



## South Fork Powerhouse Project

(Formally referred to as Slab Creek Powerhouse Project)

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South Fork Powerhouse Project: Demonstration of circumstances under which the addition of small hydro to existing projects, following a relicensing process, adds to renewable generation and achieves economic standards on par with other resources.

The Challenge: Incremental additions to generation at existing hydroelectric projects face challenges associated with siting difficulties and cost limitations.

Partners: McMillen Jacobs Associates – Design-Build Contractor

## Next Generation Hydropower (HydroNEXT)

### Optimization

- Optimize technical, environmental, and water-use efficiency of existing fleet
- Collect and disseminate data on new and existing assets
- Facilitate interagency collaboration to increase regulatory process efficiency
- Identify revenue streams for ancillary services

### Growth

- **Lower costs of hydropower components and civil works**
- Increase power train efficiency for low-head, variable flow applications
- Facilitate mechanisms for testing and advancing new hydropower systems and components
- Reduce costs and deployment timelines of new PSH plants
- Prepare the incoming hydropower workforce

### Sustainability

- Design new hydropower systems that minimize or avoid environmental impacts
- Support development of new fish passage technologies and approaches
- Develop technologies, tools, and strategies to evaluate and address environmental impacts
- Increase resilience to climate change

## Next Generation Hydropower (HydroNEXT)

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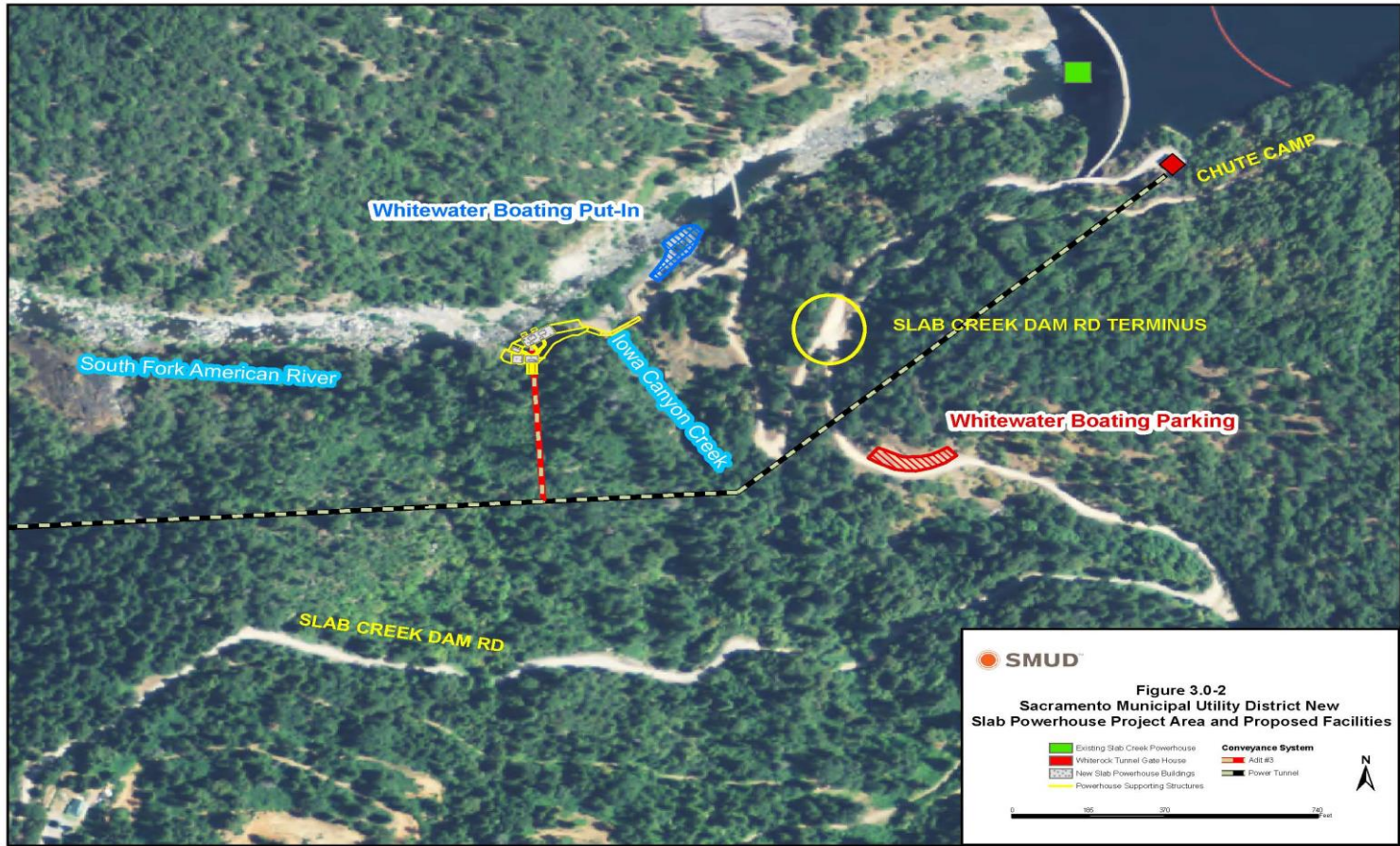
### The Impact

- Metric: Levelized cost of energy (LCOE) value of \$0.72/kWh, including construction cost, mitigation measures, and O&M, that is competitive with baseload power sources such as coal-powered power plants
- Value to Industry: Demonstration of the circumstances under which small hydro projects can be built at existing dams using new minimum release requirements imposed by relicensing proceedings
- The Final Product: 2018 Start-up, Testing, Commissioning of South Fork Powerhouse, generating 9.5 gWh as average annual energy.

- Steepness of canyon, cost of new penetration through dam, and presence of uncontrolled spills over dam limit construction of new release facilities at base of dam
- Spilling up to 1,500 cfs over the top of the dam for whitewater boating limits operations and presents safety issues if downstream powerhouse trips off line.



- Utilize existing power tunnel adit as point of minimum releases.
- Negotiate with resource agencies a new minimum flow regime for the ¼-mile segment of river between Slab Creek Dam and power tunnel adit that preserves favorable levelized cost of energy value.
- Continue to operate 0.45 MW powerhouse at base of dam that was originally constructed to generate power from 36 cfs release under old Federal Energy Regulatory Commission (FERC) license.





- Regulatory delays significantly affected project progress
  - Upper American River Project (UARP) License not issued until July 2014
  - License Amendment Application Filed Sept 2014
  - 401 Certification Issued July 2016
  - Received FERC License Amendment Order November 2016
- Accomplishments
  - FY2014 Completed All Environmental Studies
    - Negotiated Mitigation Measures with resource agencies
  - FY2015 Completed 10 Percent Design
  - FY2016 Awarded Design-Build Contract to MJA
    - Completed 50 Percent Design
    - Manufactured Tunnel Connection Valve

# Project Plan & Schedule

Task	Description	Completion Date
	Assistance Agreement Initiation	April 2012
<b>2.0</b>	Permitting (Delayed Milestones)	November 2016
	UARP license	July 2014
	License Amendment Application	September 2014
	<i>DOE Go/No-Go Meeting</i>	April 2016
	South Fork Powerhouse 401 Certification	July 2016
	UARP License Amendment	November 2016
<b>3.0</b>	Final Design	
<b>3.1</b>	Final Design/Build Contractor Selected	June 2016
<b>3.2</b>	10% Design	July 2015
<b>3.3</b>	50% Design	November 2016
<b>3.4</b>	90% Design	February 2017
<b>3.5</b>	100% Design	June 2017
<b>4.0</b>	Construction and System Testing	October 2018

Budget History					
FY2014		FY2015		FY2016	
DOE	Cost-share	DOE	Cost-share	DOE	Cost-share
--	\$ 267.038k	\$ 82.88k	\$ 727.886k	--	\$ 486.344k

- Licensing and permitting delays have lowered annual project expenditures for FY2014 –FY2016 below expected levels.
- Project construction activities in FY2017 and FY2018 will result in significant increases in expenditures.

## Partners, Subcontractors, and Collaborators:

- Montgomery Watson Harza – Owner's Engineer
- McMillen Jacobs Associates – Design-Build Contractor

## Communications and Technology Transfer (Presentations):

- National Hydropower Association Annual or Regional Meeting
- Northwest Hydro Association Annual
- HydroVision Technical Paper or Presentation

## FY17/Current research

- No further permitting barriers to start of construction
- Final Design and FERC Approval (Q2-Q3)
- Major Equipment Procurement (Q3-Q4)
- Installation of Bridge over Iowa Canyon Creek (Q3)
- Installation of White Rock Tunnel Connector Valve (Q4)

## Future Research:

- Powerhouse Construction/Testing/Commissioning (FY18)