MOUNTAINS RECREATION & CONSERVATION AUTHORITY
Los Angeles River Center & Gardens
570 West Avenue Twenty-Six, Suite 100
Los Angeles, California 90065
Phone (323) 221-9944 Fax (323) 221-9934

Agenda Item 18
SMMC
8/26/19

August 26, 2019

Chairperson Irma Muñoz
c/o Rorie Skei, Chief Deputy Executive Director
Santa Monica Mountains Conservancy
570 Ramirez Canyon Road
Malibu, California 90265

Proposition 1 Competitive Grant Application –
Los Angeles River Environmental Flows Study Supplemental Analysis

Dear Chairperson Muñoz and Conservancy Members:

I am pleased to present the enclosed application for a grant for Los Angeles River Environmental Flows Study Supplemental Analysis. The Mountains Recreation and Conservation Authority (MRCA) requests a grant in the sum of $250,000 from the Water Quality, Supply, and Infrastructure Improvement Act of 2014 (Proposition 1), under the Conservancy's Urban Creeks Program. The MRCA's Governing Board approved submittal of this application on March 6, 2019.

The proposed grant would fund added scope to the Los Angeles River Environmental Flows Study and include supplemental analysis related to ecology, habitat, and recreational uses of the river's instream flow, as well as the addition of a water quality component which will analyze adverse impacts on wildlife and vegetation should flow regimes are reduced. The amount and management of instream flow has direct impacts on current and previous planning efforts by the Santa Monica Mountains Conservancy and the San Gabriel and the Rivers and Mountains Conservancy.

Please refer to the enclosed materials that describe the proposed grant and how it fits the Conservancy's Evaluation Criteria. If you have any questions regarding this, please contact me at (323) 221-9944, extension 117.

Sincerely,

Cara Meyer
Deputy Executive Officer

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Grant Application

Print Form

The Natural Resources Agency

Santa Monica Mountains Conservancy
5750 Ramirez Canyon Road
Malibu, California 90265
Phone: 310-589-3200
Fax: 310-589-3207
www.smmc.ca.gov

Project Title:	LA River Environmental Flows Study Supplemental Analysis	**Date:**	8/26/2019
Funds:	Proposition 1	**Amount:**	250,000
Applicant Name:	Mountains Recreation & Conservation Authority	**Match amount:**	250,000
Address:	570 West Avenue 26, Suite 100	**Match source:**	RMC-WCA
State/Province:	Los Angeles, CA	**Total Project Cost:**	500,000
Zip/Postal code:	90065		
Phone:	323-221-9944	**Brief Project Description:**	Supplemental analysis to LA River Flows study related to ecology, habitat, and non-aquatic life beneficial uses of the river's instream flow and the addition of a water
Fax:	323-221-9934		

Grantee's Authorized Representative: Cara Meyer, Deputy Executive Officer 323-221-9944, x117 cara.meyer@mrca.ca.gov

Name and Title *Phone Number* *Email*

Person with day-to-day responsibility: Sarah Rascon, River Program Officer 323-221-9944, x109 sarah.rascon@mrca.ca.gov

Name and Title *Phone Number* *Email*

Project Objective: The objectives include project planning and design for a Los Angeles River flows study that will contribute to habitat, wildlife and public benefit, with water quality modelling in Los Angeles. See attached narrative.

*Attach additional pages as necessary

Project Address: Los Angeles River from Sepulveda Basin to City of Los Angeles border at City of Vernon.

Latitude:	34°10'22.0"N 118°28'59	**Acreage:**	N/A	**Trail Length:**	N/A
Longitude:	34.172785, -118.48314	**APN's:**	N/A	**Stream Miles:**	approx. 25
Congressional District:	CA 30; 28; 34	**State Senate District:**	SD 27; 18; 25; 24	**Assembly District:**	AD 45; 46; 43; 51; 53

Tasks / Milestones: **Budget:** **Completion Date:**

See attached budget.

All work is expected to be complete by August 31, 2021, notwithstanding delays outside of MRCA's control.

*Attach additional pages as necessary

I certify that the information contained in this Grant Application form, including required attachments, is accurate.

Signature of Authorized Representative *Date* 8/21/2019

Grant Application & Supplemental Information

Los Angeles River Environmental Flows Study Supplemental Analysis
Mountains Recreation and Conservation Authority

The Los Angeles River (River) has garnered considerable public attention and support for its restoration, environmental and recreational uses. The regulatory framework for river management is spread among multiple jurisdictions, making planning and implementation of changes challenging. While there have been, and continue to be, several different planning processes focusing on the River in some way, it is only recently that such efforts have focused on the water within the river channel, also referred to as instream flow. A study analyzing the instream flow and its uses is currently underway by the entities responsible for water and instream flow in the Los Angeles River, the State Water Resources Control Board (State Water Board) and Los Angeles Regional Water Quality Control Board (collectively referred to as Water Boards). The proposed $250,000 planning grant would be used to augment the study by the Water Boards to include additional analysis related to ecology, habitat, and non-aquatic life beneficial uses of the river's instream flow, (i.e. recreation, fishing and kayaking), and the addition of a water quality component analyzing potential adverse effects should flows be reduced.

Aspects of the Project/study that make it a priority for the Conservancy's Urban Creeks program are the location of the study, which is within the main channel of the River, with analysis beginning in Van Nuys at the Donald C. Tillman Water Reclamation Plant, the first facility geographically that discharges into the River. Additionally, the study's goal to seek multiple benefits that include recreation, water quality enhancements, and native habitat. The location of the study area and instream flow course run through a number of disadvantaged neighborhoods as defined by the CalEnviroScreen mapping tool. Furthermore, the Project would enhance and foster collaboration among entities involved in the River. Lastly, the volume and management of instream flow has direct impacts on current and previous planning efforts by the Santa Monica Mountains Conservancy and the San Gabriel and the Rivers and Mountains Conservancy, (Conservancies) and their Joint Power Authorities (JPAs). The MRCA's goals and mission can be carried out through our work in promoting natural environments and natural systems, while ensuring flows that increase recreational use of the River while improving the health of the entire Los Angeles River watershed.

The proposed grant would fund added scope to the Water Boards' study to include a water quality assessment task and augmenting scope to quantify effects of flow modification on the Los Angeles River and evaluate management scenarios. The effects of wastewater reuse and other flow management actions on aquatic and non-aquatic life uses in the River will also be assessed. Technical tools will be developed to quantify the relationship between various alternative flow regimes (which may include seasonal or annual needs for flow, such as presence and depth of pools, temperature, or flow timing, duration, frequency, or magnitude) and the extent to which beneficial uses are achieved Further analysis regarding water quality will be developed extensively through temperature modelling; sediment, conductance and metals modelling, as well as contaminants of emerging concern modelling (CEC), all of which will aid in evaluating effects of changes in discharge on water quality.

The study's augmented scope will maximize public benefit and recommend pragmatic flow regimes that balance both ecological and recreational needs. The Project will provide

an opportunity to allow a wider segment of the public to learn about water quality and supply issues and potential solutions to those issues. The Project will also significantly increase the accessibility and value of the River to the general public and interested users. Additionally, multiple affected parties and stakeholders will be in engaged in the application of these tools to reach consensus about appropriate flow needs in the Los Angeles River, and optimal allocation of flow reduction allowances from multiple wastewater treatment plants. The opportunity to undergo third-party technical reviews of data and findings in the study by subject matter will also be an added feature to the study.

The Project would be a partnership between the Mountains Recreation and Conservation Authority (MRCA) and the Watershed Conservation Authority (WCA). This is a joint planning effort to protect and enhance public investment in the River, along with ensuring planning efforts by Conservancies and their JPAs account for instream flows.

The specific needs addressed by this project include: the creation of a sustainable strategy for managing water resources; priorities and strategies that will help protect our natural resources from severe dry periods; improve public health and recreational opportunities; cleaner waterbodies and watersheds; and greater awareness and stewardship of coastal watershed resources. The project will ultimately lead to physical improvements that will increase public awareness of natural resources, and provide environmental learning opportunities for nearby students, contributing to future and additional environmental stewardship.

The proposed project is consistent with the goals set forth in the Santa Monica Mountains Conservancy's Climate Change Policy, State Planning Priorities, the State's Climate adaptation Plan, *Safeguarding California* and AB 32. The Project seeks to improve a locally and regionally significant public resource for public enjoyment and environmental benefit. The project seeks to ultimately mitigate greenhouse gas emissions and address the impacts of climate change on the state's natural resources. Further objectives of the project are to protect the Los Angeles River watershed through the restoration of native habitat, and promote public access to the watershed's land, water, and wildlife resources.

BUDGET

See attached budget.

TIMELINE

The project planning and design will take place over the next 2-3 years.

RESPONSE TO EVALUATION CRITERIA

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Project achieves eight or more of the thirteen purposes of Proposition 1 per Water Code Section 79732(a).

The project will involve the protection and restoration of California rivers, lakes, streams coastal waters and watersheds. The proposed grant achieves the following nine (9) Proposition 1 purposes:

1) Protect and increase the economic benefits arising from healthy watersheds, fishery resources, and instream flow.

Since the Project is expected to recommend optimal instream River flows and include water quality analysis and modeling balanced for wildlife and recreational uses, it will thereby ultimately increase the usage of the River, by bringing more visitors to the River and in-turn encouraging spending at local businesses. Additionally, the study could provide economic benefits by increased interest from concessionaires who may provide supplies and equipment for recreational activities (e.g. boating, birdwatching, fishing, etc.) along with tours and events in and around the River.

2) Implement watershed adaptation projects in order to reduce the impacts of climate change on California's communities and ecosystems.

It is likely that Los Angeles County will be affected by climate change with more severe droughts, more intense record-breaking heat days year-round and loss of California's native biodiversity. The supplemental analysis will anticipate these changes and will help mitigate them with tools such as temperature models to predict potential changes associated with changes in wastewater discharge that can adversely affect water quality. Predicted water quality and temperature changes will be included in the species response models to the extent possible based on established species tolerances that will be documented. Improving the water quality within the River is essential to the survival of the area's wildlife species.

3) Restore river parkways throughout the state, including, but not limited to, projects pursuant to the California River Parkways Act of 2004, in the Urban streams Restoration Program established pursuant to Section 7048, and urban river greenways.

The Los Angeles River is both a River Parkway and an Urban Stream that is used for recreation and wildlife habitat. The Project directly focuses on the water and instream flow within the River, beginning at the first discharge plant, adjacent and discharging into the River in the Sepulveda Basin Recreation Area, and is located in a highly urbanized watershed. The communities surrounding the River, within a half mile of the east and west banks, vary between residential and industrial land uses. This study area is so densely populated that that nearly half of residents in the perimeter are not within walking distance of a park. This is far below the accepted national standard of 10-acres per 1,000 residents, and is low even compared to other areas of Los Angeles County. Southern California

contains a wonderful network of open space and trails throughout local mountains and the coastline, but it is not readily accessible to all urban residents. Furthermore, the potential recreation and habitat impacts from a reduction of wastewater treatment plant discharge to the River's instream flow may have a negative impact to the future restoration and revitalization efforts.

4) Protect and restore aquatic, wetland, and migratory bird ecosystems, including fish and wildlife corridors and the acquisition of water rights for instream flow.

Open waterways, such as the River, function as habitat corridors, while being recognized as being a hotspot for migratory birds and small mammals, aquatic, wetland, and migratory bird ecosystems and therefore provide an appropriate location for analysis. The Project study area is located near the Santa Monica Mountains and begins in the Sepulveda Basin Wildlife Preserve, both of which provide a habitat stepping stone to facilitate movement of wildlife. Ultimately, the reduction of wastewater treatment plant's discharge of tertiary treated water that make up the River's instream flow may have a negative impact to the wildlife ecosystems that currently make the River their home. Through analyzing instream flows and studying a water quality component this will reduce the amount of pollutants in the river, potentially through dilution and thus improve the habitat potential and water quality within the river and Pacific Ocean. By improving water quality in the upper reaches of the River can help to protect aquatic and migratory bird ecosystems. Additionally, new vegetation can continue to thrive with cleaner water which will provide new habitat for birds and other species.

5) Fulfill the obligations of the State of California in complying with the terms of multipart settlement agreements related to water resources.

Wastewater treatment facilities (WTF) discharge treated wastewater to many stream systems in the State. For a WTF to reduce its discharge into the River, a process known as a wastewater change petition (1211 petition) must be filed with the State Water Board. Although presently there is no multipart settlement agreement on the River, the full flows study will be used to help inform what could eventually be either a multi-party agreement or potentially a Policy for water quality control to allocate/protect flows on the River, or some combination therein. The 1211 wastewater change petition process is a component of this as well.

9) Protect and restore rural and urban watershed health to improve watershed storage capacity, forest health, protection of life and property, stormwater resource management, and greenhouse gas reduction.

Healthy ecosystems are a product of their environment. Indicators of a healthy urban watershed include healthy waters and presence of instream flow, thriving vegetation and wildlife. All of which are present with in the River, not only in the natural soft bottom areas, but also visible in the channelized bottoms through presence of bird populations. The Project will look at the potential reduction of water volumes and the impacts of pollutants

within in the instream flow and whether this creates concentrated amounts of pollution expelled downstream into the estuary and ocean. Analysis would therefore, inform the study and advise against pollutant loading thus protecting the health of the watershed with treated water. Through this study, some level of volume reduction of instream flow could be recommended to improve water storage and water use efficiency upon identifying adverse impacts, if any.

10) Protect and restore coastal watersheds, including, but not limited to, bays, marine estuaries, and nearshore ecosystems.

The Los Angeles River is a coastal watershed, and the study aims to examine, determine, and model flow ecology relationships for marsh and estuary endpoints. As well as including in the water quality component to retain the estuary habitat that will benefit its natural resources.

11) Reduce pollution or contamination of rivers, lakes, streams, or coastal waters, prevent and remediate mercury contamination from legacy mines, and protect or restore natural system functions that contribute to water supply, water quality, or flood management.

Through analyzing instream flows, which have historically been contaminated due to groundwater contamination and illegal dumping, the supplemental analysis of the River flows study would add scope with a water quality component. Further analysis regarding water quality will be developed extensively through temperature modelling; sediment, conductance and metals modelling, as well as contaminants of emerging concern modelling (CEC), all of which will aid in evaluating effects of changes in discharge on water quality. A recommendation can then be made that would aim to reduce the amount of pollutants in the river, potentially through dilution and thus improve habitat and water quality within the River and Pacific Ocean.

12) Assist in the recovery of endangered, threatened, or migratory species by improving watershed health, instream flows, fish passage, coastal or inland wetland restoration, or other means, such as natural community conservation plan and habitat conservation plan implementation.

The Los Angeles River is home to an abundance of flora and fauna which makes the River especially attractive to wildlife. Specifically, the River is a hotspot for endangered, threatened, and migratory species that are both native and non-native to the Los Angeles River ecosystem because it offers them many advantages. First and most importantly, there is consistent water in the River. Most bird species live in or immediately adjacent to water. With Los Angeles being a seasonally dry region and with future drought, dry climate seems to be the norm. Also, the nature of the water varying from still to fast flowing attract different types of birds and fish. The River is also rich in vegetation that is plentiful with insects and seeds. The reduction of WTF discharge to the River's instream flow may have a negative impact to the endangered, threatened, and migratory species that call the River their home. For instance, the least Bell's vireo was recently added to the federal

government's Endangered Species List which has been found nesting along the River in multiple locations. Overall, the study has the ability to improve watershed health and benefit migratory species.

The project will provide multiple benefits related to water quality, water supply, and/or watershed protection and restoration.

The purpose of the study is develop technical tools that quantify the relationship between various flow regimes (which may include seasonal or annual needs for flow, such as depth of pools, temperature, or flow timing, duration, or frequency) and determine the extent to which beneficial uses are achieved. Upon completion of the supplemental analysis, the study will feature additional considerations related to water quality and instream flow regimes, resulting in improved watershed health and water quality in the river; increased vegetation will reduce concentration of greenhouse gases (slowing the rate of global warming) and reduce the heat-island effect; aesthetic enhancement to the River by maintaining flow; and encouragement and increased usage of the River for recreation. Additionally, the ultimate outcome of this Project is to provide technically sound recommendations and alternatives developed with river stakeholders to the Water Boards for consideration and implementation of flow objectives.

The project results in more reliable water supplies pursuant to the California Water Action Plan.

Since the study will analyze flow regimes to manage water resources and facilitate water use efficiency, this Project explores water re-use and conversion, while balancing the needs for instream flow according to reliant beneficial uses such as habitat, vegetation, non-aquatic life and recreation, thereby reducing the amount of imported water needed for Southern California.

The project results in restoration or protection of important species and habitat pursuant to the California Water Action Plan.

The study's analysis and eventual implementation will benefit the River and larger watershed, which provides a migratory route and habitat to both sensitive and endangered species. The following focal habitats, and associated keystone species have been identified for the study thus far:

1. Coldwater fish habitat – represented by *O. mykiss* or Santa Ana Sucker
2. Riparian habitat – need to define specific alliances (e.g. cottonwood alliance), represented by least Bell's vireo
3. Freshwater marsh habitat – defined by red-winged blackbird or Western pond turtle
4. Wading shorebird habitat – defined by black necked stilt or long-billed dowitcher
5. Warmwater, perennial flow habitat – as a surrogate for invasive species habitat, represented by largemouth bass

The project results in more resilient and sustainably managed water infrastructure pursuant to the California Water Action Plan.

By appropriately analyzing managed water resources, analyzing needs for instream flow accordingly to offset water quality hindrances, such as CEC, will aid the waters entering into the infrastructure of the River potentially to be cleaner.

The project employs new or innovative technology or practices, including decision support tools that support the integration of multiple jurisdictions, including, but not limited to, water supply, flood control, land use, and sanitation.
Modelling tools to calibrate and validate water quality for sediment, specific conductance, salinity, and metals will be developed. This will help to predict non-storm (dry weather) concentrations of suspended sediment (TSS), specific conductance (as a surrogate for salinity) and trace metals. In addition, water quality modelling for CECs will be developed.

Applicant has proven that implementation of the project is feasible.
This supplemental analysis of this study is supported by the Water Boards and their consultant, the Southern California Coastal Water Research Project (SCCWRP). The Water Boards have been involved in other instream flow studies throughout California, including a study within the Bay Delta region.

Applicant has financial capacity to perform project on a reimbursable basis.
The MRCA has the financial capacity to perform this project on a reimbursable basis. MRCA has been implementing capital projects on a reimbursable basis for many years, and anticipates reimbursable payments in our budgets. MRCA also maintains a line of credit that can be drawn upon in the event of an extended delay.

Applicant, or active project partner, has successfully completed multiple projects of similar size and scope.
The MRCA has successfully designed and implemented many studies, plans and multiple benefit recreational projects throughout the Los Angeles region. Several completed MRCA projects that are similar in size, budget, scope and duration to the proposed study include: Ballona Creek Milton Park, Marsh Park, Pacoima Wash Natural Park, and the Tujunga Wash Stream Restoration, all exemplary urban projects with innovative water quality components. All of the projects listed above are multi-million dollar projects that bear similarities to the proposed Project and also serve park-poor neighborhoods.

The MRCA, founded in 1985, is a local public agency exercising joint powers of Santa Monica Mountains Conservancy, the Conejo Recreation and Park District, and the Rancho Simi Recreation and Park District. MRCA's mission is to complement the work of these and other agencies in protecting land and public access to natural lands in southern California mountains. Since its inception, the MRCA has designed, planned and constructed scores of small and large projects throughout Los Angeles. The MRCA currently manages over 75,000 acres of parkland and holds fee title to approximately 10,000 acres. The overall goal for MRCA's urban parklands program is to "integrate nature into the urban environment". The completion of this Project will represent one additional step toward that goal.

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As a project partner, the San Gabriel and the Rivers and Mountains Conservancy (RMC) and their JPA, Watershed Conservation Authority (WCA) have years of experience planning and implementing, a wide range of projects that are similar in size and scope. Most recently, the RMC and WCA completed the Lower LA River Revitalization Plan which contains recommendations for the river's instream flow and water quality.

The project is a partnership between two or more organizations and each organization has committed to contributing toward project implementation.
As mentioned above, the Project/study is a partnership between entities: The MRCA will be managing the analysis for the Upper Los Angeles River instream flow within the City of Los Angeles, Burbank, and Glendale's boundaries while the RMC/WCA will oversee that of the Lower Los Angeles River from Vernon to the mouth of the River in Long Beach.

Completion of the project would assist a government agency in fulfilling a water resources protection, watershed ecosystem restoration or multi-benefit river parkway plan.
Upon completion of the Los Angeles River Flows Study, it is expected that either a multi-party agreement or potentially a Policy for water quality control to allocate and protect flows on the River, or some combination therein shall be informed by the study.

The project provides a plan or feasibility study that enhances cooperative watershed health protection and restoration important to two or more organizations.
The goal of the study is to analyze flow regimes in order to manage water resources and facilitate water use efficiency, while balancing the needs for instream flow according to reliant beneficial uses such as habitat, vegetation, non-aquatic life and recreation. This analysis and findings shall enhance watershed protection and restoration, important to the City of Los Angeles, County of Los Angeles, and MRCA among other organizations throughout Los Angeles.

Applicant, or project partner, has 1+ years experience maintaining and operating projects of similar size and scope.
As mentioned, since its inception in 1985, the MRCA has designed, planned and constructed scores of small and large projects throughout Los Angeles and beyond, as well as to work in conjunction with government and environmental organizations on studies that benefit the River.

The project implements a major component of an existing relevant plan related to a major recreational public use facility or watershed ecosystem restoration plan.
The Los Angeles River Revitalization Master Plan (2007) envisions the River as a natural resource asset and recreational facility. The River sparingly, only in two locations currently offers this opportunity, in the Sepulveda Basin and the Glendale Narrows. This Project seeks to maintain and enhance the Master Plan's goal, n addition to objectives stating, "to conserve, maintain and better utilize existing recreation and park facilities which promote the recreational experience".

The project provides a high-quality access point for nearby open space, parkland, regional multi-modal trails, or water-based recreation.
The study would ensure a higher quality access point and amenity for the community, specifically, by ensuring passive recreational uses such as kayaking, fishing, birding, and others remain feasible. The River currently offers a regional network of parks and trails that are highly utilized and enjoyed for their natural beauty, and the ability to combat heat-island effect, due to the River's mitigating abilities through providing vegetation and cool shaded areas. Sufficient instream flow, which fosters wildlife habitat is also a highlight and value the River adds.

Applicant has conducted outreach to the affected communities.
N/A. This will be completed during the implementation process: The affected communities will participate in public meetings and be updated on flow recommendations. MRCA will engage with local community-based organizations to ensure high-quality participation from a variety of residents.

The project includes interpretive programming or personal interpretation, and a plan to reach community audiences with meaningful information about a watershed resource.
The proposed study for River flows will include meaningful participation from the local community. MRCA may partner with community-based organizations to conduct workshops and other engagement mechanisms. Through this process, information about the River will reach a wider audience, who will influence the outcome for flow implementation.

The project adds visitor-serving amenities, accessibility, and public safety improvements to public parkland with multiple ecosystem benefits.
The Project will recommend wildlife appropriate visitor-serving amenities, including interpretative signage, greater educational content and more, where they are currently lacking. The study is expected to attract more people than currently use the River, and this can also lead to improved public safety.

The project provides non-personal interpretive elements that will significantly enhance appreciation and enjoyment of a watershed resource.
Interpretive signage or online resources will be incorporated into the Project in order to provide information about instream flows, water quality and the natural resources of River. This will promote environmental stewardship by teaching the public about environmental issues, potential solutions, and about the areas' precious natural resources and how they can play a role in improving the environment and supporting a healthy watershed.

The project creates a new venue for education and/or interpretation activities that promote water conservation and stewardship, or enhance and existing venue.

The study would enhance public use of the River, to use the river as an amenity and natural resource, while addressing water quality concerns. This will educate the public about environmental issues and how they can help improve water quality in the River.

The project results in new public access to a watershed resource with high interpretive and/or educational value, or enhance existing access.
Upon completion of the Project and water quality CEC modelling, the river will attract more visitors due to desired instream flows that are protective of wildlife and recreation for many uses. The Project's goal of balancing conservation needs with habitat, wildlife and recreation will promote value of our watershed, natural resources and river flows, which will benefit the community and enhance its use by the public.

Project will benefit specially protected species pursuant to the California Wildlife Protection Act of 1990.
The proposed study is expected to benefit such species, due to its specific emphasis on what impacts would be made by potential changes to instream flows.

EXTRA CONSIDERATION POINTS

QUANTIFIABLE CARBON REDUCTION POINTS

The project engages local communities through outreach, education, and interpretation regarding long-term stewardship and climate change awareness.
As mentioned previously, the communities surrounding the Project will be engaged through public meetings and information sharing. During these meetings, it will be conveyed why the need for a river flows study is taking place and contributes to healthy watersheds and protection of wildlife habitat. This will lead increased public awareness and eventually provide an outdoor learning tool for students nearby the River, which will contribute to future and additional environmental stewardship.

ADDITIONAL CRITERIA

Completion of the project would assist in fulfilling a Federal water resources protection or watershed ecosystem restoration plan.
Section 303 of the Federal Clean Water Act (CWA) requires that each State identify waters where the quality is impaired for applicable standards. The list of impaired waters, called the §303(d) list, evaluates water bodies in terms of pollution levels, the severity of pollution, and the beneficial uses. Where quality is impaired, a total maximum daily load (TMDL) is required to be established for each pollutant. The River ultimately drains into the Pacific Ocean, and is listed as an impaired waterbody for trash, cadmium, coliform bacteria, lead, copper, and other pollutants. The result of the study shall contribute to healthier waters in the River through contaminant concentration reduction.

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Project utilizes a local job training entity for a portion of the work.
While the Project/study will not utilize a local job training entity, future education and implementation can be provided by the local Corps. MRCA frequently partners with Community Nature Connection, a local environmental non-profit that trains and employs youth, for community engagement and outreach services.

Project has secured matching funds of at least 25 percent of total project costs.
The study has secured an additional $250,000 of matching funds from the RMC.

Project is within 1 mile of public transportation.
Multiple Metro bus stops are located on major street crossings along the main transit corridors along the River. Also, Metrolink has several stops and runs parallel to the River.

Project results in additional uses for users of a wide range of ability levels.
As mentioned, the Project seeks to ensure public uses of the river for both wildlife and recreation, while balancing conservation needs. The study will also provide a water quality model to evaluate potential water quality effects of changes in wastewater discharge.

Budget for Grant Application
LA River Flows Study Supplemental Analysis PP&D

Grant Request: $ 250,000

Budget Item		Amount
A. MRCA Staff		
various	Direct Salaries, Payroll Tax, Benefits & Allocations	$ 35,000
9998, 9999	Administrative Cost	$ 15,000
	SUBTOTAL A, MRCA Staff:	$ 50,000
B. Materials and Supplies		
5115	Land & Building Improvement - Pre-Construction	$ -
5116	Land & Building Improvement - Other	$ 1,000
7777	Equipment Allocation	$ 1,000
	SUBTOTAL B, Materials and Supplies:	$ 2,000
C. Consultants and Contractors		
5115	Land & Building Improvement - Pre-Construction	$ 196,000
5116	Land & Building Improvement - Other	$ 2,000
	SUBTOTAL C, Consultants and Contractors:	$ 198,000
	Grand Total (A+B+C):	**$ 250,000**

Los Angeles River Instream Flow Criteria: Technical Study
Scope of Work and Budget
September 13, 2018

Background

The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (collectively Water Boards) have invested heavily in promoting water reuse and recycling. However, reuse leads to potential reduction in stream flow, and the Water Boards are responsible for establishing flows for a variety of beneficial uses. Wastewater Treatment Plant dischargers seeking to reduce discharges associated with reducing flow in a stream for reuse (or any other purpose) must file a wastewater change petition and obtain approval under Water Code Section 1211 (1211 petition) from the State Water Board prior to reducing discharges. A key provision of the 1211 petition is to demonstrate that the reduced discharge will not unreasonably affect fish and wildlife, or other public trust resources.

Resolving the potential conflict between increased reuse and maintaining sufficient instream flows is challenging for two reasons. The first is technical, as the tools and processes for determining flow requirements that protect various beneficial uses are still in early stages of development. The State Water Board is currently funding development of the California Environmental Flows Framework (CEFF), a two-tier approach for setting environmental flow criteria. Tier 1 involves defining ecologically protective flow ranges based on reference hydrology for nine general stream classes in the state. The Tier 2 approach, which is just starting, provides a framework to develop specific flow criteria for different seasons necessary to protect specific species, habitats, or beneficial uses. Developing the Tier 2 framework includes a series of proposed case studies across the state demonstrating how watershed-specific analyses can be used to define flow targets for specific beneficial uses.

The second reason is procedural, as there is no established protocol for determining allocation of flow requirements when there are multiple dischargers or water users on a single water body. That circumstance has already materialized in the Los Angeles River (LA River), where the City of Burbank's 1211 petition for flow reduction associated with reuse was protested by another city, which asked the State Water Board to forestall that decision until a comprehensive environmental analysis could be completed to determine how much water should remain in the Los Angeles River. Although the most recent challenges have been addressed, the procedural concerns for equitable allocation of permission to reduce discharges for reuse remains.

A series of scoping meetings involving the State and Regional Water Boards, City and County agencies and land conservancies were held to develop an approach to help address the technical and procedural challenges associated with defining environmental flow targets for the LA River. This scope of work represents the outcome of those meetings and provides a science -informed approach for assessing flow needs and evaluating future 1211 petitions and other proposals for water capture, diversion and/or reuse.

Project Goal

The Los Angeles River Flow Study has two overarching goals. The first is to develop technical tools that quantify the relationship between various alternative flow regimes (which may include seasonal or annual needs for flow, such as presence and depth of pools, temperature, or flow timing, duration, frequency, or magnitude) and the extent to which beneficial uses are achieved. The second is to engage multiple affected parties in application of these tools to inform and solicit input about appropriate flow needs in the Los Angeles River. The ultimate outcome of this project is to provide technically sound recommendations and alternatives to the Water Boards for consideration and implementation of flow objectives.

Scope and Tasks

The following provides the scope of work and tasks that will be completed or led by SCCWRP. Note: Community Outreach is an essential actvitiy that is not included in this draft scope of work and budget, but will need to be incorporated into the project.

The process to achieving the project goals involves six activities. Underneath these activities are provided more detailed technical tasks.

Activity 1: Stakeholder and Technical Advisory Group Coordination. Development of both the technical approach and implementation strategy should be informed by a robust stakeholder coordination process. The project will be coordinated through two advisory workgroups; a technical advisory group will be regularly consulted to help guide the analytical approach, and a stakeholder advisory group will provide input on decisions regarding the beneficial uses analyzed, the biological communities focused on, and implementation approaches considered. A series of meetings or workshops will be held with key stakeholders to solicit their input and participation in the overall process and in defining desired outcomes. Stakeholders may include other regulatory agencies, discharger agencies, other public or private entities, or non-governmental organizations. State and regional water board staff will oversee the stakeholder process. Under this task, the technical team will provide summary materials on the project process and products that can support the stakeholder process and will participate in the stakeholder workgroup meetings to help answer technical questions and respond to suggestions.

SCCWRP (technical team) will lead the technical workgroup. This will include providing materials for review and facilitating discussion among the technical workgroup that will serve to provide technical review of analytical approaches and draft products.

> *Products:* Agendas, presentation materials, and meeting summaries for the technical and stakeholder advisory workgroups.

Activity 2: Non-aquatic Life Beneficial Use Assessments. The LA River supports a suite of non-aquatic life beneficial uses, such as recreation, fishing and kayaking. Existing information will be compiled on these uses and the hydrological needs necessary for their support.

> Task 2A: Characterize non-aquatic life uses. The goal of this task is to identify the prevalence of non-aquatic life uses, such as recreation and fishing, in various reaches of the LA River. A preliminary set of current and potential uses will be developed by the project team and vetted

through the stakeholder advisory workgroup. The goal of this task is not to "define the beneficial uses" but to summarize activities that occur (or could occur in the future) associated with each use, in each reach of the river. The uses will be related to specific indicators to determine the basis for potential flow criteria.

Product: Map of specific non-aquatic life uses and associated indicators by reach of the LA River

Task 2B: Determine flow-use relationships for priority beneficial uses. A conceptual assessment approach will be developed for each beneficial use that allows changes in flow to be related to changes in use that exceed specific levels designated important from a management perspective. Focused group surveys will be conducted with knowledgable stakeholder groups to help determine hydrologic needs associated with each use. The ultimate flow-use relationships will be based on the stakeholder input, expert judgement, and/or empirical relationships.

Product: Draft and final technical memo summarizing non-aquatic life beneficial uses, flow-use relationships and the associated flow targets necessary for their support.

Activity 3: Aquatic Life Beneficial Use Assessments. This activity will involve applying the Tier 2 California Environmental Flows Framework for the Los Angeles River. The State's Tier 2 framework includes the following basic steps, which will need to be evaluated and possibly adapted for their application to the Los Angeles River:

1. Characterize aquatic life uses
2. Assess hydrologic baseline conditions
3. Identify priority ecological endpoints of management concern
4. Determine flow-ecology relationships for priority ecological endpoints
5. Determine appropriate hydrologic and ecologic tools for analysis

Task 3A: Assess hydrologic baseline conditions. The Los Angeles River has been the subject of past and ongoing hydrologic studies by entities including Colorado School of Mines/UCLA, City of Los Angeles, Cities of Glendale and Burbank, and the Army Corps of Engineers. In addition, there are a range of past reports an analysis ranging from the 1962 Final Report of Referee for the Upper Los Angeles River Area to the recent Enhanced Watershed Management Plan (EWMP). This task will compile and review results from existing hydrologic studies to determine existing conditions relative to ecologically relevant hydrologic metrics. Data gaps associated with differences in the objectives of past studies relative to the goals of this study will be identified to guide subsequent hydrologic analysis.

Product: Summary of baseline hydrology and identification of data gaps

Task 3B: Identify priority ecological endpoints of management concern. The CEFF uses benthic invertebrates and fish as the primary ecological endpoints, largely because of the large amount of data on these organisms. However, other groups, such as amphibians, birds, or riparian habitat may be important for the determination of flow criteria for the Los Angeles River. This task will identify key ecological endpoints and their locations in the river, and prioritize them based on stakeholder interest, relevance to the goals of the study, and availability of data and

analytical tools. Hydrologic needs of each species or habitat will compiled to support future analysis of flow-ecology relationships.

Product: Ranked list of priority ecological endpoints and summary of available data on species distributions and flow-ecology relationships

Task 3C: Determine flow-ecology relationships and targets for stream and riparian endpoints. This task will focus on developing (or refining) the conceptual flow-ecology models and targets for riparian ecological endpoints . This task will provide targets for organisms for which the basic flow-ecology relationships have already been (or are currently being) developed as part of an ongoing project on the LA River; specifically, benthic invertebrates and focal vertebrate species identified as part of the ongoing Regional Water Board project investigating climate change induced flow changes on instream vertebrate communities (3 fish, 2 birds, 1 reptile, 1 amphibian). The conceptual models outline the key flow characteristics, seasonality, and desired variability necessary to support the priority ecological endpoints. Flow targets build from flow-ecology relationships by identifying thresholds of response that that can serve as quantitative management criteria They form the foundation for quantitative analysis of flow needs and provide an important platform for discussion among the stakeholders of where analysis should be focused.

Product: Flow-ecology models and preliminary flow targets for each reach of the LA River, based on benthic invertebrate and focal vertebrate communities.

Task 3D: Determine flow-ecology relationships and targets for non-riverine ecological endpoints. This task will expand the analysis of flow-ecology relationships to include additional habitats and species, specifically those associated with emergent marsh habitats and tidal flats located near the mouth of the river. Similar to Task 3C, this task will develop the conceptual relationships between hydrologic properties and probability of occurance for marsh and estuarine species. These relationships will be used with hydrologic analysis to produce putative flow-ecology targets for these additional ecological endpoints.

Product: Flow-ecology models and preliminary flow targets for emergent marsh and estuarine habitats and species of the LA River.

Activity 4: Apply Environmental Flows Framework to quantify effects of flow modification on the Los Angeles River and evaluate management scenarios. For this activity, we will apply the CEFF framework to assess the effects of wastewater reuse and other flow management actions on aquatic and non-aquatic life uses in the Los Angeles River. Scenarios that will be analyzed will be developed in coordination with the project's technical advisory and stakeholder committees.

Task 4A: Determine appropriate hydrologic tools and update modeling for analysis. For this task, we will enhance the existing hydrologic model for the LA River watershed to accommodate the goals of this project. Colorado School of Mines (CSM) has an established hydrologic/stormwater model for the LA River watershed that was previously implemented for the LA Sustainable Water Project. The model will be discretized to improve spatial resolution, expanded to include a reach hydraulic model, and refined with new data and information to provide baseline daily flows for all applicable reaches of the LA River. These baseline flows will be used in subsequent tasks to assess potential effects of flow modification.

Product: Hydrologic and hydraulic models for use in scenario analysis for the Los Angeles River

Task 4B: Analyze tolerances of river to flow modifications. Hydrologic models will be used iteratively to evaluate how sensitive different aquatic life and non-aquatic life endpoints are to flow alteration. The resulting tolerances will be used to define a range of flow conditions that should be considered "protective" for each ecological endpoint (i.e. how far can flow deviate from the defined reference targets before ecological impacts occur). These ranges will be used to support development of preliminary flow criteria.

Product: Flow tolerance ranges of riparian habitat, benthic invertebrates and focal vertebrate species

Task 4C: Analyze wastewater reuse scenarios. The effect of changes in discharge and flow in the LA River associated with proposed wastewater reuse scenarios will be evaluated to determine the potential effects on the priority beneficial uses. Changes in flow associated with reduced discharge will be modeled to determine the effect on beneficial use indicators. The results will be used to produce a map of "potential effect" by river reach and beneficial use.

Product: Map of potential effects on beneficial use associated with proposed wastewater reuse scenarios.

Task 4D: Evaluate stormwater capture scenarios. This task would involve modeling the effects of various stormwater management scenarios on ecological endpoints and assessing potential effects on proposed flow criteria. Stormwater capture may occur in tributaries, storm drain conveyance systems, or on the mainstem river (e.g. through use of rubber dams) and can include capturing elements of both dry season and (some) wet season runoff. Stormwater capture scenarios will be developed with the local municipalities and appropriate stakeholder groups and may also include the effects of Low Impact Development (LID) or conservation practices that reduce runoff to the river.

Product: Map of potential beneficial use effects associated with proposed stormwater capture in combination with wastewater reuse scenarios

Task 4E: Evaluate groundwater interactions. This task would expand the watershed model to include groundwater-surface water interactions. Groundwater discharge is a significant component of the hydrology in specific reaches of the LA River (e.g. Glendale Narrows). This task would allow for more direct consideration of the relative influence of changes in recharge or discharge, wastewater reuse or stormwater capture on groundwater discharge and subsequent environmental flows.

Product: Map of potential beneficial use effects associated with groundwater interactions in combination with wastewater reuse scenarios

Task 4F: Evaluate habitat modifications to offset flow reduction impacts. This task would explore options for mitigating flow impacts by creating improved physical habitat. The results could provide a mechanism for enhancing biological conditions (as well as non-aquatic life uses) in the stream as an offset to modified flow regimes. The task would provide a means of

balancing costs for physical habitat alterations against the value of the water that could be recovered. Habitat restoration scenarios would be developed in coordination with stakeholder groups and in consultation of existing restoration/revitalization plans.

Product: List of potential habitat restoration projects; Map of potential beneficial use associated with habitat restoration

Task 4G: Evaluate effects of flow alteration on tidal portions of the river. This task would evaluate the effects of flow alteration on the tidal portion of the LA River. The lowest reaches of the river are subject to bidirectional flow that produces habitat similar to tidal mudflats. This habitat is known to support a diverse assemblage of wading shorebirds. This task would develop a hydrologic model able to simulate bidirectional flow that, along with the flow-ecology relationships for wading shorebirds, would be used to assess the effect of wastewater and stormwater management on estuarine habitat.

Product: Map of potential beneficial use effects on the tidal portion of the LA River associated with the various scenarios evaluated.

Task 4H: Establish recommended flow criteria with stakeholder group. The results from previous tasks will be used to develop recommended flow criteria for each reach of the LA River. Criteria may also vary by season or type of year. This task will be done in conjunction with project partners and will focus on integrating across all beneficial uses vs. being driven by desired conditions for each individual ecological endpoint.

Product: Technical memo/report summarizing the assessment process and providing recommended flow criteria by reach of the LA River (and season).

Activity 5: Adaptive monitoring and management during implementation. Ongoing monitoring will be a key element of any implementation program. A robust monitoring strategy will provide data that can be used to validate model predictions, inform adaptive management strategies, and improve models for future applications or scenario assessments. We will work with the stakeholders and Water Board to develop monitoring recommendations that will provide a way to evaluate the actual effect of altered flow on instream biological communities and other non-aquatic life related beneficial uses. Monitoring data can be used to inform adaptiveimplementation management strategies and to improve models for future applications.

Product: Proposed monitoring strategy

Activity 6: Summary of Results/Reporting. The products of all project tasks will be compiled into an overall project report that summarizes the process used, technical approach and key findings of the project. Recommendations for implementation and future investigations will also be provided. A draft report will be produced for review by the technical workgroup and the stakeholder workgroup. Comment received from these two groups will be addressed to the extent possible before the report is finalized.

Product: Draft and final project report

Project Budget and Schedule

A budget for the technical elements of this scope of work is provided in Table 1. The costs are based on implementation through a partnership of the Southern California Coastal Water Research Project Authority (SCCWRP) and the Colorado School of Mines (hydrological modeling). The project costs also assume that the Los Angeles Regional Water Board will be responsible for coordinating stakeholder involvement in the project.

In addition to the technical elements included in this scope, the State Water Resources Control Board and the Los Angeles Regional Water Quality Control Board have already committed $1.4 million and $300,000, respectively to support this through existing contracts focused on developing tools for assessment environmental flow requirements. The State and Regional Water Boards will also provide ongoing staff resources to support the project, as described previously in this scope of work. This funding is supporting foundational science products that are directly usable for this project. Costs for any future CEQA analysis that may be necessary are not included in the current budget.

Table 1: Overall project budget

	Activity/Task	Cost
Activity 1 - Stakeholder coordination		**$61, 600**
Activity 2 - Non-aquatic Life Use Assessment		**$40,000**
2A	Characterize non-aquatic life uses	$7,500
2B	Determine flow use relationships	$32,500
Activity 3 - Aquatic Life Beneficial Use Assessment		**$215,000**
3A	Asses hydrologic baseline condition	$20,000
3B	Identify priority ecological endpoints	$20,000
3C	Determine flow ecology relationships for stream endpoints	$20,000
3D	Determine flow ecology relationships for marsh and estuary endpoints	$155,000
Activitiy 4 - Apply Environmental Flows and Evaluate Scenarios		**$772,000**
4A	Update hydrologic modeling	
4B	Analyze tolerances to flow modifications	$262,650
4C	Analyze wastewater reuse scenarios	
4D	Evaluate stormwater management scenarios	$72,100
4E	Evaluate groundwater interaction scenarios	$66,950
4F	Evaluate habitat restoration effects	$70,000
4G	Evaluate flow alteration effects on tidal portion of LA River	$267,800
4H	Establish recommended flow criteria	$32,500
Activity 5 - Monitoring and Adaptive Mangement Plan		**$50,000**
Activity 6 - Summary of results/reporting		**$25,000**

TOTAL **$1,163,600**

The project schedule is shown in Table 2 and assumes a start date of October 1, 2018. Delays in the start date would translate to a shift in the overall project schedule.

Table 2: Project schedule

Activity / Sub-Tasks	2018 Q4	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4
Activity 1 - Stakeholder coordination									
Activity 2 - Non-aquatic Life Use Assessment									
2A Characterize non-aquatic life uses									
2B Determine flow use relationships									
Activity 3 - Aquatic Life Beneficial Use Assessment									
3A Asses hydrologic baseline condition									
3B Identify priority ecological endpoints									
3C Determine flow ecology relationships for stream endpoints									
3D Determine flow ecology relationships for marsh/estuary endpoints									
Activitiy 4 - Apply Environmental Flows and Evaluate Scenarios									
4A Update hydrologic modeling									
4B Analyze tolerances to flow modifications									
4C Analyze wastewater reuse scenarios									
4D Evaluate stormwater management scenarios									
4E Evaluate groundwater interaction scenarios									
4F Evaluate habitat restoration effects									
4G Evaluate flow alteration effects on tidal portion of LA River									
4H Establish recommended flow criteria									
Activity 5 - Monitoring and Adaptive Mangement Plan									
Activity 6 - Summary of results/reporting									

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Los Angeles River Instream Flow Criteria: Technical Study
Augmentation to Scope of Work and Budget
March 10, 2019

Background

The Los Angeles River Flow Study has two overarching goals. The first is to develop technical tools that quantify the relationship between various alternative flow regimes (which may include seasonal or annual needs for flow, such as presence and depth of pools, temperature, or flow timing, duration, frequency, or magnitude) and the extent to which beneficial uses are achieved. The second is to engage multiple affected parties in application of these tools to inform and solicit input about appropriate flow needs in the Los Angeles River. The ultimate outcome of this project is to provide technically sound recommendations and alternatives to the Water Boards for consideration and implementation of flow objectives.

A series of scoping meetings involving the State and Regional Water Boards, City and County agencies and land conservancies were held to develop an approach to help address the technical and procedural challenges associated with defining environmental flow targets for the LA River. The resulting scope of work was finalized on September 13, 2018. Subsequent discussions with MRCA and RMC resulted in an agreement to augment the scope of work to add the following elements:

1. Expansion of hydrologic and hydraulic modeling to include Rio Hondo and Compton Creek to allow consideration of habitat restoration options on these tributaries

2. Addition of a water quality model to evaluate potential water quality effects of changes in wastewater discharge

The augmented scope will also include coordination of additional technical review with subject experts identified by the MRCA and RMC.

Augmented Tasks

Augmentation to Activity 4 to include evaluation of restoration opportunities on Rio Hondo and Compton Creeks. The previously scoped hydrologic and hydraulic models will be expanded to include Rio Hondo and Compton Creek. Additional reaches will be included in the models to allow for evaluation of riparian restoration opportunities to offset flow reductions along these two tributaries. Specific scenarios will be developed in coordination with the MRCA, RMC, and the existing stakeholder advisory group.

Product: evaluation of proposed management scenarios along Rio Hondo and Compton Creek

Activity 7: Assess Water Quality Effects of Flow Modifications on the LA River. We will develop, calibrate, and validate a water quality model for the LA River to evaluate how changes in treated wastewater discharge may affect key water quality constituents. The water quality model will be coupled to the hydrologic model developed under Activity 4 and will have similar spatial resolution. Output from the water quality models will be used to evaluate direct effects of changing wastewater

discharge on key water quality parameters and to provide input to the flow-ecology models to allow consideration of potential effects on aquatic species.

Task 7A: Develop, calibrate, and validate water temperature model. A water temperature model will be developed to predict water temperature based on air temperature and river characteristics. Existing temperature models will be evaluated and modified as necessary to accommodate conditions in the LA River and objectives of this study. Temperature observations will be compiled to support model calibration and validation and to demonstrate model performance.

Product: water temperature model and summary of model performance

Task 7B: Develop, calibrate, and validate water quality model for sediment/TSS, specific conductance, salinity, and metals. This task will focus on development of a water quality model to predict non-storm (dry weather) concentrations of suspended sediment (TSS), specific conductance (as a surrogate for salinity) and trace metals. Existing data will be compiled and used for model calibration and validation and to demonstrate model performance. We will focus on dry weather concentrations as the primary model outputs as they are likely the most sensitive to changes in wastewater discharge and are the most relevant for assessing potential effects on aquatic species

Product: water quality model for sediment, specific conductance, and metals and summary of model performance

Optional Task 7C: Develop, calibrate, and validate water quality model for contaminants of emerging concern (CECs). This optional task will focus on developing a model for the priority CECs identified in the report from the Science Advisory Panel to the State Water Board on CEC monitoring. Available data from wastewater discharge, local city and county monitoring, and results of a current SCCWRP study on CECs in the LA River will be used to calibrate and validate the CEC model focusing on dry weather concentrations of priority CECs. Additional field work is likely necessary to supplement the currently available data.

Product: water quality model for priority class of CECs and summary of model performance

Task 7D: Evaluate effects of changes in wastewater discharge on water quality parameters. The water quality and temperature models developed under the previous tasks will be applied to the scenarios developed under Task 4 to predict potential changes associated with changes in wastewater discharge. Predicted water quality and temperature changes will be included in the species response models to the extent possible based on established species tolerances that have been previously document or published.

Product: water quality and temperature effects of proposed management scenarios

Updated Project Budget and Schedule

The total cost or all additional tasks under this augmented scope is $277,600 (Table 1). Without, the optional CEC modeling (Task 7C), the total cost is $205,600 ($158,600 for Activity 7 + $47,000 for the expanded scope of Activity 4).

Table 1: Budget for Augmented Tasks

Activity/Task		Cost
Activity 4 - Expansion to Rio Hondo and Compton Creek		**$47,000**
Activity 7 - Water Quality Assessment		**$230,600**
7A	Temperature model	$61,800
7B	Sediment, conductance, metals model	$61,800
7C	*OPTIONAL - CEC model*	*$72,000*
7D	Evaluate effects of changes in discharge on water quality parameters	$35,000

The additional tasks would extend the overall completion date of the project by six months to Q2 of 2021 (Table 2). Modeling results would be available at the end of the first quarter of 2021, while written products would be released at the end of the second quarter of 2021.

Table 2: Schedule showing Augmented Tasks. Highlighted cells have been added or updated from the original projects schedule

Activity / Sub-Tasks	2018 Q4	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2
Activity 1 - Stakeholder coordination											
Activity 2 - Non-aquatic Life Use Assessment											
2A Characterize non-aquatic life uses											
2B Determine flow use relationships											
Activity 3 - Aquatic Life Beneficial Use Assessment											
3A Asses hydrologic baseline condition											
3B Identify priority ecological endpoints											
3C Determine flow ecology relationships for stream endpoints											
3D Determine flow ecology relationships for marsh/estuary endpoints											
Activitiy 4 - Apply Environmental Flows and Evaluate Scenarios											
4A Update hydrologic modeling											
4B Analyze tolerances to flow modifications											
4C Analyze wastewater reuse scenarios											
4D Evaluate stormwater management scenarios											
4E Evaluate groundwater interaction scenarios											
4F Evaluate habitat restoration effects											
4G Evaluate flow alteration effects on tidal portion of LA River											
4H Establish recommended flow criteria											
Activity 5 - Monitoring and Adaptive Mangement Plan											
Activity 6 - Summary of results/reporting											
Activity 7 - Water Quality Assessment											
Temperature model											
Sediment, conductance, metals model											
OPTIONAL - CEC model											
Evaluate changes in water quality parameters											