

RECLAMATION

Managing Water in the West

Shasta Enlargement Feasibility Study Update

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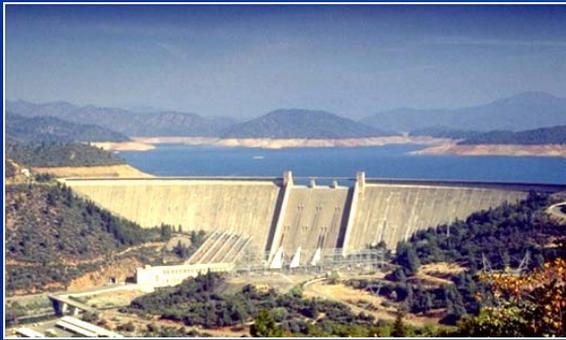
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U.S. Department of the Interior
Bureau of Reclamation

Reclamation Feasibility Studies

CALFED Surface Storage



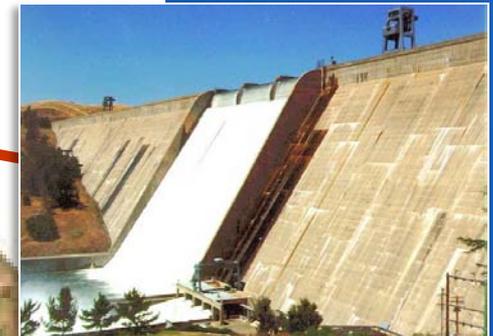
Shasta Enlargement



North-of-Delta
Offstream
Storage



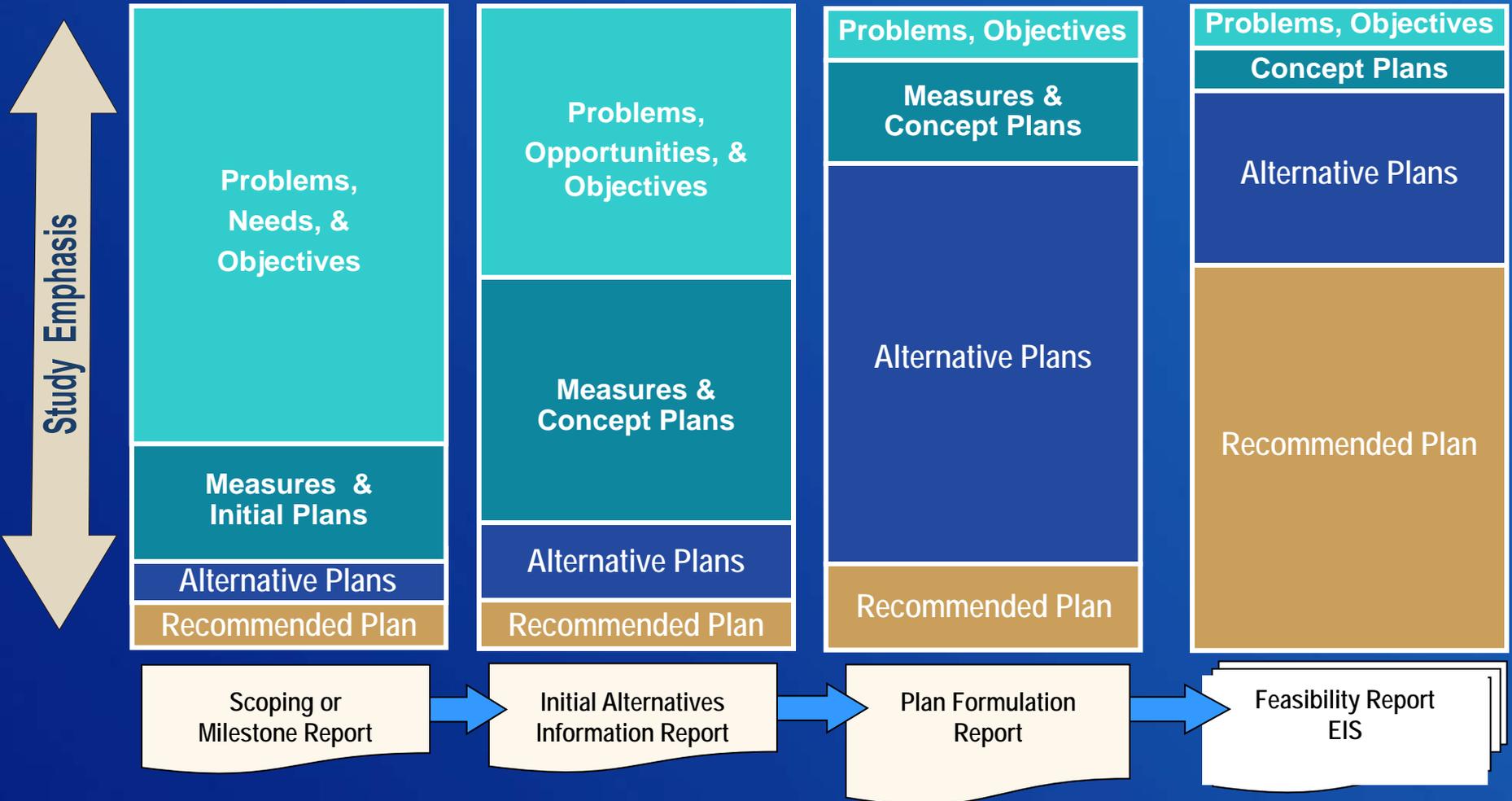
Los Vaqueros Expansion



Upper San
Joaquin River
Basin Storage

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Feasibility Study Phases



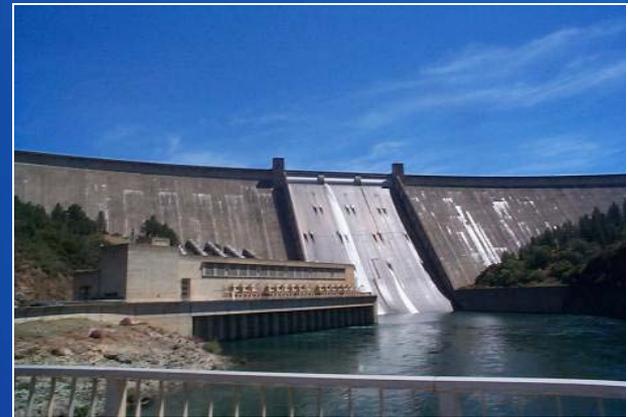
Current Shasta Facilities

Dam and Powerhouse

- 523 foot dam height (602 feet above streambed)
- 710 MW generating capacity (5 units @ 142 MW)

Reservoir / Lake

- 4.55 MAF storage capacity
- 1.3 MAF flood control space
- 5.7 MAF mean annual runoff
- 29,500 acres surface area when full
- Purposes: water supply, hydropower, fish and wildlife conservation, flood control, water quality, navigation, recreation opportunities



Shasta Enlargement Planning Objectives

- Primary Objectives
 - Anadromous Fish Survival
 - Water Supply Reliability
- Secondary Objectives
 - Ecosystem Restoration
 - Flood Damage Reduction
 - Hydropower
 - Recreation
 - Water Quality



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Shasta Enlargement Alternatives

- No-Action
- Focus on water supply reliability & fish survival
 - 6.5 foot dam raise
 - 12.5 foot dam raise
 - 18.5 foot dam raise
- Focus on dedicated cold water pool
 - 18.5 foot raise
- Focus on water supply reliability & fish survival, plus ecosystem enhancement & additional recreation
 - 18.5 foot raise

Shasta Enlargement Estimated Benefits

- **Primary Benefits (average annual increases)**
 - **Dry & Critical year deliveries ~76 to 133 TAF**
 - **All water year type deliveries ~46-76 TAF**
 - **Increased water use efficiency**
 - **Average annual fish survival ~234,000 to 1,200,000**
 - **Spawning gravel and side-channel restoration**

Shasta Enlargement Estimated Benefits

- **Secondary Benefits (annual average increases)**
 - **Hydropower generation ~ 42 to 138 GWh**
 - **Flood damage reduction**
 - **Restore & enhance ecosystem resources**
 - **Delta water quality and emergency response**
 - **Recreation ~ 83,000 to 224,000 RVD**
 - **Modernize and relocate recreation facilities**

Shasta Enlargement Monetized Costs & Benefits

Total Construction Cost

- Alternatives range from \$827 to \$1,073 million

Annual Costs & Benefits

- Annual Costs: \$42.6 to \$54.1 million
- Annual Benefits: \$43.7 to \$92.2 million
- Net Annual Benefits: \$(2.7) to \$38.2 million

Benefit/Cost Ratio

- 12.5 foot raise < 1.0
- 18.5 foot raise alternatives > 1.0
- 6.5 foot raise ~ 1.0

Shasta Enlargement Example Cost Allocation

Item/Calculation	Irrigation Water Supply	M&I Water Supply	Fish and Wildlife Enhancement	Hydro- power	Total
Allocated Total Annual Costs (\$ millions)					
Average Annual Benefits	8.3	18.7	49.2	7.7	83.9
Single Purpose Projects	23.8	18.8	49.7	7.7	-
Limited by Lesser Single Purpose	8.3	18.7	49.2	7.7	83.9
Separable Annual Costs	4.8	6.2	11.4	0.0	22.5
Remaining Benefits	3.5	12.5	37.8	7.7	61.4
% Remaining Benefits	5.7%	20.3%	61.5%	12.5%	100.0%
Allocated Remaining Joint Cost	1.8	6.4	19.4	3.9	31.5
Total Allocated Costs	6.6	12.6	30.8	3.9	54.0
Allocated Construction Costs (\$ millions)					
Construction Cost	132.5	198.6	654.9	84.0	1,069.9
% of Total Construction Cost	12.4%	18.6%	61.2%	7.9%	100.0%

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Shasta Enlargement Recreation Issue

Challenge

- Recreation facility inundation

Response

- Recreation planning objective
- Maintain existing capacity by relocating facilities
- Develop specific relocation plans with Forest Service and affected interests

Benefits

- Modernized facilities
- Larger lake
- Added capacity



Shasta Enlargement Inundation Issues

Challenges

- Potential inundation of cultural, environmental resources, and public and private property
- Resolve legal issue to allow State's cooperation in planning process (California Public Resources Code)

Response

- Avoid adverse effects to extent practicable; mitigate; compensate
- Alternatives include mitigation measures & resource protection
- Stakeholders and decision makers will consider trade-offs

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Shasta Enlargement Water Temperature Issue

Challenge

- Declining salmon and steelhead populations



Approaches

- Anadromous fish survival planning objective
- Improve river temperatures
- Cold water storage space
- Gravel augmentation

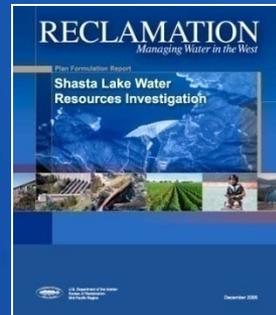
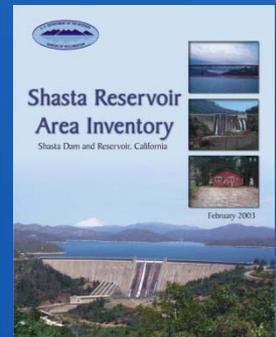
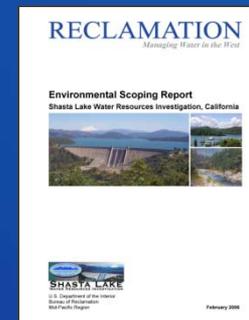
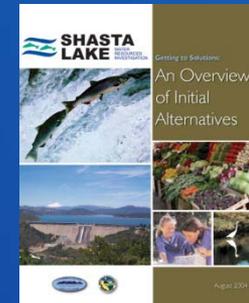
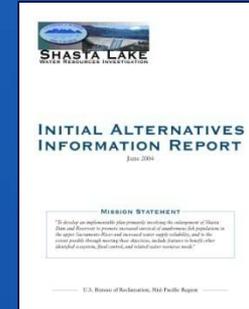
Benefits

- Increase fish survival
- Improve operational flexibility

Shasta Enlargement Reports

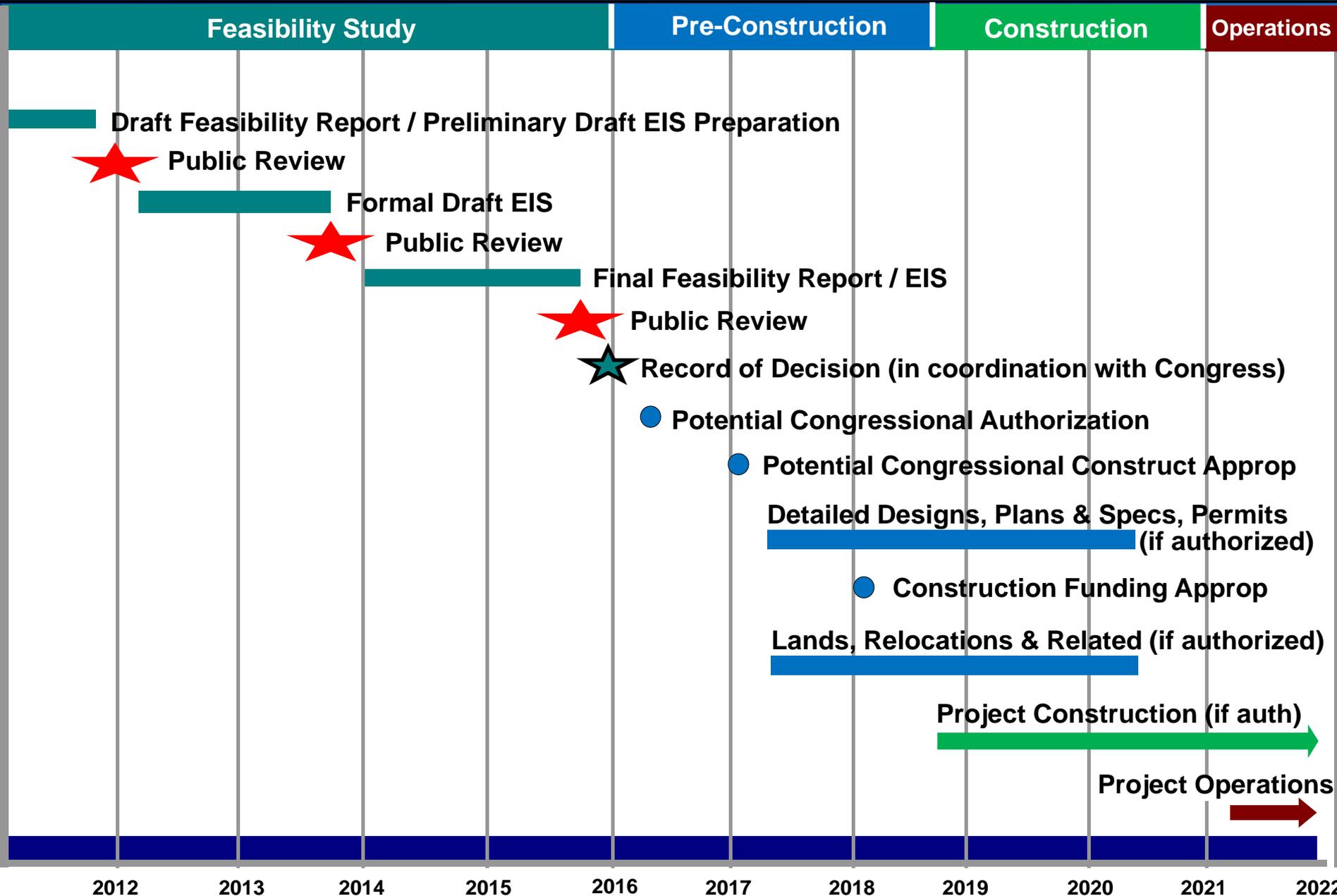
- Draft Feasibility Report & Preliminary Draft EIS (2011)
- Plan Formulation Report (2007)
- Scoping Report (2006)
- Initial Alternatives Information Report (2004)
- Appraisal Assessment (1999)

@ <http://www.usbr.gov/mp/slwri/index.html>



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Shasta Enlargement Timeline



For Additional Information

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<http://www.usbr.gov/mp/slwri/index.html>

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