Upper San Luis Rey Valley Groundwater Management Authority

Cost of Service Study

May 2024

Pursuant to California Water Code § 10730.2 and
Articles XIIIC and XIIID of the California Constitution.

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I. Executive Summary

Background

The California Legislature enacted the Sustainable Groundwater Management Act ("SGMA") in 2014, marking the first Statewide effort to manage its groundwater basins. The goal of this historic legislation is to ensure that groundwater is sustainably managed and protected for all beneficial users, both now and in the future. Although it was enacted at the State level, SGMA was envisioned to be implemented locally. As such, it mandates that local Groundwater Sustainability Agencies ("GSAs") be formed in medium and high-priority basins to develop and implement Groundwater Sustainability Plans ("GSPs").

The Upper San Luis Rey Groundwater Management Authority is a joint powers authority ("JPA") created in May 2022 to manage the Upper San Luis Rey Valley Subbasin, located in rural northern San Diego County, pursuant to SGMA. The Authority consists of member agencies Pauma Valley Community Services District ("PVCSD"), Upper San Luis Rey Resource Conservation District ("USLRRCD"), Yuima Municipal Water District ("YMWD"), and the Upper San Luis Rey Indian Water Authority ("USLRIWA"). The Authority is responsible for the implementation of the GSP, and associated monitoring and reporting activities required by the State.

The Upper San Luis Rey Valley Groundwater Sustainability Plan was adopted in January of 2022 and submitted to the California Department of Water Resources ("DWR"). On January 18, 2024, DWR approved the GSP. The Authority is tasked with implementing the Plan and achieving Subbasin sustainability by 2042.

In January 2023, the Authority engaged a consultant team led by SCI Consulting Group ("SCI Team") to develop a Cost of Service Study for the Subbasin, with the ultimate intention of developing a sustainable funding source to support GSP implementation. This effort has included comprehensive data analysis, review of funding options, evaluation of rate structure approaches, and the development of rate and fee schedules. The GSA Board and staff have provided input as well as data related to groundwater use. The scope of work also includes a community meeting, to be held in the Spring of 2024 to incorporate the community perspective into the Rate and Fee Study process. If successfully adopted, the Authority plans to implement the fee program in the Spring of 2024.

This Study outlines the fee schedule for funding the Authority's operational expenses through the next five years of GSP implementation. It summarizes the efforts of the GSA, Member Agencies, and consultants in determining the financial, legal, and policy decisions best suited to funding groundwater management in the Subbasin. This summary includes considerations of legal authority, funding structure, and fee methodology.

Objectives

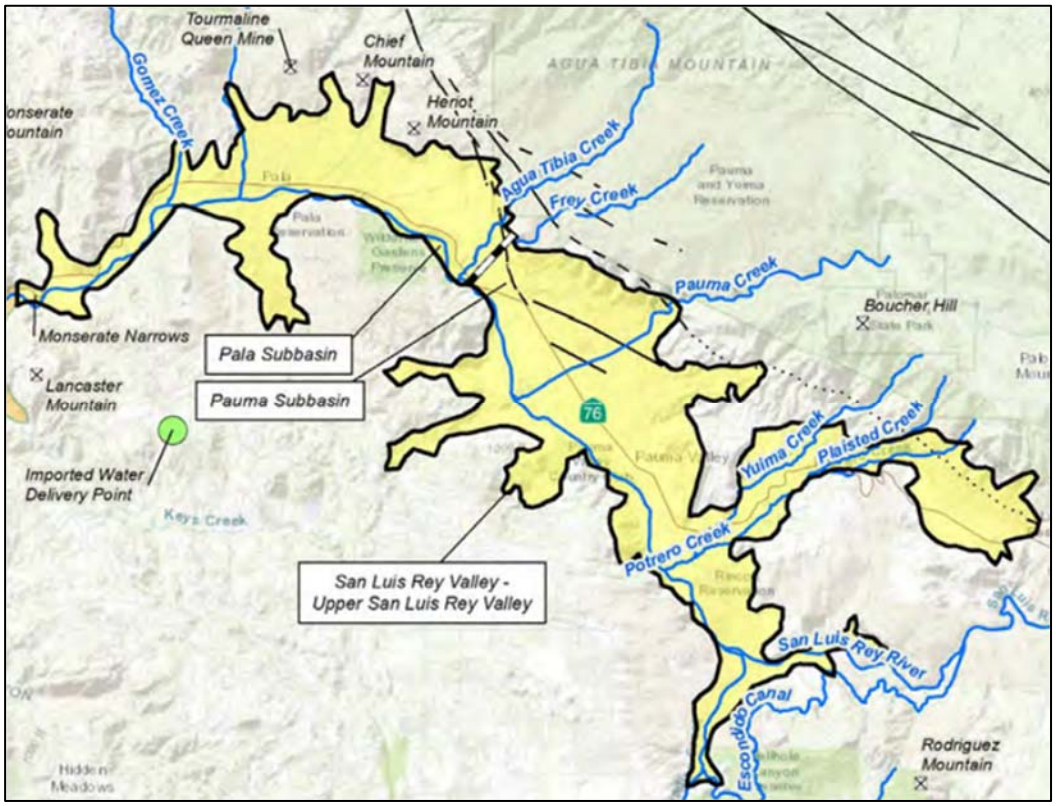
The objectives of this Cost of Service Study include the following:

- Development of a GSP implementation budget
- Development and refinement of parcel-scale groundwater-use data
- Development of fee methodology and rates

Subbasin Characteristics

The Upper San Luis Rey Valley Subbasin includes both the Pauma and Pala Subbasins and underlies approximately 19,200 acres in northern San Diego County.[1] In whole, the Subbasin extends from the confluence of the San Luis Rey River and Paradise Creek in the east, to the Monserate Narrows in the west. The Subbasin is shown below in Figure 1, as shown in the GSP (GSP, 0-3).

Figure 1 – Upper San Luis Rey Valley Subbasin Boundary



[1]Upper San Luis Rey Valley GSP, 0-6, https://sgma.water.ca.gov/portal/service/gspdocument/download/7813.

The Subbasin is primarily comprised of irrigated agricultural lands, but also contains significant open space/rangeland, limited residential land use, and a small amount of commercial/industrial land use (GSP, 0-3). A combination of groundwater, surface water, and imported water are utilized within the Subbasin for these different land uses.

The Subbasin is also home to several federally recognized tribes. The La Jolla Band of Luiseno Mission Indians, the Rincon Band of Luiseno Mission Indians, the Pauma Band of Luiseno Mission Indians, and the Pala Band of Luiseno Mission Indians exercise federally reserved water rights within their respective reservations. Pursuant to Water Code § 10720.3, participation of federally recognized tribes in SGMA activities is voluntary. Specifically, this Section notes that "any exercise of regulatory authority, enforcement, or imposition and collection of fees is pursuant to the tribe's independent authority and not pursuant to authority granted to a groundwater sustainability agency under this part." For this reason, the sovereignty of tribal lands will be respected, and they shall not be included in the fee schedule outlined by this Study, or it's associated methodology.

Basin Prioritization

The Department of Water Resources assigns each of California's 515 groundwater basins a prioritization rating. The Basin Prioritization rating dictates whether a basin is designated very low, low, medium, or high priority as shown in Table 1.

Table 1 - SGMA Priority Ranking Criteria

Priority	Total Priority Point Ranges			
Very Low	*over*	zero	*up to*	7
Low	*over*	7	*up to*	14
Medium	*over*	14	*up to*	21
High	*over*	21	*up to*	42

Medium and high priority basins are required to establish a groundwater sustainability agency and develop a groundwater sustainability plan. With a priority ranking score of 19, the Upper San Luis Rey Valley Subbasin is classified by DWR as a medium-priority basin. The Subbasin's priority point allocation is illustrated in Table 2.

Table 2 – Upper San Luis Rey Valley Subbasin Priority Points

	Criteria	Priority Points
1	Population	1
2	Population Growth	3
3	Public Supply Wells	5
4	Total Wells	3
5	Irrigated Acres	3
6	Groundwater Reliance	4
7	Impacts	0
8	Habitat and Other Information	0
	Total Priority Points	19

Subbasin Conditions

The conditions of the Upper San Luis Rey Valley Subbasin are discussed in detail in the GSP. Land use in the Subbasin is predominantly characterized by agricultural activities, with major crop varieties including avocados, citrus crops, and pasture grass.

Per Water Code § 10721(x), SGMA identifies six sustainability indicators, which are the effects caused by groundwater conditions occurring throughout the Subbasin that, when significant and unreasonable, become undesirable results. These include 1.) chronic lowering of groundwater levels, 2.) groundwater storage, 3.) land subsidence, 4.) water quality, 5.) depletion of interconnected surface water, and 6.) seawater intrusion.

As detailed in the Upper San Luis Rey Valley Subbasin's GSP, it was determined that three out of the six sustainability indicators are potentially applicable to the Upper San Luis Rey Valley Subbasin:

- Reduction on groundwater storage levels
- Chronic lowering of groundwater levels
- Degraded water quality

Land subsidence, depletion of interconnected surface water, and seawater intrusion were found not to be applicable in the Subbasin (GSP, 4-1). However, these indicators are expected to be evaluated going forward for any potential change in these findings. The GSP elaborates on the technical considerations associated with each applicable sustainability indicator in the Subbasin, and these considerations served as the foundation for establishing the criteria for sustainable management.

Chronic lowering of groundwater levels is defined in the GSP as "significant and unreasonable depletion of supply, causing undesirable results to domestic, agricultural, or municipal groundwater users if continued over the planning and implementation horizon" (GSP, 4-5). Undesirable results stemming from this indicator can be defined as "lowering of groundwater levels to a depth where the wells cannot be operated. (GSP, 4-6). This result would affect groundwater users within the Subbasin who rely heavily, and in many cases exclusively, on groundwater resources. If significant and unreasonable groundwater level declines were to occur, groundwater would be less available or unavailable to groundwater users. Ensuring sustainable groundwater levels represents a core effort of the GSP implementation services provided by the Authority.

Reduction of groundwater storage is defined in the GSP as "Groundwater in storage is the volume of groundwater in the basin that is available for groundwater production" (GSP, 4-6). This presents the possibility of undesirable results in the form of "the inability of the groundwater basin to meet water supply demands during drought periods." (GSP, 4-6.) This result would have lasting negative effects on Subbasin parcel owners' ability to obtain necessary water resources during times of drought. If a significant and unreasonable reduction of groundwater storage were to occur, groundwater would be less available or potentially unavailable during dry years. As a part of the service provided by the Authority, efforts to address this undesirable result are integral to GSP implementation.

Degraded water quality has the potential to "impair water supply and affect human health and the environment" (GSP, 4-7). Potential undesirable results include impacts to groundwater users ranging from increased sampling and monitoring, increased treatment cost, loss of wells, and negative effects on agriculture (GSP, 4-7). The GSP notes that further data is required to properly characterize water quality in the Subbasin (GSP, 4-8). Accordingly, further data collection and analysis is planned in accordance with GSP implementation in the coming years.

The sustainability indicators described as relevant to the Subbasin with the GSP relate to the service provided to property owners by the Authority to all groundwater users within the Subbasin. Avoidance of the potential undesirable results stemming from these indicators is an essential aspect of GSP implementation and SGMA compliance; and hence, a sustainable funding source is needed. In order to apportion these costs equitably and relative to the service provided, this Study proposes a charge per wellhead and a charge per acre foot ("AF") of groundwater extracted.

Upper San Luis Rey Valley Subbasin Sustainability Goal

The intent of this Cost of Service Study is to appropriately and equitably allocate the cost of the authority's service related to GSP implementation and SGMA compliance across groundwater users within the Subbasin. As such, these services relate to the larger sustainability goal of the Subbasin. As stated in the GSP, this goal is as follows (GSP, 4-3):

The sustainability goal for the USLR Subbasin is to manage and preserve its groundwater resource as a sustainable water supply. To the greatest extent possible, the goal is to preserve historic operations of beneficial use in the basin as well as allow for future planned uses as conceived by the GSA and basin stakeholders. The sustainability goal will be accomplished by achieving the following objectives:

- *Operate the USLR Subbasin groundwater resource within the sustainable yield.*
- *Implement projects and management actions to reduce USLR Subbasin groundwater demands, increase efficient use of current supplies, maximize use of supplemental water supplies, and mitigate undesirable results.*
- *Actively monitor the USLR Subbasin and adaptively manage projects and management actions to ensure the GSP is effective and that undesirable results are avoided.*

Agency Characteristics

The Pauma Valley Groundwater Sustainability Agency ("GSA," "PVGSA," or "Agency") was formed in June 2017 through a Memorandum of Understanding ("2017 MOU"), between the Pauma Valley Community Services District ("PVCSD"), Upper San Luis Rey Resource Conservation District ("USLRRCD"), Yuima Municipal Water District ("YMWD"), and the County of San Diego (the "County"), collectively referred to the "parties," for the purpose of developing a single GSP for the Upper San Luis Rey Valley Subbasin ("Subbasin") pursuant to SGMA. In November 2018, the County withdrew from the MOU. The remaining parties continued to function as the GSA and subsequently submitted the Upper San Luis Rey Valley GSP to DWR.

In January 2022, the 2017 MOU was amended to add two new parties to the agreement: Pauma Municipal Water District ("Pauma MWD") and San Luis Rey Municipal Water District ("SLR MWD").

In May 2022, the remaining parties amended the MOU to create the Upper San Luis Rey Groundwater Management Authority, a joint powers authority with the same members as Pauma Valley GSA. This amendment also created two voting Board seats for the Upper San Luis Rey Indian Water Authority ("USLRIWA"). The Authority succeeds all of the obligations of Pauma Valley GSA, including GSP implementation. The Authority is governed by a Board of Directors ("Board"), consisting of representatives of the parties to the JPA.

Groundwater Fees

Just as SGMA envisions groundwater basins being locally governed, it also envisions GSAs to be locally funded. The intent of this Fee Study is to establish the rate and fee schedule for the Upper San Luis Rey Valley Subbasin, providing a reliable stand-alone revenue source to ensure the Authority's ability to implement its GSP.

As noted above, the GSA has been funded to this point through direct member agency contributions and grant awards, as is common amongst newer GSAs throughout the State. These direct contributions have provided the Authority with the ability to develop the GSP and comply with State requirements. While the member agencies will continue to support the efforts to implement the GSP, it is assumed that direct member contribution with eventually cease. The Authority will continue to actively pursue future grant solicitations and seek to maintain sustainable funding sources.

A Fee Program for the Upper San Luis Rey Valley Subbasin

Through research and numerous discussions with staff, legal counsel, and the SCI Team, a groundwater management fee as described by Water Code § 10730.2 and consistent with Propositions 26 and 218 is selected as the optimal funding mechanism for the Authority. Per § 10730.2, this fee must be adopted pursuant to the procedural requirements described in the California Constitution, Article XIII D, Section 6, subdivisions (a) and (b). These requirements pertain to property related fees and involve mailing notices and holding a protest hearing (as described in more detail below).

Furthermore, a fee based primarily on groundwater extraction, whether actual or estimated, ensures an equitable cost distribution among groundwater users. Water Code § 10730.2 provides guidance for this type of fee to be used to fund a range of groundwater management activities that align with the Authority's revenue needs and sustainability goals.

As such, the methodology of the fee program established by this Study is based on apportioning costs according to the amount of groundwater extraction for each property. Several factors make this the optimal basis on which to allocate the costs of a groundwater sustainability program in the Upper San Luis Rey Valley Subbasin:

- Proportional: The fee is equitable in that properties that extract more groundwater (and have more at stake in ensuring a sustainable groundwater supply) would pay more while properties that extract less would pay less.
- Easy to Administer: Once extraction amounts are estimated, there will be limited changes from year to year making the fee calculation and implementation easier. Property owners who wish to submit metered data to be used in place of their estimated use can do so as they see fit.
- Easy to Understand: Proportionality based on estimated groundwater extraction is easy to understand and clearly allocates the cost of service across Subbasin property owners.
- Legally Compliant: This type of fee conforms with the California Water Code as well as Proposition 218, which SGMA makes applicable to certain groundwater extraction fees.

Rate Components: Groundwater Extraction Estimates and Revenue Requirements

Precise groundwater extraction data for many properties is largely unavailable within the Subbasin. Public water agencies operating wells are required to report extraction data to the California Department of Drinking Water, and this data is publicly available to the Agency. However, the majority of groundwater extraction comes from wells whose extraction data is either not public or is not metered. Thus, precise measurement of extraction across the Subbasin is impossible at this time. The process of installing meters on all Subbasin wells introduces financial, legal, and policy complexities that will be considered in the coming years, but this will not be achieved at the time of this Study. Therefore, this Study will estimate extraction for those non-public wells through a process that is described herein. The total groundwater extraction within the Authority's jurisdiction is estimated to be 13,470 AF per year.

Utilizing groundwater extraction as the basis for a fee allows a GSA to equitably allocate the cost managing groundwater based on the demands of groundwater extractors on the Subbasin.

The other primary component of the fee program outlined in this Study is the projected budget of the Authority related to SGMA compliance and GSP implementation. Ensuring the revenue needs of the Authority is paramount to the success of these efforts. This budget was scrutinized by Agency staff and the SCI Team, producing an annual revenue requirement applied to the groundwater extraction fees of $421,246.

In an effort to apportion costs appropriately across groundwater users, the Authority has identified a portion of its costs as those that should be shared by all well owners within the Subbasin. These costs stem from the preparation of the annual report submitted to DWR ($75,000) and the management contract that facilitates Subbasin management by Yuima MWD ($15,000). Because these costs are static and likely to remain in place in the future regardless of the amount of groundwater used in the Subbasin, they are considered optimal costs to allocate to a wellhead fee (a charge per well).

The estimated number of wells in the Subbasin is around 300, based on estimates derived from the Authority and its member agencies. While further research may be required to continue to make this number more exact, 300 wells will be used by this Cost of Service Study to determine an appropriate rate. By dividing the cost of the annual report and the management contract by this estimated total of wells, the rate per well is determined:

$$\frac{\$90{,}000}{300 \text{ Wells}} = \$300 \text{ Per Well}$$

The remaining costs are then allocated to the extraction fee portion of the proposed fee program. By subtracting the $90,000 allocated to the wellhead fee, the updated revenue need is determined to be $331,246. The final calculation of the cost of service extraction fee is a simple equation producing a rate per acre foot ("AF") of groundwater extracted, as shown below.

$$\frac{\text{Revenue Requirement (\$\$)}}{\text{Acre Feet Pumped}} = \text{Rate (\$ per AF)}$$

By applying the estimated extraction and remaining revenue requirement, the recommended rate is $24.59, as shown below.

$$\frac{\$331,246}{13,470} = \$24.59 \text{ Per Acre Foot}$$

This Rate and Fee Study provides a detailed outline of the efforts to establish a reliable revenue source to fund GSP implementation in the Upper San Luis Rey Valley Subbasin and represents the culmination of efforts by the Upper San Luis Rey Groundwater Management Authority Board, staff, and consultants.

II. Context

Many factors contribute to an effective fee methodology and a successful fee implementation. Staff and legal counsel worked with the SCI Team to establish a comprehensive understanding of the applicable legislative and legal factors and the viability of various funding mechanisms.

Legislative and Legal Understanding

Water Code § 10730.2

Groundwater Sustainability Fees

Within SGMA, two revenue mechanism opportunities are specifically described to fund GSAs:

- Water Code § 10730 is intended to fund general GSA administration and GSP implementation but excludes major capital investments for improvements.
- Water Code § 10730.2 governs groundwater extraction fees imposed to fund the full spectrum of GSA costs, including GSA administration, GSP implementation, and any major capital investments and facility operations. Note that Section 10730.2 requires more rigorous and lengthy adoption procedures.

Since the allowable use of funds generated from a Water Code § 10730.2 fee is more comprehensive (including capital costs), and necessitates more rigorous community input (a mailed noticing to all affected property owners and a public hearing), the Authority has chosen to implement the (albeit more onerous to implement) Water Code § 10730.2 fee, as described below:

> *A groundwater sustainability agency that adopts a groundwater sustainability plan pursuant to this part may impose fees on the extraction of groundwater from the basin to fund costs of groundwater management, including, but not limited to, the costs of the following:*
>
> *(1) Administration, operation, and maintenance, including a prudent reserve.*
> *(2) Acquisition of lands or other property, facilities, and services.*
> *(3) Supply, production, treatment, or distribution of water.*
> *(4) Other activities necessary or convenient to implement the plan.*

Furthermore, Section 10730.2 also states that fees may be imposed based on fixed fees and fees charged on a volumetric basis. The fees developed for this Study utilize both a volumetric basis (extraction fee) and a fixed fee (wellhead fee) and are intended to fund implementation of the GSP, and as such falls within the categories described by this code section. Nonetheless, any fee imposed by a government agency must comply with the California Constitution. Further discussion of compliance with Propositions 26 and 218 is included below.

Fee Implementation Requirements

As noted above, Water Code § 10730.2 provides guidance for fee implementation requirements, stating that: "Fees imposed pursuant to this section shall be adopted in accordance with subdivisions (a) and (b) of Section 6 of Article XIII D of the California Constitution." Article XIII D Section 6 was codified by the passage of Proposition 218 and refers to the procedural requirements of property related fees, which are discussed in more detail below. However, Proposition 218 is best understood in the context of Proposition 26.

Proposition 26

Proposition 26 was passed by voters in 2010, providing a broad constitutional definition of the term "tax", which was necessary in the wake of Proposition 218's limitations on local taxes. Public agencies implementing funding mechanisms must identify and adhere to the appropriate legal framework for the charge they are imposing. In this sense, Proposition 26 provides guidance regarding whether a charge is a tax (and thus subject to a more strenuous approval process), or whether a charge is a fee or assessment.

Proposition 218 was passed by California voters in 1996, adding Articles XIII C and XIII D to the State Constitution. The purpose of this legislation was primarily to address the effects of Proposition 13, passed in 1978, which limited the ability of local governments to impose taxes. While Proposition 218 outlined substantive and procedural guidelines for the imposition of taxes, benefit assessments, and property related fees, the definition of the term "tax" was not succinctly defined.

Proposition 26, as included in Article XIII C of the California Constitution, defines a tax as "any levy, charge, or exaction of any kind imposed by a local government," with certain exceptions. Among these exceptions are:

- *(1) A charge imposed for a specific benefit conferred or privilege granted directly to the payor that is not provided to those not charged, and which does not exceed the reasonable costs to the local government of conferring the benefit or granting the privilege to the payor.*

- *(2) A charge imposed for a specific government service or product provided directly to the payor that is not provided to those not charged, and which does not exceed the reasonable costs to the local government of providing the service or product to the payor.*

- *(7) Assessments and property-related fees imposed in accordance with the provisions of Article XIII D.*

In Identifying which of these exceptions is the appropriate constitutional definition of the proposed fee program, recent case law must be considered. In City of Buenaventura v. United Water Conservation District, the California Supreme Court held that Proposition 26, not Proposition 218, provides the appropriate framework for groundwater extraction fees.[2] While the proposed fee program described in this study must adhere to the procedural and substantive requirements of property related fees (as referenced in exception (7), above), it also satisfies exceptions (1) and (2). Exception (2), "a charge imposed for a specific government service," is likely the most appropriate exception.

Article XIII C goes on to stipulate that the governing agency must establish that any charges imposed by a government agency are not taxes:

> *The local government bears the burden of proving by a preponderance of the evidence that a levy, charge, or other exaction is not a tax, that the amount is no more than necessary to cover the reasonable costs of the governmental activity, and that the manner in which those costs are allocated to a payor bear a fair or reasonable relationship to the payor's burdens on, or benefits received from, the governmental activity.*

Proposition 218

Procedural Requirements of Property Related Fees

The procedural requirements of property related fees, as referenced in Water Code § 10730.2, are described in 1996's Proposition 218 (which is manifested as Section 6 of Article XIII D of the California Constitution). There are two distinct steps: 1.) a mailed noticing of all affected property owners (well owners in this case) and 2.) a mailed balloting on all affected property owners requiring a 50% approval for adoption.

However, Proposition 218 goes on to exempt charges for water service from step 2, the balloting requirement:

> *Except for fees or charges for sewer, water, and refuse collection services, no property related fee or charge shall be imposed or increased unless and until that fee or charge is submitted and approved by a majority vote of the property owners of the property subject to the fee or charge or, at the option of the agency.*

[2] https://www.courts.ca.gov/opinions/archive/B312471.DOC

Section 6 of Article XIII D of the California Constitution describes the specific requirements of the implementation of a property related fee and refers to subdivision (a) as the noticing requirement, (b) as the limitations on fees and services, and (c) as the balloting requirement. As noted above, Water Code § 10730.2 states that fees pursuant to section 6 shall be adopted in accordance with subdivisions (a) and (b) of this section. Hence, by omission of (c) in Section 10730.2, and by the exemption of water-related service provided by Proposition 218, balloting is not required for property related fees for groundwater sustainability.

As described above, only the first step of the two-step process applies to property related fees in this context. That step is the noticed public hearing. Once the Agency has determined the fees they wish to impose, they must mail a written notice to each affected property owner at least 45 days prior to the public hearing. During that time, and up until the conclusion of the hearing, any affected property owner may file a written protest opposing the proposed fees. If the owners of a majority of the affected parcels file a written protest, the agency cannot impose the fee (known as a "majority protest"). If a majority protest is not formed, the agency may impose the fees.

Section 6 also specifies several important requirements surrounding property related fees:

- *Revenues derived from the fee or charge shall not exceed the funds required to provide the property related service.*
- *Revenues derived from the fee or charge shall not be used for any purpose other than that for which the fee or charge was imposed.*
- *The amount of a fee or charge imposed upon any parcel or person as an incident of property ownership shall not exceed the proportional cost of the service attributable to the parcel.*
- *No fee or charge may be imposed for a service unless that service is actually used by, or immediately available to, the owner of the property in question.*

It is the intent of this Cost of Service Study to establish compliance with these requirements as they relate to the proposed cost of service fee program.

Public Meeting Requirements

As noted above, a public hearing is required in order to impose property related fees pursuant to Article XIII D. This public hearing is expected to be held in the Spring of 2024, at which point property owners will be provided with an opportunity for public comment and written protests submitted by affected property owners will be tabulated.

To further engage the public, provide an explanation of the fee program's approach, and address any questions the public may have, the Authority will hold an additional public meeting in the Spring of 2024 prior to the mailing of notice of the public hearing.

Financial Context

Past Revenue Sources

To date, the Authority (and PVGSA prior to the establishment of the JPA), has primarily been funded by member agency contributions and grant awards. In fiscal year 2022-23, member agency contributions totaled $437,379 – the entirety of the year's budget, which included local cost share funding related to grant awards. Additionally, member agencies have facilitated GSP implementation and SGMA compliance by providing staffing resources.

While the Authority has received grant funding in the past, no current grant award is held for fiscal year 2023-24 or beyond. The Authority will continue to monitor available grant programs in an effort to secure outside funding, which would bolster the financial outlook in the Subbasin and contribute to more effective GSP implementation efforts.

III. Fee Determination

The Board made clear its goal of achieving financial independence for the GSA in its management of the Subbasin, placing priority on fairness, efficient administration, and compliance with California law in developing a funding method. The Board concluded that a property related fee based on groundwater use would be the optimal approach to establishing a fee program for the Subbasin.

Due to the unavailability of metered groundwater use data for most properties in the Subbasin, it is often necessary to estimate this usage. Consequently, this Cost of Service Study partially relies on groundwater use estimations derived either from the type and amount of agricultural crops cultivated or from reasonable assumptions tied to land use.

The rate calculation is primarily dependent on two major factors: revenue requirements and groundwater extraction estimates. The development of these two factors is outlined below.

Revenue Requirements

The GSA administrative and technical staff developed a budget of expenditures based on past years and the findings and projections found in the GSP. This budget serves as the Authority's fiscal year 2023-24 budget as it relates to this Cost of Service Study and represents revenue needs in the coming years. This budget indicates a total annual revenue requirement of $421,246.

The intent of this Cost of Service Study is to establish a reliable, stand-alone funding source that will support the Authority's GSP implementation service going forward. To ensure fiscal solvency now and in the future, two changes are shown in the budget included in this Study. First, a five percent contingency has been put in place to generate a prudent reserve that may be used for unforeseen expenses related to existing or additional line items. Second, an inflationary mechanism will be utilized to adjust the budget (and corresponding rates) in future years.

As noted above, USLRGMA member agencies have contributed financially to the Authority's efforts to implement the GSP and maintain compliance with SGMA. Consideration of repayment of these contributions has been included in the budget. Contributions provided as local cost share pf past grant awards are not reimbursable and are thus removed from the repayment calculation. In Table 3 below, a summary of these contributions and an annual repayment amount is shown as $20,513, with the intent of spreading this cost over a ten-year period.

Table 3 – USLRGMA Member Agency Contributions and Repayment

Member Agency		Funding Contribution
Pauma Valley Community Services District	$	160,824
Pauma Mutual Water District	$	160,824
Upper San Luis Rey Resource Conservation District	$	25,000
Yuima Municipal Water District	$	160,824
Subtotal	$	507,472
Local Cost Share Towards Past Grant Funding *(Not Reimbursable to Member Agencies)*	$	302,340
Total Repayment Amount	$	205,133
Annual Repayment (Ten-Year Period)	$	20,513

The Authority's budget for GSP implementation and SGMA compliance costs is shown below in Table 4. A more detailed budget is also included in Appendix A.

Table 4 – Annual Costs and Revenue Requirement

Item		FY 2023-24
Professional Services - Administration	$	30,000
Office Expenses	$	192
Insurance	$	1,500
General & Admin Expenses	$	107,151
Professional Services - GSP	$	243,890
Subtotal	$	382,733
5% Contingency - rounded to nearest $1,000	$	19,000
Member Agency Contribution Repayment	$	20,513
Total Expenses	$	422,246
Offsetting Revenues		
Member Contributions *(To be replaced by fee in future years)*	$	-
Grants	$	-
Other	$	1,000
Offsetting Revenue Totals	$	1,000
Net Revenue Requirement	$	421,246

Note that a five percent contingency has been added to the budget in order to develop a prudent reserve, as described in Water Code § 10730.2. The Authority may elect to reduce the need for this contingency in future years as the Board sees fit.

Annual costs may increase as time goes on. For this reason, the fee program for the Upper San Luis Rey Valley Subbasin will utilize an inflationary mechanism to adjust the budget, and corresponding rate, over the course of the next five years. Due to regional proximity, the San Diego-Carlsbad Consumer Price Index for all urban consumers (CPI-U), may be applied to the budget and rate each year. To avoid large increases due to years which produce exceptionally high inflation rates, a 5% cap is recommended. As such, the budget (and rate) may be increased each year by the San Diego-Carlsbad CPI or 5%, whichever is lower.

Groundwater Extraction

As noted above, the methodology of the fee program for the Upper San Luis Rey Valley Subbasin is based, in part, on estimated groundwater extraction. This is necessitated by the lack of data available for groundwater extraction across most user classes. There are numerous parcels within the Subbasin that do not make their extraction data public (and many of which may not be metered).

There are several factors that inhibit the improvement of data by increasing metering of the Subbasin's wells. While California Water Code § 10725.8 authorizes the GSA to require meters for non-de minimis users, it specifically prohibits it from requiring meters on de minimis users.[3] Additionally, timing is a key issue, as any effort to increase the number of meters in the Subbasin would likely prevent the Authority from securing funding for fiscal years 2023-24 and 2024-25.

Public water systems are the exception to this approach of estimation, as they are required to document groundwater extraction. All public water systems in the Subbasin will be charged according to average known groundwater use. This is discussed in more detail below.

As a first step in estimating groundwater on a parcel scale, an overall water budget was developed that includes all water sources. This water budget pertains to all Subbasin parcels. In order to identify estimated groundwater use for parcels directly using groundwater, public water system extraction was removed from this water budget, leaving only parcel-scale groundwater use. More details related to these efforts are provided below.

[3] De minimis users are defined in the SGMA as properties using, for domestic purposes, less than 2 acre feet of groundwater per year. Most users in this classification are rural residential users.

Data Sources

The estimates used in this Fee Study rely on data from the State, technical studies, and available local data. At this time, using the best available sources to guide estimation of groundwater use is the most optimal path forward for funding the Agency's efforts to implement its GSP. Elements of GSP implementation may contribute to a better understanding of groundwater use in the Subbasin. As better data becomes available, fee calculations may be altered to incorporate any potential improvements to groundwater use data. The maximum rate, however, will only be allowed to increase annually as much as the San Diego-Carlsbad CPI or 5%, whichever is lower.

A variety of data sources were used to develop the parcel-scale groundwater use estimates. Below is a complete list of data used, followed by the source of the data in parenthesis, and a short description of the data.

- San Diego County parcel spatial database (San Diego County): GIS-based spatial database of polygons that delineate parcel boundaries in San Diego County as of June 2023. This dataset also includes County use codes, which relate to the land use of a given parcel.[4]
- County of San Diego Department of Planning and Land Use General Plan Update Study (San Diego County): land use study published in 2010 that provides estimates of groundwater use by parcel type or land use designation.[5]
- Upper San Luis Rey Valley Groundwater Subbasin boundaries (Bulletin 118 Groundwater Basin Boundary Assessment Tool): Basin boundary spatial polygons that delineate boundaries of the Authority's jurisdiction as of June 2023.[6]
- Federally recognized tribal lands spatial database (California Natural Resources Agency Open Data): GIS-based spatial database of polygons that delineate tribal land boundaries as of June 2023.[7]
- Parcel-scale crop data (USLRGMA member agencies): crop type and amount grown on agricultural parcels within the Subbasin.
- Water provider parcel data (USLRGMA member agencies): list of parcels served by various water providers within the Subbasin.
- Public Water System Use (California Division of Drinking Water): reported groundwater extraction per PWSID, for years 2021 and 2022.[8]

[4] https://sdgis-sandag.opendata.arcgis.com/datasets/SANDAG::parcels-6/explore
[5] https://www.sandiegocounty.gov/content/dam/sdc/pds/gpupdate/docs/BOS_Aug2011/EIR/Appn_D_GW.pdf
[6] https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#boundaries
[7] https://data.cnra.ca.gov/dataset/federally-recognized-tribal-lands
[8] https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/ear.html

Administrative Data

The database includes general parcel characteristics including parcel area (acres), County Assessor information (i.e., Use Code Description, Use Code Category), and owner information (i.e., Current Owner's Name and Mailing Address). These administrative datasets are associated with each parcel and were obtained from the County of San Diego.

GSA Jurisdiction and Subbasin Parcels

Parcels included in this fee program are parcels that intersect the Subbasin boundary. Parcels that intersect the Subbasin are included in the Fee Study and subject to regulation by the Agency; however, a subset of Subbasin parcels intersect tribal lands. As noted above, the Authority does not have jurisdiction over these parcels in regard to assessing fees, and these parcels are not subject to the fee program.

In determining whether a parcel lies on tribal lands, a threshold of 10% was utilized. Parcels with greater than 10% of their area intersecting tribal land were excluded from fee calculations. Parcels with 10% or less of their area intersecting tribal land were included. This approach may be refined if it is found that a parcel only partially on tribal land maintains a well that lies on tribal land.

Ultimately, the Authority's regulation is based on the location of the groundwater well(s) on the parcel. If a boundary parcel does not have a water well within the Authority's jurisdiction, then the parcel will not be subject to Authority regulation, or the property related fee for groundwater extracted from a well outside the Authority's jurisdiction. Any parcels that were inaccurately included in the fee calculation due to operating a well on a portion of their property that lies outside of the Authority's jurisdiction may request further consideration of the Board.

Water Sources

Water source data are composed of the following:

- Groundwater from the Subbasin. This is estimated according to the methodology described herein.
- Surface water diversions. The vast majority of surface water diversions are managed by water providers within the Subbasin.
- Public water systems often provide water from a mix of groundwater and surface water sources, unique to each system. Authority member agencies provided a list of parcels with a connection to their system. Groundwater extraction amounts per system were obtained through California Division of Drinking Water ("DDW") data.

Future Data Updates

Throughout this process, the Authority has maintained an openness to improve data whenever and wherever possible. This approach provides ample opportunities in the future to adjust estimates, and whenever possible, better estimate groundwater use. Property owners are encouraged to submit verified meter data in order to adjust their fees at the discretion of the Board.

Development of a Parcel Scale Water Budget

As noted above, the first step in determining groundwater use on a parcel scale is to estimate overall water use within the Authority's jurisdiction. A Technical Memorandum detailing this process is included in Appendix C. A summary of the approach is provided below.

In order to optimally organize groundwater use estimation, groundwater users are grouped into three primary "user classes" in the Subbasin. Different approaches were used to calculate water use for each rate class to achieve the most accurate estimation possible as discussed below.

1. Agricultural and other Irrigation Users

Crop irrigation use represents a substantial portion of the total groundwater extraction in the Subbasin. Determination of water use by agricultural properties relies on data provided by the Authority that associates parcels (designated by APN) with specific crop types and acreages. This data was utilized to identify type of crop and amount of crop grown per parcel.

A summary of crop types and their corresponding acreage within the Subbasin is provided in Table 5, below.

Table 5 – Upper San Luis Rey Valley Crop Types and Acreage

Agricultural Crop or Land Use	Acreage
Citrus Acres	2,511
Avo Acres	2,234
Grape Acres	77
Blueberry Ac	174
Pomegranate	12
Nursery Ac	814
Pasture Grass	626
Vegetable	12
Other Acres	156
Total	**6,615**

The quantity of water applied to each agricultural crop annually was estimated with OpenET[9]. This is a method adopted in many SGMA basins that provides accessible satellite-based evapotranspiration (ET) data for crops in a specific basin. Crop consumptive demand parameters are based on agricultural practices specific to San Diego County. Water demand for crops was used as a baseline; estimated precipitation was subtracted, and a seventy-five percent irrigation efficiency was assumed. Using this approach, applied water estimates for each crop type were developed for the Subbasin. These applied water estimates were then multiplied by the amount of crop on a given parcel, producing the estimated amount of water use.

Crop-specific consumption rates are shown in Table 6. These consumption rates are multiplied by the acreage of each crop to arrive at the annual applied water demand per parcel per crop (in AF/year). Note that citrus and avocado crops are most prevalent in the Subbasin.

Table 6 – Upper San Luis Rey Valley Crop Types and Applied Water per Acre

Land Use	**OpenET Applied Water**
Crop Type	*AF /Acre*
Citrus	3.7
Avocado	4.3
Grape	2.0
Blueberry	1.5
Pomegranate	3.2
Nursery	3.1
Pasture / Grass	2.1
Vegetable	2.0
Golf	3.8

In Table 7 below, the amount of water use for each crop type within the Subbasin is calculated by multiplying the crop acreage by the appropriate applied water amount. The total agricultural water use is estimated at 21,518 acre feet per year ("AFY"). Note that this amount represents total water use, not groundwater use specifically.

[9] https://etdata.org/about/

Table 7 – Agricultural Water Use by Crop Type

Agricultural Crop	Acres*	Applied Water (OpenET)	Water Use
Citrus	2,206	3.7	8,191
Avocado	2,084	4.3	8,935
Grape / Vine	70	2.0	137
Blueberry	174	1.5	262
Pomegranate	12	3.2	38
Nursery Ac	814	3.1	2,487
Pasture / Grass	411	2.1	869
Golf	152	3.8	576
Vegetable	12	2.0	23
Other Acres	156	NA	NA
Total	6,091	NA	21,518

Note: Approximately 524 acres of crops were removed from this calculation due to acreage being identified as being on tribal land.

2. Public Water Service Providers

Public water supply systems are the only user class in the Subbasin for which reported data is available regarding groundwater extraction. Each water provider has provided extraction data for calendar years 2021 and 2022 for use in this Cost of Service Study. This data, summarized in Table 8, was obtained and analyzed to identify groundwater extraction from the period from 2021-2022 per water system.

Importantly, reported public water system uses are not typically captured at the parcel scale, and are hence added to overall basin extraction estimates in the results. This two-step process (i.e., calculate parcel-based groundwater use, then add reported public system extraction) is preferred for two reasons: (1) there is not a sensible approach to spatially disaggregate water system extraction to individual parcels, and (2) within a fee and rate billing structure, public water systems will be directly charged for groundwater use rather than the parcels connected to those systems, which in turn pay the water purveyor.

Water system extraction can vary greatly over time in the Subbasin, depending on rainfall, surface water availability, and other factors. Ultimately, a two-year average was selected as the optimal method for allocating charges in this case. There are several benefits to this approach. First, using an average has the effect of smoothing out charges so that public water service suppliers do not incur large charges relative to previous years. Second, this contributes to revenue stability for the GSA, as changes in the cost allocation for this user class would not change as drastically from year to year as they would if a single year was used. As shown below in Table 8, the average groundwater extraction for public water systems is 5,572 AF per year.

Table 8 – Water System Groundwater Extraction

Water Provider Extraction Data				Average Extraction (AF)	Revenue	
Name	PWS ID	2021	2022	2-Year Rolling Average	Rate Per AF	Revenue
Lazy H Mutual Water Company	CA3700937	37.7	37.3	37.5	$24.59	$922.74
Pauma Valley Mutual Water Company	CA3700934	574.0	565.0	569.5	$24.59	$14,004.01
Rainbow Municipal Water District	CA3710016	0.0	0.0	0.0	$24.59	$0.00
Rancho Estates Mutual Water Company	CA3700936	660.0	569.0	614.5	$24.59	$15,110.56
Rancho Pauma Mutual Water Company	CA3710012	1,965.2	2,043.0	2,004.1	$24.59	$49,281.19
Valley Center MWD	CA3710026	0.0	0.0	0.0	$24.59	$0.00
Yuima Municipal Water District	CA3701408	93.0	56.0	74.5	$24.59	$1,831.96
Yuima Municipal Water District IDA	CA3700938	2,125.3	2,184.9	2,155.1	$24.59	$52,993.91
Pauma Ridge Mutual Water Company	NA	174.4	59.0	116.7	$24.59	$2,870.64
PUBLIC SYSTEM TOTAL				5,572	NA	$137,015

3. Rural Residential and Commercial Users

Residential and Commercial water demand was determined by analyzing all unique Assessor Use Codes in the San Diego County parcel database and assigning water uses stemming from the County of San Diego Department of Planning and Land Use General Plan Update Groundwater Study, published in 2010. This Study developed its groundwater use estimates by analyzing estimations of water demand derived from reported average quantities of water use for the variety of land uses in the study area (largely interior San Diego County).

For residential uses, the primary assumption is that a single residence has a demand of 0.5 AF/year. For parcels containing more than one residential unit, additional units were assigned 0.25 AF/year. Multi-family residential units were assigned 0.3 AF/year for each unit.

For light commercial and light industrial, such as a storefront, retail, or warehouse, the primary assumption is that a single operation has a demand of 0.3 AF/year. For heavier commercial or industrial, such as a large office, civic center, or health care facility, the primary assumption is that a single operation has a demand of 1.0 AF/year.

Residential and commercial extraction within the Subbasin is estimated to be relatively minor compared to agricultural and water system extraction. The total residential and commercial water use utilized for this Cost of Service Study is 371 AFY. Of this total, 61 AFY can be attributed to direct groundwater use.

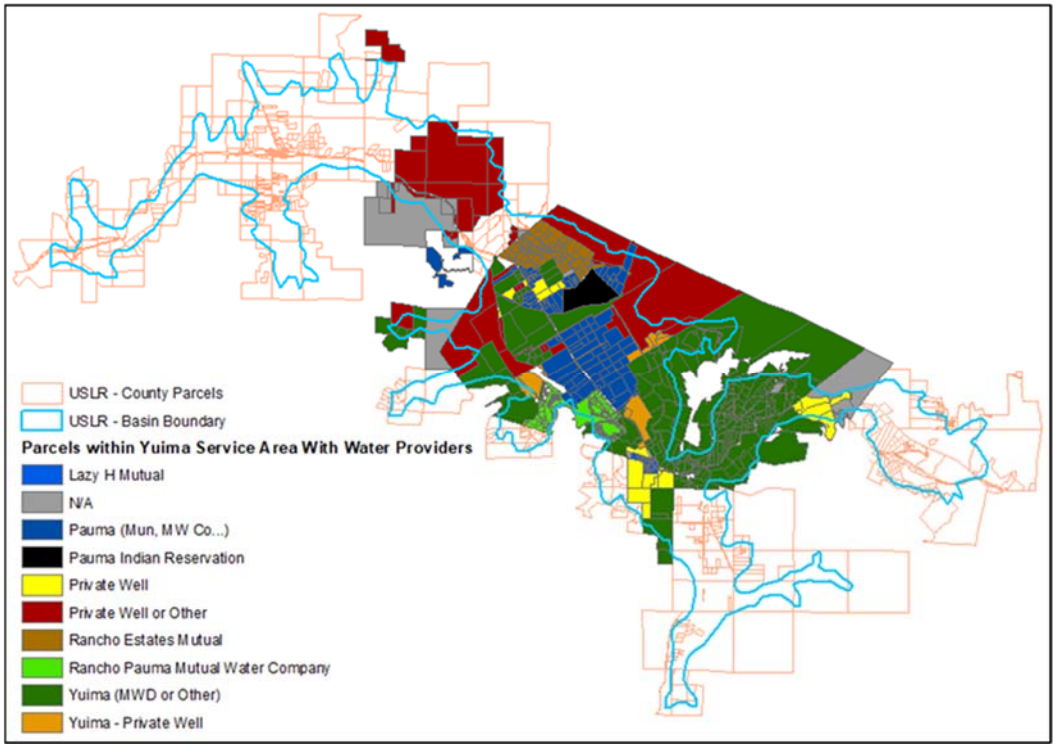
Groundwater Use Estimation

Using the data provided by the Authority that associated Subbasin parcels with specific water providers or with the use of private wells, groundwater use was separated from other sources based on water provider service.

Water Service Areas

Designation of a parcel's status as within a water provider's service area was determined by the parcel service list provided by Authority member agencies. It is assumed that water use demand determined from Assessor codes are met by the parcel's water system connection if one is present, otherwise, it is assumed this water demand is met by groundwater. In other words, it is assumed that parcels outside of a water system and/or without an explicit water system connection use groundwater to meet agricultural, residential, and commercial water demand. In cases where groundwater is used by a water provider and delivered to parcels, the water provider is charged for this groundwater use. A map of water source designations, including private wells and water providers, is shown below in Figure 2.

Figure 2 – Public Water Service Areas



Note that parcels not associated with any water provider, but also not categorized as 'Private Well' in this data, were assumed to be reliant on groundwater. This is illustrated in by the orange outline of County parcels that do not have a color-coded fill associated with them.

In Table 9 below, water source categories for agricultural, residential, or commercial parcels directly using groundwater are shown along with their associated estimated groundwater use. As noted above, the Authority has provided documentation of all parcels served by water systems, as well as those known to be served by private wells. Any other parcels known to require water use (based on County use code or crop acreage) but not served by water systems are assumed to be direct groundwater users. The total estimated direct groundwater use by parcels within the Subbasin is 7,898 AFY.

Table 9 – Summary of Parcel Categories and Estimated Direct Groundwater Use

Parcel Category for Direct Groundwater Users (As provided by USLRGMA)	**Total Groundwater Use Estimate** (AFY)
Private Well	2,614
Water Provider Not Provided, Likely Private Well	4,470
Parcel On Tribal Land (<10% of Parcel Overlies Tribal Land)	187
Yuima MWD / Private Well	627
Total Groundwater Use:	**7,898**

Summary of Estimated Groundwater Extraction

In order to identify the total estimated groundwater extraction in the Authority's jurisdiction, the public water system extraction average is combined with the total estimated groundwater use for agricultural, residential, and commercial parcels.

Table 10 shows a summary of estimated groundwater extraction from the Subbasin by user class. Note that the relatively low estimate for residential and commercial use is partly due to the exclusion of tribal lands from the fee calculation.

Table 10 – Summary of Estimated Subbasin Extraction

User Class	**AF Extracted**
Water Providers	5,572
Agricultural	7,837
Residential and Commercial	61
Total	**13,470**

Fee Calculation

The final rate calculations are twofold, identifying the wellhead fee and the extraction fee. As noted above, the wellhead fee allocates a portion of annual costs to a charge per well. The remaining costs are then allocated to the extraction fee.

The revenue allocated to the wellhead fee stems from the cost of the Authority's management contract with Yuima MWD in the amount of $15,000, and the cost of the annual report required by the State in the amount of $75,000. Dividing the sum of these costs ($90,000) by the estimated number of wells in the Subbasin, produces the rate per wellhead:

$$\frac{\$90{,}000}{300 \text{ Wells}} = \$300 \text{ Per Well}$$

The remaining cost is calculated by subtracting $90,000 from the total revenue need of $421,246. Dividing the remaining revenue requirement ($331,246) by the total estimated extraction produces a rate of $24.59 per acre-foot per year, as shown below.

$$\frac{\$331{,}246}{13{,}470} = \$24.59 \text{ Per Acre Foot}$$

A rate per AF of groundwater extracted represents an equitable approach to apportioning the cost of the service provided by the Authority's GSP implementation and SGMA compliance efforts. In the described methodology, property owners are charged in accordance with their reliance on groundwater resources within the Authority's jurisdiction. Under this approach, the charge per parcel is primarily dependent on the amount of groundwater extraction.

The sustainable management of the Upper San Luis Rey Subbasin holds implications for all groundwater users' ability to rely on this resource now and in the future. As established by the Upper San Luis Rey Valley GSP, and further supported by this Cost of Service Study, the costs incurred by the Authority are directly related to groundwater user's ability to rely on the Subbasin for agricultural, residential, or other purposes. As noted previously, the budget (and subsequently the rate), may be increased each year during the five-year period by the San Diego-Carlsbad CPI or 5%, whichever is lower.

Fee Impacts

Some examples of how this fee will impact property owners are shown in Table 11. Note that the wellhead fee is not included in this table and would be in addition to any additional charges related to this portion of the fee program.

Table 11 – Annual Rate Examples

Property Example	Estimated Water Use	Annual Charge
Rural Residence	0.5 AF	$12.30
25-Acre Citrus Field	92.5 AF	$2,274.71
25-Acre Avocado Field	107.5 AF	$2,643.58
10-Acre Vineyard	20 AF	$491.83
25-Acre Pasture	52.5 AF	$1,291.05

Appendices

Appendices include the following:

A. Detailed USLRGMA Budget.

B. County use codes and associated water use estimates as published in the 2010 County of San Diego Department of Planning and Land Use General Plan Update Groundwater Study.

C. Technical Memorandum: Parcel Scale Water Budget developed by Larry Walker Associates.

Appendix A – Detailed Budget

A more detailed budget, including specific line items within each cost category, is provided below for reference.

Table 12 – Detailed Budget

Item		FY 2023-24
Professional Services - Administration		
Management Contract	$	15,000
Non-Contract Management Services	$	15,000
Office Expenses		
Bank Service Charges	$	192
Insurance		
Error & Ommisions Directors	$	1,500
General & Admin Expenses		
Legal Fees	$	100,000
Audit	$	3,500
Website & Email Subscriptions	$	2,376
Memberships	$	1,275
Professional Services - GSP		
GSP Annual Report	$	75,000
GSP Update Reserve	$	117,590
Cost of Service Study	$	39,500
Grant Consultant	$	10,800
Engineering Review	$	1,000
Subtotal	$	382,733
5% Contingency - rounded to nearest $1,000	$	19,000
Member Agency Contribution Repayment	$	20,513
Total Expenses	$	422,246
Offsetting Revenues		
Member Contributions	$	-
(To be replaced by fee in future years)		
Other	$	1,000
Offsetting Revenue Totals	$	1,000
Net Revenue Requirement	$	421,246

Appendix B – County Use Codes and Groundwater Use Assumptions

The groundwater use assumptions provided by the County of San Diego Department of Planning and Land Use General Plan Update Study are included below for refence.

Table 3-5
Residential, Commerical, Industrial, and Other Land Uses Groundwater Demand Estimates

Water Demand Category	Water Demand Per Parcel or Unit (afy)	SANDAG Land Use Code	SANDAG Land Use Description	Assumptions
Single-Family Residential	0.5	1000	Spaced Rural Residential	450 gpd per residence
	0.5	1100	Single Family Residential	
Second Dwelling Units - Residential	0.25	None	Second Dwelling Units	Half the use of a single-family residence
Multi-Family Residential	0.3	1200	Multi-Family Residential	300 gpd per residence
Lower Water Use Service Related Commercial and Light Industrial	0.3	2103	Light Industry-General	300 gpd per entity or parcel
		2301	Junkyard/Dump/Landfill	
		5007	Store-Front Commercial	
		5009	Other Retail Trade And Strip Commercial	
		6104	Post Offices	
		6103	Libraries	
		2104	Warehousing & Public Storage	
Higher Water Use Offices, Religious Facilities, Heavy Industrial, and Public Facilities	1	2201	Extractive Industry	1,000 gpd per entity or parcel
		6002	Office-Low Rise	
		6003	Gov'T Office/Civic Centers	
		6101	Cemetery	
		6102	Religious Facilities	
		6509	Other Health Care	
		6105	Fire/Police Stations	
Military Facilities	3	6701	Military Use	Only one parcel with water use, Warner Springs Naval Training Facility. Approximately 1,500 people per year come in for training. Assumed 50 gpd per person with a stay of 14 days
Small Water Systems	-	1300	Mobile Home Parks	Small water systems demand estimated separately in Table 3-8
		1401	Jails/Prisons	
		1409	Other Group Quarters Facilities	
		1501	Hotel/Motel (Lo-Rise)	
		1503	Resort	
		6109	Other Public Services	
		6804	Senior High Schools	
		6806	Elementary Schools	
		6807	School District Offices	
		7207	Marinas	
		7210	Other Recreation	
		7601	Parks - Active	
Indian Reservations	-	5005	Specialty Commercial	Indian Reservations demand estimated separately in Table 3-9
		6108	Missions	
		7209	Casinos	
Agriculture	-	8001	Orchards And Vineyards	Agricultural water demand estimated separately in Table 3-6
		8002	Intensive Agriculture	
		8003	Field Crops	
Golf Courses	-	7204	Golf Courses	Golf course demand estimated separately in Table 3-7
		7205	Golf Course Clubhouses	

Table 3-5
Residential, Commerical, Industrial, and Other Land Uses Groundwater Demand Estimates

Water Demand Category	Water Demand Per Parcel or Unit (afy)	SANDAG Land Use Code	SANDAG Land Use Description	Assumptions
No Water Use	-	4104	Airstrips	No water use associated with land use
		4112	Freeways	
		4113	Communications And Utilities	
		4116	Park And Ride Lots	
		4117	Railroad Right Of Ways	
		4118	Road Right Of Ways	
		4119	Other Transportation	
		7603	Open Space Reserves, Preserves	
		7606	Landscape Open Space	
		7607	Residential Recreation	
		9101	Vacant Land	
		9202	Lakes, Reservoirs, Large Ponds	
		6702	Military Training	

Note: Water demand assumptions for commercial/industrial uses are based on typical wastewater flow rates from commercial sources within the EPA Onsite Wastewater Treatment Systems Manual, February 2002, pages 3-7 to 3-9. Additional water from outdoor use/andscaping is also assumed to produce a generalized estimate of water demand.
- no water demand estimated
afy - acre-feet per year
gpd - gallons per day
NA - Not Applicable, second dwelling units are located on spaced rural residential and single family residential parcels
SANDAG - San Diego Association of Governments

Appendix C – Technical Memorandum: Parcel Scale Water Budget

A technical memorandum prepared by Larry Walker Associates, detailing the parcel-scale water budget is provided below for reference.

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Technical Memorandum: Parcel Scale Water Budget

For the Upper San Luis Rey Valley Groundwater Subbasin

Prepared for the Upper San Luis Rey Groundwater Management Authority

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Updated February 2024

This technical memorandum documents the methodology and approach used to estimate water use at the parcel scale in the Upper San Luis Rey Valley Groundwater Subbasin (Subbasin) for the Upper San Luis Rey Groundwater Management Authority. Estimated water use at the parcel scale is provided as a spreadsheet ("USLR_Parcel_Water_Budget_simplified_updated_Feb_9_2024.xlsx"), and also summarized by water provider in **Table 1.** Descriptions of the spreadsheet and table are provided below, followed by supporting data sources and methodology.

Table 1. Summary of Water Use by Category of Water Provider

Table 1, provides a summary of total water use for each category of water provider. The water provider for parcels in the subbasin was included in the spreadsheet provided from Amy Reeh to Ryan Aston on October 16, 2023 (spreadsheet name: "Parcels within Yuima Service Area with Water Providers.xlsx"; referred to as *Water Provider Spreadsheet*). This information was updated February 9, 2024 with information from Amy Reeh. The water provider information includes 22 categories of water provider for 1,279 parcels. 826 parcels in the *County's Parcel Dataset* are not included in the *Water Provider Spreadsheet.* Spatial evaluation concluded that 586 of these parcels are within or partially within tribal land (parcels with <10% of their land area within tribal lands are differentiated from parcels with >11% of their land area within tribal lands to identify parcels with little tribal land overlap; the threshold for this classification may be revised at a later date). 240 parcels were initially not categorized in the *Water Provider Spreadsheet*. These parcels are likely supplied by a private well and are categorized as "Water Provider Not Provided, Likely Private Well".

Table 1. Summary of Water Use by Category of Water Provider

Water Provider or Category (From *Water Provider Spreadsheet*)	**Total Water Use Estimate (AFY)**
Lazy H Mutual	21
Parcel On Tribal Land (<10% of Parcel Overlies Tribal Land)[1]	187
Parcel On Tribal Land (>11% of Parcel Overlies Tribal Land)[2]	

Water Provider or Category (From *Water Provider Spreadsheet*)	Total Water Use Estimate (AFY)
Pauma Indian Reservation	
Pauma Mutual Water Co	357
Pauma MWD	2,821
Pauma Ridge Mutual	193
Pauma Valley Municipal Water District	165
Pauma Valley Water Co	43
Private	268
Private Well	417
Private Well or other	1,627
Private Well or other - Rancho Estates	68
Private Wells	234
Rancho Estates Mutual	540
Rancho Pauma Mutual Water Company	732
Water Provider Not Provided, Likely Private Well[3]	4,470
Yuima	4,629
Yuima MWD	4,490
Yuima MWD - Private well	262
Yuima MWD / Gells	0
Yuima MWD / Mells	0
Yuima MWD / Private Wells	0
Yuima MWD / Wells	44
YuimaMWD - Private well	321
Total Water Use (Parcels with >11% of land area overlying tribal land not included)	**21,889**

1. Parcel not initially categorized in *Water Provider Spreadsheet*. 10% or less of the parcel area is located on tribal land. Water use estimate is provided for these parcels.
2. Parcel not initially categorized in *Water Provider Spreadsheet*. 11% or more of the parcel area is located on tribal land. Water use estimate is not provided for these parcels.
3. Parcel not initially categorized in *Water Provider Spreadsheet* and parcel does not overlap tribal land. Parcel likely supplied by a private well.

Spreadsheet "USLR_Parcel_Water_Budget_simplified_updated_Feb_9_2024.xlsx"

The estimated water use for each parcel within, or partially within, the subbasin is included in the spreadsheet "USLR_Parcel_Water_Budget_simplified_updated_Feb_9_2024.xlsx". Water use information for parcels with greater than 11% of their area within tribal land is not included. The columns in the spreadsheet include:

- "APN" – The APN of parcels that are within, or partially within, the subbasin. The source of this information is the County's shapefile of parcels (described below in subsection **Parcel Shapefile**).

- "%_Parcel__In_Subbasin" – The percentage of the parcel's land area that is within the subbasin. The source of this information is the County's shapefile of parcels, and the shapefile of the subbasin boundary (described below in subsection **Parcel Shapefile** and **Upper San Luis Rey Valley Groundwater Subbasin Shapefile**).
- "Parcel_Water_Use_AFY" – The estimated quantity of annual water use per parcel in acre feet per year (AFY). This information calculated as follows:
    - Agricultural applied water use was estimated from two sources of information: the agricultural crop and associated acreage per parcel provided in the spreadsheet "parcels_within_PalaPauma_gwbasins_CLIP_9-20.xlsx" (detailed below in subsection **Agricultural Crop and Acreage by Parcel**); and the estimated agricultural applied water for each of these crops (detailed below in subsection **Agricultural Applied Water Estimate**). Water use estimates calculated by this methodology are noted as "Water use estimate based on applied water estimate to the crop/acreage as provided in "PW_AG_Parcel_Water_Use_AFY.xlsx".
    - For non-agricultural parcels (residential and commercial), water use was determined based on land use as reported by the County use code and associated water use estimate as provided in Table 3-5 and Table 3-8 of the County's General Plan Update Groundwater Study[1]. Water use estimates calculated by this methodology are noted as: "Water use estimated based on land use as reported by the County use code and associated water use estimate as provided in Table 3-5 and Table 3-8 of the County's General Plan Update Groundwater Study"
    - Parcels with greater than 11% of their area within tribal lands do not have an estimated quantity of water use.
- "Parcel_Water_Use_Note" – Methodology of the water use estimate. There are four categories:
    - 1 - "Water use estimate based on applied water estimate to the crop/acreage as provided in "PW_AG_Parcel_Water_Use_AFY.xlsx"'"
        - Further information is provided in below subsections **Agricultural Crop and Acreage by Parcel** and **Agricultural Applied Water Estimate**
    - 2 - "Water use not estimated, parcel located on tribal land (11% or greater of the parcel area overlies tribal land)"
        - Note – the percentage (11%) is arbitrary; however, a threshold percentage will need to be decided as the tribal boundary can overlap small portions of parcels, but these parcels may not necessarily be associated with the tribe.
    - 3 - "Water use estimated based on land use as reported by the County use code and associated water use estimate as provided in Table 3-5 and Table 3-8 of the County's General Plan Update Groundwater Study"
        - Link to County General Plan[1]
    - 4 – "Water use estimate based on applied water estimate to crop/acreage as provided in "PW_AG_Parcel_Water_Use_AFY.xlsx" and County Use Code"
        - Denotes parcels with both Ag water use (described as "1" above), and water use estimated rom the County's General Plan (described as "3" above).

[1] https://www.sandiegocounty.gov/content/dam/sdc/pds/gpupdate/docs/BOS_Aug2011/EIR/Appn_D_GW.pdf

- "Parcel_on_Tribal_Land" – If the parcel land area overlaps any portion of tribal land, the tribe is listed. Additional information is provided below in subsection **Federally Recognized Tribal Lands**.
- "%_Parcel_on_Tribal_Land" – Provides the percentage of parcel land area that is within tribal land.
- "PR_Water_Provider_Original" - The source of water supply to each parcel within Yuima's service area was provided in a spreadsheet sent from Amy Reeh to Ryan Aston on October 16, 2023 and updated February 9, 2024. Additional information is provided below in subsection **Water Provider for Each Parcel**.
- "Irr_Acres_from_AmyR" – The agricultural irrigated acres and crop as provided by Amy Reeh. Described in below subsection "Agricultural Crop and Acreage by Parcel"
- "Ag_Applied_Water_AcreFt_OpenET" – Estimated applied water per parcel as calculated by the "Agricultural Applied Water Estimate" (detailed in below subsection). Note, this column lists agricultural applied water for parcels on >11% of tribal land. These will need to be removed when presenting ag applied water associated with the fee study estimates.

Supporting Data and Methodology

Additional information on methodology and sources of information to estimate water use is included in the following subsections:

Upper San Luis Rey Valley Groundwater Subbasin Boundary

The Department of Water Resources (DWR) Bulletin 118 shapefile boundary of the Upper San Luis Rey Valley Groundwater Subbasin was downloaded from the SGMA Data Viewer in June of 2023. The website for download can be found at: https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#boundaries.

Parcel Shapefile

Parcel information for San Diego County was downloaded from the SANDAG/SanGIS Regional GIS Data Warehouse Open Data Portal in June 2023 (referred to as the 'County parcel dataset'). The website for download can be found at: https://sdgis-sandag.opendata.arcgis.com/datasets/SANDAG::parcels-6/explore. 1,897 parcels with an APN are located within, or partially within, the boundaries of the subbasin (it is noted 10 parcels did not have an APN and were removed, these were associated with rights of way).

It is noted that the parcel shapefile is "stacked", meaning that for any piece of ground there may be multiple parcels stacked on top of each other. For example, a condominium building may have 4 individual condos. Each condo is a separate taxable parcel, but all 4 condos will be associated with the same physical lot on the ground. In this example, there will be 4 polygons stacked on top of each other. The implication is that if the acreage of all SANDAG parcels within the subbasin are summed, the sum will be greater than the total acreage of the subbasin.

Agricultural Crop and Acreage by Parcel

Amy Reeh provided the spreadsheet "parcels_within_PalaPauma_gwbasins_CLIP_9-20.xlsx" to Ryan Aston on May 30, 2023 via email. The spreadsheet included data such as parcel APN, agricultural status ('yes' or 'no'), and if the parcel was a golf course, nursery, or on a reservation. Nine categories of agricultural crop or land use and their associated acreage were included. A summary of the crop type or land use, and the associated acreage is provided in **Table 2**. The spreadsheet contains 1,890 parcels, 4 parcels in the spreadsheet do not exist in the *County parcel dataset*; however, these parcels are not

associated with agricultural acreage (parcels in the agricultural crop spreadsheet but not in the County parcel dataset include: 1101502400, 1323608500, 1323605400, 1323607100).

Table 2. Summary of Agricultural Crop and Land Use and Associated Acreage

Agricultural Crop or Land Use	Acreage
Citrus Acres	2,510.74
Avo Acres	2234.4
Grape Acres	76.55
Blueberry Ac	173.5
Pomegranate	11.8
Nursery Ac	813.8
Pasture	474.7
Golf	151.7
Vegetable	11.5
Other Acres	156
Total	**6,615**

Agricultural Applied Water Estimate

The quantity of water applied to each agricultural crop annually was estimated with OpenET.[2] This is a method adopted in many SGMA basins that provides accessible satellite-based evapotranspiration (ET) data for crops in a specific basin.

Based on this information, the applied water for each category of agricultural crop provided in the spreadsheet "parcels_within_PalaPauma_gwbasins_CLIP_9-20.xlsx" was estimated (**Table 3**).

Table 3. Applied Water Estimate for Agricultural Crops (acre-feet/acre)

Land Use	ITRC AW, AF/acre
Citrus	3.7
Avocado	4.3
Grape	2.0
Blueberry	1.5
Pomegranate	3.2
Nursery	3.1
Pasture / Grass	2.1
Golf	3.8
Vegetable	2.0

[2] https://etdata.org/about/

Federally Recognized Tribal Lands

The shapefile of federally recognized tribal lands, updated September 15, 2023, was download in December 2023 from the California Natural Resources Agency Open Data at the following link: https://data.cnra.ca.gov/dataset/federally-recognized-tribal-lands/resource/b70512b8-6a36-4031-9245-b2405a69c2d1

Water Provider for Each Parcel

The source of water supply to each parcel within Yuima's service area was provided in a spreadsheet sent from Amy Reeh to Ryan Aston on October 16, 2023 ("Parcels within Yuima Service Area with Water Providers.xlsx"; referred to as the *Water Provider Spreadsheet*), and updated February 9, 2024. It is noted in the email that if the parcel is outside of Yuima's service area, the parcel is likely on a reservation or served by a private well. The spreadsheet contains water provider information for 1,279 parcels and includes 22 categories of water provider. 1,071 of the 1,279 parcels in the spreadsheet matched parcels overlying the subbasin from the County parcel dataset. It is noted that some parcels in the spreadsheet matched parcels that do not overlay the subbasin. The categories of water provider were grouped into simplified categories, provided in **Table 4**, and then mapped, provided in **Figure 1**. In the figure, the subbasin boundary is provided, as well as parcels in the County parcel dataset that are not included in the water provider spreadsheet (indicated as yellow/orange parcel boundaries with no fill). Important notes regarding linking the *Water Provider Spreadsheet* to the *County Parcel Dataset* include:

- 1,071 parcels in the *Water Provider Spreadsheet* match those in the *County Parcel Dataset*
- 208 parcels in the *Water Provider Spreadsheet* are not included in the *County Parcel Dataset*
- 826 parcels in the *County Parcel Dataset* are not included in the *Water Provider Spreadsheet*

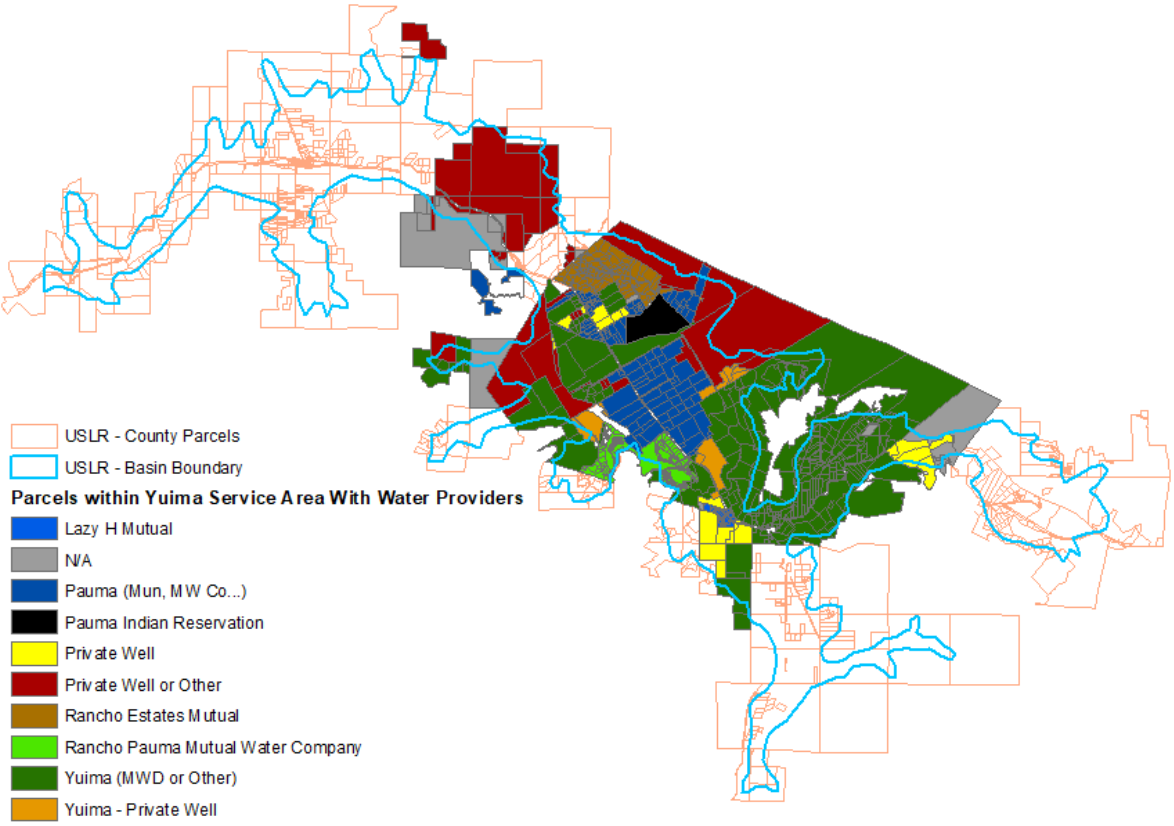

Figure 1. Water Provider by Parcel, as listed in Spreadsheet: Parcels within Yuima Service Area with Water Providers.xlsx (note parcels not overlaying the subbasin that are included in the spreadsheet)

Table 4 Categories of Water Provider, Simplified and Original

Water Provider (Simplified)	Water Provider (Original)
Lazy H Mutual	Lazy H Mutual
N/A	N/A
Pauma Indian Reservation	Pauma Indian Reservation
Pauma (Mun, MW Co...)	Pauma Mutual Water Co
	Pauma MWD
	Pauma Ridge Mutual
	Pauma Valley Municipal Water District
	Pauma Valley Water Co
Private Well	Private
	Private Well

	Private Wells
Private Well or Other	Private Well or other
	Private Well or other - Rancho Estates
	Private Well or Other -Rancho Estates
Rancho Estates Mutual	Rancho Estates Mutual
Rancho Pauma Mutual Water Company	Rancho Pauma Mutual Water Company
Yuima (MWD or Other)	Yuima
	Yuima MWD
Yuima - Private Well	Yuima MWD / Gells
	Yuima MWD / Mells
	Yuima MWD / Wells
	Yuima MWD / Private Wells
	YuimaMWD - Private well