Council Meeting of
November 23, 2010

Honorable Mayor and Members
of the City Council
City Hall
Torrance, California

Members of the Council:

SUBJECT: Public Works – Approve Third Amendment for the NPDES Storm Drain Master Plan Agreement. Expenditure: $14,900

RECOMMENDATION

Recommendation of the Public Works Director that City Council approve a Third Amendment to Consulting Services Agreement C2009-240 with Carollo Engineers, in the amount of $14,900, for a total not to exceed amount of $303,763, to prepare a Monitoring and Reporting Plan for Machado Lake Toxics Stormwater Regulations.

Funding

Funding is available from CIP No. I-98 Storm Drain Master Plan Update.

BACKGROUND

The City of Torrance awarded Consulting Services Agreement C2009-240 to Carollo Engineers on December 22, 2009 for an amount not to exceed $253,292 for the development of a citywide National Pollution Discharge Elimination System (NPDES) Storm Drain Master Plan. The purpose of this plan is to update the previous Storm Drain Master Plan and to provide steps and cost estimates for compliance with the future NPDES permit and existing and future Total Maximum Daily Loads (TMDL) storm water quality regulations. The plan will consider multi-benefit solutions to provide both adequate flood control and compliance with water quality regulations simultaneously, with an emphasis on utilizing the City's existing detention basins for dry-weather runoff infiltration.

Upon reviewing the Agreement, Carollo Engineers requested changes to the Indemnification Clause and to clarify items of the Scope of Work. This amendment was approved by City Council on April 13, 2010.

One of the first tasks of the NPDES Master Plan was to update the City's storm drain hydraulic model. Upon review by Carollo Engineers, it was determined that the City's old hydraulic model was not usable and it was recommended that the City of

Torrance use a GIS based hydraulic model that would be compatible with Los Angeles County's hydraulic model. Water quality data is obtained from the County's model.

Carollo Engineers reviewed several software systems with staff and recommended the City use XP-SWMM as the most user friendly and cost effective software that is also compatible with Los Angeles County's hydraulic model. The City of Torrance has four distinct watersheds, which are the Dominguez Channel, Santa Monica Bay, Machado Lake, and the Bishop Montgomery, Del Amo and Ocean retention basins. Watershed areas for the City's retention basins and Santa Monica Bay were not included in the GIS update or hydraulic model. The City retention basins have no outlets to any receiving water bodies and therefore are already considered as stormwater treatment systems. Stormwater from the Santa Monica Bay watershed is proposed to be treated by improvements to the Amie, Henrietta and Entradero basin improvements, included in the Stormwater Basin Enhancement Program.

On May 25, 2010 the City Council approved a second amendment for $35,571 to update the City's GIS storm drain data to make it compatible with the hydraulic model software and to set up the hydraulic model. This increased the contract not-to-exceed amount from $253,292 to $288,863.

The Los Angeles Regional Water Quality Control Board is required by Consent Decree to develop and adopt a series TMDLs for Los Angeles County by March 24, 2012. Currently the City of Torrance is required to comply with the Santa Monica Bay Beaches Bacteria TMDL, the Machado Lake Trash TMDL and the Machado Lake Nutrient TMDL. On September 2, 2010 the Los Angeles Regional Water Quality Control Board adopted the Machado Lake Toxics TMDL. Future TMDLs being developed that will impact the City of Torrance are Santa Monica Bay Trash TMDL, Dominguez Channel Ammonia TMDL, Dominguez Channel Bacteria TMDL and Dominguez Channel Toxics TMDL.

ANALYSIS

The Scope of Work for the NPDES Storm Drain Master Plan included as the first task for Carollo Engineers to prepare the Monitoring and Reporting Plan for the Machado Lake Nutrient TMDL. All TMDLs start by requiring the local agencies to prepare a Monitoring and Reporting Plan to document the level of pollution coming from that agency. Carollo Engineers completed the Machado Lake Nutrient TMDL Monitoring and Reporting Plan and will use the same maps and monitoring locations for Machado Lake Toxics TMDL Monitoring and Reporting Plan. Their fee of $14,900 is very reasonable and reflects the cost savings from using maps and monitoring locations from the last plan. For comparison, the cost for the Santa Monica Bay Beaches Bacteria TMDL Monitoring and Implementation Plan was $64,755, the cost of the Machado Lake Nutrient TMDL Monitoring Plan was $23,000, and the cost for the Machado Lake Trash TMDL Monitoring Plan was approximately $20,000.

The NPDES Storm Drain Master Plan will address the compliance for all TMDLs. When that contract was awarded the only TMDL that we could include in the Scope of Work was the Machado Lake Nutrient TMDL. The requirements for the Monitoring and Reporting Plans for each TMDL are dependent on the pollutant of concern and are not finalized until the Los Angeles Regional Water Quality Control Board adopts the TMDL. Therefore, the Scope of Work and fee for this and future Monitoring and Reporting Plans can not be developed until the Los Angeles Regional Water Quality Control Board adopts the TMDLs.

Respectfully submitted,

ROBERT J. BESTE
Public Works Director

By John Dettle, P.E.
Engineering Manager

CONCUR:

Robert J. Beste
Public Works Director

LeRoy J. Jackson
City Manager

Attachments: A. Amendment No. 3 to C2009-240
B. Consulting Services Agreement, C2009-240
C. Amendment No. 1 to C2009-240
D. Amendment No. 2 to C2009-240

ATTACHMENT A

THIRD AMENDMENT TO AGREEMENT (C2009-240)

This Third Amendment to Agreement is made and entered into as of November 23, 2010, by and between the CITY OF TORRANCE, a municipal corporation ("CITY"), and Carollo Engineers, Inc., a Delaware corporation ("CONSULTANT").

RECITALS:

A. CITY and CONSULTANT entered into an Agreement as of December 22, 2009, whereby CONSULTANT agreed to provide services for the development of a National Pollution Discharge Elimination System (NPDES) Master Plan.

B. City and CONSULTANT approved a First Amendment to the Agreement as of April 13, 2010, for changes in the Agreement's indemnification clause.

C. The CITY and CONSULTANT approved Amendment No 2 to Agreement, as of May 25, 2010, in which the parties agreed to increase Consultant's fee by $35,571 for a total not-to-exceed amount of $288,863, to add update for the City's GIS storm drain information and to use and calibrate a new hydraulic model.

D. The CITY and CONSULTANT agree to increase Consultant's fee by $14,900 for a total not-to-exceed amount of $303,763, to prepare a Monitoring and Reporting Plan for Machado Lake Toxics water quality regulations.

AGREEMENT:

1. Paragraph 1, entitled SERVICES TO BE PERFORMED BY CONSULTANT, is amended to read in its entirety as follows:

1. SERVICES TO BE PERFORMED BY CONSULTANT

CONSULTANT will provide the services listed in the Scope of Work of Agreement C2009-240, as amended by Exhibits A-1, A-2 and A-3 (the additional scope attached to this Amendment). CONSULTANT warrants that all work and services set forth in Scope of Work will be performed in a competent, professional and satisfactory manner.

2. Paragraph 3, Section A, entitled COMPENSATION, is amended to read in its entirety as follows:

A. CONSULTANT'S Fee

For services rendered pursuant to this Agreement, CONSULTANT will be paid in accordance with the Compensation Schedule, as previously amended by Exhibit B-1 and by Exhibit B-2 attached to this Third Amendment; however, in no event will the amount of money paid the CONSULTANT, for services contemplated by this Agreement, as amended, exceed the sum of $303,769 ("Agreement Sum"), unless otherwise first approved in writing by CITY.

3. In all other aspects, the Agreement, as amended is ratified and reaffirmed and remains in full force and effect.

CITY OF TORRANCE,
a Municipal Corporation

_____
Frank Scotto, Mayor

ATTEST:

_____
Sue Herbers, City Clerk

CAROLLO ENGINEERS, Inc.
a Delaware corporation

By: _____
Graham J. Juby, Ph.D., P.E.
Partner-in-Charge

_____
Stephen G. Hough, P.E.
Partner

APPROVED AS TO FORM:

John L. FELLOWS III
City Attorney

By:_____

EXHIBIT A-3
Scope of Work for
Addendum No. 3

Machado Lake Toxics Monitoring and Reporting Plan
City of Torrance

A. SCOPE OF WORK

Task 1 - Problem Investigation

Consultant will conduct interviews with City of Torrance (City) Staff and others to obtain information on the potential sources of PCB and pesticides within the City. Consultant will also collect all necessary data to allow the characterization of non-point sources of sediment into the City's stormwater drainage system. The data and information obtained from the interviews will be used to investigate and locate where existing sediments contain PCBs and pesticides. This information will be used to determine if additional sampling locations are needed.

Task 2 - Develop Monitoring Plan

Consultant will develop a field sampling plan (FSP) that will present the approach and procedures to implement stormwater sampling activities in 2010/2011 for PCB/Pesticides TMDL Study of the City storm drains discharging stormwater into Machado Lake. The field study sampling procedures, methods, and analyses for stormwater and sediments will be described in this document. The FSP will include sampling procedure, data quality objective, sampling frequency, laboratory procedure, data management and reporting. The sampling locations will be the same as those identified in the City of Torrance Stormwater Monitoring Special Work Plan for nutrients. The City of Torrance Stormwater Monitoring Special Work Plan for nutrients was completed in March 2010.

Exhibit B-2
Estimated Fee
for
Addendum No. 3 - Machado Lake Toxics Moitoring and Reporting Plan

Task	Description	PIC	Project Manager	Project Engineer	Staff Engineer	Support Services	Hours per Task	Cost per Task
		Graham Juby	Inge Wiersema	Sam Darkwah	John Meyerhofer	---		
1	Investigation	1	3	17	6	2	29	$5,110
2	Develop Monitoring Plan	2	6	30	8	5	51	$9,006
	Total Labor Hours	3	9	47	14	7	80	
	Labor Rate	$234	$213	$191	$135	$90		
	Fee	$702	$1,917	$8,977	$1,890	$630		$14,116

Other Costs:

PECE	$/hour	$9.00	$720.00	
Printing			$100.00	
Total				$820.00

Estimated Fee	$14,936.00
Use	**$14,900.00**

ATTACHMENT B

CONSULTING SERVICES AGREEMENT

This CONSULTING SERVICES AGREEMENT ("Agreement") is made and entered into as of December 22, 2009 (the "Effective Date"), by and between the CITY OF TORRANCE, a municipal corporation ("CITY"), and Carollo Engineers, P.C., a Arizona Corporation, ("CONSULTANT").

RECITALS:

A. CITY wishes to retain the services of an experienced and qualified CONSULTANT to provide professional engineering services for the development of a National Pollution Discharge Elimination System (NPDES) Master Plan of the City's storm drain system.

B. CONSULTANT represents that it is qualified to perform those services.

AGREEMENT:

1. SERVICES TO BE PERFORMED BY CONSULTANT

CONSULTANT will provide the services listed in the Scope of Services attached as Exhibit A. CONSULTANT warrants that all work and services set forth in the Scope of Services will be performed in a competent, professional and satisfactory manner.

2. TERM

Unless earlier terminated in accordance with Paragraph 4 below, this Agreement will continue in full force and effect from the Effective Date through December 22, 2011.

3. COMPENSATION

A. CONSULTANT's Fee.

For services rendered pursuant to this Agreement, CONSULTANT will be paid in accordance with the Compensation Schedule attached as Exhibit B, provided, however, that in no event will the total amount of money paid the CONSULTANT, for services initially contemplated by this Agreement, exceed the sum of $253,292.00 ("Agreement Sum"), unless otherwise first approved in writing by CITY.

B. Schedule of Payment.

Provided that the CONSULTANT is not in default under the terms of this Agreement, upon presentation of an invoice, CONSULTANT will be paid monthly the fees described in Paragraph 3.A. above, according to the Compensation Schedule. Payment will be due within 30 days after the date of the monthly invoice.

4. TERMINATION OF AGREEMENT

A. Termination by CITY for Convenience.

C2009-240

COPY

1. CITY may, at any time, terminate the Agreement for CITY's convenience and without cause.

2. Upon receipt of written notice from CITY of such termination for CITY's convenience, CONSULTANT will:

   a. cease operations as directed by CITY in the notice;
   b. take actions necessary, or that CITY may direct, for the protection and preservation of the work; and
   c. except for work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

3. In case of such termination for CITY's convenience, CONSULTANT will be entitled to receive payment for work executed; and costs incurred by reason of such termination, along with reasonable overhead and profit on the work not executed.

B. Termination for Cause.

1. If either party fails to perform any term, covenant or condition in this Agreement and that failure continues for 15 calendar days after the nondefaulting party gives the defaulting party written notice of the failure to perform, this Agreement may be terminated for cause; provided, however, that if during the notice period the defaulting party has promptly commenced and continues diligent efforts to remedy the default, the defaulting party will have such additional time as is reasonably necessary to remedy the default.

2. In the event this Agreement is terminated for cause by the default of the CONSULTANT, the CITY may, at the expense of the CONSULTANT and its surety, complete this Agreement or cause it to be completed. Any check or bond delivered to the CITY in connection with this Agreement, and the money payable thereon, will be forfeited to and remain the property of the CITY. All moneys due the CONSULTANT under the terms of this Agreement will be retained by the CITY, but the retention will not release the CONSULTANT and its surety from liability for the default. Under these circumstances, however, the CONSULTANT and its surety will be credited with the amount of money retained, toward any amount by which the cost of completion exceeds the Agreement Sum and any amount authorized for extra services.

3. Termination for cause will not affect or terminate any of the rights of the CITY as against the CONSULTANT or its surety then existing, or which may thereafter accrue because of the default; this provision is in addition to all other rights and remedies available to the CITY under law.

C. Termination for Breach of Law.

In the event the CONSULTANT or any of its officers, directors, shareholders, employees, agents, subsidiaries or affiliates is convicted (i) of a criminal offense as an incident to obtaining or attempting to obtain a public or private contract or subcontract, or in the performance of a contract or subcontract; (ii) under state or federal statutes of embezzlement, theft, forgery, bribery, falsification or destruction of records, receiving stolen property, or any other offense indicating a lack of business integrity or business honesty which currently, seriously, and directly affects responsibility as a public consultant or contractor; (iii) under state or federal antitrust statutes arising out of the submission of bids or proposals; or (iv) of violation of Paragraph 19 of this Agreement; or for any other cause the CITY determines to be so serious and compelling as to affect CONSULTANT's responsibility as a public consultant or contractor, including but not limited to, debarment by another governmental agency, then the CITY reserves the unilateral right to terminate this Agreement or to impose such other sanctions (which may include financial sanctions, temporary suspensions or any other condition deemed appropriate short of termination) as it deems proper. The CITY will not take action until CONSULTANT has been given notice and an opportunity to present evidence in mitigation.

5. FORCE MAJEURE

If any party fails to perform its obligations because of strikes, lockouts, labor disputes, embargoes, acts of God, inability to obtain labor or materials or reasonable substitutes for labor or materials, governmental restrictions, governmental regulations, governmental control, judicial orders, enemy or hostile governmental action, civil commotion, fire or other casualty, or other causes beyond the reasonable control of the party obligated to perform, then that party's performance shall be excused for a period equal to the period of such cause for failure to perform.

6. RETENTION OF FUNDS

CONSULTANT authorizes CITY to deduct from any amount payable to CONSULTANT (whether or not arising out of this Agreement) any amounts the payment of which may be in dispute or that are necessary to compensate CITY for any losses, costs, liabilities, or damages suffered by CITY, and all amounts for which CITY may be liable to third parties, by reason of CONSULTANT's negligent acts or omissions or willful misconduct in performing or failing to perform CONSULTANT's obligations under this Agreement. In the event that any claim is made by a third party, the amount or validity of which is disputed by CONSULTANT, or any indebtedness exists that appears to be the basis for a claim of lien, CITY may withhold from any payment due, without liability for interest because of the withholding, an amount sufficient to cover the claim. The failure of CITY to exercise the right to deduct or to withhold will not, however, affect the obligations of CONSULTANT to insure, indemnify, and protect CITY as elsewhere provided in this Agreement.

7. **CITY REPRESENTATIVE**

Robert J. Beste, Public Works Director, is designated as the "City Representative," authorized to act in its behalf with respect to the work and services specified in this Agreement and to make all decisions in connection with this Agreement. Whenever approval, directions, or other actions are required by CITY under this Agreement, those actions will be taken by the City Representative, unless otherwise stated. The City Manager has the right to designate another City Representative at any time, by providing notice to CONSULTANT.

8. **CONSULTANT REPRESENTATIVE(S)**

The following principal(s) of CONSULTANT are designated as being the principal(s) and representative(s) of CONSULTANT authorized to act in its behalf with respect to the work specified in this Agreement and make all decisions in connection with this Agreement:

Graham J. G. Juby, Ph.D., P.E., Partner-in-Charge

9. **INDEPENDENT CONTRACTOR**

The CONSULTANT is, and at all times will remain as to CITY, a wholly independent contractor. Neither CITY nor any of its agents will have control over the conduct of the CONSULTANT or any of the CONSULTANT's employees, except as otherwise set forth in this Agreement. The CONSULTANT may not, at any time or in any manner, represent that it or any of its agents or employees are in any manner agents or employees of CITY.

10. **BUSINESS LICENSE**

The CONSULTANT must obtain a City business license prior to the start of work under this Agreement, unless CONSULTANT is qualified for an exemption.

11. **OTHER LICENSES AND PERMITS**

CONSULTANT warrants that it has all professional, contracting and other permits and licenses required to undertake the work contemplated by this Agreement.

12. **FAMILIARITY WITH WORK**

By executing this Agreement, CONSULTANT warrants that CONSULTANT (a) has thoroughly investigated and considered the scope of services to be performed, (b) has carefully considered how the services should be performed, and (c) fully understands the facilities, difficulties and restrictions attending performance of the services under this Agreement. If the services involve work upon any site, CONSULTANT warrants that CONSULTANT has or will investigate the site and is or will be fully acquainted with the conditions there existing, prior to commencement of services set forth in this Agreement. Should CONSULTANT discover any latent or unknown conditions that will materially affect the performance of the services set forth in this Agreement, CONSULTANT must immediately inform CITY of that fact and may not proceed except at CONSULTANT's risk until written instructions are received from CITY.

13. CARE OF WORK

CONSULTANT must adopt reasonable methods during the term of the Agreement to furnish continuous protection to the work, and the equipment, materials, papers, documents, plans, studies and other components to prevent losses or damages, and will be responsible for all damages, to persons or property, until acceptance of the work by CITY, except those losses or damages as may be caused by CITY's own negligence.

14. CONSULTANT'S ACCOUNTING RECORDS; OTHER PROJECT RECORDS

Records of the CONSULTANT's time pertaining to the project, and records of accounts between CITY and the CONSULTANT, will be kept on a generally recognized accounting basis. CONSULTANT will also maintain all other records, including without limitation specifications, drawings, progress reports and the like, relating to the project. All records will be available to CITY during normal working hours. CONSULTANT will maintain these records for three years after final payment.

15. INDEMNIFICATION

CONSULTANT will indemnify, defend, and hold harmless CITY, the Redevelopment Agency of the City of Torrance, the City Council, each member thereof, present and future, members of boards and commissions, its officers, agents, employees and volunteers from and against any and all liability, expenses, including defense costs and legal fees, and claims for damages whatsoever, including, but not limited to, those arising from breach of contract, bodily injury, death, personal injury, property damage, loss of use, or property loss however the same may be caused and regardless of the responsibility for negligence. The obligation to indemnify, defend and hold harmless includes, but is not limited to, any liability or expense, including defense costs and legal fees, arising from the negligent acts or omissions, or willful misconduct of CONSULTANT, its officers, employees, agents, subcontractors or vendors. It is further agreed, CONSULTANT's obligations to indemnify, defend and hold harmless will apply even in the event of concurrent negligence on the part of CITY, the City Council, each member thereof, present and future, or its officers, agents and employees, except for liability resulting solely from the negligence or willful misconduct of CITY, its officers, employees or agents. Payment by CITY is not a condition precedent to enforcement of this indemnity. In the event of any dispute between CONSULTANT and CITY, as to whether liability arises from the sole negligence of the CITY or its officers, employees, agents, subcontractors or vendors, CONSULTANT will be obligated to pay for CITY's defense until such time as a final judgment has been entered adjudicating the CITY as solely negligent. CONSULTANT will not be entitled in the event of such a determination to any reimbursement of defense costs including but not limited to attorney's fees, expert fees and costs of litigation.

16. NON-LIABILITY OF CITY OFFICERS AND EMPLOYEES

No officer or employee of CITY will be personally liable to CONSULTANT, in the event of any default or breach by the CITY or for any amount that may become due to CONSULTANT.

17. INSURANCE

A. CONSULTANT must maintain at its sole expense the following insurance, which will be full coverage not subject to self insurance provisions:

1. Automobile Liability, including owned, non-owned and hired vehicles, with at least the following limits of liability:

   a. Primary Bodily Injury with limits of at least $500,000 per person, $1,000,000 per occurrence; and

   b. Primary Property Damage of at least $250,000 per occurrence; or

   c. Combined single limits of $1,000,000 per occurrence.

2. General Liability including coverage for premises, products and completed operations, independent contractors/vendors, personal injury and contractual obligations with combined single limits of coverage of at least $1,000,000 per occurrence.

3. Professional liability insurance with limits of at least $1,000,000 per occurrence.

4. Workers' Compensation with limits as required by the State of California and Employers Liability with limits of at least $1,000,000.

B. The insurance provided by CONSULTANT will be primary and non-contributory

C. CITY ("City of Torrance"), the Redevelopment Agency of the City of Torrance, the City Council and each member thereof, members of boards and commissions, every officer, agent, official, employee and volunteer must be named as additional insured under the automobile and general liability policies.

D. CONSULTANT must provide certificates of insurance and/or endorsements to the City Clerk of the City of Torrance before the commencement of work.

E. Each insurance policy required by this Paragraph must contain a provision that no termination, cancellation or change of coverage can be made without thirty days notice to CITY.

18. SUFFICIENCY OF INSURERS AND SURETIES

Insurance or bonds required by this Agreement will be satisfactory only if issued by companies admitted to do business in California, rated "B+" or better in the most recent edition of Best's Key Rating Guide, and only if they are of a financial category Class VII or better, unless these requirements are waived by the Risk Manager of CITY ("Risk Manager") due to unique circumstances. In the event the Risk Manager determines that the work or services to be performed under this Agreement creates an increased or decreased risk of loss to CITY, the CONSULTANT agrees that the minimum limits of

any insurance policies or performance bonds required by this Agreement may be changed accordingly upon receipt of written notice from the Risk Manager; provided that CONSULTANT will have the right to appeal a determination of increased coverage by the Risk Manager to the City Council of CITY within 10 days of receipt of notice from the Risk Manager.

19. CONFLICT OF INTEREST

A. No officer or employee of the CITY may have any financial interest, direct or indirect, in this Agreement, nor may any officer or employee participate in any decision relating to the Agreement that effects the officer or employee's financial interest or the financial interest of any corporation, partnership or association in which the officer or employee is, directly or indirectly interested, in violation of any law, rule or regulation.

B. No person may offer, give, or agree to give any officer or employee or former officer or employee, nor may any officer or employee solicit, demand, accept, or agree to accept from another person, a gratuity or an offer of employment in connection with any decision, approval, disapproval, recommendation, preparation or any part of a program requirement or a purchase request, influencing the content of any specification or procurement standard, rendering of advice, investigation, auditing, or in any other advisory capacity in any way pertaining to any program requirement, contract or subcontract, or to any solicitation or proposal.

20. NOTICE

A. All notices, requests, demands, or other communications under this Agreement will be in writing. Notice will be sufficiently given for all purposes as follows:

1. Personal delivery. When personally delivered to the recipient: notice is effective on delivery.

2. First Class mail. When mailed first class to the last address of the recipient known to the party giving notice: notice is effective three mail delivery days after deposit in an United States Postal Service office or mailbox.

3. Certified mail. When mailed certified mail, return receipt requested: notice is effective on receipt, if delivery is confirmed by a return receipt.

4. Overnight delivery. When delivered by an overnight delivery service, charges prepaid or charged to the sender's account: notice is effective on delivery, if delivery is confirmed by the delivery service.

5. Facsimile transmission. When sent by fax to the last fax number of the recipient known to the party giving notice: notice is effective on receipt. Any notice given by fax will be deemed received on the next business day if it is received after 5:00 p.m. (recipient's time) or on a non-business day.

6. Addresses for purpose of giving notice are as follows:

CONSULTANT:	Carollo Engineers, P.C. 10540 Talbert Avenue Suite 200 East Fountain Valley, CA 92708 Fax: (714) 593-5101
CITY:	City Clerk City of Torrance 3031 Torrance Boulevard Torrance, CA 90509-2970 Fax: (310) 618-2931

B. Any correctly addressed notice that is refused, unclaimed, or undeliverable because of an act or omission of the party to be notified, will be deemed effective as of the first date the notice was refused, unclaimed or deemed undeliverable by the postal authorities, messenger or overnight delivery service.

C. Either party may change its address or fax number by giving the other party notice of the change in any manner permitted by this Agreement.

21. PROHIBITION AGAINST ASSIGNMENT AND SUBCONTRACTING

This Agreement and all exhibits are binding on the heirs, successors, and assigns of the parties. The Agreement may not be assigned or subcontracted by either CITY or CONSULTANT without the prior written consent of the other.

22. INTEGRATION; AMENDMENT

This Agreement represents the entire understanding of CITY and CONSULTANT as to those matters contained in it. No prior oral or written understanding will be of any force or effect with respect to the terms of this Agreement. The Agreement may not be modified or altered except in writing signed by both parties.

23. INTERPRETATION

The terms of this Agreement should be construed in accordance with the meaning of the language used and should not be construed for or against either party by reason of the authorship of this Agreement or any other rule of construction that might otherwise apply.

24. SEVERABILITY

If any part of this Agreement is found to be in conflict with applicable laws, that part will be inoperative, null and void insofar as it is in conflict with any applicable laws, but the remainder of the Agreement will remain in full force and effect.

25. TIME OF ESSENCE

Time is of the essence in the performance of this Agreement.

26. GOVERNING LAW; JURISDICTION

This Agreement will be administered and interpreted under the laws of the State of California. Jurisdiction of any litigation arising from the Agreement will be in Los Angeles County, California.

27. COMPLIANCE WITH STATUTES AND REGULATIONS

CONSULTANT will be knowledgeable of and will comply with all applicable federal, state, county and city statutes, rules, regulations, ordinances and orders.

28. WAIVER OF BREACH

No delay or omission in the exercise of any right or remedy by a nondefaulting party on any default will impair the right or remedy or be construed as a waiver. A party's consent or approval of any act by the other party requiring the party's consent or approval will not be deemed to waive or render unnecessary the other party's consent to or approval of any subsequent act. Any waiver by either party of any default must be in writing and will not be a waiver of any other default concerning the same or any other provision of this Agreement.

29. ATTORNEY'S FEES

Except as provided for in Paragraph 15, in any dispute, litigation, arbitration, or other proceeding by which one party either seeks to enforce its rights under this Agreement (whether in contract, tort or both) or seeks a declaration of any rights or obligations under this Agreement, the prevailing party will be awarded reasonable attorney's fees, together with any costs and expenses, to resolve the dispute and to enforce any judgment.

30. EXHIBITS

All exhibits identified in this Agreement are incorporated into the Agreement by this reference.

31. CONSULTANT'S AUTHORITY TO EXECUTE

The person(s) executing this Agreement on behalf of the CONSULTANT warrant that (i) the CONSULTANT is duly organized and existing; (ii) they are duly authorized to execute this Agreement on behalf of the CONSULTANT; (iii) by so executing this Agreement, the CONSULTANT is formally bound to the provisions of this Agreement;

and (iv) the entering into this Agreement does not violate any provision of any other Agreement to which the CONSULTANT is bound.

CITY OF TORRANCE
a Municipal Corporation

Frank Scotto, Mayor

ATTEST:

Sue Herbers
City Clerk

APPROVED AS TO FORM:
JOHN L. FELLOWS III
City Attorney

By:

Carollo Engineers, P.C.
a Arizona Corporation

By: C67217

Graham J. G. Juby, Ph.D., P.E.
Partner-in-Charge

Stephen G. Hough PE
Partner

Attachments: Exhibit A Scope of Services
Exhibit B Compensation Schedule

Revised: 10/29/2008

EXHIBIT A

SCOPE OF SERVICES

EXHIBIT A

Project Approach

Based on our knowledge of the project area and consistent with our understanding of the City's goals, we have prepared a scope of services to complete this Master Plan. The primary work efforts of this scope include meetings, stormwater quantity evaluation, stormwater quality evaluation, evaluation of City-wide conveyance and treatment management strategies, and preparation of a master plan report.

Task 1 - Evaluation of Stormwater Quantity/Conveyance

Under this task, our team will update the existing model to include new pipes, all drainage related improvements, and recommendations in the 1997 Master Plan. We will be looking to evaluate the previous Master Plan report and existing models to validate the recommended improvements as they pertain to:

- Watershed area and hydrology.
- Expected pollutant loading and removal.
- Cost effectiveness.
- Reuse application.
- Ease of operation and maintenance.
- Construction constraints.

Task 1.1 - Review the City's 1997 Drainage Master Plan and GIS Layers

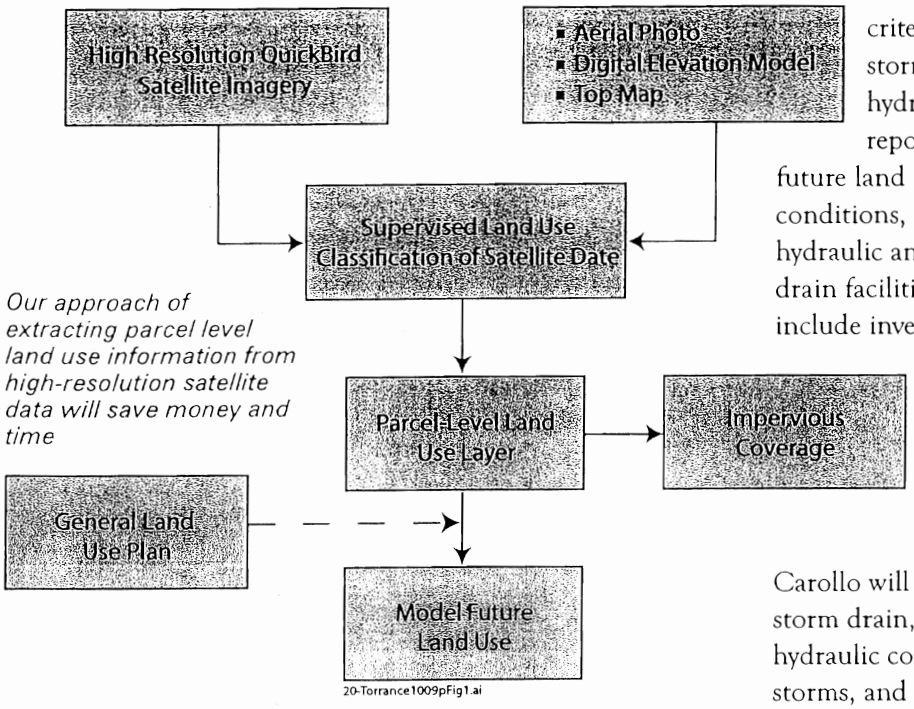
The objective of this task is to review and assess the quality of available storm drain-related data and identify additional needs. Carollo will not "reinvent the wheel" but will inventory and review the appropriate available data for the City. Specific sources of information that will be targeted are:

- The 1997 Drainage Master Plan.
- Existing City, County, and State (Caltrans) drawings and atlas maps to identify changes in the storm drain system since completion of the 1997 Master Plan.
- The City's GIS layers to confirm storm drain infrastructure ownership including those that maintained by the County, Caltrans, other private agencies, and private facilities.
- Existing Models - RATSC7.

Task 1.2 - Identify Updates to the City's GIS Databases and/or Coverage of Storm Drain Infrastructure

The City's storm drain plans produced in 1997 will be used to identify updates needed to the City's GIS databases and/or coverage of the storm drain system pipes, catch basins, tributary areas, and watersheds. The updates will include adding storm drain-related attributes such as pipe size, slope, material type, invert elevation, surface elevation, ownership, drawing number, type and size of catch basin. Other GIS attributes such as Time of Concentration (TC), composite runoff coefficient, area (in acres), system number, and peak flow rate (Q), that provide a link between hydrology and hydraulic analysis will also be included.

We will create a new parcel-based land use layer using high resolution QuickBird satellite imagery. The satellite imagery will be combined with aerial photos, parcel maps of the city, topo maps, and digital elevation models to derive a parcel-level land use layer. The spatial resolution of QuickBird imagery is 61 cm. Our approach is illustrated in the chart on the adjacent page. The parcel-level land use coverage and impervious layer will be used to identify industries and uses within the City that could be contributing pollutants to receiving waters



Our approach of extracting parcel level land use information from high-resolution satellite data will save money and time

including those with RWQCB industrial permits. Industries will be mapped by parcel and watershed. Other properties such as schools, nurseries, and parks that may not have NPDES industrial permits, but may be significant contributors of pollutant sources such as trash and nutrients, will also be identified.

A new watershed layer will be created with attributes including existing and pending TMDLs for that watershed. Municipally owned properties that could provide opportunities for the application of BMPs will be identified.

Likely future land use will be modeled using the City's general land use plan and the results of the analysis of satellite imageries. That is, satellite remote sensing will be used to model the likely future development conditions based on accurate depiction of the existing development.

Task 1.3 - Review LACDPWD County-Wide Model and Conduct Hydrologic and Hydraulic Analysis

Using the latest Los Angeles County criteria, Carollo will update the City storm drain model and issue an updated hydrology report of the system. The report will account for both existing and future land use/zoning/development, hydrologic conditions, and runoff rates. In addition, a hydraulic and quantitative analysis of the storm drain facilities will be undertaken. The analysis will include investigation into basins, both retention and detention, other known public or private facilities serving the City, other areas within the City boundary, and any additional facilities draining to the City.

Carollo will evaluate the hydraulic capacity of each storm drain, by using uniform flows for present hydraulic conditions, 10-year, 25-year, and 50-year storms, and segregate the analysis by watershed. The information obtained by the hydraulic capacity analysis will be included in a detailed report generated for the City. The report will detail hydraulic deficiencies within the system and describe various robust BMP options to alleviate trouble areas identified in the hydraulic capacity analysis. One option will include the diversion of excess storm drain flow and run-off to the Vine and Walnut detention basins. The report will include the altered hydraulic capacities of basins and downstream conveyance systems given each BMP option.

The Capital Improvement Program (CIP) and associated cost estimates will be integral to the report. We will use GA optimization techniques to optimize the CIP.

Deliverables

Deliverables include updated GIS storm drain database and hydraulic model, storm drain condition survey and hydraulic capacity/ deficiencies, watershed/industries/TMDL map,

list of system deficiencies, CIP recommendations to address capacity and structural deficiencies, and associated cost estimates. We will also deliver all satellite imageries to the City.

Task 2 - Evaluate Stormwater Quality and Recommend Treatment to Comply with Existing and Proposed TMDLs

Carollo will develop water quality improvement alternatives that meet the needs of stormwater runoff pollution reduction, and improve the quality of receiving water bodies. The final evaluation of BMPs for pollutant load and runoff quantity reduction will be conducted through a decision-making process to reflect the principles of formal prioritization.

Task 2.1 - Review LACDPW Watershed Management Modeling System

Carollo will review the pollutants of concern identified in the Watershed Management Modeling System, on both a watershed and sub-watershed basis. In addition, Carollo will undertake an exhaustive review of the all sections of the County's plan applicable to water quality data, hydraulic models, and associated maps addressing the City watersheds. The relevance of technologies, with regard to the City' compliance with TMDLS, identified through the water quality data and principles review will also be evaluated.

With the use of available stormwater monitoring data, including data in the County's watershed plan applicable to the City and Santa Monica Bay Beaches Bacteria (SMBBB) TMDL, Carollo plans to determine effects of watershed priorities and current Environmental Protection Agency (EPA) and RWQCB regulations on NPDES and TMDLs for monitoring and treatment requirements as they pertain to the City.

Task 2.2 - Confirmation of Water Quality Objectives

Carollo will investigate the water quality objectives outlined in the County's plan to ensure that all objectives integrate all applicable existing stormwater quality standards including RWQCB, existing and proposed NPDES MS4 permits, SMBBB TMDLs, and Machado Lake Trash and Nutrient TMDLs. Research with regard to all applicable pending and future stormwater quality standards listed in the RWQCB Basin Plan will also be undertaken. This includes the recently adopted Ventura County NPDES MS4 Permit, the future MS4 Permit for Los Angeles area cities, and Dominguez Channel Metals TMDL.

Task 2.3 - Compliance Review

All applicable existing and pending City, County, and Regional NPDES MS4 permit stormwater codes, ordinances, and regulations will be thoroughly examined and all noncompliance issues will be identified. With this information, Carollo will then identify the appropriate compliant actions and responsible entities, among the LACDPW, the City's Public Works Department, the City's Community Development Department, the City's Community Services (Parks and Recreation) Department, SMBBB Jurisdictional Groups 5 and 6, and the Machado Lake TMDL Jurisdictional Group. A comprehensive description of compliant actions and corrective action plan, created by Carollo, will guide the City in reaching compliance with existing and pending codes, ordinances, and regulations.

Task 2.4 - Projection of Pollutant Sources and Associated Loadings

With the data available in the County's plan, Carollo will project expected pollutant sources and associated loadings for each watershed given a 3/4-inch and 1-inch rain, in addition to a 1-hour and a 10-year storm event. For the analysis, the City hydraulic data and a simple land use-based pollutant load model will be used.

Task 2.5 - Sub-Watershed TMDL Compliance Prioritization

To clearly identify high priority areas within the City, Carollo will evaluate sub-watersheds on the

basis of TMDL compliance, pollution potential burden to nearby waterways, and environmental impacts to receiving waters. This evaluation will be utilized to determine phased implementation of recommended BMPs.

Task 2.6 - Pollution Source Identification Via Reconnaissance

With the aid of GIS maps and a variety of reconnaissance tactics, Carollo will systematically identify significant sources of pollution in each sub-watershed. Aerial photos, storm drain system maps, and business license data will all be targets of our reconnaissance efforts. These reconnaissance tools will be used to complete a visual screening of land use areas of concern and identify corresponding storm drain manholes for sampling and analysis. In addition, other potential pollutant source areas such as restaurants, veterinarians and animal boarding facilities, dog parks, home and garden centers, car washes, high-density residential, and other establishments with outdoor waste storage areas will be located and identified. As a means to further understand the sub-watersheds and potential pollutant contributors, Carollo will schedule interviews with City inspectors and local agency NPDES inspectors for leads on problem areas or businesses.

Deliverables

Deliverables include regulations review/compliance actions, watershed/source high-priority areas map, and pollutant source/visual screening.

Task 3 - Evaluate and Develop City-Wide Conveyance and Treatment Management Strategies

Task 3.1 - Research and Identify Potential Water Treatment Technologies

With the hydraulic and water quality data assembled, Carollo will thoroughly research relevant literature on source control, diversion programs, treatment controls, and beneficial reuse options. Potential water treatment technologies, both structural and non-structural, reuse opportunities, and multi-purpose treatment opportunities will be identified and evaluated based on the City's Treatment Management Strategies. Investigated technologies will include Standard Urban Stormwater Mitigation Plan (SUSMP) BMPs, LID BMPs, and local/regional BMPs to meet TMDL/NPDES permit compliance. Moreover, numerous reuse alternatives will be explored including groundwater replenishment, parkway/median irrigation, and habitat restoration. Other devices such as hydrodynamic separators will be evaluated.

To properly evaluate the various treatment and reuse alternatives identified, Carollo will generate a matrix based upon a combination of known and anticipated TMDL requirements. The treatment/reuse matrix will account for the effectiveness in treating identified pollutants, most specifically, whether they provide peak flow reductions, applicable drainage types/sizes, relative cost of operation and maintenance, relative hydraulic restrictions, and any need for pretreatment. As a source of reference, examples for each treatment/reuse alternative will be provided.

Disinfection

Prior to any recreational or irrigation reuse, disinfection of the stored runoff is required in accordance with California Title 22 requirements. Stormwater runoff is often considered grey water, as it is neither fresh water nor heavily polluted. The treatment and incorporation of grey water into a reclaimed water distribution system demonstrates good water management practice by the Cities of Los Angeles and Santa Monica. This environmentally friendly project is welcomed by the California Department of Public Health[1] (CDPH), but the planning, design, construction, and operation require regulatory knowledge and innovative engineering. An understanding of grey water quality and the objectives of the reclaimed water code under Title 22 of the California Code

1 Based upon discussions between Mr. Jeff Stone with CDPH (Recycled Water Chief) and Mr. Andrew Salveson of Carollo Engineers.

of Regulations are needed. Our team works constantly with CDPH, with interactions ranging from the Recycled Water Chief (Mr. Jeff Stone), to the treatment technology lead (Mr. Brian Bernados), to numerous local District Engineers and their staff. Carollo is working hand-in-hand with CDPH to certify the majority of treatment technologies for reclaimed water use in California, from conventional filtration to innovative ultraviolet light (UV), ozone, pasteurization, and satellite treatment technologies. Our team has the solid trust of CDPH. This well-earned trust will help your innovative water project as it moves from concept to design to operation.

Your grey water is not conventional wastewater. However, there will be pathogens in the grey water that must be destroyed to protect public health. The question is "how much and what treatment processes will reduce them to acceptable levels?"

One conventional approach would be to employ identical filtration and disinfection technologies used for recycled water treatment. This conventional approach assumes that microbiological concentrations in the grey water are similar to the microbiological concentrations in a clarified secondary effluent. For reference, we have provided pathogen and indicator organism data for clarified secondary effluents from recent Carollo projects. For example, a clarified secondary effluent will typically contain a large concentration of indigenous virus, bacteria, and protozoa, as shown in Table 1 (all data is compiled from recent Carollo disinfection projects). Likely, the grey water – or runoff – to undergo treatment will not have the high pathogen concentrations found at municipal wastewater treatment plants (WWTPs). One comparative example is the urban runoff from the City of Oceanside, also included in Table 1. Thus, designing a "Title 22" disinfection system may be design overkill, resulting in high costs for treatment of a high quality water (Table 2). High dose UV disinfection may not be needed to attain safe pathogen levels.

A second conventional approach would be to simply target the reduction of total coliform to the

Table 1 - Pathogen Loads in Clarified Unfiltered and Undisinfected WWTP Effluents
Microbiological Concentration Ranges in Clarified Secondary Effluents

WWTP	Total Coliform MPN/100 mL	Fecal Coliform MPN/100 mL	*E. Coli* MPN/100 mL	*Enterococci* MPN/100 mL	Virus (coliphage) PFU/mL	Giardia#/L	*Cryptosporidium* #/L
Dinuba (CA)			not tested	not tested	88 to 130	not tested	not tested
Bradenton (FL)			not tested	not tested			
San Jose (CA)	31,000 to 103,000	7,300 to 19,000	3,200 to 9,200	350 to 1,200	not tested	not tested	not tested
DSRSD (CA)	>160,000	>160,000	not tested	not tested	6 to 15	<0.1 to 36	0.1 to 13.5
Oceanside (urban runoff)					not tested	not tested	not tested

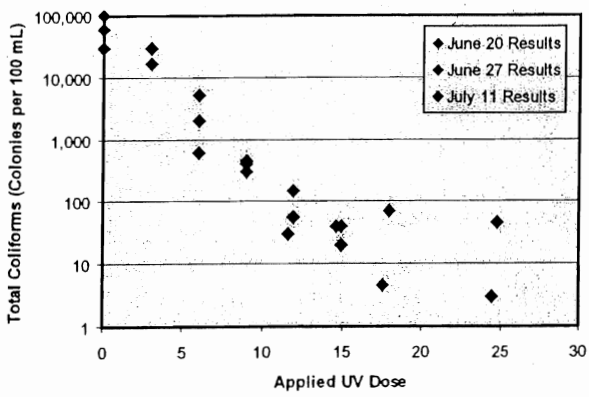
Table 2 - Filtration and Disinfection Treatment Costs Meeting Title 22 Criteria (using sand filtration and UV disinfection)
Treatment Costs for a 2 MGD Design Flow

Sand	UV Disinfection Meeting Title 22	UV Disinfection Meeting a Potentially Reduced Criteria
$1,500,000 - $2,500,00	$3,500,000 -$5,500,000	$2,000,000-$4,000,000

2.2-MPN/100-mL level. While this would meet the effluent monitoring criteria for reclaimed water, there is no demonstration that virus and protozoa disinfection is occurring, or that public health is being protected. To reduce the rigor of treatment technologies due to a potentially low pathogen load, demonstration of pathogen loads and technology performance to CDPH is required.

Cost-effective treatment cannot be done without the knowledge of water quality. As shown in Table 2, the City could save nearly $1,500,000 in construction costs if a low pathogen load is determined and if treatment to stringent levels is demonstrated. Similar to recent data gathering efforts for Oceanside and San Jose, our team will evaluate microbiological levels (virus, bacteria, and protozoa), water quality, and disinfection dose response through bench top UV (Figure 1), ozone, and chlorine disinfection testing. While this testing will take 6 to 8 weeks for completion, and may cost $25,000 to $35,000, it will likely demonstrate that Title 22 treatment is excessive and that $1,500,000 can be saved, while still meeting all Title 22 water quality and pathogen criteria.

Figure 1
Mean Total Coliforms in Treated Filter Effluent vs. Applied UV Dose



Task 3.2 - Development of Alternative Solutions for Stormwater Quality Problems

In order to reduce quantity and improve the quality of runoff, Carollo will develop alternative solutions for storm drain water quality problems (excluding the Santa Monica Bay Watershed) within the City that maximize the use of the City's existing storm drain system capacity, detention basins, treatment and infiltration, and structural/non-structural BMPs. In addition, Carollo work with SMBBB TMDL Jurisdictional Groups 5 and 6 to incorporate all their findings and recommendations into the City's Master Plan.

The alternative evaluation will include investigation into sub-regional BMPs and LID for new development and redevelopment, and distributed retrofits using existing right-of-ways, parkways, and storm drains. After a thorough evaluation accounting for alternative feasibility and cost, the most viable and cost-effective improvements to adequately protect existing and future developments from both stormwater conveyance and stormwater quality issues, and ensure compliance with existing and future regulations, will be selected.

Task 3.3 - Review of Public Works Procedures and Specifications

Carollo will conduct a thorough review of existing Public Works procedures and specifications. With our extensive knowledge and understanding of BMP practices, Carollo will propose applicable BMP standard drawings for street/curb, gutter and catch basin construction projects, and BMPs for Fire Station No. 3 Training Facility discharges.

Task 3.4 - Develop a City Watershed-Based Water Quality Monitoring Plan and Scope for TMDL and Waste Load Allocation Compliance

Carollo will examine watersheds within the City and determine appropriate monitoring locations and use this information to develop a sophisticated watershed-based water quality monitoring plan. Detailed scopes targeting compliance with existing and proposed TMDLs and Waste Load Allocations as identified in the pending MS4 NPDES Permit for Los Angeles area cities will accompany the monitoring plan. In connection with the city-wide monitoring plan, a watershed specific monitoring and reporting plan for the Machado Lake Watershed will be generated. As an integral

component of the plan, end of pipe (at City boundary) Waste Load Allocations measurements will be taken to facilitate plan development.

Task 3.5 - Dry and Wet Weather Flow Diversion Evaluation

Carollo will conduct a hydraulic assessment to investigate the possibility of diverting additional dry and wet weather flows to existing detention basins. Within this assessment, Carollo will focus on infrastructure that previously possessed storm drains constructed to bypass basins, most notably the Walnut Avenue and Vine Avenue basins. Through the hydraulic assessment and analysis of the watersheds influencing existing detention basins, a list of BMP-related storm drain improvements will be proposed in order to maximize detention basin effectiveness.

Task 3.6 - Design and Certify Detention Basin Pump Stations as Full Capture Systems

To investigate potential full-capture systems identified in the Machado Lake Trash TMDL Staff Report, Carollo will develop and coordinate a testing plan in order to certify the Maple, Walteria, and 237th Street detention basins/pump stations as full capture devices for trash. The plan will include inspection of the installation of full-capture screens at manholes downstream of force main discharges and quantifying trash collected from each basin discharged from force mains. To ensure testing is acceptable, appropriate coordination with local and regional agencies will be employed. Upon completion of testing, Carollo will generate a report for submittal to the RWQCB for certification of the Maple, Walteria, and/or 237th Street Detention Basin(s) as full-capture trash BMPs.

Task 3.7 - Conduct Structural BMP Siting Study

Using the High Priority Area determinations and associated critical constituent data compiled in previous tasks, Carollo will conduct a Structural BMP Siting Study to identify potential opportunities for cost-effective structural BMP implementation to mitigate critical constituents associated with High Priority Areas. To best qualify BMPs determined in the Siting Study, Carollo will develop Structural BMP threshold criteria. A review of the Santa Monica Bay Jurisdictional Groups 5 and 6 BMP Siting Study will be employed and results from the study will be incorporated.

Task 3.8 - Review and Update the City's CIP

Carollo will perform an extensive review of the City's phased CIP and update as needed. Through the review, Carollo will identify potential BMP treatment improvements and practices that parallel the City's treatment objectives. Potential BMP treatment improvements will be evaluated on the basis of existing and future MS4 NPDES permits and TMDL regulations, qualities of engineering effectiveness, financial affordability, and public and political acceptability.

Task 3.9 - Review of City Funding Policies

Carollo will perform a comprehensive review of the City's current funding policies affiliated with stormwater conveyance and treatment. Identification and recommendation of new funding strategies for financing the phased implementation of the planned projects will be primary objectives of the review. The policy objectives and conveyance/compliance goals developed by the City will be integral to funding strategy identification. In addition, Carollo intends to evaluate the applicable state and federal grants, research the implementation of an assessment program for new developments, and explore the possibility of implementing a stormwater utility parcel fee.

Deliverables

Deliverables include alternative treatment/reuse solutions and matrix report, BMP assessment and siting study, recommended CIP for BMPs and cost estimates, basin/pump station full-capture system report to the RWQCB, capacity and treatment funding strategies and fee sources/alternatives report, draft Master Plans (60%, 90%), and Final Master Plan.

Task 4 - Meetings

Several meeting formats will be necessary to successfully communicate preliminary findings and to manage the project. We will conduct coordination meetings with City staff on a monthly basis. During coordination meetings, we will discuss work items completed and all pending items requiring City approval or action. These meetings allow City staff involved with the project to participate and provide valuable input to help direct the work effort.

Task 4.1 - Conduct Project Kickoff Meeting

Key members of the project team will attend the project kickoff meeting. At this meeting, a project management plan will be presented that outlines communication protocol and a plan to successfully complete the project on time and within budget.

Task 4.2 - Attend Monthly Progress Meetings

Our team will closely coordinate with the City in monthly progress meetings throughout the project life cycle. These meetings will ensure that there no "surprises" along the way. Monthly progress reports will also provide a summary of tasks and funds expended.

Task 5 - Master Plan Report

We will compile the efforts and finding of the study into a complete document that includes an executive summary as well as pertinent factual and backup data necessary for implementation. The final document will be a concise and easily understood document that incorporates the finding of all the tasks and can be used by the City to communicate the recommended program to a diverse audience.

EXHIBIT B

COMPENSATION SCHEDULE

EXHIBIT B
City of Torrance
2010 Storm Drain System Master Plan
Preliminary Fee Schedule
(October 1, 2009)

	Task Description	Hours by Classification							Costs					
		Partner-in-Charge	Project Professional	Professional	Assistant Professional	Technicians	Word Processing / Clerical	Total	Labor Costs	PECE	Other	Subs	Subs & Other Costs	Total Cost
		234	213	180	160	142	90							
Task 1	Evaluation of Stormwater Quantity/Conveyance	2				112	8	122	$17,092	$1,098			$1,098	$18,190
	Groundwater Replenishment Retention Basins		8	12	16			36	$6,424	$324			$324	$6,748
	Dominguez Channel Drainage Basin and Detention Basins		16	32	36			84	$14,928	$756			$756	$15,684
	Santa Monica Bay Drainage Basin and Detention Basins		8	8	16			32	$5,704	$288			$288	$5,992
	Harbor Lakes Drainage Basin and Detention Basins		16	24	36			76	$13,488	$684			$684	$14,172
Task 2	Evaluation of Stormwater Quality	4					8	12	$1,656	$108			$108	$1,764
	Groundwater Replenishment Retention Basins		8	16	24			48	$8,424	$432			$432	$8,856
	Dominguez Channel Drainage Basin and Detention Basins		36	48	60			144	$25,908	$1,296			$1,296	$27,204
	Santa Monica Bay Drainage Basin and Detention Basins		8	12	16			36	$6,424	$324			$324	$6,748
	Harbor Lakes Drainage Basin and Detention Basins		24	42	52			118	$20,992	$1,062			$1,062	$22,054
Task 3	Evaluate and Develop City-Wide Conveyance and Treatment Management Strategies	4				64	8	76	$10,744	$684			$684	$11,428
	Groundwater Replenishment Retention Basins		8	16	16			40	$7,144	$360			$360	$7,504
	Dominguez Channel Drainage Basin and Detention Basins		24	32	48			104	$18,552	$936			$936	$19,488
	Santa Monica Bay Drainage Basin and Detention Basins		8	12	24			44	$7,704	$396			$396	$8,100
	Harbor Lakes Drainage Basin and Detention Basins		24	32	48			104	$18,552	$936			$936	$19,488
Task 4	Meetings	4	24	24			8	60	$11,088	$540	$600		$1,140	$12,228
Task 5	Report Preparation	8	24	40	24	48	16	160	$26,280	$1,440	$5,500		$6,940	$33,220
Task 6	Incorporate Infiltration Basins into Existing Model		8	32	40			80	$13,864	$560			$560	$14,424
	Totals	22	244	382	456	224	48	1376	$221,104	$11,664	$6,100	$0	$17,764	$253,292

ATTACHMENT C

FIRST AMENDMENT TO AGREEMENT C2009-240

This First Amendment to Agreement C2009-240 is made and entered into as of April 13, 2010, by and between the CITY OF TORRANCE, a Municipal Corporation ("CITY"), and CAROLLO ENGINEERS, P.C., an Arizona Corporation ("CONSULTANT").

RECITALS:

A. CITY and CONSULTANT entered into an Agreement on December 22, 2009, whereby CONSULTANT agreed to provide services for the development of a National Pollution Discharge Elimination System (NPDES) Master Plan.

B. CONSULTANT has requested and CITY has agreed to modify the Indemnification Clause in Paragraph 15 of the Consulting Services Agreement.

C. The CITY wishes to substitute a more concise "Scope of Work", which does not change the project Tasks for the "Project Approach" provided with the Request for Proposals.

C2009-240

AGREEMENT:

1. Paragraph 1, entitled SERVICES TO BE PERFORMED BY CONSULTANT is amended to read in its entirety as follows:

1. SERVICES TO BE PERFORMED BY CONSULTANT

CONSULTANT will provide the services listed in the Revised Scope of Work attached as Exhibit A-1. CONSULTANT warrants that Tasks are the same as previously provided in the Scope of Services attached as Exhibit A to the Original Agreement and changes are only for clarity. CONSULTANT warrants that all work and services set forth in Revised Scope of Work will be performed in a competent, professional and satisfactory manner.

2. Section 15, entitled INDEMNIFICATION is amended to read in its entirety as follows:

15. INDEMNIFICATION

CONSULTANT will indemnify, pay for cost of defense, and hold harmless CITY, the City Council, each member thereof, present and future, its officers, agents and employees, from and against any and all liability, expenses, including defense costs and legal fees, and claims for damages

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whatsoever, including, but not limited to, those arising from breach of contract, bodily injury, death, personal injury, property damage, loss of use, or property loss. The obligation to indemnify, pay for costs of defense, and hold harmless includes, but is not limited to, any liability or expense, including defense costs and legal fees, arising from the negligent acts or omissions, or willful misconduct of CONSULTANT, its officers, employees, agents, subconsultants, or vendor. It is further agreed, CONSULTANT's obligations to indemnify, defend, and hold harmless will apply, but only to the extent covered by CONSULTANT's negligence, even in the event of concurrent negligence on the party of CITY, the City Council, each member thereof, present and future, or its officers, agents, and employees, except for liability resulting from the negligence or willful misconduct of CITY, its officers, employees, or agents. Payment by CITY is not a condition precedent to enforcement of this indemnity.

3. In all other respects, the Agreement dated December 22, 2009, between CITY and CONTRACTOR is ratified and reaffirmed and is in full force and effect.

CITY OF TORRANCE,
a Municipal Corporation

Frank Scotto, Mayor

ATTEST:

Sue Herbers, City Clerk

APPROVED AS TO FORM:

John L. FELLOWS III
City Attorney

By:

CAROLLO ENGINEERS, P.C.
an Arizona Corporation

By:
Graham J. Juby, Ph.D, P.E.
Partner-in-Charge

By:
Stephen G. Hough, P.E.
Partner

EXHIBIT A-1

REVISED SCOPE OF WORK

EXHIBIT A

Scope of Work

Details of the scope of services to be conducted by Carollo Engineers to complete the Stormwater Master Plan are presented below.

Task 1 - Evaluation of Stormwater Quantity/Conveyance

Under this task, our team will update the existing model to include new pipes, all drainage related improvements, and recommendations in the 1997 Master Plan. We will evaluate the previous Master Plan report and existing models to validate the recommended improvements as they pertain to:

- Watershed area and hydrology.
- Expected pollutant loading and removal.
- Cost effectiveness.
- Reuse application.
- Ease of operation and maintenance.
- Construction constraints.

Task 1.1 - Review the City's 1997 Drainage Master Plan and GIS Layers

The objective of this task is to review and assess the quality of available storm drain-related data and identify additional needs. Specific sources of information that will be reviewed are:

- The 1997 Drainage Master Plan.
- Existing City, County, and State (Caltrans) drawings and atlas maps to identify changes in the storm drain system since completion of the 1997 Master Plan.
- The City's GIS layers to confirm storm drain infrastructure ownership including those that maintained by the County, Caltrans, other private agencies, and private facilities.
- Existing Models - RATSC7.

Task 1.2 - Identify Updates to the City's GIS Databases and/or Coverage of Storm Drain Infrastructure

The City's storm drain plans produced in 1997 will be used to identify updates needed to the City's GIS databases and/or coverage of the storm drain system pipes, catch basins, tributary areas, and watersheds. The updates will include adding storm drain-related attributes such as pipe size, slope, material type, invert elevation, surface elevation, ownership, drawing number, type and size of catch basin. Other GIS attributes such as Time of Concentration (TC), composite runoff coefficient, area (in acres), system number, and peak flow rate (Q), that provide a link between hydrology and hydraulic analysis will also be included.

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Using the latest Los Angeles County criteria, update the City storm drain model and issue an updated hydrology report of the system. The report will account for both existing and future land use/zoning/development, hydrologic conditions, and runoff rates. In addition, a hydraulic and quantitative analysis of the storm drain facilities will be undertaken. The analysis will include investigation into basins, both retention and detention, other known public or private facilities serving the City, other areas within the City boundary, and any additional facilities draining to the City.

Evaluate the hydraulic capacity of each storm drain, by using uniform flows for present hydraulic conditions, 10-year, 25-year, and 50-year storms, and segregate the analysis by watershed. The information obtained by the hydraulic capacity analysis will be included in a detailed report generated for the City. The report will detail hydraulic deficiencies within the system and describe various robust BMP options to alleviate trouble areas identified in the hydraulic capacity analysis. One option will include the diversion of excess storm drain flow and run-off to the Vine and Walnut detention basins. The report will include the altered hydraulic capacities of basins and downstream conveyance systems given each BMP option.

The Capital Improvement Program (CIP) and associated cost estimates will be integral to the report. We will use GA optimization techniques to optimize the CIP.

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Deliverables include updated GIS storm drain database and hydraulic model, storm drain condition survey and hydraulic capacity/deficiencies, watershed/industries/TMDL map, list of system deficiencies, CIP recommendations to address capacity and structural deficiencies, and associated cost estimates. We will also deliver all satellite imageries to the City.

Task 2 - Evaluate Stormwater Quality and Recommend Treatment to Comply with Existing and Proposed TMDLs

Develop water quality improvement alternatives that meet the needs of stormwater runoff pollution reduction, and improve the quality of receiving water bodies. The final evaluation of BMPs for pollutant load and runoff quantity reduction will be conducted through a decision-making process to reflect the principles of formal prioritization.

Task 2.1 - Review LACDPW Watershed Management Modeling System

Review the pollutants of concern identified in the Watershed Management Modeling System, on both a watershed and sub-watershed basis. In addition, undertake review of the sections of the County's plan applicable to water quality data, hydraulic models, and associated maps addressing the City watersheds. The relevance of technologies, with regard to the City' compliance with TMDLS, identified through the water quality data and principles review will also be evaluated.

With the use of available stormwater monitoring data, including data in the County's watershed plan applicable to the City and Santa Monica Bay Beaches Bacteria (SMBBB) TMDL, determine effects of watershed priorities and current Environmental Protection Agency (EPA) and

RWQCB regulations on NPDES and TMDLs for monitoring and treatment requirements as they pertain to the City.

Task 2.2 - Confirmation of Water Quality Objectives

Investigate the water quality objectives outlined in the County's plan to verify that the objectives integrate applicable existing storm-water quality standards including RWQCB, existing and proposed NPDES MS4 permits, SMBBB TMDLs, and Machado Lake Trash and Nutrient TMDLs. Research with regard to applicable pending and known future stormwater quality standards listed in the RWQCB Basin Plan will also be undertaken. This includes the recently adopted Ventura County NPDES MS4 Permit, the future MS4 Permit for Los Angeles area cities, and Dominguez Channel Metals TMDL.

Task 2.3 - Compliance Review

Applicable existing and pending City, County, and Regional NPDES MS4 permit stormwater codes, ordinances, and regulations will be thoroughly examined and noncompliance issues will be identified. With this information, identify the appropriate compliant actions and responsible entities, among the LACDPW, the City's Public Works Department, the City's Community Development Department, the City's Community Services (Parks and Recreation) Department, SMBBB Jurisdictional Groups 5 and 6, and the Machado Lake TMDL Jurisdictional Group. A comprehensive description of compliant actions and corrective action plan will be created to guide the City in reaching compliance with existing and pending codes, ordinances, and regulations.

Task 2.4 - Projection of Pollutant Sources and Associated Loadings

With the data available in the County's plan, project expected pollutant sources and associated loadings for each watershed given a 3/4-inch and 1-inch rain, in addition to a 1-hour and a 10-year storm event. For the analysis, the City hydraulic data and a simple land use-based pollutant load model will be used.

Task 2.5 - Sub-Watershed TMDL Compliance Prioritization

To clearly identify high priority areas within the City, evaluate sub-watersheds on the basis of TMDL compliance, pollution potential burden to nearby waterways, and environmental impacts to receiving waters. This evaluation will be utilized to determine phased implementation of recommended BMPs.

Task 2.6 - Pollution Source Identification Via Reconnaissance

With the aid of GIS maps and a variety of reconnaissance tactics, identify significant sources of pollution in each sub-watershed. Aerial photos, storm drain system maps, and business license data will all be targets of our reconnaissance efforts. These reconnaissance tools will be used to complete a visual screening of land use areas of concern and identify corresponding storm drain manholes for sampling and analysis. In addition, other potential pollutant source areas such as restaurants, veterinarians and animal boarding facilities, dog parks, home and garden centers, car washes, high-density residential, and other establishments with outdoor waste storage areas will be located and identified. As a means to further understand the sub-watersheds and potential pollutant contributors, schedule interviews with City inspectors and local agency NPDES inspectors for leads on problem areas or businesses.

Deliverables

Deliverables include regulations review/compliance actions, watershed/source high-priority areas map, and pollutant source/visual screening.

Task 3 - Evaluate and Develop City-Wide Conveyance and Treatment Management Strategies

Task 3.1 - Research and Identify Potential Water Treatment Technologies

With the hydraulic and water quality data assembled, research relevant literature on source control, diversion programs, treatment controls, and beneficial reuse options. Potential water treatment technologies, both structural and non-structural, reuse opportunities, and multi-purpose treatment opportunities will be identified and evaluated based on the City's Treatment Management Strategies. Investigated technologies will include Standard Urban Stormwater Mitigation Plan (SUSMP) BMPs, LID BMPs, and local/regional BMPs to meet TMDL/ NPDES permit compliance. Moreover, reuse alternatives will be explored including groundwater replenishment, parkway/median irrigation, and habitat restoration. Other devices such as hydrodynamic separators will be evaluated.

To properly evaluate the various treatment and reuse alternatives identified, generate a matrix based upon a combination of known and anticipated TMDL requirements. The treatment/ reuse matrix will account for the effectiveness in treating identified pollutants, most specifically, whether they provide peak flow reductions, applicable drainage types/sizes, relative cost of operation and maintenance, relative hydraulic restrictions, and any need for pretreatment. As a source of reference, examples for each treatment/ reuse alternative will be provided.

Task 3.2 - Development of Alternative Solutions for Stormwater Quality Problems

In order to reduce quantity and improve the quality of runoff, develop alternative solutions for storm drain water quality problems (excluding the Santa Monica Bay Watershed) within the City that maximize the use of the City's existing storm drain system capacity, detention basins, treatment and infiltration, and structural/non-structural BMPs. In addition, work with SMBBB TMDL Jurisdictional Groups 5 and 6 to incorporate their findings and recommendations into the City's Master Plan.

The alternative evaluation will include investigation into sub-regional BMPs and LID for new development and redevelopment, and distributed retrofits using existing right-of-ways, parkways, and storm drains. After an evaluation accounting for alternative feasibility and cost, the most viable and cost-effective improvements to adequately protect existing and future developments from both stormwater conveyance and stormwater quality issues, and help to maintain compliance with existing and known future regulations, will be selected.

Task 3.3 - Review of Public Works Procedures and Specifications

Conduct a review of existing Public Works procedures and specifications. Propose applicable BMP standard drawings for street/curb, gutter and catch basin construction projects, and BMPs for Fire Station No. 3 Training Facility discharges.

Task 3.4 - Develop a City Watershed-Based Water Quality Monitoring Plan and Scope for TMDL and Waste Load Allocation Compliance

Examine watersheds within the City and determine appropriate monitoring locations and use this information to develop a sophisticated watershed-based water quality monitoring plan. Detailed scopes targeting compliance with existing and proposed TMDLs and Waste Load Allocations as identified in the pending MS4 NPDES Permit for Los Angeles area cities will accompany the monitoring plan. In connection with the city-wide monitoring plan, a watershed specific monitoring and reporting plan for the Machado Lake Watershed will be generated. As an integral component of the plan, end of pipe (at City boundary) Waste Load Allocations measurements will be taken to facilitate plan development.

Task 3.5 - Dry and Wet Weather Flow Diversion Evaluation

Conduct a hydraulic assessment to investigate the possibility of diverting additional dry and wet weather flows to existing detention basins. Within this assessment, focus on infrastructure that previously possessed storm drains constructed to bypass basins, most notably the Walnut Avenue and Vine Avenue basins. Through the hydraulic assessment and analysis of the watersheds influencing existing detention basins, a list of BMP-related storm drain improvements will be proposed in order to maximize detention basin effectiveness.

Task 3.6 - Design and Certify Detention Basin Pump Stations as Full Capture Systems

To investigate potential full-capture systems identified in the Machado Lake Trash TMDL Staff Report, develop and coordinate a testing plan in order to certify the Maple, Walteria, and 237th Street detention basins/pump stations as full capture devices for trash. The plan will include inspection of the installation of full-capture screens at manholes downstream of force main discharges and quantifying trash collected from each basin discharged from force mains. Appropriate coordination with local and regional agencies will be employed. Upon completion of testing, generate a report for submittal to the RWQCB for certification of the Maple, Walteria, and/or 237th Street Detention Basin(s) as full-capture trash BMPs.

Task 3.7 - Conduct Structural BMP Siting Study

Using the High Priority Area determinations and associated critical constituent data compiled in previous tasks, conduct a Structural BMP Siting Study to identify potential opportunities for cost-effective structural BMP implementation to mitigate critical constituents associated with High Priority Areas. To best qualify BMPs determined in the Siting Study, develop Structural BMP threshold criteria. A review of the Santa Monica Bay Jurisdictional Groups 5 and 6 BMP Siting Study will be employed and results from the study will be incorporated.

Task 3.8 - Review and Update the City's CIP

Perform an extensive review of the City's phased CIP and update as needed. Through the review, identify potential BMP treatment improvements and practices that parallel the City's treatment objectives. Potential BMP treatment improvements will be evaluated on the basis of existing and known future MS4 NPDES permits and TMDL regulations, qualities of engineering effectiveness, financial affordability, and public and political acceptability.

Task 3.9 - Review of City Funding Policies

Perform a comprehensive review of the City's current funding policies affiliated with stormwater conveyance and treatment. Identification and recommendation of new funding strategies for financing the phased implementation of the planned projects will be primary objectives of the review. The policy objectives and conveyance/compliance goals developed by the City will be integral to funding strategy identification. In addition, evaluate the applicable state and federal grants, research the implementation of an assessment program for new developments, and explore the possibility of implementing a stormwater utility parcel fee.

Deliverables

Deliverables include alternative treatment/reuse solutions and matrix report, BMP assessment and siting study, recommended CIP for BMPs and cost estimates, basin/pump station full-capture system report to the RWQCB, capacity and treatment funding strategies and fee sources/alternatives report, draft Master Plans (60%, 90%), and Final Master Plan.

Task 4 - Meetings

Several meeting formats will be necessary to successfully communicate preliminary findings and to manage the project. Conduct coordination meetings with City staff on a monthly basis. During coordination meetings, discuss work items completed and all pending items requiring City

approval or action. These meetings allow City staff involved with the project to participate and provide valuable input to help direct the work effort.

Task 4.1 - Conduct Project Kickoff Meeting

Key members of the project team will attend the project kickoff meeting. At this meeting, a project management plan will be presented that outlines communication protocol and a plan to successfully complete the project on time and within budget.

Task 4.2 - Attend Monthly Progress Meetings

Closely coordinate with the City in monthly progress meetings throughout the project life cycle. Monthly progress reports will also provide a summary of tasks and funds expended.

Task 5 - Master Plan Report

Compile the efforts and finding of the study into a complete document that includes an executive summary as well as pertinent factual and backup data necessary for implementation. The final document will be a concise and easily understood document that incorporates the finding of all the tasks and can be used by the City to communicate the recommended program to a diverse audience.

ATTACHMENT D

AMENDMENT No 2 TO AGREEMENT

This Amendment to Agreement is made and entered into as of May 25, 2010, by and between the CITY OF TORRANCE, a municipal corporation ("CITY"), and Carollo Engineers, ~~P.C., an Arizona Corporation~~ Inc. ("CONSULTANT").

RECITALS:

A. CITY and CONSULTANT entered into an Agreement on December 22, 2009, whereby CONSULTANT agreed to provide services for the development of a National Pollution Discharge Elimination System (NPDES) Master Plan.

B. City and CONSULTANT approved an Amendment to the Agreement on April 13, 2010 for changes in the Consulting Services Agreement Indemnification clause.

C. The CITY and CONSULTANT agree to increase Consultant's fee by $35,571.00. for a total not to exceed amount of $288,863.00, to add update for the City's GIS storm drain information and to use and calibrate a new hydraulic model.

C2009-240

AGREEMENT:

1. Paragraph 1, entitled SERVICES TO BE PERFORMED BY CONSULTANT is amended to read in its entirety as follows:

   1. **SERVICES TO BE PERFORMED BY CONSULTANT**

      CONSULTANT will provide the services listed in amended Scope of Work of Agreement C2009-240 (original scope) and Exhibit A-2 (additional scope attached hereto). CONSULTANT that all work and services set forth in Scope of Work will be performed in a competent, professional and satisfactory manner.

2. Paragraph 3, Section A, entitled COMPENSATION, is amended to read in its entirety as follows:

   A. CONSULTANT'S Fee

   For services rendered pursuant to this Agreement, CONSULTANT will be paid in accordance with the original agreement compensation schedule and this Amendment Compensation Schedule attached as Exhibit B-1; however in no event will the amount of money paid the CONSULTANT, for services initially contemplated by the original agreement and this Amendment exceed the sum of

COPY

288,863.00 ("Agreement Sum"_, unless otherwise first approved in writing by CITY.

3. In all other aspects, the Agreement dated December 22, 2009, and the Amendment dated April 13, 2010 between CITY and CONSULTANT are ratified and reaffirmed and are in full force and effect.

CITY OF TORRANCE,
a Municipal Corporation

Frank Scotto, Mayor

CAROLLO ENGINEERS, ~~P.C.~~ Inc.
~~a Arizona Corporation~~

By:
Graham J. Juby, Ph.D., P.E.
Partner-in-Charge

Stephen G. Hough, P.E.
Partner

ATTEST:

Sue Herbers, City Clerk

APPROVED AS TO FORM:

John L. FELLOWS III
City Attorney

By:

Exhibit A-2
Changes in Scope of Services
Contract Amendment

City of Torrance Storm Drain Master Plan

A. INTRODUCTION

The original scope of services for the City of Torrance's (City's) Storm Drain Master Plan was based on the assumption that the City had an existing stormwater model that Carollo Engineers (Carollo) could use to model the City's storm drain network. Carollo's proposal included updating the City's model to incorporate new features (such as storm drains, catch basins, etc.). Because a stormwater model does not currently exist, the data for a majority of the City's older stormwater infrastructure is not readily available in a model-useable format. The City's Geographic Information System (GIS) does not currently hold the needed data. Also, stormwater modeling tools available today are much more sophisticated, requiring specialized expertise in selecting and handling data.

The effort to create a new stormwater model will include physically entering data from as-builts to establish pipe/channel network connectivity, and sub-catchment delineation (size, elevation, etc). The data handling effort will be significant. Fortunately, the City's GIS data system has some portion of the data that can be used. The GIS database alone cannot entirely provide the data needed by modeling professionals.

Several modeling software systems options exist for the City. We reviewed several options with City staff and recommended the City focus on XP-SWMM, Info-SWMM, or MOUSE. XP-SWMM will soon have the ability to use WSPGW software as a hydraulic modeling add-on, providing future potential capabilities that the City may desire.

After careful consideration, the City staff selected XP-SWMM. The cost of implementation of XP-SWMM was less than for Info-SWMM or MOUSE. Also, by selecting XP-SWMM, the City will be better prepared to model and develop solutions to address compliance issues with future Total Maximum Daily Loads (TMDLs) and stormwater regulations. XP-SWMM can handle both hydraulic and hydrologic modeling. The capabilities present in XP-SWMM far outreach the older modeling system used to develop the 1997 Storm Drain Master Plan and represents a significant improvement in the ability of modeling today's complex problems associated with stormwater water quality.

City staff have also directed Carollo to only model the Machado Lake and Dominguez Channel watersheds as the Santa Monica Bay watershed has already been analyzed as part of the Stormwater Basin Enhancement Program and the Ocean and Bishop Basins are retention basins serving as Best Management Practices (BMPs).

B. SCOPE OF SERVICES

1 - Storm Drain Data Collection and Database Development

a. The City's existing GIS includes 6,259 storm drains and approximately 2,850 manholes, inlets, and junctions. This database does not include all the required information for stormwater modeling. The basic information needed for stormwater modeling includes storm drain sizes, pipe/channel slope, type of storm drain, storm drain material, pipe/channel network connectivity, manhole or inlet invert, and ground/spill elevations. Carollo will physically extract this information from as-builts. Two separate databases will

be created; one database for manholes, inlets, and junctions, and the other for pipes and open channel. The manhole, inlets, and junction database does not include ground or spill elevation and invert elevation. Carollo will use the available GIS tools to the extent possible. Access to the City's record files and GIS system may become necessary. If so, Carollo will request access to these records at City office locations.

1) The City has decided to limit the scope of the stormwater model development to the Machado Lake and Dominguez Channel Watersheds. Carollo's effort will be limited to these areas.

2 - Develop a New Storm Drain Stormwater Model

a. A new stormwater model will be created using XP-SWMM selected by City staff. The City will not need to buy the software unless the City plans to perform modeling internally. The cost of the software itself has not been included in Carollo's proposed costs to perform the added scope of work. XP-SWMM will be used to model the Machado Lake and Dominguez Channel watersheds. The existing stormwater storage/BMPs will be included in the stormwater model to allow the model to evaluate hydrologic and hydraulic impacts of these measures.

   1) Sub-Catchment Delineation. We will divide the main subbasins into multiple sub-catchments using the City's high-resolution digital elevation model (DEM) as well as any elevation and contour data provided by the City. The sub-catchments delineation will be automated in ArcGIS based on the following:

      (a) Confluence points of tributaries, as deemed appropriate and significant relative to stormwater management planning based on engineering judgment and good modeling practice.

      (b) Other points of interest, such as water-quality monitoring stations, locations of water-quality concerns, potential flood control project sites, significant outfall locations downstream of existing developments, or where significant development is anticipated and projected to occur.

b. Develop Hydrologic Model Capabilities

   The new model software will have more advanced modeling capabilities than the City's previous model and will have the capability to model hydrologic conditions. The new stormwater model will include quantitative computations and evaluations necessary to analyze runoff characteristics of the sub-catchments under existing and future conditions. The model will also assist in developing the need and extent of release rate criteria for the subbasins with stormwater storage/BMP facilities. Carollo will have to input data including rainfall information, drainage network layouts and capacities, travel times within sub-catchments, and significant obstructions, and GIS-based data will be added to develop the selected hydrologic model capabilities.

3 - Model Calibration

Calibration efforts include the adjustment of the hydrologic model parameters to accurately simulate the existing conditions of the watershed. Carollo assumes the City has calibration data from the 1997 modeling effort. Carollo will contact the Los Angeles County Flood Control District to obtain additional data for calibration purposes as well. Also, the output from the County's hydrologic model will be used for hydraulic calibration purposes. Once the new stormwater model has been calibrated, the model will be ready for the tasks outlined within Carollo's original scope of services including incorporation of land-use data and evaluation of the City's

stormwater collection system using data provided from the County's hydrologic model. Model calibration will be limited to the needs of modeling the Machado Lake and Dominguez Channel watersheds.

4 - OPTIONAL ITEMS NOT INCLUDED

a. Updating the City's GIS database with information on all physical features of the stormwater system.

b. The cost of purchasing modeling software for the City's use.

c. Modeling areas within the City's boundaries outside of the Machado Lake and Dominguez Channel watersheds.

d. Other items not specifically included in Tasks 1, 2, and 3 above.

EXHIBIT B-1

New Storm Drain Model Development

City of Torrance

Storm Drain Model Development - XP-SWMM
(model limited to Machado Lake and Dominguez Channel watersheds within City of Torrance boundaries)

WORK ELEMENT	Graham Juby - Partner	Erik Jorgensen - PM	Sam Darkwah	Andrew Wiesner	Word Processing	Other Direct Costs	Carollo Total
1. Storm Drain Data Collection and Database Development	2	16	40	48	0	$ 1,129	$ 20,805
2. Develop a New Storm Drain Model	2	8	24	0	0	$ 1,186	$ 8,086
3. Model Calibration	2	8	16	6	0	$ 366	$ 6,680
							$ 35,571
STAFF TOTAL	6	32	80	54	0		
RATE	$ 234	$ 213	$ 197	$ 165	$ 90		
COST TOTAL	$ 1,404	$ 6,816	$ 15,760	$ 8,910	$ -	$ 2,681	$ 35,571