriate used to scale other types of development (both residential and non-residential) to an SFR. It is recommended that the City employ this table when evaluating the appropriate Water Entitlement Fee for proposed developments.

### **Summary**

It is recommended that the updated Water Entitlement Fee be set to \$3,148 per SFR as this rate is sufficient to cover the projected costs of either Option 2 or 3 based on the assumptions described herein. It is further recommended that the City prioritize use of the Water Entitlement Fee as follows: 1) purchase of water rights (Option 1) when available at a price point that fits within the fee structure, 2) implementation/construction of GSP (Option 3), and 3) importation of a 20-year supply for each SFR through TCCWD (Option 2).