

Basin Study Element	Task	Deliverable(s)	Timeline	Budget Estimate - Reclamation and IDIQ Contractor	Budget Estimate - Non-Federal Cost Share Partner
Analyze Existing Supplies & Future Projections	T1. Summarize information on existing water supply	Technical Report #1 - Existing & Future Water Supplies	March 2015 to June 2015	T2. \$60,000 T3. \$60,000	T1. \$7,500
Develop Climate Change Scenarios Affecting Water Supplies	T2. Develop climate change analysis projections. T3. Apply climate change analysis to existing supplies.				
Analyze Existing & Future Water Demands	T4. Summarize information on existing and future water demand. T5. Evaluate groundwater/mitigation demand. T6. Evaluate ecological benefits of meeting baseline stream flow targets in the Upper Deschutes. Evaluate additional ecological benefits in Upper Deschutes, Crescent Creek, and Little Deschutes at altered flows.				
Develop Climate Change Scenarios Affecting Water Demands	T7. Peer review/evaluation of existing flow/temperature modeling associated with Tumalo Creek and the middle Deschutes River (helps to inform location of instream efforts). T8. Evaluate stream water quality and reservoir linkage. T9. Apply climate change analysis to projected future demands.	Technical Report #2 - Existing & Future Water Demands		T7. \$7,500 T8. T9. \$60,000	T4. \$7,500 T5. \$10,000 T6. \$150,000
Analyze How Existing Water & Power Infrastructure will Perform in the Face of Changing Water Realities	T10. Identify and evaluate current water and power infrastructure in the basin, and develop metrics of measuring baseline system reliability. T11. In-depth analysis of COID infrastructure/Master Plan and Master Plan framework for other districts (directly linked to addressing water supply imbalances in Tasks 14, 15 and 17). T12. Characterize projected water and power infrastructure performance based on climate change projections				
Develop Options to Meet Future Water Supply Needs	T13. Crane Prairie, Wickiup and Crescent reservoir optimization options: a. modelling b. operations c. governance T14. Evaluate water conservation and re-allocation options and packages of options/projects based on previous studies. Identify viable options for meeting the water supply needs for irrigation, instream and municipal/water suppliers. Identify legal and administrative requirements for option implementation. T15. Inter-district management and agreements, and governance structure. T16. Off-channel storage options.	Technical Report #4 - Water Supply Options for the Future		T13. \$25,000 T14. \$20,000 T16. \$20,000	T10. \$5,000 T11. \$100,000 T12. \$60,000 T10. \$20,000 T11. \$20,000
Conduct Evaluation & Trade-Off Analysis of Options Identified	T17. Develop scenarios to meet water supply and demand imbalances based on future near-term and long-term projections, district conservation and management plans, and opportunities identified in prior tasks (Two sets of scenarios - one with "new" storage, the other without). T18. Identify cost and funding options, for both near-term and long-term projects, associated with each scenario. T19. Model outcomes of identified scenarios. T20. Evaluate changes in supply and demand imbalance with each near-term and long-term scenario. T21. Conduct trade-off analysis of options accounting for costs, environmental impact, risk, stakeholder response and other potential attributes.				
Draft and Final Basin Study Developed	T22. Incorporate Technical Reports and comments into a consolidated Draft Basin Study Report: upon review of the draft, Prepare and Publish Final Basin Study.	Draft Basin Study Report and Final Basin Study Report	August 2017 to February 2018	T22. \$30,000	T13. \$25,000 T14. \$80,000 T15. \$20,000 T17. \$200,000 T21.
*Sub-Total:				\$172,500	\$295,000

Notes:

*Sub-basin sub-totals account only for task budget that is specific to the sub-basin, overarching task budgets are not included

Tasks and budget numbers in bold represent items tasks that run across all sub-basins

Basin Study Element	Task	Deliverable(s)	Timeline	Budget Estimate - Reclamation and IDIQ Contractor	Budget Estimate - Non-Federal Cost Share Partner
Analyze Existing Supplies & Future Projections	T1. Summarize information on existing water supply.	Technical Report #1 - Existing & Future Water Supplies	March 2015 to June 2015	T1. \$7,500	
Develop Climate Change Scenarios Affecting Water Supplies	T2. Develop climate change analysis.				
	T3. Apply climate change analysis to existing supplies.				
Analyze Existing & Future Water Demands	T4. Summarize information on existing and future water demand. T5. Evaluate groundwater/mitigation demand. T6. Evaluate water rights availability based on 70 years of gage data in an effort to determine what quantity of "paper" water rights will equate to "wet water" instream to meet baseline flow targets.	Technical Report #2 - Existing & Future Water Demands		T4. \$7,500 T5. \$10,000 T6. \$5,000	
Develop Climate Change Scenarios Affecting Water Demands	T7. Peer review/evaluation of existing flow/temperature modeling. T8. Apply climate change analysis to projected future demands.				
Analyze How Existing Water & Power Infrastructure will Perform in the Face of Changing Water Realities	T9. Identify and evaluate current water and power infrastructure in the basin, and develop metrics of measuring baseline system reliability. T10. Characterize projected water and power infrastructure performance based on climate change projections.	Technical Report #3 - Current Infrastructure & Climate Change		T9. \$5,000 T10. \$60,000	T9. \$20,000
Develop Options to Meet Future Water Supply Needs	T11. Evaluate water conservation and re-allocation options and packages of options/projects based on previous studies. Identify viable options for meeting the water supply needs for irrigation, instream and municipal/water suppliers. Identify legal and administrative requirements for option implementation. T12. Evaluate groundwater-surface water switches as a potential opportunity. T13. Document remaining piping opportunities within TSID. T14. Evaluate the opportunity for water right transfers. T15. Develop a Drought Management Plan based on existing information and optimization of tools available. T16. Evaluate policies/priving of TSID leasing to optimize program.	Technical Report #4 - Water Supply Options for the Future		T11. \$3,000	T11. \$10,000 T12. \$5,000 T13. \$5,000 T14. \$5,000 T15. \$10,000 T16. \$5,000
Conduct Evaluation & Trade-Off Analysis of Options Identified	T17. Develop scenarios to meet water supply and demand imbalances based on future near-term and long-term projections, district conservation and management plans, and opportunities identified in prior tasks (Two sets of scenarios - one with "new" storage, the other without). T18. Identify cost and funding options, for both near-term and long-term projects, associated with each scenario. T19. Model outcomes of identified scenarios. T20. Evaluate changes in supply and demand imbalance with each near-term and long-term scenario. T21. Conduct trade-off analysis of options accounting for costs, environmental impact, risk, stakeholder response and other potential attributes.	Technical Report #5 - Recommended Options	January 2017 to July 2017	T16. - T21. \$100,000	T16. - T21. \$200,000
Draft and Final Basin Study Developed	T22. Incorporate Technical Reports and comments into a consolidated Draft Basin Study Report: upon review of the draft, Prepare and Publish Final Basin Study.	Draft Basin Study Report and Final Basin Study Report	August 2017 to February 2018	T22. \$30,000	T22. \$40,000
*Sub-Total:				\$7,500	\$45,000

Notes:

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Tasks and budget numbers in bold represent items tasks that run across all sub-basins

Basin Study Element	Task	Deliverable(s)	Timeline	Budget Estimate - Reclamation and IDIQ Contractor	Budget Estimate - Non-Federal Cost Share Partner
Analyze Existing Supplies & Future Projections	T1. Summarize information on existing water supply. T2. Evaluate, and update as necessary, water supply modelling; to be consistent with input from the sub-basin stakeholders (Requires discussion to ensure consistency with legislation).	Technical Report #1 - <i>Existing & Future Water Supplies</i>	March 2015 to June 2015	T2. \$3,000 T3. \$60,000 T4. \$60,000	T1. \$7,500 T2. \$10,000
Develop Climate Change Scenarios Affecting Water Supplies	T3. Develop climate change analysis. T4. Apply climate change analysis to existing supplies.				
Analyze Existing & Future Water Demands	T5. Summarize information on existing and future water demand. T6. Evaluate/Update fish habitat information for steelhead and chinook on mainstem between the Crooked River Feed Canal, NUID pumps and McKay and Ochoco creeks; including evaluation of existing flow/temperature information and existing and additional information on flow habitat at PV1 (Requires discussion to ensure consistency with legislation).	Technical Report #2 - <i>Existing & Future Water Demands</i>		T6. \$7,500	T5. \$7,500
Develop Climate Change Scenarios Affecting Water Demands	T7. Evaluate groundwater/mitigation demand T8. Apply climate change analysis to projected future demands			T8. \$60,000	T7. \$10,000
Analyze How Existing Water & Power Infrastructure will Perform in the Face of Changing Water Realities	T9. Identify and evaluate current water and power infrastructure in the basin, and develop metrics of measuring baseline system reliability. T10. Characterize projected water and power infrastructure performance based on climate change projections.	Technical Report #3 - <i>Current Infrastructure & Climate Change</i>		T9. \$5,000 T10. \$60,000	T9. \$20,000
Develop Options to Meet Future Water Supply Needs	T11. Evaluate water conservation and re-allocation options and packages of options/projects based on previous studies. Identify viable options for meeting the water supply needs for irrigation, instream and municipal/water suppliers. Identify legal and administrative requirements for option implementation. T12. Crooked River Legislation - uncontracted stored water for instream and mitigation needs. T13. OID Management Opportunities - phased piping and optimization of leasing T14. Document cost-benefit of McKay Creek Switch T15. Evaluate the feasibility of OID diversion switch T16. Document City of Prineville wetlands project and associated water quality/quantity benefits.	Technical Report #4 - <i>Water Supply Options for the Future</i>		T11. \$3,000 T12. T13. T15. T16.	T11. \$10,000 T12. \$5,000 T13. \$5,000 T14. \$5,000 T16. \$7,000
Conduct Evaluation & Trade-Off Analysis of Options Identified	T17. Develop scenarios to meet water supply and demand imbalances based on future near-term and long-term projections, district conservation and management plans, and opportunities identified in prior tasks (Two sets of scenarios - one with "new" storage the other without) T18. Identify cost and funding options, for both near-term and long-term projects, associated with each scenario T19. Model outcomes of identified scenarios T20. Evaluate changes in supply and demand imbalance with each near-term and long-term scenario T21. Conduct trade-off analysis of options accounting for costs, environmental impact, risk, stakeholder response and other potential attributes	Technical Report #5 - <i>Recommended Options</i>	January 2017 to July 2017	T17. \$100,000 T21.	T17. \$200,000 T21.
Draft and Final Basin Study Developed	T22. Incorporate Technical Reports and comments into a consolidated Draft Basin Study Report: upon review of the draft, Prepare and Publish Final Basin Study	<i>Draft Basin Study Report and Final Basin Study Report</i>	August 2017 to February 2018	T22. \$30,000	T22. \$40,000
*Sub-Total:				\$7,500	\$42,000

Notes:

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Tasks and budget numbers in bold represent items tasks that run across all sub-basins

Over-Arching Tasks 1/6/2015

Basin Study Element	Task	Budget Estimate - Reclamation and IDIQ Contractor	Budget Estimate - Non-Federal Cost Share Partner
Project Management	T. Stakeholder coordination and meetings	\$15,000	\$20,000
	T. Study team coordination and meetings	\$20,000	\$30,000
Administration	T. Accounting		\$5,000
	T. Contract Management		\$5,000
Contingency	T. Contingency	\$25,000	\$25,000
Analyze Existing Supplies & Future Projections	T. Summarize information on existing water supply. T. Develop climate change analysis.	\$60,000	\$7,500
Develop Climate Change Scenarios Affecting Water Supplies	T. Apply climate change analysis to existing supplies.	\$60,000	
Analyze Existing & Future Water Demands	T. Summarize information on existing and future water demand. T. Evaluate groundwater/mitigation demand.		\$7,500
	T. Apply climate change analysis to future demands.	\$60,000	\$10,000
Analyze How Existing Water & Power Infrastructure will Perform in the Face of Changing Water Realities	T. Identify and evaluate current water and power infrastructure in the basin, and develop metrics of measuring baseline system reliability.	\$5,000	\$20,000
	T. Characterize projected water and power infrastructure performance based on climate change projections.	\$60,000	
Conduct Evaluation & Trade-Off Analysis of Options Identified	T. Develop scenarios to meet water supply and demand imbalances based on future near-term and long-term projections, district conservation and management plans, and opportunities identified in prior tasks.	\$100,000	\$200,000
	T. Identify cost and funding options, for both near-term and long-term projects, associated with each scenario.		
	T. Model outcomes of identified scenarios		
	T. Evaluate changes in supply and demand imbalance with each near-term and long-term scenario		
	T. Conduct trade-off analysis of options accounting for costs, environmental impact, risk, stakeholder response and other potential attributes		
Draft and Final Basin Study Developed	T. Incorporate Technical Reports and comments into a consolidated Draft Basin Study Report: upon review of the draft, prepare and publish Final Basin Study	\$30,000	\$40,000
Subtotal Over-Arching Tasks:		\$435,000	\$370,000
Subtotal Deschutes Sub-Group:		\$172,500	\$295,000
Subtotal Whychus Sub-Group:		\$7,500	\$45,000
Subtotal Crooked Sub-Group:		\$7,500	\$42,000
Total:		\$622,500	\$752,000

Four Required Elements of a Basin Study

1. Projections of water supply and demand, including an assessment of risks to the water supply relating to climate change (as defined in 9503(b)(2) of the SWA):

a. changes in snowpack;
b. changes in the timing and quantity of runoff;
c. changes in groundwater recharge and discharge; and
d. any increase in the demand for water as a result of increasing temperatures or the rate of reservoir water realites, such as population growth and climate change, including an analysis of the extent to which changes in the water supply will impact Reclamation operations and facilities (as defined in 950(b)(3) of the SWA):

a. the ability of Reclamation to deliver water;
b. hydroelectric power generation facilities;
c. recreation at Reclamation facilities;
d. fish and wildlife habitat;
e. applicable species listed as an endangered, threatened, or candidate species under the ESA of 1973;
f. water quality issues (including salinity levels);
g. flow and water dependent ecological resiliency; and
h. flood control management.

3. Development of options to improve operations and infrastructure to supply adequate water in the future.

4. A trade-off analysis of the options identified, findings and recommendations as appropriate. Such analysis simply examines all proposed alternatives in terms of their relative cost, environmental impact, risk, stakeholder response, or other attributes common to the alternatives. The analysis can be either quantitative or qualitative in measurement.