

Big Rock Creek Groundwater Recharge Feasibility Study

Alternatives Analysis – Preliminary Findings

3 June 2021

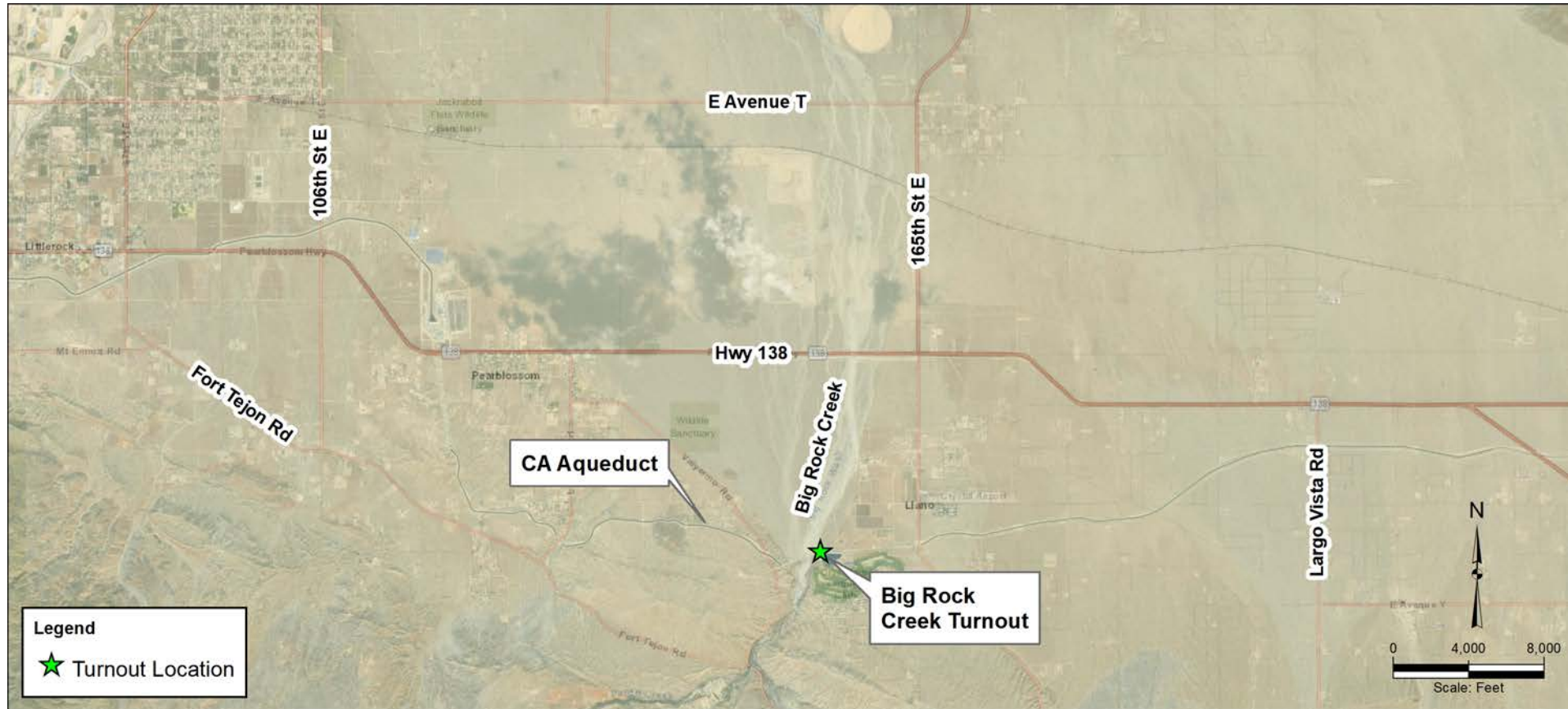
Agenda

- Project Background
- Recharge Alternatives Overview
 - Locations
 - Recharge Capacity
 - Capital/O&M Costs
 - Permitting Considerations
- Preliminary Alternative Rankings
- Open Discussion
- Schedule and Next Steps

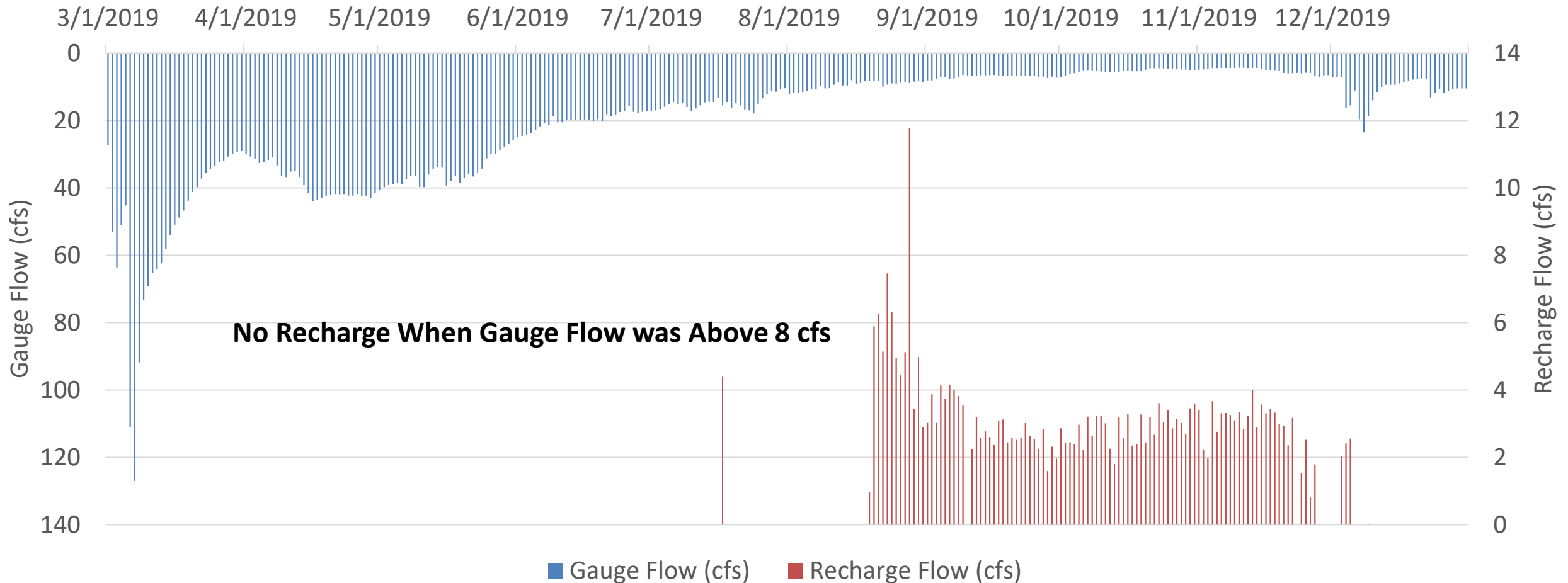
Project Background

- Purpose of the Study is to evaluate recharge feasibility of Big Rock Creek
- Conducted Recharge Demonstration Project
 - Concluded that using the Creek for artificial recharge produced limited capacity (3 cfs)
 - Suggested potential alternatives to improve recharge in the Creek vicinity

Big Rock Creek Map



Cannot Recharge when Natural Runoff is Present

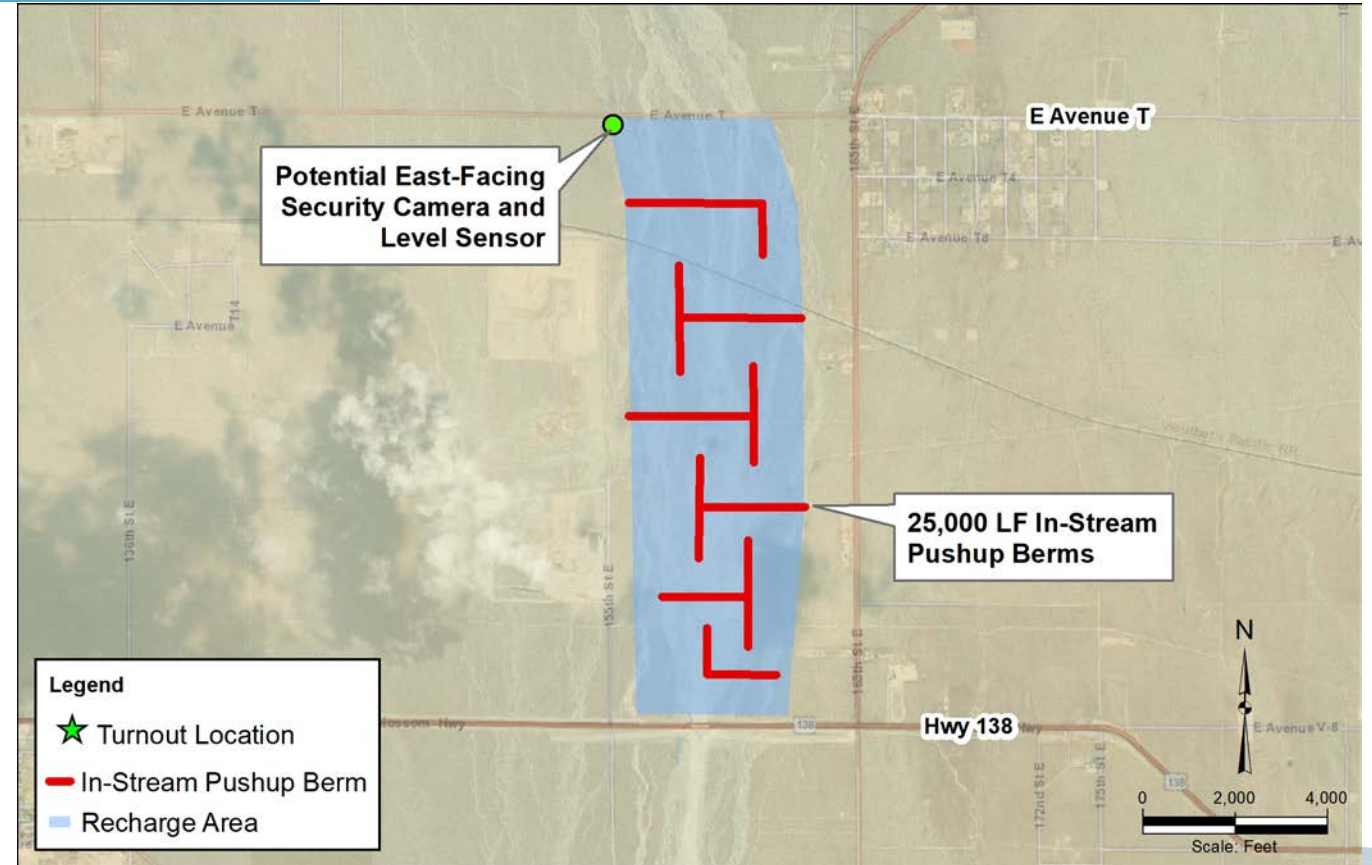


Recharge Alternatives Overview

- Alternative 1: In-Stream Pushup Berms
- Alternative 2: East Avenue T and East Avenue S Culverts
- Alternative 3: Offsite Recharge Basins and Pipeline
- Alternative 4: Water Booster Station and Pipeline from Carl B. Hunter WTP

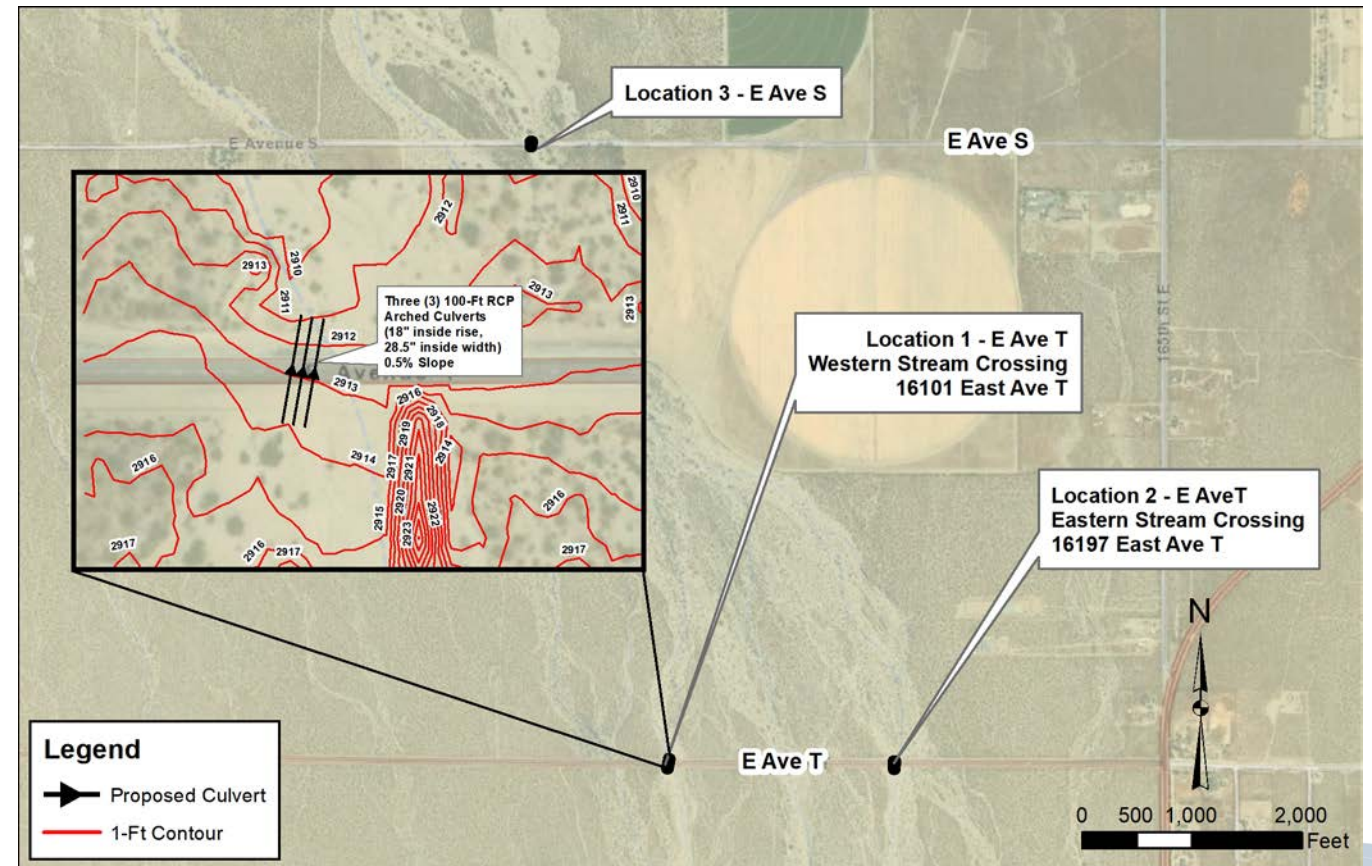
Alternative 1: In-Stream Pushup Berms

- Recharge Capacity: **20,000 AFY**
- Capital Cost: **\$0.52 M**
- 20-Year O&M Cost: **\$1.65 M**
- **Very Intensive Environmental and Permitting Requirements**
 - Up to 2 years to complete permitting
 - Continuous environmental surveying required due to berm reconstruction
- Share Creek with Mother Nature



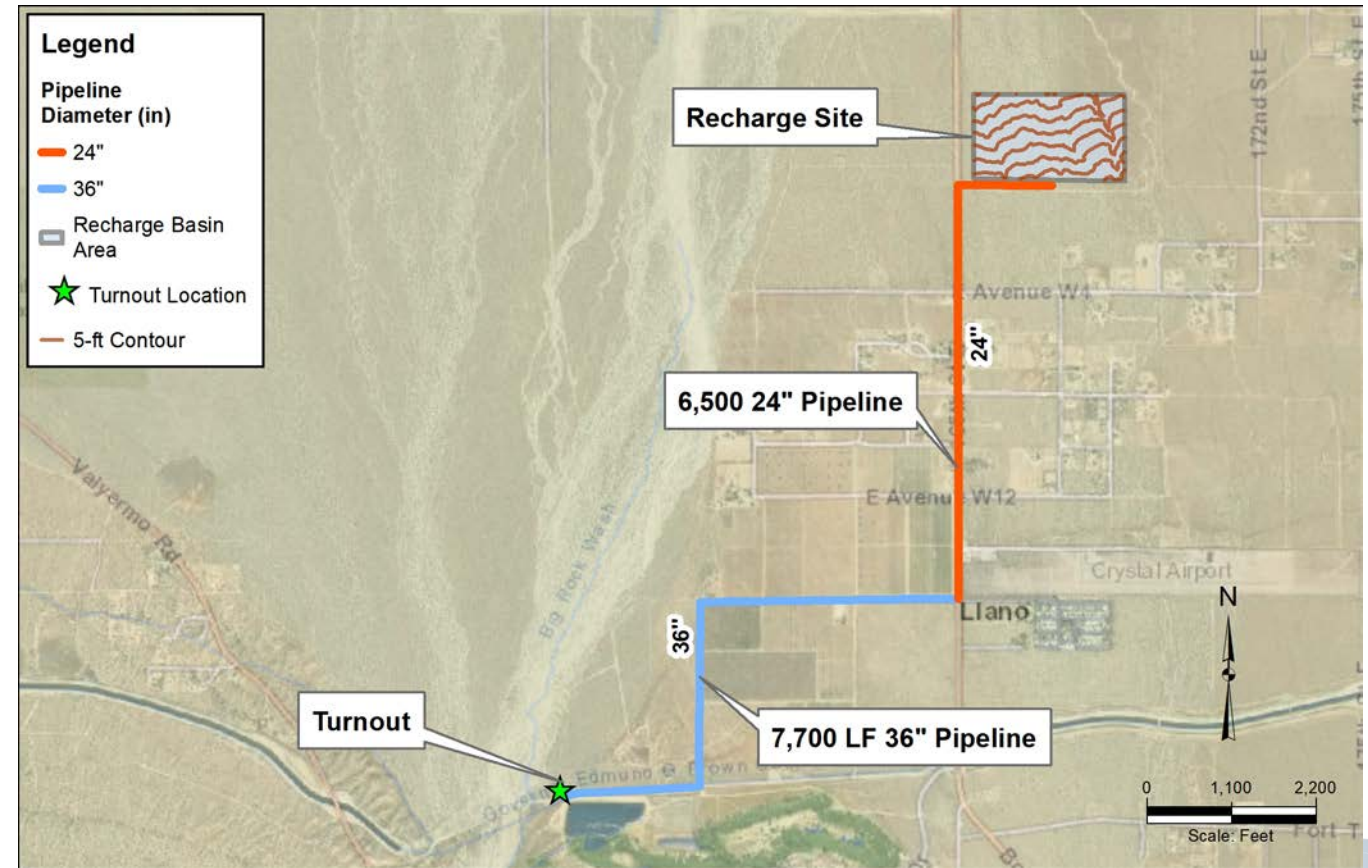
Alternative 2: East Avenue T and East Avenue S Culverts

- Recharge Capacity: **2,200 AFY**
- Capital Cost: **\$0.51 M**
- 20-Year O&M Cost: **\$0.04 M**
- **Limited Capacity**
- Moderate Permitting Requirements
- Small Footprint
- Provides some flood control across East Ave T



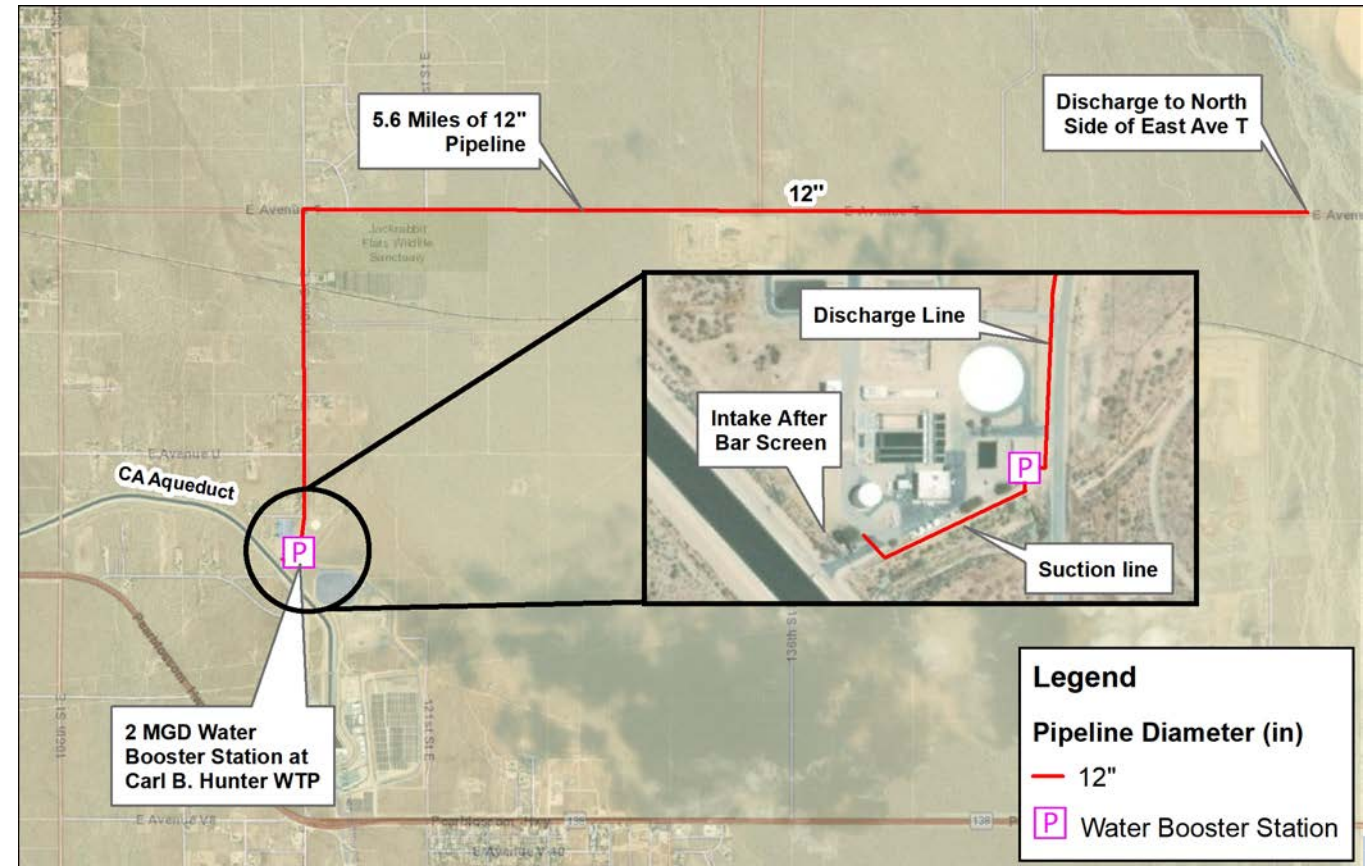
Alternative 3: Offsite Recharge Basins and Pipeline

- Recharge Capacity: **20,000 AFY**
- Capital Cost: **\$9.7 M**
- 20-Year O&M Cost: **\$1.01 M**
- **High Yield, High Cost**
- **Limited Permitting Requirements**
 - Contained footprint
 - Pipeline stays within right-of-way
- Standard pipeline and berm construction



Alternative 4: Water Booster Station and Pipeline from Carl B. Hunter WTP

- Recharge Capacity: **2,200 AFY**
- Capital Cost: **\$10.1 M**
- 20-Year O&M Cost: **\$1.38 M**
- **Low Yield, High Costs**
Moderate permitting requirements
- Large project footprint/
required easement acquisition



Preliminary Alternative Rankings

Evaluation Criteria Definition			
Evaluation Criteria	Definition	Scoring Range	Weighting Factor
Recharge Capacity	Total annual recharge volume (AFY) anticipated for the alternative	0 (Worst) - 5 (Best)	30%
Capital Cost	The capital cost required to construct the alternative	0 (Worst) - 5 (Best)	15%
20-Year O&M Cost	The 20-year lifespan O&M cost required to operate and maintain the alternative	0 (Worst) - 5 (Best)	10%
Regulatory and Permitting Requirements	Regulatory and permitting requirements and associated costs needed to construct and operate the alternative	0 (Worst) - 5 (Best)	25%
Ease of Construction	Accounts for complexity of construction and the project footprint	0 (Worst) - 5 (Best)	10%
Community Impacts	Potential positive and/or negative impacts to the surrounding community during and after construction of the alternative	0 (Worst) - 5 (Best)	10%

- Alternatives scored on a relative scale from 0 (worst) to 5 (best)
- Weighting factors applied to each score based on the relative importance of each criteria

Preliminary Alternative Rankings

Criteria	Weight	Range	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
			In-Channel Berms		East Avenue T/S Culverts		Offsite Recharge Basins		Water Booster Station/Pipeline	
			Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score
Recharge Capacity	30%	0 - 5	5.0	1.50	0.54	0.16	5.0	1.50	0.54	0.16
Capital Cost	15%	0 - 5	5.0	0.75	4.90	0.74	0.3	0.04	0.25	0.04
20-Year O&M Cost	10%	0 - 5	0.1	0.01	5.00	0.50	0.2	0.02	0.14	0.01
Regulatory and Permitting Requirements	25%	0 - 5	0.5	0.13	4.00	1.00	5.0	1.25	3.00	0.75
Ease of Construction	10%	0 - 5	5.0	0.50	4.00	0.40	3.0	0.30	2.00	0.20
Community Impacts	10%	0 - 5	3.0	0.30	5.00	0.50	3.0	0.30	3.00	0.30
Total	100%			3.19		3.30		3.41		1.47

Preliminary Alternative Rankings

Alternative	Score	Rank
1 - In-Channel Berms	3.19	3
2 - East Avenue T and S Culverts	3.30	2
3 - Offsite Recharge Basins	3.41	1
4 - Water Booster Station/ Pipeline	1.47	4

- Alternative 3 – Offsite Recharge Basins is the preferred alternative
 - Largest recharge capacity (tied with Alternative 1)
 - Recharge capacity flexibility
 - Stay out of the creek
 - Simplest permitting/ regulatory requirements

Next Steps

- Identify specific parcels for recharge basins
- Preliminary design for recharge facilities
- CEQA documentation



Kennedy Jenks



OPEN DISCUSSION / QUESTIONS
