Attachment A

DENISE DUFFY & ASSOCIATES, INC.
PLANNING AND ENVIRONMENTAL CONSULTING

July 22, 2024

Mr. Randy Ishii, Director
Department of Public Works, Facilities and Parks
1441 Schilling Place, 2nd Floor
Salinas, CA 93901

Subject: **Little Bear Creek Hydrologic and Hydraulic Study Scope & Budget**

Mr. Ishii,

Thank you for providing Denise Duffy & Associates, Inc. (DD&A) with the opportunity to provide environmental services for Little Bear Creek Project. Attached please find a scope of work and cost estimate to prepare a Hydrologic and Hydraulic Study for the project site according to the requirements of the County of Monterey.

DD&A is an environmental consulting firm with over 40 years of experience providing biological and planning services to public and private clients throughout California. DD&A is committed to effective problem solving that allows clients to meet their goals while respecting the natural resources that enrich our communities. Our full staff of planners, arborists, biologists, botanists, and other professionals are well-equipped to provide the requested services for the project.

We look forward to performing this work for you.

Sincerely,

Josh Harwayne, Senior Project Manager
DENISE DUFFY & ASSOCIATES, INC.

Little Bear Creek Project
Hydrologic and Hydraulic Study Scope & Budget

INTRODUCTION

Denise Duffy & Associates, Inc. (DD&A) is pleased to submit this work program, cost proposal, and schedule to conduct the requested environmental services. The goal of the proposed project is to 1) analyze and address floodplain issues in the Little Bear Creek area; and 2) To address expedited permit processes for cleaning and long-term maintenance of Little Bear Creek.

The following work program to be performed by DD&A with Balance Hydraulics (Balance) serving as the primary technical contributor is based on review of the proposed project description received from the County of Monterey (dated April 16, 2024), existing materials related to the project, and knowledge of the natural resources and regulatory requirements in the vicinity. The scope of work includes the following tasks: 1) Project Initiation, 2) Field Review and Data Collection, 3) Biological Resources Study, 4) Hydrologic Modeling, 5) Existing Conditions hydrologic Modeling, 6) Project Alternatives Development, 7) Project Alternatives Hydrologic Modeling, 8) Reporting, and 9) Communications, Meetings, and Project Management.

WORK PLAN

Task 1. Project Initiation

This task includes communication and coordination with the project proponent and technical team to determine data needs in an effort to define the scope and project path. In addition, pre-survey research will be conducted utilizing available resources, and documentation relevant to the Project.

Task 2. Field Review and Data Collection

Under this task information will be reviewed and compiled for use in assessing the existing flood risk/hazard along the study reach and to identify opportunities and constraints used to select and develop project design elements and management actions.

Spatial datasets will be collected at both the watershed and creek reach scales and will be compiled into a project work map that will be used to populate input to the hydrologic and hydraulic models, develop concepts for project alternatives, and present outcomes from the study. Datasets will include, but not be limited to topographic data, current and historic aerial photographs, land cover information, soils data, building footprints, storm drain mapping, County parcel boundaries, and FEMA flood mapping.

A preliminary review of the LiDAR data (collected by the USGS in 2017) covering the study reach indicates there is adequate point coverage to support development of a terrain surface used in the modeling and as a topo base for concept level design work. Given this, a significant topographic mapping and survey effort is not recommended and instead a focused survey effort primarily at the channel crossing locations and other key areas of interest is proposed. This task has been budgeted assuming survey data will be collected using RTK-GPS and/or total station methods by a two-person team across a single-day period. Along with the survey data collection effort, a site visit will be conducted to gather information on channel roughness, recent sediment deposits, and to generally observe and document the condition of the creek along the study reach. This scope has been budgeted assuming County staff will coordinate access (as needed) to key areas of interest along the study reach.

Lastly under this task, previous studies and other information related to Little Bear/Santa Rita Creek along with photographs, videos, and news articles of past flood events will be compiled for use in parameterizing/calibrating the models, identifying opportunities and constraints, and informing the development of design alternatives.

Task 3. Biological Resources Study.

DD&A will prepare a Biological Resources Report. The report will include documentation of the biological resources identified or with the potential to occur within the project area, an assessment of potential impacts resulting from the proposed project, mitigation to reduce impacts and recommendations for any additional surveys that may be required.

Task 4. Hydrologic Modeling.

Hydrologic modeling of the Little Bear/Santa Rita Creek watershed will be completed with the purpose of generating runoff hydrographs to be routed through the hydraulic model described in Task 4. Hydrographs will be calculated using the Curve Number rainfall-runoff methodology implemented within the Army Corps of Engineers HEC-HMS software platform. Two calibration storm events (e.g. February 21, 2017, and January 9, 2023) along with 10- and 100-year design storm events will be simulated in the model. Hydrographs will be calculated at several key points of concentration within the watershed and as far downstream as the Highway 101 creek crossing.

Task 5. Existing Conditions Hydraulic Modeling.

An existing conditions hydraulic model of the study reach will be developed to help identify conveyance constrictions, map channel overtopping locations and floodplain inundation extents, and provide a baseline condition that project alternative simulations (see Task 6) can be measured against. Modeling will be completed using the Army Corps of Engineers HECRAS software platform, taking advantage of the two-dimensional, unsteady state routing capabilities of the software. The model domain will extend both upstream and downstream of the study reach and extend laterally beyond the extents of the modeled 100-year floodplain. At least 7 channel crossings (i.e. bridges and culverts) have been identified along the study reach that will be parameterized in the model. Local storm drains (if any are present) will not be included in the model geometry. Consistent with the hydrologic modeling effort, the existing conditions hydraulic model will include simulations for two calibration storm events and the 10- and 100-year design storm events. Output from the model will be presented in the form of water surface profiles along the creek centerline and spatially varied maximum water surface elevation and depth plots for each of the four simulated flow scenarios.

The study reach is mapped by FEMA as a Zone AE special flood hazard area, indicating the mapping is supported by detailed modeling. While we currently do not have access to and cannot review the FEMA model, it has been our experience that the models used to develop the FEMA floodplains in Monterey County are typically several decades old, lack information that support model parameters, and are insufficient for use in detailed flood studies, particularly at the relatively small scale of Little Bear Creek. Budget has been set aside under this task to request the model files through the FEMA Engineering Library, primarily for use in defining parameters at the channel crossings and for comparing channel geometries to the LiDAR data to support estimates of sediment deposition. Use of and an update to the FEMA model and associated floodplain mapping is not proposed as part of this phase of the project.

Task 6. Project Alternatives Development.

Working closely with County staff, up to four project alternatives will be developed to a conceptual level, each with the primary objective of minimizing flood risk and hazard along the study reach. While the configuration of these project alternatives is not yet known, an example of the type of projects envisioned is provided below:

- Vegetation and silt removal alternative: This alternative would lower channel bed and restore banks at locations where sediment deposition is observed and remove vegetation that has the potential to constrict flow. This project would likely be paired with a long-term channel maintenance plan that would allow for more sustained benefits.
- Channel crossing improvements alternative: In the event the model predicts one or more of the channel crossings located along the study reach presents a significant constriction to flow, this alternative would improve the conveyance capacity at that crossing(s) with careful consideration of any adjunct impacts to flood risk downstream of the improvement.
- Upstream detention basin alternative: This alternative would include a detention basin upstream from the study reach with the purpose of lowering flood flow rates. If selected as a project alternative, we would look to the County for guidance on whether this basin should be sited on a specific property or if a site-specific concept design should be avoided.
- Combinations alternative: This alternative would include elements from all the alternatives above.

Project alternatives will be developed to a conceptual level and generally presented on a single plan-view figure with an embedded typical detail or cross-section as needed. "Rough" grading plans will be developed for each of the alternatives in order for key project elements to be incorporated into the two-dimensional model terrain (see Task 6 below). Detailed cost estimates will not be completed for the project alternatives at this time; rather, comparative project cost estimates will be provided (e.g. a vegetation and silt removal alternative will cost less than a channel crossing improvements alternative). A summary will be prepared pertaining to anticipated biological impacts and permitting approach for each of the project alternatives.

Task 7. Project Alternatives Hydraulic Modeling.

The hydraulic model developed under Task 6 will be used to evaluate the flood control benefits anticipated to result from each of the project alternatives defined under Task 5 with iteration anticipated between designs and simulations to optimize outcomes. The four project alternatives will be assessed against the 10-, and 100-year flood events (for a total of 8 formalized project alternative simulations). Output from the model will be presented primarily in the form of change (from existing conditions) in inundation extent and change in water surface elevation plots. Where relevant, the model will also be used to present information related to potential impacts to flow velocity magnitudes and directions.

Task 8. Reporting.

A Draft Flood Study Report will be prepared that includes a summary of the collected background information, hydrologic modeling, existing conditions hydraulic modeling, project alternatives concepts, and project alternatives modeling. The various benefits and costs of each project alternative will be presented to facilitate the selection of a preferred alternative for future refinement, permitting, funding, and implementation. Time is allotted within this task to review the findings of this report with County staff and receive feedback. Received comments will be incorporated in the Final Flood Study Report.

Task 9. Communications and Project Management.

This task includes project management, schedule, and budget tracking. In addition, time is allotted under this task for site meetings, in-person meetings, remote meetings, routine project communication, and administrative tasks.

COST ESTIMATE

The tasks required to complete the Hydrologic and Hydraulic Study (H&H) has been outlined in the budget section of this proposal. This project will be billed on a time and materials basis by task with a not to exceed amount, as identified in the attached budget.

General Assumptions:

The budget is based on completing only the tasks identified above and does not include protocol-level wildlife surveys, focused botanical surveys, an arborist survey, a delineation of wetlands and waters, formal consultation with resource agencies, preparation of CEQA and/or NEPA documentation, or permit acquisition services. DD&A is available to provide these services if necessary and requested; however, an add-on to the scope would be necessary.

This budget also assumes that only electronic copies of the report will be provided to the project proponent and that production of hard copies will not be necessary.

SCHEDULE

The project will be initiated immediately upon authorization of this scope and budget. The report will be completed no more than 8 months after authorization is provided.

Denise Duffy & Associates, Inc.
PROJECT NAME: Little Bear Creek Flood Study

Task	Description	Sr. Project Manager	Associate Environmental Scientist	Assistant Environmental Scientist	Graphics/GIS	Administrative Manager	DD&A Costs by Task	Balance Hydraulics	Expenses	Total Direct Costs *(incl admin fee 15%)*	Total by Task
1	Project Initiation	12	12	8		3	$ 5,734			$0	**$5,734**
2	Field Review and Data Collection						$ -	$11,920	$2,590	$16,687	**$16,687**
3	Biological Resources Study	8	24	8	8	1	$ 7,810		$250		**$7,810**
4	Hydrologic Modeling						$ -	$11,870		$13,651	**$13,651**
5	Existing Conditions Hydraulic Modeling						$ -	$19,840		$22,816	**$22,816**
6	Project Alternatives Development	12	24	8			$ 7,552	$30,480		$35,052	**$42,604**
7	Project Alternatives Hydraulic Modeling						$ -	$16,350		$18,803	**$18,803**
8	Reporting						$ -	$9,930		$11,420	**$11,420**
9	Communications, Meetings, and Project Management	32	24			8	$ 11,152	$5,060		$5,819	**$16,971**
											$156,494
	Total Hours	*64*	*84*	*24*	*8*	*12*					
	Rate ($/hour)	*$192*	*$176*	*$128*	*$116*	*$98*					
	Total Costs	**$12,288**	**$14,784**	**$3,072**	**$928**	**$1,176**	**$32,248**	**$105,450**	**$2,840**	**$124,246**	**$156,494**

Notes: *Expenses (direct costs) include photocopying, supplies, travel, postage, etc.*