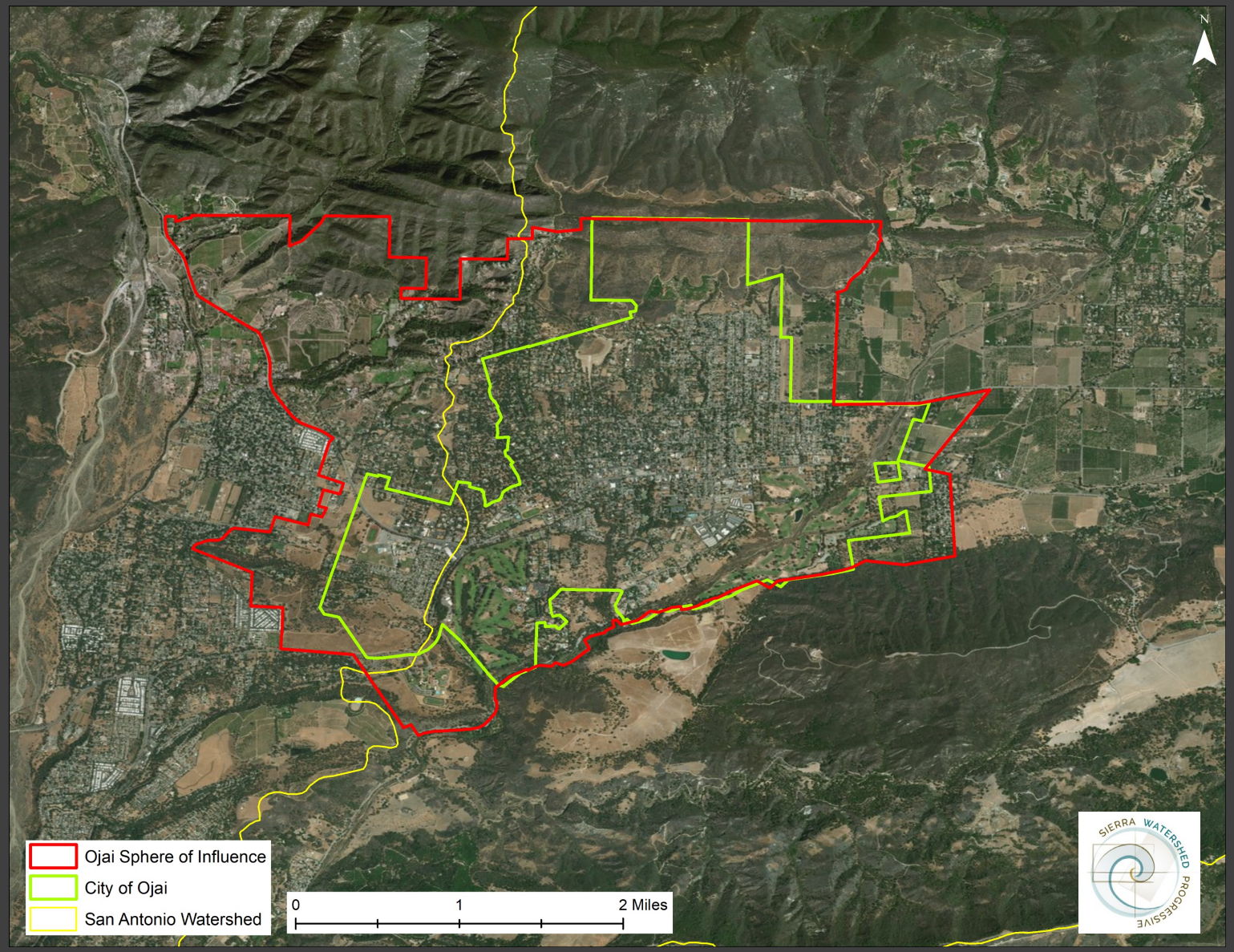
Comparative Analysis for Reduced Water Demand & Recharge
Phase I Deliverables and Report

Ojai City and Sphere of Influence

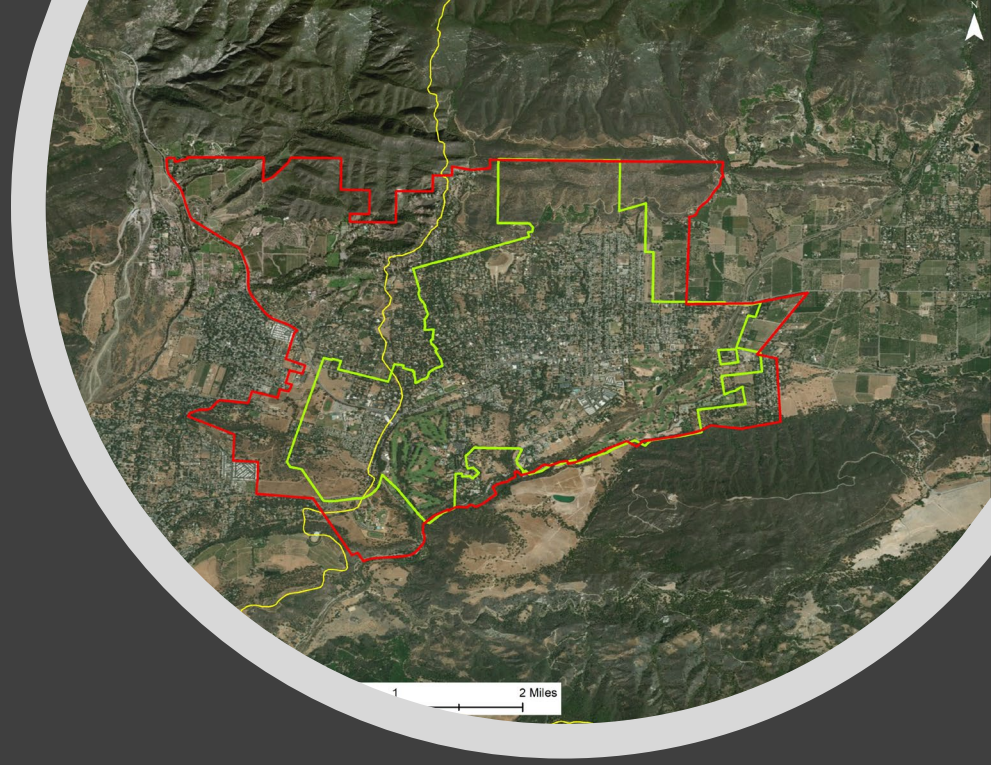
Focus Area

MAJOR OUTCOMES

- Complete quantification of potential for reduced water demand for each parcel
- Complete quantification for potential for groundwater recharge for each parcel
- Prioritization of City/Sphere of Influence Project Sites
- Catalog of Projects (conceptual)
- External Discussions with Recommendation
- Understanding of City's optimized role in Regional Water Management



Final Phase I Deliverables



- Task 1.1

Kick Off Meeting and Data Acquisition

- Task 1.2

Water Vision Statements

- Task 2.1

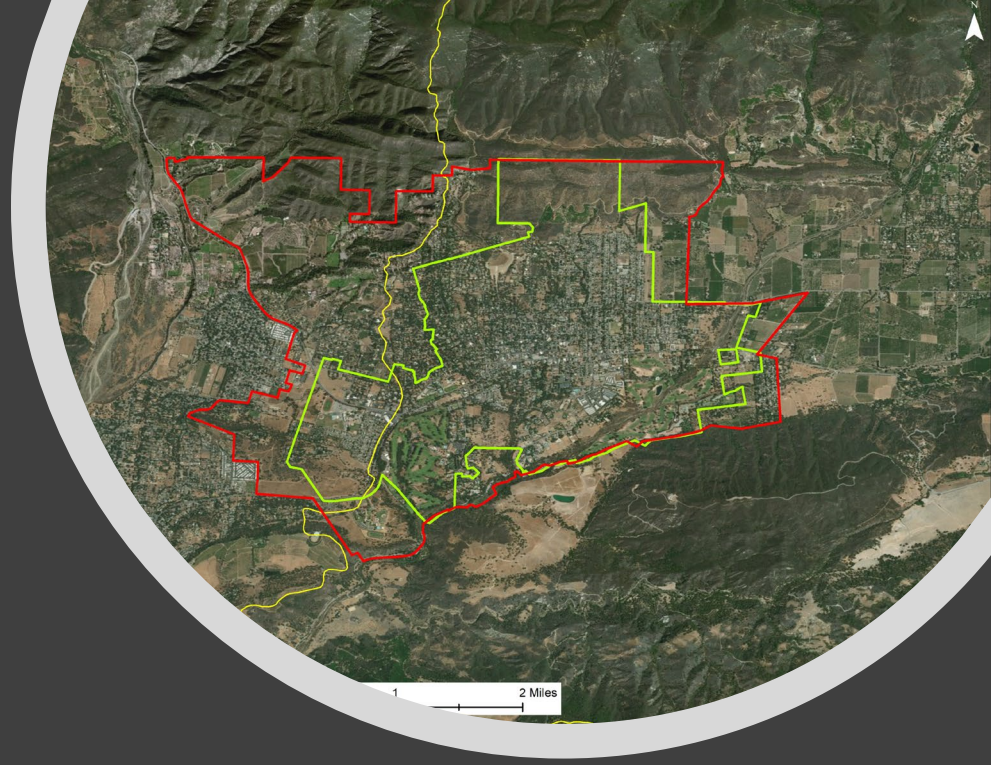
Water Efficiency Toolkits: Definitions/Metrics

- Task 2.2

Water Savings/Recharge Analysis

(*by Land Use Type, to be Groundtruthed in Phase II*)

Phase II Deliverables
(to be complete fall 2018)



- Task 2.3 Spatial Identification of Opportunities

Includes Groundtruthing of Phase I data

- Task 3.1 Project Prioritization Methodology

- Task 3.2 Project Prioritization by Land Use

- Task 3.3 Project Catalog

(in progress, Draft November)

- Task 4.0 Climate Scenario Analysis

- Task 5.0 External Demand Analysis

(General Plan Update, New Sources, Agency Collaboration, Funding Strategy, Messaging Strategy, and Programmatic Collaboration)

Task 1.1
Kick-off Meeting and Data Acquisition

Kick-off Meetings:

- Kick Off Meetings (2) with Public Works and City Manager
- Kick Off Meeting (1) with Technical Advisors
- (Kear Groundwater, Hicks Law, Ash Consulting, Eagle Aerial)

Data Acquisition:

- Eagle Aerial transferred delineated data to Watershed Progressive

Related to Phase II:

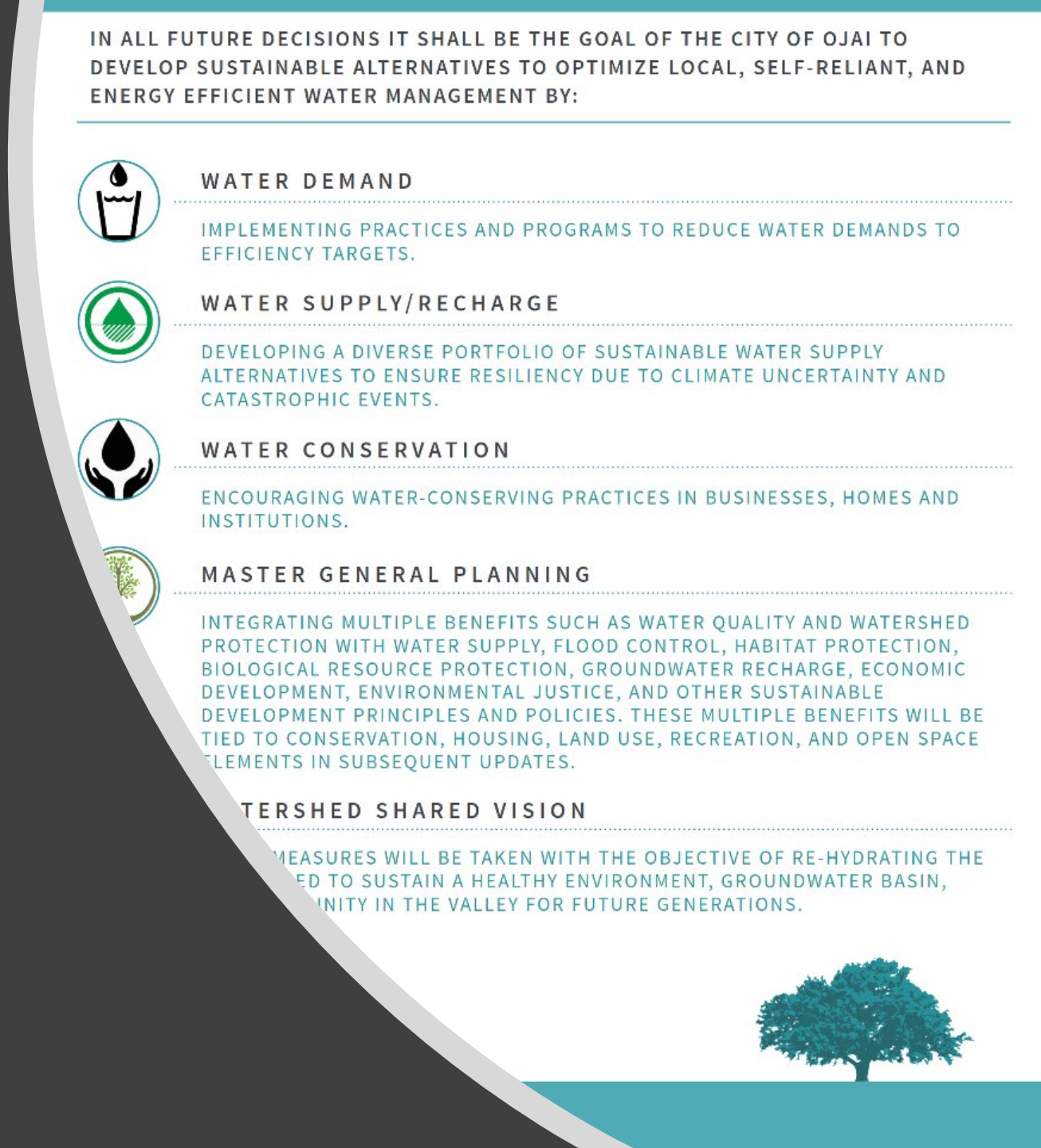
- Spatial Identification of Opportunities, Catalog of Projects, Climate Scenario Analysis
- General Plan Update language for Elements to be updated

Task 1.2
Vision Statements

- Distributed to City Manager and City Engineer for input.

<u>Related to Phase II:</u>

- Public Outreach Strategy for Vision Statement
- General Plan Update language for Elements to be updated



Task 2.1
Water Efficiency Toolkits

Related to Phase II:

- Catalog of Projects
- Project Prioritization
- Water Demand Analysis
- External Recommendations

- Irrigation Efficiencies
- Greywater
- Blackwater Reuse
- Rainwater Reuse
- Mechanical Water Reuse
- Stormwater Reuse
- Stormwater Recharge
- Ocean Friendly Gardens

Task 2.2
Water Savings/Recharge Analysis
(by land use type)

Related to Phase II:

Catalog of Projects

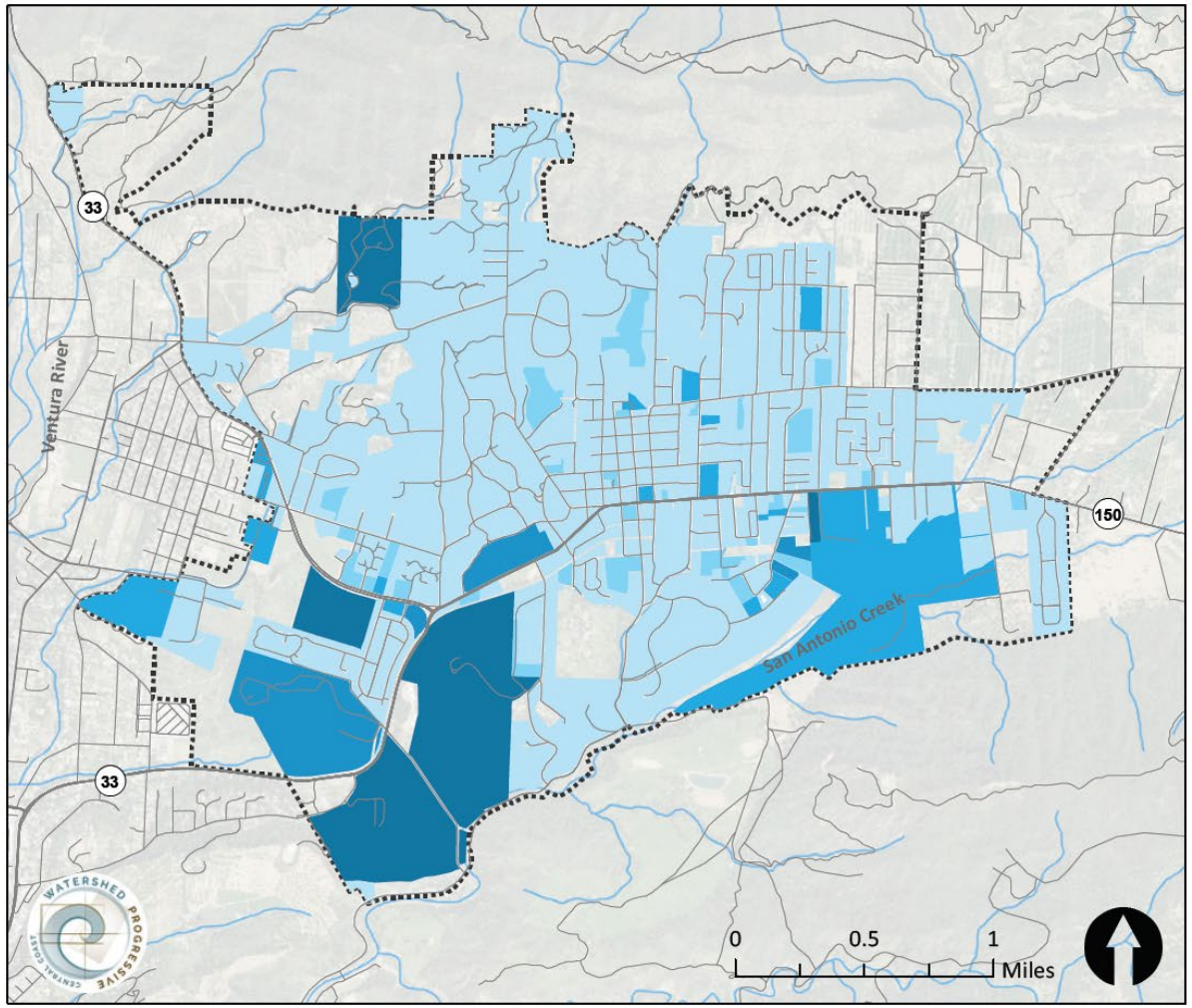
Project Prioritization

Water Demand Analysis

External Recommendations

4. IDENTIFICATION OF OPPORTUNITIES

RAINWATER HARVESTING POTENTIAL



All of the data inputs, assumptions, and the estimated potential benefit identified in the spatial opportunities analysis is under review, and additional error analysis and ground truthing of this data is expected.

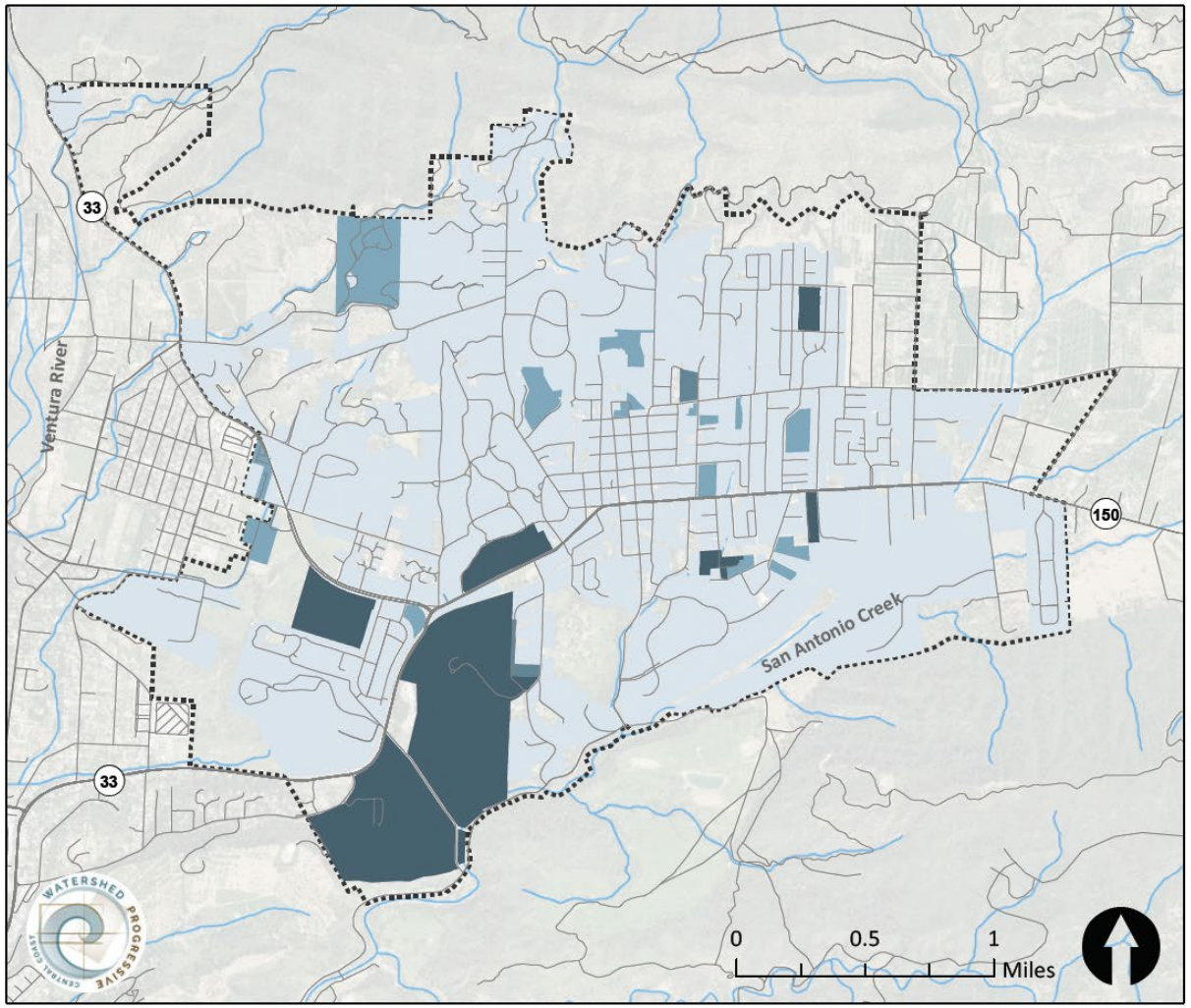
LAND USE TYPE	Water Conservation Potential (acre feet per year, AFY)
Residential	350
Schools	25
Public Facilities	10
Commercial/ Industrial	70
City-Owned	2
Total	457

Water conservation and recharge estimates for rainwater harvesting in the City of Ojai are based on assumptions described in Chapter 3.

- A total of 2,912 buildings in the City of Ojai were identified for rainwater harvesting;
- 100% of the average annual rainfall (21.49") upon the identified buildings' roof area is diverted to storage and available for reuse; and
- There is no overflow from the rainwater storage cisterns.

4. IDENTIFICATION OF OPPORTUNITIES

GREYWATER RECLAMATION & REUSE POTENTIAL



LAND USE TYPE	Groundwater Recharge Conservation Potential (acre feet per year, AFY)
Residential	620
Schools	55
Public Facilities	4
Commercial/ Industrial	95
City-Owned	2
Total	776

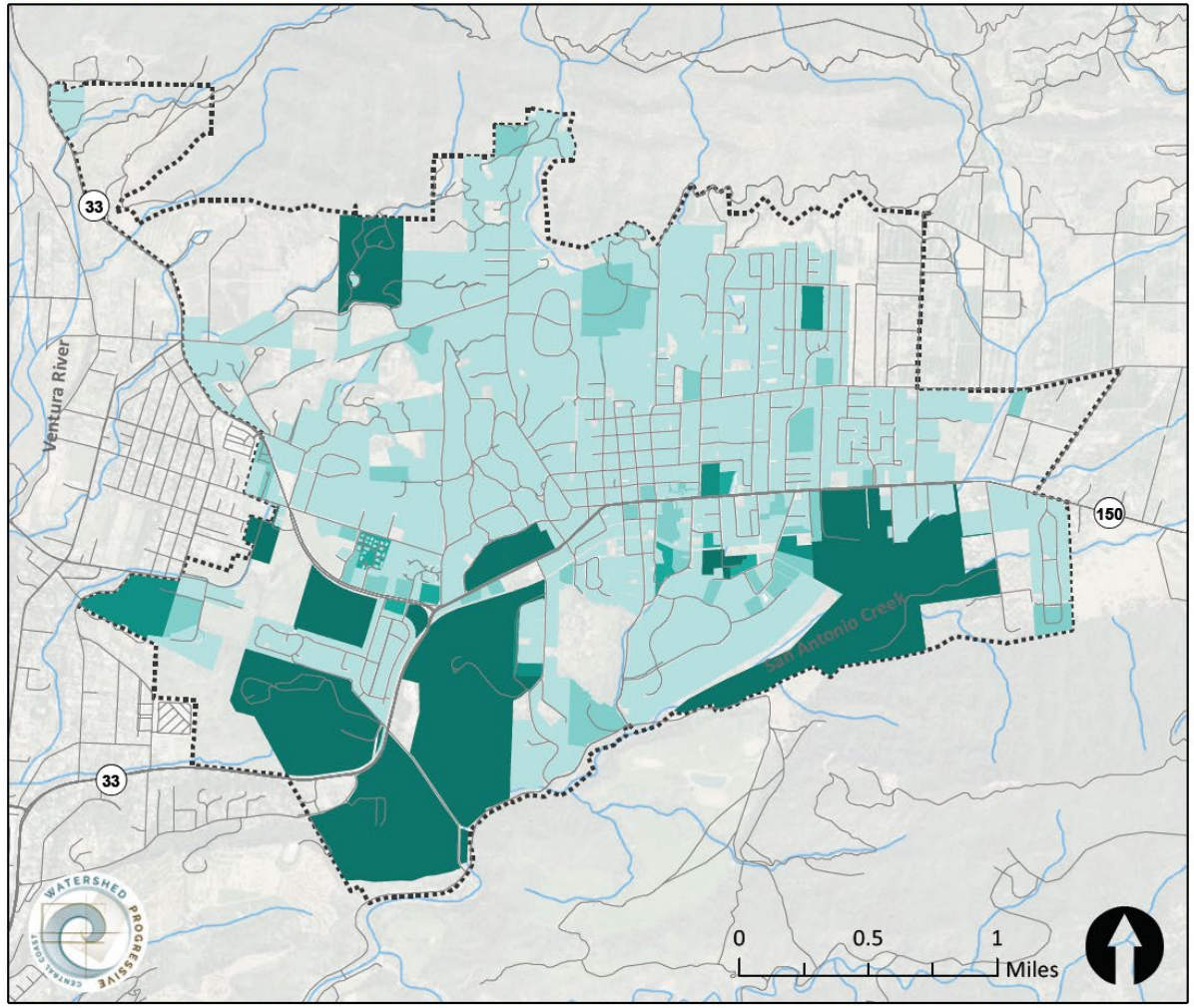
All of the data inputs, assumptions, and the estimated potential benefit identified in the spatial opportunities analysis is under review, and additional error analysis and ground truthing of this data is expected.

Water recharge estimates for greywater reclamation and reuse are based upon the following assumptions:

- Residential greywater reuse potential is based on estimates for number of people per household;
- For schools, greywater reuse potential is based upon student enrollment and number of staff;
- For commercial/industrial, city owned, and other public facilities, greywater reuse potential is based upon estimated number of people using the structure and greywater production from bathroom sinks only.

4. IDENTIFICATION OF OPPORTUNITIES

STORMWATER TO INFILTRATION POTENTIAL



LAND USE TYPE	Groundwater Recharge Potential (acre feet per year, AFY)
Residential	315
Schools	70
Public Facilities	30
Commercial/ Industrial	155
City Owned	15
Roads & Sidewalks	400
Total	985

All of the data inputs, assumptions, and the estimated potential benefit identified in the spatial opportunities analysis is under review, and additional error analysis and ground truthing of this data is expected.

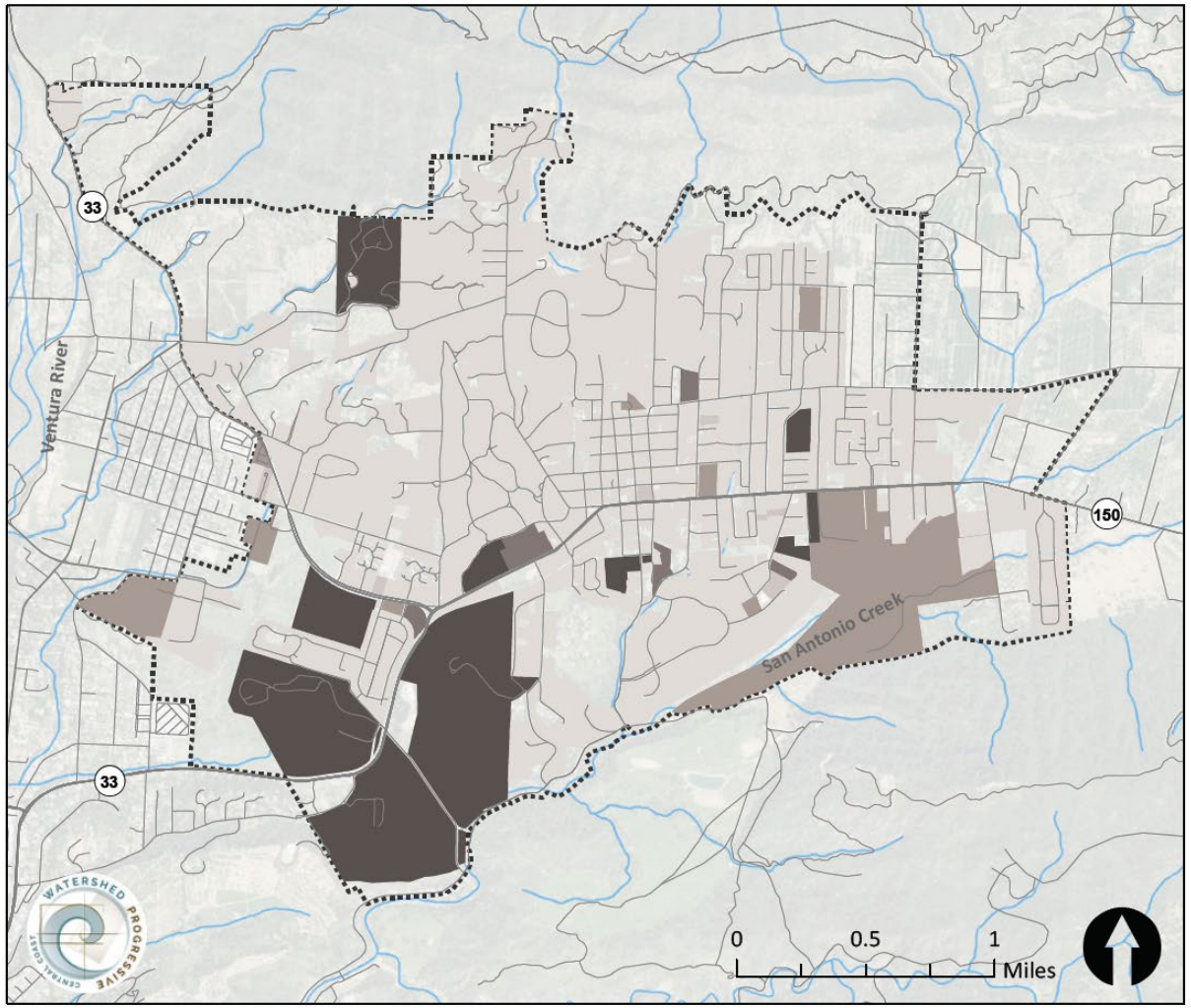
Infiltration estimates are for the areas within a parcel only, and do not include inputs, or run-on, from off-site and are not yet matched with percolation criteria (slope, soils, depth to groundwater, etc).

Recharge estimates for stormwater infiltration in the City of Ojai are based upon the following assumptions:

- 100% of captured stormwater is converted to infiltrated and recharged groundwater;
- Average annual wet weather precipitation of 21.5 inches per year;
- Green infrastructure is designed to capture the 95th percentile annual rainfall event of 2.0 inches; and
- Estimates for potential stormwater runoff for infiltration exclude rooftops.

4. IDENTIFICATION OF OPPORTUNITIES

MECHANICAL WATER REUSE POTENTIAL



LAND USE TYPE	Water Conservation Potential (acre feet per year, AFY)
Residential	53
Schools	4
Public Facilities	1
Commercial/ Industrial	10
City-Owned	3
Total	71

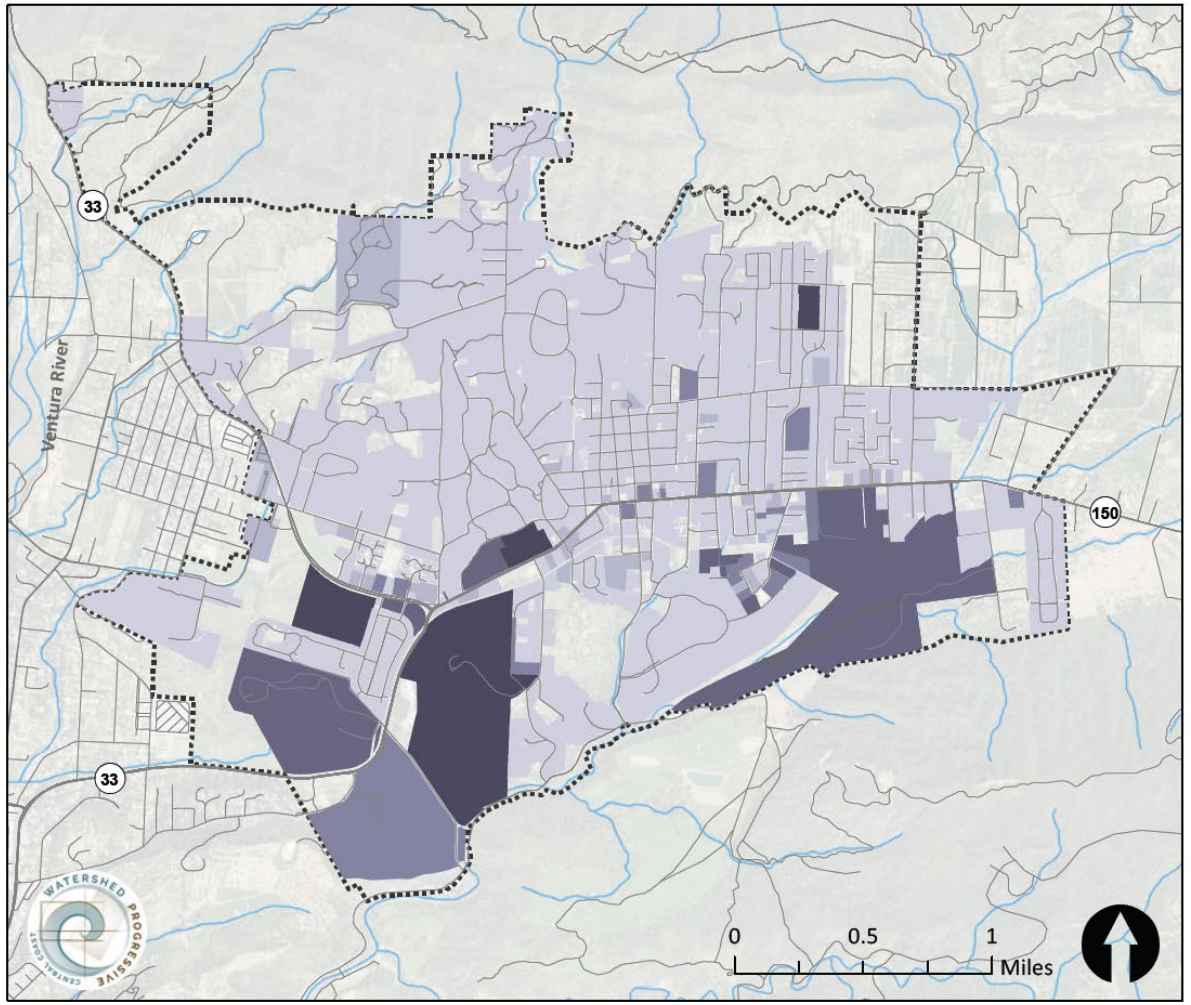
All of the data inputs, assumptions, and the estimated potential benefit identified in the spatial opportunities analysis is under review, and additional error analysis and ground truthing of this data is expected.

HVAC condensate collection and reuse potential is based upon the following assumptions:

- A central AC for an entire home can collect 5 to 20 gallons of condensate water per day;
- The amount of condensate water can range from 3 to 10 gallons/day per 1,000 square feet of air-conditioned space;
- In the City of Ojai, air conditioning is assumed to be in use 8 hours per day for half the days of the year.

4. IDENTIFICATION OF OPPORTUNITIES

BLACKWATER TREATMENT AND REUSE POTENTIAL

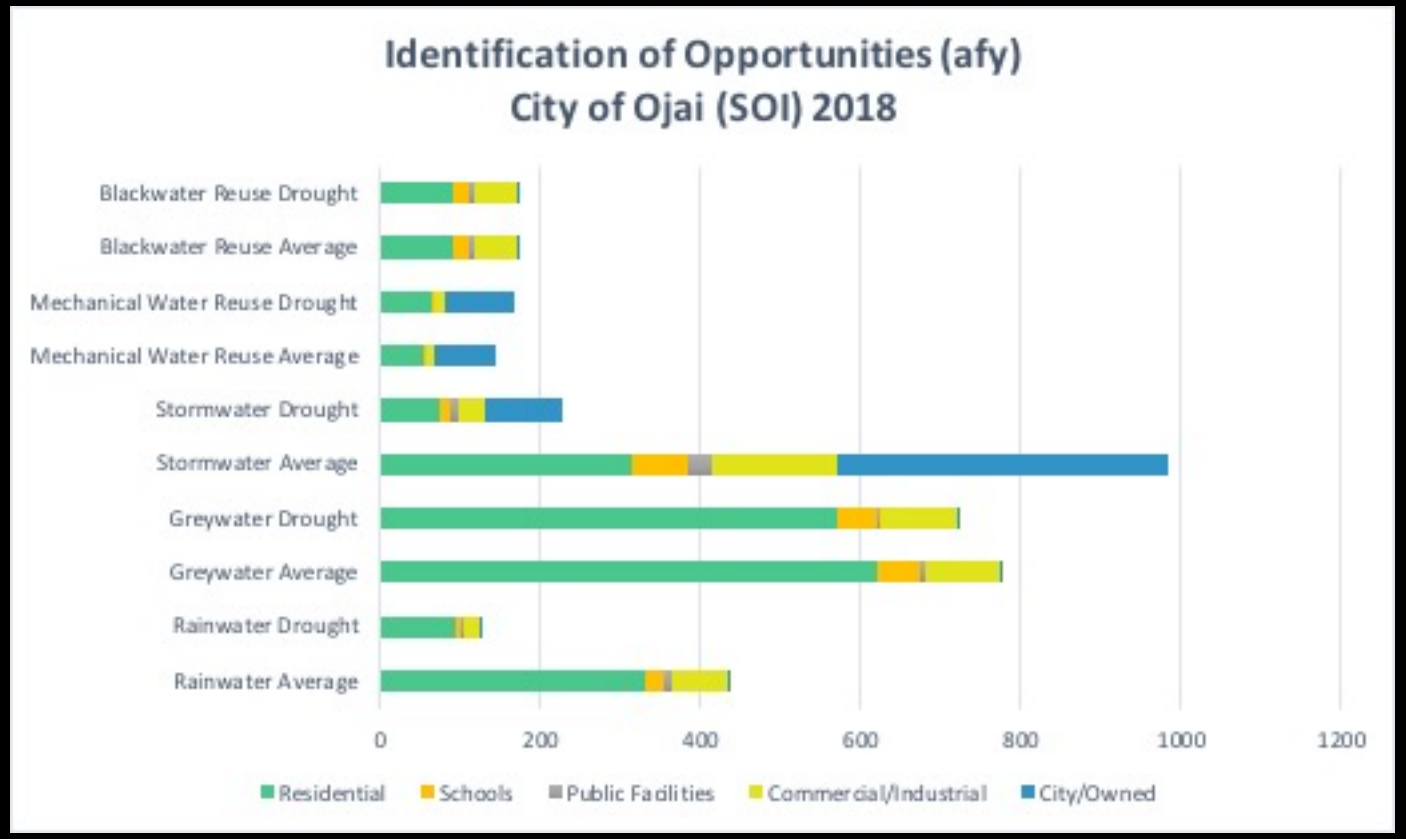


All of the data inputs, assumptions, and the estimated potential benefit identified in the spatial opportunities analysis is under review, and additional error analysis and ground truthing of this data is expected.

LAND USE TYPE	Water Conservation Potential (acre feet per year, AFY)
Residential	90
Schools	20
Public Facilities	6
Commercial/ Industrial	55
City-Owned	2
Total	173

Blackwater treatment and reuse potential is based upon the following assumptions:

- Blackwater is collected from toilets only (bathroom sinks, showers, bathtubs and laundry machines are diverted for greywater reuse;
- Low-flow toilets produce 1.6 gallons of wastewater per flush and are flushed 5 times per day per person; and
- The average number of people living in each household is 2.54 people (USCB, persons per household, 2012-2016).



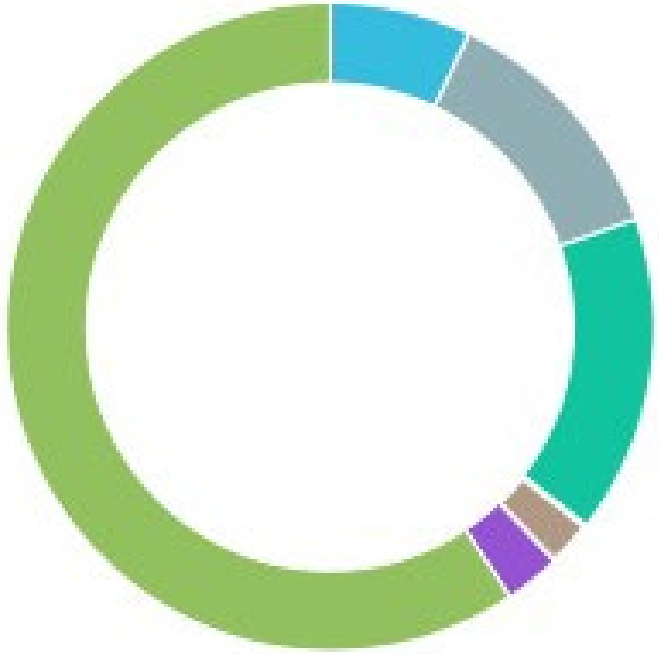
Task 2.2
Water Savings/Recharge Analysis
(by land use type)

Land Use Zones:

- Hotel
- Schools
- Residential
- Commercial
- Urban
- Golf Courses
- Parks
- Home-Ag
- Commercial-Ag

Identification of Opportunities 6182* AFY

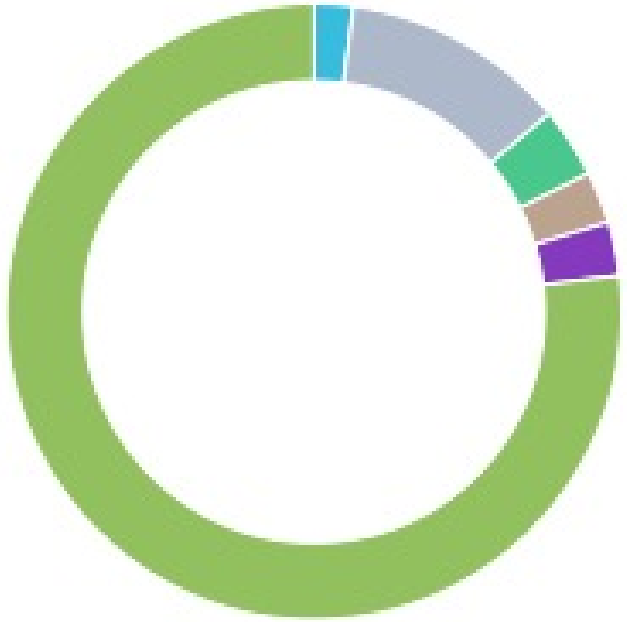
Average Precipitation 21.5"



Rainwater Average
Greywater Average
Stormwater Average
Mechanical Water Reuse Average
Blackwater Reuse Average
Irrigation/Ag+Residential

Identification of Opportunities 6110* AFY

Drought Precipitation 3.88"



Rainwater Drought
Greywater Drought
Stormwater Drought
Mechanical Water Reuse Drought
Blackwater Reuse Drought
Irrigation/Ag+Residential*

GUIDE TO USING THE PROJECT CATALOGUE

For each site identified as a Priority Project the following information is included on the Project Concept page:

Multi-Benefit Icons Key

- EDUCATION
- WATER SECURITY
- GROUNDWATER RECHARGE
- WATER QUALITY
- HEAT ISLAND REDUCTION
- WATER RE-USE
- DEMONSTRATION PROJECTS
- CLIMATE CHANGE RESILIENCY
- WATER EFFICIENCY
- HABITAT
- FIRE MANAGEMENT
- COMMUNITY STAKEHOLDERS
- FLOOD REDUCTION
- INSTREAM FLOW ENHANCEMENT
- ALTERNATIVE TRANSPORTATION

Value Added Future Recommendations

1. Complete Streets Chapter Addition
2. Design Guideline Treatments *(proposal pending)*
3. Bike Path Recharge Learning Lab (*Collaboration with Ventura County/City*)

As a living document, SWP proposes to draft a new chapter for incorporation into the Master Plan that provides additional details and guidelines for green infrastructure strategies that can be evaluated for inclusion into future Complete Street projects. The specific treatments would be linked to (1) the general Complete Street recommendations and (2) specific locations where the Master Plan recommends improvements. The outcome will allow the City to integrate planned CIP projects with water supply, flood control, habitat protection, groundwater recharge, and other sustainable development principles and policies.

Next Steps

- Reach out to identified site partners to understand willingness to be included in planning.
- Finalize Climate Scenario modeling on toolkits.
- Finalize quantification of Catalog of Projects (top 30 projects), based on prioritization criteria.
- Finalize External Recommendations for Ojai City collaborative actions with existing plans and partnerships.
- Apply for regional grants, with City and Partners approval to create 100% implementation ready plans.