BUREAU OF RECLAMATION

Verde Reservoirs Sediment Mitigation Project (VRSMP)

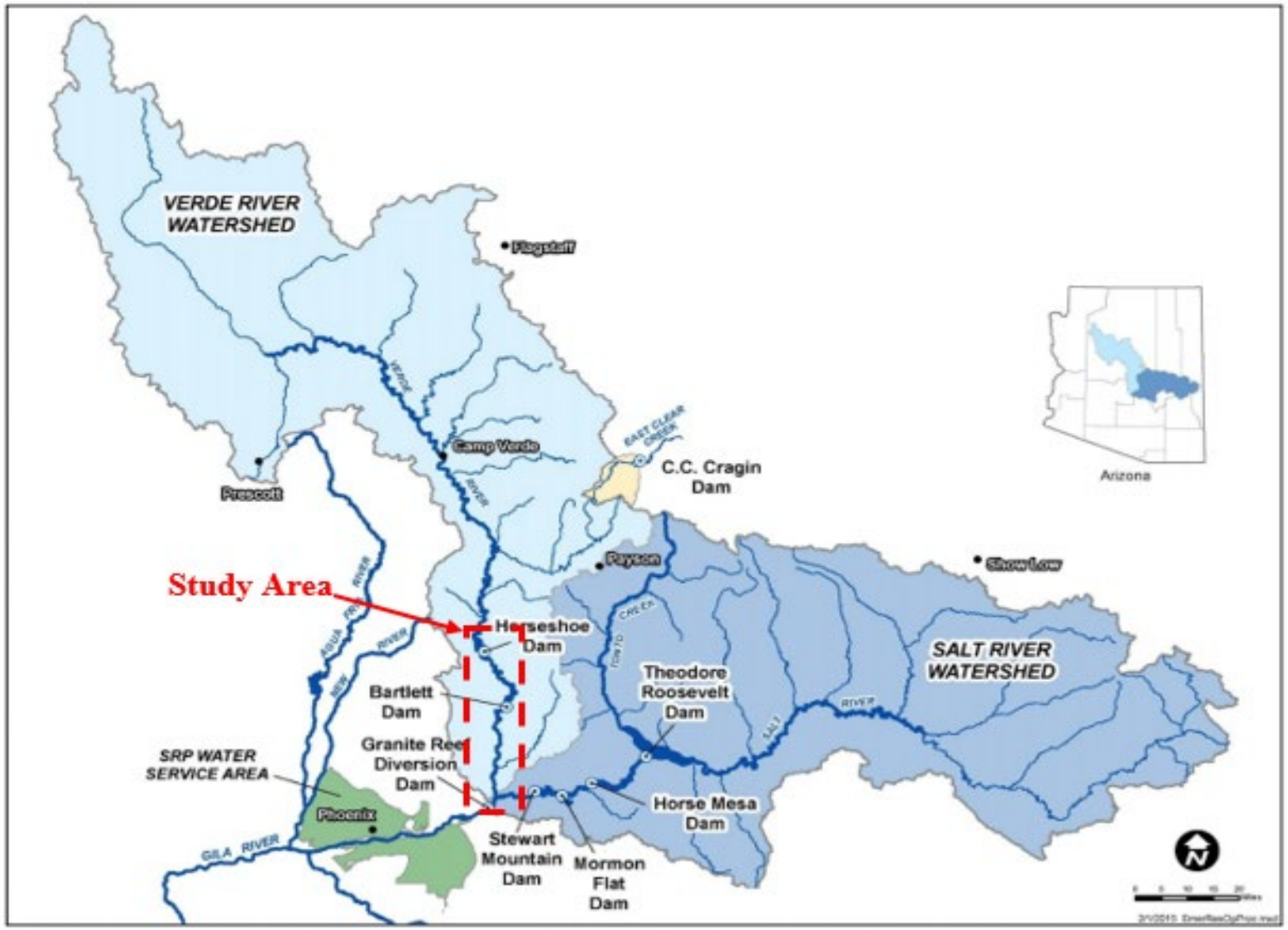
February 2023

Contents

- Overview of the Verde Reservoir Sediment Mitigation Study (VRSMS) Appraisal Report
- VRSMP Feasibility Study process and timeline

VRSMS Appraisal Report Summary

- Horseshoe Dam is part of the Salt River Federal Reclamation Project (SRFRP)
- The SRFRP is operated and maintained by the Salt River Project (SRP)
- Sediment accumulation behind Horseshoe Dam has reduced storage capacity



VRSMS Appraisal Study Problems, Needs and Opportunities

Problem:

Sediment accumulation behind Horseshoe Dam is reducing storage capacity

Need:

Restore lost capacity and mitigate future sediment accumulation

Opportunity:

Developing new water sources, managing existing water sources differently, rehabilitation measures, system upgrades, conservation measures, etc.

Horseshoe Dam and Reservoir

Horseshoe Reservoir at 0% full

VRSMS Appraisal Study Background

Because of sedimentation, Horseshoe Reservoir's capacity has been reduced by approximately 46,000 acre-feet since it was placed in service in 1949. The lost capacity reduces available storage capacity for City of Phoenix and SRP's water shareholders. The VRSMS evaluated alternatives for restoring capacity and mitigating future impacts of sediment on the Verde River reservoirs as well opportunities for creating additional benefits of water supplies, flood control, dam safety, the environment, recreation, and hydropower.

Sedimentation in Horseshoe Dam

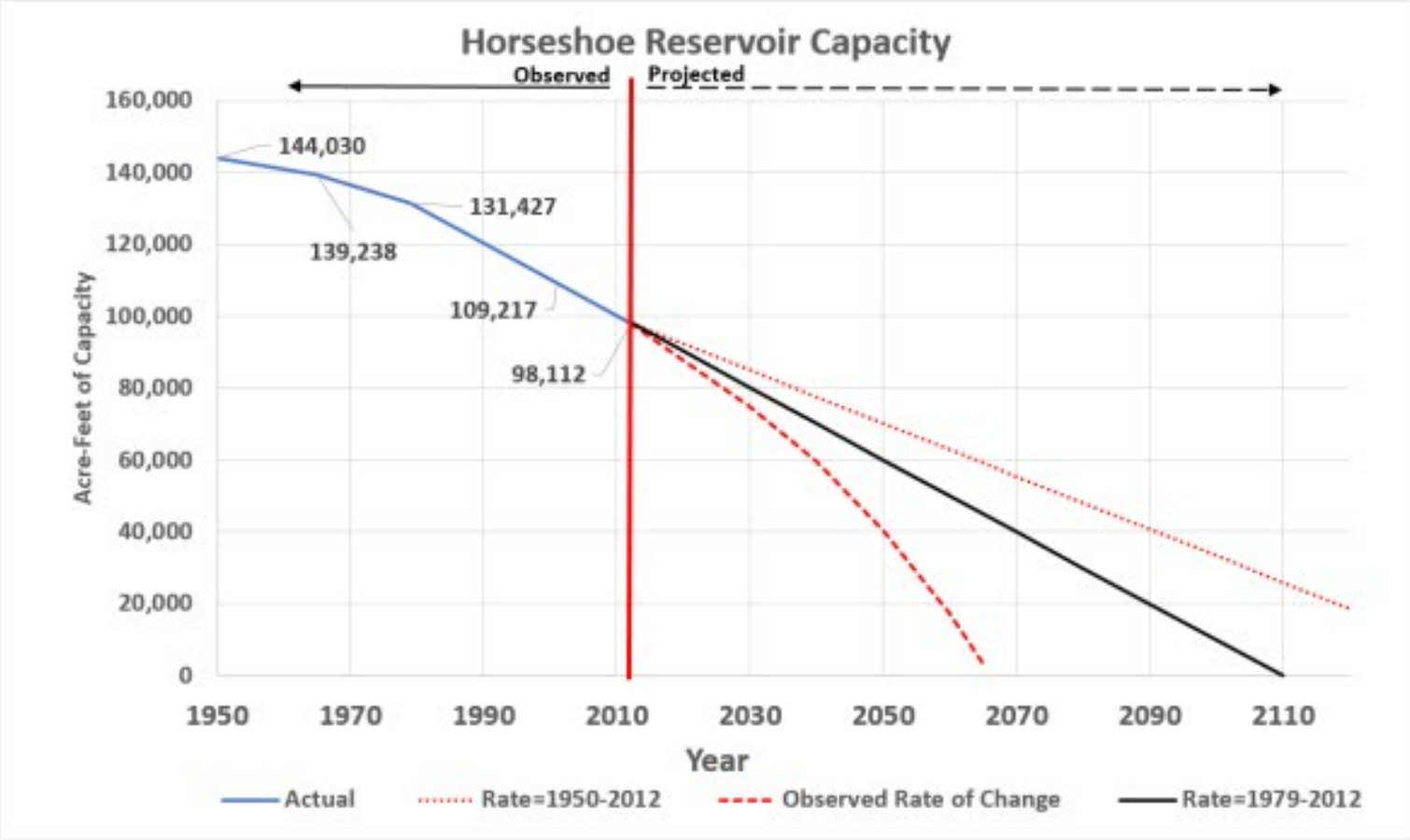
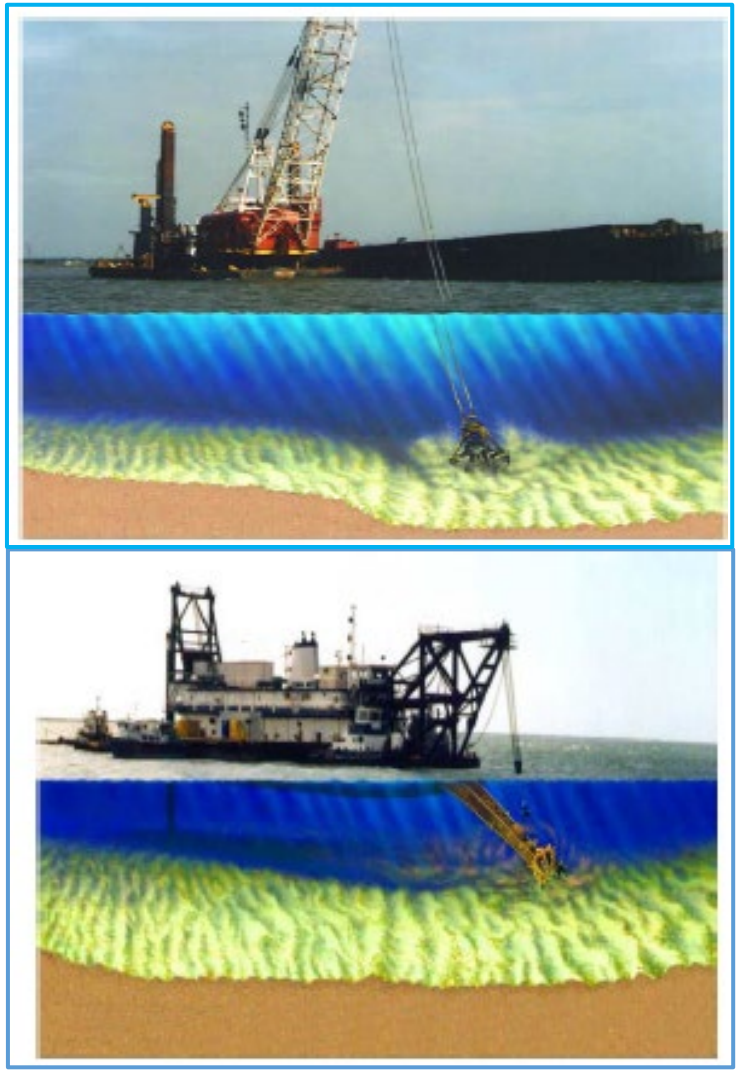


Table 4. Horseshoe Sediment Survey Results and Accumulation Rates

Year of Sediment Survey	Capacity (AF)	Annual Capacity Loss Rate to Sediment (AFY)
1950	144,030	
1965	139,238	(319)
1979	131,427	(558)
2001	109,217	(1,010)
2012	98,281	(994)

Appraisal Study Alternatives Analyzed

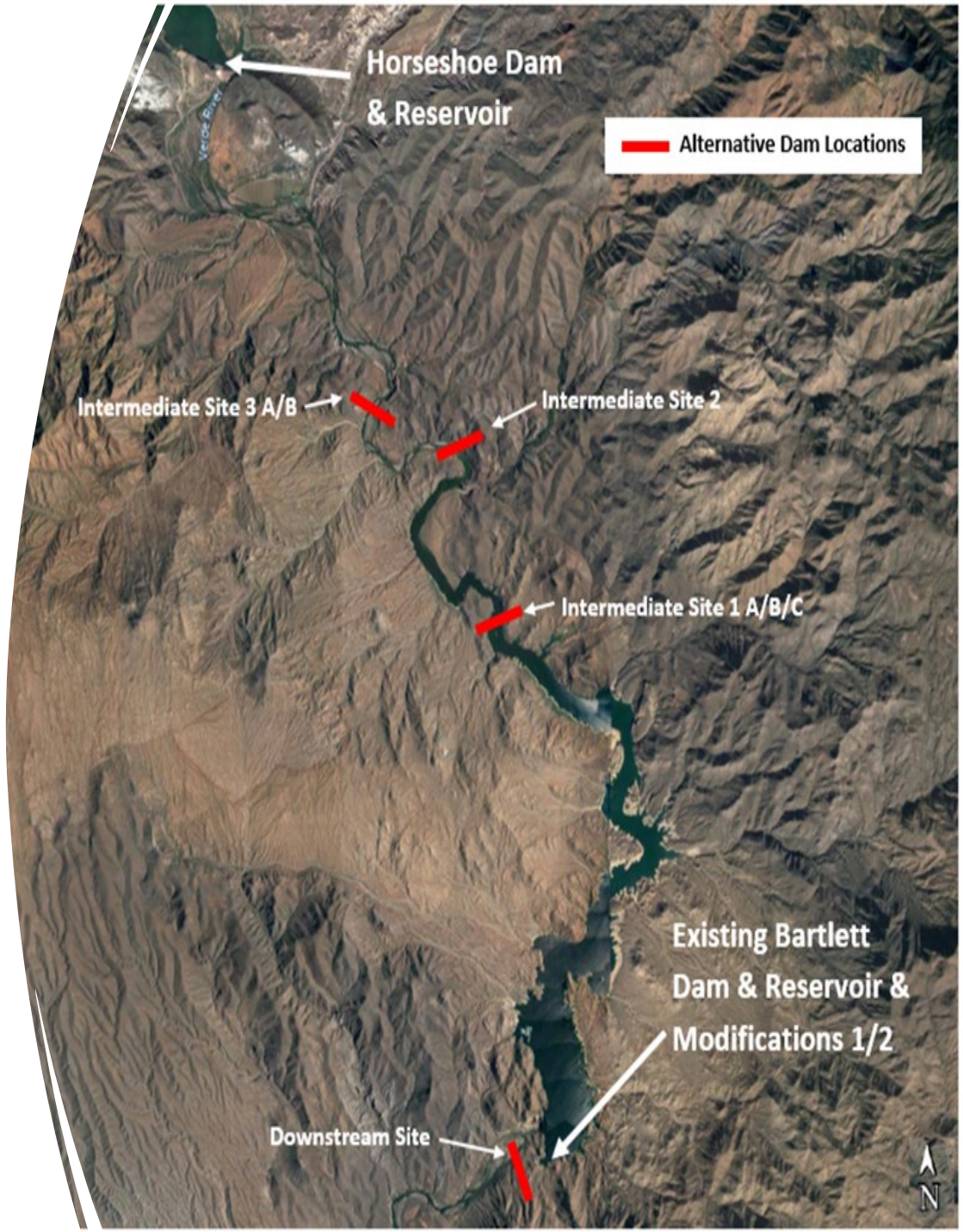
- Without Action
  - Sediment accumulation continues
  - Loss of storage increases
  - Groundwater use increases
- Sediment Removal (mechanical removal)
  - Low overall criteria scoring
  - Uncertainty if implementable
  - Benefit cost ratio less than one



Mechanical removal

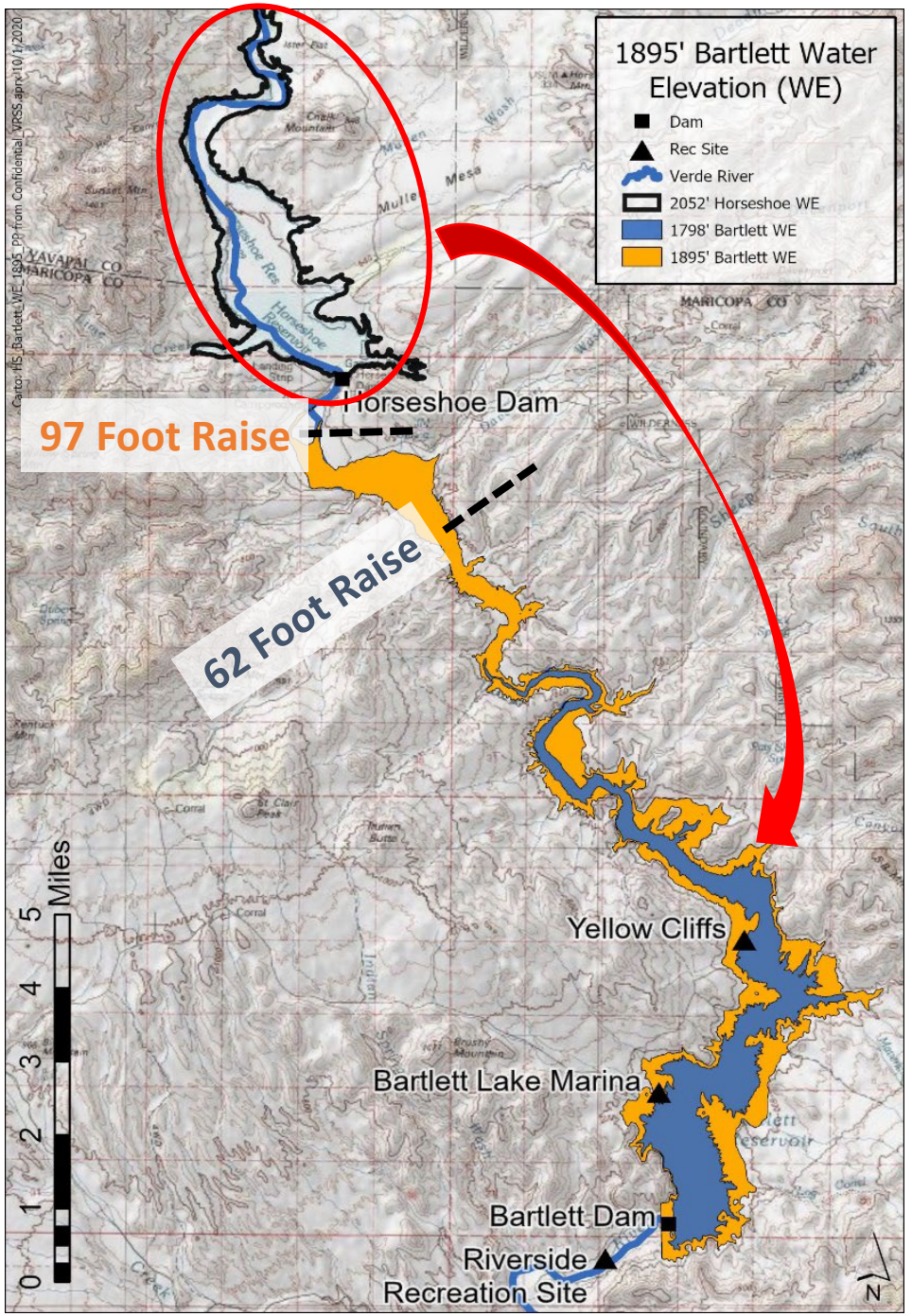
Appraisal Study Alternatives Analyzed

- Several alternatives considered but not fully evaluated
  - Several other dam sites upstream and downstream of Bartlett Dam
  - Reservoir sluicing and flushing
  - Watershed sediment management



Appraisal Study Alternatives Analyzed

- Bartlett Modification 1 (97’ Raise)
- Bartlett Modification 2 (62’ Raise)
  - Moves storage capacity from Horseshoe to Bartlett
  - Restores lost capacity due to sediment
  - Creates additional surface water supply (average annual yields)
    - 91,000 af (Bartlett Mod 1)
    - 36,000 af (Bartlett Mod 2)
  - Potential to reduce groundwater pumping



Appraisal Study Hydrological Forecast – Average Annual Water Yield

Table 15. Summary of Modeled Surface Water Yield (2031-2130)

Alternative	Change in Annual Phoenix Gatewater Accrual [AFY]	Change in Annual SRP Surface Water Delivery [AFY]	NVS Average Annual Yield [AFY]	Annual Average Surface Water Delivery Change from w/o action [AFY]
Without Action	-	-	-	-
Sed Removal	3,000	7,000	-	10,000
BT Mod 1 (97 ft)	8,000	16,000	91,000	115,000
BT Mod 2 (62 ft)	8,000	16,000	36,000	60,000

Appraisal Study Recommendations

- Seek/confirm authority to conduct a feasibility study
- Develop cost share agreements to conduct feasibility study
- Clearly define planning objectives
- Address risks and uncertainties during the feasibility study process

Link to full VRSMS appraisal study report

https://www.usbr.gov/lc/phoenix/reports/verdeRSMS/VRSMS_Appraisal_Report.pdf

Feasibility Process

- Feasibility Scoping
- Conduct planning activities
- Inventory existing resources and forecast future conditions
- Formulate, evaluate and compare alternative plans
- Select recommended plan
- Prepare final report

For more details on the feasibility process visit
https://www.usbr.gov/recman/cmp/cmp09-02.pdf

VRSMP Feasibility Study

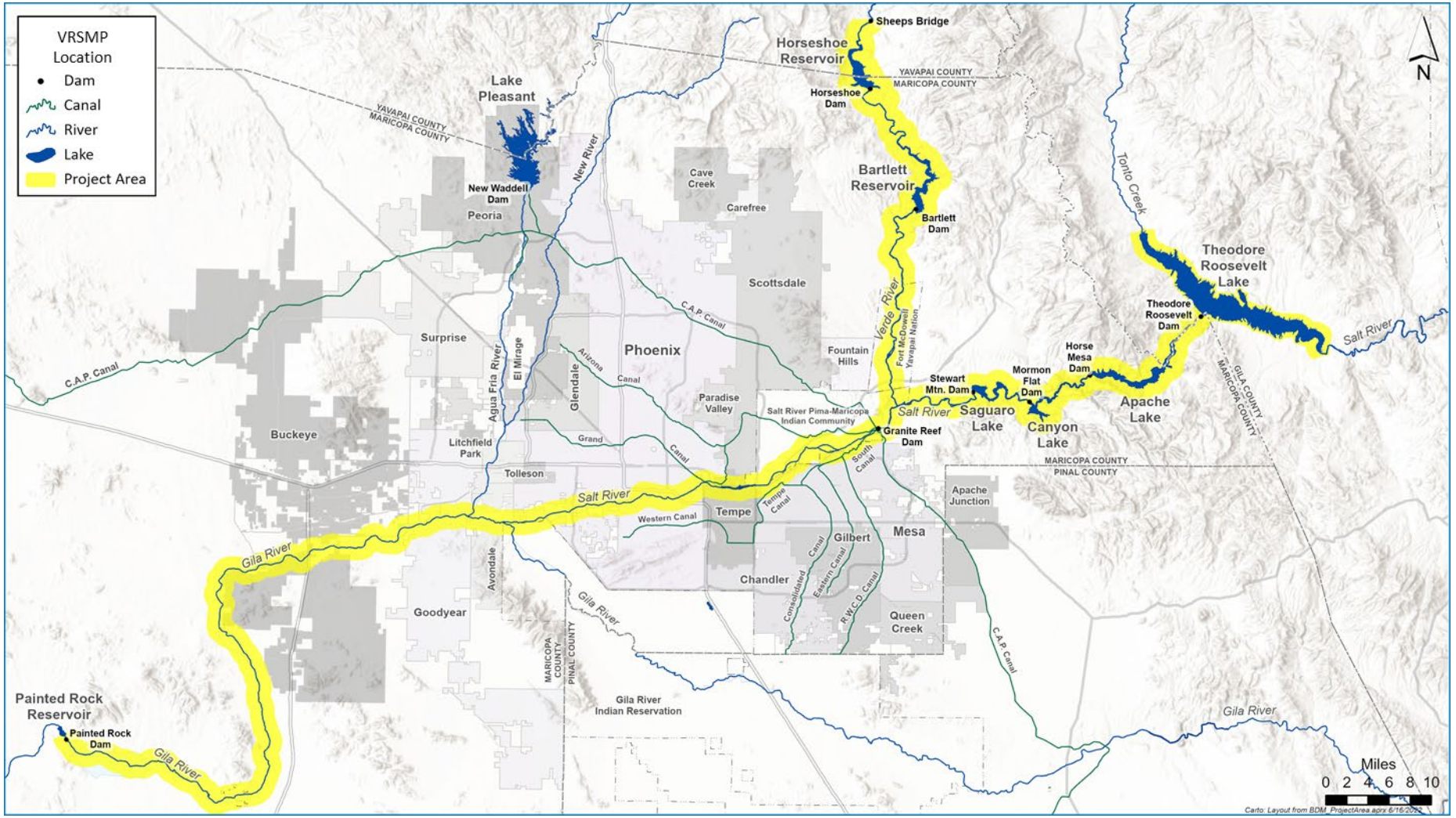
The feasibility study will elaborate on the analysis in the VRSMS Appraisal Report for restoring lost capacity and increasing benefits created by the Verde River reservoir system for the purposes of water supply, hydropower, dam safety, flood control, environmental and recreation.

Bartlett Dam

VRSMP Feasibility Objectives

- Restore water storage capacity on the Verde Reservoir system that has been lost from sedimentation at Horseshoe Reservoir and mitigate future sediment accumulation impacts
- Evaluate additional water storage capacity and associated water supplies on the Verde Reservoir system including opportunities for use to facilitate negotiations and implementation of Indian Water Rights Settlements and other federal uses.
- Consider opportunities for increasing benefits created by the Verde River reservoir system for the purposes of hydropower, dam safety, flood control, fish and wildlife and recreation
- To the extent practicable, avoid and minimize adverse impacts on physical, biological, socioeconomic, cultural, and tribal resources

VRSMP Tentative Study Area



VRSMP Feasibility Study Timeline

- November 2021 – Feasibility Study authorized by Title IX of the Bipartisan Infrastructure Law, P.L. 117-58
- SRP non-federal entity MOU and Cost Share Agreement
- May 2022, Cost Share Agreement between Reclamation and SRP
- Fall 2022 – Value Planning
- Winter 2023 – Complete 30% design
- Spring 2024 – Initiate NEPA process
- Fall 2026 – Complete Feasibility Report

Email questions to:

VRSMP@usbr.gov

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