

## **SOLANO COUNTY WATER AGENCY**

### **AGREEMENT FOR PROFESSIONAL SERVICES (Professional Services/Standard Contract)**

THIS AGREEMENT, **effective July 1, 2024**, is between SOLANO COUNTY WATER AGENCY, a public agency existing under and by virtue of Chapter 573 of the 1989 statutes of the State of California, hereinafter referred to as "Agency," and **Eagle Aerial Solutions**, hereinafter referred to as "Contractor."

The Agency requires services for **WaterView Software, CII Compliance and NFT Analysis For AB1668/SB606 Compliance**; and the Contractor is willing to perform these services pursuant to the terms and conditions set out in this Agreement.

IT IS MUTUALLY AGREED, as follows:

1. **SCOPE OF SERVICES**

The Agency hereby engages the Contractor, and the Contractor agrees to perform the services for **WaterView Software, CII Compliance and NFT Analysis For AB1668/SB606 Compliance**, as described in Exhibit A, in accordance with the terms of this Agreement and any applicable laws, codes, ordinances, rules or regulations. In case of conflict between any part of this Agreement, this Agreement shall control over any Exhibit.

2. **COMPENSATION**

Compensation for services shall be as follows: Hourly rate of personnel plus any allowed reimbursable expenses based on unit costs as indicated on any allowed reimbursable expense in Exhibit B **not to exceed \$214,269** for all work contemplated by this Agreement.

3. **METHOD OF PAYMENT**

Payment for services will be approved by the Agency's representative only if all contract requirements have been met.

Invoices must be submitted monthly, and upon approval of the Agency's representative, the Agency shall pay the Contractor monthly in arrears for fees and allowed expenses incurred the prior month. ***Invoices that are over 6 months old will not be approved or paid by the Agency. In no event shall the cumulative total paid pursuant to this agreement exceed the maximum amount provided for in paragraph 2 of this Agreement.***

Every invoice shall specify the hours worked for each task identified in Exhibit A undertaken. To be approved by payment, any allowed reimbursable expenses will need supporting written documentation such as receipts and mileage logs.

Each invoice shall be accompanied by a spreadsheet showing, by month, costs incurred to date for the project broken down by the Tasks identified in Exhibit A. The spreadsheet shall show, for each task,

budget amounts, and total expended and remaining amounts. The spreadsheet shall show a subtotal for each fiscal year covered by the contract. Any amendments to the contract shall be listed and incorporated into the spreadsheet. An example of a typical spreadsheet shall be provided by the Agency.

4. **TIME OF PERFORMANCE**

This Agreement shall become effective as of the date it is executed and said services will take place between this date and **June 30, 2025**, as directed by the Agency.

5. **MODIFICATION AND TERMINATION**

This Agreement may be modified or amended only by written instrument signed by the parties hereto, and the Contractor's compensation and time of performance of this Agreement shall be adjusted if they are materially affected by such modification or amendment.

Any change in the scope of the professional services to be done, method of performance, nature of materials or price thereof, or to any other matter materially affecting the performance or nature of the professional services will not be paid for or accepted unless such change, addition or deletion be approved in advance, in writing, by the Agency's General Manager.

This Agreement may be terminated by the Agency at any time, without cause, upon written notification to the Contractor. The Contractor may terminate this Agreement upon 30 days written notice to Agency.

Following termination by the Agency or the Contractor, the Contractor shall be reimbursed for all expenditures made in good faith in accordance with the terms of this Agreement that are unpaid at the time of termination.

6. **PERMITS** *(Note: include only if permits are required)*

Permits required by governmental authorities will be obtained at the Contractor's expense, and the Contractor will comply with local, state and federal regulations and statutes including Cal/OSHA requirements.

7. **INDEMNIFY AND HOLD HARMLESS**

*To the extent permitted by law, Contractor shall hold harmless, defend at its own expense and indemnify Solano County Water Agency, its directors, officers, employees, and authorized volunteers, against any and all liability, claims, losses, damages, or expenses, including reasonable attorney's fees and costs, arising from all acts or omissions of Contractor or its officers, agents, or employees in rendering services under this contract; excluding, however, such liability, claims, losses, damages or expenses arising from Solano County Water Agency's sole negligence or willful acts.*

8. **MINIMUM INSURANCE REQUIREMENTS**

Contractor shall procure and maintain for the duration of the contract insurance against claims for injuries or death to persons or damages to property which may arise from or in connection with the performance of the work hereunder and the results of that work by the Contractor, his agents, representatives, employees or subcontractors. Coverage shall be at least as broad as the following:

1. **Commercial General Liability (CGL)** – Insurance Services Office (ISO) Commercial General Liability Coverage (Occurrence Form CG 00 01) including products and completed operations, property damage, bodily injury, personal and advertising injury with limit of at least two million dollars (\$2,000,000) per occurrence or the full per occurrence limits of the policies available, whichever is greater. If a general aggregate limit applies, either the general aggregate limit shall apply separately to this project/location (coverage as broad as the ISO CG 25 03, or ISO CG 25 04 endorsement provided to Solano County Water Agency) or the general aggregate limit shall be twice the required occurrence limit.
2. **Automobile Liability** – Insurance Services Office (ISO) Business Auto Coverage (Form CA 00 01), covering Symbol 1 (any auto) or if Contractor has no owned autos, Symbol 8 (hired) and 9 (non-owned) with limit of one million dollars (\$1,000,000) for bodily injury and property damage each accident.
3. **Workers' Compensation Insurance** – as required by the State of California, with Statutory Limits, and Employer's Liability Insurance with limit of no less than \$1,000,000 per accident for bodily injury or disease. **Waiver of Subrogation:** The insurer(s) named above agree to waive all rights of subrogation against the Solano County Water Agency, its elected or appointed officers, officials, agents, authorized volunteers and employees for losses paid under the terms of this policy which arise from work performed by the Named Insured for the Solano County Water Agency; but this provision applies regardless of whether or not the Solano County Water Agency has received a waiver of subrogation from the insurer.

If the Contractor maintains broader coverage and/or higher limits than the minimums shown above, the Solano County Water Agency requires and shall be entitled to the broader coverage and/or higher limits maintained by the Contractor. Any available insurance proceeds in excess of the specified minimum limits of insurance and coverage shall be available to the Solano County Water Agency.

**Other Required Provisions** – The general liability policy must contain, or be endorsed to contain, the following provisions:

1. **Additional Insured Status:** The Solano County Water Agency, its directors, officers, employees, and authorized volunteers are to be given insured status (at least as broad as ISO Form CG 20 10 10 01), with respect to liability arising out of work or operations performed by or on behalf of the Contractor including materials, parts, or equipment furnished in connection with such work or operations.
2. **Primary Coverage:** For any claims related to this project, the Contractor's insurance coverage shall be primary at least as broad as ISO CG 20 01 04 13 as respects to the Solano County Water Agency, its directors, officers, employees and authorized volunteers. Any insurance or self-insurance maintained by the Solano County Water Agency its directors, officers, employees and authorized volunteers shall be excess of the Contractor's insurance and shall not contribute with it.

**Notice of Cancellation:** Each insurance policy required above shall provide that coverage shall not be canceled, except with notice to the Solano County Water Agency.

**Self-Insured Retentions:** Self-insured retentions must be declared to and approved by the Solano County Water Agency. The Solano County Water Agency may require the Contractor to provide proof of ability to pay losses and related investigations, claim administration, and defense expenses

within the retention. The policy language shall provide, or be endorsed to provide, that the self-insured retention may be satisfied by either the named insured or Solano County Water Agency.

**Acceptability of Insurers:** Insurance is to be placed with insurers having a current A.M. Best rating of no less than A: VII or as otherwise approved by Solano County Water Agency.

**Verification of Coverage:** Contractor shall furnish the Solano County Water Agency with certificates and amendatory endorsements or copies of the applicable policy language effecting coverage required by this clause. All certificates and endorsements are to be received and approved by the Solano County Water Agency before work commences. However, failure to obtain the required documents prior to the work beginning shall not waive the Contractor's obligation to provide them. The Solano County Water Agency reserves the right to require complete, certified copies of all required insurance policies, including policy Declaration pages and Endorsement pages.

**Subcontractors:** Contractor shall require and verify that all subcontractors maintain insurance meeting all the requirements stated herein, and Contractor shall ensure that the Solano County Water Agency, its directors, officers, employees, and authorized volunteers are an additional insured on Commercial General Liability Coverage.

**Safety:** In the performance of this contract the Contractor shall comply with all applicable federal, state and local statutory and regulatory requirements including, but not limited to California Department of Industrial Relations (Cal/OSHA) regulations; and the U.S. Department of Transportation Omnibus Transportation Employee Testing Act, related to their scope of work and operations. In case of conflict in regulations, the most stringent shall apply.

9. **COMPLIANCE WITH LAW**

The Contractor shall be subject to and comply with all federal, state and local laws and regulations applicable with respect to its performance under this Agreement, including but not limited to, licensing, employment and purchasing practices, and wages, hours and conditions of employment.

10. **RECORD RETENTION**

Except for materials and records, delivered to the Agency, the Contractor shall retain all materials and records prepared or obtained in the performance of this Agreement, including financial records, for a period of at least three years after the Contractor's receipt of the final payment under this Agreement. Upon request by the Agency, the Contractor shall make such materials and records available to the Agency at no additional charge and without restriction or limitation to State and federal governments at no additional charge.

11. **OWNERSHIP OF DOCUMENTS**

All materials and records of a finished nature, such as final plans, specifications, reports and maps, prepared or obtained in the performance of this Agreement, shall be delivered to and become the property of the Agency. All materials of a preliminary nature, such as survey notes, sketches, preliminary plans, computations, and other data, prepared or obtained in the performance of this Agreement, shall be made available, upon request, to the Agency at no additional charge and without restriction or limitation on their use.

12. **SUBCONTRACT AND ASSIGNMENT**



This Agreement binds the heirs, successors, assigns and representatives of the Contractor. The Contractor shall not enter into subcontracts for any work contemplated under this Agreement and shall not assign this Agreement or monies due or to become due, without the prior written consent of the General Manager of the Agency or his designee, subject to any required state or federal approval. *(Note: list any subcontractors here)*

13. **NONRENEWAL**

The Contractor understands and agrees that there is no representation, implication, or understanding that the services provided by the Contractor under this Agreement will be purchased by the Agency under a new agreement following expiration or termination of this Agreement and waives all rights or claims to notice or hearing respecting any failure to continue purchase of all or any such services from the Contractor.

14. **NOTICE**

Any notice provided for herein are necessary to the performance of this Agreement and shall be given in writing by personal delivery or by prepaid first-class mail addressed as follows:

AGENCY

Chris Lee, General Manager  
Solano County Water Agency  
810 Vaca Valley Parkway, Suite 203  
Vacaville, CA 95688

CONTRACTOR

Jazmine Molloy  
Eagle Aerial Solutions  
3333 Michelson Drive, Suite 300  
Irvine, CA 92612

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The parties have executed this Agreement the day and year first above written. If the Contractor is a corporation, documentation must be provided that the person signing below for the Contractor has the authority to do so.

Solano County Water Agency  
a Public Agency

By: \_\_\_\_\_  
Chris Lee  
General Manager

By: \_\_\_\_\_  
Jazmine Molloy  
Director of Product Development

**FOR SCWA USE ONLY**

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Contract Period: 7/1/24 to 6/30/25  
File Number: AG-E-11  
Account Manager: Drew Gantner  
G/L Account #: 6551AC  
Job Cost #: 2028  
Contract Type: Professional Services

## EXHIBIT A

### SCOPE OF SERVICES

#### **Scope of Work:**

SCWA requires assistance in helping Member Agencies meet the efficiency and allocation requirements outlined in the new long-term California water conservation legislation, SB606 & AB1668.

SCWA requires use of WaterView, CII compliance mapping and non-functional turf analysis, which are specifically developed and performed to support water professionals in preparing for and maintaining regulatory compliance under the new state standards. These services offer a comprehensive set of features and functionalities that enable users to effectively manage water resources and optimize efficiency.

#### **Services to be provided:**

Member Agencies (retail water purveyors) are required to comply with SB 606 and AB 1668. Compliance will be met by the following tasks:

- WaterView Software:
  - Eagle Aerial Solutions together with CalWEP, has custom designed and developed WaterView™, to help water professionals meet the efficiency and allocation requirements established under the new long term California water conservation legislation, SB606 & AB1668. EAS proposes the implementation of WaterView™ as a critical SaaS tool that helps prepare and maintain regulatory compliance under the new state standards.
  - Analyzes and visually reports, via multiple “dashboards”, current and historical efficiency performance from the district to the individual customer level.
  - Helps spot water use trends, track and manage over-allocation users within each district, and identify targeted land classification types like high turf areas for effective rebating.
  - Helps design and implement a wide variety of precisely targeted water conservation and efficiency outreach programs AND assess the effectiveness of those programs over time.
- CII Compliance Pathway for the City of Rio Vista:
  - The proposed CII Compliance Pathway for the City of Rio Vista will include Land Use Land Cover (LUCD) mapping of CII & MFR parcels and Irrigated Landscape DIM Premise Delineation.
  - The LUCD classification scheme matches the definitions developed for the California Department of Water Resources (DWR) Program.
  - Functional Turf vs. Non-Functional Turf assessment.
  - Dedicated Irrigation Meters (DIMs) and Multi-Use Meters (MUMs) Initial Analysis.
- Non-Functional Turf (NFT) Analysis for SCWA Agencies:

- The EAS/NV5 team will perform a Non-Functional Turf (NFT) analysis across all CII parcels (including medians and parkway strips) within the services areas of the retail water agencies listed below. This analysis in accordance with the compliance requirements in AB 1572.
- Agencies falling under this aspect of the contract will include:
  - City of Vacaville
  - City of Vallejo
  - City of Fairfield
  - Suisun Irrigation District
  - City of Dixon

**Deliverables:**

WaterView will provide all the necessary data, analysis, mapping and reporting as required by SB 606 and AB 1668 for participating Member Agencies, City of Vacaville, City of Vallejo, City of Dixon, City of Fairfield, City of Suisun City and City of Rio Vista.

**EXHIBIT B**

**RATE OF COMPENSATION**

## Pricing Summary and Breakdown:

<b>Solano County Water Agency: WaterView™ Renewal</b>	
<i>Total Connections: 106,000</i>	
<i>Participating Retailers: City of Vacaville, City of Vallejo, City of Fairfield, City of Dixon, Suisun City, City of Rio Vista</i>	
<b>WaterView™ + CII Module</b>	<b>1 YEAR AGREEMENT</b>
Annual Subscription Cost <i>(CalWEP Member Discount applied)</i>	<b>\$135,886</b>

## LUCD Mapping, CII DIM/MUM Premise Delineation + WV CII Module for the City of Rio Vista:

DIM and MUM Initial Analysis	CII area: 5.05 sq miles
Landscape Use Classification Dataset (LUCD) Mapping	CII + MFR Areas: 5.85 sq miles
CII DIM Premise Delineation	Based on 111 DIMs (MUMs TBD)
<b>Total Mapping &amp; CII Project NTE Cost</b>	<b>\$51,000</b>

## Non-Functional Turf (NFT) Analysis for SCWA Agencies:

City of Vacaville	29.97 sqmi	\$6,623
City of Vallejo	49.91 sqmi	\$11,030
City of Fairfield	33.93 sqmi	\$7,499
Suisun Irrigation District	3.89 sqmi	\$1,000
City of Dixon	5.57 sqmi	\$1,231
<b>Total</b>	<b>123.27 sqm</b>	<b>\$27,383</b>

*\*City of Rio Vista not included as NFT has been included in CII Pathway to Compliance SOW*

<b>Contract Total</b>	<b>\$214,269</b>
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# Proposal for Solano County Water Agency

WaterView™

CII Compliance Pathway for the City of Rio Vista  
Non-Functional Turf (NFT) Analysis for CII Parcels

April 18<sup>th</sup>, 2024

Solano County Water Agency

**Drew Gantner**

[DGantner@scwa2.com](mailto:DGantner@scwa2.com)

Office: (707) 941-5356

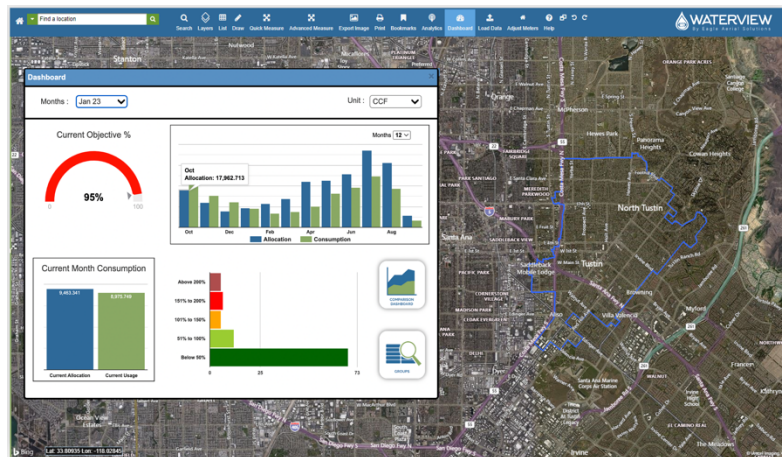
Eagle Aerial Solutions is pleased to provide the below proposal per the request of the Solano County Water Agency.

## WaterView™

Eagle Aerial Solutions together with CalWEP, has custom designed and developed WaterView™, to help water professionals meet the efficiency and allocation requirements established under the new long term California water conservation legislation, SB606 & AB1668. EAS proposes the implementation of WaterView™ as a critical SaaS tool that helps prepare and maintain regulatory compliance under the new state standards.

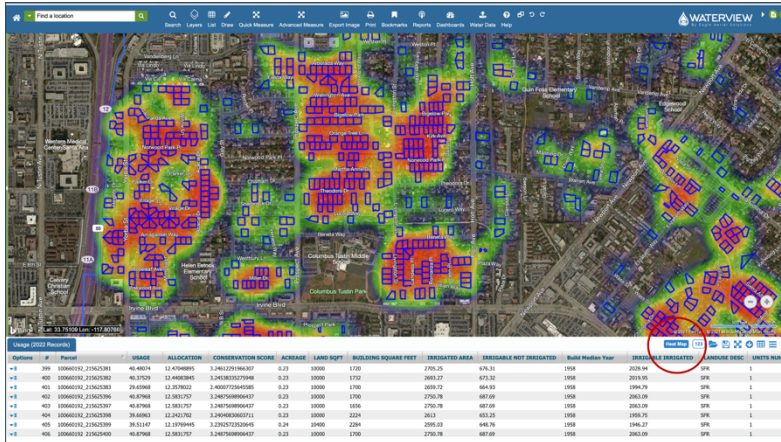
WaterView™ is a data management tool, integrated with GIS technologies, that was designed specifically to help water professionals meet the efficiency and allocation requirements established under the new long-term California water conservation legislation .

This cloud-based platform helps water suppliers track, analyze, and quantify real elements of water use behavior, while meeting their unique water use objectives. WaterView™ allows water agencies to analyze total water allocation at the parcel level in compliance with proposed legislative standards, helps spot water use trends, tracks and manages over-allocation users within each district, and aids in the new state reporting requirements.



Within the foundational architecture of the software, each WaterView™ account is customized to fully mirror local, state, and legislative mandates and requirements, helping water agencies work within their given parameters, stay in compliance, and avoid fines.

As a data management platform, WaterView™ combines multiple data sets (daily local ET readings, parcel data, demographic data, irrigated landscape square footage, household size, etc.) to allow precise, targeted conservation efforts at the district, group, and customer level. These targeted efficiency assessments and outreach capabilities will lead to more effective conservation campaigns while saving money over untargeted, large-scale outreach efforts.



The platform’s in-depth data mining and analytical querying capabilities allows water managers to spot water use trends, track and manage “over-allocation” users within a service area and identify targeted land classification types like high turf areas, essential for effective water management under new framework. Turf being the most water intensive vegetation in the service area, WaterView™ provides a custom GIS layer identifying high and low turfed areas across a supplier’s service area. Access to location-based data about turf allows a

purveyor to save significant money and time by allowing conservation teams to target customers with the largest amount of turf, thereby reducing the cost of outreach efforts and rebate programs.

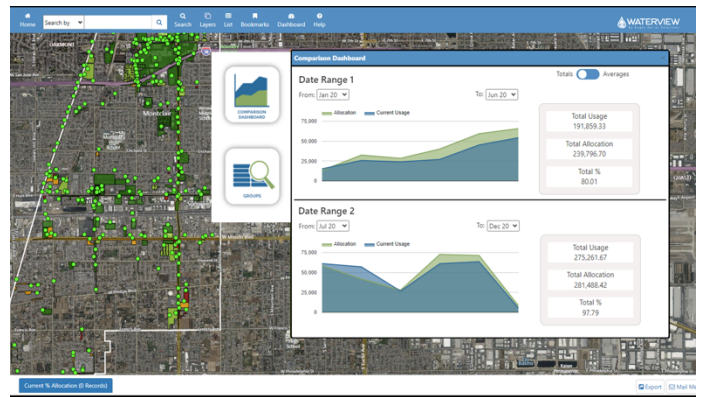
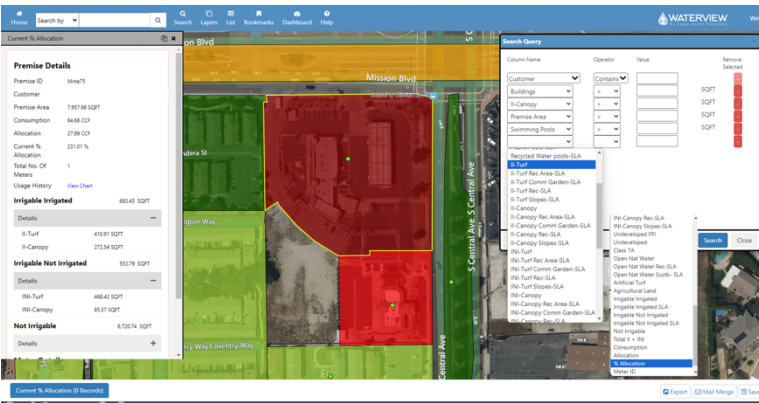
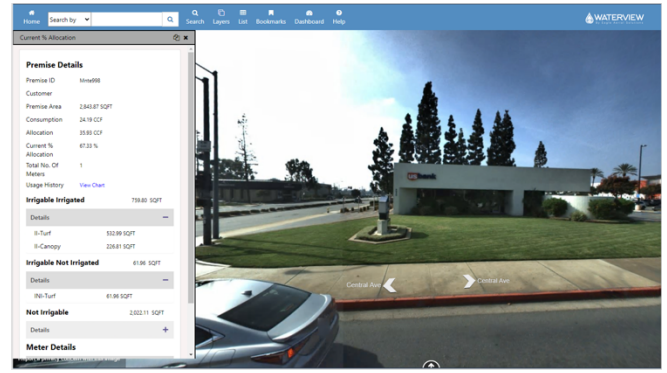
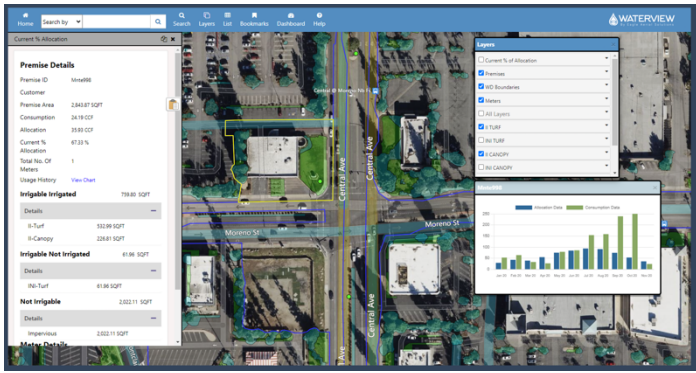
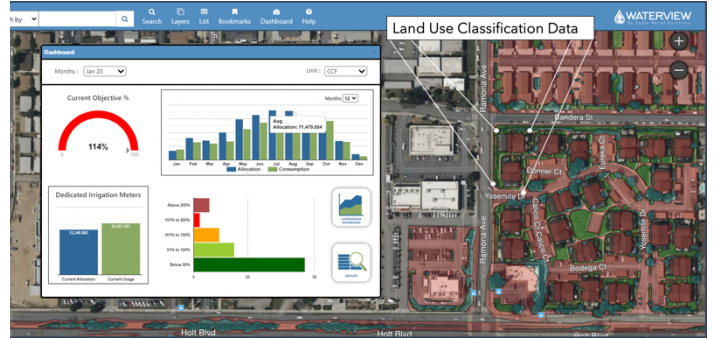
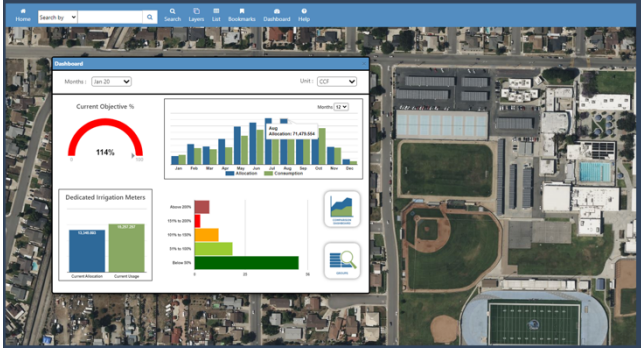
**WaterView™ is a powerful tool that:**

- Analyzes and visually reports, via multiple “dashboards”, current and historical efficiency performance from the district to the individual customer level.
- Helps spot water use trends, track and manage over-allocation users within each district, and identify targeted land classification types like high turf areas for effective rebating.
- Helps design and implement a wide variety of precisely targeted water conservation and efficiency outreach programs AND assess the effectiveness of those programs over time.

**Specific features include:**

- The ability to ongoingly determine use and efficiency from parcel-level to district level.
- High-resolution aerial imagery
- Daily ET data automatically integrated.
- Detailed demographic data for more accurate indoor water use efficiency measurements.
- Parcel data and district boundaries
- GIS tools to query by data (parcel, address, customer number, etc.), draw/measure, search, and query by designated areas.
- Ability to integrate water use data from your district (using our customized data loader tool)
- Other tools, functionality, and data as determined by districts to be helpful







**Subscribing Agencies will:**

Be required to provide regular water use data to be imported into the WaterView™ portal. A Unique ID (UID) for the meter location must be used to tie the usage data to the meter address. Names do not need provided, unless your district would like to do direct mailings for outreach to target certain customers for incentives to become more efficient.

**Technical Support & Project Management:**

Technical support will be provided through the duration of the contract. Software training will be done by a series of onboarding virtual meetings. Your agency will be assigned a Customer Success Advocate that will provide any additional training(s) or account customization via virtual meeting platforms and screen sharing throughout the life of the WaterView™ subscription.

**Security of the WaterView™ Platform:**

Eagle Aerial Solutions developed the WaterView™ portal in partnership with Digital Map Products Now LightBox, using their existing stable and robust online mapping technology. DMP/LightBox has been providing mapping services for nearly 20 years to large enterprise and government customers including Zillow, Google, Apple, CBRE, and the State of California. More than 350,000 users are accessing data from their platform daily to make informed decisions.

For more detailed information please refer to the full security statement:

<https://www.eagleaerial.com/docs/waterview-security.pdf>

**Pricing for WaterView™**

<b>Solano County Water Agency: <i>WaterView Renewal</i></b>	
<i>Total Connections:</i> 106,000	
<i>Participating Retailers:</i> City of Vacaville, City of Vallejo, City of Fairfield, City of Dixon, City of Suisun City, City of Rio Vista	
<b>WaterView™ + CII Module</b>	1 YEAR AGREEMENT
Annual Subscription Cost <i>(CalWEP Member Discount applied)</i>	<b>\$135,886</b>

## CII Compliance Pathway for the City of Rio Vista:

Eagle Aerial Solutions (Eagle) has 35 years of experience in providing cutting-edge geospatial solutions. Our expanding products and services include ortho-imagery, oblique imagery, elevation data and contours, building footprints, web-based GIS software solutions, remote sensing analysis services, and consulting expertise. Eagle and partner company NV5 Geospatial (NV5), will perform the DIM boundary work and the Land Use Classification Data (LUCD) analysis in compliance with California requirements. The mapped data will be prepped and ingested into the custom WaterView web-based solution and combined with numerous datasets, such as ET data, demographic data, assessor data, base maps, parcel data and the like. WaterView is the only software that has been custom designed to effectively support the use of CII mapped datasets. This combination of data and software is necessary for the mapped data to be easily accessible and useable for data management, analysis, reporting and conservation outreach purposes, all in service to compliance with the legislative mandates of AB1668/SB606.

The proposed CII Compliance Pathway for the City of Rio Vista will include Land Use Land Cover (LUCD) mapping of CII & MFR parcels and Irrigated Landscape DIM Premise Delineation.

### Land Use Classification Data (LUCD)

The EAS/NV5 team is currently producing the detailed land cover classification for CA DWR as part of the CII Landscape Area Measurement project using 2020 4band imagery. In order to maintain accuracy and consistency the data will be provided to the City of Rio Vista in the exact format to the exact classification scheme that is being produced for the CA DWR. The classification scheme and accuracy protocols required by the state are outlined here. We use a combination of machine learning, object-based image analysis, object smoothing and manual editing to produce the final dataset. Each area is visually quality controlled by an experienced photo interpreter and the dataset is accurately assessed to make sure it meets the quality requirements.

### Area of interest:



### Geographic Extents:

The geographic area addressed in this Statement of Work (SOW) are as requested by the City of Rio Vista:

- Entire Service Area Boundary: 7.12 sq miles
- Imagery : 2020 summer acquisition
- Resolution: 1ft

Once the City of Rio Vista has approved the geographic extents to be included in the mapping footprint. There will be no adjustment of AOI boundaries or parcel boundaries.

If any refinement of the boundary is necessary (i.e. additions of newly developed parcels), additional area can be added to the scope of work on a price per square mile (mi<sup>2</sup>) basis.

### Classification Scheme

The modified turfgrass specific LUCD classification schema is shown below:

LUCD Canopy Priority Classification System		
Level 1	Level 2	Irrigation Status
1. Impervious	Impervious	Not Irrigable
2. Pools	Swimming pools/man made water features	Irrigated
3. Irrigated	3.1.1 Turf grass	Irrigated <b>(CII Properties only: Turf grass separated in Functional and Non-Functional)</b> Irrigated
	3.1.2 Other vegetated ground cover	
	3.2 Canopy 3.3 Bare	
4. Irrigable not irrigated	4.1.1 Turf grass	Irrigable not irrigated Irrigable not irrigated
	4.1.2 Other vegetated ground cover	
	4.2 Canopy 4.3 Bare	Irrigable not irrigated
5. Non irrigated vegetation	Undeveloped for the purposes of irrigation	Not Irrigable
6. Undeveloped lands	Undeveloped Lands	Not Irrigable
7. Horse Corrals	Horse Corrals	Irrigated
8. Open Water	Other open natural water (rivers/ponds)	Not Irrigable
9. Artificial Turf	Artificial Turf	Not Irrigable
10. Agricultural Land	Agricultural Land (0.25 acre mmu)	Irrigated

The LUCD classification scheme matches the definitions developed for the California Department of Water Resources (DWR) Program. The classification system is a “canopy priority” and classifies landscape area using a top down approach. If the canopy of a tree extends over a roof top or out over the roadway, the entire extent of that canopy will be considered canopy and receive the appropriate irrigation status based on the land use. Each class has a unique irrigation status associated:

- Irrigated: areas that are presumed to be irrigated at the time the imagery was collected
- Irrigable not irrigated: areas that show high potential of being irrigated at one time, but are presumed to not be currently irrigated, based on the imagery used to conduct the analysis
- Not irrigable: areas that have no irrigation

The Minimum Mapping Unit (MMU) used for capturing features and accuracy assessment from the imagery is 64 square feet. The classification data will be summarized to the client provided parcel location data.

### Functional Turf vs. Non-Functional Turf

The LUCD Level 2 classifications ‘3.1 Turf grass’ and ‘4.1 Turf grass’ will be categorized into ‘Functional Turf’ (abbreviated FT) or ‘Non-Functional Turf’ (abbreviated NFT), based on a California DWR Program’s definition

## Quality Control and Accuracy Assessment

The EAS/NV5 Team conducts detailed quality control and accuracy assessments to ensure the datasets we provide meet rigid accuracy standards. This is not something most other companies do, and for those that do take these steps, something they often do incorrectly. Often companies use a pixel-based accuracy assessment metric that means that if a large field of 100 pixels is considered correct then they take that as 100 samples. We instead use an object-based analysis where a single object is evaluated by a skilled photo interpreters as to whether it was correctly or incorrectly classified so the 100 pixel field discussed above is considered as 1 sample- not 100. This assessment methodology more correctly identifies the accuracy and therefore reliability of the dataset.

The EAS/NV5 team will map the classification dataset to an overall accuracy of 95%. To ensure this accuracy level is met, an assessment will be performed through independent interpretation of check points distributed throughout the service areas. Checkpoint distribution will be stratified by Level 2 LUCD classes (defined in the classification table) as well as geography. A minimum of 25 checkpoints (objects) per square mile will be randomly distributed across the sites in addition, 25 sites will be allocated to specific land use classes not sufficiently represented by the randomly distributed points. Photo interpreters will independently classify each checkpoint with the outline of the classified product, but with no information of the mapped class. Each classified point will be interpreted and evaluated to an appropriate classification of both land cover and land use within the context

of the overall line work associated with the mapped classification. A confusion matrix will be developed to assess user and producer accuracies for each class as well as the overall accuracy across classes. Overall accuracy will meet or exceed 95%, with individual per-class user accuracies at 90% or better at a 95% confidence interval.

An example of the level of detail provided in the LUCD classification mapping is demonstrated in Figure 6.

### LUCD Classification

- Impervious
- Pools
- Irrigated Canopy
- Irrigated Turf/ Cover
- Irrigable Not Irrigated Canopy
- Irrigable Not Irrigated Turf/ Cover
- Not Irrigable Vegetation
- Undeveloped Lands
- Horse Corrals
- Open Water
- Artificial Turf
- Agricultural Lands
- Parcel Boundary



## Dedicated Irrigation Meters (DIMs) and Multi-Use Meters (MUMs) Initial Analysis

In our work with water districts, we have found that most do not have a clear delineation between DIMs and MUMs, in addition many multi-family residential landscapes (MFR) have DIMs. So, a necessary first step is analysis of the CII and MFR data to separate the DIMs from the MUMs, and the water provided to each. This analysis allows focus to be placed on the largest water customers first. To support this the Eagle/NV5 team has developed the methodology outlined below.

Input data is requested from the water supplier that includes.

- Customer list
- Consumption data (one year of monthly data)
- Other datasets such as agency boundary, parcel shapefiles, HOA maps, Generalized meter service area, 1 ft Digital Elevation Model (DEM), other GIS layers or products available.

### Meter Grouping (Premise Estimates)

With full access to the source data the EAS/NV5 team will geolocate the dedicated irrigation meters (DIMs) and work to group them by customer into premise aggregations. This process aims to define the total number of premises in the service area and, with consumption data, can order these premise aggregations by water consumption. With this analysis complete, the water supplier can make informed decisions regarding the cost and level of effort necessary to map the premise boundaries and define the landscape area within these premise boundaries. The meter grouping or premise aggregation process is outlined in 3, 4, and 5.

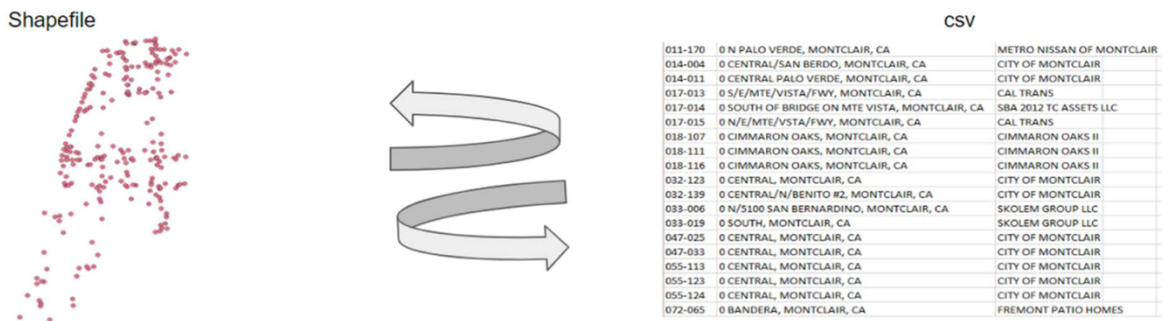


Figure 3: Data provided in form of a shapefile or .csv with geospatial coordinates or addresses can be geolocated on the map.

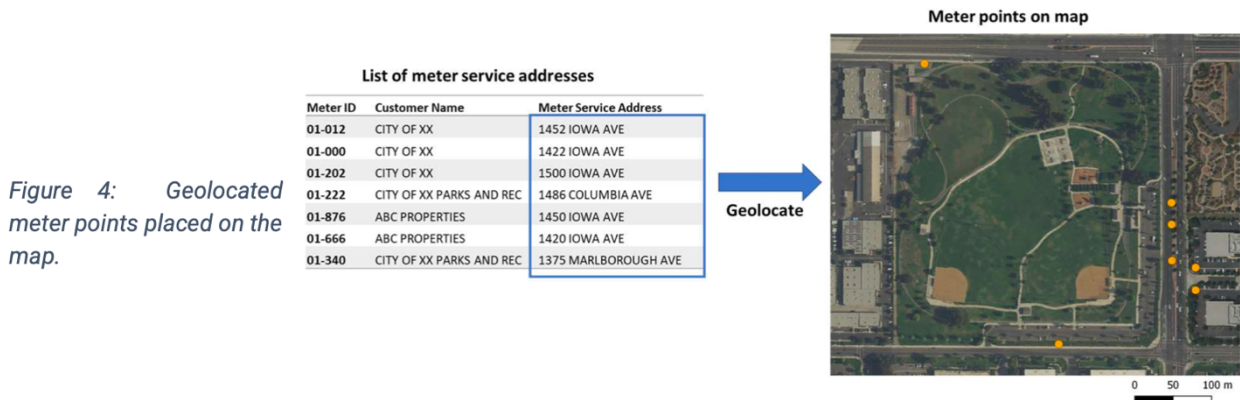


Figure 4: Geolocated meter points placed on the map.





**Grouping meters into premises based on location and customer name.**

Meter ID	Customer Name	Meter Service Address
01-012	CITY OF XX	1452 IOWA AVE
01-000	CITY OF XX	1422 IOWA AVE
01-202	CITY OF XX	1500 IOWA AVE
01-222	CITY OF XX PARKS AND REC	1486 COLUMBIA AVE
01-876	ABC PROPERTIES	1450 IOWA AVE
01-666	ABC PROPERTIES	1420 IOWA AVE
01-340	CITY OF XX PARKS AND REC	1375 MARLBOROUGH AVE

Figure 5: Meter locations are grouped by their customer information and those meters that are serving adjoining landscapes, and are paid for by one customer, are grouped into a premise. Further mapping is still necessary to determine the true geographical extent of the premise and to map the landscape area served by these meters.

### DIM & MUM Consumption Analysis

With the above meter grouping or premise aggregation completed the EAS/NV5 team will additionally run an in-depth consumption analyses. These analyses will be delivered in the form of a PDF report and will help inform any prioritization that will need to occur when DIM delineation is undertaken, see Figure 6 and Figure 7. In parallel, a consumption analysis of the Multi Use Meters (MUMs) will also be performed to determine which are qualified to come under the regulations, and which are not.

#### Water Consumption Analysis

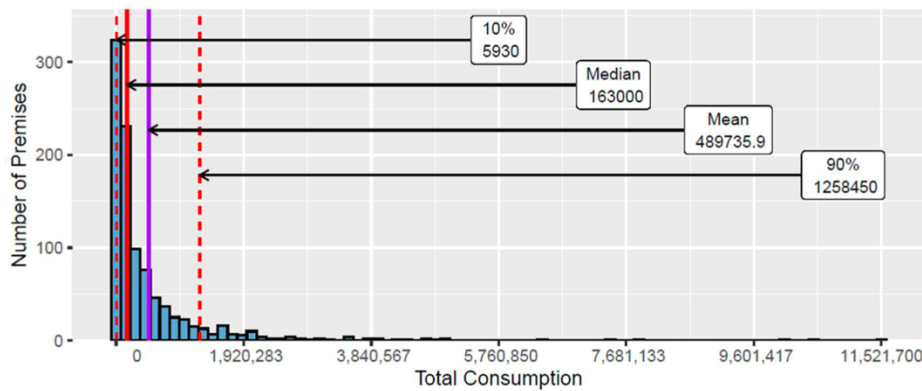


Figure 6: Example of the water consumption analysis provided in the report.

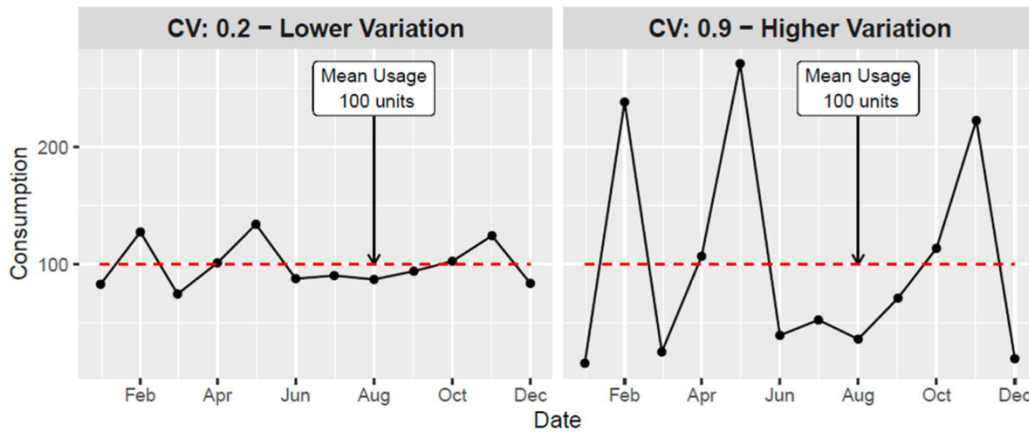


Figure 7: Coefficient of Variation (CV) analysis which demonstrates water use trend analysis – performed on a per premise basis and used to determine anomalies of water use. CV is standardized and presented as a numerical value between 0-1. The smaller the number, the less variance in month-to-month usage.

With meter groupings confirmed and the prioritization finalized, the EAS/NV5 team will map the provisional premise boundaries. This work is completed using heads up digitization methods with the base imagery used in the analysis for reference. Ancillary data sources such as Google Street View and other image services are consulted to help in the identification of premise boundaries. The goal of this step is to provisionally map the max extent of the landscaping that the dedicated irrigation meters are serving.

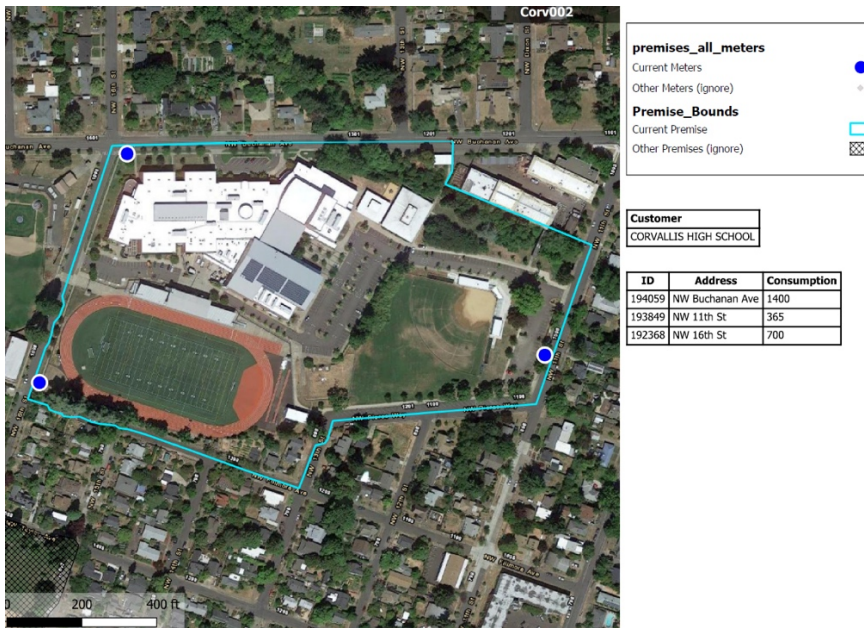
**Approving Meter Grouping Report and Prioritization of Mapping** - The above will provide an analysis of unique dedicated irrigation meters and a rough estimate of premise locations (premises will generally have more than one meter serving them). The next step requires the supplier to review and approve (or request adjustments) to these groups. After the groupings have been finalized the client can prioritize which premises are mapped first or can use this as an opportunity to adjust the level of effort to the available budget

### Premise Mapping

With meter groupings confirmed and the prioritization finalized, the EAS/NV5 analysts will map the provisional premise boundaries. This work is completed using heads up digitization methods with the base imagery used in the analysis for reference. Ancillary data sources such as Google Street View and other image services are consulted to help in the identification of premise boundaries. The goal of this step is to provisionally map the max extent of the landscaping that the dedicated irrigation meters are serving.

### Premise Approval

Once the premise boundaries are mapped in draft form the boundaries will need to be reviewed and approved by the water district staff. We have found that the refinement of these premise boundaries is best supported by water district staff that is very familiar with the customers' properties (i.e. meter readers or some other equivalent). The approval process can take many forms but is most often facilitated by the EAS/NV5 analysts and project managers through a web-based review portal (see Figure 7 for example). We will work closely with the client to determine the most appropriate review combination to support a timely and efficient review period.



**Figure 7.** Example premise boundary as displayed in a PDF map review packet generated and delivered to aid in the review and approval of premise boundaries. Additional review is accomplished via shapefile review and through facilitated screen share sessions.

### CII SLA Mapping

With a complete set of approved premises, the EAS/NV5 analysts will map the CII Special Landscape Areas (SLA) within each premise according to established guidance. CII Special Landscape Areas are mapped landscapes dedicated solely to edible plants, areas irrigated with recycled water, water features using recycled water, and areas dedicated to active play such as parks, sports fields, golf courses, and where turf provides a playing surface. Engineered slopes are mapped landscape areas that are purposely graded and planted for vegetative slope stabilization and erosion control Special Landscape Areas and Engineered Slopes are mapped as a part of the Maximum Applied Water Allowance (MAWA). The goal of this step is to identify landscape features that may require the full water budget to support the needs of the community. This work is completed using heads up digitization methods with the base imagery used in the analysis for reference. Ancillary data sources such as Google Street View and other image services are consulted to help in the identification of SLA. There are seven classes of landscape that qualify as SLA, they are listed in the table below.

#	Class name	Class Description
1	Public Pools	Community pools open to public use
2	Recycled Water	Landscape and water features fed by recycled water DIMs
3	Engineered Slopes	Slopes where vegetation is planted for the purpose of terrain stabilization and/or erosion control.
4	Active/Passive Recreation	Active and passive recreational areas (e.g. outdoor event spaces and sports fields)
5	Edible Plants/Community Garden	Landscape dedicated solely to edible plants. Community and educational gardens.
6	Supplemental Water	Ponds and lakes sustaining wildlife, recreation, or public benefit.
7	Cemeteries	Green area associated with graves



### SLA Approval

Once the SLA are mapped in draft form the boundaries will need to be reviewed and approved by the water district staff. It has been found that the refinement of these features is best supported by water district staff that is very familiar with the customers' properties (i.e., meter readers or some other equivalent). The approval process can take many forms but is most often facilitated by NV5 analysts and EAS project managers through a web-based review portal or water district review of PDF maps.

### Report, Final Delivery, and Metadata

Once all data has been finalized and approved by the City of Rio Vista staff, development of the final products will begin. The final products include a file geodatabase (GDB) that contains the LUCD/SLA classified premises and the mapped meters. In addition, a final technical data report will be generated. This report will outline the process steps taken to accomplish this work as well as provide summary statistics of the results. All deliveries will contain FGDC compliant metadata created in a format most suitable to the City of Rio Vista.

### CII Compliance Pathway for City or Rio Vista Pricing:

DIM and MUM Initial Analysis	CII area: 5.05 sq miles
Landscape Use Classification Dataset (LUCD) Mapping	CII + MFR Areas: 5.85 sq miles
CII DIM Premise Delineation	Based on 111 DIMs (MUMs TBD)
<b>Total Mapping &amp; CII Project NTE Cost</b>	<b>\$51,000</b>

## Non Functional Turf (NFT) Analysis for SCWA Agencies:



The EAS/NV5 team will perform a Non-Functional Turf (NFT) analysis across all CII parcels (including medians and parkway strips) within the services areas of the retail water agencies listed below. This analysis is in accordance with the compliance requirements in AB 1572.

City of Vacaville	29.97 sqmi
City of Vallejo	49.91 sqmi
City of Fairfield	33.93 sqmi
Suisun Irrigation District	3.89 sqmi
City of Dixon	5.57 sqmi
Total	123.27 sqm

### Geographic Area(s):

The EAS/NV5 team will confirm the mapping footprint at the onset of the project with each water supplier.

### Source Data:

The EAS/NV team will use 4 band aerial imagery with a 1 ft resolution that was flown in Q3 (summer) of 2020 for the analysis.

### Deliverable(s):

NFT shapefile will be loaded into each supplier's WaterView account for full access. An electronic delivery of the spatial files is available upon the request of the water suppliers.

## Pricing Summary and Breakdown:

<b>Solano County Water Agency: WaterView™ Renewal</b>	
<i>Total Connections:</i> 106,000	
<i>Participating Retailers:</i> City of Vacaville, City of Vallejo, City of Fairfield, City of Dixon, Suisun City, City of Rio Vista	
<b>WaterView™ + CII Module</b>	1 YEAR AGREEMENT
Annual Subscription Cost <i>(CalWEP Member Discount applied)</i>	<b>\$135,886</b>

## LUCD Mapping, CII DIM/MUM Premise Delineation + WV CII Module for the City of Rio Vista:

DIM and MUM Initial Analysis	CII area: 5.05 sq miles
Landscape Use Classification Dataset (LUCD) Mapping	CII + MFR Areas: 5.85 sq miles
CII DIM Premise Delineation	Based on 111 DIMs (MUMs TBD)
<b>Total Mapping &amp; CII Project NTE Cost</b>	<b>\$51,000</b>

## Non-Functional Turf (NFT) Analysis for SCWA Agencies:

City of Vacaville	29.97 sqmi	\$6,623
City of Vallejo	49.91 sqmi	\$11,030
City of Fairfield	33.93 sqmi	\$7,499
Suisun Irrigation District	3.89 sqmi	\$1,000
City of Dixon	5.57 sqmi	\$1,231
<b>Total</b>	<b>123.27 sqm</b>	<b>\$27,383</b>

\*City of Rio Vista not included as NFT has been included in CII Pathway to Compliance SOW

<b>Contract Total</b>	<b>\$214,269</b>
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