San Pasqual Valley Groundwater Sustainability Plan (GSP) Stakeholder Workshop

Management Action No 7 – Initial Surface Water Recharge Evaluation

Draft Preliminary Feasibility Study

December 12, 2023

The City of SAN DIEGO

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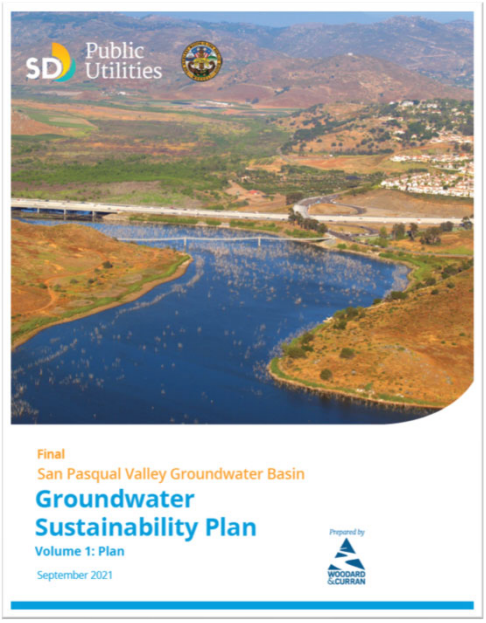
DWR approved the San Pasqual Valley Groundwater Sustainability Plan on October 26!



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Stakeholder Input Format

- This is a stakeholder workshop and anyone is welcome to ask questions or provide comments
- Public comment will take place at the end of the presentation
- Those wishing to speak should place their name and organization in the **Chat**; participants will be called on in the order received
- Follow-up comments and questions can be sent to **Staci Domasco (SDomasco@sandiego.gov)**

Meeting Agenda

1. Welcome and introductions
2. Scope of Project Management Action (PMA) No. 7: Initial Surface Water Recharge Evaluation
3. Review of recharge strategies and evaluation criteria
4. Approach to ranking strategies and results
5. Public comment
6. Next steps and closing remarks

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Scope of Initial Surface Water Recharge Evaluation

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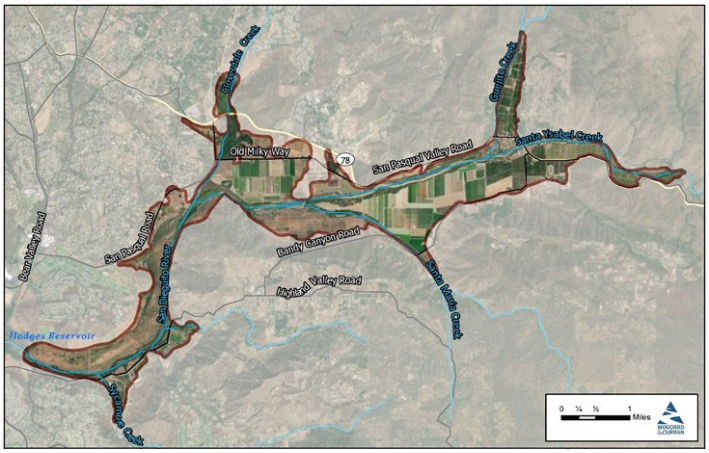
Surface Water Recharge Evaluation: Scope

A *Preliminary Feasibility Study* has been developed to summarize surface water recharge opportunities in San Pasqual Valley.

The *Preliminary Feasibility Study* reflects the information learned over the course of six technical memoranda previously shared with this group and outlines next steps for further development of a potential recharge project.

Draft Preliminary Feasibility Study was released for public comment on December 5.



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Review of Technical Memoranda (TMs):

- **TM 1: Evaluation Criteria TM** – review of criteria and options for water recharge and basis for subsequent TMs.
- **TM 2: Streambed Investigation** – field data collection and modeling to provide site-specific data to update model and understand best options for surface recharge
- **TM 3: Water Sources for Potential Recharge** – evaluating options for where recharge water might come from
- **TM 4: Potential Recharge Strategies** – an evaluation of recharge strategies and their feasibility
- **TM 5: Model Updates and Simulations** – documentation of model refinements and simulation of selected recharge strategies
- **TM 6: Evaluation of Benefits to GDEs** – an evaluation of potential effects of recharge strategies on groundwater dependent ecosystems

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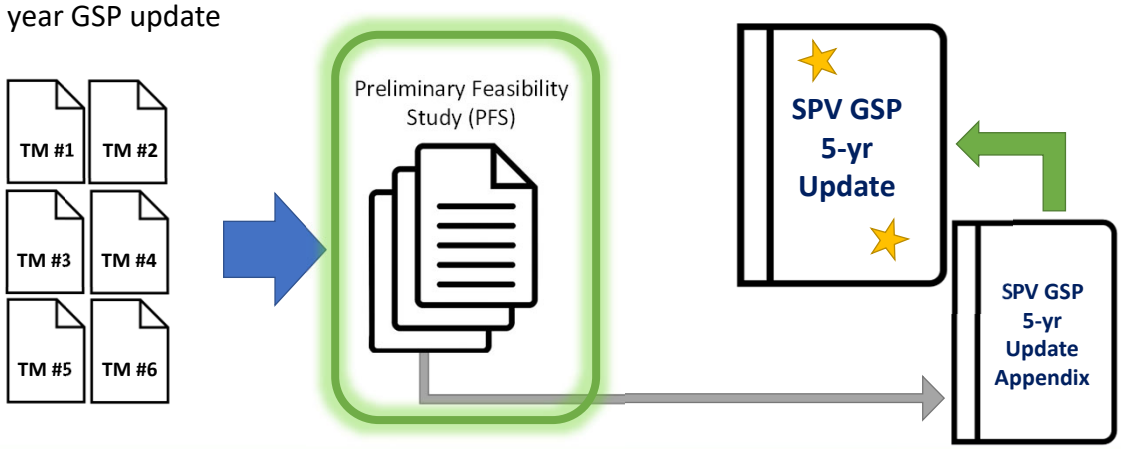
Relationship to GSP

- Current GSP and estimates show the Basin is sustainable
- If future Basin sustainability conditions change *and* GSA determines enhanced recharge strategies are needed, the *Preliminary Feasibility Study* may be used to help inform decisions on mitigation planning
- The *Preliminary Feasibility Study*, created from these TMs, will be a new appendix in the 5-year GSP update



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Surface Water Recharge Evaluation: Schedule

	Scope Task	2022										2023												2024		
#	Task	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Planning and Management Action No. 7																										
Task 1	*Development of Evaluation Criteria*																									
	Develop draft evaluation criteria and scoring				Δ																					
Task 2	*Reevaluate Streambed Characteristics*																									
	Oversee streambed infiltration testing at 15 locations											Δ														
Task 3	*Water Sources for Potential Recharge Projects*																									
	Evaluate reservoir operations											Δ														
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	Develop potential recharge strategies															Δ										
Task 5	*Model Simulations*																									
	Conduct SPV GSP Model simulations																		Δ							
Task 6	*Evaluate Benefits to GDEs*																									
	Assessment of GDE benefits for recharge alternatives																		Δ							
Task 7	*Preliminary Feasibility Study Report*																									
	Prepare draft Feasibility Study Report																									
	Public Review (45 days)																						Δ			
	Revised Feasibility Study + Responses (30 days)																									
	Prepare final Feasibility Study Report																									

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Preliminary Feasibility Study – Strategies and Modeling Outcomes

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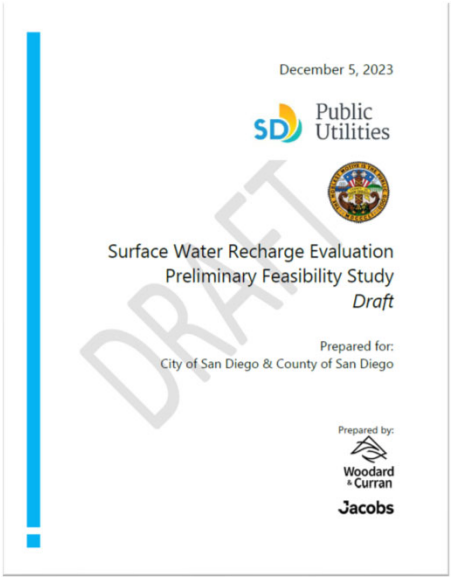
Preliminary Feasibility Study Structure

- PFS includes:
  - Executive Summary
  - Introduction
  - Potential Recharge Strategies
  - Potential Recharge Strategies Analysis
  - Conclusions and Next Steps
  - Appendices (Technical Memoranda 1 through 6; Roadmap for Strategy Planning)



Evaluation Criteria

- **Criterion 1:** Reduction of Modeled Deficit in Groundwater Storage
- **Criterion 2:** Average Reduction of Depth to Water
- **Criterion 3:** Fewer Exceedances of Minimum Thresholds
- **Criterion 4:** Efficiency of Recharge Strategy
- **Criterion 5:** Average Reduction of Groundwater TDS Concentration
- **Criterion 6:** Fewer Consecutive Days Groundwater Levels are Below 30-feet bgs
- **Criterion 7:** Costs and Benefits of Implementation and Maintenance
- **Criterion 8:** Feasibility of Implementation and Maintenance

Potential Recharge Strategies

Enhance streamflow infiltration in Santa Ysabel Creek with in-channel detention structure (rubber dam).

Strategy 1B

Augment Santa Ysabel Creek flows with controlled releases from Sutherland Reservoir.

Strategy 2A

Augment Santa Ysabel Creek flows with deliveries from Ramona MWD's untreated water system.

Strategy 3A

Enhance groundwater recharge via injection wells by treating and injecting water from Ramona MWD's untreated water system.

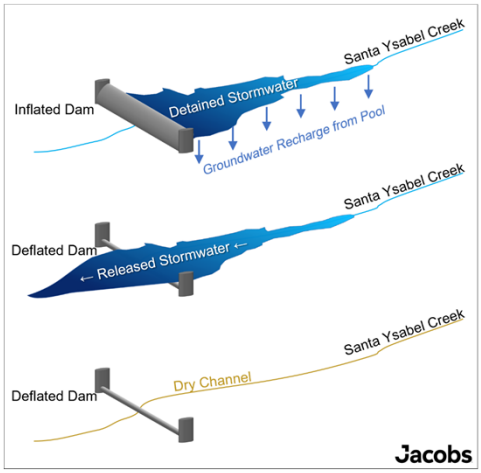
Strategy 3D

Potential Recharge Strategies Analysis

- The four potential recharge strategies were evaluated against a Baseline simulation, which assumed no recharge strategies are implemented
- Used SPV GSP Model v2.0 that reflects updates and refinements since development of the GSP
- Uses same climate, hydrology, and land use conditions described in GSP
- Recharge events as modeled were trigged by specific conditions, with goal to provide resilience against undesirable results

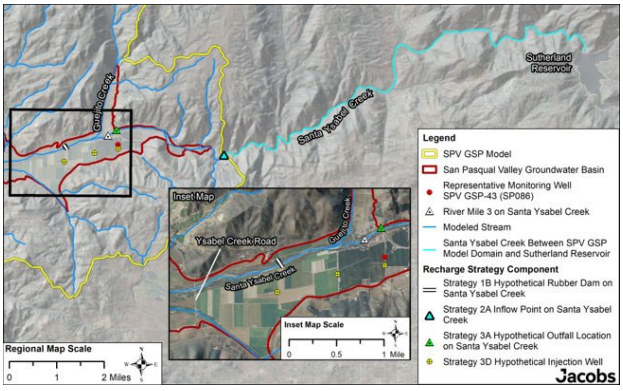
Evaluation of Strategy 1B – Rubber Dam

- Uses stormwater for recharge
- Lowest overall volume of water recharged to the Basin
- Highest cost per AF ($24,975/AF)



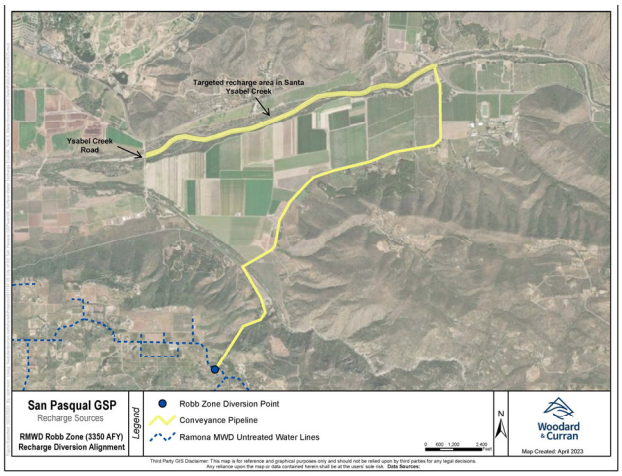
Evaluation of Strategy 2A – Sutherland Releases

- Relatively simple to implement with minimal infrastructure needed specific for this strategy
- Moderate recharge benefits
- Lowest cost per AF due to lack of new infrastructure needed ($2,139/AF)



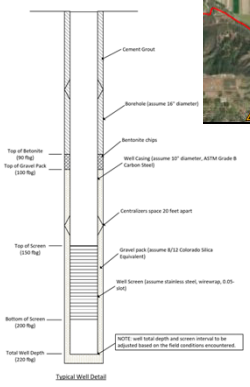
Evaluation of Strategy 3A – Ramona Releases to Creek

- High recharge volume
- High reliability during drought
- Requires construction of pipeline which increases cost per AF ($4,500/AF)
- Infrastructure could be idle at times



Evaluation of Strategy 3D – Injection of Ramona Water

- Highest recharge volume
- High reliability during drought
- Requires construction of pipeline, treatment facility, and wells which increases cost per AF ($6,614/AF)
- Complex to operate and maintain
- Infrastructure could be idle at times



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Preliminary Feasibility Study – Ranking Approach and Results

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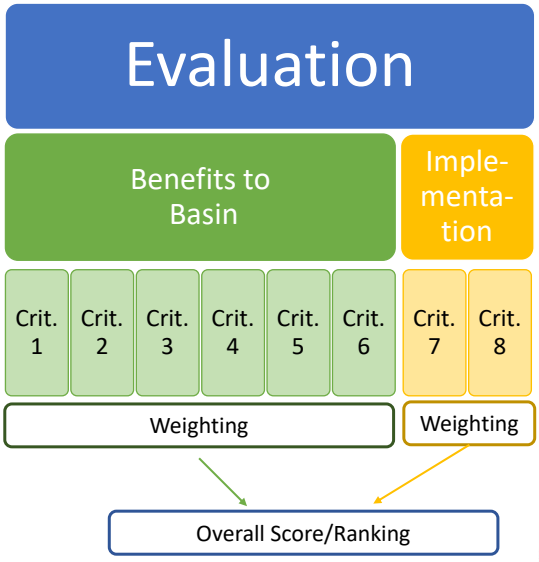
Summary of Ranking Approach

- Two step approach was used to balance consideration of benefits against what implementation would require
  - Benefits to Basin included Criteria 1 through 6
  - Implementation considerations included Criteria 7 and 8
- Strategies were ranked 1-4 for each criterion, with 1 being most favorable for a criterion
- Weighting was applied separately to Benefits criteria and Implementation criteria



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Ranking Results - Benefits Criteria

Recharge Strategy Rank Related to Recharge Volume and Modeled Output

Recharge Strategy	Criterion 1 Reduction of Modeled Deficit in Groundwater	Criterion 2 Average Reduction of Depth to Water	Criterion 3 Fewer Exceedances of MT	Criterion 4 Efficiency of Recharge Strategy	Criterion 5 Average Reduction of Groundwater TDS Concentration	Criterion 6 Fewer Consecutive Days Groundwater Levels are below 30 ft bgs	Total Score (raw)	Weighted Total Score
	18.6%	10%	25.7%	25.7%	10%	10%		
1B–Enhance Streamflow Infiltration with In-stream Modifications	4	4	4	1	4	4	21	3.23
2A–Augment Streamflow with Sutherland Controlled Releases	3	3	3	4	2	3	18	3.16
3A–Augment Streamflow with Ramona MWD Deliveries	2	2	2	3	2	2	13	2.26
3D–Injection Wells with Ramona MWD Deliveries	1	1	1	2	1	1	7	1.26

A rank of 1 indicates the most favorable recharge strategy, whereas a rank of 4 indicates the least favorable recharge strategy for a given criterion.
Percentages listed in the table header are weighting factors that have been normalized to sum to 100%.

Ranking Results – Implementation Criteria

Summary and Ranking of Evaluation Criteria Results Related to Cost and Implementation for All Recharge Strategies

Recharge Strategy	Summary of Cost and Implementation Criteria		Scoring and Ranking of Cost and Implementation Criteria			
	Criterion 7: Costs of Implementation and Maintenance ($/AF)	Criterion 8: Feasibility of Implementation and Maintenance	Criterion 7 40%	Criterion 8 60%	Total Score (raw)	Weighted Total Score
1B–Enhance Streamflow Infiltration with In-stream Modifications	24,975	Medium	4	2	6	2.8
2A–Augment Streamflow with Sutherland Controlled Releases	2,139	Easy-Medium	1	1	2	1
3A–Augment Streamflow with Ramona MWD Deliveries	4,500	Medium-Difficult	2	3	5	2.6
3D–Injection Wells with Ramona MWD Deliveries	6,614	Difficult	3	4	7	3.6

A rank of 1 indicates the most favorable recharge strategy, whereas a rank of 4 indicates the least favorable recharge strategy for a given criterion.

Ranking Results - Overall

Overall Ranking of Strategies

Recharge Strategy	Step 1: Benefit Criteria (1-6) Weighted Score	Step 2: Cost and Implementation Criteria (7 & 8) Weighted Score	Overall Ranking: Combined Weighted Score	Overall Ranking: Final Rank
1B–Enhance Streamflow Infiltration with In-stream Modifications	3.23	2.8	6.0	4
2A–Augment Streamflow with Sutherland Controlled Releases	**3.16**	**1**	**4.2**	**1**
3A–Augment Streamflow with Ramona MWD Deliveries	2.26	2.6	4.9	2 (tie)
3D–Injection Wells with Ramona MWD Deliveries	1.26	3.6	4.9	2 (tie)

Example Roadmap

- A "roadmap" is provided for each of the four strategies
  - Outlines the potential planning process
  - Details on what each step may include provided in Appendix G
- Recommended factors to consider in future steps of the planning process are identified for each of the strategies

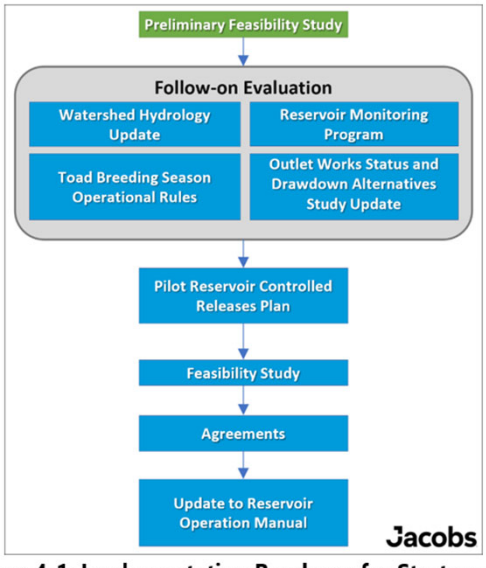

Figure 4-1: Implementation Roadmap for Strategy 2A

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PUBLIC COMMENT

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NEXT STEPS & CLOSING REMARKS

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Next Steps

Stakeholder comments on Preliminary Feasibility Study requested by January 22 to SDomasco@sandiego.gov

GSA will:

- Finalize Preliminary Feasibility Study after considering comments
- Incorporate study into the GSP 5-Year Update
- Continue to monitor Basin for sustainability as defined in the GSP to determine the need to implement recharge strategies in the context of the other Projects and Management Actions available to the GSA

Surface Water Recharge Evaluation: Schedule

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SPV GSP Implementation

Status of Management Action (MA) Implementation:

- **MA 3 –** Support Water Quality Improvement Plan (WQIP) Actions – *Continuous*
- **MA 4 –** Coordinate/Collaborate Regionally with Other Entities to Perform Monitoring & Implement Regional Projects – *Continuous*
- **MA 5 –** Education & Outreach for TDS & Nitrate – *Emailed to Stakeholders and posted online*
- **MA 6 –** Coordinate with City on Hodges Watershed Improvement Project – *Continuous*
- **MA 7 –** Initial Surface Water Recharge Evaluation – *Draft Preliminary Feasibility Study available for comment until January 22*
- **MA 8 –** Study GDEs, Phase I Desktop Study – *Underway*

GSP Resources

- San Pasqual Valley GSP Website
  - https://www.sandiegocounty.gov/content/sdc/pds/SGMA/san-pasqual-valley.html
- San Pasqual Valley GSP
  - https://sgma.water.ca.gov/portal/gsp/preview/75
  - Annual Report for Water Years 2020, 2021, and 2022
  - https://sgma.water.ca.gov/portal/gspar/preview/140
- San Pasqual Valley GSP Data Management System (Opti)
  - https://opti.woodardcurran.com/sanpasqual/login.php

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THANK YOU!

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