



# STORMWATER CAPTURE AND GROUNDWATER RECHARGE FEASIBILITY STUDY AT SATICOY PARK IN VENTURA COUNTY UNINCORPORATED COMMUNITY OF SATICOY



December 21, 2022





**Title:** Stormwater Capture and Groundwater Recharge

Feasibility Study at Saticoy Park

Date: December 21, 2022

Watershed: Santa Clara River

Funding Source: Proposition 1 Disadvantaged Community Involvement

Program (DACIP)

**Project Type:** Technical Assistance

**Total Project Cost** \$134,027

**Lead Agency:** County of Ventura represented by Ventura County

Public Works Agency – Watershed Protection's County

Stormwater Program

**Project Team:** Ewelina Mutkowska, MSc, Project Manager

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Amanda Antonelli, Rincon Consultants, Inc.

Heidi Hayes, TheAgency, Inc.



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https://uninc.vcstormwater.org/projects/stormwater-capture-studies/saticoy-park-

stormwater-capture

#### 1 Project Name

Stormwater Capture and Groundwater Recharge Feasibility Study at Saticoy Park.

#### 2 Proponent

The County of Ventura, represented by Ventura County Public Works Agency – Watershed Protection's County Stormwater Program.

#### 3 Type

Technical Assistance to conduct a feasibility study for stormwater capture and groundwater recharge, resulting in the selection of the most feasible alternative project concept and development of a 30% project design.

#### 4 Location

The proposed Stormwater Capture and Groundwater Recharge Feasibility Study (Study) was conducted at Saticoy Park, which is in the Ventura County unincorporated community of Saticoy, California. The Saticoy Park is located at 11321 Violeta Street, Ventura, CA (Assessor's Parcel Number 090-0-101-010). The community of Saticoy is bordered by Telegraph Road to the north, the Santa Clara River to the south, Campanula Avenue to the east, and Brown Barranca to the west. The site is immediately surrounded by residential land use area. See Figure 1 for the project map.

The site is within the Santa Clara River Watershed (SCR). The SCR starts in the San Gabriel Mountains in Los Angeles County, flows through Ventura County, and ends in the Pacific Ocean between San Buenaventura (Ventura) and Oxnard.

#### 5 Cost

The total cost for the Study was \$134,027.

#### **6** User Needs Supported Categories (Generated from TAPPED)

According to an assessment of community and institutional needs, Saticoy's top water-related issues are related to drinking water quality, water availability, the high cost of water, and access to clean and safe water. Other notable issues include flooding and stormwater quality impacts on the community.



Figure 1 Project Site Vicinity Map

#### 7 Project Abstract

As an operator of a municipal storm sewer system (MS4), the County of Ventura (County), is investigating the feasibility to plan, design, and construct regional stormwater mitigation best management practices (BMPs) to meet the requirements of the National Pollutant Discharge Elimination System (NPDES) MS4 Permit, Total Maximum Daily Load (TMDL) requirements for Bacteria in the Santa Clara River, and the Statewide Trash Amendments. The goal of this Study, funded by a Proposition 1 grant from the California State Department of Water Resources, is to evaluate the feasibility of a stormwater mitigation BMP in Saticoy, and if found feasible, prepare a concept and preliminary design for future grant applications for funding to implement the project. The scope of the proposed Project included technical assistance for site assessments, a feasibility study, an engineering preliminary design to develop a 30% project concept, and public outreach to the Saticoy community residents (in English and Spanish). The proposed Project will be included in the Santa Clara River Watershed Management Program (https://www.vcstormwater.org/programs/watershed-management-program) and included in the Ventura County Municipal Stormwater Resources Plan (https://www.vcstormwater.org/publications/plans/stormwater-resource-plan.)

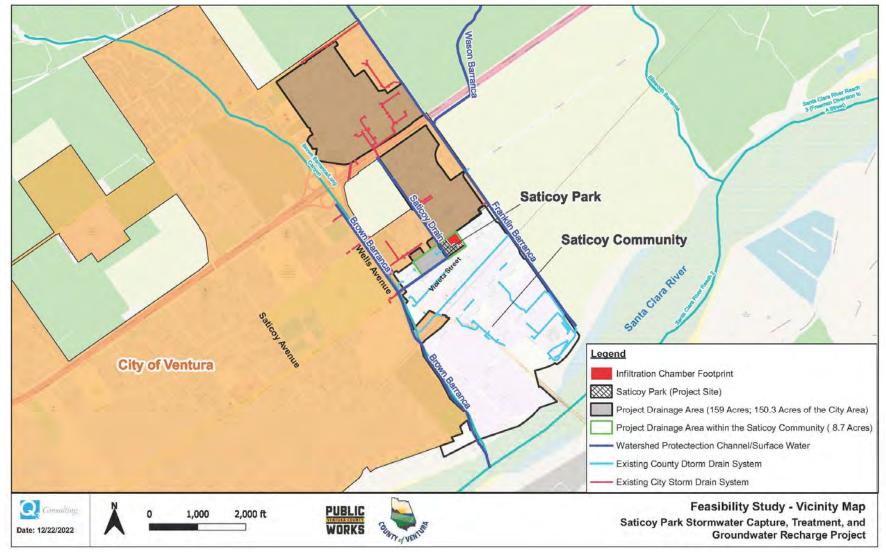
#### **8 Project Outcomes**

Saticoy Park, located at 11321 Violeta Street, was chosen as the location for the proposed Project to study. The surrounding area of Saticoy Park is prone to flooding during storm events, especially along Brown Barranca. Photos of flooding in the area after a storm and of the general project area are included in Appendix A. The location was chosen due to expected favorable geotechnical conditions, limited land acquisition costs, opportunity for community benefits, and potential to alleviate flooding issues. In addition, the captured stormwater would aid in sustainable groundwater recharge.

The Study assessed the feasibility of an advanced treatment train for the purpose of meeting the upcoming TMDL requirements for the Santa Clara River Watershed. A feasibility report was prepared based on the Study findings; the report included hydrology analysis, geotechnical evaluations, cost estimates, a potential project timeline, and quantified anticipated benefits of the proposed project. The report, including 30% design plans, is included in Appendix B.

Report findings concluded that the selected project location only has potential to treat 8.7 acres of County unincorporated area, i.e., 5.5% of the project's drainage area of 159 acres. The majority (150.3 acres or 94.5%) of the drainage area tributary to the proposed Project falls within the jurisdiction of the City of Ventura, see Figure 2.

Based on findings from the geotechnical investigation, conventional infiltration chambers and dry wells were not deemed feasible at Saticoy Park due to a perched groundwater condition and clayey soils unsuitable for traditional infiltration. Instead, the proposed Project would intend to fully capture and treat the 85<sup>th</sup> percentile storm event by implementation of an underground precast detention chamber to capture and store runoff, geo-hydraulic infiltration tubing to increase infiltrative capacity of the site soils, and an UV treatment system for bacterial disinfection.



**Figure 2 Project Site Location Map** 

The feasibility study analysis concluded that a system including an underground precast concrete detention chamber with approximate surface area and volume of 52,385 square feet (SF) and 350,500 cubic feet (CF), respectively, geo-hydraulic infiltration tubing installed over 60,000 SF of Saticoy Park, and a 1,000 gallons per minute (GPM) UV treatment system was the most feasible option to fully capture and treat runoff volume from the 85<sup>th</sup> percentile, 24-hour storm event. The proposed BMP would also serve to recharge the underlying Saugus aquifer with an estimated 25.9 acre-feet of water per year.

A high capacity in-line gross solid removal device (Dual Stage Hydrodynamic Separator by BioClean) and a secondary membrane filtration system (Kraken Filter by Bioclean) are proposed for the project to reduce trash and large solids deposited in the detention chamber and eliminate suspended solids that would reduce efficiency of the UV treatment system. The pretreatment system would fully capture trash particles larger than 5mm for volumes up to 1-year, 1-hour storm event. This would remove an estimated 963.8 gallons of trash annually and make 159 acres of tributary drainage area compliant with the Statewide Trash Amendments.

Due to the limited potential for infiltration and groundwater recharge at the Saticoy Park site, the cost to construct and operate the proposed system is higher than expected. The 159-acre treatment area is mostly under the City of Ventura's jurisdiction with the County contributing 7.5% of the drainage area (i.e., 12 acres). However, lower stormwater flows in Saticoy Drain, a tributary to Brown Barranca, could mitigate flooding in the Saticoy community. This study will be shared with the City of Ventura for consideration and potential collaboration, if funding is available in the future. If implemented, this proposed Project would offer benefits of stormwater capture, surface water quality improvement, groundwater recharge, trash capture, flood mitigation, public education, and Santa Clara River water quality improvements.

#### 9 Project Photos / Exhibits

See Appendix A for photos.

#### 10 Community / Participant Testimonial (If available / applicable)

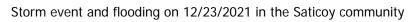
Two presentations are planned for January 2023 to showcase the Study. The first presentation at the Municipal Advisory Council with the community of Saticoy is scheduled for January 9, 2023, and another presentation at the Santa Clara River Watershed Committee (SCRWC) is scheduled for January 26, 2023. The SCRWC stakeholders include public agencies, non-governmental organizations, non-profit organizations, private citizens, and many more. More information about the SCWRC is available at <a href="https://www.scrwatershed.org/index.php/vision">https://www.scrwatershed.org/index.php/vision</a>. The presentation slides are included in Appendix C.

Educational brochures and a website were prepared for the Study. The educational brochures were prepared in English and Spanish and include information about stormwater capture feasibility studies, not only at Saticoy Park, but also in the community of El Rio (included in Appendix D). The website includes information from the Study and can be found at <a href="https://uninc.vcstormwater.org/projects/stormwater-capture-studies/saticoy-park-stormwater-capture">https://uninc.vcstormwater.org/projects/stormwater-capture-studies/saticoy-park-stormwater-capture</a>. The website link is also provided in Appendix E.

### Appendix A Photos

### Appendix A – Photos







Storm event and flooding on 12/23/2021 in the Saticoy community



Storm event and flooding on 12/23/2021 in the Saticoy community



Proposed project location – Saticoy Park



Proposed project location – Saticoy Park



Aerial view of Saticoy Park and surrounding residential area

#### Appendix B

#### Feasibility Report and 30% Design Plans, Prepared by Q3 Consulting, Inc.

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#### **Appendix C**

## PowerPoint Presentation, Presented at the Municipal Advisory Council in the Saticoy Community and the Santa Clara River Watershed Committee Meetings

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# Stormwater Capture at Saticoy Park Feasibility Study

Presentation to Saticoy Municipal Advisory Council



January 9, 2023

## Agenda

## Introduction

- Ventura Countywide Stormwater Permit
- Santa Clara River TMDLs
- California Trash Capture Requirements

## Study Details

- Project Purpose
- Project Description
- Community Benefits

### **Question and Answer**



## Ventura Countywide Stormwater Permit











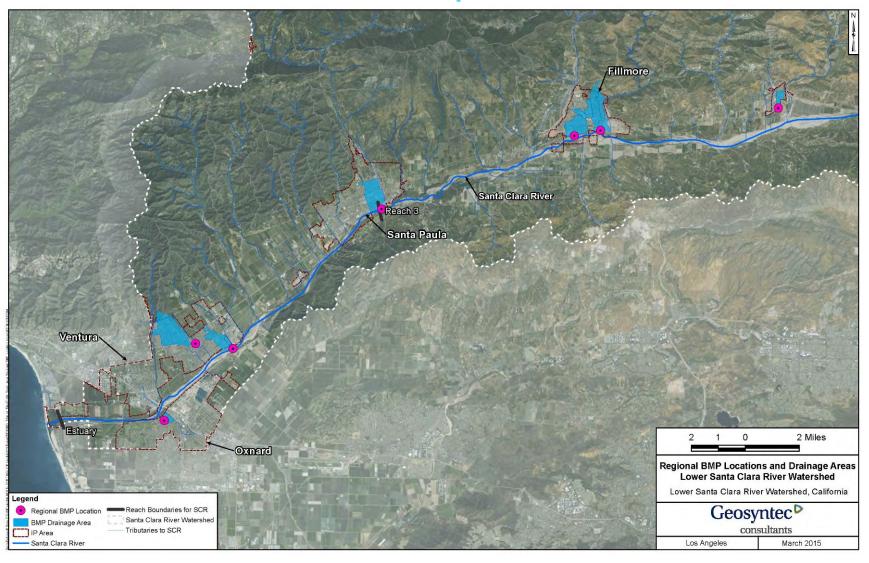
## 2012 Santa Clara River Bacteria Total Maximum Daily Loads (TMDLs)

- ✓ TMDL effective March 21, 2012
- ✓ Dry weather compliance effective March 21, 2023
- ✓ Wet weather compliance effective March 21, 2029





## 2015 Santa Clara River Bacteria TMDL Implementation Plan





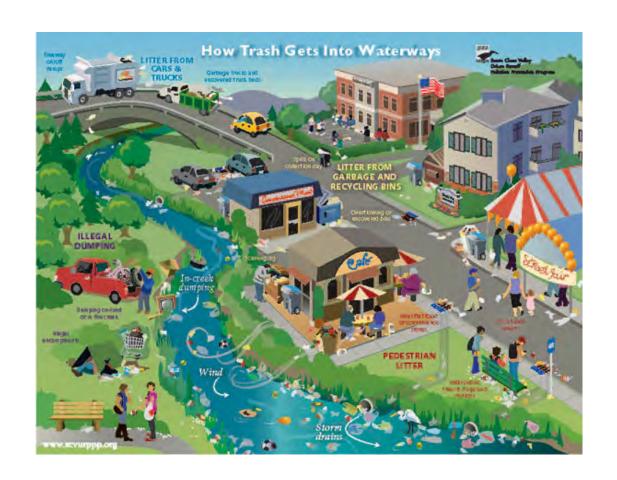
Watershed Protection January 9, 2023 Slide 5

## 2015 California Trash Control Requirements

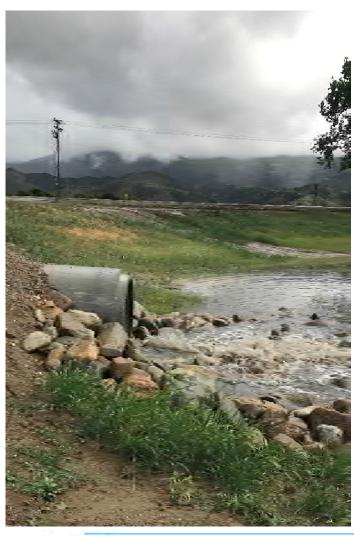
- ✓ 2015 Statewide

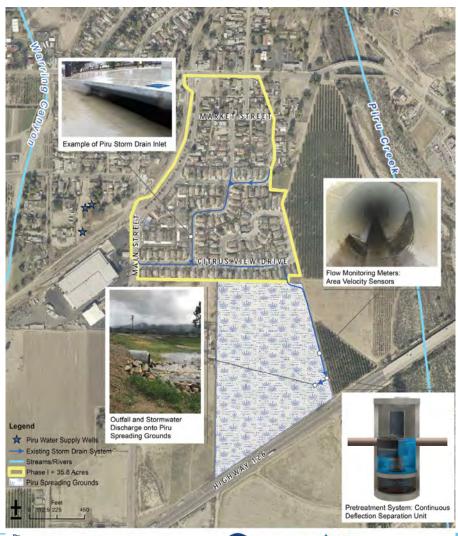
  Trash Amendments
- ✓ Require the capture
   of all trash and
   debris larger than

   5mm from public
   storm drain system
   before 2030



## Stormwater Capture in Piru Spreading Grounds (Completed in 2020)







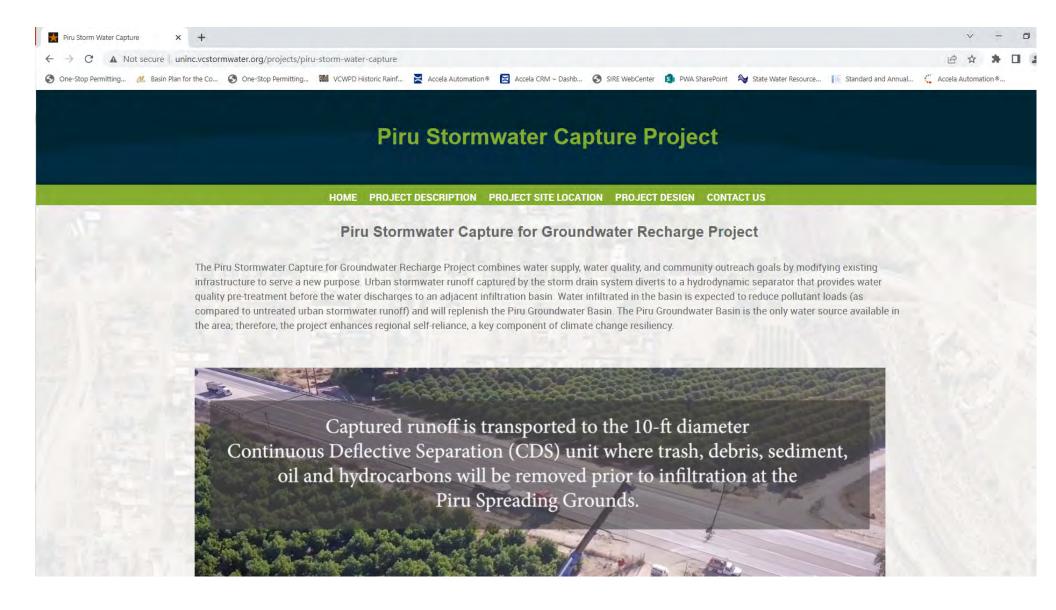








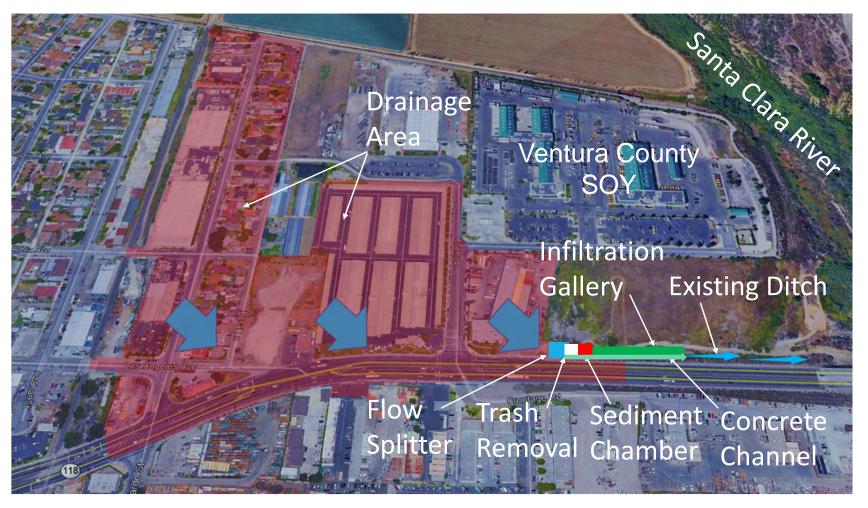




http://uninc.vcstormwater.org/projects/piru-storm-water-capture



## Caltrans & County Collaboration Saticoy Stormwater Capture Project



SOY - Saticoy Operational Yard



## Caltrans & County Collaboration Saticoy Stormwater Capture Project

### **Caltrans & County Collaboration:**

- Caltrans: design (100% completed) and construction (estimated for completion in 2029)
- County of Ventura: long-term operations & maintenance



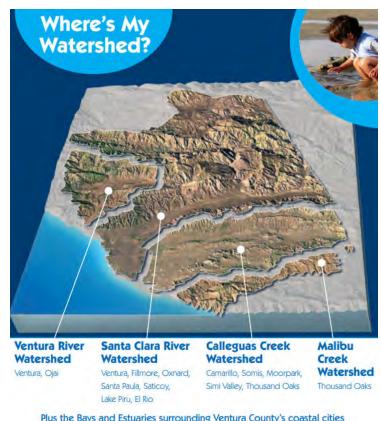






## 2023 Santa Clara River Watershed Management Program

- ✓ Strategies, control measures, and BMPs
- ✓ Regional Stormwater Mitigation BMPs
- ✓ Stormwater capture and groundwater recharge projects
- ✓ Due September 11, 2023



Plus the Bays and Estuaries surrounding Ventura County's coastal cities including Port Hueneme, Oxnard and Ventura.

The watershed is everyone's responsibility.

Inside you'll learn how we all, unknowingly, contribute to its contamination and how we can stop.



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## Feasibility Study Purpose



Reduce pollution in stormwater runoff in El Rio community in Ventura County



Alleviate flooding



Improve water quality in Santa Clara River Watershed



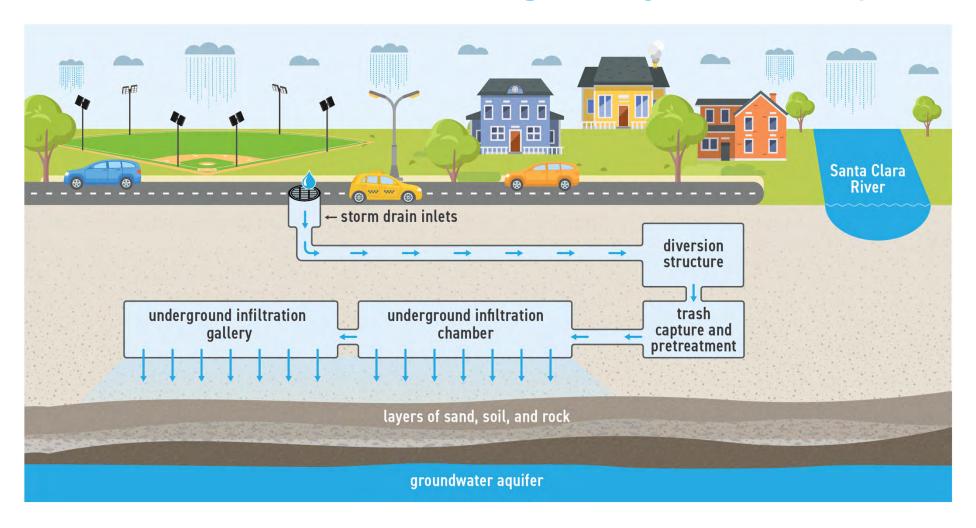
Meet Bacterial TMDL requirements



Meet requirements of Trash Amendments



## Stormwater Capture and Groundwater Recharge Project Concept

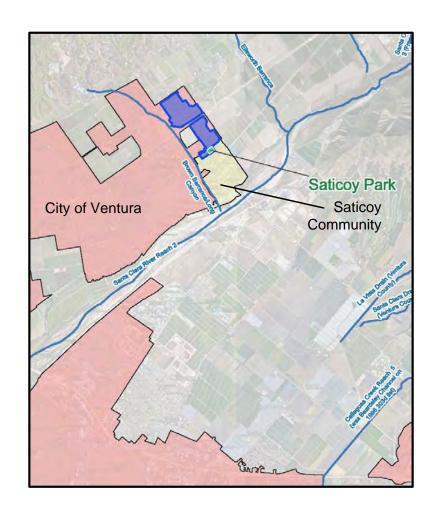




January 9, 2023 Slide **13** 

## 2022 Stormwater Capture at Saticoy Park Feasibility Study

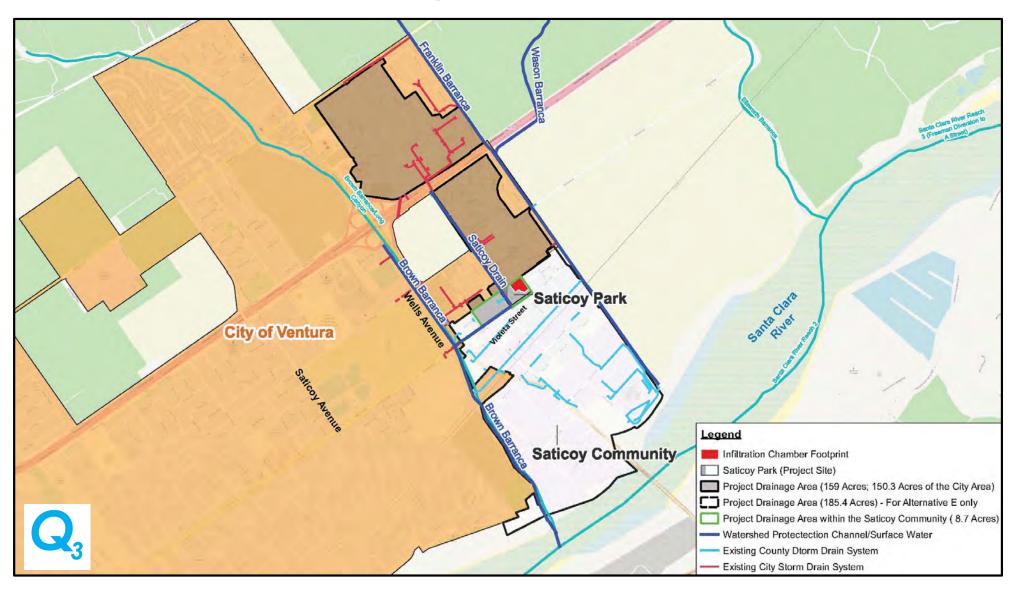
- ✓ Proposition 1 Disadvantaged Community (DAC) Grant Program
- ✓ Stormwater capture for groundwater recharge and bacterial indicator treatment at County's Saticoy Park Feasibility study and 30% design
- ✓ Future grant funding will be needed for construction
- ✓ Future funding will be needed for long-term O&M





Watershed Protection January 9, 2023 Slide 14

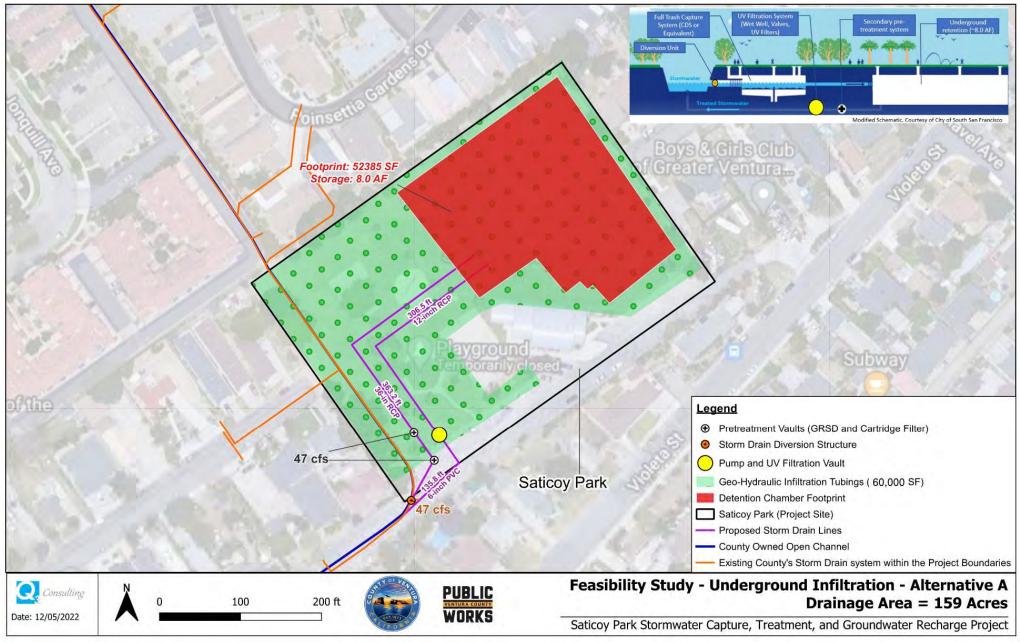
## Saticoy Park Location





Watershed Protection January 9, 2023 Slide 15

## Stormwater Capture at Saticoy Park Feasibility Study Location





January 9, 2023

Slide 16

## Stormwater Capture at Saticoy Park Feasibility Study Description

✓ Treatment area: 159 acres

✓ Estimated 57 acre-feet of captured stormwater per year

✓ Underground detention chamber under baseball field at Saticoy Park with UV treatment and geo-hydraulic

infiltration

✓ Trash capture device and runoff pretreatment controls

 Opportunity to collaborate on baseball field and park upgrade



## Stormwater Capture at Saticoy Park Proposed Project Benefits

- ✓ Reduce localized flooding in Brown Barranca and vicinity
- ✓ Sustainable source for groundwater recharge (26 acre-feet/year)
- ✓ Bacteria TMDL Compliance
- ✓ Compliance with State Trash Control requirements
- ✓ Educational opportunities at Boys and Girls Club, Saticoy Park and Community



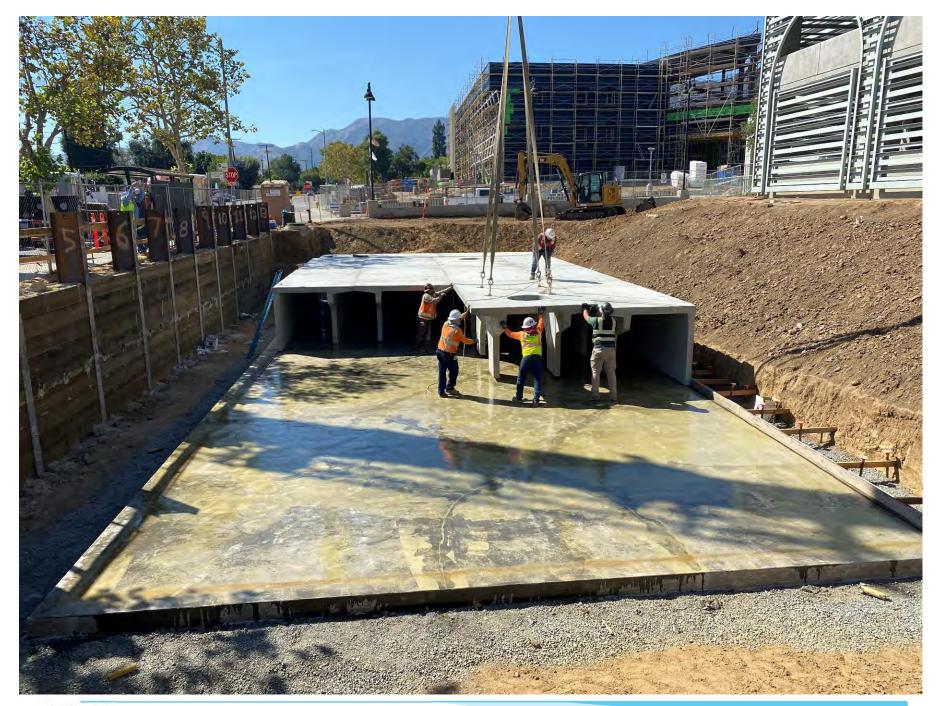


## Stormwater Capture at Saticoy Park Construction Considerations

- ✓ Installation of underground detention chamber under baseball field at Saticoy Park with underground UV treatment and underground geo-hydraulic infiltration tubing
  - ✓ Installation of new storm drain piping and inlets
  - Opportunity to rebuild baseball field and park facilities
  - ✓ No road closure is anticipated.
  - ✓ Est. construction cost \$19M
  - ✓ Est. O&M cost \$123,000 per year



Courtesy of Trojan Technologies (2022)





## Stormwater Capture at Saticoy Park Schedule and Next Steps

Task	Duration	Year 1	Year 2	Year 3	Year 4	Year 5
		Q1 Q2 Q3 Q4				
Grant Funding Application / Project Financing	18 months					
Coordination with County GSA	48 months					
Final Design & Flow Monitoring	18 months					
Environmental Permitting	12 months					
Community Outreach	27 months					
Procurement / Construction Bid	6 months					
Construction	12 months					
Final Walk and Closeout	3 months					



January 9, 2023 Slide 21



## Questions?

### **Project Contact**

Ewelina Mutkowska, Manager County Stormwater Program (805) 645-1382

Ewelina.Mutkowska@ventura.org

### Visit our website:

http://uninc.vcstormwater.org/projects/stormwater-capture-studies/saticoypark-stormwater-capture



Watershed Protection January 9, 2023 Slide 22

#### Appendix D

Public Outreach Brochure (English and Spanish), Prepared by Rincon Consultants, Inc.

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## Stormwater capture and groundwater recharge projects help the community:

- Recharge the underlying groundwater aquifer
- Enhance local water supply
- Alleviate flooding
- Reduce pollution in stormwater runoff
- Improve water quality in the Santa Clara River
- Meet California trash control requirements
- Meet Bacterial TMDL¹ requirements

'TMDL = Total Maximum Daily Load, the calculation of the maximum amount of a pollutant allowed to enter a waterbody so that the waterbody will meet water quality standards for that pollutant.



### How can you help?



Use drought-tolerant plants to reduce landscape water needs



Always pick up after your pets



Install a rain barrel to capture stormwater on your property



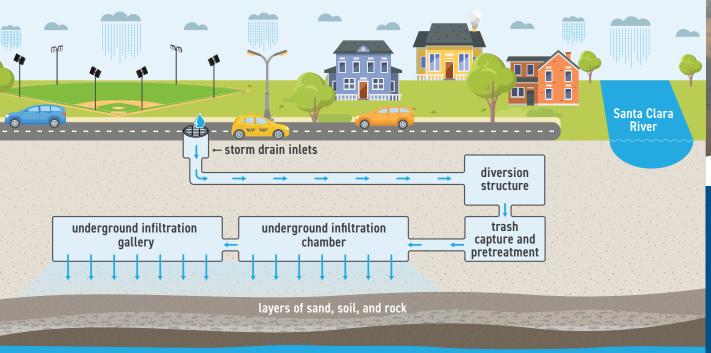
Participate in local beach and riverbank clean-ups



Eliminate water waste



Always keep trash and litter inside closed containers



Stormwater Capture Feasibility Studies



### i To Learn More

**Project Contact:** 

Ewelina Mutkowska,
Senior Stormwater Manager
Ewelina.Mutkowska@ventura.org

Learn more at https://uninc.vcstormwater.org/

## El Rio Stormwater Capture and Groundwater Recharge Project



- 78 acre-feet of captured stormwater per year
- Allevate flooding across 207 acres in the El Rio community
- Underground stormwater capture and infiltration under the baseball field at Rio Plaza Elementary School
- Upgrade of the school's baseball field
- Water quality improvement in the Santa Clara River
- Compliance with the Federal Clean
  Water Act
- Improvements to storm drains along Cortez Street in Fl Rio





## El Rio and Saticoy Project Sites



## Saticoy Park Stormwater Capture and Groundwater Recharge Project



- 57 acre-feet of captured stormwater per year
- Underground stormwater capture and infiltration under the baseball field at Saticoy Park
- Opportunity to collaborate on the baseball field and park upgrades
- Water quality improvement in the Santa Clara River
- Compliance with the Federal Clean Water Act
- Reduce stormwater flows in Brown Barranca to mitigate flooding in the Saticoy Community





#### Los proyectos de captura de aguas pluviales y recarga de aguas subterráneas ayudan a la comunidad:

- Recargar el acuífero subterráneo subvacente
- Mejorar el suministro local de agua
- Aliviar las inundaciones
- Reducir la contaminación en la escorrentía de aguas pluviales
- Mejorar la calidad del agua en el río Santa Clara
- Cumplir con los requisitos de control de basura de California
- Cumplir con los requisitos de TMDI 1 bacterianas

<sup>1</sup>TMDL = Carga Diaria Máxima Total (Total Maximum Daily Load en inglés), significa el cálculo de la cantidad máxima de un contaminante permitido para entrar en un cuerpo de agua para que el cuerpo de agua cumpla y continúe cumpliendo con los estándares de calidad del agua para



### ¿Cómo puede ayudar?



Use plantas tolerantes a la seguía para reducir las necesida de agua de su paisajismo



Instale un barril de lluvia para capturar las aguas pluviales en su propiedad



Capturar las aguas pluviales en su propiedad



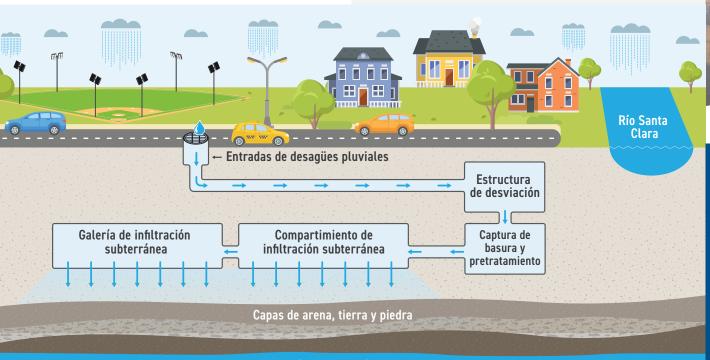
Siempre recoge después de tus mascotas



Participar en limpiezas de playas v ríos



Mantenga siempre la basura dentro de contenedores cerrados



**EL RIO Y PARQUE SATICOY** Estudios de Viabilidad de **Captura de Aguas Pluviales** 





### Para Obtener Más Información

Contacto del proyecto: Ewelina Mutkowska, Gerente Senior de Aguas Pluviales Ewelina.Mutkowska@ventura.org

Mantenga siempre la basura dentro de contenedores cerrados: https://uninc.vcstormwater.org/

## El Rio Proyecto de Captura de Aguas Pluviales y Recarga de Aguas Subterráneas



- 78 acres-pies de aguas pluviales capturadas por año
- Aliviar las inundaciones en 207 acres en la comunidad de El Río
- Captura de infiltración subterránea de aguas pluviales debajo del campo de béisbol en la escuela primaria Rio Plaza
- Mejora del campo de béisbol de la escuela
- Mejora de la calidad del agua en el río Santa Clara
- Cumplimiento de la Ley Federal de Agua Limpia
- Mejoras a los desagües pluviales a lo largo de la calle Cortez en El Río





## El Rio y Saticoy Sitios del Proyecto



## Parque Saticoy Estudio de Viabilidad de Captura de Aguas Pluviales



- 57 acre-pies de aguas pluviales capturadas por año
- Captura de infiltración subterránea de aguas pluviales debajo del campo de béisbol en el parque Saticoy
- Oportunidad de colaborar en las mejoras del campo de béisbol y del parque
- Mejora de la calidad del agua en el río Santa Clara
- Cumplimiento de la Ley Federal de Agua Limpia
- Reducir los flujos de aguas pluviales en Brown Barranca para mitigar las inundaciones en la comunidad de Saticoy





#### Appendix E

#### Project Website, Prepared by the Agency, Inc.

Available at

https://uninc.vcstormwater.org/projects/stormwater-capture-studies/saticoy-park-stormwater-capture