



Contract Number

23.25

SAP Number

San Bernardino County Flood Control District

Department Contract Representative	Michael Fam
Telephone Number	(909) 387-8121
Consultant	WEST Consultant, Inc.
Consultant Representative	David S. Smith
Telephone Number	(858) 487-9378
Contract Term	01/24/2023 - 01/23/2025
Original Contract Amount	\$1,141,242
Amendment Amount	
Total Contract Amount	\$1,141,242
Cost Center	1970002510

IT IS HEREBY AGREED AS FOLLOWS:

WHEREAS, San Bernardino County Flood Control District (District) desires to update the San Bernardino County Hydrology Manual; and

WHEREAS, the District conducted a competitive process to find WEST Consultant, Inc. (Consultant) to provide these services, and

WHEREAS, the District finds Consultant qualified to conduct the services required to update the San Bernardino County Hydrology Manual; and

WHEREAS, the District desires that such services be provided by Consultant and Consultant agrees to perform these services as set forth below;

NOW, THEREFORE, the District and Consultant mutually agree to the following terms and conditions:

A. DEFINITIONS

- A.1 **Board:** The San Bernardino County Flood Control District Board of Supervisors.
- A.2 **District:** The San Bernardino County Flood Control District.
- A.3 **Contract:** The Contract between the District and WEST Consultant, Inc.
- A.4 **Consultant:** WEST Consultant, Inc.

A.5 County: San Bernardino County.

A.6 Purchasing Agent: The Director of the County Purchasing Department.

A.7 Services: Those professional services described and set forth in Exhibit 1, "Scope of Work."

A.8 Subcontractor: An individual, company, firm, corporation, partnership or other organization, not in the employment of or owned by Consultant who is performing services on behalf of Consultant under the Contract or under a separate contract with or on behalf of Consultant.

B. CONSULTANT RESPONSIBILITIES

B.1 Provide those professional Services required to update the San Bernardino County Hydrology Manual per Request for Proposal No. PWG123-FLOOD-4707 and the received proposal from the Consultant dated October 13, 2022, as set forth in the Scope of Work, Exhibit 1, attached hereto.

B.2 Provide the District with a name and telephone number of a single point of contact for questions regarding Services.

B.3 Notifying the District in writing, of any change in mailing address within ten (10) business days of the change.

B.4 Maintaining a current email address and fax telephone number with the District.

C. GENERAL CONTRACT REQUIREMENTS

C.1 Recitals

The recitals set forth above are true and correct and incorporated herein by this reference.

C.2 Contract Amendments

Consultant agrees any alterations, variations, modifications, or waivers of the provisions of the Contract, shall be valid only when reduced to writing, executed and attached to the original Contract and approved by the person(s) authorized to do so on behalf of Consultant and District.

C.3 Contract Exclusivity

This is not an exclusive Contract. The District reserves the right to enter into a contract with other consultants for the same or similar services. The District does not guarantee or represent that the Consultant will be permitted to perform any minimum amount of work, or receive a minimum amount of compensation, under the terms of this Contract.

C.4 Attorney's Fees and Costs

If any legal action is instituted to enforce any party's rights hereunder, each party shall bear its own costs and attorney fees, regardless of who is the prevailing party. This paragraph shall not apply to those costs and attorney fees directly arising from a third-party legal action against a party hereto and payable under Indemnification and Insurance Requirements.

C.5 Background Checks for Consultant Personnel

Consultant shall ensure that its personnel (a) are authorized to work in the jurisdiction in which they are assigned to perform services; (b) do not use legal or illegal substances in any manner which will impact their ability to provide services to the District; and (c) are not otherwise disqualified from performing the services under applicable law. If requested by the District and not in violation of applicable law, Consultant shall conduct a background check, at Consultant's sole expense, on all its personnel providing services. If requested by the District, Consultant shall provide the results of the background check of each individual to verify that the individual meets Consultant's standards for employment. Such background check shall be in the form generally used by Consultant in its initial hiring of employees or

contracting for contractors or, as applicable, during the employment-screening process but must, at a minimum, have been performed within the preceding 12-month period. Consultant personnel who do not meet the District's hiring criteria, in District's sole discretion, shall not be assigned to work on District property or services, and District shall have the right, at its sole option, to refuse access to any of Consultant's personnel to any District facility.

C.6 Change of Address

Consultant shall notify the District in writing, of any change in mailing address within ten (10) business days of the change.

C.7 Choice of Law

This Contract shall be governed by and construed according to the laws of the State of California.

C.8 Compliance with District Policy

In performing the services and while at any District facilities, Consultant personnel (including subcontractors) shall (a) conduct themselves in a businesslike manner; (b) comply with the policies, procedures, and rules of the District regarding health and safety, and personal, professional and ethical conduct; (c) comply with the finance, accounting, banking, Internet, security, and/or other applicable standards, policies, practices, processes, procedures, and controls of the District; and (d) abide by all laws applicable to the District facilities and the provision of the services, and all amendments and modifications to each of the items addressed in subsections (b), (c), and (d) (collectively, "District Policies"). District Policies, and additions or modifications thereto, may be communicated orally or in writing to Consultant or Consultant personnel or may be made available to Consultant or Consultant personnel by conspicuous posting at a District facility, electronic posting, or other means generally used by District to disseminate such information to its employees or contractors. Consultant shall be responsible for the promulgation and distribution of District Policies to Consultant personnel to the extent necessary and appropriate.

District shall have the right to require Consultant's employees, agents, representatives and subcontractors to exhibit identification credentials issued by District in order to exercise any right of access under this Contract.

C.9 Confidentiality

Consultant shall protect from unauthorized use or disclosure names and other identifying information concerning persons receiving services pursuant to this Contract, except for statistical information not identifying any participant. Consultant shall not use or disclose any identifying information for any other purpose other than carrying out the Consultant's obligations under this Contract, except as may be otherwise required by law. This provision will remain in force even after the termination of the Contract.

C.10 Primary Point of Contact

Consultant will designate an individual to serve as the primary point of contact for the Contract. Consultant or designee must respond to District inquiries within two (2) business days. Consultant shall not change the primary contact without written acknowledgement to the District. Consultant will also designate a back-up point of contact in the event the primary contact is not available.

C.11 District Representative

The Chief Flood Control Engineer or his/her designee shall represent the District in all matters pertaining to the services to be rendered under this Contract, including termination and assignment of this Contract, and shall be the final authority in all matters pertaining to the services/Scope of Work by Consultant. If this Contract was initially approved by the San Bernardino County Flood Control District Board of Supervisors, then the Board of Supervisors must approve all amendments to this Contract, unless otherwise delegated.

C.12 Damage to District Property

Consultant shall repair, or cause to be repaired, at its own cost, all damages to District vehicles, facilities, buildings or grounds caused by the willful or negligent acts of Consultant or its employees or agents.

Such repairs shall be made immediately after Consultant becomes aware of such damage, but in no event later than thirty (30) days after the occurrence.

If the Consultant fails to make timely repairs, the District may make any necessary repairs. The Consultant, as determined by the District, shall repay all costs incurred by the District for such repairs, by cash payment upon demand, or District may deduct such costs from any amounts due to the Consultant from the District, as determined at the District's sole discretion.

C. 13 Debarment and Suspension

Consultant certifies that neither it nor its principals or subcontractors is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any federal department or agency. (See the following United States General Services Administration's System for Award Management website <https://www.sam.gov>). Consultant further certifies that if it or any of its subcontractors are business entities that must be registered with the California Secretary of State, they are registered and in good standing with the Secretary of State.

C.14 Drug and Alcohol Free Workplace

In recognition of individual rights to work in a safe, healthful and productive work place, as a material condition of this Contract, the Consultant agrees that the Consultant and the Consultant's employees, while performing service for the District, on District property, or while using District equipment:

- C.14.1** Shall not be in any way impaired because of being under the influence of alcohol or an illegal or controlled substance.
- C.14.2** Shall not possess an open container of alcohol or consume alcohol or possess or be under the influence of an illegal or controlled substance.
- C.14.3** Shall not sell, offer, or provide alcohol or an illegal or controlled substance to another person, except where Consultant or Consultant's employee who, as part of the performance of normal job duties and responsibilities, prescribes or administers medically prescribed drugs.

Consultant shall inform all employees that are performing service for the District on District property, or using District equipment, of the District's objective of a safe, healthful and productive work place and the prohibition of drug or alcohol use or impairment from same while performing such service for the District.

The District may terminate for default or breach of this Contract and any other Contract the Consultant has with the District, if the Consultant or Consultant's employees are determined by the District not to be in compliance with above.

C.15 Duration of Terms

This Contract, and all of its terms and conditions, shall be binding upon and shall inure to the benefit of the heirs, executors, administrators, successors, and assigns of the respective parties, provided no such assignment is in violation of the provisions of this Contract.

C.16 Employment Discrimination

During the term of the Contract, Consultant shall not discriminate against any employee or applicant for employment because of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, genetic information, marital status, sex, gender, gender identity, gender expression, sexual orientation, age, or military and veteran status. Consultant shall comply with Executive Orders 11246, 11375, 11625, 12138, 12432, 12250, 13672, Title VI and Title VII of the Civil Rights Act of 1964, the California Fair Employment and Housing Act and other applicable Federal, State and County and District laws and regulations and policies relating to equal employment and contracting opportunities, including laws and regulations hereafter enacted.

C.17 Environmental Requirements

In accordance with County Policy 11-08, the District prefers to acquire and use products with higher levels of post-consumer recycled content. Environmentally preferable goods and materials must perform satisfactorily and be available at a reasonable price. The District requires Consultant to use recycled paper for any printed or photocopied material created as a result of this Contract. Consultant is also required to use both sides of paper sheets for reports submitted to the District whenever practicable.

To assist the District in meeting the reporting requirements of the California Integrated Waste Management Act of 1989 (AB 939), Consultant must be able to annually report the District's environmentally preferable purchases. Consultant must also be able to report on environmentally preferable goods and materials used in the provision of their service to the District, utilizing a District approved form.

C.18 Improper Influence

Consultant shall make all reasonable efforts to ensure that no District officer or employee, whose position in the District enables him/her to influence any award of the Contract or any competing offer, shall have any direct or indirect financial interest resulting from the award of the Contract or shall have any relationship to the Consultant or officer or employee of the Consultant.

C.19 Improper Consideration

Consultant shall not offer (either directly or through an intermediary) any improper consideration such as, but not limited to cash, discounts, service, the provision of travel or entertainment, or any items of value to any officer, employee or agent of the District in an attempt to secure favorable treatment regarding this Contract.

The District, by written notice, may immediately terminate this Contract if it determines that any improper consideration as described in the preceding paragraph was offered to any officer, employee or agent of the District with respect to the proposal and award process. This prohibition shall apply to any amendment, extension or evaluation process once a contract has been awarded.

Consultant shall immediately report any attempt by a District officer, employee or agent to solicit (either directly or through an intermediary) improper consideration from Consultant. The report shall be made to the supervisor or manager charged with supervision of the employee or the District Administrative Office. In the event of a termination under this provision, the District is entitled to pursue any available legal remedies.

C.20 Informal Dispute Resolution

In the event the District determines that service is unsatisfactory, or in the event of any other dispute, claim, question or disagreement arising from or relating to this Contract or breach thereof, the parties hereto shall use their best efforts to settle the dispute, claim, question or disagreement. To this effect, they shall consult and negotiate with each other in good faith and, recognizing their mutual interests, attempt to reach a just and equitable solution satisfactory to both parties.

C.21 Legality and Severability

The parties' actions under the Contract shall comply with all applicable laws, rules, regulations, court orders and governmental agency orders. The provisions of this Contract are specifically made severable. If a provision of the Contract is terminated or held to be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions shall remain in full effect.

C.22 Licenses, Permits and/or Certifications

Consultant shall ensure that it has all necessary licenses, permits and/or certifications required by Federal, State, District, and municipal laws, ordinances, rules and regulations. The Consultant shall maintain these licenses, permits and/or certifications in effect for the duration of this Contract. Consultant will notify District immediately of loss or suspension of any such licenses, permits and/or certifications. Failure to maintain a required license, permit and/or certification may result in immediate termination of this Contract.

Required license: California Registered Civil Engineer

C.23 Material Misstatement/Misrepresentation

If during the course of the administration of this Contract, the District determines that Consultant has made a material misstatement or misrepresentation or that materially inaccurate information has been provided to the District, this Contract may be immediately terminated. If this Contract is terminated according to this provision, the District is entitled to pursue any available legal remedies.

C.24 Mutual Covenants

The parties to this Contract mutually covenant to perform all of their obligations hereunder, to exercise all discretion and rights granted hereunder, and to give all consents in a reasonable manner consistent with the standards of "good faith" and "fair dealing".

C.25 Nondisclosure

Consultant shall hold as confidential and use reasonable care to prevent unauthorized access by, storage, disclosure, publication, dissemination to and/or use by third parties of, confidential information that is either: (1) provided by the District to Consultant or an agent of Consultant or otherwise made available to Consultant or Consultant's agent in connection with this Contract; or, (2) acquired, obtained, or learned by Consultant or an agent of Consultant in the performance of this Contract. For purposes of this provision, confidential information means any data, files, software, information or materials in oral, electronic, tangible or intangible form and however stored, compiled or memorialize and includes, but is not limited to: technology infrastructure, architecture, financial data, trade secrets, equipment specifications, user lists, passwords, research data, and technology data.

C.26 Notice of Delays

Except as otherwise provided herein, when either party has knowledge that any actual or potential situation is delaying or threatens to delay the timely performance of this contract, that party shall, within twenty-four (24) hours, give notice thereof, including all relevant information with respect thereto, to the other party.

C.27 Ownership of Documents

All documents, data, products, graphics, computer programs and reports prepared by Consultant pursuant to the Contract shall be considered property of the District upon payment for services (and products, if applicable). All such items shall be delivered to District at the completion of work under the Contract, subject to the requirements of Article D—Term of the Contract. Unless otherwise directed by District, Consultant may retain copies of such items.

C.28 Participation Clause

The District desires that Municipalities, School Districts, and other Tax Districts within the San Bernardino District requiring the same services provided herein may at their option and through the District Purchasing agent, avail themselves of this Contract. Upon notice, in writing, the Consultant agrees to the extension of the terms of a resultant contract with such governmental bodies as though they have been expressly identified in this bid, with the provisions that:

C.28.1 Such governmental body does not have and will not have in force any other contract for like purchases.

C.28.2 Such governmental body does not have under consideration for award any other bids or quotations for like purchases.

Such governmental body shall make purchases directly through and to the Consultant. The District will not be liable for any such purchase made between the Consultant and another governmental body who avails themselves of this contract.

C.29 Air, Water Pollution Control, Safety and Health

Consultant shall comply with all air pollution control, water pollution, safety and health ordinances and statutes, which apply to the work performed pursuant to this Contract.

C.30 Records

Consultant shall maintain all records and books pertaining to the delivery of services under this Contract and demonstrate accountability for contract performance. All records shall be complete and current and comply with all Contract requirements. Failure to maintain acceptable records shall be considered grounds for withholding of payments for invoices submitted and/or termination of the Contract.

All records relating to the Consultant's personnel, consultants, subcontractors, services/Scope of Work and expenses pertaining to this Contract shall be kept in a generally acceptable accounting format. Records should include primary source documents. Fiscal records shall be kept in accordance with Generally Accepted Accounting Principles and must account for all funds, tangible assets, revenue and expenditures. Fiscal records must comply with the appropriate Office of Management and Budget (OMB) Circulars, which state the administrative requirements, cost principles and other standards for accountancy.

C.31 Relationship of the Parties

Nothing contained in this Contract shall be construed as creating a joint venture, partnership, or employment arrangement between the Parties hereto, nor shall either Party have the right, power or authority to create an obligation or duty, expressed or implied, on behalf of the other Party hereto. In the performance of this Contract, Consultant, its agents and employees, shall act in an independent capacity and not as officers, employees, or agents of the San Bernardino District. Any provision of this Contract that may appear to give the District any right to direct the Consultant concerning the details of performing the services/Scope of Work, or to exercise any control over such performance, shall mean only that the Consultant shall follow the direction of the District concerning the end results of the performance.

C.32 Release of Information

No news releases, advertisements, public announcements or photographs arising out of the Contract or Consultant's relationship with District may be made or used without prior written approval of the District.

C.33 Strict Performance

Failure by a party to insist upon the strict performance of any of the provisions of this Contract by the other party, or the failure by a party to exercise its rights upon the default of the other party, shall not constitute a waiver of such party's right to insist and demand strict compliance by the other party with the terms of this Contract thereafter.

C.34 Subcontracting

Consultant shall obtain District's written consent, which District may withhold in its sole discretion, before entering into Contracts with or otherwise engaging any subcontractors who may supply any part of the services to District. At District's request, Consultant shall provide information regarding the subcontractor's qualifications and a listing of a subcontractor's key personnel including, if requested by the District, resumes of proposed subcontractor personnel. Consultant shall remain directly responsible to District for its subcontractors and shall indemnify District for the actions or omissions of its subcontractors under the terms and conditions specified in Article G. All approved subcontractors shall be subject to the provisions of this Contract applicable to Consultant Personnel.

For any subcontractor, Consultant shall:

- 34.1** Be responsible for subcontractor compliance with the Contract and the subcontract terms and conditions; and
- 34.2** Ensure that the subcontractor follows District's reporting formats and procedures as specified by District.
- 34.3** Include in the subcontractor's subcontract substantially similar terms as are provided in Articles B. Consultant Responsibilities and C. General Contract Requirements.

Upon expiration or termination of this Contract for any reason, District will have the right to enter into direct Contracts with any of the subcontractors. Consultant agrees that its arrangements with subcontractors will not prohibit or restrict such subcontractors from entering into direct contracts with District.

C.35 Subpoena

In the event that a subpoena or other legal process commenced by a third party in any way concerning the Services provided under this Contract is served upon Consultant or District, such party agrees to notify the other party in the most expeditious fashion possible following receipt of such subpoena or other legal process. Consultant and District further agree to cooperate with the other party in any lawful effort by such other party to contest the legal validity of such subpoena or other legal process commenced by a third party as may be reasonably required and at the expense of the party to whom the legal process is directed, except as otherwise provided herein in connection with defense obligations by Consultant for District.

C.36 Termination for Convenience

The District reserves the right to terminate the Contract, for any reason, with a thirty (30) day written notice of termination. Such termination may include all or part of the services described herein. Upon such termination, payment will be made to the Consultant for services rendered and expenses reasonably incurred prior to the effective date of termination. Upon receipt of termination notice Consultant shall promptly discontinue services unless the notice directs otherwise. Consultant shall deliver promptly to District and transfer title (if necessary) to all completed work, and work in progress, including drafts, documents, plans, forms, data, products, graphics, computer programs and reports.

C.37 Time of the Essence

Time is of the essence in performance of this Contract and of each of its provisions.

C.38 Venue

The parties acknowledge and agree that this Contract was entered into and intended to be performed in San Bernardino County, California. The parties agree that the venue of any action or claim brought by any party to this Contract will be the Superior Court of California, County of San Bernardino, San Bernardino District. Each party hereby waives any law or rule of the court, which would allow them to request or demand a change of venue. If any action or claim concerning this Contract is brought by any third-party and filed in another venue, the parties hereto agree to use their best efforts to obtain a change of venue to the Superior Court of California, County of San Bernardino, San Bernardino District.

C.39 Conflict of Interest

Consultant shall make all reasonable efforts to ensure that no conflict of interest exists between its officers, employees, or subcontractors and the District. Consultant shall make a reasonable effort to prevent officers, employees, subcontractors, or members of governing bodies from using their positions for purposes that are, or give the appearance of being motivated by a desire for private gain for themselves or others such as those with whom they have family business, or other ties. Officers, employees, and agents of cities, counties, districts, and other local agencies are subject to applicable conflict of interest codes and state law. In the event the District determines a conflict of interest situation exists, any increase in costs, associated with the conflict of interest situation, may be disallowed by the District and such conflict may constitute grounds for termination of the Contract. This provision shall not be construed to prohibit employment of persons with whom Consultant's officers, employees, or agents have family, business, or other ties so long as the employment of such persons does not result in increased costs over those associated with the employment of any other equally qualified applicant.

C.40 Former District Administrative Officials

Consultant agrees to provide, or has already provided information on former San Bernardino District administrative officials (as defined below) who are employed by or represent Consultant. The information provided includes a list of former District administrative officials who terminated District employment within the last five years and who are now officers, principals, partners, associates or members of the business. The information also includes the employment with or representation of Consultant. For purposes of this provision, "District administrative official" is defined as a member of the Board of

Supervisors or such officer's staff, County Executive Officer or member of such officer's staff, District department or group head, assistant department or group head, or any employee in the Exempt Group, Management Unit or Safety Management Unit.

C.41 Disclosure of Criminal and Civil Procedures

District reserves the right to request the information described herein from Consultant. Failure to provide the information may result in a termination of the Contract. The District also reserves the right to obtain the requested information by way of a background check performed by an investigative firm. The Consultant also may be requested to provide information to clarify initial responses. Negative information discovered may result in Contract termination.

Consultant is required to disclose whether the firm, or any of its partners, principals, members, associates or key employees (as that term is defined herein), within the last ten years, has been indicted on or had charges brought against it or them (if still pending) or convicted of any crime or offense arising directly or indirectly from the conduct of the firm's business, or whether the firm, or any of its partners, principals, members, associates or key employees, has within the last ten years, been indicted on or had charges brought against it or them (if still pending) or convicted of any crime or offense involving financial misconduct or fraud. If the response is affirmative, the Consultant will be asked to describe any such indictments or charges (and the status thereof), convictions and the surrounding circumstances in detail.

In addition, the Consultant is required to disclose whether the firm, or any of its partners, principals, members, associates or key employees, within the last ten years, has been the subject of legal proceedings as defined herein arising directly from the provision of services by the firm or those individuals. "Legal proceedings" means any civil actions filed in a court of competent jurisdiction, or any matters filed by an administrative or regulatory body with jurisdiction over the firm or the individuals. If the response is affirmative, the Consultant will be asked to describe any such legal proceedings (and the status and disposition thereof) and the surrounding circumstances in detail.

For purposes of this provision "key employees" includes any individuals providing direct service to the District. "Key employees" do not include clerical personnel providing service at the firm's offices or locations.

C.42 Copyright

District shall have a royalty-free, non-exclusive and irrevocable license to publish, disclose, copy, translate, and otherwise use, copyright or patent, now and hereafter, all reports, studies, information, data, statistics, forms, designs, plans, procedures, systems, and any other materials or properties developed under this Contract including those covered by copyright, and reserves the right to authorize others to use or reproduce such material. All such materials developed under the terms of this Contract shall acknowledge the San Bernardino District as the funding agency and Consultant as the creator of the publication. No such materials, or properties produced in whole or in part under this Contract shall be subject to private use, copyright or patent right by Consultant in the United States or in any other country without the express written consent of District. Copies of all educational and training materials, curricula, audio/visual aids, printer material, and periodicals, assembled pursuant to this Contract must be filed with the District prior to publication.

C.43 Artwork, Proofs and Negatives

All artwork, proofs, and/or negatives in either print or digital format for anything produced under the terms of this Contract are the property of the District. These items must be returned to the District within ten (10) days, upon written notification to the Consultant. In the event of a failure to return the documents, the District is entitled to pursue any available legal remedies. In addition, Consultant will be barred from all future solicitations, for a period of at least six (6) months.

C.44 Iran Contracting Act

IRAN CONTRACTING ACT OF 2010, Public Contract Code sections 2200 et seq. (Applicable for all Contracts of one million dollars (\$1,000,000) or more). In accordance with Public Contract Code section 2204(a), the Consultant certifies that at the time the Contract is signed, the Consultant signing the

Contract is not identified on a list created pursuant to subdivision (b) of Public Contract Code section 2203 as a person (as defined in Public Contract Code section 2202(e)) engaging in investment activities in Iran described in subdivision (a) of Public Contract Code section 2202.5, or as a person described in subdivision (b) of Public Contract Code section 2202.5, as applicable.

Consultants are cautioned that making a false certification may subject the Consultant to civil penalties, termination of existing contract, and ineligibility to bid on a contract for a period of three (3) years in accordance with Public Contract Code section 2205.

C.45 Prevailing Wage Laws

By its execution of this Contract, Consultant certifies that it is aware of the requirements of California Labor Code Sections 1720 et seq. and 1770 et seq. as well as California Code of Regulations, Title 8, Section 16000 et seq. ("Prevailing Wage Laws"), which require the payment of prevailing wage rates and the performance of other requirements on certain "public works" and "maintenance" projects. Section 1720 of the California Labor Code states in part: "For purposes of this paragraph, 'construction' includes work performed during the design, site assessment, feasibility study, and other preconstruction phases of construction including, but not limited to, inspection and land surveying work..." If the Services/Scope of Work are being performed as part of an applicable "public works" or "maintenance" project, as defined by the Prevailing Wage Laws, and if the total compensation is \$1,000 or more, Consultant agrees to fully comply with such Prevailing Wage Laws. Consultant shall make copies of the prevailing rates of per diem wages for each craft, classification or type of worker needed to execute the Services available to interested parties upon request, and shall post copies at the Consultant's principal place of business and at the project site. Consultant will also adhere to any other applicable requirements, including but not limited to, those regarding the employment of apprentices, travel and subsistence pay, retention and inspection of payroll records, workers compensation and forfeiture of penalties prescribed in the Labor Code for violations. Consultant shall defend, indemnify and hold the District, its elected officials, officers, employees and agents free and harmless from any claims, liabilities, costs, penalties or interest arising out of any failure or alleged failure to comply with Prevailing Wage Laws. See Attachment A, which is attached and incorporated by reference, for additional information regarding Prevailing Wage Laws. Consultant shall comply with all applicable terms and conditions in Attachment A. The applicable general prevailing wage determinations are on file with the District and are available to any interested party on request. Consultant shall post a copy of the applicable prevailing wage determinations at the job site.

C. 46 Errors, Omissions and/or Conflicts

Consultant shall be responsible for the integrity of all design and research studies prepared or approved by the Consultant and should District suffer damages due to errors, omissions, and/or conflicts within such documents, the Consultant shall be responsible to District for costs of all such damages.

C. 47 California Consumer Privacy Act

To the extent applicable, if Consultant is a business that collects the personal information of a consumer(s) in performing Services pursuant to this Contract, Consultant must comply with the provisions of the California Consumer Privacy Act (CCPA). (Cal. Civil Code §§1798.100, et seq.). For purposes of this provision, "business," "consumer," and "personal information" shall have the same meanings as set forth at Civil Code section 1798.140. Consultant must contact the District immediately upon receipt of any request by a consumer submitted pursuant to the CCPA that requires any action on the part of the District, including but not limited to, providing a list of disclosures or deleting personal information. Consultant must not sell, market or otherwise disclose personal information of a consumer provided by the District unless specifically authorized pursuant to terms of this Contract. Consultant must immediately provide to the District any notice provided by a consumer to Consultant pursuant to Civil Code section 1798.150(b) alleging a violation of the CCPA, that involves personal information received or maintained pursuant to this Contract. Consultant must immediately notify the District if it receives a notice of violation from the California Attorney General pursuant to Civil Code section 1798.155(b).

D. TERM OF CONTRACT

This Contract is effective as of January 24, 2023 and expires January 23, 2025 but may be terminated earlier in accordance with provisions of this Contract. The Contract term may be extended for two additional one-year periods by mutual written agreement of the Parties.

E. DISTRICT RESPONSIBILITIES

District, through its Engineering Manager over Planning and Water Resources (hereinafter "Engineering Manager"), or the Engineering Manager's designee, is responsible for providing the Consultant with a central point of contact to facilitate the terms of the Contract. At the time of Contract commencement, the central point of contact is:

San Bernardino County Flood Control District
Attn: Ibram Gayed
825 East Third Street, Room 142
San Bernardino, CA 92415-0835
Fax: (909) 387-8050

F. FISCAL PROVISIONS

F.1 The maximum amount of payment under this Contract shall not exceed \$1,141,242. Consultant's compensation will be paid on a time and materials basis in accordance with the Fee Schedule attached hereto as Exhibit 2. The consideration to be paid to Consultant, as provided herein, shall be in full payment for all Consultant's services and expenses incurred in the performance hereof, including travel and per diem.

Consultant bears the risk that it may not be able to generate its anticipated (or any) profit in completing its performance of all required items of work for the specified level of compensation. In no event shall Consultant be entitled to receive compensation for any item of work required of Consultant under the terms of the Contract, which item of work is not performed by Consultant (including Consultant's agents and approved subcontractors).

F.2 Reserved

F.3 Consultant shall provide District itemized monthly invoices, in arrears, and in a format acceptable to the District for services performed under this Contract within twenty (20) days of the end of the previous month. The District shall make payment to Consultant within sixty (60) calendar days after receipt of invoice or the resolution of any billing dispute.

F.4 Consultant shall accept all payments from District via electronic funds transfer (EFT) directly deposited into the Consultant's designated checking or other bank account. Consultant shall promptly comply with directions and accurately complete forms provided by District required to process EFT payments.

F.5 District is exempt from Federal excise taxes and no payment shall be made for any personal property taxes levied on Consultant or on any taxes levied on employee wages. The District shall only pay for any State or local sales or use taxes on the services rendered or equipment and/or parts supplied to the District pursuant to the Contract.

F.6 Costs for Services under the terms of this Contract shall be incurred during the contract period except as approved by District. Consultant shall not use current year funds to pay prior or future year obligations.

F.7 Funds made available under this Contract shall not supplant any federal, state or any governmental funds intended for services of the same nature as this Contract. Consultant shall not claim reimbursement or payment from District for, or apply sums received from District with

respect to that portion of its obligations that have been paid by another source of revenue. Consultant agrees that it will not use funds received pursuant to this Contract, either directly or indirectly, as a contribution or compensation for purposes of obtaining funds from another revenue source without prior written approval of the District.

- F.8** Consultant shall adhere to the County's Travel Management Policy (8-02 and 08-02SP1) when travel is pursuant to this Contract and for which reimbursement is sought from the District. In addition, Consultant is encouraged to utilize local transportation services, including but not limited to, the Ontario International Airport.

G. INDEMNIFICATION AND INSURANCE REQUIREMENTS

For the purposes of this Section G, "District" or "County" shall be deemed to refer to both the San Bernardino County Flood Control District and San Bernardino County.

G.1 Indemnification

The Consultant agrees to indemnify, defend (with counsel reasonably approved by District) and hold harmless the District, San Bernardino County, and their authorized officers, employees, agents and volunteers (collectively, "Indemnitees") from any and all claims, actions, losses, damages and/or liability arising out of this Contract from any cause whatsoever, including the acts, errors or omissions of any person and for any costs or expenses incurred by the Indemnitees on account of any claim except where such indemnification is prohibited by law. This indemnification provision shall apply regardless of the existence or degree of fault of Indemnitees. The Consultant indemnification obligation applies to the Indemnitees' "active" as well as "passive" negligence but does not apply to the Indemnitees' "sole negligence" or "willful misconduct" within the meaning of Civil Code section 2782.

G.2 Additional Insured

All policies, except for Worker's Compensation, Errors and Omissions and Professional Liability policies shall contain additional endorsements naming the District and its officers, employees, agents and volunteers as additional named insured with respect to liabilities arising out of the performance of services hereunder. The additional insured endorsements shall not limit the scope of coverage for the District to vicarious liability but shall allow coverage for the District to the full extent provided by the policy. Such additional insured coverage shall be at least as broad as Additional Insured (Form B) endorsement form ISO, CG 2010.11 85.

G.3 Waiver of Subrogation Rights

Consultant shall require the carriers of required coverages to waive all rights of subrogation against the District, its officers, employees, agents, volunteers, contractors and subcontractors. All general or auto liability insurance coverage provided shall not prohibit Consultant and Consultant's employees or agents from waiving the right of subrogation prior to a loss or claim. Consultant hereby waives all rights of subrogation against the District.

G.4 Policies Primary and Non-Contributory

All policies required herein are to be primary and non-contributory with any insurance or self-insurance programs carried or administered by the District.

G.5 Severability of Interests

Consultant agrees to ensure that coverage provided to meet these requirements is applicable separately to each insured and there will be no cross liability exclusions that preclude coverage for suits between Consultant and District or between District and any other insured or additional insured under the policy.

G.6 Proof of Coverage

Consultant shall furnish Certificates of Insurance to the District Department administering the Contract evidencing the insurance coverage at the time the Contract is executed, additional endorsements, as required shall be provided prior to the commencement of performance of

services hereunder, which certificates shall provide that such insurance shall not be terminated or expire without thirty (30) days written notice to the Department, and Consultant shall maintain such insurance from the time Consultant commences performance of services hereunder until the completion of such services. Within fifteen (15) days of the commencement of this contract, Consultant shall furnish a copy of the Declaration page for all applicable policies and will provide complete certified copies of the policies and endorsements immediately upon request.

G.7 Acceptability of Insurance Carrier

Unless otherwise approved by Risk Management, insurance shall be written by insurers authorized to do business in the State of California and with a minimum "Best" Insurance Guide rating of "A- VII".

G.8 Deductibles and Self-Insured Retention

Any and all deductibles or self-insured retentions in excess of \$10,000 shall be declared to and approved by Risk Management.

G.9 Failure to Procure Coverage

In the event that any policy of insurance required under this Contract does not comply with the requirements, is not procured, or is canceled and not replaced, District has the right but not the obligation or duty to cancel this Contract or obtain insurance if it deems necessary and any premiums paid by District will be promptly reimbursed by Consultant or District payments to the Consultant will be reduced to pay for District purchased insurance.

G.10 Insurance Review

Insurance requirements are subject to periodic review by District. The Director of Risk Management or designee is authorized, but not required, to reduce, waive or suspend any insurance requirements whenever Risk Management determines that any of the required insurance is not available, is unreasonably priced, or is not needed to protect the interests of District. In addition, if the Department of Risk Management determines that heretofore unreasonably priced or unavailable types of insurance coverage or coverage limits become reasonably priced or available, the Director of Risk Management or designee is authorized, but not required, to change the above insurance requirements to require additional types of insurance coverage or higher coverage limits, provided that any such change is reasonable in light of past claims against District, inflation, or any other item reasonably related to the District's risk.

Any change requiring additional types of insurance coverage or higher coverage limits must be made by amendment to this contract. Consultant agrees to execute any such amendment within thirty (30) days of receipt.

Any failure, actual or alleged, on the part of District to monitor or enforce compliance with any of the insurance and indemnification requirements will not be deemed as a waiver of any rights on the part of District.

G.11 Consultant agrees to provide insurance set forth in accordance with the requirements herein. If Consultant uses existing coverage to comply with these requirements and that coverage does not meet the specified requirements, Consultant agrees to amend, supplement or endorse the existing coverage to do so.

Without in anyway affecting the indemnity herein provided and in addition thereto, Consultant shall secure and maintain throughout the contract term the following types of insurance with limits as shown:

G.11.1 Workers' Compensation/Employer's Liability – A program of Workers' Compensation insurance or a state-approved, self-insurance program in an amount and form to meet all applicable requirements of the Labor Code of the State of California, including

Employer's Liability with \$250,000 limits covering all persons including volunteers providing services on behalf of the Consultant and all risks to such persons under this contract.

If Consultant has no employees, it may certify or warrant to the District that it does not currently have any employees or individuals who are defined as "employees" under the Labor Code and the requirement for Workers' Compensation coverage will be waived by the County's Director of Risk Management.

With respect to Consultants that are non-profit corporations organized under California or Federal law, volunteers for such entities are required to be covered by Workers' Compensation insurance.

G.11.2 Commercial/General Liability Insurance – Consultant shall carry General Liability Insurance covering all operations performed by or on behalf of Consultant providing coverage for bodily injury and property damage with a combined single limit of not less than one million dollars (\$1,000,000), per occurrence. The policy coverage shall include:

- a. Premises operations and mobile equipment.
- b. Products and completed operations.
- c. Broad form property damage (including completed operations).
- d. Explosion, collapse and underground hazards.
- e. Personal injury.
- f. Contractual liability.
- g. \$2,000,000 general aggregate limit.

G.11.3 Automobile Liability Insurance – Primary insurance coverage shall be written on ISO Business Auto coverage form for all owned, hired and non-owned automobiles or symbol 1 (any auto). The policy shall have a combined single limit of not less than one million dollars (\$1,000,000) for bodily injury and property damage, per occurrence.

If Consultant is transporting one or more non-employee passengers in performance of contract services, the automobile liability policy shall have a combined single limit of two million dollars (\$2,000,000) for bodily injury and property damage per occurrence.

If Consultant owns no autos, a non-owned auto endorsement to the General Liability policy described above is acceptable.

G.11.4 Umbrella Liability Insurance – An umbrella (over primary) or excess policy may be used to comply with limits or other primary coverage requirements. When used, the umbrella policy shall apply to bodily injury/property damage, personal injury/advertising injury and shall include a "dropdown" provision providing primary coverage for any liability not covered by the primary policy. The coverage shall also apply to automobile liability.

G.11.5 Professional Liability – Professional Liability Insurance with limits of not less than one million (\$1,000,000) per claim and two million (\$2,000,000) aggregate limits

or

Errors and Omissions Liability Insurance – Errors and Omissions Liability Insurance with limits of not less than one million (\$1,000,000) and two million (\$2,000,000) aggregate limits

or

Directors and Officers Insurance coverage with limits of not less than one million (\$1,000,000) shall be required for Contracts with charter labor committees or other not-for-profit organizations advising or acting on behalf of District.

If insurance coverage is provided on a "claims made" policy, the "retroactive date" shall be shown and must be before the date of the state of the contract work. The claims made insurance shall be maintained or "tail" coverage provided for a minimum of five (5) years after contract completion.

G.11.6 Reserved

G.11.7 Cyber Liability Insurance - Cyber Liability Insurance with limits of no less than \$1,000,000 for each occurrence or event with an annual aggregate of \$2,000,000 covering privacy violations, information theft, damage to or destruction of electronic information, intentional and/or unintentional release of private information, alteration of electronic information, extortion and network security. The policy shall protect the involved District entities and cover breach response cost as well as regulatory fines and penalties.

Abuse/Molestation Insurance – Consultant shall have abuse or molestation insurance providing coverage for all employees for the actual or threatened abuse or molestation by anyone of any person in the care, custody, or control of any insured, including negligent employment, investigation and supervision. The policy shall provide coverage for both defense and indemnity with liability limits of not less than one million dollars (\$1,000,000) with a two million dollars (\$2,000,000) aggregate limit.

H. SUCCESSORS AND ASSIGNS

H.1 This Contract shall be binding upon District and Consultant and their respective successors and assigns.

H.2 Neither the performance of this Contract, nor any part thereof, nor any monies due or to become due thereunder may be assigned by Consultant without the prior written consent and approval of District.

H.3 Death or Incapacity: If the Consultant transacts business as an individual, his/her death or incapacity shall automatically terminate this Contract as of the date of such event, and neither he/she nor his/her estate shall have any further right to perform hereunder, and District shall pay him/her or his/her estate the compensation payable under Article F, Fiscal Provisions, for any services rendered prior to such termination not heretofore paid, reduced by the amount of additional costs which will be incurred by District by reason of such termination. If there be more than one Consultant and any one of them die or become incapacitated and the others continue to render the services covered herein, District will make payment to those continuing as though there had been no such death or incapacity and District will not be obliged to take any account of the person who died or became incapacitated or to make any payments to such person or his estate. The provision shall apply in the event of progressive or simultaneous occasions of death or incapacity among any group of persons named as Consultant herein, and if death or incapacity befalls the last one of such group before this Contract is fully performed, then the rights shall be as if there had been only one Consultant.

I. RIGHT TO MONITOR AND AUDIT

I.1 The District, State and Federal government shall have absolute right to review and audit all records, books, papers, documents, corporate minutes, and other pertinent items as requested, and shall have absolute right to monitor the performance of Consultant in the delivery of services provided under this Contract. Consultant shall give full cooperation, in any auditing or monitoring conducted. Consultant shall cooperate with the District in the implementation, monitoring, and

evaluation of this Contract and comply with any and all reporting requirements established by the District.

- I.2** All records pertaining to services delivered and all fiscal, statistical and management books and records shall be available for examination and audit by District representatives for a period of three years after final payment under the Contract or until all pending District, State and Federal audits are completed, whichever is later.

J. CORRECTION OF PERFORMANCE DEFICIENCIES

- J.1** Failure by Consultant to comply with any of the provisions, covenants, requirements or conditions of this Contract shall be a material breach of this Contract.

- J.2** In the event of a non-cured breach, District may, at its sole discretion and in addition to any other remedies available at law, in equity, or otherwise specified in this Contract:

- a. Afford Consultant thereafter a time period within which to cure the breach, which period shall be established at the sole discretion of District; and/or
- b. Discontinue reimbursement to Consultant for and during the period in which Consultant is in breach, which reimbursement shall not be entitled to later recovery; and/or
- c. Withhold funds pending duration of the breach; and/or
- d. Offset against any monies billed by Consultant but yet unpaid by District those monies disallowed pursuant to Item "b" of this paragraph; and/or
- e. Terminate this Contract immediately and be relieved of the payment of any consideration to Consultant. In the event of such termination, District may proceed with the work in any manner deemed proper by District. The cost to District shall be deducted from any sum due to Consultant under this Contract and the balance, if any, shall be paid by Consultant upon demand.

- J.3** Unless a remedy is specifically designated as exclusive, no remedy conferred by any of the specific provision of the Contract is intended to be exclusive of any other remedy, and each and every remedy shall be cumulative and shall be in addition to every other remedy given hereunder, now or hereafter existing at law or in equity or by statute or otherwise. The election of any one or more remedies by either Party shall not constitute a waiver of the right to pursue other available remedies.

K. NOTICES

All written notices provided for in this Contract or which either party desires to give to the other shall be deemed fully given, when made in writing and either served personally, or by facsimile, or deposited in the United States mail, postage prepaid, and addressed to the other party as follows:

San Bernardino County
Flood Control District
825 East Third Street, Room 142
San Bernardino, CA 92415-0835

WEST Consultant, Inc.
11440 W Bernardo Ct, Ste 360
San Diego, CA 92127

Notice shall be deemed communicated two (2) District working days from the time of mailing if mailed as provided in this paragraph.

L. ENTIRE AGREEMENT

This Contract, including all Attachment, Exhibits and other attachments, which are attached hereto and incorporated by reference, and other documents incorporated herein, represents the final, complete and exclusive agreement between the parties hereto. Any prior agreement, promises, negotiations or representations relating to the subject matter of this Contract not expressly set forth herein are of no force or effect. This Contract is executed without reliance upon any promise, warranty or representation by any

party or any representative of any party other than those expressly contained herein. Each party has carefully read this Contract and signs the same of its own free will.

M. ELECTRONIC SIGNATURES

This Agreement may be executed in any number of counterparts, each of which so executed shall be deemed to be an original, and such counterparts shall together constitute one and the same Agreement. The parties shall be entitled to sign and transmit an electronic signature of this Agreement (whether by facsimile, PDF or other mail transmission), which signature shall be binding on the party whose name is contained therein. Each party providing an electronic signature agrees to promptly execute and deliver to the other party an original signed Agreement upon request.

IN WITNESS WHEREOF, the San Bernardino County Flood Control District and Consultant have each caused this Contract to be subscribed by its respective duly authorized officers, on its behalf.

SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT

By 
~~Curt Hagman~~, Chairman, Board of Supervisors

JAN 10 2023

Dawn M. Rowe

Dated:

SIGNED AND CERTIFIED THAT A COPY OF THIS DOCUMENT HAS BEEN DELIVERED TO THE CHAIRMAN OF THE BOARD

Lynna Monell

Clerk of the Board of Supervisors

By 



WEST Consultants Inc.

(Print or type name of corporation, company, contractor, etc.)

By 

(Authorized signature – sign in blue ink)

Name David S Smith

(Print or type name of person signing contract)

Title Vice President

(Print or Type)

Dated: 12/2/22


Address 11440 W. Bernardo Ct, Suite 360

San Diego, CA 92127

FOR COUNTY USE ONLY

Approved as to Legal Form

SEE ATTACHED

By 
Sophie A. Akins, Deputy County Counsel

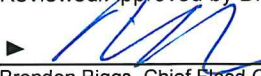
Date _____

Reviewed for Contract Compliance

By 
Andy Silao, P.E.

Date 12/12/2022

Reviewed/Approved by District

By 
Brendon Biggs, Chief Flood Control Engineer

Date 12/12/22

IN WITNESS WHEREOF, the San Bernardino County Flood Control District and Consultant have each caused this Contract to be subscribed by its respective duly authorized officers, on its behalf.

SAN BERNARDINO COUNTY FLOOD CONTROL
DISTRICT

►

Curt Hagman, Chairman, Board of Supervisors

Dated: _____

SIGNED AND CERTIFIED THAT A COPY OF THIS
DOCUMENT HAS BEEN DELIVERED TO THE
CHAIRMAN OF THE BOARD

Lynna Monell
Clerk of the Board of Supervisors

By _____
Deputy

WEST Consultants, Inc.

(Print or type name of corporation, company, contractor, etc.)

By ► David S Smith
(Authorized signature – sign in blue ink)

Name David S Smith
(Print or type name of person signing contract)

Title Vice President
(Print or Type)

Dated: 12/2/22

Address 11940 W. Bernardo Lt, Suite 360
San Diego, CA 92127

FOR COUNTY USE ONLY

Approved as to Legal Form

► Sophie Akins

Sophie A. Akins, Deputy County Counsel

Date December 7, 2022

Reviewed for Contract Compliance

► _____

Andy Silao, P.E.

Date _____

Reviewed/Approved by District

► _____

Brendon Biggs, Chief Flood Control Engineer

Date _____

ATTACHMENT A

PREVAILING WAGE REQUIREMENTS

A. All or a portion of the Scope of Work in the Contract requires the payment of prevailing wages and compliance with the following requirements:

1. Determination of Prevailing Rates:

Pursuant to Labor Code sections 1770, et seq., the District has obtained from the Director of the Department of Industrial Relations (DIR) pursuant to the California Labor Code, the general prevailing rates of per diem wages and the prevailing rates for holiday and overtime work in the locality in which the Scope of Work is to be performed. Copies of said rates are on file with the District, will be made available for inspection during regular business hours, may be included elsewhere in the specifications for the Scope of Work, and are also available online at www.dir.ca.gov. The wage rate for any classification not listed, but which may be required to execute the Scope of Work, shall be commensurate and in accord with specified rates for similar or comparable classifications for those performing similar or comparable duties. In accordance with Labor Code section 1773.2, the Consultant shall post, at appropriate and conspicuous locations on the job site, a schedule showing all applicable prevailing wage rates and shall comply with the requirements of Labor Code sections 1773, et seq.

2. Payment of Prevailing Rates

Each worker of the Consultant, or any subcontractor, engaged in the Scope of Work, shall be paid not less than the general prevailing wage rate, regardless of any contractual relationship which may be alleged to exist between the Consultant or any subcontractor, and such worker.

3. Prevailing Rate Penalty

The Consultant shall, as a penalty, forfeit two hundred dollars (\$200.00) to the District for each calendar day or portion thereof, for each worker paid less than the prevailing rates as determined by the Director of the DIR for such work or craft in which such worker is employed by the Consultant or by any subcontractor in connection with the Scope of Work. Pursuant to California Labor Code section 1775, the difference between such prevailing wage rates and the amount paid to each worker for each calendar day, or portion thereof, for which each worker was paid less than the prevailing wage rate, shall be paid to each worker by the Consultant.

4. Ineligible Contractors:

Pursuant to the provisions of Labor Code section 1777.1, the Labor Commissioner publishes and distributes a list of contractors ineligible to perform work as a contractor or subcontractor on a public works project. This list of debarred contractors is available from the DIR website at <http://www.dir.ca.gov/Public-Works/PublicWorks.html>. Any contract entered into between a contractor and a debarred subcontractor is void as a matter of law. A debarred subcontractor may not receive any public money for performing work as a subcontractor on a public works contract, and any public money that may have been paid to a debarred subcontractor by a contractor on the project shall be returned to the District. The Consultant shall be responsible for the payment of wages to workers as a debarred subcontractor who has been allowed to work on the Scope of Work.

5. Payroll Records:

a. Pursuant to California Labor Code section 1776, the Consultant and each subcontractor, shall keep accurate certified payroll records, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker or other employee employed by them in connection with the Scope of Work. The payroll records enumerated herein shall be verified by a written declaration made under penalty of perjury that the information contained in the payroll record is true and correct and that the Consultant or subcontractor has complied with the requirements of the California Labor Code sections 1771, 1811, and 1815 for any Scope of Work performed by his or her employees. The payroll records shall be available for inspection at all reasonable hours at the principal office of the Consultant on the following basis:

- i. A certified copy of an employee's payroll record shall be made available for inspection or furnished to such employee or his/her authorized representative on request;
- ii. A certified copy of all payroll records shall be made available for inspection or furnished upon request to the District, the Division of Labor Standards Enforcement of the DIR;
- iii. A certified copy of payroll records shall be made available upon request to the public for inspection or copies thereof made; provided, however, that a request by the public shall be made through either the District or the Division of Labor Standards Enforcement. If the requested payroll records have not been previously provided to the District or the Division of Labor Standards Enforcement, the requesting party shall, prior to being provided the records, reimburse the cost of preparation by the Consultant, subcontractor and the entity through which the request was made; the public shall not be given access to such records at the principal office of the Consultant;

- iv. The Consultant shall file a certified copy of the payroll records with the entity that requested such records within ten (10) days after receipt of a written request; and
 - v. Copies provided to the public, by the District or the Division of Labor Standards Enforcement shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address and social security number. The name and address of the Consultant or any subcontractor, performing a part of the Scope of Work shall not be marked or obliterated. The Consultant shall inform the District of the location of payroll records, including the street address, city and county and shall, within five (5) working days, provide a notice of a change of location and address.
- b. The Consultant shall have ten (10) days from receipt of the written notice specifying in what respects the Consultant must comply with the above requirements. In the event Consultant does not comply with the requirements of this section within the ten (10) day period, the Consultant shall, as a penalty to the District, forfeit one-hundred dollars (\$100.00) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Labor Standards Enforcement, such penalty shall be withheld from any portion of the payments then due or to become due to the Consultant.
- 6. Limits on Hours of Work:**
Pursuant to California Labor Code section 1810, eight (8) hours of labor shall constitute a legal day's work. Pursuant to California Labor Code section 1811, the time of service of any worker employed at any time by the Consultant or by a subcontractor, upon the Scope of Work or upon any part of the Scope of Work, is limited and restricted to eight (8) hours during any one calendar day and forty (40) hours during any one calendar week, except as provided for under Labor Code section 1815. Notwithstanding the foregoing provisions, work performed by employees of Consultant or any subcontractor, in excess of eight (8) hours per day and forty (40) hours during any one week, shall be permitted upon compensation for all hours worked in excess of eight (8) hours per day at not less than one and one-half (1½) times the basic rate of pay.
- 7. Penalty for Excess Hours:**
The Consultant shall pay to the District a penalty of twenty-five dollars (\$25.00) for each worker employed on the Scope of Work by the Consultant or any subcontractor, for each calendar day during which such worker is required or permitted to work more than eight (8) hours in any calendar day and forty (40) hours in any one calendar week, in violation of the provisions of the California Labor Code, unless compensation to the worker so employed by the Consultant is not less than one and one-half (1½) times the basic rate of pay for all hours worked in excess of eight (8) hours per day.
- 8. Senate Bill 854 (Chapter 28, Statutes of 2014) and Senate Bill 96 (Chapter 28, Statutes of 2017) Requirements:**
- a. Consultant shall comply with Senate Bill 854 and Senate Bill 96. The requirements include, but are not limited to, the following:
 - i. No contractor or subcontractor may be listed on a bid proposal for a public works project unless registered with the DIR pursuant to Labor Code section 1725.5, with limited exceptions from this requirements for bid purposes only as allowed under Labor Code section 1771.1(a).
 - ii. No contractor or subcontractor may be awarded a contract for public work or perform work on a public works project unless registered with the DIR pursuant to Labor Code section 1725.5.
 - iii. This project is subject to compliance monitoring and enforcement by the DIR.
 - iv. As required by the DIR, Consultant is required to post job site notices, as prescribed by regulation, regarding compliance monitoring and enforcement by the DIR.
 - v. Consultants and all subcontractors must submit certified payroll records online to the Labor Commissioner for all public works projects.
 - 1) The certified payroll must be submitted at least monthly to the Labor Commissioner.
 - 2) The District reserves the right to require Consultant and all subcontractors to submit certified payroll records more frequently than monthly to the Labor Commissioner.
 - 3) The certified payroll records must be in a format prescribed by the Labor Commissioner.
 - vi. Registration with the DIR and the submission of certified payroll records to the Labor Commissioner are not required if the public works project is \$25,000 or less when the project is for construction, alteration, demolition, installation or repair work, or if the public works project is \$15,000 or less when the project is for maintenance work.
 - b. Labor Code section 1725.5 states the following:

"A contractor shall be registered pursuant to this section to be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any public work contract that is subject to the requirements of this chapter. For the purposes of this section, "contractor" includes a subcontractor as defined by Section 1722.1.

(a) To qualify for registration under this section, a contractor shall do all of the following:

(1) (A) Register with the Department of Industrial Relations in the manner prescribed by the department and pay an initial nonrefundable application fee of four hundred dollars (\$400) to qualify for registration under this section and an annual renewal fee on or before July 1 of each year thereafter. The annual renewal fee shall be in a uniform amount set by the Director of Industrial Relations, and the initial registration and renewal fees may be adjusted no more than annually by the director to support the costs specified in Section 1771.3.

(B) Beginning June 1, 2019, a contractor may register or renew according to this subdivision in annual increments up to three years from the date of registration. Contractors who wish to do so will be required to prepay the applicable nonrefundable application or renewal fees to qualify for the number of years for which they wish to preregister.

(2) Provide evidence, disclosures, or releases as are necessary to establish all of the following:

(A) Workers' compensation coverage that meets the requirements of Division 4 (commencing with Section 3200) and includes sufficient coverage for any worker whom the contractor employs to perform work that is subject to prevailing wage requirements other than a contractor who is separately registered under this section. Coverage may be evidenced by a current and valid certificate of workers' compensation insurance or certification of self-insurance required under Section 7125 of the Business and Professions Code.

(B) If applicable, the contractor is licensed in accordance with Chapter 9 (commencing with Section 7000) of the Business and Professions Code.

(C) The contractor does not have any delinquent liability to an employee or the state for any assessment of back wages or related damages, interest, fines, or penalties pursuant to any final judgment, order, or determination by a court or any federal, state, or local administrative agency, including a confirmed arbitration award. However, for purposes of this paragraph, the contractor shall not be disqualified for any judgment, order, or determination that is under appeal, provided that the contractor has secured the payment of any amount eventually found due through a bond or other appropriate means.

(D) The contractor is not currently debarred under Section 1777.1 or under any other federal or state law providing for the debarment of contractors from public works.

(E) The contractor has not bid on a public works contract, been listed in a bid RFP, or engaged in the performance of a contract for public works without being lawfully registered in accordance with this section, within the preceding 12 months or since the effective date of the requirements set forth in subdivision (e), whichever is earlier. If a contractor is found to be in violation of the requirements of this paragraph, the period of disqualification shall be waived if both of the following are true:

(i) The contractor has not previously been found to be in violation of the requirements of this paragraph within the preceding 12 months.

(ii) The contractor pays an additional nonrefundable penalty registration fee of two thousand dollars (\$2,000).

(b) Fees received pursuant to this section shall be deposited in the State Public Works Enforcement Fund established by Section 1771.3 and shall be used only for the purposes specified in that section.

(c) A contractor who fails to pay the renewal fee required under paragraph (1) of subdivision (a) on or before the expiration of any prior period of registration shall be prohibited from bidding on or engaging in the performance of any contract for public work until once again registered pursuant to this section. If the failure to pay the renewal fee was inadvertent, the contractor may renew its registration retroactively by paying an additional nonrefundable penalty renewal fee equal to the amount of the renewal fee within 90 days of the due date of the renewal fee.

(d) If, after a body awarding a contract accepts the contractor's bid or awards the contract, the work covered by the bid or contract is determined to be a public work to which Section 1771 applies, either as the result of a determination by the director pursuant to Section 1773.5 or a court decision, the requirements of this section shall not apply, subject to the following requirements:

(1) The body that awarded the contract failed, in the bid specification or in the contract documents, to identify as a public work that portion of the work that the determination or decision subsequently classifies as a public work.

(2) Within 20 days following service of notice on the awarding body of a determination by the Director of Industrial Relations pursuant to Section 1773.5 or a decision by a court that the contract was for public work as defined in this chapter, the contractor and any subcontractors are registered under this section or are replaced by a contractor or subcontractors who are registered under this section.

(3) The requirements of this section shall apply prospectively only to any subsequent bid, bid proposal, contract, or work performed after the awarding body is served with notice of the determination or decision referred to in paragraph (2).

(e) The requirements of this section shall apply to any bid proposal submitted on or after March 1, 2015, to any contract for public work, as defined in this chapter, executed on or after April 1, 2015, and to any work performed under a contract for public work on or after January 1, 2018, regardless of when the contract for public work was executed.

(f) This section does not apply to work performed on a public works project of twenty-five thousand dollars (\$25,000) or less when the project is for construction, alteration, demolition, installation, or repair work or to work performed on a public works project of fifteen thousand dollars (\$15,000) or less when the project is for maintenance work."

c. Labor Code section 1771.1 states the following:

"(a) A contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, as defined in this chapter, unless currently registered and qualified to perform public work pursuant to Section 1725.5. It is not a violation of this section for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the Business and Professions Code or by Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Section 1725.5 at the time the contract is awarded.

(b) Notice of the requirement described in subdivision (a) shall be included in all bid invitations and public works contracts, and a bid shall not be accepted nor any contract or subcontract entered into without proof of the contractor or subcontractor's current registration to perform public work pursuant to Section 1725.5.

(c) An inadvertent error in listing a subcontractor who is not registered pursuant to Section 1725.5 in a bid proposal shall not be grounds for filing a bid protest or grounds for considering the bid nonresponsive, provided that any of the following apply:

(1) The subcontractor is registered prior to the bid opening.

(2) Within 24 hours after the bid opening, the subcontractor is registered and has paid the penalty registration fee specified in subparagraph (E) of paragraph (2) of subdivision (a) of Section 1725.5.

(3) The subcontractor is replaced by another registered subcontractor pursuant to Section 4107 of the Public Contract Code.

(d) Failure by a subcontractor to be registered to perform public work as required by subdivision (a) shall be grounds under Section 4107 of the Public Contract Code for the contractor, with the consent of the awarding authority, to substitute a subcontractor who is registered to perform public work pursuant to Section 1725.5 in place of the unregistered subcontractor.

(e) The department shall maintain on its Internet Web site a list of contractors who are currently registered to perform public work pursuant to Section 1725.5.

(f) A contract entered into with any contractor or subcontractor in violation of subdivision (a) shall be subject to cancellation, provided that a contract for public work shall not be unlawful, void, or voidable solely due to the failure of the awarding body, contractor, or any subcontractor to comply with the requirements of Section 1725.5 or this section.

(g) If the Labor Commissioner or his or her designee determines that a contractor or subcontractor engaged in the performance of any public work contract without having been registered in accordance with this section, the contractor or subcontractor shall forfeit, as a civil penalty to the state, one hundred dollars (\$100) for each day of work performed in violation of the registration requirement, not to exceed an aggregate penalty of eight thousand dollars (\$8,000) in addition to any penalty registration fee assessed pursuant to clause (ii) of subparagraph (E) of paragraph (2) of subdivision (a) of Section 1725.5.

(h)(1) In addition to, or in lieu of, any other penalty or sanction authorized pursuant to this chapter, a higher tiered public works contractor or subcontractor who is found to have entered into a subcontract with an unregistered lower tier subcontractor to perform any public work in violation of the requirements of Section 1725.5 or this section shall be subject to forfeiture, as a civil penalty to the state, of one hundred dollars (\$100) for each day the unregistered lower tier subcontractor performs work in violation of the registration requirement, not to exceed an aggregate penalty of ten thousand dollars (\$10,000).

(2) The Labor Commissioner shall use the same standards specified in subparagraph (A) of paragraph (2) of subdivision (a) of Section 1775 when determining the severity of the violation and what penalty to assess, and may waive the penalty for a first time violation that was unintentional and did not hinder the Labor Commissioner's ability to monitor and enforce compliance with the requirements of this chapter.

(3) A higher tiered public works contractor or subcontractor shall not be liable for penalties assessed pursuant to paragraph (1) if the lower tier subcontractor's performance is in violation of the requirements of Section 1725.5 due to the revocation of a previously approved registration.

(4) A subcontractor shall not be liable for any penalties assessed against a higher tiered public works contractor or subcontractor pursuant to paragraph (1). A higher tiered public works contractor or subcontractor may not require a lower tiered subcontractor to indemnify or otherwise be liable for any penalties pursuant to paragraph (1).

(i) The Labor Commissioner or his or her designee shall issue a civil wage and penalty assessment, in accordance with the provisions of Section 1741, upon determination of penalties pursuant to subdivision (g) and subparagraph (B) of paragraph (1) of subdivision (h). Review of a civil wage and penalty assessment issued under this subdivision may be requested in accordance with the provisions of Section 1742. The regulations of the Director of Industrial Relations, which govern proceedings for review of civil wage and penalty assessments and the withholding of contract payments under Article 1 (commencing with Section 1720) and Article 2 (commencing with Section 1770), shall apply.

(j)(1) Where a contractor or subcontractor engages in the performance of any public work contract without having been registered in violation of the requirements of Section 1725.5 or this section, the Labor Commissioner shall issue and serve a stop order prohibiting the use of the unregistered contractor or the unregistered subcontractor on all public works until the unregistered contractor or unregistered subcontractor is registered. The stop order shall not apply to work by registered contractors or subcontractors on the public work.

(2) A stop order may be personally served upon the contractor or subcontractor by either of the following methods:

(A) Manual delivery of the order to the contractor or subcontractor personally.

(B) Leaving signed copies of the order with the person who is apparently in charge at the site of the public work and by thereafter mailing copies of the order by first class mail, postage prepaid to the contractor or subcontractor at one of the following:

(i) The address of the contractor or subcontractor on file with either the Secretary of State or the Contractors' State License Board.

(ii) If the contractor or subcontractor has no address on file with the Secretary of State or the Contractors' State License Board, the address of the site of the public work.

(3) The stop order shall be effective immediately upon service and shall be subject to appeal by the party contracting with the unregistered contractor or subcontractor, by the unregistered contractor or subcontractor, or both. The appeal, hearing, and any further review of the hearing decision shall be governed by the procedures, time limits, and other requirements specified in subdivision (a) of Section 238.1.

(4) Any employee of an unregistered contractor or subcontractor who is affected by a work stoppage ordered by the commissioner pursuant to this subdivision shall be paid at his or her regular hourly prevailing wage rate by that employer for any hours the employee would have worked but for the work stoppage, not to exceed 10 days.

(k) Failure of a contractor or subcontractor, owner, director, officer, or managing agent of the contractor or subcontractor to observe a stop order issued and served upon him or her pursuant to subdivision (j) is guilty of a misdemeanor punishable by imprisonment in county jail not exceeding 60 days or by a fine not exceeding ten thousand dollars (\$10,000), or both.

(l) This section shall apply to any bid proposal submitted on or after March 1, 2015, and any contract for public work entered into on or after April 1, 2015. This section shall also apply to the performance of any public work, as defined in this chapter, on or after January 1, 2018, regardless of when the contract for public work was entered.

(m) Penalties received pursuant to this section shall be deposited in the State Public Works Enforcement Fund established by Section 1771.3 and shall be used only for the purposes specified in that section.

(n) This section shall not apply to work performed on a public works project of twenty-five thousand dollars (\$25,000) or less when the project is for construction, alteration, demolition, installation, or repair work or to work performed on a public works project of fifteen thousand dollars (\$15,000) or less when the project is for maintenance work."

d. Labor Code section 1771.4 states the following:

"a) All of the following are applicable to all public works projects that are otherwise subject to the requirements of this chapter:

(1) The call for bids and contract documents shall specify that the project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

(2) The awarding body shall post or require the prime contractor to post job site notices, as prescribed by regulation.

(3) Each contractor and subcontractor shall furnish the records specified in Section 1776 directly to the Labor Commissioner, in the following manner:

- (A) At least monthly or more frequently if specified in the contract with the awarding body.
- (B) In a format prescribed by the Labor Commissioner.
- (4) If the contractor or subcontractor is not registered pursuant to Section 1725.5 and is performing work on a project for which registration is not required because of subdivision (f) of Section 1725.5, the unregistered contractor or subcontractor is not required to furnish the records specified in Section 1776 directly to the Labor Commissioner but shall retain the records specified in Section 1776 for at least three years after completion of the work.
- (5) The department shall undertake those activities it deems necessary to monitor and enforce compliance with prevailing wage requirements.
- (b) The Labor Commissioner may exempt a public works project from compliance with all or part of the requirements of subdivision (a) if either of the following occurs:
 - (1) The awarding body has enforced an approved labor compliance program, as defined in Section 1771.5, on all public works projects under its authority, except those deemed exempt pursuant to subdivision (a) of Section 1771.5, continuously since December 31, 2011.
 - (2) The awarding body has entered into a collective bargaining agreement that binds all contractors performing work on the project and that includes a mechanism for resolving disputes about the payment of wages.
- (c) The requirements of paragraph (1) of subdivision (a) shall only apply to contracts for public works projects awarded on or after January 1, 2015.
- (d) The requirements of paragraph (3) of subdivision (a) shall apply to all contracts for public work, whether new or ongoing, on or after January 1, 2016."

B. STATE PUBLIC WORKS APPRENTICESHIP REQUIREMENTS

1. State Public Works Apprenticeship Requirements:

- a. The Consultant is responsible for compliance with Labor Code section 1777.5 and the California Code of Regulations, title 8, sections 230 – 230.2 for all apprenticeable occupations (denoted with “#” symbol next to craft name in DIR Prevailing Wage Determination), whether employed by the Consultant, subcontractor, vendor or consultant. Included in these requirements is (1) the Consultant’s requirement to provide notification (i.e. DAS-140) to the appropriate apprenticeship committees; (2) pay training fund contributions for each apprenticeable hour employed on the Contract; and (3) utilize apprentices in a minimum ratio of not less than one apprentice hour for each five journeyman hours by completion of Contract work (unless an exception is granted in accordance with Labor Code section 1777.5) or request for the dispatch of apprentices.
- b. Any apprentices employed to perform any of the Scope of Work shall be paid the standard wage to apprentices under the regulations of the craft or trade for which such apprentice is employed, and such individual shall be employed only for the work of the craft or trade to which such individual is registered. Only apprentices, as defined in California Labor Code section 3077, who are in training under apprenticeship standards and written apprenticeship agreements under California Labor Code sections 3070 et seq. are eligible to be employed for the Scope of Work. The employment and training of each apprentice shall be in accordance with the provisions of the apprenticeship standards and apprentice agreements under which such apprentice is training.

2. Compliance with California Labor Code section 1777.5 requires all public works contractors to:

- a. Submit Contract Award Information (DAS-140):
 - i. Although there are a few exemptions (identified below), all Contractors, regardless of union affiliation, must submit contract award information when performing on a California public works project.
 - ii. The DAS-140 is a notification “announcement” of the Contractor’s participation on a public works project—it is not a request for the dispatch of an apprentice.
 - iii. Contractors shall submit the contract award information (you may use form DAS 140) within 10 days of the execution of the prime contract or subcontract, but in no event later than the first day in which the Contractor has workers employed on the public work.
 - iv. Contractors who are already approved to train apprentices (i.e. check “Box 1” on the DAS-140) shall only be required to submit the form to their approved program.
 - v. Contractors who are NOT approved to train apprentices (i.e. those that check either “Box 2” or “Box 3” on the DAS-140) shall submit the DAS-140 TO EACH of the apprenticeship program sponsors in the area of your public works project. For a listing of apprenticeship programs see

b. **Employ Registered Apprentices**

- i. Labor Code section 1777.5 requires that a contractor performing work in an "apprenticeable" craft must employ one (1) hour of apprentice work for every five (5) hours performed by a journeyman. This ratio shall be met prior to the Contractor's completion of work on the project. "Apprenticeable" crafts are denoted with a pound symbol "#" in front of the craft name on the prevailing wage determination.
- ii. All Contractors who do not fall within an exemption category (see below) must request for dispatch of an apprentice from an apprenticeship program (for each apprenticeable craft or trade) by giving the program actual notice of at least 72 hours (business days only) before the date on which apprentices are required.
- iii. Contractors may use the "DAS-142" form for making a request for the dispatch of an apprentice.
- iv. Contractors who are participating in an approved apprenticeship training program and who did not receive sufficient number of apprentices from their initial request must request dispatch of apprentices from ALL OTHER apprenticeship committees in the project area in order to fulfill this requirement.
- v. Contractor should maintain and submit proof (when requested) of its DAS-142 submittal to the apprenticeship committees (e.g. fax transmittal confirmation). A Contractor has met its requirement to employ apprentices only after it has successfully made a dispatch request to all apprenticeship programs in the project area.
- vi. Only "registered" apprentices may be paid the prevailing apprentice rates and must, at all times work under the supervision of a Journeyman (Cal. Code Regs., tit 8, § 230.1).

c. **Make Training Fund Contributions**

- i. Contractors performing in apprenticeable crafts on public works projects, must make training fund contributions in the amount established in the prevailing wage rate publication for journeymen and apprentices.
- ii. Contractors may use the "CAC-2" form for submittal of their training fund contributions.
- iii. Contractors who do not submit their training fund contributions to an approved apprenticeship training program must submit their contributions to the California Apprenticeship Council (CAC), PO Box 420603, San Francisco, CA 94142-0603.
- iv. Training fund contributions to the CAC are due and payable on the 15th day of the month for work performed during the preceding month.
- v. The "training" contribution amount identified on the prevailing wage determination shall not be paid to the worker, unless the worker falls within one of the exemption categories listed below.

3. Exemptions to Apprenticeship Requirements:

- a. The following are exempt from having to comply with California apprenticeship requirements. These types of contractors do not need to submit a DAS-140, DAS-142, make training fund contributions, or utilize apprentices:
 - i. When the Contractor holds a sole proprietor license ("Owner-Operator") and no workers were employed by the Contractor. In other words, the contractor performed the entire work from start to finish and worked alone.
 - ii. Contractors performing in non-apprenticeable crafts. "Apprenticeable" crafts are denoted with a pound symbol "#" in front of the craft name on the prevailing wage determination.
 - iii. When the Contractor has a direct contract with the Public Agency that is under \$30,000.
 - iv. When the project is 100% federally-funded and the funding of the project does not contain any city, county, and/or state monies (unless the project is administered by a state agency in which case the apprenticeship requirements apply).
 - v. When the project is a private project not covered by the definition of public works as found in Labor Code section 1720.

4. Exemption from Apprenticeship Ratios:

- a. The Joint Apprenticeship Committee shall have the discretion to grant a certificate, which shall be subject to the approval of the Administrator of Apprenticeship, exempting the Contractor from the 1-to-5 ratio set forth in this Section when it finds that any one of the following conditions are met:
 - i. Unemployment for the previous three-month period in such area exceeds an average of fifteen percent (15%); or
 - ii. The number of apprentices in training in such area exceeds a ratio of 1-to-5 in relation to journeymen; or

- iii. The Apprenticeable Craft or Trade is replacing at least one-thirtieth (1/30) of its journeymen annually through apprenticeship training, either on a statewide basis or on a local basis; or
 - iv. If assignment of an apprentice to any work performed under the Contract Documents would create a condition which would jeopardize such apprentice's life or the life, safety or property of fellow employees or the public at large, or if the specific task to which the apprentice is to be assigned is of such a nature that training cannot be provided by a journeyman.
 - b. When such exemptions from the 1-to-5 ratio between apprentices and journeymen are granted to an organization which represents contractors in a specific trade on a local or statewide basis, the member contractors will not be required to submit individual applications for approval to local Joint Apprenticeship Committees, provided they are already covered by the local apprenticeship standards.
- 5. Contractor's Compliance:**
- a. The responsibility of compliance with this Section for all Apprenticeable Trades or Crafts is solely and exclusively that of the Consultant. All decisions of the Joint Apprenticeship Committee(s) under this Section are subject to the provisions of California Labor Code section 3081 and penalties are pursuant to Labor Code section 1777.7 and the determination of the Labor Commissioner.

EXHIBIT 1
Scope of Work

(Attached behind this cover page)

RFP - No. PWG123-FLOOD-4707

Scope of Work

Task 1 Background Research

Task 1.A Collect/Research Current Manual information:

The Consultant shall gather and review all relevant Hydrology Manual information, including the current Hydrology Manual, Addendum, Detention Basin Design Criteria, and related data. This will include obtaining, reviewing, compiling comments and proposed resolutions, and identifying any additional work from the previous Hydrology Manual, which will need to be reviewed and confirmed in coordination with the District Committee.

Task 1.B Additional items to be included in the updated Hydrology Manual:

The Consultant shall perform research, review the existing Hydrology Manual, Addendum, and Detention Basin Design Criteria, and determine all revisions and additional analyses necessary to issue a new Hydrology Manual by **updating the current Hydrology Manual, including but not limited to the following objectives:**

- 1) Using the NOAA Atlas 14 data in the hydrology methods.
- 2) Using the Natural Resources Conservation Service (NRCS) website to determine the soil groups and suggest a different method to be used in cases of missing data on the NRCS website.
- 3) Provide a method to analyze the Sediment Bulking factor and the recommendation for where and when this factor should be used.
- 4) Provide a post-fire hydrology method to calculate the runoff after a fire.
- 5) Provide the different methods that can be used to calculate the lag time for the unit hydrograph method and the recommendations for using each method.
- 6) The recommendation of when using (1) day or (5) days unit hydrograph calculations and provide the details procedure for both.
- 7) The process and calculations for the maximum loss rate, and the low loss fraction for five (5) days unit hydrograph.
- 8) The recommendation of when using reduction factors for rainfall data with the unit hydrograph and the way to determine this.
- 9) The ability to use the technique of Precipitation Zone Numbers (PZN), Arc Hydro application (GIS for water resources), HEC-HMS Software and/or develop new software with details procedure for how to implement in the updated Hydrology Manual.
- 10) Provide relation curves and/or equations between different return frequencies.
- 11) All the hydrology analyses shall be simple (i.e., the ability to do hand Calculations) and provide detailed examples for each method showing the hydrology map, and detailed hand calculations.
- 12) Provide a list of the approved computer software that matches the New Updated Hydrology Manual procedure and can be used in any hydrology analyses.

- 13) Provide an update on the Detention Basin Design Criteria memo and to be included in the New Updated Hydrology Manual.
- 14) Other suggestions are based on current industry standards and experience.
- 15) The impacts of revised methodology on existing studies/projects.
- 16) Any additional work required and/or recommended by The District Committee.

This work will include a meeting with the District Committee to discuss these findings and the results of the work associated with Tasks 1.A & 1.B. The final results of this effort shall be submitted to The District. The final list of revisions will be shared with The District Committee during meeting number 1 (below) and the recommendations will then be considered for inclusion by The District. The approved revisions will be incorporated into appropriate sections of the Hydrology Manual. The number of chapters (sections) of the New Updated Hydrology Manual will be per the discussion between the Consultant and the District Committee to include all the work described here in the scope of the work.

Task 2 TAC Meetings

The Consultant shall facilitate meetings with The District Committee to gather input on the Manual and discuss proposed revisions, chapter by chapter, throughout the Manual revisions process. The process will require the Consultant to plan each meeting and: distribute the agenda and request comments on the applicable sections to all the District Committee at least 3 weeks prior to each meeting with the deadline to return comments in one week's time; assemble all of the comments into the comments spreadsheet and redistribute to all the District Committee at least 1 week prior to each meeting; facilitate each meeting and take meeting minutes including names and details of what was said and clearly record the recommendation or resolution of all comments and any additional items or work required; prepare written minutes and update comments spreadsheet with a recommendation or resolution information including justification or supporting information for each comment and document any correspondence that has any bearing on the recommendations; distribute finalized spreadsheet and minutes to The District Committee the week prior to the next meeting.

In order to gather input from the District Committee in an expeditious manner, the following meeting schedule, by Hydrology Manual Chapter, is proposed:

Meeting	Hydrology Manual Chapters
1	Kick-off meeting, Overview Previous Studies, Submit schedule
2	1, 2, 3, 4
3	5, 6, 7
4	8, 9, 10, 11
5	Any New Chapters, Appendices, and Workbook
6	Final Meeting

Task 3 Manual Revisions

Task 3.A Compile County Committee:

Following Task 1 and each of the proposed Task 2 meetings, the Consultant shall provide the District with meeting minutes and a spreadsheet of The District Committee's comments on potential revisions to the Manual as outlined in Task 2. The consultant will also coordinate with The District Committee as necessary and identify, detail, summarize, and document any additional work, research, or studies required.

Task 3.B Hydrology Manual Revisions

The Consultant shall revise the Hydrology Manual text, formatting, exhibits, figures, and tables chapter by chapter, following the meetings outlined under Task 2. The revisions will also include the work necessary to address the comments from The District Committee, with any work requiring any additional studies.

Task 4 Draft and Final Manual Submittals

Following the District approval, the Consultant shall submit a draft and final updated Hydrology Manual for The District's review and approval. Deliverables are outlined in more detail under Section 6 below.

Task 5 Presentations to The District Committee:

Following final approval of the updated final Hydrology Manual, the Consultant shall provide a presentation on the updated Hydrology Manual to The District Committee. The consultant shall prepare a PowerPoint presentation and a handout summarizing the changes for distribution. The PowerPoint and handout will be submitted to The District for review and comment 2 weeks prior to the initial presentation.

C. MATERIAL AND DATA TO BE FURNISHED BY THE DISTRICT

The Consultant shall attend a kick-off meeting, in addition to the meeting outlined in Task 2 above, with The District project manager within 30 days after the initial Notice to Proceed. The District shall furnish the following material, in digital format when possible, at this meeting:

- A current copy of the Hydrology Manual in PDF format.
- A current copy of the Hydrology Manual Addendum in PDF format.
- A current copy of the Detention Basin Design Criteria in PDF format.

D. SERVICES TO BE PERFORMED BY THE DISTRICT

The District shall provide project management and administration. All questions about project definition and scope will be answered in a timely manner when requested by the Consultant. All correspondence with respect to the contract and submittals required will be directed to the Project Manager.

E. DELIVERABLES

The following table summarizes the deliverable work products for Tasks 1 through 5 of the San Bernardino County Hydrology Manual Update.

Task	Number of Copies	Description
Task 1	1 Digital Copy, via email	<i>Details of suggestions updated and the additional required items.</i>
Task 2 and 3.B	2 Paper Copies; 1 Digital Copy of each document in track changes and 1 clean copy	<i>Meeting agendas, Hydrology Manual update comments spreadsheets and meeting minutes, chapter-by-chapter</i>
Task 4	2 Paper Copies of Draft and Final Manuals; 1 Digital Copy (of both Draft and Final Manuals) of the document in track changes and 1 cleaner digital file of the Hydrology Manual with navigable/linkable table of contents, list of figures, and list of tables.	<i>Draft and final Hydrology Manual</i>
Task 5	1 digital copy via email	<i>PowerPoint presentation and revision summary handout</i>

F. SCHEDULE

The County Hydrology Manual Updates shall be completed in approximately 24 months. The consultant is required to submit a project schedule. This schedule assumes that all required data provided by The District is complete at the start of work and that the Notice to Proceed for this task order is received by November 2022. Additionally, it is assumed that the District Committee will review delivered items (Manual chapters, presentations, and Draft and Final Manuals) and submit comments within 2 weeks of receiving them. Changes in project scope may result in modifications to the project schedule. The District reserves the right to delay or postpone dates as necessary.

G. ADDITIONAL REQUIREMENTS

The Consultant must be registered as a Civil Engineer with the California Board for Professional Engineers, Land Surveyors, and Geologists. The Consultant should have similar work experience in updating or preparing Hydrology Manual with any Federal, State, or Local agent. The Consultant should have experience in preparing hydrology and hydraulic reports for different types of projects. A list of experiences and a copy of the professional license must be submitted with the proposal.

The Final Hydrology Manual must be sealed and signed by the consultant.

WEST Consultants, Inc

Proposal Description

PROPOSAL DESCRIPTION

This section describes WEST's approach to update the San Bernardino County Hydrology Manual (Hydrology Manual). The WEST team will leverage both our engineering experience and our experience preparing hydrology manuals to meet the San Bernardino County Flood Control District's (District) goals and objectives as identified in the scope of work: collecting/researching current manual information; adding items to the updated Hydrology Manual; facilitating TAC meetings; preparing Hydrology Manual revisions with draft and final submittals; and presenting results to the District Committee. In general, many of the methods in the current Hydrology Manual are considered very sound and still appropriate. The requested improvements/changes in the scope of work are also considered relevant and provide the framework for this proposal. WEST is also recommending addressing the climate change topic in the updated Hydrology Manual as an additional improvement. A few items deserve special mention regarding the unique approach and methods the WEST team intends to implement:

- ◆ Sediment bulking factor (Item 3)
- ◆ Post-fire hydrology (Item 4)
- ◆ Infiltration rates and low loss / max loss (Items 2 and 7)
- ◆ Reduction factors for rainfall and depth-duration-frequency curves (Items 1, 8, and 10)
- ◆ Climate change considerations (Item 14)

The specific approaches for the scope of work tasks are discussed in detail below.

TASK 1A. BACKGROUND RESEARCH – COLLECT/RESEARCH CURRENT MANUAL INFORMATION

This task will be completed as described in the scope of work. Note that the WEST team is thoroughly familiar with most existing manuals in Southern California, Arizona, and Nevada through our hydrologic work with clients in those states including work updating hydrology manuals.

TASK 1B. BACKGROUND RESEARCH – ADDITIONAL ITEMS TO BE INCLUDED IN THE UPDATED HYDROLOGY MANUAL

The scope of work identified 16 specific objectives/topics to be included in the updated Hydrology Manual. WEST's approach to each topic is discussed below.

ITEM 1. USE OF NOAA ATLAS 14

Based on WEST's experience updating the Sacramento County Hydrology Manual, WEST will first review the NOAA 14 rainfall frequencies, including spatial variability and the background data used by NOAA before committing to include NOAA 14 methodologies in an updated San Bernardino County Hydrology Manual. In Sacramento, WEST found that the spatial distribution of NOAA 14 rainfall frequencies did not match known local rainfall climatology.

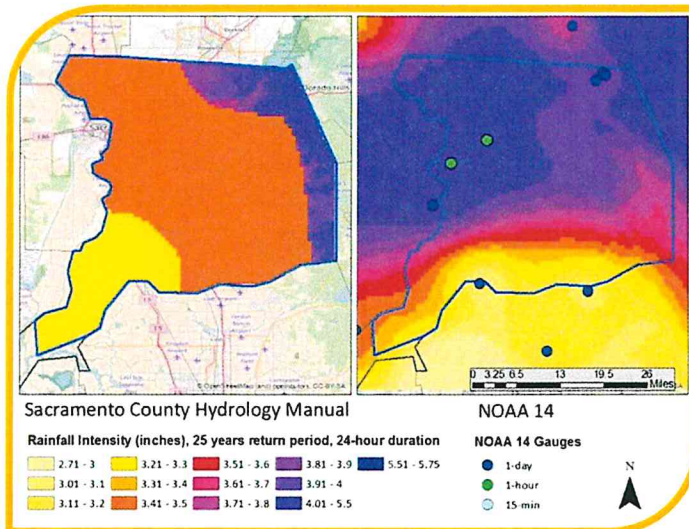


Figure 1: Comparison of previous 2-year, 24-hour duration rainfall in Sacramento County Hydrology Manual with NOAA 14.

In Sacramento County, it is well understood that rainfall generally increases from west to east, primarily due to orographic influences of the western slopes of the Sierra Nevada Mountains. In contrast, NOAA 14 showed the opposite. WEST found that only a handful of recording gage data records were used in the NOAA 14 analysis: two hourly gages and two daily rain gages located in Sacramento County. Additionally, data from Sacramento County's extensive ALERT rain gage network were ignored in the NOAA analysis.

As shown in **Figure 1**, known local behavior as indicated in the previous

Sacramento County Hydrology Manual is quite different from NOAA 14.

To remedy the situation, Sacramento County tasked WEST to incorporate approximately 40-years of ALERT rainfall data and prepare a new precipitation frequency analysis.

The updated results for the 100-year, 24-hour precipitation values compared to the values in the existing hydrology manual are presented in **Figure 2**. The result is a significant improvement in the spatial variability of precipitation return periods across the county.

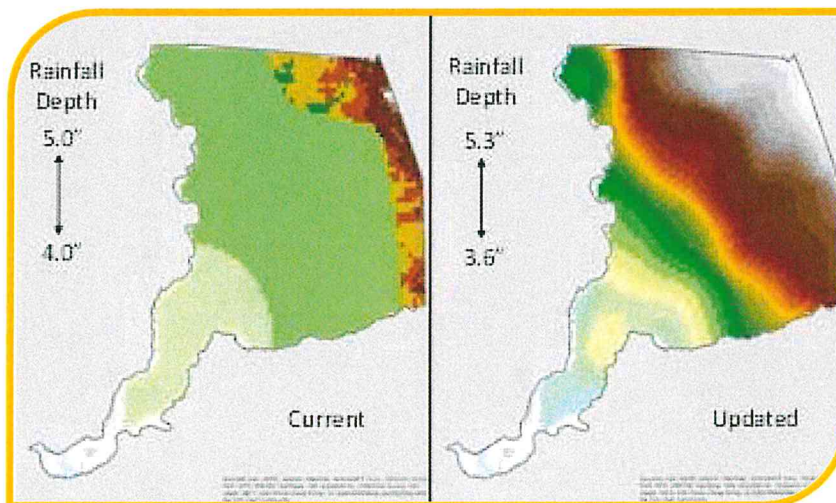


Figure 2: Comparison of previous Sacramento County 100-year, 24-hour with updated values.

For San Bernardino County, WEST will evaluate the rainfall records used in the NOAA 14 development across the County and verify that NOAA 14 values appropriately represent precipitation return periods over the County. The WEST team will make recommendations as to the viability of committing to NOAA 14 in the Hydrology Manual Update.

ITEM 2. USE OF THE NRCS WEBSITE TO DETERMINE THE SOIL GROUPS AND SUGGEST A DIFFERENT METHOD TO BE USED IN CASES OF MISSING DATA ON THE NRCS WEBSITE

In the current hydrology manual, unit hydrograph infiltration is incorporated through the use of low loss rates and maximum loss rates. In the calculation procedures, the low loss and maximum loss rates are compared at each computational time step. At time steps where the low loss exceeds the maximum loss rate, the maximum loss rate governs. The effective hyetograph is then developed by subtracting the governing loss rate from gross rainfall rate at each time step.

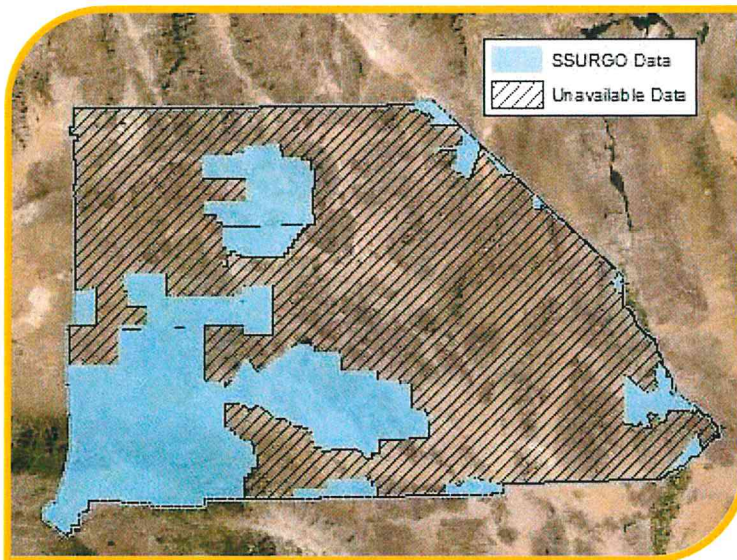


Figure 3: County Soil Data Availability

The subarea scale low loss rates are estimated using the Natural Resources Conservation Service (formerly SCS) Curve Number (CN) runoff equation. This equation is used widely throughout the engineering industry and is the basis of many past hydrology studies. Given its prevalence, the WEST team proposes to maintain its use in the updated manual. There are a variety of reasons for this decision, chief among them is maintaining a level of consistency with previous studies and any associated hydraulic structure design.

The maximum loss rates are typically calculated using Antecedent Moisture Condition (AMC) adjusted CN numbers in Figure C-6 of the current manual. Subsequent to the adopted date of the manual, publicly available soils data have been published on the NRCS website. In addition to the updated Hydrologic Soil Groups (HSG) A, B, C, and D classifications, infiltration rates are also available. Given the more extensive and updated soils and infiltration data, the WEST team proposes to update the maximum loss rate information. In general, this work will consist of the following tasks:

- Extract HSG and hydraulic conductivity data from the NRCS publicly available database for the entire county.
- In areas where data is missing (see **Figure 3**), characterize the soil texture and infiltration rates. This work will primarily consist of desktop analyses of existing HSG information, geology maps, and aerial imagery.
- Map existing countywide NRCS land use classifications to the proposed manual cover types and quality level. The proposed cover type information is assumed to remain consistent with the current manual.
- Create countywide spatial CN and infiltration files.

- ◆ Post-process the CN and infiltration files in order to update Figure C-6 in the current manual.

There is not an efficient way to automate the low loss and maximum loss calculation within most hydrologic software. Therefore, the WEST team will develop a script (e.g., Python or Excel VBA) with a simple Graphical User Interface (GUI) that will allow a user to easily enter pre-processed data (e.g., NOAA precipitation, time step, CN, etc.) for generation of the effective rainfall values needed for various hydrology software packages.

ITEM 3. PROVIDE A METHOD TO ANALYZE THE SEDIMENT BULKING FACTOR AND THE RECOMMENDATION FOR WHERE AND WHEN THIS FACTOR SHOULD BE USED

Flood control facilities are typically sized to convey or store flow from a hydrological event with a defined return interval. Because sediment/debris displaces water and contributes to an increase in the volumetric flow rate and flood depth, design flows are sometimes increased beyond the clear-water flow rate to account for the transported sediment/debris; this process is called sediment/debris bulking.

Gaged streamflow data represent the total (i.e., water plus sediment) flow, and therefore do not require additional bulking for sediment when used for flood-frequency analyses. However, when a hydrologic model is used to develop a clear-water design discharge for a given watershed, the peak clear-water flow rate may be multiplied by a factor greater than one (1) to compute a design flow that includes the volumetric contribution of the entrained sediment/debris. This multiplier is known as a bulking factor, and it is equal to the ratio of the bulked discharge to the clear-water discharge.

Portions of San Bernardino County lie within the eastern segment of the Transverse Mountain Ranges, which are known for their high erosion rates and extreme sedimentation events, especially following wildfires. Due to the history of these events, the County has constructed many sediment/debris basins to capture sediment/debris, effectively removing the material from the flow volume and thus reducing downstream impacts. The resulting use of debris basins has enabled basin cleanout data to be paired with storm precipitation and watershed burn data to develop regional regression equations (e.g., Gartner *et al.*, 2014; Gatwood *et al.*, 2000) useful for predicting design sediment/debris yields from undeveloped, mountainous watersheds. The predicted sediment volume can either be used to size sediment/debris basins (removing or reducing the need to bulk downstream flows) or distributed throughout a clear-water storm hydrograph to develop a peak bulked flow for conveyance infrastructure design.

The San Bernardino County Department of Public Works Water Resources Division currently applies a standard bulking factor of two (2) for recently burned watersheds, and the US Army Corps of Engineers Los Angeles District Debris Method is implemented using a spreadsheet tool and used to compute predicted post-fire sediment/debris volumes for sizing basins. Flows are also bulked pre-fire for other undeveloped land without an upstream sediment/debris basin, but bulking factors are selected on a case-by-case basis and there are no standard guidelines.

The WEST team will analyze available studies, geologic maps, and other resources to identify areas within San Bernardino County with elevated sediment/debris hazards, and for which sediment/debris must

specifically be considered in the design hydrology. We anticipate these will include areas with a reasonable probability (e.g., one percent) of post-fire minor and major debris flows, based on recent research by Kean & Staley (2021), and all desert alluvial fans. The result will be a map of the County that identifies high-sediment-hazard areas. We anticipate that any new projects located in the identified high-hazard areas will require planning for sediment in the design hydrology, regardless of the recent burn history.

Next, we will analyze available basin cleanout and watershed data within the County and perform a review of relevant literature to determine an appropriate method for computing a debris yield exceedance frequency relationship for a given watershed, using a coincident frequency analysis and available fire perimeter and National Oceanic and Atmospheric Administration (NOAA) Atlas 14 precipitation data. Using this method, users will be able to compute the n -year sediment/debris yield for a watershed that corresponds to the design hydrologic event. This will be an important contribution of the update: rather than solely plan for sediment hazards when a project is planned immediately following a fire, projects located in high-risk areas will be designed to accommodate a statistically-derived sediment yield event with a defined recurrence interval. We will develop a spreadsheet tool as a standard resource to accompany the Hydrology Manual.

Finally, the WEST Consultants team will develop clear guidance about when and how to plan for sediment in a hydrologic analysis. The following is an example approach:

- All projects located in or immediately downstream of high sediment/debris hazard areas will require planning for sediment hazard mitigation, whether this be design of a sediment/debris basin, design of flood control infrastructure with sufficient capacity to convey n -year peak bulked flows, or a combination of the two. Users will also have the option of adopting a reasonably conservative bulking factor in lieu of completing the analysis.

Sediment hazards will always be considered for projects located in watersheds following a fire, regardless of whether the watershed is in an identified high-hazard area. We anticipate emergency projects designed in the period zero (0) to two (2) years following a fire will conform to a design procedure similar to that used by Federal Burned Area Emergency Response (BAER) teams and State Watershed Emergency Response Teams (WERT), if sediment hazards are not already identified by those groups.

- General design for projects located in an undeveloped watershed that burned two (2) to 10 years prior will also require planning for elevated sediment loading, but will use a similar approach as that for pre-fire, high-hazard areas.

In both the 0 to 2 years and 2 to 10 years cases, an appropriately conservative bulking factor will also be permitted, with the highest bulking factor in the period 0 to 2 years post-fire and an intermediate bulking factor in the period 2 to 10 years post-fire.

ITEM 4. PROVIDE A POST-FIRE HYDROLOGY METHOD

Wildfires can dramatically change the clear-water hydrological response of a watershed to even modest rainstorms. The loss of a vegetative canopy, leaf litter, and duff reduces interception, storage, and

evaporative losses, while burned soils often become hydrophobic, limiting infiltration (DeBano 1981; Cannon et al., 2003; USDA, 2016). This produces increased runoff volumes (USDA, 2016), which arrive at basin outlets more quickly (reduced time of concentration) due to the removal of vegetative obstructions, resulting in larger peak flows. Post-fire runoff also increases proportionally with watershed size (Stoof et al., 2012).

When modeling a post-fire storm event, hydrologists must determine the extent to which clear-water runoff has increased/accelerated due to a loss of vegetation and/or the lack of infiltration due to soil hydrophobicity, then alter one or more runoff modeling components to reflect these changes. This can include adjustments to Curve Numbers (CN), times of concentration, flow travel times, Manning's roughness coefficients, soil infiltration characteristics, and unit hydrographs.

The San Bernardino County Department of Public Works Water Resources Division currently modifies basin hydrological analyses for post-fire watersheds by adjusting the maximum loss rate and low-loss fractions in the burned area, based on a change in the Antecedent Moisture Condition (AMC) from AMC II to AMC III and a corresponding increase in the CN. This is typically done based on knowledge of watersheds and engineering judgment, rather than using a standard process.

The WEST team will review available literature, including several recent studies, to identify appropriate methods for adjusting hydrologic parameters to reflect the impact of fires and subsequent watershed recovery on various physical processes in San Bernardino County watersheds. We anticipate this will mainly focus on adjustments to CN, reflecting a sudden loss of vegetation and increase in soil hydrophobicity, though the research will also determine the appropriateness of adjustments to the shape of the unit hydrograph and other factors. Based on this research, we will develop a simple and standard method for adjusting a given watershed's hydrologic parameters based on the time since the 100 percent coverage burn (with the latter computed using the method described by Gatwood et al. (2000)).

Next the WEST team will develop a process for determining the n -year adjusted clear-water flow value that incorporates the burn frequency of the watershed and rainfall recurrence interval. In general, this will involve the development of time-since-100 percent-watershed-burn frequency relationships and rainfall frequency curves. Based on watershed specific flow rate results from the aforementioned CN adjustments, a combined probability analyses will be performed to generate the n -year clear-water flow.

Finally, the WEST team will develop clear guidance about when and how to adjust clear-water hydrologic computations for watersheds subject to wildfire. We anticipate the following:

- All projects located in or downstream of undeveloped areas subject to wildfire and elevated runoff will require planning for elevated flows due to increased runoff following fire.
- For emergency mitigation projects designed in the period 0 to 2 years following a fire, clear-water design flows will be based on the greater of the following:
 - The modeled runoff for the current, burned condition, using a procedure like that used by Federal Burned Area Emergency Response (BAER) teams and State Watershed Emergency Response Teams (WERT), if runoff is not already estimated by those groups for the burned area

- Runoff modeled using the n -year excess precipitation (computed using a coincident fire/precipitation frequency analysis) and any appropriate adjustments to the unit hydrograph reflecting the n -year fire condition
- ◆ For general (non-emergency) projects located in or downstream of undeveloped areas subject to wildfire, clear-water design flows will be based on the coincident n -year excess precipitation and any appropriate adjustments to the unit hydrograph reflecting the n -year fire condition.

When applicable, users will be required to multiply the design clear-water flow by a sediment bulking factor or add the anticipated post-fire sediment design discharge to the clear-water discharge, to identify the total (bulked) design discharge.

ITEM 5. PROVIDE DIFFERENT METHODS THAT CAN BE USED TO CALCULATE THE LAG TIME FOR THE UNIT HYDROGRAPH METHOD AND THE RECOMMENDATIONS FOR USING EACH METHOD

The current Hydrology Manual Unit Hydrograph (UH) lag time is referred to by some as “Corps lag.” The WEST team has used this lag formula successfully on many projects involving calibration and it is considered one of the best due to the physically based parameters and good results. The estimation of the \bar{n} value is probably the most difficult parameter to estimate accurately; however, the current manual provides adequate guidance on this parameter. In addition to the Corps lag, WEST will provide recommendations for one or two other lag methods and guidance on when (if ever) an alternative to Corps lag is appropriate or recommended.

ITEM 6. THE RECOMMENDATION OF WHEN USING (1) DAY OR (5) DAYS UNIT HYDROGRAPH CALCULATIONS AND PROVIDE DETAILED PROCEDURES FOR BOTH

A one (1)-day hydrograph is often used to represent a high intensity event that is a common cause of flooding and scour damage in urban areas, where the time of concentration is relatively small. In larger watersheds, it can take quite a bit longer to reach the peak flow. Under those circumstances, not only is the peak flow of concern, but the sheer volume of water conveyed by the storm can overflow reservoirs and dams, which can drastically increase the potential for failure. For any jurisdiction responsible for flood safety in a large area, the five (5)-day hydrograph can be an essential computation.

Detailed computational procedures for development of a 5-day hydrograph is not entirely obvious; extrapolation of the 24-hour hydrograph may not be appropriate or computationally simple (at least by hand). Research conducted as part of this task will consider the 5-day hydrograph's applicability to various conditions, best assumed antecedent conditions, and how that may change the magnitude and shape of the hydrograph.

ITEM 7. THE PROCESS AND CALCULATIONS FOR THE MAXIMUM LOSS RATE, AND THE LOW LOSS FRACTION FOR (5) DAYS UNIT HYDROGRAPH.

In the approach for Item 2, a procedure is discussed to calculate (and automate) the low loss and maximum loss. The low-loss procedure will be applicable to the 5-day unit hydrograph calculations, but with two important considerations:

1. Antecedent moisture condition (AMC) as applied to the 5-day hydrograph will need to be revised. Currently, the AMC is based solely upon the return storm event (e.g. AMC I for the 2-year and 5-year storm, etc.). It is also understood that soil will become saturated given a long rainfall event. Hence there is a disconnect: A 2-year storm, 5-day hydrograph is to use an AMC I value for computation, but by the end of the storm the ground will potentially be saturated at the AMC III value. It also cannot simply be assumed that the 5-year storm always has an AMC III condition throughout the event, as this may grossly overestimate the volume of water, and hence lead to poor decisions regarding flooding potential, dam operation, evacuation requirements, among other ramifications. This factor will be evaluated, and recommendations made as part of the project.
2. As part of this task, the loss rates will be analyzed and then potentially adjusted to consider the 5-hour storm parameters.

ITEM 8. THE RECOMMENDATION OF WHEN TO USE REDUCTION FACTORS FOR RAINFALL DATA WITH THE UNIT HYDROGRAPH

Rainfall reduction factors or, as they are commonly called, Depth Area Reduction Factors (DARF), are routinely used to convert a point estimate of rainfall depth for a given duration and frequency to an aerial estimate of rainfall depth of the same duration and frequency. The intent of DARF is to provide an appropriate uniform distribution of rain over the target watershed area for hydrologic design.

WEST personnel have developed a rigorous approach to DARF development through multiple recent large-scale studies of the geometric properties of storms in the United States. Curtis et. al., (2011) developed DARFs for eastern Colorado. The results were subsequently incorporated into design manuals for the City of Colorado Springs and for the Mile High Flood Control District in Denver. WEST Consultants and Applied Weather Associates (2021) developed DARFs across a spectrum of basin sizes and durations for the entire state of Arizona. Similarly, WEST Consultants led a research team that included the University of Texas, Arlington, Texas A&M University, and Rice University to develop DARFs across the state of Texas. (Curtis et. al., 2022). These studies collectively evaluated the geometric properties of approximately 500,000 individual storm cells to form the foundation for probabilistically defining DARFs. The DARF studies led by WEST personnel represent three of the most pre-eminent DARF studies in the southwestern US.

Figure 4 on the following page illustrates the procedure used in the referenced studies. First, gridded radar-rainfall images were analyzed, and areas of rainfall were identified as storm cells. Next, an ellipse was fit to each identified storm cell area of significant rainfall. For each ellipse, several properties were

identified including shape (ratio of long axis to short axis), area of each ellipse, peak intensity within each ellipse, the distribution of intensities, and the ellipse orientation (angle of long axis from north). Speed and direction were also studied. The collection of storm cell properties was used to create an idealized storm cell shape as shown in the lower right corner of **Figure 4**.

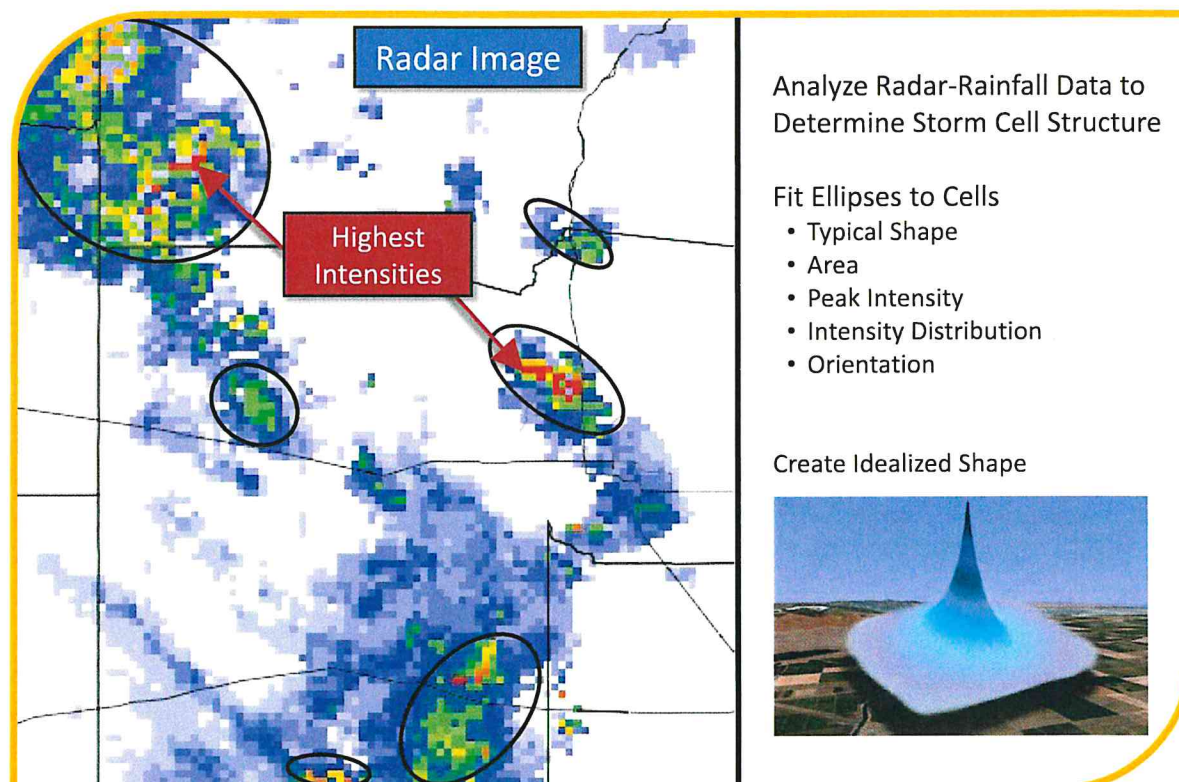


Figure 4: Analysis of Geometric Properties of Storms

WEST understands the challenges of complex terrain for radar coverage in the region to develop DARFs, especially over an area as large as San Bernardino County. WEST overcame similar challenges in the complex terrain of Colorado, the rugged arid Arizona environment, and the wide variety of conditions faced across the state of Texas.

The WEST team will develop DARFs for San Bernardino County leveraging methods, tools, and expertise developed for the referenced studies in Colorado, Arizona, and Texas. WEST will evaluate DARFs using multiple methods (i.e., geographically fixed, and storm-centered). Duration, return period, and watershed scale will be considered. WEST will also consider regionalization or zones if DARFs are found to significantly vary across the County or as a function of storm type.

WEST's approach will provide San Bernardino County with realistic DARFs that appropriately reflect the region's hydroclimatology in the County's hydrologic design procedures. WEST will provide the necessary charts, curves, tables, and/or tools needed to effectively use DARF in the County's design procedures and make recommendations for their application.

ITEM 9. THE ABILITY TO USE THE TECHNIQUE OF PRECIPITATION ZONE NUMBERS (PZN), ARC HYDRO APPLICATION (GIS FOR WATER RESOURCES), HEC-HMS SOFTWARE AND/OR DEVELOP NEW SOFTWARE WITH DETAILED PROCEDURE FOR HOW TO IMPLEMENT IN THE UPDATED HYDROLOGY MANUAL

The WEST team does not recommend adopting Precipitation Zone Numbers (PZN) as part of this project. Developing this procedure in a meaningful way would involve the analyses of a significant amount of data, which would be best as a separate project. If developing PZN zones is a District goal for this project, procedures will be described to implement this strategy and zones will be developed using available data, but our assumption is that new data would not be gathered by the WEST team for this purpose. The WEST team fully supports the concept for the updated Hydrology Manual to encourage the use of the Arc Hydro application and HEC-HMS software. As discussed in Item 2, WEST recommends developing a simple script (e.g., Python or Excel VBA) to accomplish the low loss and maximum loss calculation. The WEST team will provide the complete procedure for calculating the loss and entering the effective rainfall (after losses) into HEC-HMS.

ITEM 10. PROVIDE RELATION CURVES AND/OR EQUATIONS BETWEEN DIFFERENT RETURN FREQUENCIES

Provided NOAA 14 proves to be a viable tool for San Bernardino County hydrology (see Item 1), the NOAA 14 easily accessible “point and click” website automatically provides tables and curves relating precipitation depths, duration, and return frequencies (DDF). **Figure 5** below shows a portion of a DDF table for a location in San Bernardino County. DDFs are provided for 1-1,000-year frequencies and 5-minute to 60-day durations. A corresponding set of DDF curves are shown in **Figure 6** on the following page.

POINT PRECIPITATION FREQUENCY (PF) ESTIMATES

WITH 90% CONFIDENCE INTERVALS AND SUPPLEMENTARY INFORMATION
NOAA Atlas 14, Volume 6, Version 2

PF tabular

PF graphical

Supplementary information

[Print page](#)

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.101 (0.084-0.123)	0.133 (0.111-0.162)	0.176 (0.146-0.214)	0.210 (0.173-0.259)	0.258 (0.205-0.328)	0.295 (0.229-0.383)	0.332 (0.252-0.443)	0.371 (0.273-0.509)	0.425 (0.300-0.608)	0.466 (0.318-0.691)
10-min	0.145 (0.121-0.176)	0.191 (0.159-0.232)	0.252 (0.209-0.307)	0.302 (0.248-0.371)	0.370 (0.294-0.470)	0.422 (0.328-0.549)	0.476 (0.361-0.635)	0.532 (0.392-0.730)	0.609 (0.430-0.871)	0.668 (0.455-0.991)
15-min	0.176 (0.146-0.213)	0.231 (0.192-0.281)	0.305 (0.253-0.371)	0.365 (0.300-0.448)	0.447 (0.355-0.569)	0.511 (0.397-0.664)	0.576 (0.437-0.768)	0.644 (0.474-0.863)	0.736 (0.519-1.05)	0.808 (0.551-1.20)
30-min	0.260 (0.217-0.316)	0.343 (0.285-0.417)	0.452 (0.375-0.551)	0.541 (0.445-0.665)	0.663 (0.527-0.843)	0.758 (0.589-0.985)	0.854 (0.648-1.14)	0.955 (0.703-1.31)	1.09 (0.771-1.56)	1.20 (0.817-1.78)

Figure 5: Example depth, duration, frequency table for a location in San Bernardino County from NOAA 14.

NOAA 14 also provides gridded rainfall maps for all frequencies and durations, for the median, low (5%) and high (95%) confidence intervals. These maps can be used within an automated tool to extract the

precipitation value for the desired duration and return period. That information is preferable over relation curves or equations, since they reflect the exact estimates obtained by NOAA 14.

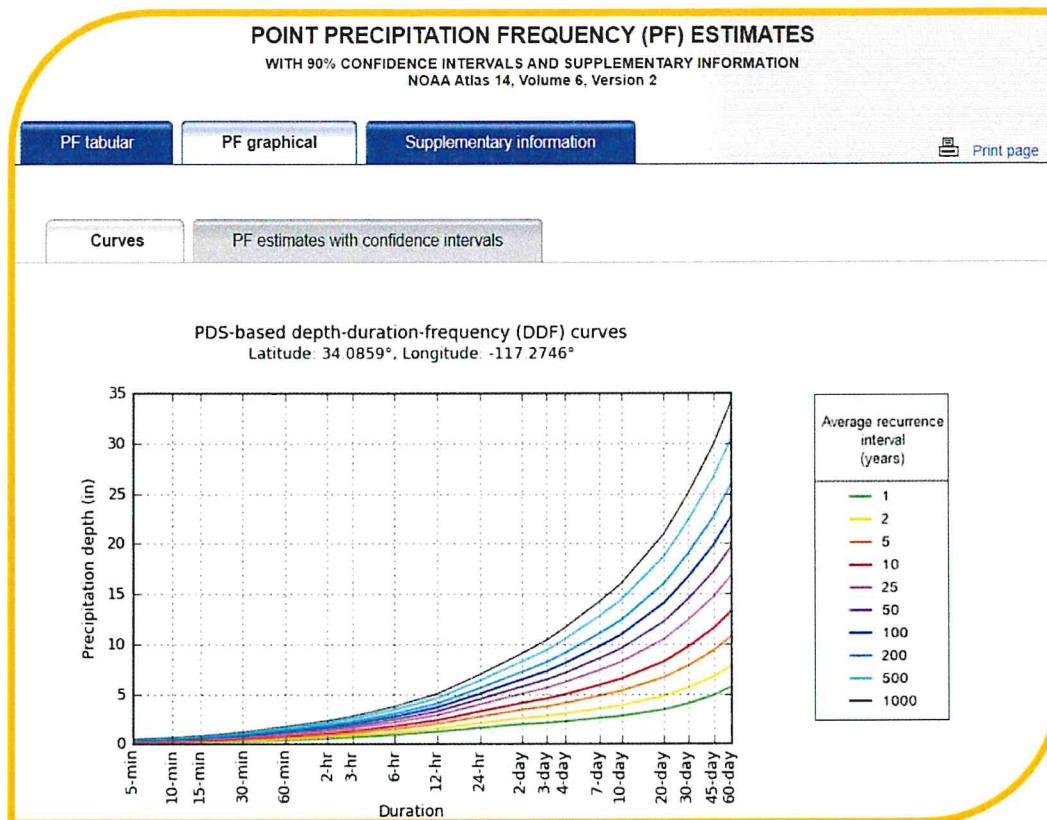


Figure 6: Example DDF curves from NOAA 14.

WEST developed a graphical user interface tool for the Flood Control District of Maricopa County, AZ, that extracts precipitation frequency for different return periods and durations based on information provided by the user (e.g., a shapefile with a polygon for a specific basin, or coordinates). The tool also selects the most appropriate depth area reduction factor (DARF) based on the size of the project area. An example of one of the tool outputs is shown in **Figure 7** on the following page.

For the cases when automated systems cannot be used, WEST can develop relationships or tables used to manually calculate design rainfall. While uncertainties will always be added by that simplification, these relationships can be determined based on specific characteristics that control extreme precipitation, for example, topography, or distance to the coast. WEST's experienced hydrometeorologists have the expertise to fit these relationships, without adding undesired uncertainties.

Should NOAA 14 be found inappropriate for use in San Bernardino County, WEST will make recommendations for alternative methods to produce DDF tables and curves.

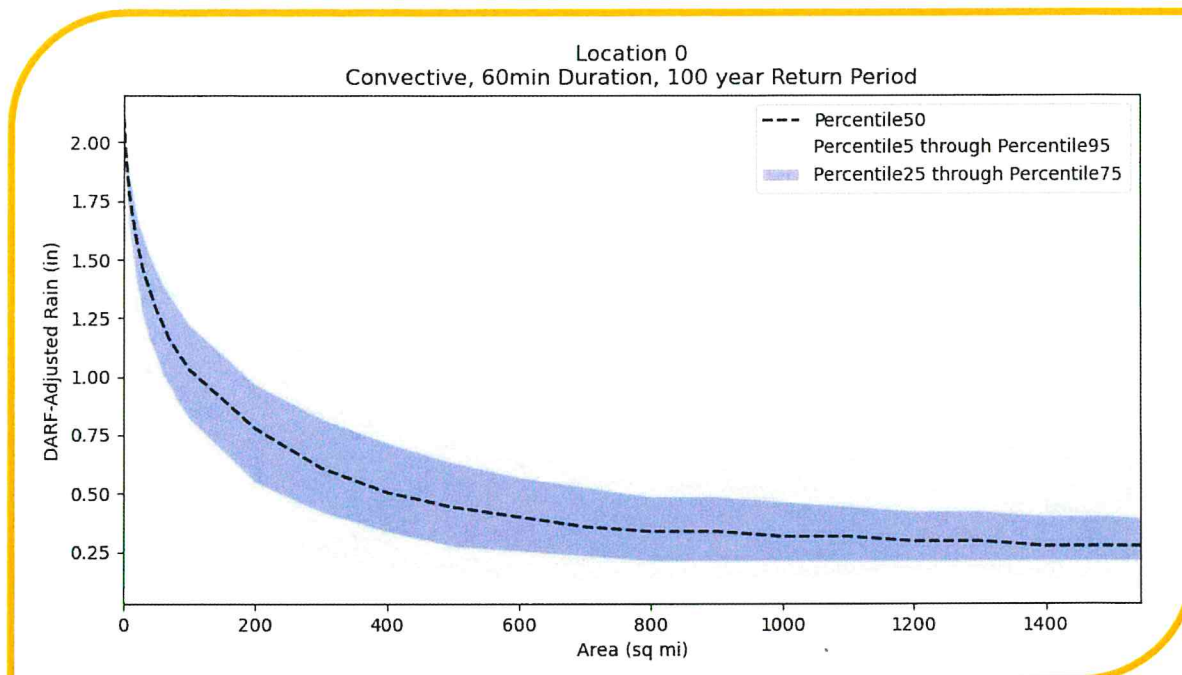


Figure 7: One of the outputs of the tool created for the Flood Control District of Maricopa County, AZ, showing the depth-area-reduction-factor (DARF) Adjusted 60-minute, 100-year rainfall values with uncertainty.

ITEM 11. ALL THE HYDROLOGY ANALYSES SHALL BE SIMPLE (I.E., THE ABILITY TO DO HAND CALCULATIONS) AND PROVIDE DETAILED EXAMPLES FOR EACH METHOD SHOWING THE HYDROLOGY MAP, AND DETAILED HAND CALCULATIONS

WEST understands there are many users of the Hydrology Manual within the District and some that are not familiar with hydrologic software. The ability for hand calculations will be preserved (especially for Rational Method calculations, where appropriate). One idea for the District to consider is adopting a "Hydrology Manual Spreadsheet" that provides needed hydrologic forms and calculations as clearly labeled Excel tabs. There is also a potential to incorporate the scripts discussed in other sections (e.g., Item 2 and 3) potentially 4 into this spreadsheet. The benefit would be that any calculation needed for compliance with the Hydrology Manual would be completed in that single document with pre-formatted forms and the ability to expand as needed to accommodate both large and small projects. A single spreadsheet concept for calculations would also simplify District reviews.

ITEM 12. PROVIDE A LIST OF THE APPROVED COMPUTER SOFTWARE THAT MATCHES THE NEW UPDATED HYDROLOGY MANUAL PROCEDURE AND CAN BE USED IN ANY HYDROLOGY ANALYSIS

As discussed in Item 11, the WEST team recommends considering a single spreadsheet for all calculations needed for compliance with the updated Hydrology Manual. After those calculations are completed, model input data could be imported to HEC-HMS or other similar software packages. The WEST team can include a list of software packages we have seen and used in the past, however, our intent will be to create a process that will be widely applicable to hydrologic software, including less frequently used software packages that may be preferred by some users.

ITEM 13. PROVIDE AN UPDATE ON THE DETENTION BASIN DESIGN CRITERIA MEMO AND TO BE INCLUDED IN THE NEW UPDATED HYDROLOGY MANUAL

The current Hydrology Manual included an overview of detention design, but detailed aspects were published in a separate 1987 memorandum titled "Detention Basin Design Criteria for San Bernardino County" (SBCFCD & SBCLMD, 1986). The scope of work here includes both the Hydrology Manual and the Detention Basin Design Criteria for San Bernardino County (referred to hereafter as the 'Criteria'), with the Criteria remaining a separate entity.

The separation of the Criteria from the Manual is somewhat misleading, since detention basin design requires nearly all hydrologic factors included in the Manual to be considered, including precipitation, infiltration, bulking, hydrograph development, flow routing and hydraulics, sediment transport, scour, environmental impacts, and others. Hence, it is critical that an update to the Criteria be consistent with related areas in the Hydrology Manual.

The Criteria must also recognize that detention basin design relies upon subject matter experts outside of hydraulics and hydrology. This expertise is required to effectively meet the detention related geotechnical investigations, bank stability design, and structural analysis of the numerous supporting appurtenances such as reinforced concrete spillways and retaining walls. The latter would require a specialized foundation design by geotechnical experts that takes into consideration both soil factors and flow dynamics (Travis, Kandar, & Wahlin, 2018). Also, roadway design is often needed to ensure access to the basins to allow removal of debris, and so transportation engineers may also be required.

The WEST team will identify the aspects of the Criteria that remain accurate and relevant today. The current Criteria includes guidance in several areas that was sophisticated and forward thinking, and arguably remains the best approach even today. There are also areas that deserve a more complete treatment and implementation of updated information, improved procedures, and new or improved applicable software. These areas include:

- ◆ Requiring design to consider return storms that span from the 2-year to the 100-year. It is common for older manuals to fail to recognize the importance of more frequent events. As an example, the Pima County Hydrology Manual considered only the 100-year flow until recently, when it was updated to include proper consideration of the full spectrum of flows, which improved accuracy of the procedure (Travis, 2018). Of direct relevance for multiple storm returns are mixed-use basins that may attempt to improve water quality, water supply, flood protection, debris capture and other factors. Although multi-use basins were largely overlooked as a design focus until the late 1980's, there are now many items in the literature on these systems.
- ◆ The Criteria includes analysis of the timing of other detention basins within an overall system. In 1986 work regarding how to analyze and optimize this system had only just been published (Bennett & Mays, 1985), and it took another twenty years to extend this work to consider retention basin networks as well – a configuration that allowed consideration of detention basins with low outflow (Travis & Mays, 2008). This area of the Criteria can be expanded further given work on overflow systems that also work as flow measuring devices, and estimation of debris accumulation and how it propagates through a detention basin network.
- ◆ Vortex prevention devices, such as those required in the Criteria, can be critical components, since vortex formation remains difficult to predict, even utilizing the most advanced techniques. [Travis & Mays (2011) & (2012)]. For perspective, there are myriad research papers published on this subject since 1986 which will need to be considered as part of the update.
- ◆ The Criteria takes particular note of the impact of burned watersheds on debris magnitude, an overlooked aspect of detention basin design at the time of writing. However, since the Criteria was developed other adverse effects of runoff from burned watersheds have been determined and efforts made to update current manuals accordingly. These adverse effects include higher runoff, non-Newtonian flow characteristics, and even direct changes to the fundamental structure of the impacted soil (Travis, Teal, & Gusman, 2012). Research has also considered inherent increases in prediction risk following fires (Travis & Wahlin, 2012) and regression equations to predict stormflow have been developed based upon previously overlooked or minimized watershed characteristics (Wilder, et al., 2021). Coordination with effort conducted as part of Items 3 and 4 will be necessary here.
- ◆ Determining debris-storage requirements for detention basins is an essential aspect to the detention design requirements listed in the original Criteria. In particular, the Criteria states that the engineer is to use the information found in Tatum (1963) to guide design. Tatum's work was ground-breaking, but research has now moved significantly past this oft-cited work. Among other applicable and more recent research that will need to be considered includes work by Gartner, Cannon, and Helsel (2008). Their publication is relevant because it includes specific consideration of San Bernardino County and adjacent regions in southern California, even using a picture of debris deposition in San Bernardino County as the cover picture.



Figure 8. Debris deposited in San Bernardino County.

Another aspect of the Criteria update is to include new advances in modeling, whether it be by hand or by software. Indeed, since the original publication of the Criteria, computer modeling has advanced greatly. These improvements range from complex Computational Fluid Dynamics (CFD) to new simplified methods. In addition, entirely new modeling opportunities have become available, such as the ability to perform simplified risk analyses of relevant aspects such as bank collapse [Travis, Schmeeckle, & Sebert (2011a), (2011b)].

Given the need to provide solution algorithms that can be calculated by hand, it is recommended that the presented procedures be included in an accompanying Excel workbook (or equivalent) exactly as presented in the Criteria. This workbook could also facilitate County review of submitted material. Among other uses, this Excel file could provide the following algorithms, including:

- ◆ Anti-vortex design (limited)
- ◆ Compound weir computation
- ◆ Convex channel routing
- ◆ Debris-storage volume estimates
- ◆ Detention geometry (area-depth)
- ◆ Inflow hydrograph generation
- ◆ Modified Puls
- ◆ Seismic Seiche per UBC Chapter 70
- ◆ Simple routing systems
- ◆ Spillway hydraulics

The presentation of each of these key analytical procedures would be provided within Excel the same way one might proceed by hand. The table approach to computation, already prevalent in the Criteria, is well suited for direct implementation into an Excel worksheet; (Table F-1 on page F-4 is one example). This implementation can include nomographs, referenced figures, etc., without difficulty, as the WEST team has extensive experience incorporating these and other visual based analytical tools into Excel. This experience has been contributed to the engineering community at large - examples include Travis, (2011) Travis, Wahlin, & Piotrowski (2017); Travis, (2014); and Travis, Wahlin, & Miller (2018) – as well as deliverables to governmental entities and private clients. Examples of the latter include:

- ◆ 1-D flow irrigation routing prediction, Salt River Project (SRP), 2018
- ◆ Database Interface for Rapid Population Of Data For The VIPER Workbook, United States Bureau of Reclamation (USBR), 2013
- ◆ Detention flow routing, Mohave County Flood Control District (MCFCD), 2015

- ◆ Detention pond evaporation, Anonymous mining company, 2013
- ◆ Groundwater dynamics, New Mexico Interstate Stream Commission (NMISC), multiple years
- ◆ Sediment transport, Flood Control District of Maricopa County (FCDMC), multiple years

ITEM 14. OTHER SUGGESTIONS BASED ON CURRENT INDUSTRY STANDARDS AND EXPERIENCE

Although not specifically mentioned in the RFP, climate change is an issue that cannot be overlooked. Updated hydrology standards may be in place for the next 25 to 50 years and will likely be impacted by the changing climate. In California, climate change impacts on design accrue due to a very strong natural variability signal in California's climate which, at times, may amplify or mitigate anthropogenic climate forcings. With the rapidly accumulating evidence that DDFs are being influenced by a changing climate, San Bernardino County would be remiss if climate change impacts on precipitation were not given serious thought.

The WEST team has broad experience working with a wide range of issues regarding climate change including serving the California Department of Water Resources (DWR) Climate Change Technical Advisory Group, evaluating climate change impacts of drought contingency planning for reservoir operations with the Sacramento District of the US Army Corps of Engineers and the Middle Rio Grande Conservancy District, and conducting an expert peer review of a California DWR commissioned study of the changing flood risk in California's Central Valley.

WEST recently provided DDFs for the updated Sacramento County Hydrology Manual based on climate changes projected using downscaled data from global climate models (CMIP5). The results show up to a 70% increase in precipitation with short duration (hourly) and high return period (larger than 100-year), and an increase of approximately 10% for durations larger than a day for all return periods. The ratio between projected DDF and observed DDF for Sacramento for multiple durations and return periods are shown in **Figure 9** above. Similarly, WEST is accounting for the impact of projected climate changes on design storms in Texas and on the development DARFs in Arizona.

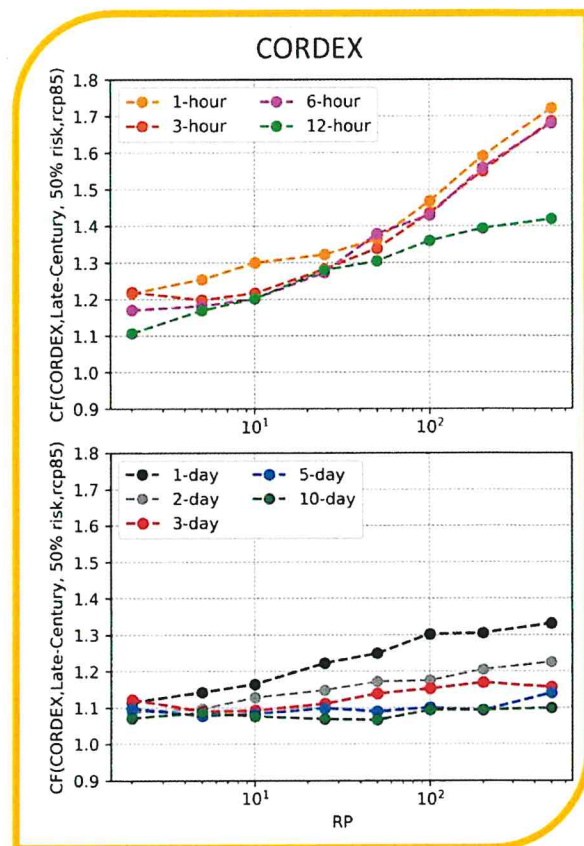


Figure 9: Ratio between projected and observed Depth Duration Frequency curves.

The next generation of downscaled climate model data (CMIP6) is becoming available. CMIP6 models reflect the most recent weather and climate modeling technology and offer much better resolution than prior generations. Higher resolution models are important for regions with complex terrain like San Bernardino County. Some CMIP6 data subsets are available now. Complete CMIP6 data sets for California should be available in early 2023.

DDFs provided by NOAA 14 do not account for a changing climate. Furthermore, NOAA 14 does not include the most recent data. This raises two key questions:

1. Are trends already present in the observed data set which hint at future trends?
2. Is climate change altering the depth, duration, frequency relationships that are so critical for hydrologic design?

A further complicating factor is the pending development of a successor to NOAA 14 which is tentatively titled NOAA 15. NOAA 15 will leverage the most recent data, newer statistical approaches, and consider the impact of climate change on DDFs. Work is in the very preliminary stages for this nationwide effort with no guarantee on the timing of functional deliverables, particularly for southern California. It may be at least three to five years before a finished NOAA 15 project is available.

What is clear is that eventually there will be a NOAA 15 with climate change informed DDFs. It would be prudent for San Bernardino County to consider how best to navigate the transition from a hydrology manual update that considers climate change to a NOAA 15 based manual. Preparing a thoughtful transition will minimize costs for the next manual update.

ITEM 15. THE IMPACTS OF REVISED METHODOLOGY ON EXISTING STUDIES/PROJECTS

This item is proposed to be addressed by selecting up to three (3) hydrology studies which implemented various components (e.g., UH calculations) of the current Hydrology Manual. The WEST team will then selectively update the included calculations using the proposed revised methodology. A brief quantitative and qualitative analyses will be conducted to present potential impacts of the revised methodology. The WEST team will coordinate with the District regarding particular preferences and/or concerns prior to completing this task to ensure this item is adequately addressed.

ITEM 16. ANY ADDITIONAL WORK REQUIRED AND/OR RECOMMENDED BY THE DISTRICT COMMITTEE

WEST assumes a level of effort for this item comparable to updating a single average chapter. Significant additional work may need to be scoped separately if budgeted hours are inadequate to complete the task.

TASK 2. TAC MEETINGS

After completing the initial research for Task 1A, WEST recommends holding the first TAC meeting as soon as possible to obtain input from the engineering community for the updated Hydrology Manual. Subsequent

TAC meetings will occur as described in the scope of work. WEST has assumed the TAC meetings will occur in person, but significant savings may result if an online meeting venue is preferred by the District. An online venue may also result in more participation from the engineering community and controls can be implemented to limit microphone/video privileges in a manner to keep the meeting on schedule and on topic.

TASK 3A. MANUAL REVISIONS – COMPILE COUNTY COMMITTEE

This task will be completed as described in the scope of work.

TASK 3B. MANUAL REVISIONS – HYDROLOGY MANUAL REVISIONS

This task will be completed as described in the scope of work.

TASK 4. DRAFT AND FINAL MANUAL SUBMITTALS

This task will be completed as described in the scope of work.

TASK 5. PRESENTATIONS TO THE DISTRICT COMMITTEE

This task will be completed as described in the scope of work.

EXHIBIT 2
Fee Schedule

(Attached behind this cover page)



11440 West Bernardo Court
Suite 360
San Diego, CA 92127-1644
(858) 487-9378
(858) 487-9448 fax

CLIENT/JOB NAME

San Bernardino County
Hydrology Manual Update

		FY22 Rates					
		Hourly Rate	Vice President 281.00	Project Manager 253.00	Senior Engineer 195.00	Staff Engineer 133.00	Engineering Technician 107.00
							Total Task Hours
							CCST
A. LABOR COSTS							
TASK No.	DESCRIPTION						
1	Background Research						
1A	(a) Kickoff meeting	4	4	4			12
	(b) Obtain and review Hydrology Manual information	4	16	85	15		121
	(c) Compile comments and proposed resolutions	8	24	56	32	8	128
	(d) Identify additional work from the previous Hydrology Manual to be reviewed/confirmed	5	15	40	24	8	54
1B	(e) Update Hydrology Manual with NOAA Atlas 14 data methodology	2	10	44	16	4	76
	(f) Update with NRCS website to determine soil groups; suggest different method when missing	12	48	116	64	64	324
	(g) Update method to analyze Sediment Bulking factor and when/where to use it	8	30	125	56	2	221
	(h) Provide a post-fire hydrology method to calculate runoff after a fire	2	36	170	4	2	214
	(i) Provide different methods for calculating lag time for UH method and recommendations for each	6	20	32	12	2	72
	(j) Recommendations for when to use (1) day or (5) day UH and detailed procedures for each	2	40	20	20	80	162
	(k) Process and calculations for the maximum loss rate and low loss fraction for (5) day UH	2	20	40	16	20	98
	(l) Recommendation when to use rainfall reduction factors for rainfall data with the UH and procedure	2	12	96	28	4	142
	(m) Ability to use PZM, ArcHydro, HEC-HMS, and/or develop new software	4	10	16	12	2	44
	(n) Provide relation curves and/or equations between different return frequencies	4	14	40	16	4	78
	(o) Provide detailed examples for each method showing the hydrology map and detailed hand calcs	4	10	16	12	2	44
	(p) Provide list of approved computer software that matches the updated Hydrology Manual	4	10	16	12	2	44
	(q) Provide update on the Detention Basin Design Criteria memo to include in Hydrology Manual	5	40	120	40	100	308
	(r) Other suggestions based on current industry standards and experience	2	14	92	24	22	154
	(s) Impacts of revised methodology on existing studies/projects	6	26	120	32	6	190
	(t) Additional work required and/or recommended by the District Committee	4	22	60	40	8	134
	(u) Meeting with the District Committee to discuss findings	16	25	24	8		74
	(v) Submit final results to District	8	20	48	16	8	102
	Subtotal	118	468	1380	500	368	2834
2	TAC Meetings						
	(a) 3 weeks prior to Meeting 1, distribute agenda, request comments for previous studies	12	28	36	8		89
	(b) Facilitate Meeting 1, prepare meeting minutes, update comment resolution	12	16	30	8		66
	(c) 3 weeks prior to Meeting 2, distribute comment spreadsheet, agenda, request comments for applicable sections	12	28	47	8		95
	(d) Facilitate Meeting 2, prepare meeting minutes, update comment resolution	12	16	43	8		79
	(e) 3 weeks prior to Meeting 3, distribute comment spreadsheet, agenda, request comments for applicable sections	12	28	47	8		95
	(f) Facilitate Meeting 3, prepare meeting minutes, update comment resolution	12	16	43	8		79
	(g) 3 weeks prior to Meeting 4, distribute comment spreadsheet, agenda, request comments for applicable sections	12	28	47	8		95
	(h) Facilitate Meeting 4, prepare meeting minutes, update comment resolution	12	16	43	8		79
	(i) 3 weeks prior to Meeting 5, distribute comment spreadsheet, agenda, request comments for applicable sections	12	28	38	8		86
	(j) Facilitate Meeting 5, prepare meeting minutes, update comment resolution	12	16	30	8		66
	(k) 3 weeks prior to Meeting 6, distribute comment spreadsheet, agenda, request comments for applicable sections	12	28	38	8		86
	(l) Facilitate Meeting 6, prepare meeting minutes, update comment resolution	12	16	30	8		66
	Subtotal	144	264	474	96	0	978
3	Manual Revisions						
3A	(a) <time included in Task 2 for meeting minutes and comments spreadsheet updates>						0
3B	(b) Revise Manual for Chapter A	2	8	12	4		26
	(c) Revise Manual for Chapter B	8	20	74	48	12	162
	(d) Revise Manual for Chapter C	8	20	124	92	8	252
	(e) Revise Manual for Chapter D	8	20	116	24	8	176
	(f) Revise Manual for Chapter E	8	20	214	80	8	330
	(g) Revise Manual for Chapter F	8	20	50	32	8	118
	(h) Revise Manual for Chapter G	4	16	12	6	8	46
	(i) Revise Manual for Chapter H	8	20	42	6	8	84
	(j) Revise Manual for Chapter I	4	16	12	6	8	46
	(k) Revise Manual for Chapter J	4	20	16	8	8	56
	(l) Revise Manual for Chapter K	8	20	48	20	8	104
	(m) Revise Manual for new Chapter (L)	8	20	50	23	8	149
	(n) Revise Manual for new Chapter (M)	8	20	120	38	8	191
	Subtotal	66	240	930	387	100	1743
4	Draft and Final Manual Submittals						
	(a) Submit Task 1 deliverable via email	1	1				2
	(b) Prepare 2 paper copies of draft manual	1				4	5
	(c) Prepare 2 paper copies of final manual	1				4	5
	(d) Prepare navigable/linkable table of contents, list of figures, list of tables (draft)	1			4		5
	(e) Prepare navigable/linkable table of contents, list of figures, list of tables (final)	1			4		5
	(f) Submit Task 5 deliverable via email	1	1				2
	Subtotal	2	6	0	8	8	24
5	Presentations to the District Committee						
	(a) Prepare PowerPoint presentation of final Hydrology Manual and handout with summary of changes	8	32	67	24	8	139
	(b) Present presentation to District Committee	8	8	14			30
	Subtotal	16	40	81	24	8	169
TOTAL HOURS		365	1,018	2,855	1,015	484	5,748
TOTAL LABOR COST							\$1,102,804
B. DIRECT COSTS							
							COST
Mileage (7 trips to San Bernardino)				1204	x Rate	0.625	= 753
Direct Costs (SME travel, shipping, research articles, meals)							= 2800
River Focus direct costs (mileage, meals, research articles)							= 885
Ted Hromadka and Troy Walker Engineering (senior advisor time)							= 34,000
TOTAL DIRECT COST							\$38,438
TOTAL FOR ALL TASKS							\$1,141,242