15-0465

THE ATTACHED AGREEMENT HAS BEEN REVIEWED
AND APPROVED AS TO FORM BY THE CITY
ATTORNEY'S OFFICE AND WILL BE
FORMALLY SIGNED UPON APPROVAL BY
THE CITY COUNCIL

Carol A Trujillo Jr

Glen R. Googins
City Attorney

Dated: 10-9-2015

AGREEMENT
BETWEEN
THE CITY OF CHULA VISTA AND
D-MAX ENGINEERING, INC.
TO PERFORM DRY WEATHER MS4 OUTFALL DISCHARGE
MONITORING SERVICES

Attachment 1

Agreement between City of Chula Vista and D-Max Engineering Inc., To perform Dry Weather MS4 Outfall Discharge Monitoring Services

This agreement (Agreement), effective **[FILL-IN EFFECTIVE DATE]**, is between the City-related entity whose name and business form is indicated on Exhibit A, Paragraph 2, (City), and the entity whose name, business form, place of business and telephone numbers are indicated on Exhibit A, Paragraphs 4 through 6, (Consultant), and is made with reference to the following facts:

RECITALS

WHEREAS, the San Diego Regional Water Quality Control Board (RWQCB) adopted in May 2013, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirement for Discharges From The Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region Order No. R9-2013-0001, NPDES No. CAS0109266; and

WHEREAS, this order was issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370); and

WHEREAS, CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants; and

WHEREAS, in order to comply with Federal and State law, the City of Chula Vista is required to perform Dry Weather MS4 outfall discharge monitoring (Provision D.2.b; RWQCB, 2013) to identify, prioritize, control and monitor the non-storm water and illicit discharges within its jurisdictions; and

WHEREAS, dry weather MS4 outfall discharge monitoring includes but is not limited to field screening, field monitoring, field sampling and laboratory testing and analysis and trash assessment monitoring at identified locations throughout City; and

WHEREAS, due to the expertise and specialized equipment necessary to perform these services, City had determined it is necessary to retain the serivces of Consultant in order to satisfy dry weather MS4 outfall discharge monitoring requirements; and,

WHEREAS, Consultant warrants and represents that it is experienced and staffed in a manner such that it can deliver the services required of Consultant to City in accordance with the time frames and the terms and conditions of this Agreement.

[End of Recitals. Next Page Starts Obligatory Provisions.]

NOW, THEREFORE, for valuable consideration the City and Consultant do hereby mutually agree as follows:

All of the Recitals above are incorporated into this Agreement by this reference.

ARTICLE I. CONSULTANT'S OBLIGATIONS

A. **General**

1. General Duties. Consultant shall perform all of the services described on Exhibit A, Paragraph 7 (General Duties).

2. Scope of Work and Schedule. In performing and delivering the General Duties, Consultant shall also perform the services, and deliver to City the "Deliverables" described in Exhibit A, Paragraph 8, entitled "Scope of Work and Schedule," according to, and within the time frames set forth in Exhibit A, Paragraph 8, time being of the essence of this agreement. The General Duties and the work and Deliverables required in the Scope of Work and Schedule shall be referred to as the "Defined Services." Failure to complete the Defined Services by the times indicated does not, except at the option of the City, terminate this Agreement.

   a. *Reductions in Scope of Work.* City may independently, or upon request from Consultant, from time to time, reduce the Defined Services to be performed by the Consultant under this Agreement. Upon doing so, City and Consultant agree to meet in good faith and confer for the purpose of negotiating a corresponding reduction in the compensation associated with the reduction.

   b. *Additional Services.* In addition to performing the Defined Services, City may require Consultant to perform additional consulting services related to the Defined Services (Additional Services), and upon doing so in writing, if they are within the scope of services offered by Consultant, Consultant shall perform same on a time and materials basis at the rates set forth in the "Rate Schedule" in Exhibit A, Paragraph 10(C), unless a separate fixed fee is otherwise agreed upon. All compensation for Additional Services shall be paid monthly as billed.

3. Standard of Care. The Consultant expressly warrants that the work to be performed pursuant to this Agreement, whether Defined Services or Additional Services, shall be performed in accordance with the standard of care ordinarily exercised by members of the profession currently practicing under similar conditions and in similar locations.

   a. *No Waiver of Standard of Care.* Where approval by City is required, it is understood to be conceptual approval only and does not relieve the Consultant of responsibility for complying with all laws, codes, industry standards, and liability for damages caused by negligent acts, errors, omissions, noncompliance with industry standards, or the willful misconduct of the Consultant or its subcontractors.

B. **Application of Laws.** Should a federal or state law pre-empt a local law, or regulation, the Consultant must comply with the federal or state law and implementing regulations. No provision of this Agreement requires the Consultant to observe or enforce compliance with any provision, perform any other act, or do any other thing in contravention of federal, state, territorial, or local law, regulation, or ordinance. If compliance with any provision of this Agreement violates or would require the Consultant to violate any law, the Consultant agrees to notify City immediately in writing. Should this occur, the City and the Consultant agree that they will make appropriate arrangements to proceed with or, if necessary, amend or terminate this Agreement, or portions of it, expeditiously.

1. Subcontractors. Consultant agrees to take appropriate measures necessary to ensure that all participants utilized by the Consultant to complete its obligations under this Agreement, such as subcontractors, comply with all applicable laws, regulations, ordinances, and policies, whether federal, state, or local, affecting Project implementation. In addition, if a subcontractor is expected to fulfill any responsibilities of the Consultant under this Agreement, the Consultant shall ensure that the subcontractor carries out the Consultant's responsibilities as set forth in this Agreement.

C. **Insurance**

1. General. Consultant must procure and maintain, during the period of performance of this Agreement, and for twelve months after completion, policies of insurance from insurance companies to protect against claims for injuries to persons or damages to property that may arise from or in connection with the performance of the work under this Agreement and the results of that work by the Consultant, his agents, representatives, employees or subcontractors, and provide documentation of same prior to commencement of work.

2. Minimum Scope of Insurance. Coverage must be at least as broad as:

   a. *CGL.* Insurance Services Office Commercial General Liability coverage (occurrence Form CG0001).

   b. *Auto.* Insurance Services Office Form Number CA 0001 covering Automobile Liability, Code 1 (any auto).

   c. *WC.* Workers' Compensation insurance as required by the State of California and Employer's Liability Insurance.

   d. *E&O.* Professional Liability or Errors & Omissions Liability insurance appropriate to the Consultant's profession. Architects' and Engineers' coverage is to be endorsed to include contractual liability.

3. Minimum Limits of Insurance. Consultant must maintain limits no less than those included in the table below:

i. General Liability: (Including operations, products and completed operations, as applicable)	$1,000,000 per occurrence for bodily injury, personal injury, (including death), and property damage. If Commercial General Liability insurance with a general aggregate limit is used, either the general aggregate limit must apply separately to this Project/location or the general aggregate limit must be twice the required occurrence limit.
ii. Automobile Liability:	$1,000,000 per accident for bodily injury, including death, and property damage.
iii. Workers' Compensation Employer's Liability:	Statutory $1,000,000 each accident $1,000,000 disease-policy limit $1,000,000 disease-each employee
iv. Professional Liability or Errors & Omissions Liability:	$1,000,000 each occurrence

If the Consultant maintains higher limits than the minimums shown above, the City requires and shall be entitled to coverage for the higher limits maintained by the Consultant.

4. Deductibles and Self-Insured Retentions. Any deductibles or self-insured retentions must be declared to and approved by the City. At the option of the City, either the insurer will reduce or eliminate such deductibles or self-insured retentions as they pertain to the City, its officers, officials, employees and volunteers; or the Consultant will provide a financial guarantee satisfactory to the City guaranteeing payment of losses and related investigations, claim administration, and defense expenses.

5. Other Insurance Provisions. The general liability, automobile liability, and where appropriate, the worker's compensation policies are to contain, or be endorsed to contain, the following provisions:

   a. *Additional Insureds*. City of Chula Vista, its officers, officials, employees, agents, and volunteers are to be named as additional insureds with respect to all policies of insurance, including those with respect to liability arising out of automobiles owned, leased, hired or borrowed by or on behalf of the Consultant, where applicable, and, with respect to liability arising out of work or operations performed by or on behalf of the Consultant, including providing materials, parts or equipment furnished in connection with such work or operations. The general liability additional insured coverage must be provided in the form of an endorsement to the Consultant's insurance using ISO CG 2010 (11/85) or its equivalent. Specifically, the endorsement must not exclude Products/Completed Operations coverage.

b. *Primary Insurance.* The Consultant's General Liability insurance coverage must be primary insurance as it pertains to the City, its officers, officials, employees, agents, and volunteers. Any insurance or self-insurance maintained by the City, its officers, officials, employees, or volunteers is wholly separate from the insurance of the Consultant and in no way relieves the Consultant from its responsibility to provide insurance.

c. *Cancellation.* The insurance policies required by this Agreement shall not be canceled by either party, except after thirty days' prior written notice to the City by certified mail, return receipt requested. The words "will endeavor" and "but failure to mail such notice shall impose no obligation or liability of any kind upon the company, its agents, or representatives" shall be deleted from all certificates.

d. *Waiver of Subrogation.* Consultant's insurer will provide a Waiver of Subrogation in favor of the City for each required policy providing coverage for the term required by this Agreement. In addition, Consultant waives any right it may have or may obtain to subrogation for a claim against the City.

6. Claims Forms. If General Liability, Pollution and/or Asbestos Pollution Liability and/or Errors & Omissions coverage are written on a claims-made form:

   a. *Retro Date.* The "Retro Date" must be shown, and must be before the date of the Agreement or the beginning of the work required by the Agreement.

   b. *Maintenance and Evidence.* Insurance must be maintained and evidence of insurance must be provided for at least five years after completion of the work required by the Agreement.

   c. *Cancellation.* If coverage is canceled or non-renewed, and not replaced with another claims-made policy form with a "Retro Date" prior to the effective date of the Agreement, the Consultant must purchase "extended reporting" coverage for a minimum of five years after completion of the work required by the Agreement.

   d. *Copies.* A copy of the claims reporting requirements must be submitted to the City for review.

7. Acceptability of Insurers. Insurance is to be placed with licensed insurers admitted to transact business in the State of California with a current A.M. Best's rating of no less than A V. If insurance is placed with a surplus lines insurer, insurer must be listed on the State of California List of Eligible Surplus Lines Insurers (LESLI) with a current A.M. Best's rating of no less than A X. Exception may be made for the State Compensation Fund when not specifically rated.

8. Verification of Coverage. Consultant shall furnish the City with original certificates and amendatory endorsements effecting coverage required by Section I.C. of this Agreement. The endorsements should be on insurance industry forms, provided those endorsements

or policies conform to the requirements of this Agreement. All certificates and endorsements are to be received and approved by the City before work commences. The City reserves the right to require, at any time, complete, certified copies of all required insurance policies, including endorsements evidencing the coverage required by these specifications.

9. Subcontractors. Consultant must include all subconsultants as insureds under its policies or furnish separate certificates and endorsements for each subconsultant. All coverage for subconsultants is subject to all of the requirements included in these specifications.

10. Not a Limitation of Other Obligations. Insurance provisions under this Article shall not be construed to limit the Consultant's obligations under this Agreement, including Indemnity.

11. Additional Coverage. To the extent that Insurance coverage exceeds the minimums identified in section 3, recovery shall not be limited to the insurance minimums, but shall instead extend to the actual policy limits.

D. **Security for Performance**

1. Performance Bond. In the event that Exhibit A, at Paragraph 18, indicates the need for Consultant to provide a Performance Bond (indicated by a check mark in the parenthetical space immediately preceding the subparagraph entitled "Performance Bond"), then Consultant shall provide to the City a performance bond, in the amount indicated at Exhibit A, Paragraph 18, in the form prescribed by the City and by such sureties which are authorized to transact such business in the State of California, listed as approved by the United States Department of Treasury Circular 570, http://www.fms.treas.gov/c570, and whose underwriting limitation is sufficient to issue bonds in the amount required by the Agreement, and which also satisfy the requirements stated in Section 995.660 of the Code of Civil Procedure, except as provided otherwise by laws or regulations. All bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act. Surety companies must be duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds for the limits so required. Form must be satisfactory to the Risk Manager or City.

2. Letter of Credit. In the event that Exhibit A, at Paragraph 18, indicates the need for Consultant to provide a Letter of Credit (indicated by a check mark in the parenthetical space immediately preceding the subparagraph entitled "Letter of Credit"), then Consultant shall provide to the City an irrevocable letter of credit callable by the City at its unfettered discretion by submitting to the bank a letter, signed by the City Manager, stating that the Consultant is in breach of the terms of this Agreement. The letter of credit shall be issued by a bank, and be in a form and amount satisfactory to the Risk Manager or City Attorney which amount is indicated in the space adjacent to the term, "Letter of Credit," in Exhibit A, Paragraph 18.

3. Other Security. In the event that Exhibit A, at Paragraph 18, indicates the need for Consultant to provide security other than a Performance Bond or a Letter of Credit

(indicated by a check mark in the parenthetical space immediately preceding the subparagraph entitled "Other Security"), then Consultant shall provide to the City such other security therein listed in a form and amount satisfactory to the Risk Manager or City Attorney.

E. **Business License.** Consultant agrees to obtain a business license from the City and to otherwise comply with Title 5 of the Chula Vista Municipal Code.

ARTICLE II. CITY OBLIGATIONS

A. **Consultation and Cooperation.** City shall regularly consult the Consultant for the purpose of reviewing the progress of the Defined Services and Schedule, and to provide direction and guidance to achieve the objectives of this Agreement. The City shall allow Consultant access to its office facilities, files and records, as deemed necessary and appropriate by the City, throughout the term of this Agreement. In addition, City agrees to provide the materials identified at Exhibit A, Paragraph 9, with the understanding that delay in the provision of those materials beyond thirty days after authorization to proceed, shall constitute a basis for the justifiable delay in the Consultant's performance.

B. **Compensation.**

1. Following Receipt of Billing. Upon receipt of a properly prepared bill from Consultant, submitted to the City as indicated in Exhibit A, Paragraph 17, but in no event more frequently than monthly, on the day of the period indicated in Exhibit A, Paragraph 17, City shall compensate Consultant for all services rendered by Consultant according to the terms and conditions set forth in Exhibit A, Paragraph 10, adjacent to the governing compensation relationship indicated by a "checkmark" next to the appropriate arrangement, subject to the requirements for retention set forth in Paragraph 18 of Exhibit A, and shall compensate Consultant for out of pocket expenses as provided in Exhibit A, Paragraph 11.

2. Supporting Information. Any billing submitted by Consultant shall contain sufficient information as to the propriety of the billing, including properly executed payrolls, time records, invoices, contracts, or vouchers describing in detail the nature of the charges to the Project in order to permit the City to evaluate that the amount due and payable is proper, and such billing shall specifically contain the City's account number indicated on Exhibit A, Paragraph 17(C) to be charged upon making such payment.

3. Exclusions. In determining the amount of the compensation City will exclude any cost: 1) incurred prior to the effective date of this Agreement; or 2) arising out of or related to the errors, omissions, negligence or acts of willful misconduct of the Consultant, its agents, employees, or subcontractors.

    a. *Errors and Omissions.* In the event that the City Administrator determines that the Consultant's negligence, errors, or omissions in the performance of work under this Agreement has resulted in expense to City greater than would have

resulted if there were no such negligence, errors, omissions, Consultant shall reimburse City for any additional expenses incurred by the City. Nothing in this paragraph is intended to limit City's rights under other provisions of this Agreement.

4. Payment Not Final Approval. The Consultant understands and agrees that payment to the Consultant for any Project cost does not constitute a City final decision about whether that cost is allowable and eligible for payment under the Project and does not constitute a waiver of any violation of Consultant of the terms of the Agreement. The Consultant acknowledges that City will not make a final determination about the eligibility of any cost until the final payment has been made on the Project or the results of an audit of the Project requested by the City has been completed, whichever occurs latest. If City determines that the Consultant is not entitled to receive any portion of the compensation due or paid, City will notify the Consultant in writing, stating its reasons. The Consultant agrees that Project closeout will not alter the Consultant's responsibility to return any funds due City as a result of later refunds, corrections, or other similar transactions; nor will Project closeout alter the right of City to disallow costs and recover funds provided for the Project on the basis of a later audit or other review.

   a. *Consultant's Obligation to Pay.* Upon notification to the Consultant that specific amounts are owed to City, whether for excess payments or disallowed costs, the Consultant agrees to remit to City promptly the amounts owed, including applicable interest.

ARTICLE III. ETHICS

A. Financial Interests of Consultant

1. Consultant is Designated as an FPPC Filer. If Consultant is designated on Exhibit A, Paragraph 14, as an "FPPC filer," Consultant is deemed to be a "Consultant" for the purposes of the Political Reform Act conflict of interest and disclosure provisions, and shall report economic interests to the City Clerk on the required Statement of Economic Interests in such reporting categories as are specified in Paragraph 14 of Exhibit A, or if none are specified, then as determined by the City Attorney.

2. No Participation in Decision. Regardless of whether Consultant is designated as an FPPC Filer, Consultant shall not make, or participate in making or in any way attempt to use Consultant's position to influence a governmental decision in which Consultant knows or has reason to know Consultant has a financial interest other than the compensation promised by this Agreement.

3. Search to Determine Economic Interests. Regardless of whether Consultant is designated as an FPPC Filer, Consultant warrants and represents that Consultant has diligently conducted a search and inventory of Consultant's economic interests, as the term is used in the regulations promulgated by the Fair Political Practices Commission, and has

determined that Consultant does not, to the best of Consultant's knowledge, have an economic interest which would conflict with Consultant's duties under this Agreement.

4. Promise Not to Acquire Conflicting Interests. Regardless of whether Consultant is designated as an FPPC Filer, Consultant further warrants and represents that Consultant will not acquire, obtain, or assume an economic interest during the term of this Agreement which would constitute a conflict of interest as prohibited by the Fair Political Practices Act.

5. Duty to Advise of Conflicting Interests. Regardless of whether Consultant is designated as an FPPC Filer, Consultant further warrants and represents that Consultant will immediately advise the City Attorney if Consultant learns of an economic interest of Consultant's that may result in a conflict of interest for the purpose of the Fair Political Practices Act, and regulations promulgated thereunder.

6. Specific Warranties Against Economic Interests. Consultant warrants, represents and agrees that:

   a. Neither Consultant, nor Consultant's immediate family members, nor Consultant's employees or agents (Consultant Associates) presently have any interest, directly or indirectly, whatsoever in any property which may be the subject matter of the Defined Services, or in any property within 2 radial miles from the exterior boundaries of any property which may be the subject matter of the Defined Services, (Prohibited Interest), other than as listed in Exhibit A, Paragraph 14.

   b. No promise of future employment, remuneration, consideration, gratuity or other reward or gain has been made to Consultant or Consultant Associates in connection with Consultant's performance of this Agreement. Consultant promises to advise City of any such promise that may be made during the Term of this Agreement, or for twelve months thereafter.

   c. Consultant Associates shall not acquire any such Prohibited Interest within the Term of this Agreement, or for twelve months after the expiration of this Agreement, except with the written permission of City.

   d. Consultant may not conduct or solicit any business for any party to this Agreement, or for any third party that may be in conflict with Consultant's responsibilities under this Agreement, except with the written permission of City.

IV. LIQUIDATED DAMAGES

A. **Application of Section**. The provisions of this section apply if a Liquidated Damages Rate is provided in Exhibit A, Paragraph 13.

1. Estimating Damages. It is acknowledged by both parties that time is of the essence in the completion of this Agreement. It is difficult to estimate the amount of damages resulting

from delay in performance. The parties have used their judgment to arrive at a reasonable amount to compensate for delay.

2. Amount of Penalty. Failure to complete the Defined Services within the allotted time period specified in this Agreement shall result in the following penalty: For each consecutive calendar day in excess of the time specified for the completion of the respective work assignment or Deliverable, the Consultant shall pay to the City, or have withheld from monies due, the sum of Liquidated Damages Rate provided in Exhibit A, Paragraph 13 (Liquidated Damages Rate).

3. Request for Extension of Time. If the performance of any act required of Consultant is directly prevented or delayed by reason of strikes, lockouts, labor disputes, unusual governmental delays, acts of God, fire, floods, epidemics, freight embargoes, or other causes beyond the reasonable control of the Consultant, as determined by the City, Consultant shall be excused from performing that act for the period of time equal to the period of time of the prevention or delay. In the event Consultant claims the existence of such a delay, the Consultant shall notify the City's Contract Administrator, or designee, in writing of that fact within ten calendar days after the beginning of any such claimed delay. Extensions of time will not be granted for delays to minor portions of work unless it can be shown that such delays did or will delay the progress of the work.

ARTICLE V. INDEMNIFICATION

A. **Defense, Indemnity, and Hold Harmless.**

1. General Requirement. To the maximum extent allowed by law, Consultant shall defend, indemnify, protect and hold harmless the City, its elected and appointed officers, agents and employees, from and against any and all claims, demands, causes of action, costs, expenses, (including reasonable attorney's fees and actual costs), liability, loss, damage or injury, in law or equity, to property or persons, including wrongful death, in any manner arising out of or incident to any alleged acts, omissions, negligence, or willful misconduct of Consultant, its officials, officers, employees, agents, and contractors, arising out of or in connection with the performance of the Defined Services, the results of such performance, or this Agreement. This indemnity provision does not include any claims, damages, liability, costs and expenses arising from the sole negligence or sole willful misconduct of the City, its officers, employees. Also covered is liability arising from, connected with, caused by or claimed to be caused by the active or passive negligent acts or omissions of the City, its agents, officers, or employees which may be in combination with the active or passive negligent acts or omissions of the Consultant, its employees, agents or officers, or any third party.

2. Design Professional Services. Notwithstanding the forgoing, if the services provided under this Agreement are design professional services, as defined by California Civil Code section 2782.5, as may be amended from time to time, the defense and indemnity obligation under Section 1, above, shall be limited to the extent required by California Civil Code section 2782.8.

3. Costs of Defense and Award. Included in the obligations in Sections A.1 and A.2, above, is the Consultant's obligation to defend, at Consultant's own cost, expense and risk, any and all suits, actions or other legal proceedings, that may be brought or instituted against the City, its directors, officials, officers, employees, agents and/or volunteers, subject to the limitations in Sections A.1. and A.2. Subject to the limitations in Sections A.1. and A.2., Consultant shall pay and satisfy any judgment, award or decree that may be rendered against City or its directors, officials, officers, employees, agents and/or volunteers, for any and all related legal expenses and costs incurred by each of them.

4. Insurance Proceeds. Consultant's obligation to indemnify shall not be restricted to insurance proceeds, if any, received by the City, its directors, officials, officers, employees, agents, and/or volunteers.

5. Declarations. Consultant's obligations under Article V shall not be limited by any prior or subsequent declaration by the Consultant.

6. Enforcement Costs. Consultant agrees to pay any and all costs City incurs enforcing the indemnity and defense provisions set forth in Article V.

7. Survival. Consultant's obligations under Article V shall survive the termination of this Agreement.
8. No Alteration of Other Obligations. This Article V, shall in no way alter, affect or modify any of the Consultant's other obligations and duties under this Agreement.

ARTICLE VI. TERMINATION OF AGREEMENT

A. **Termination for Cause**. If, through any cause, Consultant shall fail to fulfill in a timely and proper manner Consultant's obligations under this Agreement, or if Consultant shall violate any of the covenants, agreements or stipulations of this Agreement, City shall have the right to terminate this Agreement by giving written notice to Consultant of such termination and specifying the effective date thereof at least five (5) days before the effective date of such termination. In that event, all finished or unfinished documents, data, studies, surveys, drawings, maps, reports and other materials prepared by Consultant shall, at the option of the City, become the property of the City, and Consultant shall be entitled to receive just and equitable compensation, in an amount not to exceed that payable under this Agreement and less any damages caused City by Consultant's breach, for any work satisfactorily completed on such documents and other materials up to the effective date of Notice of Termination.

B. **Termination of Agreement for Convenience of City**. City may terminate this Agreement at any time and for any reason, by giving specific written notice to Consultant of such termination and specifying the effective date thereof, at least thirty (30) days before the effective date of such termination. In that event, all finished and unfinished documents and other materials described hereinabove shall, at the option of the City, become City's sole and

exclusive property. If the Agreement is terminated by City as provided in this paragraph, Consultant shall be entitled to receive just and equitable compensation, in an amount not to exceed that payable under this Agreement, for any satisfactory work completed on such documents and other materials to the effective date of such termination. Consultant hereby expressly waives any and all claims for damages or compensation arising under this Agreement except as set forth in this section.

ARTICLE VII. RECORD RETENTION AND ACCESS

A. **Record Retention**. During the course of the Project and for three (3) years following completion, the Consultant agrees to maintain, intact and readily accessible, all data, documents, reports, records, contracts, and supporting materials relating to the Project as City may require.

B. **Access to Records of Consultant and Subcontractors**. The Consultant agrees to permit, and require its subcontractors to permit City or its authorized representatives, upon request, to inspect all Project work, materials, payrolls, and other data, and to audit the books, records, and accounts of the Contractor and its subcontractors pertaining to the Project.

C. **Project Closeout**. The Consultant agrees that Project closeout does not alter the reporting and record retention requirements of this Agreement.

ARTICLE VIII. PROJECT COMPLETION, AUDIT, AND CLOSEOUT

A. **Project Completion**. Within ninety (90) calendar days following Project completion or termination by City, Consultant agrees to submit a final certification of Project expenses and audit reports, as applicable.

B. **Audit of Consultants**. Consultant agrees to perform financial and compliance audits the City may require. The Consultant also agrees to obtain any other audits required by City. Consultant agrees that Project closeout will not alter Consultant's audit responsibilities. Audit costs are allowable Project costs.

C. **Project Closeout**. Project closeout occurs when City notifies the Consultant that City has closed the Project, and either forwards the final payment or acknowledges that the Consultant has remitted the proper refund. The Consultant agrees that Project closeout by City does not invalidate any continuing requirements imposed by the Agreement or any unmet requirements set forth in a written notification from City

ARTICLE IX. MISCELLANEOUS PROVISIONS

A. **Assignability**. The services of Consultant are personal to the City, and Consultant shall not assign any interest in this Agreement, and shall not transfer any interest in the same (whether by assignment or notation), without prior written consent of City.

1. Limited Consent. City hereby consents to the assignment of the portions of the Defined Services identified in Exhibit A, Paragraph 16 to the subconsultants identified as "Permitted Subconsultants."

B. **Ownership, Publication, Reproduction and Use of Material.** All reports, studies, information, data, statistics, forms, designs, plans, procedures, systems and any other materials or properties produced under this Agreement shall be the sole and exclusive property of City. No such materials or properties produced in whole or in part under this Agreement shall be subject to private use, copyrights or patent rights by Consultant in the United States or in any other country without the express written consent of City. City shall have unrestricted authority to publish, disclose (except as may be limited by the provisions of the Public Records Act), distribute, and otherwise use, copyright or patent, in whole or in part, any such reports, studies, data, statistics, forms or other materials or properties produced under this Agreement.

C. **Independent Contractor**. City is interested only in the results obtained and Consultant shall perform as an independent contractor with sole control of the manner and means of performing the services required under this Agreement. City maintains the right only to reject or accept Consultant's work products. Consultant and any of the Consultant's agents, employees or representatives are, for all purposes under this Agreement, independent contractors and shall not be deemed to be employees of City, and none of them shall be entitled to any benefits to which City employees are entitled including but not limited to, overtime, retirement benefits, worker's compensation benefits, injury leave or other leave benefits. Therefore, City will not withhold state or federal income tax, social security tax or any other payroll tax, and Consultant shall be solely responsible for the payment of same and shall hold the City harmless with regard to them.

1. Actions on Behalf of City. Except as City may specify in writing, Consultant shall have no authority, express or implied, to act on behalf of City in any capacity whatsoever, as an agent or otherwise. Consultant shall have no authority, express or implied, to bind City or its members, agents, or employees, to any obligation whatsoever, unless expressly provided in this Agreement.

2. No Obligations to Third Parties. In connection with the Project, Consultant agrees and shall require that its agents, employees, subcontractors agree that City shall not be responsible for any obligations or liabilities to any third party, including its agents, employees, subcontractors, or other person or entity that is not a party to this Agreement. Notwithstanding that City may have concurred in or approved any solicitation, subagreement, or third party contract at any tier, City shall have no obligation or liability to any person or entity not a party to this Agreement.

D. **Administrative Claims Requirements and Procedures**. No suit or arbitration shall be brought arising out of this Agreement, against City unless a claim has first been presented in writing and filed with City and acted upon by City in accordance with the procedures set forth in Chapter 1.34 of the Chula Vista Municipal Code, as same may from time to time be

amended, the provisions of which are incorporated by this reference as if fully set forth herein, and such policies and procedures used by City in the implementation of same. Upon request by City, Consultant shall meet and confer in good faith with City for the purpose of resolving any dispute over the terms of this Agreement.

E. **Administration of Contract.** Each party designates the individuals (Contract Administrators) indicated on Exhibit A, Paragraph 12, as that party's contract administrator who is authorized by the party to represent it in the routine administration of this Agreement.

F. **Term.** This Agreement shall terminate when the parties have complied with all executory provisions hereof.

G. **Statement of Costs.** In the event that Consultant prepares a report or document, or participates in the preparation of a report or document in performing the Defined Services, Consultant shall include, or cause the inclusion of, in the report or document, a statement of the numbers and cost in dollar amounts of all contracts and subcontracts relating to the preparation of the report or document.

H. **Consultant is Real Estate Broker and/or Salesman.** If the box on Exhibit A, Paragraph 15 is marked, the Consultant and/or its principals is/are licensed with the State of California or some other state as a real estate broker or salesperson. Otherwise, Consultant represents that neither Consultant, nor its principals are licensed real estate brokers or salespersons.

I. **Notices.** All notices, demands or requests provided for or permitted to be given pursuant to this Agreement must be in writing. All notices, demands and requests to be sent to any party shall be deemed to have been properly given or served if personally served or deposited in the United States mail, addressed to such party, postage prepaid, registered or certified, with return receipt requested, at the addresses identified in this Agreement as the places of business for each of the designated parties.

J. **Integration.** This Agreement, together with any other written document referred to or contemplated in it, embody the entire Agreement and understanding between the parties relating to the subject matter hereof. Neither this Agreement nor any provision of it may be amended, modified, waived or discharged except by an instrument in writing executed by the party against which enforcement of such amendment, waiver or discharge is sought.

K. **Capacity of Parties.** Each signatory and party to this Agreement warrants and represents to the other party that it has legal authority and capacity and direction from its principal to enter into this Agreement, and that all necessary resolutions or other actions have been taken so as to enable it to enter into this Agreement.

L. **Governing Law/Venue.** This Agreement shall be governed by and construed in accordance with the laws of the State of California. Any action arising under or relating to this Agreement shall be brought only in the federal or state courts located in San Diego County, State of California, and if applicable, the City of Chula Vista, or as close thereto as possible. Venue for this Agreement, and performance under it, shall be the City of Chula Vista.

(End of page. Next page is signature page.)

Signature Page

to

Agreement between
City of Chula Vista
and
D-Max Engineering Inc.,
To perform Dry Weather MS4 Outfall Discharge Monitoring Services

IN WITNESS WHEREOF, City and Consultant have executed this Agreement, indicating that they have read and understood same, and indicate their full and complete consent to its terms:

City of Chula Vista

By: _____
Mary Casillas Salas, Mayor

Attest:

_____
Donna Norris, City Clerk

Approved as to form:

_____
Glen R. Googins, City Attorney

D-MAX ENGINEERING INC.

By: _____
Arsalan Dadkhah, Principal

Exhibit List to Agreement: Exhibit A
Attachment list to Exhibit A of the Agreement:
Attachment 1: Flow Monitoring and Equipment Calibration Procedures
Attachment 2: Sample Collection Procedures
Attachment 3: Analyte List Procedures
Attachment 4: Quality Assurance/Quality Control Procedures
Attachment 5: Non-storm Water Action Levels

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Exhibit A

to
Agreement between
City of Chula Vista
and
D-Max Engineering Inc.

1. Effective Date: The Agreement shall take effect upon full execution of the Agreement, as of the effective date stated on page 1 of the Agreement.

2. City-Related Entity:

   (X) City of Chula Vista, a municipal chartered corporation of the State of California

   ( ) The Chula Vista Public Financing Authority, a _____

   ( ) The Chula Vista Industrial Development Authority, a _____

   ( ) Other: _____, a [insert business form]

(City)

3. **Place of Business for City:**

   City of Chula Vista
   276 Fourth Avenue
   Chula Vista, CA 91910

4. **Consultant:**

   D-MAX ENGINEERING INC.,

5. **Business Form of Consultant:**

   ( ) Sole Proprietorship
   ( ) Partnership
   (X) Corporation

6. **Place of Business, Telephone and Fax Number of Consultant:**
   D-MAX Engineering, Inc.
   7220 Trade Street, Suite 119
   San Diego, CA 92121
   Phone: (858)586-6600
   Fax: (858)586-6644

7. General Duties:

Consultant shall perform Dry Weather field screening, trash monitoring, MS4 (Municipal Separate Storm Sewer System) Outfall Monitoring, sampling, and laboratory analysis at various storm water conveyance system outfalls throughout City. Consultant shall perform upstream investigations, additional sampling, and laboratory analysis, as authorized by City, as may be necessary to identify pollutant sources. Consultant shall prepare and submit to City a comprehensive report including field observations; field and laboratory test results, upstream investigations and source identification, as well as recommendations.

8. Scope of Work and Schedule:

A. Detailed Scope of Work:

Dry Weather MS4 Outfall Discharge Monitoring Services Consultants shall:

(1) Provide all personnel, equipment, and materials necessary to perform the Dry Weather MS4 Outfall Discharge Monitoring Services outlined below in compliance with the requirements of the National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirement for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Regional Water Quality Control Board (RWQCB) Order No. R9-2013-0001) and regulations promulgated by the United States Environmental Protection Agency.

(2) Consultant shall, maintain, confirm, and update City's jurisdictional MS4 maps as applicable during field screening (Provision D.2.a.(2)). The City has identified the known Major MS4 Outfalls that discharge directly to receiving waters within its jurisdiction, Table 5. The identified Major MS4 Outfalls have been geo-located on respective Geographic Information System (GIS) jurisdictional map of the San Diego Bay WMA as required by Provision D.2.a.(1) of the MS4 Permit. The jurisdictional MS4 maps contain at a minimum the following items:

- Segments of the MS4 owned, operated, and maintained by the City
- Known locations of inlets that discharge and/or collect runoff into the City's MS4
- Known locations of connections with other MS4s not owned or operated by the City
- Known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the City's jurisdiction
- Segments of receiving waters within the City's jurisdiction that receive and convey runoff discharged from the City's MS4 outfalls
- Locations of the MS4 outfalls within City's jurisdiction:
  - Latitude and longitude of MS4 outfall point of discharge
  - Watershed Management Area
  - Hydrologic subarea
  - Outlet size
  - Accessibility (i.e. safety and without disturbance of critical habitat)
  - Approximate drainage area

- Classification of whether the MS4 outfall is known to have persistent non-storm water flows, transient non-storm water flows, no non-storm water flows, or unknown non-storm water flows

- Locations of the selected non-storm water persistent flow MS4 outfall discharge monitoring stations within City's jurisdiction.

(3) Perform annual field screening monitoring at all identified Major MS4 Outfall locations per Table 5 and Figure 1 that discharge to receiving waters within the City of Chula Vista. Consultant must record all data per the attached MS4 Outfall Visual Observations Field Data Sheet (Form 1) at each MS4 outfall discharge monitoring station inspected and perform flow estimation as described per Attachment 2.

- At locations where pollutant concentrations exceed Non-storm Water Action Levels (NAL's) established in Attachment 5, after authorization by the City, upstream investigations shall be conducted to identify the source of the discharge. Upstream investigations shall be conducted within two business days of receiving dry weather field screening results that exceed NAL's.

(4) Conduct semi-annual field observations at each of the selected highest priority Major MS4 Outfalls with non-storm water persistent flows monitoring sites per Table 6. Consultant shall record all data per the attached MS4 Outfall Visual Observations Field Data (Form 1) for Non-Storm Water Persistent Flow MS4 Outfall Discharges and perform flow estimation as described in Attachment 1.

- Outfall Prioritization: City of Chula Vista has identified 6 highest priority Major MS4 Outfalls with non-storm water persistent flows that will be monitored within the City jurisdiction, in accordance with MS4 Permit Provision D.2.b.(2)(b) (RWQCB, 2013).

- The City may substitute a next-highest priority major outfall for a selected major outfall in the event that one of the following criteria becomes applicable, until no qualifying Major MS4 Outfalls remain within the City's jurisdiction:

  - The non-storm water discharges have been effectively eliminated (i.e., no flowing, pooled, or ponded water) for three consecutive non-storm water monitoring events.
  - The source of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants.
  - The constituents in the persistent flow non-storm water discharge do not exceed Non-storm Water Action Levels (NALs). Refer to Attachment 5
  - The source of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(5) Perform semi-annually field monitoring and collect in-situ measurements during the monitoring events at each of the selected highest priority Major MS4 Outfalls with non-storm water persistent flows monitoring sites (Table 6). Field monitoring will be documented on a field observation form, as modified from the MS4 Outfall Visual

Observations Field Data Sheet. Field monitoring parameters include:

- pH
- Temperature
- Specific conductivity
- Dissolved oxygen
- Turbidity

(6) Collect samples semi-annually during the monitoring events at each of the selected highest priority Major MS4 Outfalls with non-storm water persistent flows monitoring sites (Table 6) for analysis by an analytical laboratory, provided sufficient measurable flow or ponded water is present. Grab samples will be collected according to the procedures described per Attachment 2 and will follow Surface Water Ambient Monitoring Program (SWAMP) protocols. Quality assurance and quality control procedures are outlined in Attachment 4.

- Perform laboratory analysis on the collected samples from each of the selected highest priority Major MS4 Outfalls monitoring sites for analytical monitoring as detailed per Figures 2, 3 and 4. Attachment 3 details the analytes required for MS4 outfall for persistent flow monitoring including analytical methods and detection limits. Analytes that are field measured are not required to be analyzed by a laboratory. Chemical and bacterial analysis of samples will be performed by a laboratory certified for the appropriate fields of testing by the California Environmental Laboratory Accreditation Program (ELAP). The laboratory should also be a participant of the Stormwater Monitoring Coalition's Inter calibration Program. Quality assurance and quality control procedures for laboratory analysis are outlined per Attachment 4.

(7) Conduct Physical Aesthetics Monitoring (Trash Assessment) at six (6) paired receiving water sites and Major MS4 Outfall monitoring locations identified in Table 7 using attached Trash Assessment Form (Form 2). Monitoring approach, frequency and timing is summarized below:

- Wet Weather Monitoring, Wet Season
  - Annually inspect after wet weather event during wet season. Sample within 72 hours of a storm.
  - Inspect predetermined transect of 2-25 feet (standard area) from major outfall MS4 sites.
  - Assess major outfall MS4 site when assessing receiving water.
- Dry Weather Monitoring, Dry Season
  - Annual inspection during dry weather season (May 1 – September 30)
  - Inspect predetermined transect of 2-25 feet (standard area) from major outfall MS4 sites.
  - Assess major outfall MS4 site when assessing receiving water.
- Dry Weather Monitoring, Wet Season
  - Annual inspection during dry periods of the wet season (October 1 – April 30), 72 hours or more after storm event
  - Perform MS4 inspections at all locations

- Inspect predetermined transect of 2-25 feet (standard area) from major outfall MS4 sites.
- Assess major outfall MS4 site when assessing receiving water.

(8) Conduct Physical Aesthetics Monitoring (Trash Assessment) at MS4 Outfall monitoring sites within the focused priority areas identified in Table 8 using attached Trash Assessment Form (Form 2).

(9) Confined space entry is generally not required at the locations identified in Tables 5, 6, 7 and 8. However, two-person crews may be required in order to assure the safety of the field personnel. If additional upstream testing is necessary, then some confined space entry may be required. The Consultant will be required to provide all safety equipment, materials, and tools necessary to accomplish the field screening and sampling.

(10) Notify the City of any discharge, which may endanger the public health or safety and/or the environment immediately and in writing within 24 hours of the time the Consultant becomes aware of said discharge.

(11) Perform additional sampling and chemical analysis, as authorized by the City, as may be necessary to identify pollutant sources.

(12) Perform all sampling, handling, and testing of laboratory samples in accordance with 40 Code of Federal Regulations (CFR) Part 136. Consultant's laboratory shall be certified to perform such analysis by the California Department of Health Services.

(13) Provide the City with Dry Weather MS4 Outfall and Physical Aesthetics (Trash) Monitoring Assessments report that includes but not limited to:

- Identified known and suspected controllable sources (e.g., facilities, areas, land uses, pollutant generating activities) of transient and persistent flows;
- Identified sources of transient and persistent flows that have been reduced or eliminated;
- Identified necessary modifications to monitoring locations and frequencies necessary to identify and eliminate sources of persistent flows;
- Ranked persistently flowing outfalls according to potential threat to receiving water quality and provide updated prioritized list of outfalls;
- Identified known and suspected sources that may cause or contribute to NAL exceedances;
- Analyze data collected as part of the MS4 Permit-required dry weather outfall monitoring;
- Identify and evaluate progress in achieving non-storm water volume and load reductions;
- Analysis of trash data collected as part of Physical Aesthetics Monitoring, including types of trash and potential source(s);
- Estimated annual non-storm water volumes and loads discharged from the City's Major MS4 Outfalls to receiving waters, with an estimate of the percent contribution from each known source for each MS4 outfall.

All reports shall be in a format acceptable to the RWQCB, as required in the NPDES Municipal Permit, Order No. R9-2013-0001, and as required for inclusion in regional databases.

(14) Provide the City of Chula Vista with all original data, reports, records, etc., of Dry Weather MS4 Outfall Discharge and Physical Aesthetics (Trash) Monitoring Services, as well as certified copies of all calibration, quality assurance, and maintenance records. Further, the consultant shall maintain copies of all records related to Dry Weather MS4 Outfall Discharge and Physical Aesthetics (Trash) Monitoring Services performed under the contract for a minimum of five years from the date of sampling, measurement, report, etc. This period may be extended due to possible unresolved litigation regarding a discharge or when requested by the City of Chula Vista or the Executive Officer of the Regional Water Quality Control Board. All reports shall be in a format acceptable to the Regional Water Quality Control Board and compatible with the San Diego Copermittees' Regional Monitoring reporting standards and the San Diego Bay WQIP Monitoring and Assessment Plan.

B. Date for Commencement of Consultant Services:

( ) Same as Effective Date of Agreement

(X) Other: **Five (5) working days after the date of Notice to Proceed.**

C. Dates or Time Limits for Delivery of Deliverables:

Deliverable No. 1: Dry Weather MS4 Outfall Monitoring Services- complete field screening, visual observations, field monitoring, sample laboratory analysis, and physical aesthetics (Trash Assessment) monitoring at all outfall locations identified in Tables 5, 6, 7 and 8 between October 1, 2015 and June 30, 2016. Provide the City with all original data, photos, reports, records, etc., of Dry Weather MS4 Outfall Discharge and Physical Aesthetics (Trash) Monitoring Services, as well as written reports of laboratory testing; certified copies of all calibration, quality assurance, and maintenance records within thirty working days of the completion of said activities. Data from the MS4 Outfall Monitoring services shall be provided to the City no later than July 25 of each year.

Deliverable No. 2: Source Identification Upstream Investigations – Provide City with written reports of Field Screening, Analytical Monitoring, and source identification upstream investigations performed in conjunction with Dry Weather MS4 Outfall Monitoring activities to identify the upstream source(s) of pollutants detected or observed during Field Screening. Such reports shall be included in the Final Report (Deliverable 4) and submitted to City.

Deliverable No. 3: As- needed Monitoring — if requested and authorized by City, conduct field screening, sampling, and analytical monitoring on an on- call, as needed retainer basis throughout the term of Agreement to identify pollutant sources within ten working days of the completion of said analyses. Provide City with written reports of field screening, sampling, and analysis, and related forms within ten working days of the completion of said work. Such reports shall also be included in the Final Report (Deliverable 4) and submitted to City.

Deliverable No. 4: Report – Provide City with two draft copies of Dry Weather MS4 Outfall Discharge Monitoring Report and Physical Aesthetic Assessment Report within thirty working days of the completion of field Screening, field monitoring and trash assessment activities. Provide three hard copies and one CD of the final report within seven working days of approval of the draft by City.

D. Date for completion of all Consultant services:

Services are to be provided by Consultant on a time-and-materials basis **from November 04, 2015 through June 30, 2017**. Upon a determination by City staff that Consultant has satisfactorily performed the required services during Fiscal Years 2015-2016 & 2016-2017 and upon subsequent approval by the City Manager, this agreement may be extended if City so elects in its sole discretion up through June 2020, in one-year increments, upon terms and conditions contained herein.

9. Materials Required to be Supplied by City to Consultant:

N/A

10. Compensation:

A. ( ) Single Fixed Fee Arrangement.

For performance of all of the Defined Services by Consultant as herein required, City shall pay a single fixed fee in the amounts and at the times or milestones or for the Deliverables set forth below:

Single Fixed Fee Amount:_____, payable as follows:

Milestone or Event or Deliverable	Amount or Percent of Fixed Fee

( ) 1. Interim Monthly Advances. The City shall make interim monthly advances against the compensation due for each phase on a percentage of completion basis for each given phase such that, at the end of each phase only the compensation for that phase has been paid. Any payments made hereunder shall be considered as interest free loans that must be returned to the City if the Phase is not satisfactorily

completed. If the Phase is satisfactorily completed, the City shall receive credit against the compensation due for that phase. The retention amount or percentage set forth in Paragraph 19 is to be applied to each interim payment such that, at the end of the phase, the full retention has been held back from the compensation due for that phase. Percentage of completion of a phase shall be assessed in the sole and unfettered discretion by the Contracts Administrator designated herein by the City, or such other person as the City Manager shall designate, but only upon such proof demanded by the City that has been provided, but in no event shall such interim advance payment be made unless the Consultant shall have represented in writing that said percentage of completion of the phase has been performed by the Consultant. The practice of making interim monthly advances shall not convert this agreement to a time and materials basis of payment.

B. ( ) Phased Fixed Fee Arrangement.

For the performance of each phase or portion of the Defined Services by Consultant as are separately identified below, City shall pay the fixed fee associated with each phase of Services, in the amounts and at the times or milestones or Deliverables set forth. Consultant shall not commence Services under any Phase, and shall not be entitled to the compensation for a Phase, unless City shall have issued a notice to proceed to Consultant as to said Phase.

Phase	Fee for Said Phase
1.	$ _____
2.	$ _____
3.	$ _____

( ) 1. Interim Monthly Advances. The City shall make interim monthly advances against the compensation due for each phase on a percentage of completion basis for each given phase such that, at the end of each phase only the compensation for that phase has been paid. Any payments made hereunder shall be considered as interest free loans that must be returned to the City if the Phase is not satisfactorily completed. If the Phase is satisfactorily completed, the City shall receive credit against the compensation due for that phase. The retention amount or percentage set forth in Paragraph 18 is to be applied to each interim payment such that, at the end of the phase, the full retention has been held back from the compensation due for that phase. Percentage of completion of a phase shall be assessed in the sole and unfettered discretion by the Contracts Administrator designated herein by the City, or such other person as the City Manager shall designate, but only upon such proof demanded by the City that has been provided, but in no event shall such interim advance payment be made unless the Consultant shall have represented in writing that said percentage of completion of the phase has been performed by the Consultant. The practice of making interim monthly advances shall not convert this agreement to a time and materials basis of payment.

C. (X) Hourly Rate Arrangement

For performance of the Defined Services by Consultant as herein required, City shall pay Consultant for the productive hours of time spent by Consultant in the performance of said Services, at the rates or amounts set forth in the Rate Schedule herein below according to the following terms and conditions:

(1)(**X**) Not-to-Exceed Limitation on Time and Materials Arrangement

Notwithstanding the expenditure by Consultant of time and materials in excess of **$49,900** for completion of Deliverables 1 and 4, Consultant agrees that Consultant will perform all of the Defined Services herein required of Consultant to complete those deliverables, listed in Exhibit A, Tables 5, 6, 7 & 8 including all materials and other "reimbursables." Consultant agrees to perform the Defined Services herein required for Deliverables 2 and 3, which are undefined as to quantity or number and within the sole discretion of City to initiate, up to the limits of compensation shown in the following schedule. When funds authorized for Deliverables 2 and 3 are exhausted, Consultant and City shall renegotiate the funding for Deliverables 2 and 3 before Consultant proceeds with further work.

Subject to stipulations of Exhibit A, Paragraph 8, Part D, unit rates for Fiscal Years 2017-2018, 2018-2019 and 2019-20 will increase by **2%** annually. Accordingly, the Not-to-Exceed Limitation on Time and Materials for Deliverables 1 and 4 will be increased to **$50,898, $51,916 and $52,955** for the third, fourth and fifth years, respectively, if the City exercises its option to extend the agreement in each of these years. Also, the budget for Deliverables 2 and 3 will be estimated annually.

TABLE 1
Compensation

Task	Budget for each task/ each Fiscal Year	
1. Dry Weather MS4 Outfall Monitoring Services and Reports (Deliverable 1 and 4)	**Not-to-Exceed $49,900**	
2. Source Identification Upstream Investigations (deliverable 2)	Estimate	$20,000
3. As- needed Monitoring Services Throughout the term of the Agreement (Deliverable 3)	Estimate	$20,000
Maximum Total Compensation for deliverables 1, 2, and 4 (for each Fiscal Year 2015-2016 and 2016-2017)		**$69,900**

TABLE 2
Personnel Rate Fee Schedule

Category of Employees of Consultant*	Hourly Rate
Principal	$160
Project Manager**	$140
Project Engineer/Scientist	$120
Assistant Project Scientist/ Engineer	$110
Staff Scientist/ Engineer II	$98
Staff Scientist/ Engineer II	$88
2-Person Field Crew	$186
3-Person Field Crew (For Confined Space Entry Only)	$350
Drafter/CAD Operator	$70
Field Technician	$70
Word Processor	$60
Clerks	$50

* Categories of Employees anticipated to Perform Work on this project

** Appearance as expert witness at court trials, mediation, arbitration hearings, and depositions will be charged at $200/hour. Time spent for such appearances will be charged at the above standard hourly rates.

Note: Subject to stipulations of Paragraph 8 Part D of Exhibit A to the Agreement, above rates will increase by **2%** per year for the third, fourth and fifth years. Field and hourly services will be charged portal to portal from D-Max office.

(2) ( ) Limitation without Further Authorization on Time and Materials Arrangement

At such time as Consultant shall have incurred time and materials equal to $_____ (Authorization Limit), Consultant shall not be entitled to any additional compensation without further authorization issued in writing and approved by the City. Nothing herein shall preclude Consultant from providing additional Services at Consultant's own cost and expense. See Exhibit B for wage rates.

( ) Hourly rates may increase by 6% for services rendered after [month], 20___, if delay in providing services is caused by City.

11. Materials Reimbursement Arrangement

For the cost of out of pocket expenses incurred by Consultant in the performance of services herein required, City shall pay Consultant at the rates or amounts set forth below:

( ) None, the compensation includes all costs.

		Cost or Rate
( )	Reports, not to exceed $_____:	$_____
( )	Copies, not to exceed $_____:	$_____
( )	Travel, not to exceed $_____:	$_____
( )	Printing, not to exceed $_____:	$_____

( ) Postage, not to exceed $_____: $_____

( ) Delivery, not to exceed $_____: $_____

( ) Outside Services: $_____

(X) Other Actual Identifiable Direct Costs: $_____

TABLE 3
Field Screening Rate Fee Schedule

Item	Unit Cost ($)*
Vehicle, Per Day (includes mileage)	$90
Safety Equipment, Per Day	No Charge**
pH, Per Test	No Charge
Temperature, Per Test	No Charge
Specific Conductivity, Per Test	No Charge
Dissolved Oxygen, per Test	No Charge
Turbidity, Per Test	No Charge

* Field Screening tests shall be performed according to Attachment 2.

Note: Subject to stipulations of Paragraph 8 Part D of Exhibit A to the Agreement, above rates will increase by **2%** per year for the third fourth and fifth years.

TABLE 4
Laboratory Analysis Rate Fee Schedule

Test	Unit Cost per Test ($)*
Total Dissolved Solids (TDS)	$18.40
Total Suspended Solids (TSS)	$20.13
Turbidity (Typically measured in the field)	$13.80
Total Hardness	$20.13
MBAS	$24.15
Color	$28.75
Nutrients, Ammonia	$20.70
Nutrients, Orthophosphate	$16.10
Nutrients, Nitrate	$24.15
Nutrients, Nitrite	$24.15
Nutrients, Nitrite + Nitrate	$24.15
Nutrients, TKN	$44.28
Nutrients, Total Nitrogen	$48.30
Nutrients, Total Phosphorus	$20.13
Metal, Cadmium (Dissolved & Total)	$24.15
Metal, Chromium (Dissolved & Total)	$24.15
Metal, Chromium III (Dissolved & Total)	$0.00
Metal, Chromium VI (Dissolved & Total)	$24.15
Metal, Copper (Dissolved & Total)	$24.15
Metal, Iron (Dissolved & Total)	$24.15
Metal, Lead (Dissolved & Total)	$24.15

Test	Unit Cost per Test ($)*
Metal, Manganese (Dissolved & Total)	$24.15
Metal, Nickel (Dissolved & Total)	$24.15
Metal, Selenium (Dissolved & Total)	$24.15
Metal, Silver (Dissolved & Total)	$24.15
Metal, Zinc (Dissolved & Total)	$24.15
Metals Prep Fee	$13.80
Total & Fecal Coliform Bacteria	$86.25
Enterococcus Bacteria	$80.50

* Laboratory tests shall be performed according to the procedures described in Attachment 2, and will follow Surface Water Ambient Monitoring Program (SWAMP) protocols.
NOTE: Subject to stipulations of Paragraph 8 Part D of Exhibit A to the Agreement, for the third, fourth and fifth years, laboratory analysis unit rates will be calculated based on laboratory invoice plus 15% markup, which will not exceed 2% over the previous year's unit rated.

12. Contract Administrators:

City: Boushra Salem, Senior Civil Engineer
Department of Public Works
1800 Maxwell Road
Chula Vista, CA 91911
Telephone: (619) 397-6111
Fax: (619) 397-6259

Consultant: Arsalan Dadkhah, Ph.D., P.E.
Principal, D-MAX Engineering, Inc.
7220 Trade Street, Suite 119
San Diego, CA 92121
Phone: (858)586-6600
Fax: (858)586-6644

13. Liquidated Damages Rate:

( ) $_____ per day.
( ) Other: _____

14. Statement of Economic Interests, Consultant Reporting Categories, per Conflict of Interest Code (Chula Vista Municipal Code chapter 2.02):

( ) Not Applicable. Not an FPPC Filer.

( ) FPPC Filer

( ) Category No. 1. Investments, sources of income and business interests.

( ) Category No. 2. Interests in real property.

( ) Category No. 3. Investments, business positions, interests in real property, and sources of income subject to the regulatory, permit or licensing authority of the department administering this Agreement.

( ) Category No. 4. Investments and business positions in business entities and sources of income that engage in land development, construction or the acquisition or sale of real property.

( ) Category No. 5. Investments and business positions in business entities and sources of income that, within the past two years, have contracted with the City of Chula Vista or the City's Redevelopment Agency to provide services, supplies, materials, machinery or equipment.

( ) Category No. 6. Investments and business positions in business entities and sources of income that, within the past two years, have contracted with the department administering this Agreement to provide services, supplies, materials, machinery or equipment.

( ) List Consultant Associates interests in real property within 2 radial miles of Project Property, if any:

_____

_____

_____

_____

15. ( ) Consultant is Real Estate Broker and/or Salesman

16. Permitted Sub consultants:

ADS Environmental Services
4820 Mercury Street, Suite C
San Diego, CA 92111
Phone: (858) 571-0045

EnviroMatrix Analytical, Inc.
4340 Viewridge Avenue, Suite A
San Diego, CA 92123
Phone: (858) 560-7717

17. Bill Processing:

A. Consultant's Billing to be submitted for the following period of time:

(X) Monthly

( ) Quarterly
( ) Other: _____

B. Day of the Period for submission of Consultant's Billing:

( ) First of the Month
( ) 15th Day of each Month
(X) End of the Month
( ) Other: _____

C. City's Account Number: **[TO BE ASSIGNED]**

18. Security for Performance

( ) Performance Bond, $ _____
( ) Letter of Credit, $ _____
( ) Other Security:
Type: _____
Amount: $ _____
(X) Retention. If this space is checked, then notwithstanding other provisions to the contrary requiring the payment of compensation to the Consultant sooner, the City shall be entitled to retain, at their option, either the following "Retention Percentage" or "Retention Amount" until the City determines that the Retention Release Event, listed below, has occurred:

(X) Retention Percentage: **10%**
( ) Retention Amount: $ _____

Retention Release Event:
( ) Completion of All Consultant Services
(X) Other: Delivery and Acceptance of Reports to the satisfaction of the Director of Public Works.
( ) Other: The Retention Amount may be released on a monthly basis provided that Consultant has performed said monthly services to the sole satisfaction of the Assistant City Manager/Director of Development Services or his designee.

Table 5

MAJOR OUTFALL INVENTORY

Site	Location	Conveyance Type	Size (inches)	Drainage Area (acres)	Hydrologic Subarea	Latitude	Longitude
B-1	In canyon north of N. Rancho Del Ray Pkwy., opposite of Huerto Pl.	Outfall	42	69	909.12	32.64753	-117.03140
C-1	West side of Bay Blvd., south of J St., south side of channel, under road, access from gate east side of Bay Blvd.	Outfall	48	19	909.12	32.62116	-117.09449
C-2	East of Bay Blvd., south of J St., south side of channel	Outfall	DBC	440	909.12	32.62139	-117.09394
C-3	East of Bay Blvd., about 400 ft. north of J St., west of I-5, east side of channel	Outfall	48	44	909.12	32.62325	-117.09426
C-6	Southeast corner of intersection of H St. and trolley tracks, in channel	Outfall	54	145	909.12	32.62918	-117.09507
C-7	East of trolley tracks, north of G St., at NW corner of mobile home park, access from F St.	Outfall	48	101	909.12	32.63428	-117.09706
C-9	West of Broadway, opposite Vance St., behind 430 Broadway, south side of channel	Outfall	36	9	909.12	32.63331	-117.09102
C-10	Outlet in main channel at the end of Center St., east of Brightwood Ave.	Outfall	48	133	909.12	32.63862	-117.04264
C-11	East of Memorial Park, west of 3rd Ave., north of Park Way, northernmost box culvert	Outfall	144 x 60 SBC	567 (With C-12)	909.12	32.63869	-117.07956
C-15	Behind 277 G St., access via alley west of Del Mar Ave., south of Madrona St., north outfall	Outfall	48	380 (With C-16 & 17)	909.12	32.63843	-117.07739
C-16	Behind 277 G St., access from alley west of Del Mar Ave., south of Medrona St., central outfall	Outfall	60 x 48	Confluence with C-15	909.12	32.63843	-117.07739
C-17	Behind 277 G St., access from alley west of Del Mar Ave., south of Medrona St., southernmost outfall	Outfall	48	Confluence with C-15	909.12	32.63843	-117.07739
C-18	North of H St., 150 ft. west of Elm Ave., easternmost outfall	Outfall	40	216 (With C-19 & C-20)	909.12	32.63599	-117.07208

Table 5
MAJOR OUTFALL INVENTORY (CONTINUE)

Site	Location	Conveyance Type	Size (inches)	Drainage Area (acres)	Hydrologic Subarea	Latitude	Longitude
C-19	North of H St., 150 ft. west of Elm Ave., central outfall	Outfall	40	Confluence with C-18	909.12	32.63599	-117.07208
C-20	North of H St., 150 west of Elm Ave., westernmost squash outfall	Outfall	40	Confluence with C-18	909.12	32.63599	-117.07208
C-22	Behind 53 Shasta St., NE side of channel	Natural Creek	36	182	909.12	32.63633	-117.06676
C-23	Catch basin at SW corner of Woodlawn Ave. & H St. intersection, next to Arco driveway	Catch Basin	78	189	909.12	32.62953	-117.09403
C-24	Manhole in middle of I St., just west of Oaklawn Ave.	Manhole	36	36	909.12	32.62646	-117.09178
C-25	East side of Broadway, manhole just south of 405 Broadway, in alley entrance	Manhole	69	23	909.12	32.63400	-117.09060
C-26	At end of concrete channel behind 479 Corte Maria	Outfall	36	10	909.12	32.63792	-117.06728
GA-1	Behind 585 Parkside Dr. in canyon	Outfall	36	30	909.12	32.64727	-117.04263
J-1	South of Main St., east of 3461 Main St., in vegetated area	Outfall	36	73	910.20	32.59239	-17.05917
J-2	Northwest of intersection of Main St. and Fresno, inside 60" DBC, east side of channel	Outfall	36	82	910.20	32.59487	-117.06681
J-3	South of Orange Ave., west of 3rd Ave., in channel south of Orange Glen Apts, access from gate of 3rd Ave.	Outfall	(2x) 42	131	910.20	32.60097	-117.06590
J-7	West of 2nd Ave., south of Palomar St., in Park Palomar Apts, NE end of channel, access from Quintara St.	Outfall	48	64	910.20	32.60622	-117.06266
J-11	East of Dixon Way, West of Tobias Dr., behind 1263 Tobias Dr.	Outfall	42	75	910.20	32.61077	-117.0571
J-12	West of Hilltop Dr., across from Tranquilo Ln., more northern outfall	Outfall	42	81	910.20	32.61277	-117.05540
J-13	West of Hilltop Dr., across from Tranquilo Ln., more southern outfall	Outfall	48	91	910.20	32.61275	-117.05539
J-19	South side of Orange Ave., across from 272 Orange Ave.	Manhole	36	22	910.20	32.60159	-117.06313

Table 5
MAJOR OUTFALL INVENTORY (CONTINUE)

Site	Location	Conveyance Type	Size (inches)	Drainage Area (acres)	Hydrologic Subarea	Latitude	Longitude
J-21	North side of E. Naples St., across from Helix Ave., next to 65 E. Naples St.	Catch Basin	39	207	910.20	32.61802	-117.05405
LC-1	East side of Canyon Dr., about 350 ft. south of Country Vista	Outfall	48	111	909.12	32.65510	-117.00528
LC-2	Across from 1579 Country Vistas Ln., in the canyon	Outfall	48	161	909.12	32.65560	-117.00418
LC-3	In canyon near west end of Trailridge Dr.	Outfall	42	81	909.12	32.65373	-116.99792
LC-4	In canyon west of Corral Canyon Rd., 600 ft. north of E. H St.	Outfall	36	70	909.12	32.64968	-116.98914
LC-5	In canyon, east of Corral Canyon Rd., 640ft. north of E. H St.	Outfall	36	31	909.12	32.65024	-116.98816
LC-6	West of E. H St., east of Carroll Canyon Rd.	Outfall	54	161	909.12	32.65016	-116.986836
LC-7	About 50 ft. east from gravel access road (east of SDCWA concrete slab)	Manhole	48	44	909.12	32.65767	-116.99061
MGC-1	West of Chula Vista Municipal Golf Course, at SE corner of Willow St. Bridge	Earthen Channel	48	347	909.12	32.65901	-117.04207
MGC-2	In Chula Vista Golf Course, 700 ft. east of Willow St	Outfall	36	12	909.12	32.66009	-117.04038
MGC-3	In Chula Vista Golf Course, 1240 ft. east of Willow St., west of the golf course bridge	Outfall	36	20	909.12	32.66093	-117.03893
MGC-4	In Chula Vista Golf Course, opposite Allen School Rd.	Outfall	36	22	909.12	32.66160	-117.03730
OLR-1	North of Bonita Rd., opposite Otay Lakes Rd., east outfall	Outfall	36	35	909.12	32.66148	-117.03146
OLR-3	North of Allen School Ln., just east of intersection with Surry Dr	Outfall	36	50	909.12	32.65739	-117.03153
OLR-5	Northwest corner of Otay Lakes Rd., and Avenida Del Rey intersection, west outfall in concrete bank	Outfall	36	76	909.12	32.65174	-117.01492

Table 5
MAJOR OUTFALL INVENTORY (CONTINUE)

Site	Location	Conveyance Type	Size (inches)	Drainage Area (acres)	Hydrologic Subarea	Latitude	Longitude
ORC-1	Southwest corner of Magdalena Ave. and Rock Mountain Rd. intersection	Outfall	36	15	910.20	32.60580	-116.97481
ORS-1	About 30 ft. from survey marker in canyon, north of amphitheatre service road and green sewer manhole	Outfall	60	236	910.20	32.59094	-117.00888
ORS-3	West of Heritage Rd., north of Entertainment Circle, north end of gravel parking lot, yellow manhole cover	Manhole	84	235	910.20	32.59065	-117.00649
ORW-1	South of Rancho Dr., SW corner of Shadow Pines condos, in canyon	Outfall	36	22	910.20	32.59125	-117.03790
ORW-2	Southeast corner of I-805 and Main St. intersection, next to the northbound off-ramp	Outfall	42	33	910.20	32.59461	-117.03553
ORW-3	South of Main St., behind Toyota dealership	Outfall	48	209	910.20	32.59374	-117.02709
ORW-5	South of Main St., east of Nirvana Ave., about 200 ft. east of intersection (center outlet)	Outfall	42	51	910.20	32.59288	-117.017026
ORW-6	South of Main St., east of Nirvana Ave., about 200 ft. east of intersection (eastern outlet)	Outfall	42	51	910.20	32.59288	-117.017026
ORW-7	North of Main St., east of Nirvana Ave.	Outfall	54	115	910.20	32.59478	-117.014369
ORW-9	South of 850 Energy Way, in open space	Outfall	72	244	910.20	32.59457	-117.01202
PC-1	South of Main St., west of Melrose Dr., west of 248C Rancho Drive, west side of natural channel	Outfall	36	18	910.2	32.59154	-117.04199
PC-2	East of Maple Dr., north of Main St., west side of channel, behind 1671 Maple Dr.	Outfall	(2x) 42	72	910.20	32.59611	-117.04087
PC-5	West of Oleander Ave., behind 1544 Oleander Ave., access from gate at 1518 Oleander Ave.	Outfall	36	32	910.2	32.60273	-117.03473
PC-7	South of Olympic Pkwy., about 20 ft. from sidewalk, about 100 ft. east of light post, north side of creek	Outfall	48	76	910.20	32.60885	-117.020245
PC-8	South side of Olympic Pkwy., 3400 ft. east of Brandywine Ave.	Outfall	36	14	910.20	32.60935	-117.01696

Table 5
MAJOR OUTFALL INVENTORY (CONTINUE)

Site	Location	Conveyance Type	Size (inches)	Drainage Area (acres)	Hydrologic Subarea	Latitude	Longitude
PC-9	South side of Olympic Pkwy., about 50 ft. south from curb inlet	Outfall	48	42	910.20	32.60997	-117.015216
PC-10	South of Olympic Pkwy., about 50 ft. from curb inlet on Olympic Pkwy.	Outfall	36	24	910.20	32.61159	-117.011205
PC-11	South of Olympic Pkwy., north side of creek	Outfall	36	36	910.20	32.61328	-117.00891
PC-12	South side of Olympic Pkwy., about 50 ft. from curb inlet on south side of Olympic Pkwy.	Outfall	54	71	910.20	32.61542	-117.005645
PC-13	South side of Olympic Pkwy., west of Heritage Rd., north side of creek	Outfall	48	67	910.20	32.61645	-117.002651
PC-14	South of Olympic Pkwy., west of high school, north side of creek	Outfall	36	32	910.20	32.6188	-116.99625
PC-16	West of Santa Victoria, in back of the Otay Ranch High School sports fields, inside of the canyon	Outfall	42	45	910.20	32.61806	-116.99055
PC-17	North of Olympic Pkwy., north side of creek, west of foot bridge	Outfall	36	15	910.20	32.62305	-116.990364
PC-18	North of Olympic Pkwy., east of intersection with Santa Venetia St., south side of creek	Outfall	48	45	910.20	32.62334	-116.98975
PC-19	Northwest corner of the Olympic Pkwy. and La Media Rd. intersection, more south inlet	Outfall	96	365	910.20	32.62513	-116.98663
PC-20	Northwest corner of the Olympic Pkwy. and La Media Rd. intersection, more north outlet	Outfall	84	201	910.20	32.62517	-116.98664
PC-21	East side of La Media Rd., about 50 ft. north of Olympic Pkwy, near ramp	Manhole	42	28	910.20	32.62566	-116.98637
PC-22	North of Olympic Pkwy., north side of creek, at south end of Coral View Ave.	Outfall	42	19	910.20	32.62749	-116.98313
PC-23	North of Olympic Pkwy., west of E. Palomar St., north side of creek	Outfall	42	55	910.20	32.62966	-116.979976
PC-24	North of Olympic Pkwy., west of E. Palomar St., south side of creek (closest to culvert)	Outfall	48	76	910.20	32.6296	-116.979926

Table 5
MAJOR OUTFALL INVENTORY (CONTINUE)

Site	Location	Conveyance Type	Size (inches)	Drainage Area (acres)	Hydrologic Subarea	Latitude	Longitude
PC-25	North of Olympic Pkwy., west of E. Palomar St., just west of Site PC-24	Outfall	60	24	910.20	32.62956	-116.979968
PC-27	North of Olympic Pkwy., west of SR-125 off-ramp, north side of creek	Outfall	36	37	910.20	32.63262	-116.973722
PC-28	North of Olympic Pkwy., west of SR-125 off-ramp, north side of creek	Outfall	(2x) 72	271	910.20	32.63265	-116.973538
PC-29	North of Olympic Pkwy., west of SR-125 off-ramp	Outfall	72 SBC	132	910.20	32.63259	-116.973207
PC-30	North of Olympic Pkwy., across from Otay Ranch High School west parking lot entrance, north side of channel	Outfall	36	26	910.20	32.62142	-116.99342
PC-32	South of Orange Ave. I-805 south on ramp, west side of I-805, north of Main St.	Manhole	36	32	910.20	32.60180	-117.03669
PC-33	Manhole in street in front of 689 Rivera St., west of Brandywine	Manhole	54	42	910.20	32.60865	-117.02869
PC-34	South of Olympic Pkwy., about 50 ft. east of Brandywine, north side of creek	Outfall	48	56	910.20	32.60816	-117.02728
PC-35	Manhole in street in front of 281 Talus St., east of Melrose	Manhole	36	3	910.20	32.60028	-117.03806
PR-5	West of Oleander Ave., 220 ft. south of E. Palomar St. intersection	Outfall	72	325	910.20	32.61400	-117.03397
PR-6	Manhole in street in front of 349 Spruce St.	Manhole	54	151	910.20	32.61177	-117.03979
RC-4	South of N. Rancho Del Rey Pkwy., about 1200 ft. down trail	Outfall	48	60	909.12	32.64556	-117.025923
RC-5	North side of trail, west of Rancho Del Rey Pkwy, about 1600 ft. from parking lot	Manhole	36	38	909.12	32.64471	-117.017113
RC-9	South of Rancho Del Rey, west of Del Rey, in middle of dirt trail	Outfall	48	105	909.12	32.64172	-117.03340
RC-10	Southeast corner of S. Rancho Del Rey Blvd. and Buena Vista Way, in landscaping	Manhole	42	54	909.12	32.64345	-117.01053
RC-11	In middle of S. Rancho Del Rey Blvd., near entrance to Discovery Park	Manhole	36	70	909.12	32.64423	-117.01080

Table 5
MAJOR OUTFALL INVENTORY (CONTINUE)

Site	Location	Conveyance Type	Size (inches)	Drainage Area (acres)	Hydrologic Subarea	Latitude	Longitude
RH-1	Northeast corner of Proctor Valley Rd. and Agua Vista Dr. intersection	Outfall	48	85	910.32	32.66018	-116.94133
RH-2	Northeast corner of Proctor Valley Rd. and Agua Vista Dr.	Outfall	84	1,316	910.32	32.66018	-116.94133
SC-1	South of Hunte Pkwy. and Eastlake Pkwy. Intersection, at bottom of the slope.	Outfall	54	12	910.20	32.61257	-116.95938
SC-2	Hunte Pkwy. opposite Exploration Falls Dr, at bottom of slope	Outfall	96	344	910.20	32.61855	-116.95102
SC-3	Hunte Pkwy. opposite Hidden Path Dr, in basin at bottom of slope	Outfall	84	184	910.20	32.62371	-116.94631
SC-4	Inside canyon in Olympic Training Center, through access gate	Outfall	48	81	910.20	32.62394	-116.939359
SC-5	West of Olympic Training Center (about 2500 ft. east of Olympic Pkwy.)	Outfall	36	50	910.20	32.62644	-116.940381
SC-6	South of Olympic Pkwy., east of Hunte Pkwy., west outlet to creek	Outfall	42	89	910.20	32.63304	-116.944626
SC-7	South of Olympic Pkwy., east of Hunte Pkwy., eastern outlet to creek	Outfall	48	204	910.20	32.63304	-116.944578
SC-8	East of South Creekside Dr, opposite Silver Springs Dr, beyond 4ft. fence, in Salt Creek	Outfall	78	273	910.20	32.63496	-116.94521
SC-9	West of Lost Creek Rd. cul-de-sac, at base of slope, west of trail	Outfall	54	25	910.20	32.63522	-116.94328
SC-10	West of Old Janal Ranch Rd., across from 1389 Old Janal Ranch Rd., at bottom of slope	Outfall	48	75	910.20	32.63765	-116.94415
SC-11	East of South Creekside Dr. behind 1343 South Creekside Dr.	Outfall	60	88	910.20	32.63792	-116.94553
SC-12	Across from 1330 N. Creekside Dr, east of park near the pond	Outfall	42	81	910.20	32.63932	-116.94507
SC-13	West of Old Janal Ranch Rd., south of Rambling Vista Rd., east of Salt Creek	Manhole	36	34	910.20	32.63916	-116.94430

Table 5
MAJOR OUTFALL INVENTORY (CONTINUE)

Site	Location	Conveyance Type	Size (inches)	Drainage Area (acres)	Hydrologic Subarea	Latitude	Longitude
SC-14	West of Old Janal Ranch Rd., across from 1293 Old Janal Ranch Rd., west of park, south of the wood bridge	Outfall	60	22	910.20	32.64134	-116.94464
SC-15	South of Otay Lakes Rd., NW of 2710 Otay Lakes Rd., at bottom of slope	Outfall	36	53	910.20	32.64477	-116.94606
SC-16	North of Otay Lakes Rd., east of Hunte Pkwy., west of Woods Dr.	Outfall	54	102	910.20	32.64565	-116.947124
SC-17	West of Hawthorne Creek Dr. and Joshua Creek Dr. intersection	Outfall	60	177	910.20	32.64816	-116.947275
SC-18	East of Hunte Pkwy., south of Store Gate St., west side of creek	Outfall	42	50	910.20	32.65103	-116.948977
SC-19	Southwest corner of Stone Gate St. and Hawthorne Creek Dr.	Outfall	42	81	910.20	32.65199	-116.94890
SC-20	East of Hunte Pkwy., about 500 ft. south of Yosemite Dr.	Outfall	36	4	910.20	32.65497	-116.95126
SC-21	West side of Hunte Pkwy., south of Yosemite Dr.	Manhole	42	24	910.20	32.65567	-116.95465
SC-22	East of Hunte Pkwy., about 500 ft. south of River Rock Rd., east side of Salt Creek	Outfall	42	67	910.20	32.65745	-116.95239
SC-23	North side of Proctor Valley Rd., about 300 ft. east of Hunte Pkwy., next to west end of concrete ditch	Outfall	36	33	910.20	32.66175	-116.95438
SC-24	South side of Duncan Ranch Rd., east of Hunte Pkwy., fenced area south side of concrete ramp	Outfall	48	42	910.20	32.66502	-116.95508
SR-1	East of trolley lines, north of SR-2, about 300 ft. north of E St.	Outfall	36	19	909.12	32.64136	-117.09980
SR-2	Northeast corner of E St. and trolley lines intersection	Outfall	18 SBC	41	909.12	32.63984	-117.09928
SR-3	East of N. Broadway, NW corner of 591 C St.	Outfall	48	80	909.12	32.64884	-117.09623
SR-4	South bank of Sweetwater River, between Broadway and Highland	Outfall	42	17	909.12	32.65311	-117.09430

Table 5
MAJOR OUTFALL INVENTORY (CONTINUE)

Site	Location	Conveyance Type	Size (inches)	Drainage Area (acres)	Hydrologic Subarea	Latitude	Longitude
SR-6	Southwest corner of 4th Ave. and C St., in channel	Outfall	(2x) 31	82	909.12	32.65036	-117.08819
SR-7	South of 3rd Ave. and North Glover Ave. in back of CVS Pharmacy	Outfall	48	81	909.12	32.64995	-117.08656
SR-9	North end of Las Flores Dr., next to 3 Las Flores Dr.	Outfall	48	92	909.12	32.65315	-117.07837
SR-10	Manhole in west side of 5th St., south of Brisbane, between two curb inlets	Outfall	42	19	909.12	32.65122	-117.09283
SS-1	West of Country Vistas Ln. cul-de-sac, furthest brow ditch west, manhole	Outfall	36	78	909.12	32.66192	-117.01114
SS-2	North of E. H St. and 50 ft. west of SR-125, at base of slope, easternmost outfall	Outfall	60	84	909.12	32.65924	-116.97750
SS-3	North of E. H St. and 60 ft. west of SR-125, at base of slope, westernmost outfall	Outfall	48	97	909.12	32.65917	-116.97767
SS-5	South of Proctor Valley Rd., west of Rolling Ridge Rd., south of landscape maintenance yard	Outfall	66	153	909.12	32.66442	-117.97977
SS-7	South of San Miguel Ranch Rd., in detention basin (in NW corner)	Outfall	48	62	909.12	32.67189	-116.996426
SS-8	South of San Miguel Ranch Rd. in detention basin (in SE corner)	Outfall	54	59	909.12	32.6715	-116.995943
SS-9	East of the end of Jonel Way, inlet to detention basin at base of slope, west of SR-125	Outfall	54	42	909.12	32.67682	-116.98833
SS-10	Northwest corner of Mount San Miguel Park, at bottom of fire access road	Outfall	42	50	909.12	32.67248	-116.97523
SV-1	North of I-805, south side of river, south of Plaza Bonita Mall	Outfall	(2x) 42	45	909.12	32.65076	-117.06646
SV-2	Behind Ramada Inn at Bonita Rd./Bonita Glen intersection, north of Bonita Rd.	Outfall	54 SBC	136	909.12	32.64914	-117.06477
SW-1	West side of Bay Blvd. across from 1075 complex	Outfall	42	72	910.20	32.60811	-117.09231

Table 5
MAJOR OUTFALL INVENTORY (CONTINUE)

Site	Location	Conveyance Type	Size (inches)	Drainage Area (acres)	Hydrologic Subarea	Latitude	Longitude
SW-2	Northeast corner of San Diego County Swiss Club, south of Main St., west of I-5	Outfall	48	64	910.20	32.59470	-117.08910
SW-3	West of Industrial Blvd., 200 ft. north of Dorothy St.	Outfall	78	231	910.20	32.60094	-117.08464
SW-4	South of Main St., east side of trolley tracks, across from Otay Valley Regional Park, access from bridge at Hanson Aggregates	Outfall	36	31	910.20	32.59043	-117.08368
SW-5	North side of Otay River, behind 2383 Faivre Rd.	Outfall	60	80	910.20	32.59119	-117.08100
SW-6	East side of Beyer Blvd., 400 ft. south of Hanson Aggregates entrance	Outfall	48	115	910.20	32.59124	-117.07315
TC-2	West side of 5th Ave. and Shy Lane intersection	Outfall	36	5	910.20	32.60702	-117.07580
TC-3	Behind 421 Telegraph Canyon Rd., south side of channel	Outfall	42	46	909.11	32.62923	-117.04544
TC-5	About 500 ft. east of Paseo Del Rey and Telegraph Canyon Rd., intersection at south side of channel	Outfall	36	32	909.11	32.62692	-117.03289
TC-6	Northwest of Paseo Del Rey and Telegraph Canyon Rd. intersection, north side of channel, under the bridge	Outfall	36	25	909.11	32.62768	-117.03423
TC-7	About 500 ft. west of Medical Center Dr. and Telegraph Canyon Rd. intersection, north side of channel	Outfall	36	117	909.11	32.62609	-117.02842
TC-8	Northwest corner of Paseo Ladera and Telegraph Canyon Rd., south side of channel	Outfall	42	68	909.11	32.62363	-117.02086
TC-10	South of Telegraph Canyon Rd., about 100 ft. south of curb inlet on road, east of Paseo Ladera	Outfall	48	63	909.11	32.62276	-117.018108
TC-11	North side of Telegraph Canyon Rd. (about 30 ft. from curb inlet on road), east of Paseo Ladera	Outfall	(2x) 48	10	909.11	32.62397	-117.014809
TC-12	North of Telegraph Canyon Rd., about 40 ft. from road, south side of creek	Outfall	(2x) 48	72	909.11	32.62409	-117.014094
TC-13	North side of Telegraph Canyon Rd., about 40 ft. from road, south side of creek	Outfall	36	38	909.11	32.62474	-117.011157

Table 5
MAJOR OUTFALL INVENTORY (CONTINUE)

Site	Location	Conveyance Type	Size (inches)	Drainage Area (acres)	Hydrologic Subarea	Latitude	Longitude
TC-14	North of Telegraph Canyon Rd., west of Heritage Rd., south side of creek	Outfall	60	108	909.11	32.62584	-117.008504
TC-16	South side of Telegraph Canyon Rd., about 200 ft. west of Buena Vista Way, north side of channel	Outfall	42	40	909.11	32.62868	-117.00276
TC-17	South side of Telegraph Canyon Rd., about 40 ft. from curb inlet on road, east of Buena Vista Way	Outfall	36	42	909.11	32.62989	-117.001193
TC-18	South side of Telegraph Canyon Rd., about 200 ft. east of Buena Vista Way, just east of "Eastlake Design District" sign, west of rock pathway, north side of channel	Outfall	48	50	909.11	32.63070	-117.00009
TC-19	South side of Telegraph Canyon Rd., about 100 ft. east of Buena Vista Way, west of "Eastlake Design District" sign, south side of channel	Outfall	48	82	909.11	32.62991	-117.00069
TC-20	About 100 ft. north of the north end of Santa Madera Ave cul-de-sac, south side of channel, access from dirt trail	Outfall	60	157	909.11	32.63277	-116.99634
TC-21	South of Otay Lakes Rd., east of La Media Rd. (western outlet)	Outfall	42	45	909.11	32.63844	-116.989749
TC-22	South of Otay Lakes Rd., east of La Media Rd. (eastern outlet)	Outfall	54	55	909.11	32.63844	-116.989727
TC-23	South of Otay Lakes Rd., east of La Media Rd., next to foot trail	Outfall	48	62	909.11	32.63859	-116.988815
TC-25	South side of Telegraph Canyon Road, about 100 ft. west of Rutgers Ave., north side of channel	Outfall	42	62	909.11	32.64113	-116.98405
TC-26	South of Otay Lakes Rd., about 20 ft. north of foot trail	Outfall	60	131	909.11	32.64112	-116.981722
TC-27	North side of Telegraph Canyon Rd., about 200 ft. east of the entrance to Otay Lake Lodge Mobile Home Park, south side of channel	Outfall	36	8	909.11	32.64216	-116.97987
TC-28	North side of Otay Lake Rd., midway between Saint Claire and entrance to Otay Lakes Lodge Mobile Home Park	Outfall	36	3	909.11	32.64253	-116.97854
TC-29	Northwest corner of Saint Claire Dr. and Otay Lakes Rd.	Outfall	54	60	909.11	32.64378	-116.97632

Table 5
MAJOR OUTFALL INVENTORY (CONTINUE)

Site	Location	Conveyance Type	Size (inches)	Drainage Area (acres)	Hydrologic Subarea	Latitude	Longitude
TC-30	Center of St. Claire Dr. at Versailles Rd.	Outfall	42	111	909.11	32.64447	-116.97630
TC-31	North side of Otay Lakes Rd., south side of channel across from 2060 Otay Lakes Rd.	Outfall	36	15	909.11	32.64501	-116.97382
TC-32	Northeast corner of SR-125 and Otay Lakes Rd. intersection	Manhole	42	12	909.11	32.64585	-116.97199
TC-33	About 45 ft. east of detention basin outlet structure, east of SR-125 north onramp, in basin	Outfall	36	44	909.11	32.64752	-116.96963
TC-34	North of Otay Lakes Rd., west of shopping center, in detention basin (NE corner)	Outfall	42	15	909.11	32.64755	-116.969019
TC-36	East side of Paseo Ladera, about 500 ft. north of Telegraph Canyon Rd.	Manhole	36	87	909.11	32.62487	-117.02032
TC-37	South of Telegraph Canyon Rd., west side of I-805 northbound off-ramp, catch basin	Outfall	42	30	909.11	32.62870	-117.04292
TC-38	Moss St. and trolley tracks intersection, catch basin inside 694 Moss St.	Catch Basin	60	123	909.11	32.61283	-117.08840
TC-39	West of property at SW corner of L St. and Industrial Blvd., inlet at end of brow ditch between property and I-5	Outfall	24	2	909.11	32.61487	-117.09086
WC-1	In center of La Media Rd. and Santa Luna St. intersection	Manhole	36	55	910.20	32.60783	-116.981476
WC-3	About 100 ft. west of Wolf Canyon Loop and Bob Fletcher Way, in basin, smaller outfall	Outfall	42	25	910.20	32.61418	-116.97385
WC-4	One hundred feet west of Wolf Canyon Loop and Bob Fletcher Way, in basin, larger outfall	Outfall	84	161	910.20	32.61418	-116.97385

Table 6
Major MS4 Outfalls for Non-Storm Water Persistent Flow Monitoring

Dry Weather Outfall Monitoring Stations	HA or HSA	Latitude	Longitude
RC-8	909.12	32.64437	-117.00262
RH-1	910.32	32.66018	-116.94133
SC-2	910.20	32.61855	-116.95102
SW-1	910.20	32.60811	-117.09231
TC-11	909.11	32.62397	-117.014809

Table 7
Paired Receiving Water and MS4 Outfall Stations in Focused Priority Area

Site	Location	Hydrologic Subarea	Latitude	Longitude
C-1	West side of Bay Blvd., south of J St., south side of channel, under road, access from gate east side of Bay Blvd.	909.12	32.62116	-117.09449
ORW-1	South of Rancho Dr., SW corner of Shadow Pines condos, in canyon	910.20	32.59125	-117.03790
SR-4	South bank of Sweetwater River, between Broadway and Highland	909.12	32.65311	-117.09430
SV-1	North of I-805, south side of river, south of Plaza Bonita Mall	909.12	32.65076	-117.06646
SW-4	South of Main St., east side of trolley tracks, across from Otay Valley Regional Park, access from bridge at Hanson Aggregates	910.20	32.59043	-117.08368
TC-39	West of property at SW corner of L St. and Industrial Blvd., inlet at end of brow ditch between property and I-5	909.11	32.61487	-117.09086

Table 8

MS4 Outfall Dry Weather Field Screening Stations Inventory in Focused Priority Area

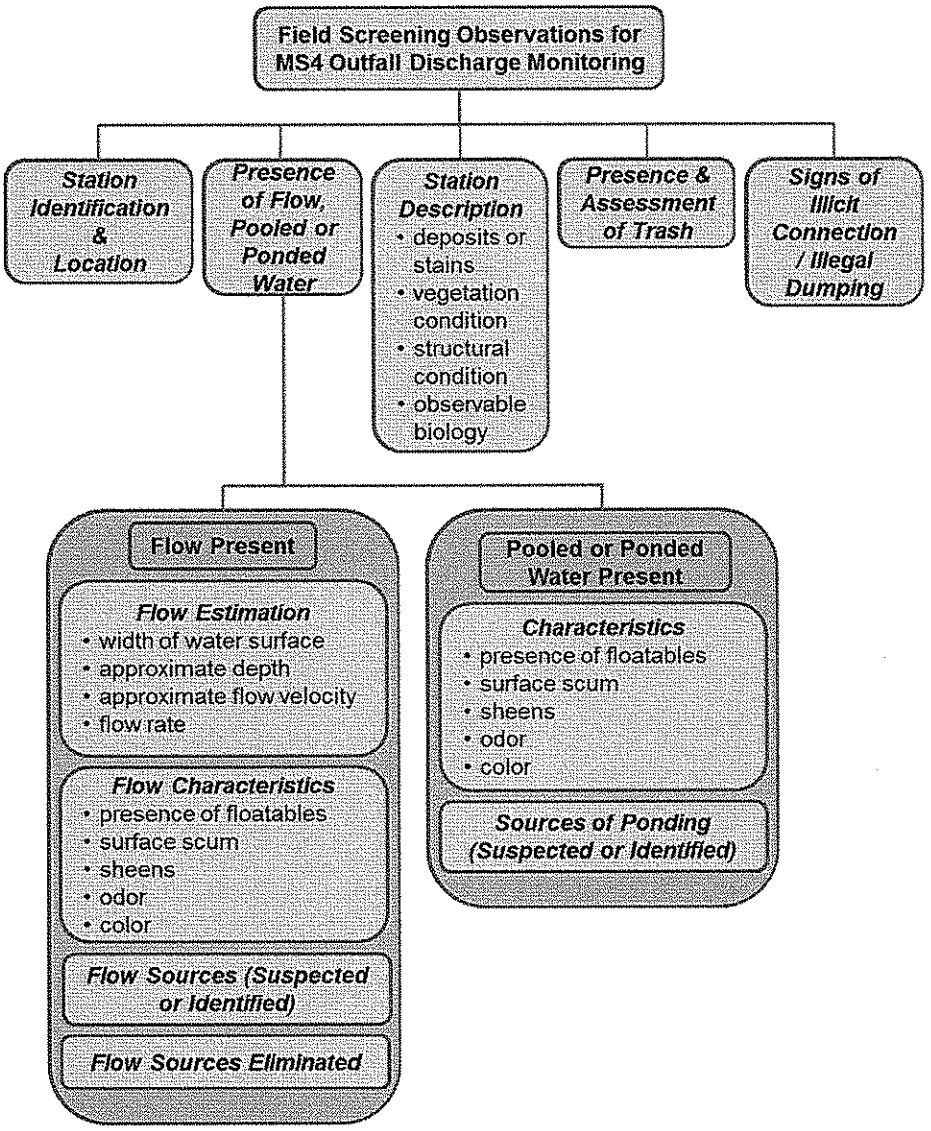
Site	Hydrologic Subarea	Latitude	Longitude
C-2	909.12	32.62139	-117.09394
C-3	909.12	32.62325	-117.09426
C-6	909.12	32.62918	-117.09507
C-7	909.12	32.63428	-117.09706
C-9	909.12	32.63331	-117.09102
C-11	909.12	32.63869	-117.07956
C-12	909.12	32.63869	-117.07956
C-13	909.12	32.63869	-117.07956
C-14	909.12	32.63906	-117.07722
C-15	909.12	32.63843	-117.07739
C-16	909.12	32.63843	-117.07739
C-17	909.12	32.63843	-117.07739
C-18	909.12	32.63599	-117.07208
C-19	909.12	32.63599	-117.07208
C-20	909.12	32.63599	-117.07208
C-22	909.12	32.63633	-117.06676
C-23	909.12	32.62953	-117.09403
C-24	909.12	32.62646	-117.09178
C-25	909.12	32.634	-117.0906
C-26	909.12	32.63792	-117.06728
J-1	910.20	32.59239	-117.05917
J-2	910.20	32.59487	-117.06681
J-3	910.20	32.60097	-117.0659
J-7	910.20	32.60622	-117.06266
J-10	910.20	32.61112	-117.05745
J-11	910.20	32.61077	-117.0571
J-12	910.20	32.61277	-117.0554
J-13	910.20	32.61275	-117.05539
J-19	910.20	32.60159	-117.06313

Table 8
MS4 Outfall Dry Weather Field Screening Stations Inventory in Focused Priority Area (Continue)

Site	Hydrologic Subarea	Latitude	Longitude
J-20	910.20	32.60995	-117.06001
J-21	910.20	32.61802	-117.05405
ORC-1	910.20	32.60580	-116.97481
PC-1	910.20	32.59154	-117.04199
PC-2	910.20	32.59611	-117.04087
PC-32	910.20	32.6018	-117.03669
PC-35	910.20	32.60028	-117.03806
PR-6	910.20	32.61177	-117.03979
SR-1	909.12	32.64136	-117.0998
SR-2	909.12	32.63984	-117.09928
SR-3	909.12	32.64884	-117.09623
SR-6	909.12	32.65036	-117.08819
SR-7	909.12	32.64995	-117.08656
SR-9	909.12	32.65315	-117.07837
SR-10	909.12	32.65122	-117.09283
SV-2	909.12	32.64914	-117.06477
SW-1	910.20	32.60811	-117.09231
SW-2	910.20	32.5947	-117.0891
SW-3	910.20	32.60094	-117.08464
SW-5	910.20	32.59119	-117.081
SW-6	910.20	32.59124	-117.07315
TC-2	910.20	32.60702	-117.0758
TC-3	909.11	32.62923	-117.04544
TC-37	909.11	32.6287	-117.04292
TC-38	909.11	32.61283	-117.0884

Figure 1

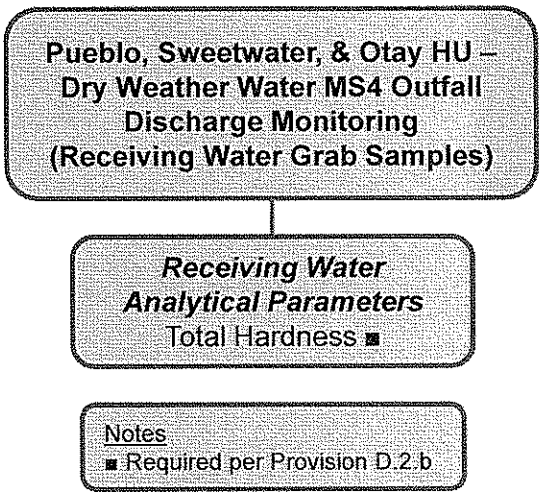
Field Screening Visual Observations
for MS4 Outfall Discharge Monitoring Stations



Note: This figure describes detailed monitoring procedures and analytical methods that are illustrative and may be revised on the basis of site-specific environmental conditions and equivalent alternate analytical methods.

Figure 2

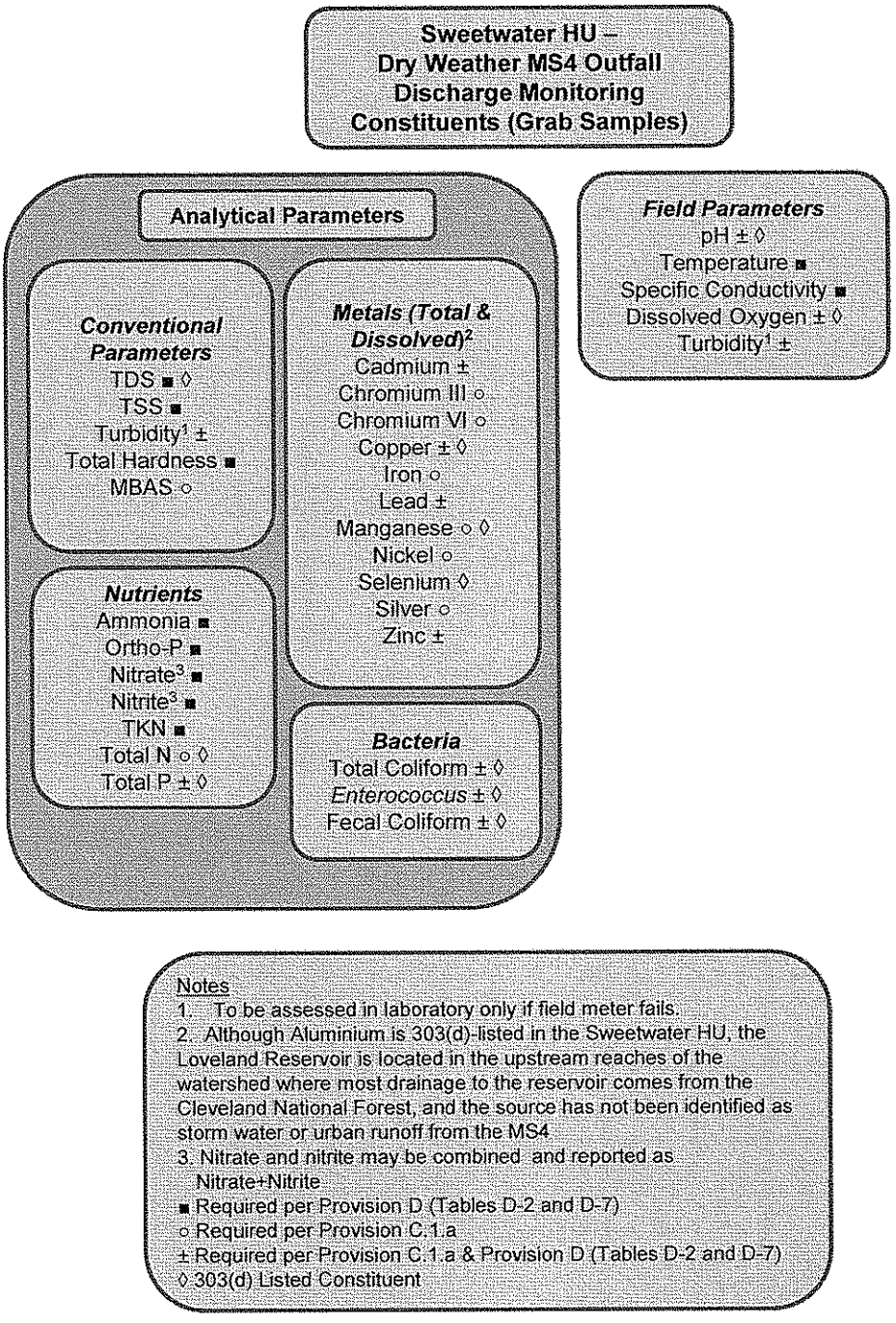
Sweetwater, & Otay HU – Dry Weather
MS4 Outfall Discharge Monitoring Receiving Water Grab Samples



- *Note: This figure describes detailed monitoring procedures and analytical methods that are illustrative and may be revised on the basis of site-specific environmental conditions and equivalent alternate analytical methods.*

Figure 3

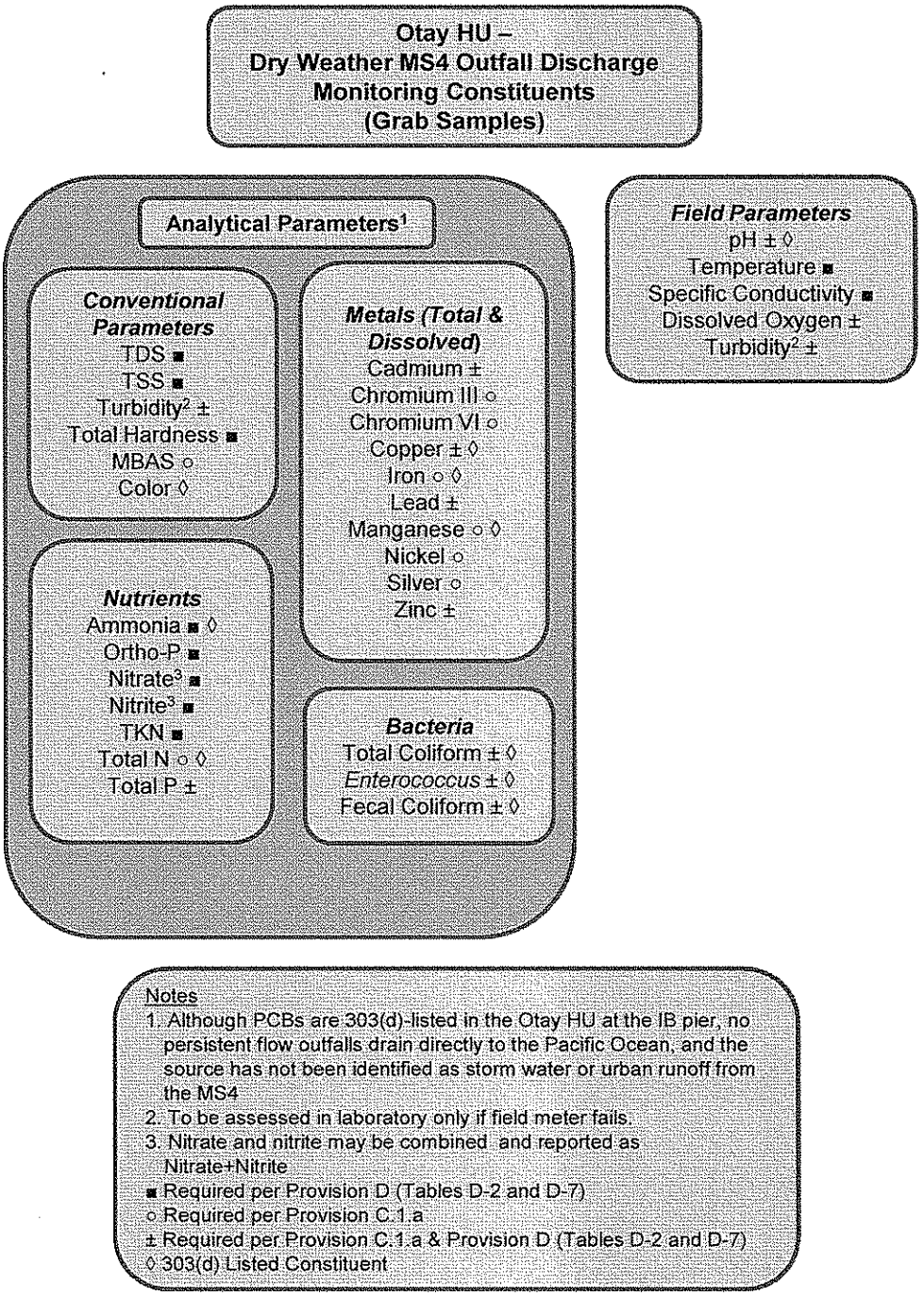
Sweetwater HU Dry Weather MS4 Outfall Discharge Monitoring Constituents



○ *Note: This figure describes detailed monitoring procedures and analytical methods that are illustrative and may be revised on the basis of site-specific environmental conditions and equivalent alternate analytical methods.*

Figure 4

Otay HU Dry Weather MS4 Outfall Discharge Monitoring Constituents



Note: This figure describes detailed monitoring procedures and analytical methods that are illustrative and may be revised on the basis of site-specific environmental conditions and equivalent alternate analytical methods.

FORM 1
City of Chula Vista
MS4 Outfall Visual Observations Field Data Sheet

Visit Type: ☐ Routine ☐ Follow-Up

General Site Description

Site ID				**Latitude**			
Location				**Longitude**			
				HSA			
Date		**Time**		**Observer(s)**			

Atmospheric Conditions

Weather ☐ Clear ☐ Partly Cloudy ☐ Overcast ☐ Fog
Tide ☐ N/A ☐ Low ☐ Incoming ☐ High ☐ Outgoing Tide Height: ____ ft.
Last Rain ☐ >72 hours. ☐ <72 hours but ≤ 0.1"

Observations

Odor	☐ None	☐ Sewage	☐ Sulfides	☐ Petroleum	☐ Manure	☐ Other	☐ na (dry)
Color	☐ None	☐ Yellow	☐ Brown	☐ White	☐ Gray	☐ Other	☐ na (dry)
Clarity	☐ Clear	☐ Cloudy >4" vis	☐ Murky <4" vis	☐ Other			☐ na (dry)
Floatables	☐ None	☐ Trash	☐ Bubbles	☐ Foam	☐ Oily Sheen	☐ Other	☐ na (dry)
Deposits	☐ None	☐ Coarse Particles	☐ Fine Particulates	☐ Stains	☐ Oily Deposits	☐ Other	
Vegetation	☐ None	☐ Limited	☐ Normal	☐ Excessive	☐ Other		
Biology	☐ None	☐ Insects	☐ Algae	☐ Fish	☐ Snails	☐ Mussels/ Barnacles	
Conveyance Condition	☐ Normal	☐ Damaged	☐ Scour Pond	☐ Other			
Water Flow	☐ Flowing	Flow Rate: _____		☐ Ponded	☐ Dry	☐ Tidal	
Storm drain flow reaches Receiving Water?		☐ Yes		☐ No	☐ Unknown	☐ na (dry)	

Trash Assessment

Estimated Area of Assessment, LXW (ft): _____
Evaluation Includes ☐ MS4 ☐ Receiving Water ☐ Both
Rating ☐ None ☐ Optimal ☐ Suboptimal ☐ Marginal ☐ Submarginal ☐ Poor* (* *Complete Trash Attachment*)
Potential Threat to: ☐ Human Health ☐ Aquatic Health ☐ na
Evidence of Illegal Dumping: ☐ Yes *(describe in comments)* ☐ No

Flow Estimation

Flow Rate: _____ ☐ gpm ☐ cfs *Fill in flow rate calculation supporting information below if applicable*

Channel or Box Culvert

Width		in
Depth		in
Velocity		ft/sec

Filling a Bottle or Known Volume

Volume		mL
Time to Fill		sec

Flowing Pipe

Diameter		ft
Depth		ft
Velocity		ft/sec

Comments: _____

Source Identification and Elimination

Evidence of Obvious IC/ID: ☐ Odor ☐ Color ☐ Clarity ☐ Floatables ☐ Deposits ☐ High Flow ☐ Non-standard Connection ☐ Other ☐ No
Flow Source: ☐ Groundwater Seepage ☐ Irrigation Runoff ☐ Vehicle Washing ☐ Wet Cleaning or Power Washing ☐ Construction ☐ Pool Drainage ☐ Sewage ☐ NPDES Permitted Discharge ☐ Other ☐ Unable to Determine
Basis for Source Identificaiton: ☐ Field Investigation ☐ Historical Data ☐ Literature Review ☐ BPJ ☐ Other
If Identified, Was Source Eliminated? *(describe in comments)* ☐ Yes ☐ No

Source ID and Elimination Comments:

Calculating the Area (a) of the Cross Section of a Circular Pipe Flowing Partially Full

D = Depth of water a = area of water in partially filled pipe
d = diameter of the pipe Ta = Tabulated Value Then a = Ta*d2

D/d	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0013	0.0037	0.0069	0.0105	0.0147	0.0192	0.0242	0.0294	0.0350
0.1	0.0409	0.0470	0.0534	0.0600	0.0668	0.0739	0.0817	0.0885	0.0951	0.1039
0.2	0.1118	0.1199	0.1281	0.1365	0.1440	0.1535	0.1623	0.1711	0.1800	0.1890
0.3	0.1982	0.2074	0.2187	0.2280	0.2355	0.2450	0.2540	0.2642	0.2780	0.2836
0.4	0.2934	0.3032	0.3130	0.3220	0.3328	0.3428	0.3527	0.3627	0.3727	0.3827
0.5	0.3980	0.4030	0.4130	0.4230	0.4330	0.4430	0.4520	0.4620	0.4720	0.4820
0.6	0.4920	0.5020	0.5120	0.5210	0.5310	0.5400	0.5500	0.5590	0.5690	0.5780
0.7	0.5870	0.5960	0.6050	0.6140	0.6230	0.6320	0.6400	0.6490	0.6570	0.6660
0.8	0.6740	0.6810	0.6890	0.6970	0.7040	0.7120	0.7190	0.7250	0.7320	0.7360
0.9	0.7450	0.7500	0.7560	0.7610	0.7660	0.7710	0.7750	0.7790	0.7820	0.7840

AREA x VELOCITY (CREEK/CHANNEL METHOD)

a. Measure the width, depth, and velocity of the water.

b. Convert each value to a common unit (i.e. all measurements converted to cm, ft, or in.).

c. Multiply the width * depth * velocity to determine flow.

d. Multiply the flow by 0.8 for creek measurements –or-- 0.9 for concrete channel measurements to account for channel roughness.

e. The results if measured in

a. Ft = Ft^3/sec
b. cm = cm^3/sec (mL/sec)
c. in = in^3/sec

f. Convert to desired value.

TIME REQUIRED TO FILL A KNOWN VOLUME (FILL A BOTTLE METHOD)

1. Determine volume/capacity of the sample bottle.
2. Measure time required to fill the bottle.
3. Flow will be determined by initial volume units:
   - mL/s
   - oz/s
4. Convert to desired value.

AREA x VELOCITY (PARTIALLY FILLED PIPE)

g. All measurement must be converted to a common unit before calculation (ft, in, or cm).

h. Let D = water depth.

i. Let d = *inside* pipe diameter

j. Calculate D/d.

k. Find the tabulated (Ta) value on the partially filled pipe formula chart above using the D/d value. (i.e. if D/d = 0.263 then Ta = .1623).

l. Find the area using the formula $a = Ta*d^2$.

m. Multiply area (a) by the water velocity.

n. Convert to desired value.

SAE / Metric Unit Conversion

0.083 ft	=	**1 in**	=	**2.54 cm**
0.1337 ft^3	=	**1 gal**	=	**128 oz**
			=	**3.785 L**
0.0078 gal	=	**1 oz**	=	**.0011 ft^3**
1000 cm^3	=	**1 L**	=	**1000 mL**

CITY OF CHULA VISTA
PUBLIC WORKS DEPARTMENT-STORMWATER SECTION
1800 MAXWELL ROAD, CHULA VISTA, CA 91911
(619) 397-6000

FORM 2
Trash Assessment Form

SITE ID: _____ **DATE:** _____

LOCATION: _____ **TIME:** _____

OBSERVERS: _____

SITE CHARACTERISTICS

RECEIVING WATER TYPE: ☐ Coastal/Bay ☐ River/Stream						
SURROUNDING DRAINAGE LAND USES						
Primary:	☐ High Density Residential	☐ Low Density Residential	☐ Commercial	☐ Industrial	☐ Park	☐ Open
	☐ Public Transportation Stations	☐ Major Road/Freeway	☐ Mixed Urban			
Secondary:	☐ High Density Residential	☐ Low Density Residential	☐ Commercial	☐ Industrial	☐ Park	☐ Open
	☐ Public Transportation Stations	☐ Major Road/Freeway	☐ Mixed Urban			
AREA OF TRASH ASSESSMENT L x W (FT):						
HABITAT TYPE:	☐ Marsh	☐ Mudflat	☐ Rip-Rap	☐ Sandy	☐ Riparian	
HOMELESS ENCAMPMENT NEAR ASSESSMENT AREA: ☐ Yes ☐ No Distance from area: _____ Feet						
PUBLIC TRANSPORTATION STATIONS NEAR ASSESSMENT AREA: ☐ Yes ☐ No Distance from area: _____ Feet						

AMOUNT AND EXTENT OF TRASH

☐ **Optimal**	On first glance, no trash visible. Little or no trash (<10 pieces) evident when evaluated area is closely examined for litter and debris.
☐ **Suboptimal**	On first glance, little or no trash visible. After close inspection small levels of trash (~10-50 pieces) evident in evaluated area.
☐ **Marginal**	Trash is evident in low to medium levels (~51-100 pieces) on first glance. Evaluated area contains litter and debris. Evidence of site being used by people: scattered cans, bottles, food wrappers, blankets, or clothing present.
☐ **Submarginal**	Trash distracts the eye on first glance. Evaluated area contains substantial levels of litter and debris (>100- 400) . Evidence of site being used frequently by people: many cans, bottles, food wrappers, blankets, or clothing present.
☐ **Poor**	Site is significantly impacted by trash. Evidence of trash accumulation behind a constriction point or evidence of excessive dumping. Evaluated area contains substantial levels of litter and debris (>400 pieces).

Trash Assessment Form (Continue)

ROUTE AND SOURCE

TYPE	Ranking or Count by Type *	Percentage of Total **	POTENTIAL ROUTE (CHECK UP TO 2)					POTENTIAL SOURCE (CHECK UP TO 2)						
			Dumping	Littering	Upstream/Tidal	Storm Drain	Unable to determine	Household	Construction	Commercial	Industrial	School	Transient	Unable to determine
Automotive														
Biohazard Waste														
E-Waste														
Cigarette Butts														
Construction														
Fabric/Clothing														
General Packaging														
Plastic Bags														
Food Waste														
Household														
Shopping Carts														
Toxic Chemicals														
Yard Waste														
Other														

* Only rank the types of trash PRESENT in evaluated area from 1 through 14 (1 is most prevalent – 14 is least prevalent).

** Percentage is based on the total trash present. A summary of trash types must equal 100%

POTENTIAL RISKS (OPTIONAL)

☐ **Potential Threat to Human Health**	Presence of more than one of, or a combination of the following items: hypodermic needles or other medical waste; used diapers, animal waste, or human feces; any toxic substance such as chemical containers, vehicle batteries, or fluorescent light bulbs. Alternatively high prevalence of any one item (e.g. Greater than 50 items that present a puncture or laceration hazard); or observations of mosquito larvae directly observed in water ponded due to trash. All subject to best professional judgment. Describe potential threat on back of form.
☐ **Potential Threat to Aquatic Health**	Large amount* of persistent, buoyant litter such as: hard or soft plastics, balloons, Styrofoam (equivalent to a cup), or large amount of settleable, degradable and nontoxic debris; cigarette butts. Presence of more than one of, or a combination of the following items: toxic items such as vehicle batteries, or spray cans; any evidence large clumps of yard waste from landscape maintenance such as yard waste or dumped leaf litter (not naturally occurring). All subject to best professional judgment. Describe potential threat on back of form. *Large amount is defined as 50 pieces or more.

Comments:

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ATTACHMENT 1

Flow Monitoring and Equipment Calibration Procedures

(Reference: Attachment A of Attachment A2 to Appendix K of the San Diego Bay Water Quality Improvement Plan "WQIP")

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Flow Monitoring and Equipment Calibration Procedures

This attachment describes the methodologies and equipment that are proposed to be used to complete flow monitoring and field measurements for the MS4 Outfall Monitoring Program, as well as the installation and maintenance procedures.

Flow estimation and water quality sampling are dynamic processes which may require modification based on current site and channel conditions. Thus, the methodologies presented are subject to modification or substitution in order to meet the requirements of this monitoring program.

Flow Monitoring

Dry Weather MS4 Outfall Flow Monitoring

Field-Based Flow Estimation

During non-storm water screening and MS4 outfall monitoring, flow will be estimated visually and/or manually using one of the methodologies detailed in Section 3.2.2 of the National Pollutant Discharge Elimination System (NPDES) Storm Water Sampling Guidance Document (EPA-833-B-92-001; United States Environmental Protection Agency (USEPA), 1992). These methodologies include, but are not limited to the "float method" and the "bucket and stopwatch method".

Equipment-Based Flow Estimation

Copermittees may choose to perform optional equipment-based flow monitoring of non-storm water persistent flows. Equipment-based flow estimation procedures are described in Section B.1.2.1.

Wet Weather MS4 Outfall Flow Monitoring

During wet weather MS4 outfall monitoring, the flow rates and volumes will be measured or estimated from the MS4 outfalls. Flow rates will be measured or estimated in accordance with the NPDES Storm Water Sampling Guidance Document Section 3.2.1 (USEPA, 1992), or by another method proposed by the Copermittees that is acceptable to the San Diego RWQCB. Flow monitoring may need to be adapted specifically for tidally influenced sites.

Equipment-Based Flow Estimation

Flow hydrograph and volume estimations will be captured utilizing estimated flow rates in accordance with the Section 3.2.1 of the USEPA document NPDES Storm Water Sampling Guidance Document (USEPA, 1992).

Measurement devices, sensor types, and equipment program settings will be selected on a site specific basis using best professional judgment. Due to flood control concerns typically associated with MS4 outfalls during storm events especially, a primary measurement device such as a weir or flume is unlikely to be selected. Thus, a lower profile secondary flow measurement device, such as an area-velocity senor or bubbler pressure transducer, is recommended for flow estimation from MS4 Outfalls.

Flow will be monitored at each site to determine the volume of runoff. Flow may be estimated with a Sigma 920 Flow Meter (or similar type device) with an area velocity sensor and pressure transducer (Figure A-1). An area velocity sensor measures water level and velocity. Flow will be calculated based on the cross sectional area of the pipe, level of water, slope, and velocity. Flow may also be estimated using a HOBO level logger (or similar type device) (Figure A-2). The HOBO level logger is a pressure transducer only, and the flow will be estimated based on the area of the pipe, level of water, and slope.

Field teams will mount equipment securely using best professional judgment. Sampler tubing and wiring will be routed through conduits that will be placed between the monitoring locations and the sampling equipment or enclosures. Above-ground instruments will be protected within a site equipment enclosure. Depending on site configuration, enclosures may be semi-permanent (installed before monitoring begins and removed only when the monitoring program ends) or temporary. Exposed conduit, intakes, and sensors will be securely fastened using stainless steel brackets, screws, and anchors (Figure A-3).

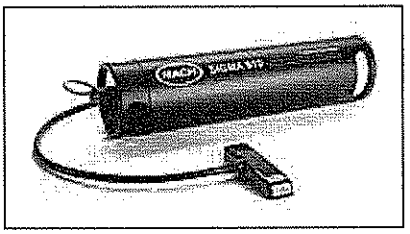

Figure A-1
Sigma 910 Flowmeter and Area/Velocity Pressure Sensor

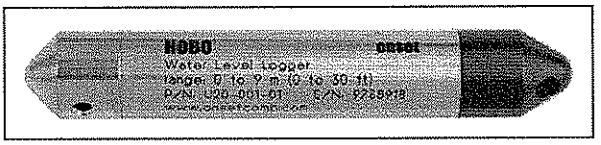

Figure A-2
HOBO Level Logger

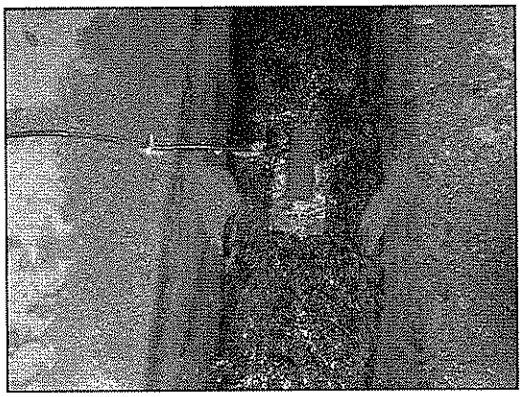

Figure A-3
Example of Sensor Installation

The flow meter may be connected to an automated sampler through a 4-20 milliampere (mA) range output. In this configuration, the flow meter provides a method to control or pace the sampler, and store sampling data and other auxiliary data. The flow meter may measure and log estimated flow, rainfall, and sample history.

At each site, the pipe diameter and slope will be measured and recorded. Level and flow measurements will be logged at minimum 5-minute intervals for the duration of the monitoring event when using continuous logging devices. Data downloads will occur after the monitoring event is complete. Due to the velocities and potential for debris to be carried by storm flows, it is possible that the flow sensor may be damaged during storm flows. Damage to a flow sensor may result in a data gap of actual recorded flows. In this event, flows from the respective drainage area will be modeled for any data gaps based on the drainage area and impervious cover.

Data Downloads and Storage

All recorded flow data downloaded to a field computer will be immediately copied to a main office data server. The server will be backed up daily in accordance with standard server practices. Data will also be copied to project folders for QA review and approval prior to moving to the project file.

Equipment Calibration

Field Meter Calibration

Calibration of all field meters will be conducted immediately prior to deployment or use. Water quality probes will be calibrated with specified calibration solutions, and it will be verified that the solution expiration date has not been exceeded. All calibrations will be conducted in accordance with the manufacturer's specifications.

Flow Equipment Calibration

Calibration of flow equipment will be conducted immediately prior to deployment or use using the procedures described in the corresponding operations and maintenance manual.

All level logging equipment will be calibrated on-site and field verified for accuracy with a level measurement tape.

Autosampler Calibration

Calibration of autosampling equipment will be conducted immediately prior to deployment or use using the procedures described in the corresponding operations and maintenance manual.

All autosampling equipment will be calibrated on-site and field verified for aliquot collection accuracy using a graduated flask or beaker.

ATTACHMENT 2

Sample Collection Procedures

(Reference: Attachment B of Attachment A2 to Appendix K of the San Diego Bay Water Quality Improvement Plan "WQIP")

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Sample Collection Procedures

This attachment describes the sampling procedures for the MS4 Outfall Monitoring Program.

Dry Weather MS4 Outfall Sample Collection

For dry weather monitoring events, the Copermittees will collect and an alyze grab samples from each dry weather MS4 outfall discharge monitoring station to satisfy the requirements of the MS4 Permit. Analytes that are field measured are not required to be analyzed by a laboratory.

Wet Weather MS4 Outfall Sample Collection

For wet weather monitoring events, the Copermittees will collect and analyze samples from each wet weather MS4 outfall discharge monitoring station to satisfy the following requirements in accordance with the MS4 Permit:

- Analytes that are field measured are not required to be analyzed by a laboratory;
- The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;
- Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;
- For all other constituents, composite samples must be collected for a dur ation adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:
    - Time-weighted composites collected over the length of the storm event or the first 24 h our period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or
    - Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or
    - If automated compositing is not feasible, a c omposite sample may be collected using a m inimum of 4 g rab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours; and
- Only one analysis of the composite of aliquots is required

To ensure the most consistent sample collection method for all sites, the Copermittees will collect a single time-weighted composite at each site. When unattended automated sampling is feasible, time-weighted composites will be collected over the length of the storm event or in the first 24-hour period, whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment set at the time intervals listed in Table B-1 based on the anticipated size of the storm.

Table B-1
Automated Sample Pacing for Time-Weighted Composites Per Storm Duration

Storm Duration (Hours)	Sample Aliquot Interval (Minutes)	Sample Volume (mL)	Total Sample Aliquots	Total Volume (mL)
2	10	800	12	9,600
4	10	800	24	19,200
6	10	400	36	14,400
8	10	400	48	19,200
12	10	400	72	28,800
16	20	400	48	19,200
20	20	400	60	24,000
24	20	400	72	28,800

mL = milliliter

When unattended automated sampling is not feasible (i.e., security or safety issues), a composite sample will be collected using a minimum of four grab samples, collected during the first 24 hours of the stormwater discharge, or for the entire stormwater discharge if the storm event is less than 24 hours at the time intervals listed in Table B-2 based on the anticipated size of the storm. Some variation may occur depending on the actual storm intensity and duration. After the storm event, the discrete samples will be composited into one time-weighted composite for chemistry analysis.

Table B-2
Grab Sample Pacing for Time-Weighted Composites Per Storm Duration

Storm Duration (Hours)	Sample Aliquot Interval (Minutes)	Sample Volume (mL)	Total Sample Aliquots	Total Volume (mL)
2	20	2,000	6	12,000
4	20	2,000	12	24,000
6	40	2,000	9	18,000
8	40	2,000	12	24,000
12	60	2,000	12	24,000
16	60	2,000	16	32,000
20	120	2,000	10	20,000
24	120	2,000	12	24,000

Automated samples for chemistry will be collected with a Sigma 900MAX autosampler (or similar type device). Teflon-lined tubing will be installed and secured at each monitoring location prior to the wet weather event. The autosampler will be deployed by the field team upon arrival at each site. Samples will be pumped with the autosampler into a clean glass bottle. The sample bottle will be appropriately labeled with the sample identifier (ID), date, and time, and will be preserved on ice for transport to the laboratory. After compositing, samples will be subsampled into the appropriate bottles for analysis. Grab samples will be collected using either the Sigma 900MAX autosampler or a sample bottle connected to a sample pole that will be used to collect the sample directly from the outfall location. Nitrile or latex gloves will be worn during sample handling.

Bacteria samples and field measurements will not be taken from the composite sample; therefore, a grab sample will be collected for bacteria and field measurements during elevated flows. The grab sample will be collected after the second hour of stormwater runoff and before the sixth hour of stormwater runoff. If the stormwater runoff is less than 2 hours, the grab sample will be collected as close to the peak of flow as possible.

Bacteria samples will be collected using sterile techniques. Nitrile or latex type gloves will be worn during sample handling. During the sampling event, a 100-milliliter (mL) sterile bacteria bottle will be secured to a sample pole that will be used to collect the sample directly from the outfall location. Care will be employed to not allow contact with area structures or the bottom sediments. The container will be opened only for the needed time to collect the sample and will then be closed immediately following sample collection. If it is suspected that the container was compromised at any times, the sample container will be discarded, and a new sample will be collected with a new sample bottle. The sample bottle must be filled only to the 100-mL mark on the bottle (not over topped or under filled).

Field parameters will include hydrogen ion concentration (pH), conductivity, temperature, dissolved oxygen (DO), and turbidity. Samples will be collected and the measurements will be made using a YSI Inc. 6600 series water quality probe or similar type device. Calibration of the instruments will be conducted in accordance with Attachment B.

A field observation data sheet will be completed for each sample collected to be representative of site conditions during each sample collection. Chain-of-custody (COC) documentation (Section E.3) will be completed, and samples will be delivered to the respective laboratory to allow for all applicable analyte holding times.

Chain-of-Custody Procedures

Chain-of-custody (COC) procedures will be used for all samples throughout the collection, transport, and analytical process. A copy of a COC form is included in Attachment C. Samples will be considered to be in custody if they are: 1) in the custodian's possession or view, 2) retained in a secured place (under lock) with restricted access, or 3) placed in a container and secured with an official seal so that

the sample cannot be reached without breaking the seal. The principal documents used to identify samples and to document possession will be COC records, field logbooks, and field tracking forms.

The COC procedures will be initiated during sample collection. A COC record will be provided with each sample or group of samples. Each person who had custody of the samples will sign the form and ensure that the samples were not left unattended unless properly secured. Documentation of sample handling and custody will include the following:

- Sample identifier.
- Sample collection date and time.
- Any special notations on sample characteristics or analysis.
- Initials of the person collecting the sample.
- Date the sample was sent to the analytical laboratory.
- Shipping company and waybill information.

Completed COC forms will be placed into a plastic envelope and kept inside the cooler containing the samples. Upon delivery to the analytical laboratory, the COC form will be signed by the person receiving the samples. COC records will be included in the final reports prepared by the analytical laboratories and will be considered an integral part of the laboratory report.

Health and Safety

Field sampling events have the potential for dangerous situations to arise. Field personnel need to be aware of safety hazards and take appropriate precautions. A health and safety tailgate meeting will be held prior to any on-site activity. During this meeting, site-specific hazards will be discussed and addressed appropriately. There are several health and safety issues that pertain to the proposed sampling and equipment installation within any areas.

Traffic Hazards and Traffic Control

Because this study is being conducted in residential areas, traffic control procedures must be employed. All traffic rules and regulations and all traffic control signs and devices should be obeyed. Field personnel should allow for extra time when planning travel routes. Vehicle traffic is a major concern during field monitoring activities. Traffic presents hazards when site workers are working close to roadways and the potential exists to be hit by oncoming traffic, and when driving to, from, and on the site. Driving during rain events also presents hazards as slick roadway conditions exist. It is recommended that safe speeds and distances be maintained to avoid rain-related accidents.

Whenever possible, field personnel should park as far off the road as possible to avoid interfering with any traffic flow and should comply with the following guidelines when working:

- Turn on the vehicle's flashing yellow warning light and hazard lights.
- Put out safety cones to mark off the work area.
- Place yellow barricade around open manhole to clearly mark the area.
- Avoid steep slopes and stream banks.
- Always use a flashlight in the dark.
- Always wear bright orange and reflective safety vests to be more visible.

Confined Space

Several monitoring locations for this project are located in the underground MS4 system. To install, maintain, and uninstall monitoring equipment within the MS4, confined space entry will need to be performed. Confined spaces are defined as any space with only one entry and exit point; therefore, an MS4 is considered a confined space. To perform confined space entry, project personnel must have confined space entry, attendant, and supervisor training, and must have their certificate card. Entering confined spaces presents many health and safety hazards if not performed properly. These hazards include asphyxiation, falls, burns, drowning, engulfment, toxic exposure, and electrocution. A confined space represents the potential for unusually high concentrations of contaminants, explosive atmospheres, limited visibility, physical injury, and restricted movement.

A five-gas meter will be used to monitor the atmosphere within the MS4 prior to any personnel entering the system. If the MS4 is unsafe for entry, field personnel may attempt to ventilate the space. If the MS4 is still determined to be unsafe for entry, then no personnel will enter the MS4. Once the MS4 has been determined to be safe for entry, the personnel may enter. A harness and retrieval system are used for personnel entering the system. When field personnel are in the MS4, continued air monitoring will occur to ensure that the atmosphere remains non-hazardous. Should air monitoring determine at any time that the air is becoming hazardous, field staff will immediately evacuate the confined space.

Weather Hazards

Installation and maintenance activities will be conducted during dry weather periods only. Though the San Diego region is generally mild during the fall season, the most likely safety issue related to weather is excessive heat. Extreme heat can adversely affect monitoring instrument response and reliability, respiratory protection performance, and chemical protective clothing materials. Standard precautions should be taken to mitigate heat exhaustion during field monitoring events.

Storm event monitoring will occur during wet weather. Wet weather conditions increase slipping and t ripping hazards, braking distances of vehicles, and the potential for slippage or handling difficulties of field equipment. Rain fills holes and obscures trip-and-fall hazards. Tools and personnel can slip on wet surfaces. Rain and wet weather conditions may decrease visibility and increase the potential for driving accidents. Rain and high humidity may also limit the effectiveness of certain direct-reading instruments (e.g., photoionization detectors (PIDs)).

ATTACHMENT 3

Analyte List Procedures

(Reference: Attachment A5 to Appendix K of the San Diego Bay Water Quality Improvement Plan "WQIP")

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Analyte	Volume Required	Analytical Method	Target Reporting Limit[1]	Units	Max Holding Time
Conventional Parameters					
Dissolved Oxygen	In field	Meter	0.01	mg/L	NA
Dissolved Organic Carbon	250 mL	SM 5310 C	0.6	mg/L	28D
Color	500 mL	SM 2120B	3	Color Units	48H
pH	In field	Meter	0.01	pH	NA
Specific Conductivity	In field	Meter	2.5	µS/cm	NA
MBAS	100 mL	SM5540C	0.05	mg/L	7D
Sulfates	250 mL	USEPA 300.0	1.0	mg/L	28D
TDS	500 mL	SM 2540C	10	mg/L	7D
Temperature	In field	Meter	0.1	◦C	NA
Total Hardness	Calculation from Calcium and Manganese	SM 2340B	1	mg/L	6M
Total Organic Carbon	250 mL	SM 5310 C	0.6	mg/L	28D
Trash	In field	Visual Observation	NA	Count	NA
TSS	1000 mL	SM 2540D	0.5	mg/L	7D
Turbidity	In field or lab: 250 mL	Meter	0.5	NTU	NA or 48H

This table describes detailed monitoring and analytical methods that are illustrative and may be revised based on site-specific environmental conditions and equivalent alternate analytical methods.

NA = Not applicable; mL = milliliter; L = liter; D = day; H = hour; M = month

Sediment Toxicity and Benthic Community Effects are listed as a cause for impairment of receiving waters in the San Diego Bay WMA on the 303(d) list, however are not applicable to MS4 Outfalls.

1. SWAMP Target Reporting Limits are recommended and not required. At a minimum, monitoring programs will meet requirements set forth in the State Implementation Plan (SIP).
2. Nitrite and nitrate may be combined and reported as nitrite+nitrate.

Analyte	Volume Required	Analytical Method	Target Reporting Limit[1]	Units	Max Holding Time
Indicator Bacteria					
Enterococcus	100 mL	SM 9230C	1	Colonies/100mL	8H
Fecal Coliform	100 mL	SM 9221E	2	MPN/100mL	8H
Total Coliform	100 mL	SM 9221B	2	MPN/100mL	8H
Inorganic Analytes					
Aluminum (Dissolved)	250 mL	USEPA 200.8	0.3	µg/L	6M
Aluminum (Total)	250 mL	USEPA 200.8	0.3	µg/L	6M
Arsenic (Dissolved)	250 mL	USEPA 200.8	0.3	µg/L	6M
Arsenic (Total)	250 mL	USEPA 200.8	0.3	µg/L	6M
Cadmium (Dissolved)	250 mL	USEPA 200.8	0.01	µg/L	6M
Cadmium (Total)	250 mL	USEPA 200.8	0.01	µg/L	6M
Chromium (Dissolved)	250 mL	USEPA 200.8	0.1	µg/L	6M
Chromium (Total)	250 mL	USEPA 200.8	0.1	µg/L	6M
Chromium III	NA	Calculated from Chromium and Chromium VI	NA	NA	NA

This table describes detailed monitoring and analytical methods that are illustrative and may be revised based on site-specific environmental conditions and equivalent alternate analytical methods.

NA = Not applicable; mL = milliliter; L = liter; D = day; H = hour; M = month

Sediment Toxicity and Benthic Community Effects are listed as a cause for impairment of receiving waters in the San Diego Bay WMA on the 303(d) list, however are not applicable to MS4 Outfalls.

1. SWAMP Target Reporting Limits are recommended and not required. At a minimum, monitoring programs will meet requirements set forth in the State Implementation Plan (SIP).
2. Nitrite and nitrate may be combined and reported as nitrite+nitrate.

Analyte	Volume Required	Analytical Method	Target Reporting Limit[1]	Units	Max Holding Time
Chromium VI	250 mL	USEPA 218.6	0.1	µg/L	28D
Copper (Dissolved)	250 mL	USEPA 200.8	0.01	µg/L	6M
Copper (Total)	250 mL	USEPA 200.8	0.01	µg/L	6M
Iron (Dissolved)	250 mL	USEPA 200.7	0.02	mg/L	6M
Iron (Total)	250 mL	USEPA 200.7	0.02	mg/L	6M
Lead (Dissolved)	250 mL	USEPA 200.8	0.01	µg/L	6M
Lead (Total)	250 mL	USEPA 200.8	0.0002	µg/L	6M
Mercury (Dissolved)	250 mL	USEPA 200.8	0.0002	µg/L	6M
Mercury (Total)	250 mL	USEPA 200.8	0.0002	µg/L	6M
Manganese (Dissolved)	250 mL	USEPA 200.8	0.01	µg/L	6M
Manganese (Total)	250 mL	USEPA 200.8	0.01	µg/L	6M
Nickel (Dissolved)	250 mL	USEPA 200.8	0.02	µg/L	6M
Nickel (Total)	250 mL	USEPA 200.8	0.02	µg/L	6M
Selenium (Dissolved)	250 mL	USEPA 200.8	0.3	µg/L	6M
Selenium (Total)	250 mL	USEPA 200.8	0.3	µg/L	6M
Silver (Dissolved)	250 mL	USEPA 200.8	0.02	µg/L	6M

This table describes detailed monitoring and analytical methods that are illustrative and may be revised based on site-specific environmental conditions and equivalent alternate analytical methods.

NA = Not applicable; mL = milliliter; L = liter; D = day; H = hour; M = month

Sediment Toxicity and Benthic Community Effects are listed as a cause for impairment of receiving waters in the San Diego Bay WMA on the 303(d) list, however are not applicable to MS4 Outfalls.

1. SWAMP Target Reporting Limits are recommended and not required. At a minimum, monitoring programs will meet requirements set forth in the State Implementation Plan (SIP).
2. Nitrite and nitrate may be combined and reported as nitrite+nitrate.

Analyte	Volume Required	Analytical Method	Target Reporting Limit[1]	Units	Max Holding Time
Silver (Total)	250 mL	USEPA 200.8	0.02	µg/L	6M
Thallium (Dissolved)	250 mL	USEPA 200.8	1	µg/L	6M
Thallium (Total)	250 mL	USEPA 200.8	1	µg/L	6M
Zinc (Dissolved)	250 mL	USEPA 200.8	0.1	µg/L	6M
Zinc (Total)	250 mL	USEPA 200.8	0.1	µg/L	6M
Nutrients					
Ammonia	250 mL	USEPA 350.1	0.1	mg/L	28D
Nitrate[2]	250 mL	USEPA 353.2	0.01	mg/L	48H
Nitrite[2]	250 mL	USEPA 353.2	0.01	mg/L	48H
Orthophosphate	250 mL	USEPA 365.1	0.01	mg/L	48H
Total Kjeldahl Nitrogen (TKN)	250 mL	USEPA 351.2	0.5	mg/L	28D
Total Nitrogen	Calculation	Calculated from TKN, Nitrate, and Nitrite	NA	NA	NA
Phosphorus (Dissolved)	250 mL	USEPA 365.1	0.01	mg/L	28D
Phosphorus (Total)	250 mL	USEPA 365.1	0.01	mg/L	28D
Organics					

This table describes detailed monitoring and analytical methods that are illustrative and may be revised based on site-specific environmental conditions and equivalent alternate analytical methods.

NA = Not applicable; mL = milliliter; L = liter; D = day; H = hour; M = month

Sediment Toxicity and Benthic Community Effects are listed as a cause for impairment of receiving waters in the San Diego Bay WMA on the 303(d) list, however are not applicable to MS4 Outfalls.

1. SWAMP Target Reporting Limits are recommended and not required. At a minimum, monitoring programs will meet requirements set forth in the State Implementation Plan (SIP).
2. Nitrite and nitrate may be combined and reported as nitrite+nitrate.

Analyte	Volume Required	Analytical Method	Target Reporting Limit[1]	Units	Max Holding Time
Chlordane	1000ml	EPA 608	0.002	µg/L	7D
Diazinon	1000 mL	EPA 625	0.05	µg/L	7D
PAHs	1000 mL	EPA 8270C	10	µg/L	7D
PCBs	1000 mL	GCMS SIM/ EPA 608	0.002	µg/L	7D/7D
Synthetic Organic Compounds					
Organophosphate Pesticides	2 L	USEPA 625M	0.05	µg/L	7/40D
Synthetic Pyrethroid Pesticides	2 L	GC/MS NCI-SIM	2-10	ng/L	7/40D
Toxicity					
Growth with *Hyalella azteca*	15 L	EPA-821-R-02-013	NA	Pass/Fail	36H
Larval Survival and Growth with *Pimephales promelas*	15 L	EPA-821-R-02-013	NA	Pass/Fail	36H
Survival and Reproduction with *Ceriodaphnia dubia*	4 L	EPA-821-R-02-013	NA	Pass/Fail	36H
Growth with *Selenastrum capricornutum*	4 L	EPA-821-R-02-013	NA	Pass/Fail	36H

This table describes detailed monitoring and analytical methods that are illustrative and may be revised based on site-specific environmental conditions and equivalent alternate analytical methods.

NA = Not applicable; mL = milliliter; L = liter; D = day; H = hour; M = month

Sediment Toxicity and Benthic Community Effects are listed as a cause for impairment of receiving waters in the San Diego Bay WMA on the 303(d) list, however are not applicable to MS4 Outfalls.

1. SWAMP Target Reporting Limits are recommended and not required. At a minimum, monitoring programs will meet requirements set forth in the State Implementation Plan (SIP).
2. Nitrite and nitrate may be combined and reported as nitrite+nitrate.

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ATTACHMENT 4

Quality Assurance/Quality Control Procedures

(Reference: Attachment C of Attachment A2 to Appendix K of the San Diego Bay Water Quality Improvement Plan "WQIP")

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QUALITY ASSURANCE / QUALITY CONTROL

Field Quality Assurance/Quality Control

Quality assurance (QA) and quality control (QC) for sampling processes will include proper collection of the samples to minimize the possibility of contamination. All samples will be collected in laboratory-supplied, laboratory-certified, contaminant-free sample bottles. Field staff will wear powder-free nitrile gloves or a similar type of gloves at all times during sample collection.

Target measurement objectives for field quality control samples are provided in Table C-1

Table C-1
Field Quality Control Samples

Sample Type	Measurement Objective			Frequency of Analysis
	Field Duplicate	Field Blank	Equipment Blank	
Conventionals	RPD<25%[a]	<RL for target analyte	<RL for target analyte	Per batch of samples submitted to the laboratory[b]
Indicator Bacteria	RPD<25%[c]	Negative Response	Negative Response	Per batch of samples submitted to the laboratory[b]
Metals	RPD<25%[a]	<RL for target analyte	<RL for target analyte	Per batch of samples submitted to the laboratory[b]
Nutrients	RPD<25%[a]	<RL for target analyte	<RL for target analyte	Per batch of samples submitted to the laboratory[b]
Solid Parameters	RPD<25%[a]	<RL for target analyte	<RL for target analyte	Per batch of samples submitted to the laboratory[b]
Organics	Per method	<RL for target analyte	<RL for target analyte	Per batch of samples submitted to the laboratory[b]

Notes:
RL = reporting limit.
RPD = relative percent difference.
a. NA if native concentration of either sample<RL.
b. For equipment blanks, the frequency is 10% of the cleaned material. Equipment blanks are only analyzed for TOC and total metals per Section F.1.5
c. Field duplicates are not a current SWAMP requirement for indicator bacteria. However, the collection and analysis of a field duplicate is recommended.

Training

All sampling personnel will be trained according to field sampling standard operating procedures (SOPs). Additionally, the field staff will be made aware of the significance of the project's detection limits and the requirement to avoid contamination of samples at all times.

Field Blank

A field blank will be collected and analyzed to assess contamination from field-related conditions to ensure that positive bias of the sample has not been introduced, and to remain in compliance with the Surface Water Ambient Monitoring Program (SWAMP) protocols. One field blank will accompany each batch of samples submitted to the analytical laboratory.

Field Duplicate

A duplicate sample may be collected and analyzed to assess the variability in sampling and to remain in compliance with the SWAMP protocols. One field duplicate will accompany each batch of samples submitted to the analytical laboratory.

Temperature Blank

A temperature blank will be used to ensure that sample holding temperatures were maintained from sample collection through delivery to the laboratory.

Equipment Blank

The selected analytical laboratory Teflon-lined tubing, silicone pump tubing, silicone bottle stoppers, and stainless steel sample intake strainers. The following blank samples will be created for analysis:

- One blank sample representative of the cleaned silicone and Teflon-lined tubing. Blank water will be passed through at least 10% of cleaned tubing and be representative of both silicone and Teflon-lined tubing.
- One blank representing the bottles and stoppers. Blank water will be passed into/over at least 10% of cleaned bottles and stoppers.

The analytical laboratory will analyze the equipment blanks for total organic carbon and total metals at a minimum. The analytical laboratories will analyze blank water from the cleaned sampling equipment at the same detection level proposed for sample analysis; this will verify that the sampling equipment in contact with sample water is clean and is not a likely source of contamination.

If a blank sample produces an analyte detection above the RL, the equipment will be cleaned and blanked again. Cleaned and blanked sampling equipment will not be deployed for sampling until an acceptable blank analysis has occurred unless directed by the Copermittees.

Inspection/Acceptance of Supplies and Consumables

Sample bottles (provided by the laboratory) and collection equipment will be inspected prior to their use. Procured supplies will be examined for damage prior to use per Table C-2.

Field supplies will be stored at the sampling team's offices; laboratory supplies will be stored at the laboratory. Inspection and testing requirements for laboratory supplies are covered in the laboratory's QA/QC procedures.

Table C-2
Inspection/Acceptance Testing Requirements for Consumables and Supplies

Project-Related Supplies/ Consumables	Inspection/ Testing Specifications/ Source	Acceptance Criteria	Frequency	Responsible Party
Pre-cleaned sample bottles	Closed bottle	Lids screwed on bottles	100%	Sampling Team
Silicone tubing	Laboratory cleaned	Pass blanking analysis	New tubing each season	Laboratory/Sampling Team
Teflon tubing	Laboratory cleaned	Pass blanking analysis	New tubing each season	Laboratory/Sampling Team
Gloves	New box	New box	As needed	Sampling Team

Laboratory Quality Assurance/Quality Control

This section addresses QA/QC activities associated with laboratory analyses. Laboratory QA/QC samples provide information to assess potential laboratory contamination, analytical precision, and accuracy. Analytical quality assurance for this program includes the following:

- Employing analytical chemists trained in the procedures to be followed.
- Adherence to documented procedures, United States Environmental Protection Agency (USEPA) approved methods, and written Standard Operating Procedures (SOPs).
- Calibration of analytical instruments.

- Use of quality control samples, internal standards, surrogates, and Standard Reference Materials (SRMs).
- Complete documentation of sample tracking and analysis.

Internal laboratory quality control checks will include the use of laboratory replicates, method blanks, matrix spikes/matrix spike duplicates (MS/MSDs), and laboratory control samples (LCSs). The quality control checks performed by constituent class is presented in Table C-3. The frequency of the laboratory QA/QC samples will a minimum of once per batch per analyte unless otherwise adjusted by Copermittees.

Table C-3
Laboratory Quality Control Samples by Constituent Class

Laboratory Quality Control	Conventionals	Indicator Bacteria	Inorganic Analytes	Nutrients	Solid Parameters	Synthetic Organic Compounds
Calibration Standard	✓	–	✓	✓	–	–
Calibration Verification	✓	–	✓	✓	–	✓
Laboratory Blank	✓	✓	✓	✓	✓	✓
Reference Material	✓	–	✓	✓	–	✓
Matrix Spike	✓	–	✓	✓	–	✓
Matrix Spike Duplicate	✓	–	✓	✓	–	✓
Laboratory Duplicate	✓	✓	✓	✓	✓	–
Internal Standard	✓	–	✓	–	–	✓
Sterility Checks	–	✓	–	–	–	–
Laboratory Positive Control	–	✓	–	–	–	–
Laboratory Negative Control	–	✓	–	–	–	–
Laboratory Water Control	–		–	–	–	–
Conductivity/Salinity Control Water	–	–	–	–	–	–
Additional Control Water	–	–	–	–	–	–
Sediment Control	–	–	–	–	–	–
Reference Toxicant Tests	–	–	–	–	–	–
Tuning	–	–	–	–	–	✓
Surrogate	–	–	–	–	–	✓
Calibration	–	–	–	–	–	✓

Data Quality Objectives

Data quality objectives (DQOs) are quantitative and qualitative statements that define project objectives and specify the acceptable ranges of field sampling and laboratory performance. DQOs include accuracy, precision, and completeness.

Accuracy describes how close the measurement is to its true value. Accuracy is the measurement of a sample of known concentration and comparing the known value against the measured value. The accuracy of chemical measurements will be checked by performing tests on a standard prior to and/or during sample analysis. A standard is a known concentration of a certain solution. Standards can be purchased from chemical or scientific supply companies. Standards might also be prepared by a professional partner (e.g., a commercial or research laboratory). The concentrations of the standards should be within the mid-range of the equipment. Recovery measurements are determined by spiking a replicate sample in the laboratory with a known concentration of the analyte. Accuracy of the project data will be determined by comparing results from MS/MSDs, LCSs, field blanks, and equipment blanks to the accuracy objectives to be developed by Copermittees.

Precision describes how well repeated measurements agree. The evaluation of precision described here applies to repeated measurements and samples collected in the field (field duplicates) or the laboratory (laboratory replicates and MS/MSDs). Precision measurements will be determined by comparing results from field duplicates, laboratory replicates and MSD to the precision objectives specified in Appendix F. Relative Percent Differences (RPDs) will be calculated to determine the precision between duplicate samples. This calculation is presented in Equation 1. Precision objectives will be developed by the Copermittees.

$$RPD = \frac{abs[x_1 - x_2]}{0.5 * (x_1 + x_2)} \qquad \text{Equation 1}$$

where:

abs is the absolute value.
x1 is measurement 1.
x2 is measurement 2.

Completeness is the fraction of planned data that must be collected to fulfill the statistical criteria of the project. There are no statistical criteria that require a certain percentage of data. However, the anticipated target is 90%. This accounts for adverse weather conditions, safety concerns, and equipment problems. The project team determined completeness by comparing the number of measurements planned to be collected with the number of measurements actually collected that are deemed valid. An invalid measurement would be one that does not meet the sampling method requirements. Completeness will be measured as a percentage of the number of samples collected that meet the respective DQOs compared to the anticipated number of samples. This calculation is presented in Equation 2.

$$Completeness = \frac{Actual\ number\ of\ samples\ collected}{Project\ required\ total\ samples\ to\ be\ collected} * 100 \quad \text{Equation 2}$$

Instrument/Equipment Calibration and Frequency

Laboratory equipment will be calibrated based on manufacturer recommendations and in accordance with the method and laboratory SOP. The laboratory SOP is maintained by the respective Laboratory Directors and QA officers, and is available upon request.

Corrective Action

Corrective action will be taken when an analysis is deemed suspect. Reasons a sample may be considered suspect consist of exceedances of the RPD ranges, spike recoveries, and blanks. The corrective action may vary from analysis to analysis, but typically will involve the following:

Check of procedures:

- Review of documents and calculations to identify possible errors.
- Error correction.
- Re-analysis of the sample extract, if available, to see if results can be improved.
- Reprocessing and re-analysis of additional sample material, if it is available.

Malfunctions that occur during data collection and laboratory analyses will be the responsibility of the field crew or laboratory conducting the work, respectively. In the case of field instruments, problems will be addressed through instrument cleaning, repair, or replacement of parts or the instrument, as warranted. Field crews should carry basic spare parts and consumables with them, and have access to spare parts. The laboratories have procedures in place to follow when failures occur, and have identified individuals responsible for corrective action and developed appropriate documentation as needed.

ATTACHMENT 5

Non-storm Water Action Levels

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C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[7]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[8]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[7] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[8] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

		Freshwater (CTR)		Saltwater (CTR)	
Parameter	Units	MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The