

AGREEMENT FOR PROFESSIONAL SERVICES

THIS AGREEMENT is made and entered into this ____ day of _____, 2019, by and between the City of Merced, a California Charter Municipal Corporation, whose address of record is 678 West 18th Street, Merced, California 95340, (hereinafter referred to as "City") and McCampbell Analytical Incorporated, a California Corporation, whose address of record is 1534 Willow Pass Road, Pittsburg, California 94565 (hereinafter referred to as "Consultant").

WHEREAS, City is undertaking a project for bioassay laboratory services; and,

WHEREAS, Consultant represents that it possesses the professional skills to provide bioassay laboratory services in connection with said project.

NOW, THEREFORE, the parties hereto, in consideration of the mutual covenants hereinafter recited, hereby agree as follows:

1. **SCOPE OF SERVICES.** The Consultant shall furnish the following services: Consultant shall provide the bioassay laboratory services described in Exhibit "A" attached hereto.

No additional services shall be performed by Consultant unless approved in advance in writing by the City, stating the dollar value of the services, the method of payment, and any adjustment in contract time. All such services are to be coordinated with City and the results of the work shall be monitored by the Director of Public Works or designee. However, the means by which the work is accomplished shall be the sole responsibility of the Consultant.

2. **TIME OF PERFORMANCE.** All of the work outlined in the Scope of Services shall be completed in accordance with the Schedule outlined in Exhibit "B" attached hereto and incorporated herein by reference. By mutual agreement and written addendum to this Agreement, the City and the Consultant may change the requirements in said Schedule.

3. **RESERVED.**

4. **COMPENSATION.** Payment by the City to the Consultant for actual services rendered under this Agreement shall be made upon presentation of an invoice detailing services performed under the Scope of Services, in accordance

with the fee schedule set forth in Exhibit "B" attached hereto and incorporated herein by reference. The Consultant agrees to provide all services required under the Scope of Services in Exhibit "A" within the compensation amount set forth in Exhibit "B". For Consultant's services rendered under this Agreement, City shall pay Consultant the not to exceed sums of Twenty-Three Thousand Nine Hundred Sixty-Four Dollars (\$23,964.00) for Fiscal Year 2019/2020 and Twenty-Three Thousand Nine Hundred Sixty-Four Dollars (\$23,964.00) for Fiscal Year 2020/2021 for a total contract amount of Forty-Seven Thousand Nine Hundred Twenty-Eight Dollars (\$47,928.00).

5. **METHOD OF PAYMENT.** Compensation to Consultant shall be paid by the City after submission by Consultant of an invoice delineating the services performed.

6. **RECORDS.** It is understood and agreed that all plans, studies, specifications, data magnetically or otherwise recorded on computer or computer diskettes, records, files, reports, etc., in possession of the Consultant relating to the matters covered by this Agreement shall be the property of the City, and Consultant hereby agrees to deliver the same to the City upon termination of the Agreement. It is understood and agreed that the documents and other materials including but not limited to those set forth hereinabove, prepared pursuant to this Agreement are prepared specifically for the City and are not necessarily suitable for any future or other use.

7. **CONSULTANT'S BOOKS AND RECORDS.** Consultant shall maintain any and all ledgers, books of account, invoices, vouchers, canceled checks, and other records or documents evidencing or relating to charges for services or expenditures and disbursements charged to the City for a minimum of three (3) years, or for any longer period required by law, from the date of final payment to the Consultant to this Agreement. Any records or documents required to be maintained shall be made available for inspection, audit and/or copying at any time during regular business hours, upon oral or written request of the City.

8. **INDEPENDENT CONTRACTOR.** It is expressly understood that Consultant is an independent contractor and that its employees shall not be employees of or have any contractual relationship with the City. Consultant shall be responsible for the payment of all taxes, workers' compensation insurance and unemployment insurance. Should Consultant desire any insurance protection, the Consultant is to acquire same at its expense.

In the event Consultant or any employee, agent, or subcontractor of Consultant providing services under this Agreement is determined by a court of competent jurisdiction or the California Public Employees Retirement System (PERS) to be eligible for enrollment in PERS as an employee of the City, Consultant shall indemnify, protect, defend, and hold harmless the City for the payment of any employee and/or employer contributions for PERS benefits on behalf of Consultant or its employees, agents, or subcontractors, as well as for the payment of any penalties and interest on such contributions, which would otherwise be the responsibility of City.

9. INDEMNITY. Consultant shall indemnify, protect, defend (with legal counsel selected by the City), save and hold City, its officers, employees, and agents, harmless from any and all claims or causes of action for death or injury to persons, or damage to property resulting from intentional or negligent acts, errors, or omissions of Consultant or Consultant's officers, employees, volunteers, and agents during performance of this Agreement, or from any violation of any federal, state, or municipal law or ordinance, to the extent caused, in whole or in part, by the willful misconduct, negligent acts, or omissions of Consultant or its employees, subcontractors, or agents, or by the quality or character of Consultant's work, or resulting from the negligence of the City, its officers, employees, volunteers and agents, except for loss caused by the sole negligence or willful misconduct of the City or its officers, employees, volunteers or agents. It is understood that the duty of Consultant to indemnify and hold harmless includes the duty to defend as set forth in Section 2778 of the California Civil Code. Acceptance by City of insurance certificates and endorsements required under this Agreement does not relieve Consultant from liability under this indemnification and hold harmless clause. This indemnification and hold harmless clause shall survive the termination of this Agreement and shall apply to any damages or claims for damages whether or not such insurance policies shall have been determined to apply. By execution of this Agreement, Consultant acknowledges and agrees to the provisions of this Section and that it is a material element of consideration.

10. INSURANCE. During the term of this Agreement, Consultant shall maintain in full force and effect at its own cost and expense, the following insurance coverage:

a. Workers' Compensation Insurance. Full workers' compensation insurance shall be provided with a limit of at least One Hundred Thousand Dollars (\$100,000) for any one person and as required by law, including Employer's Liability limits of \$1,000,000.00 per accident. The policy shall be endorsed to waive the insurer's subrogation rights against the City.

b. General Liability.

- (i) Consultant shall obtain and keep in full force and effect general liability coverage at least as broad as ISO commercial general liability coverage occurrence Form CG 0001.
- (ii) Consultant shall maintain limits of no less than One Million Dollars (\$1,000,000) per occurrence for bodily injury, personal injury and property damage.
- (iii) The City, its officers, employees, volunteers and agents are to be named as additional insureds under the policy, as respects liability arising out of work or operations performed by or on behalf of the Consultant.
- (iv) The policy shall stipulate that this insurance will operate as primary insurance for work performed by Consultant and its sub-contractors, and that any other insurance or self insurance maintained by City or other named insureds shall be excess and non-contributory.
- (v) Consultant shall maintain its commercial general liability coverage for three (3) years after completion of the work and shall add an additional insured endorsement form acceptable to the City naming the City of Merced, its officers, employees, agents and volunteers for each year thereafter for at least three (3) years after completion of the work. Copies of the annual renewal and additional insured endorsement form shall be sent to the City within thirty (30) days of the annual renewal.

c. Automobile Insurance.

- (i) Consultant shall obtain and keep in full force and effect an automobile policy of at least One Million Dollars (\$1,000,000) per accident for bodily injury and property damage.
- (ii) The City, its officers, employees, volunteers and agents are to be named as additional insureds under the policy, as respects automobiles owned, leased, hired or borrowed by the Consultant.

- (iii) The policy shall stipulate that this insurance will operate as primary insurance for work performed by Consultant and its sub-contractors, and that any other insurance or self insurance maintained by City or other named insureds shall be excess and non-contributory.

d. Professional Liability Insurance. Consultant shall carry professional liability insurance appropriate to Consultant's profession in the minimum amount of One Million Dollars (\$1,000,000). Architects and engineers' coverage is to be endorsed to include contractual liability.

e. Qualifications of Insurer. The insurance shall be provided by an acceptable insurance provider, as determined by City, which satisfies all of the following minimum requirements:

- (i) An insurance carrier admitted to do business in California and maintaining an agent for service of process within this State; and,
- (ii) An insurance carrier with a current A.M. Best Rating of A:VII or better (except for workers' compensation provided through the California State Compensation Fund).

f. Certificate of Insurance. Consultant shall complete and file with the City prior to engaging in any operation or activity set forth in this Agreement, certificates of insurance evidencing coverage as set forth above and which shall provide that no cancellation or expiration by the insurance company will be made during the term of this Agreement, without thirty (30) days written notice to City prior to the effective date of such cancellation—including cancellation for nonpayment of premium.

g. Notwithstanding any language in this Agreement to the contrary, Consultant shall be entitled to be paid pursuant to the terms of this Agreement until Consultant has obtained the insurance required by this Section 10 and provided documentation of said insurance to the City. In addition to any other remedies City may have, City reserves the right to withhold payment if Consultant's insurance policies are not current.

11. ASSIGNABILITY OF AGREEMENT. It is understood and agreed that this Agreement contemplates personal performance by the Consultant and is

based upon a determination of its unique personal competence and experience and upon its specialized personal knowledge. Assignments of any or all rights, duties or obligations of the Consultant under this Agreement will be permitted only with the express written consent of the City.

12. **TERMINATION FOR CONVENIENCE OF CITY.** The City may terminate this Agreement any time by mailing a notice in writing to Consultant that the Agreement is terminated. Said Agreement shall then be deemed terminated, and no further work shall be performed by Consultant. If the Agreement is so terminated, the Consultant shall be paid for that percentage of the phase of work actually completed, based on a pro rata portion of the compensation for said phase satisfactorily completed at the time the notice of termination is received.

13. **CONFORMANCE TO APPLICABLE LAWS.** Consultant shall comply with its standard of care regarding all applicable Federal, State, and municipal laws, rules and ordinances. No discrimination shall be made by Consultant in the employment of persons to work under this contract because of race, color, national origin, ancestry, disability, sex or religion of such person.

Consultant hereby promises and agrees to comply with all of the provisions of the Federal Immigration and Nationality Act (8 U.S.C.A. 1101 *et seq.*), as amended; and in connection therewith, shall not employ unauthorized aliens as defined therein. Should Consultant so employ such unauthorized aliens for the performance of work and/or services covered by this Agreement, and should any agency or instrumentality of the federal or state government, including the courts, impose sanctions against the City for such use of unauthorized aliens, Consultant hereby agrees to, and shall, reimburse City for the cost of all such sanctions imposed, together with any and all costs, including attorneys' fees, incurred by the City in connection therewith.

14. **WAIVER.** In the event that either City or Consultant shall at any time or times waive any breach of this Agreement by the other, such waiver shall not constitute a waiver of any other or succeeding breach of this Agreement, whether of the same or any other covenant, condition or obligation. Waiver shall not be deemed effective until and unless signed by the waiving party.

15. **INCONSISTENT OR CONFLICTING TERMS IN AGREEMENT AND EXHIBITS.** In the event of any contradiction or inconsistency between any attached document(s) or exhibit(s) incorporated by reference herein and the provisions of the Agreement itself, the terms of the Agreement shall control.

Any exhibit that is attached and incorporated by reference shall be limited to the purposes for which it is attached, as specified in this Agreement. Any contractual terms or conditions contained in such exhibit imposing additional obligations on the City are not binding upon the City unless specifically agreed to in writing, and initialed by the authorized City representative, as to each additional contractual term or condition.

16. **AMBIGUITIES.** This Agreement has been negotiated at arms' length between persons knowledgeable in the matters dealt with herein. Accordingly, any rule of law, including, but not limited to, Section 1654 of the Civil Code of California, or any other statutes, legal decisions, or common-law principles of similar effect, that would require interpretation of any ambiguities in this Agreement against the party that drafted this Agreement is of no application and is hereby expressly waived.

17. **VENUE.** This Agreement and all matters relating to it shall be governed by the laws of the State of California and any action brought relating to this agreement shall be held exclusively in a state court in the County of Merced.

18. **AMENDMENT.** This Agreement shall not be amended, modified, or otherwise changed unless in writing and signed by both parties hereto.

19. **INTEGRATION.** This Agreement constitutes the entire understanding and agreement of the parties and supersedes all previous and/or contemporaneous understanding or agreement between the parties with respect to all or any part of the subject matter hereof.

20. **AUTHORITY TO EXECUTE.** The person or persons executing this Agreement on behalf of the parties hereto warrants and represents that he/she/they has/have the authority to execute this Agreement on behalf of their entity and has/have the authority to bind their party to the performance of its obligations hereunder.

21. **COUNTERPARTS.** This Agreement may be executed in one or more counterparts with each counterpart being deemed an original. No counterpart shall be deemed to be an original or presumed delivered unless and until the counterparts executed by the other parties hereto are in the physical possession of the party or parties seeking enforcement thereof.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed on the date first above written.

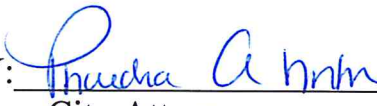
CITY OF MERCED
A California Charter Municipal
Corporation

BY: _____
City Manager

ATTEST:
STEVE CARRIGAN, CITY CLERK

BY: _____
Assistant/Deputy City Clerk

APPROVED AS TO FORM:

BY:  5-23-17
City Attorney Date

ACCOUNT DATA:

BY: _____
Verified by Finance Officer

CONSULTANT
MCCAMPBELL ANALYTICAL
INCORPORATED,
A California Corporation

BY: 
(Signature)

Andrew Gantner
(Typed Name)

Its: Aquatic Toxicology Director
(Title)

BY: 
(Signature)

Angela Rudelius
(Typed Name)

Its: Laboratory Manager
(Title)

Taxpayer I.D. No. 680252953

ADDRESS: 1534 Willow Pass Road
Pittsburg, CA 94565

TELEPHONE: (925) 252-9262

FAX: (925) 252-9269

E-MAIL: drew.gantner@mccampbell.com

Scope of Work

CHAPTER 1 PROPOSAL SUMMARY

The City of Merced (Merced) has submitted a Request for Proposal (RFP) seeking professional services from qualified firms for chronic toxicity testing. Specifically, Merced is seeking services to conduct monthly acute fathead minnow (*Pimephales promelas*) and quarterly chronic *Selenastrum capricornutum*, *Ceriodaphnia dubia* and fathead minnow on Final Effluent testing per their NPDES permit #CA0079219.

McCampbell Analytical, Inc. (MAI) is pleased to have the opportunity to submit this proposal, in conjunction with Robertson-Bryan, Inc. (RBI), collectively referred to as the MAI team, to provide chronic fathead minnow NPDES compliance testing and consulting services for Merced.

MAI is located approximately 110 miles northwest of the Merced Wastewater Treatment Plant and offers a full range of analytical testing services for drinking water, waste water, storm water, soils, hazardous waste, industrial materials, agricultural materials, and analyses of a wide variety of chemical compounds including organics, inorganics, and metallic elements. The MAI Aquatic Toxicology department is both ELAP and NELAP accredited in over 15 chronic and acute bioassay test methods for both freshwater and marine organisms. MAI has also developed a digital data acquisition system which has dramatically streamlined the chronic bioassay testing and reporting process.

RBI is a multi-disciplinary consulting firm founded in 2000 by Mr. Stuart Robertson and Dr. Michael Bryan. RBI is a growing company which generates \$3M-4M annual revenue and has been profitable in every year. RBI offers extensive expertise and experience in providing scientific, regulatory, engineering, and program management services to municipal wastewater utilities and regulatory agencies with respect to requirements of the Clean Water Act, California Porter-Cologne Water Quality Control Act, and National Pollutant Discharge Elimination System (NPDES) permits. Our engineers, aquatic toxicologists, environmental chemists, and biologists have assisted many municipal wastewater utilities in Northern California in addressing toxicity issues and identify cost effective compliance solutions. RBI's expertise in wastewater engineering and aquatic toxicology has allowed us to successfully manage and resolve numerous toxicity issues related to routine and accelerated chronic toxicity monitoring and TREs.

The MAI team will provide a high level of service to Merced with MAI as the lead contractor providing compliance bioassay testing services as well as TIE services should they be necessary. RBI, as a subcontractor to MAI, will provide TRE consulting services should Merced exceed their chronic toxicity unit (TUC) TRE trigger (i.e. > 1 TUC in any accelerated monitoring tests).

Mr. Drew Gantner is the proposed project manager for MAI and will oversee the regular operations associated with the scope of work as outlined in the work plan proposal in Chapter 4. Mr. Gantner will immediately notify and work with Merced and RBI if any toxicity test or accelerated monitoring trigger is exceeded. Contact information is provided in **Table 1**.

Scope of Work

TABLE 1. CONTACT INFORMATION FOR KEY MAI TEAM MEMBERS

Contact Name	Firm	Title	Phone	Email
Mr. Drew Gantner	MAI	Aquatic Toxicology Director	(925) 252-9262	drew.gantner@mccampbell.com
Ms. Angela Rydelius	MAI	Laboratory Manager	(925) 252-9262	angela@mccampbell.com
Ms. Theresa Johnson	MAI	QA/QC Director	(925) 252-9262	theresa.johnson@mccampbell.com
Dr. Michael Bryan	RBI	Partner/ Principal Scientist	(916) 714-1801	bryan@robertson-bryan.com
Mr. Cameron Irvine, M.S.	RBI	Senior Environmental Scientist II	(916) 714-1805	cam@robertson-bryan.com
Mr. Paul Bedore, M.S.	RBI	Senior Environmental Scientist	(916) 405-8918	paul@robertson-bryan.com
Dr. Ben Giudice	RBI	Senior Environmental Engineer II	(916) 714-1801	ben@robertson-bryan.com

CHAPTER 2 COMPANY PROFILES

MCCAMPBELL ANALYTICAL, INC.

MAI (<http://mccampbell.com/>) first opened our doors in 1991 back in Pacheco, CA. The company was started and is still headed by Edward Hamilton, a geologist at heart, with a clear passion for quality chemistry. Since our days with only a few gas chromatographs, MAI has grown to into a full service analytical laboratory that offers both environmental and aquatic toxicity analyses. MAI's mission is to provide high quality and timely chemical analyses to our clients, guide our clients to choose the correct collection protocols and test methods to meet their goals, and to provide research and development solutions for our clients. In addition, one of Mr. Hamilton's primary goals was to provide a safe and rewarding career-oriented work environment for MAI staff and to allow them to explore and enjoy the fascinating field of analytical chemistry, microbiology, and aquatic toxicology. MAI is proud to be independently owned.

Over the past 5 years, MAI's gross revenue has increased \$1M each year and we have hired an additional 30 employees in that time to meet the demand of our clientele. MAI has now grown to over 90 employees in a 32,000 sq. ft. facility located in Pittsburg, CA. Our highly skilled team of chemists and environmental specialists includes chemists, biochemists, biologists, microbiologists, geologists, engineers, zoologists, and botanists. All of which have college degrees from accredited universities, many holding advanced degrees.

MAI offers a full range of aquatic toxicity and analytical testing services for drinking water, waste water, storm water, soils, hazardous waste, industrial materials, agricultural materials, and analyses of a wide variety of organic and inorganic compounds and metallic elements. Our laboratory is continually re-investing in newer instrumentation and laboratory equipment to offer the best sensitivity & service.

We are California State Certified by the Environmental Laboratory Accreditation Program (ELAP), certification #1644, and have state certification for Oregon through the National Environmental Laboratory Accreditation Program (NELAP) certification #4033. Quality Control/Quality Assurance (QA/QC) is vital to MAI; our QC data includes reference toxicant tests, lab control spikes, matrix spikes, sample duplicates, surrogate recoveries, and serial dilutions, the results of which accompany all reports. Our laboratory information management system (LIMS) automatically detects any outlying data points, hold time exceedances, and other errata which are flagged in reports for clear interpretation of results.

MAI boasts over 85 major pieces of instrumentation worth nearly \$10 million, which allows us to accommodate large sample submittals. Instrument redundancy ensures that the standard turnaround time for most chemistry samples is 5 days and 14 days for bioassay samples. MAI

Scope of Work

has a great deal of flexibility in receiving samples before or after standard work hours and provides certified sample containers, pick-up, and delivery throughout the Bay and Sacramento areas with a fleet of full-time couriers.

MAI has not dealt with any lawsuits or litigation regarding work performed in the past 5 years. Nor has MAI ever had any alleged or unlawful incidents or been sued.

ROBERTSON-BRYAN, INC.

RBI is a multi-disciplinary consulting firm founded in 2000 by Mr. Stuart Robertson and Dr. Michael Bryan. RBI is a growing company which generates \$3M-4M annual revenue and has been profitable in every year. We currently employ 18 engineers and scientists with expertise in National Pollutant Discharge Elimination System (NPDES)-related services, regulatory compliance, water quality, aquatic and terrestrial resources, water and power resource planning, wastewater design, project management, and construction management. The firm draws on decades of proven consulting and research experience to address technical, economic, and regulatory issues, while providing timely and effective solutions for resolving interrelated resource concerns. Well-established relationships with resource agencies, municipalities, and other public and private organizations throughout the state are a testament to the firm's ability to develop effective solutions. We are proud to have a reputation for combining sound scientific and engineering principles with innovative and creative approaches to meet our client's needs throughout California.

RBI Team

- Experienced in resolving toxicity compliance issues through TREs
- Known for implementing innovative solutions for evaluating impacts on receiving waters and other methods for resolving TREs
- Successful history working in stakeholder groups including Central Valley Clean Water Agency (CVCWA), Regional Water Boards, State Board, and USEPA

Robertson-Bryan, Inc.

9888 Kent Street, Elk Grove CA 95624

Michael D. Bryan, Ph.D., Managing Partner

bryan@robertson-bryan.com

(916) 714-1802

<http://robertson-bryan.com/>

RBI offers extensive expertise and experience in providing scientific, regulatory, engineering, and program management services to municipal wastewater utilities and regulatory agencies with respect to requirements of the Clean Water Act, California Porter-Cologne Water Quality Control Act, and NPDES permit system. Our engineers, aquatic toxicologists, environmental chemists, and biologists have assisted many of the municipal wastewater utilities in Northern California to solve toxicity issues, facilitate streamlined NPDES permitting, and identify cost effective compliance solutions. RBI's expertise in wastewater engineering and the aquatic

Scope of Work

sciences has allowed us to successfully manage and resolve numerous NPDES permit compliance issues, including toxicity compliance related to routine and accelerated chronic toxicity monitoring and TREs.

RBI has not dealt with any lawsuits or litigation regarding work performed in the past 5 years. Nor has RBI ever had any alleged or unlawful incidents or been sued.

CHAPTER 3 QUALIFICATIONS

MCCAMPBELL ANALYTICAL, INC. LABORATORY QUALIFICATIONS

The MAI aquatic toxicology department is ELAP and NELAP accredited in over 15 chronic and acute bioassay test methods using both freshwater and marine species, a list of these methods is provided in **Table 2**. Mr. Drew Gantner, the Aquatic Toxicology Director has over 20 years of experience in the field of aquatic toxicology, both in the laboratory as well as in the field. Our laboratory is highly proficient in a multitude of freshwater and marine bioassays conducted on both waters and sediments. A summary of MAI's pertinent project experience with WET testing services is provided in **Attachment B**.

Over the past 3 years, Mr. Gantner has strived to update and improve the aquatic toxicology department. This has resulted in a >200% increase in testing capability. In the spring of 2016, our aquatic toxicology laboratory expanded with the addition of 1,400 sq. ft. of workspace including several environmentally controlled test rooms that are capable of accommodating large volumes of bioassay testing.

MAI staff have extensive experience conducting phase I, II, and III TIE studies and have performed two TIEs over the past 2 years. Often times when performing TIEs, the samples may need to have chemistry analyses performed on various TIE extractions. One unique advantage of MAI is our ability to take samples from the aquatic toxicology department and have them analyzed 'in house' by a full time staff of extractionists and chemists for a wide variety of analytical chemistry methods. This means that we do not need to ship samples to third party labs, reducing costs and expediting the turnaround time for analytical results. These results can be available to inform next steps in a TIE or TRE within a few hours due to MAI's ability to analyze samples on very short turn-around times and compile all of the project-specific data using our integrated laboratory LIMS system.

TABLE 2. MAI LIST OF ELAP ACCREDITED BIOASSAY TEST METHODS

FRESHWATER TEST SPECIES	ACUTE	CHRONIC	HAZARDOUS WASTE	10-DAY SEDIMENT
Water Flea (<i>Ceriodaphnia dubia</i>)	•	•		
Green Algae (<i>Selenastrum capricornutum</i>)		•		
Fathead Minnow (<i>Pimephales promelas</i>)	•	•	•	
Water Flea (<i>Daphnia magna</i>)	•			
Rainbow Trout (<i>Oncorhynchus mykiss</i>)	•		•	
Amphipod (<i>Hyalella azteca</i>)				•
Midge (<i>Chironomus dilutus</i>)				•
Marine/Estuarine Test Species				
Sheepshead Minnow (<i>Cyprinodon variegatus</i>)	•	•		
Mysid Shrimp (<i>Americamysis bahia</i>)	•	•		
Inland Silverside (<i>Menidia beryllina</i>)	•	•		
Mussel (<i>Mytilus galloprovincialis</i>)		•		

RBI'S TOXICITY CONSULTING EXPERTISE

Over the past 10 years RBI has assisted dischargers in the management and direction of over 20 separate TREs, implemented multiple special studies associated with effluent toxicity, and engaged with regulators to resolve toxicity compliance issues. In the past 2 years we have completed or are currently supporting 8 TRE investigations. A primary value-added service provided by RBI is our extensive experience working with multiple NPDES dischargers and relationships developed with regulators in multiple regions over many years on the following types of efforts:

- Developing and conducting TREs/TIEs, including facility performance evaluations, toxicity source evaluation studies, and supporting toxicity control actions.
- Independent toxicity test evaluation, interpretation, and policy discussions.
- Advising clients on the need to enter or not enter accelerated toxicity monitoring or a TRE based on detailed and independent reviews of laboratory toxicity reports.
- Compliance reporting of toxicity testing and special study findings to regulators.
- Developing and evaluating alternative compliance strategies.
- Implementing NPDES-permit required species screening studies.
- Participation in expert panels associated with WET and toxicity monitoring, reviewing, and commenting on a draft State Board Toxicity Policy, Basin Plan Amendments, TMDLs, and other regulatory efforts.
- Developing and conducting effluent and receiving water special studies to evaluate toxicity and contaminants.
- Negotiations with regulators.

Scope of Work

- Providing expert witness testimony and NPDES permit hearing testimony.

RBI has broad NPDES and toxicity testing experience that gives us a strong background and diverse perspective to meet the City's WET consulting needs. Each of the over 20 TREs RBI has led, and more toxicity events that did not lead to TREs, began with a detailed independent review of toxicity data to identify any test irregularities suggesting the data may be of questionable quality and supporting the need for retesting. Confirmation testing is useful to confirm toxicity and may involve split samples analyzed by one or more additional labs. A detailed and impartial TRE work plan is then developed to identify the cause of toxicity if a TRE is triggered. RBI has a proven record of quickly identifying causes of toxicity due to various plant upsets and from toxicity due to complex or multiple factors (e.g., pesticide applications [1], testing and sampling artifacts [7], or contaminants [5] requiring treatment upgrades [4]). Interim TRE results, status updates, and updated TRE/TIE work plans are developed as needed throughout the TRE and communicated with regulators. RBI frequently facilitates or leads interactions between clients and Regional Water Quality Control Board (Regional Board) staff to communicate project information and negotiate a path forward. RBI has also provided expert testimony on NPDES permit and toxicity related issues. A summary of RBI's pertinent project experience with TRE investigations and WET consulting support services is provided in **Attachment B**. Select projects are also described below.

As part of a team effort, RBI is leading the development and evaluation of additional methods to characterize toxicity-related effects of publically owned treatment works (POTW) discharges for the Central Valley Clean Water Agencies (CVCWA). These methods are intended to augment current conventional accelerated monitoring and TRE approaches for addressing toxicity events. The study is being conducted in coordination with the Central Valley Regional Board with the intent that reported findings will become acceptable approaches for dischargers to evaluate and address low-level toxicity. Such approaches could be extended to dischargers in the San Francisco Bay region. Low-level toxicity often observed in routine bioassay tests conducted by POTWs is often associated with test artifacts and not indicative of effluent toxicity levels that would result in adverse effects to receiving water beneficial uses. These alternative methods include use of secondary laboratory control waters, split-sample testing by multiple labs, appropriately designated in-stream waste concentrations, receiving water bioassessment, and toxicity assessment of receiving waters upstream and downstream of the discharge.

RBI has developed work plans and implemented chronic freshwater WET 3-species species sensitivity screening analyses. Justification for the continued use of *C. dubia* as the sensitive species, despite instances of toxicity observed to *S. capricornutum*, was communicated to the Regional Water Board in a technical memorandum prepared by RBI and included with the Report of Waste Discharge for the Lehigh Cement Co. Three- species sensitivity screening analysis, performed for another discharger of treated water to slightly brackish receiving water, supported the use of brackish-water-tolerant inland silverside (*Menidia beryllina*) for WET testing. Top smelt (*Atherinops affinis*) was the named species in the discharger's permit but, given a limited and unreliable supply of test organisms, the Los Angeles Regional Water Quality

Scope of Work

Control Board accepted this conclusion with the condition that testing with top smelt would resume once a reliable supply of test organisms was available. Results also reaffirmed previous TRE findings that freshwater testing organisms identified in the permit (i.e., fathead minnow [*Pimephales promelas*] for acute WET and algae for chronic WET compliance testing) were not appropriate.

RBI's clients routinely conduct chronic WET testing with fathead minnows but these tests seldom exceed toxicity triggers. Episodic toxicity to the fathead minnow in Regional San effluent in 2008 and 2009 were quickly resolved when toxicity was not persistent in accelerated/TRE testing. A chronic toxicity trigger exceedance was associated with an irregular dose-response in one test. Acute toxicity was associated with seasonal "first flush" conditions and not due to any specific effluent parameter in another toxicity trigger exceedance. RBI has also designed and implemented a study to identify the potential impacts of discharge on toxicity to *C. dubia*, algae, and fathead minnow in receiving water. These data informed RBI-led regulatory agency negotiations to an exemption from chronic toxicity testing for this discharger.

Based on our experience, knowledge of issues, and with the trust of regulators from years of sound technical discussions, the MAI team can provide the City staff with insights into highly effective approaches for communications and data presentations to Regional Board staff. Our team members meet and communicate regularly with Regional Board staff on a variety of issues and collaboratively on work groups. These interactions include participation in the Sacramento-San Joaquin River Delta Regional Monitoring Program (RMP) TAC where Mr. Irvine has represented and supported POTWs in developing monitoring plans for current use pesticide and evaluating toxicity test data and reports since 2015. RBI has also been involved with work and reviews of the State Water Resources Control Board (State Board) draft toxicity policy since 2009. The initial draft policy recommend effluent limits for dischargers with reasonable potential to cause toxicity, rather than relying on toxicity triggers for accelerated testing and TREs. WET test data would be evaluated using the Test of Significant Toxicity (TST), an alternative statistical approach developed by EPA (2010). On behalf of the POTW community, Dr. Bryan and Mr. Irvine of RBI have attended meetings with stakeholders (including the California Association of Sanitary Agencies; CASA), State Board members, and State Board staff to provide technical input that was used to refine and improve the initial draft toxicity policy. RBI has a thorough understanding of the State Board's proposed toxicity policy and how it will affect discharges once approved. An updated draft toxicity policy is expected in 2018.

PAST EXPERIENCE

SACRAMENTO REGIONAL WASTEWATER TREATMENT PLANT CERIODAPHNIA DUBIA TRE AND REGULATORY COMPLIANCE SUPPORT (2004-2017)

RBI has supported the Sacramento Regional County Sanitation District (Regional San) toxicity investigations and special studies:

Scope of Work

- A *C. dubia* TRE in 2005-2007 was led by Mr. Irvine (at the time of this project and those below, Mr. Irvine was with CH2M) in coordination with SRWTP staff. Detailed reviews of operational and discharge data, source evaluations, and novel TIE studies identified the cause of toxicity as an artifact of sampling. Bacteria was growing in the composite effluent samples. Source control was achieved by reconfiguration of the effluent collection autosamplers. A multidisciplinary TRE team, close client coordination, and the use of innovative approaches were critical to overcome the challenges of this variable and intermittent toxicity that was attenuated in stored samples.
- Mr. Irvine continued to support Regional San on episodic toxicity events to the fathead minnow in 2008 and 2009, *Selenastrum* in 2009, *C. dubia* in 2011 and 2013, and rainbow trout in 2013. All were quickly resolved.
- In 2012, Mr. Irvine co-authored a report for Regional San evaluating potential *H. azteca* WET test methods in response to a 2010 NPDES permit requirement.
- In 2010, Mr. Irvine supported SRWTP in developing a work plan and evaluating results that showed Delta smelt were not adversely affected by environmentally relevant effluent concentrations. This was done when Regional San was approached by the Regional Board to participate in a toxicity study with UC Davis to investigate toxicity to Delta smelt from effluent ammonia.
- A similar study was supported in 2009 with Dr. Don Weston (UC Berkeley) and CalTest to characterize effluent pyrethroid toxicity to *H. azteca*. This study, and split samples tested at an alternative lab on behalf of Regional San, was one of the first to identify the presence of pyrethroid insecticides in treated wastewater and that *H. azteca* were not adversely affected by environmentally relevant concentrations of SRWTP effluent.
- Mr. Irvine led an evaluation of Regional San's historical SRWTPs *C. dubia* chronic toxicity data to determine if statistical evaluations with the TST would result in different interpretations of toxicity compared with the NOEC. A 2017 report to Regional San concluded that there was not an appreciable difference in most of SRWTPs toxicity test results based on the TST when compared with the NOEC.

CITY OF WOODLAND WATER POLLUTION CONTROL FACILITY *SELENASTRUM CAPRICORNUTUM* AND *CERIODAPHNIA DUBIA* TREs (2009-2017)

RBI (Dr. Bryan, PIC; Ben Giudice, PI; and Paul Bedore, S) provided technical consulting services related to implementation of a *S. capricornutum* (algae) TRE for the City of Woodland's Water Pollution Control Facility in 2009-2015 and *C. dubia* TRE in 2016-2017. Toxicity to *Selenastrum* was intermittent and low-level, making the TRE particularly

RELEVANT EXPERIENCE

- Conducted TREs to identify cause of chronic toxicity to *Selenastrum* and *C. dubia*
- Developed and utilized alternative methods to demonstrate that low-level toxicity did not impact receiving water aquatic life
- Negotiated with the Regional Board for a higher chronic toxicity trigger in NPDES permit

Scope of Work

challenging to resolve. For the *Selenastrum* TRE, we investigated various toxicity drivers and sources with the following actions:

- Facility performance review – conducted an extensive review of plant monitoring data, chemical inventory and chemical-specific toxicity testing, and service area contributors.
- TIEs – conducted five Phase I TIEs and several hold-time studies to determine stability of the toxicant(s); developed TIEs to target reactive oxygen species produced via ultraviolet (UV) disinfection process.
- Toxicity source evaluations – Tested effluent at different points in the treatment process. RBI demonstrated that the UV light disinfection was a toxicity driver.
- Bioassessment – conducted a rapid bioassessment of the benthic macroinvertebrate (BMI) community in the receiving water, which showed no significant difference in community structure or composition upstream vs. downstream of the outfall.
- Assessment of dilution available in the receiving water – performed a dilution analysis, based on bioassay results, to provide evidence that dilution in Tule Canal is sufficient to eliminate concerns of potential toxicity in the receiving water.

Consequently, RBI successfully concluded the TRE and negotiated with Regional Board enforcement and permitting staff to allow a 2 TUC trigger for *Selenastrum* in the City's renewed NPDES permit. Details on the more recent *C. dubia* TRE can be provided upon request.

EL DORADO IRRIGATION DISTRICT *C. DUBIA* TRE (2011–PRESENT)

RBI has provided consulting services to the El Dorado Irrigation District (EID) since 1996.

RBI (Dr. Bryan, PIC and Paul Bedore, PI) recently supported EID with a *C. dubia* TRE for the Deer Creek Wastewater Treatment Plant to investigate causes of low-level, intermittent toxicity, and undertook the following TRE activities:

- Facility performance review – reviewed plant monitoring data, interviewed plant operators, evaluated chemical use, and reviewed effluent water quality data.
- Split bioassay testing – conducted four split bioassay tests, utilizing three separate bioassay laboratories, which showed that low-level, intermittent toxicity demonstrated by one lab could not be confirmed by two other labs.
- Bioassessment – conducted rapid bioassessment of the BMI community in receiving waters. Assessment of historic BMI data before and after effluent exceeded the 1 TUC trigger was

RELEVANT EXPERIENCE

- Conducted a TRE to identify cause of chronic toxicity to *C. dubia*
- Utilized alternative methods including bioassessment to demonstrate that low-level toxicity did not impact receiving water aquatic life
- Negotiated with the Regional Board to use bioassessment data to conclude the TRE

Scope of Work

crucial for interpreting current observed changes in BMI structure, and whether caused by the discharge.

RBI prepared a TRE Action Plan, a TRE Action Plan addendum, a TRE Final Report, and also held meetings with enforcement staff to review TRE findings and negotiate the use of bioassessment data confirming that the discharge did not cause receiving water toxicity.

CITY OF STOCKTON *C. DUBIA* TRE AND REGULATORY COMMUNICATIONS (2005 – PRESENT)

RBI (Dr. Bryan, PIC and Paul Bedore, PI) has been providing NPDES compliance, permit renewal, and engineering consulting services to the City of Stockton since 2005. Tasks have included Report of Waste Discharge preparation and NPDES permit negotiation, dilution/mixing zone assessments for nitrate and trihalomethanes, a cyanide hold-time study, preparation and update of TRE Work Plans/Action Plans, and others. RBI has successfully implemented four TREs for the City, many of which involved overseeing TIE testing and all involved close consultation with Regional Board enforcement staff to negotiate conclusions of the TREs. A *C. dubia* TRE was initiated in 2016 and is ongoing:

- TIEs and source evaluation studies found that seasonal effluent toxicity was primarily associated with pesticide applications to holding ponds for mosquito control.
- Intermittent causes of low-level toxicity were associated with a slug flow through the treatment plant, over-dosing of polymer, and test organism sensitivity.
- Prepared a TRE Action Plan, numerous sampling plans, and an interim report on TRE activities and findings for Regional Board enforcement staff.
- Led meetings with City and Regional Board staff to communicate concerns and negotiate appropriate NPDES permit terms.

CITY OF ROSEVILLE ON-CALL NPDES AND WET CONSULTING (1998–PRESENT)

RBI (Mike Bryan, PIC; Paul Bedore, PI; and other RBI staff) has provided NPDES permit renewal and compliance services to the City of Roseville since 1998. Tasks have included various NPDES compliance and toxicity support services:

- Reviewed WET test results and supported a TRE for *C. dubia*. Review of failed fathead minnow test identified abnormal dose-response indicating pathogen interference or stimulatory control response, which led to disqualifying use of the WET test for regulatory compliance purposes.
- Led and negotiated multiple NPDES permit renewals.
- Developed a study plan and led investigations to evaluate contributions of current use pesticides and toxicity to the receiving water from two WWTPs.

Scope of Work

LEHIGH SOUTHWEST CEMENT COMPANY C. *DUBIA* TRE AND REGULATORY COMMUNICATIONS (2013-PRESENT)

RBI (Mike Bryan, PIC, Paul Bedore, PM; Ben Giudice, and Cameron Irvine, technical support) is currently conducting a TRE to address toxicity to *C. dubia* in quarry water discharges. The project also involves directing routine WET testing, including designing and conducting a species sensitivity analysis to support NPDES permit renewal. For the TRE, multiple TIEs have identified toxicity from metals that led to the design, construction, and optimization of a treatment system. Optimization of the treatment system is being informed through targeted/novel TIEs to identify causes of residual toxicity. RBI has led regular communications to update Regional Board staff on this TRE status, activities planned to address observed toxicity, and negotiate modifications to toxicity/TRE investigation requirements. RBI-led negotiations saved Lehigh millions of dollars in testing requested by the Regional Board. RBI prepared internal technical reports and memoranda that evaluated the performance of Lehigh's interim and full-scale treatment system including multivariate statistical evaluations to determine the factors/causes associated with residual toxicity.

CHAPTER 4 WORK PLAN

LABORATORY TESTING

Management of Services and Expertise: The aquatic toxicology laboratory director, Mr. Gantner, will serve as the key contact person for this project. With 20 years of experience in the field of aquatic toxicology and project management Mr. Gantner has a tremendous amount of experience with scheduling, testing and reporting the final results for work performed. Mr. Gantner works very closely with Ms. Theresa Johnson, the MAI QA/QC department director as well as Ms. Angela Rydelius the MAI laboratory manager to ensure that all services provided by MAI meet the expectations of Merced, deliverables are met in a timely fashion, and that all work performed in the laboratory adheres to ELAP and NELAP standards.

Scheduling Testing:

Organism Ordering: MAI cultures larval fathead minnows in-house for acute fathead minnow testing. However, attaining a sufficient number of <24-hours old required for chronic fathead minnow testing is challenging and the highest quality test organisms can most often be acquired from a commercial supplier with resources dedicated exclusively to aquaculture. MAI works with three different organism suppliers distributed throughout the United States. We will contract for the most robust and consistent organisms when any of them have problems or if weather may affect shipping reliability from a specific region. MAI also cultures *Selenastrum capricornutum* and *Ceriodaphnia dubia* and these organisms are available for testing every day of the year.

Sample Pickups: MAI will schedule pick-up services for samples from the Merced Wastewater Treatment plant as required. Our couriers will provide ice and ensure that the samples are

Scope of Work

handled properly during transportation to the MAI laboratory. Couriers are available Monday through Friday during the hours of 8 AM to 3 PM and will respond with 24 hour prior notice. Weekend pick-ups are available with 72 hours advanced notice. Courier service will be provided at a fee of \$165 per trip.

Sample Log-in: Upon receipt at MAI, log-in staff will record the sample temperature, review Chain-of-Custody records, and document additional required information required under the NELAP standard. All samples shall be moved to a cold storage area within the aquatic toxicology department and stored at 4°C ($\pm 2^\circ\text{C}$) once the initial log-in process has been completed, unless needed immediately to prepare test solutions.

Effluent Characterization: Prior to use in a test, each effluent sample will be analyzed for initial water quality parameters (e.g. pH, dissolved oxygen, specific conductivity, total residual chlorine, total ammonia, alkalinity and hardness) to ensure that the samples are suitable for bioassay testing. If any of these parameters fall outside of the recommended parameters established by the test method, MAI will contact Merced to discuss these exceedances and determine a course of action (e.g., resampling, retesting, other).

Test Initiation and Maintenance: All tests shall be performed per guidance provided in MAI SOPs specific to each test method. SOPs are presented in **Attachment C**.

Statistical Analysis: Once the fish weight data is complete, all test data is uploaded directly to our CETIS statistical software database and appropriate statistical calculations for organism survival and mean dry biomass (e.g. hypothesis testing and point-estimate analyses) are performed. All test data shall be reviewed for data quality and dose-response curves shall be reviewed for acceptability.

Validation and Notification: Preliminary results for testing will be available within 24-72 hours after the test has terminated and will be emailed to the city of Merced. MAI will immediately notify the City of Merced as well as RBI if any potential toxicity is identified in the routine compliance test. If toxicity is observed then RBI may be asked to review test results for anomalies that would indicate an unreliable test.

Analytical Reports: Chronic toxicity reports shall include the following:

- Cover page with signature
- Sample date(s)
- Test initiation date
- Test species
- End point values for each dilution (e.g. growth rate, percent survival)
- No Observable Effect Level (NOEL) values in percent effluent. The NOEL shall equal the IC25 or EC25. If neither IC25 nor EC25 can be determined, the NOEL shall equal to the No Observable Effect Concentration (NOEC) derived using hypothesis testing. The NOEC

Scope of Work

is the maximum percent effluent concentration that causes no observable effect on test organisms based on a critical life stage toxicity test.

- IC15, IC25, IC40, and IC50 values (or EC15, EC25, EC40, and EC50) as percent effluent
- TUC values (100/NOEL, where NOEL=IC25, EC25 or NOEC)
- Mean percent mortality ($\pm$ s.d.) after 96 hours in 100% effluent (if applicable)
- IC50 or EC50 value(s) for reference toxicant test(s)
- Three sample median and three most recent chronic toxicity results
- Available water quality measurements for each test (Chlorine residual, pH, DO, temperature, conductivity, hardness, salinity, ammonia)
- Future TST pass/fail evaluation

Quality Control (QA/QC) Program: MAI will provide QA/QC data for each test when applicable and this data will be included with all analytical report packages. The QA/QC data shall consist of:

- 1) Results of the concurrent reference toxicant data with the statistical output page for all species and dilutions giving the NOEC, LOEC, type of toxicant, dilution water used, concentrations used, PMSD, and dates tested. TST statistical analyses can also be performed upon request at no charge.
- 2) The concurrent reference toxicant control charts for each test will be submitted with the reports and will include charts for the LC50, IC50, and IC25 as applicable.
- 3) Any information related to deviations from protocol or problems encountered will be addressed in a case narrative in the QA/QC section of the report.

All records are kept on file for a minimum of five years at the MAI facility.

TRE AND TIE CONSULTATION

The MAI team will review all toxicity reports to identify if there are any test irregularities suggesting the data may be of questionable quality or if retesting is recommended. If it is appropriate for the bioassay result to trigger accelerated testing, and if toxicity is confirmed by valid accelerated testing results, then a TRE is triggered. A TRE work plan will be developed within 30 days for submittal to the Regional Board, as required in the Merced NPDES permit. A TRE work plan will typically describe the 6 TRE phases in EPA (1999, 1993a,b, 1992) guidance¹.

¹ U.S. EPA. 1992. Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I. Office of Research and Development, Duluth, MN. May 1992. EPA 600/6-91/005F.
U.S. EPA. 1993a. Methods for Aquatic Toxicity Identification Evaluations. Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity. Office of Research and Development, Washington, D.C. September 1993. EPA 600/R-92/080.
U.S. EPA. 1993b. Methods for Aquatic Toxicity Identification Evaluations. Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity. Office of Research and Development, Washington, D.C. September 1993. EPA 600/R-92/081.

Scope of Work

The MAI team has developed dozens of these for other clients during each TRE we have led (**Attachment B**).

Conference calls or meetings to kick-off any assigned tasks would likely be attended by Mr. Drew Gantner, Mr. Cameron Irvine, and/or Mr. Paul Bedore, to consider the TRE scope, strategies, and expectations. The MAI team will be available anytime to act on requests from the City and work diligently to meet deliverable expectations and deadlines.

The time to complete a TRE can vary, depending on the complexity of the toxicity driver(s). Toxicity associated with a plant upset may be addressed within days to months, and can be as simple as reviewing operations documentation and data. Toxicity is more challenging to identify when intermittent and/or attenuated in stored samples. It is also important to determine whether the bioassay result is driven by true effluent toxicity or by test variability and factors that affect test outcome that may be specific to a given laboratory, and thus the “toxicity” is not observed by another lab. The specific turnaround times for reporting will also vary with the complexity of the TRE or toxicity task, but tend to be in the order of weeks to months. TRE/TIE Work Plans can be developed in less than a day or over weeks, when complicated and involve coordination among parties. Information learned during a TRE may also lead to a recommendation to discuss an alternative compliance strategy with regulators. RBI has used such strategies successfully and is helping to further their use through the CVCWA low-level toxicity special study.

COLLABORATION WITH MERCED STAFF SPECIFIC TO INTERPRETATION OF AND PRESENTATION OF DATA TO REGULATOR(S)

The MAI team is available at all times and will respond immediately when a new toxicity issue arises. We will allocate any needed resources to support the City in meeting their toxicity and TRE requirements. Our experience can also help the City craft narratives to support their actions and facilitate communication to the Regional Water Board of WET test findings or a TRE conclusion/resolution. For example, where we identify WET test uncertainties that necessitate retesting and where delicate and deliberate reporting language can potentially avoid triggering accelerated testing or a TRE. The MAI team will work efficiently and effectively to meet the City’s schedule and goals. Specific turnaround times for any needed TRE reporting can vary depending on the data complexity but can typically be completed within a 30 days when relatively straight forward.

U.S. EPA. 1999. Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants. Office of Wastewater Management, Washington, D.C. August 1999. EPA 833B-99/002.

CHAPTER 5 PROPOSED INNOVATIONS

Electronic Data Recording System: MAI staff have developed a proprietary software and electronic data recording system used exclusively by our aquatic toxicology department. This system has increased the overall efficiency and productivity of the department by eliminating the need for paper bench-sheets and logs and. It has also improved the quality of our data by decreasing transcription errors and automatically reviewing data for completeness and correctness through the use of data filters which automatically flag missing or anomalous data. This electronic data system has increased the efficiency of our data flow through LIMS as well as exporting data to the CETIS software for statistical evaluations of toxicity results. This system of data recording allow MAI staff to perform the statistical analyses on test data and have final test results within a few minutes after the last data from a bioassay has been collected.

Ammonia Toxicity Reduction: MAI has worked closely with a discharger in the South San Francisco Bay area with a history of toxicity with their acute fathead minnow compliance testing. That client has a history of elevated ammonia beyond the toxic threshold for fathead minnows and that the previous bioassay laboratory was using zeolite to remove toxicity. This method of ammonia removal is relatively invasive when treating an effluent sample as it removes many ions in solution other than ammonia that are critical to the health of aquatic organisms. In addition to removing beneficial ions, zeolite can also remove other toxic compounds from solution. The Regional Water Board (Region 2) is also aware of the unintended effects of zeolite on effluent and would not allow the continued use of zeolite for ammonia removal. MAI staff recommended to the client try to mitigate elevated levels of un-ionized ammonia in the effluent by adjusting the pH of the effluent to pH 6.0 and using MES buffer (2-(N-morpholino)ethanesulfonic acid) to prevent the pH of the effluent from drifting upwards. Since the implementation of the use of MES buffer and adjusting the pH of the effluent, our client has not had a failed a fathead minnow bioassay since January 2018 despite frequently having total ammonia levels exceeding 40 ppm.

TIE Innovations: In addition to the many TREs conducted by the MAI team, RBI staff have developed innovative solutions and novel tools to evaluate and identify causes of toxicity. These innovations include developing *in situ* toxicity testing methods² to compare lab and field-based toxicity results. Novel toxicants to *C. dubia* in treated wastewater have also been identified using innovative TIEs and source evaluation studies to confirm that bacteria growing in the composite samples were the driver for chronic toxicity trigger exceedances.

² G.A. Burton Jr., M.S. Greenberg, C.A. Rowland, C.A. Irvine, D.R. Lavoie, J.A. Brooker, L. Moore, D. Raymer, and R.A. William. 2005. In situ exposures using caged organisms: a multi-compartment approach to detect aquatic toxicity and bioaccumulation. *Environmental Pollution*. 20:133-144.

CHAPTER 6 PROJECT TEAM AND RELEVANT EXPERIENCE

Summaries of relevant experience for key staff are provide below and detailed resumes are provided in **Attachment A. Figures 1 and 2** present the organization charts for the MAI team as well as responsibilities of the MAI team members, and identifies personnel who will interact with City staff. The primary day-to-day communications will largely be handled by Drew Gantner of MAI. Other key personnel will be included in these discussions as is appropriate. The MAI team is available with the needed resources to support the City's on-call WET consulting services immediately upon receipt of a signed contract.

Drew Gantner (Aquatic Toxicology Lab Director, MAI) has 20 years of aquatic toxicology experience in conducting comprehensive environmental bioassays, Toxicity Identification Evaluations, analyzing related data, designing and implementing laboratory and field studies, and developing innovative strategies to improve field sampling and laboratory testing procedures. Since arriving at McCampbell Analytical in 2015, Mr. Gantner has increased the number of accredited toxicity test methods by 200% with five additional embryo development toxicity tests pending accreditation from the State Water Board. Mr. Gantner has performed many Toxicity Identification Evaluations for clientele in the waste water, petroleum and agricultural industries. Mr. Gantner will be the direct point of contact for Merced for this contract and will communicate appropriately with MAI and RBI staff regarding the status of work performed for Merced.

Angela Rydelius (Laboratory Manager, MAI) oversees all aspects of the laboratory to ensure that operations run smoothly, that all employees have what they require to perform their duties, and that customers are satisfied with each and every transaction. With over 20 years of experience in the environmental testing industry, including a background as an analytical chemist, she has excellent knowledge of analytical procedures and processes as well as a strong commitment to creating a respectful and productive work environment. Anglea is well versed in CA ELAP, NELAP, and process improvement. Her dedication the lab and its employees make her an outstanding leader and an exemplary role model.

Theresa Johnson (Director of QA/QC, MAI) is the head of Quality Control and is responsible for the day to day operations within the Quality aspect of the organization. She will ensure that the overall regulatory guidelines with respect to CA ELAP, NELAP and ISO 17025 are followed and upheld. Policies and procedures are maintained in a timely manner by Theresa. Her experience includes analytical chemistry, microbiology, aquatic toxicology, and clinical testing capacities. She has been known to be a strong role model in management positions with continuous improvements in Quality aspects using Six Sigma, Process Excellence, and Root Cause Analysis. Management elements handled by Theresa include mentoring staff, hiring, training, promoting and initiating a teamwork environment while providing positive leadership influence. Theresa shares her enthusiasm in being part of this science field for the past 20 years as an experienced Quality Management Professional with a demonstrated history of working in the environmental, medical device, clinical and pharmaceutical service industries.

Scope of Work

Dr. Michael Bryan (Principal Scientist and Managing Partner at RBI) has a Ph.D. in Toxicology and over 30 years of combined research and consulting experience in performing and interpreting bioassays (including TREs/TIEs), conducting water quality assessments, and conducting NPDES permit renewals and special studies. His consulting work has focused on studies to assess the effects of wastewater discharges on receiving water aquatic life and other beneficial uses. Dr. Bryan has led or assisted in over 50 NPDES permit renewals, obtained new permits for new discharges to the Delta, maintained and obtained new Thermal Plan exceptions for other dischargers, and has developed and processed seven Basin Plan amendments for site-specific objectives. Dr. Bryan is an innovative leader in the municipal NPDES arena. His 23-year track record of producing science-based, implementable solutions in the wastewater arena has earned him strong professional relationships with Regional Board members and staff (from the Executive Officer to mid-level staff, in both permitting and enforcement), State Board staff, and staff within the fisheries agencies. Dr. Bryan will participate in planning meetings, review work products, and oversee the work of the MAI team. He will oversee and participate when needed, in close coordination with Merced staff, in any negotiations or communications with Regional Board staff.

Cameron Irvine (M.S., Senior Environmental Scientist II at RBI) is a senior scientist with over 20 years of experience evaluating toxicity, developing toxicity testing methods, leading TREs and developing TIEs, and communicating results with regulatory staff. He led a *C. dubia* TRE at SRWTP in 2008 that identified toxicity due to bacterial growth in effluent sampling containers. Cameron has supported TIEs and TREs for other industrial and wastewater clients where ion imbalance in brackish receiving water was causing toxicity to *C. dubia*. In coordination with the Regional Board, these TREs were addressed by changes in species used for testing. He has also led special study investigations into the TST statistical approach to determine the potential for this change in toxicity assessment methods to affect SRWTP toxicity results; participated in university led research studies into the effects of ammonia and pyrethroids in POTW effluent on toxicity to delta smelt and *H. azteca*, respectively; and represented Regional San in California Association of Sanitary Agencies discussions with State Board proposed changes to the statewide toxicity policy. He currently represents POTWs as an alternate member on the Delta Regional Monitoring Program Technical Advisory Committee where he is contributing to the development of an updated current use pesticide monitoring plan. His toxicity data analyses and comments have led to clarifying *C. dubia* toxicity test protocols and data interpretation with the Surface Water Ambient Monitoring Program (SWAMP). Cameron has developed *in situ* toxicity testing for freshwater organisms and *in situ* TIEs. He also chairs the American Society of Testing and Materials (ASTM) E50.47 subcommittee which oversees toxicity testing methods and is past chair of the Society of Environmental Toxicology and Chemistry (SETAC) Science Committee. Cameron will be the RBI lead in reviewing toxicity reports and responding to any TRE.

Paul Bedore (M.S., Senior Environmental Scientist at RBI) has 13 years of experience conducting water quality assessments and research related to stormwater, wastewater treatment, and pollutant fate/transport in the environment. Paul has managed 10 TREs for POTWs in the past three years. In addition, he has served as technical lead on numerous NPDES

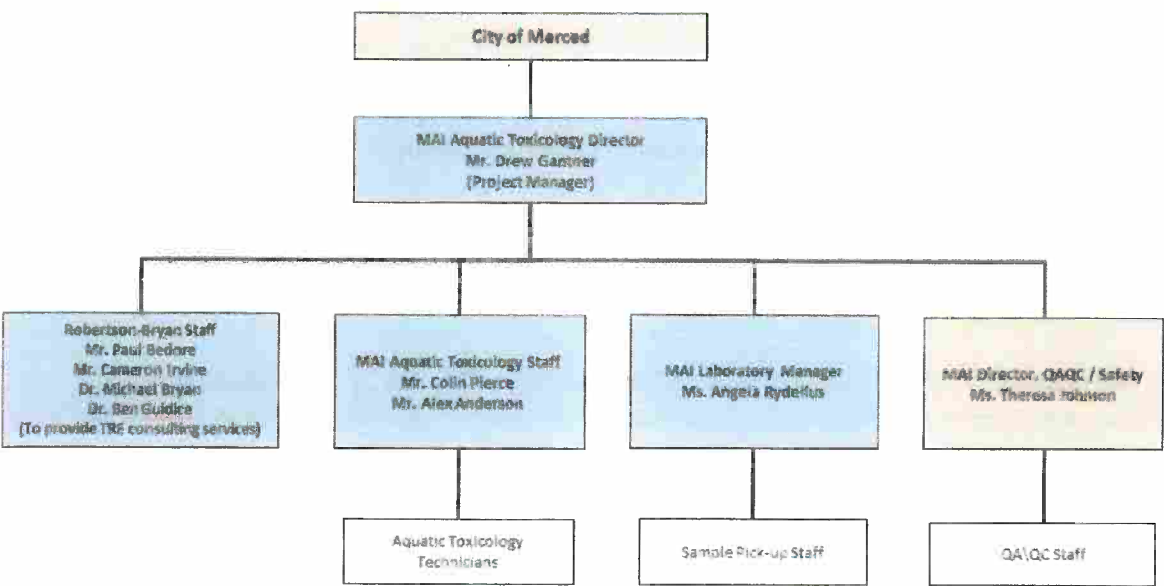
Scope of Work

stormwater and wastewater evaluations, technical reports and work plans, and water quality impact assessments for California Environmental Quality Act (CEQA) compliance and NPDES permitting. Paul has extensive experience in NPDES permit renewals for both stormwater and wastewater permits. He also has negotiated special monitoring studies required by CWC 13267 Orders on behalf of RBI clients, saving clients millions of dollars in unwarranted monitoring costs. Paul has provided technical review of Regional Board Basin Plan Amendments and testimony at Basin Planning hearings on the issue of pyrethroid toxicity. Paul assists clients by directing services related to WET requirements of NPDES permits, TRES, special monitoring studies, and MS4 storm water programs. Prior to working for RBI, Paul was a lead operator of Sierra Nevada Brewing Company's industrial wastewater facility and was an environmental scientist for the California Department of Pesticide Regulation's Registration Branch. He will support toxicity related tasks on this project.

Dr. Ben Giudice (Ph.D., Sr. Environmental Engineer II at RBI) has 10 years of experience studying and practicing environmental and water resources engineering. His expertise includes wastewater process engineering, environmental fate and transport, risk assessment, ecotoxicology, CECs, analytical chemistry, and field and laboratory data collection, compilation, and analysis. Ben's academic work includes site, watershed, and regional scale risk assessments of roadside applied herbicides in highway runoff; studies of endocrine disruptors, pharmaceuticals, and personal care products in runoff from land applied municipal biosolids; and studies on the effects of endocrine disruptors on reproduction in aquatic invertebrates. Ben leads technical evaluations for wastewater and stormwater permitting and compliance and in support of environmental impact assessments. He will support toxicity related tasks on this project as needed.

FIGURE 1. MAI TEAM ORGANIZATIONAL CHART

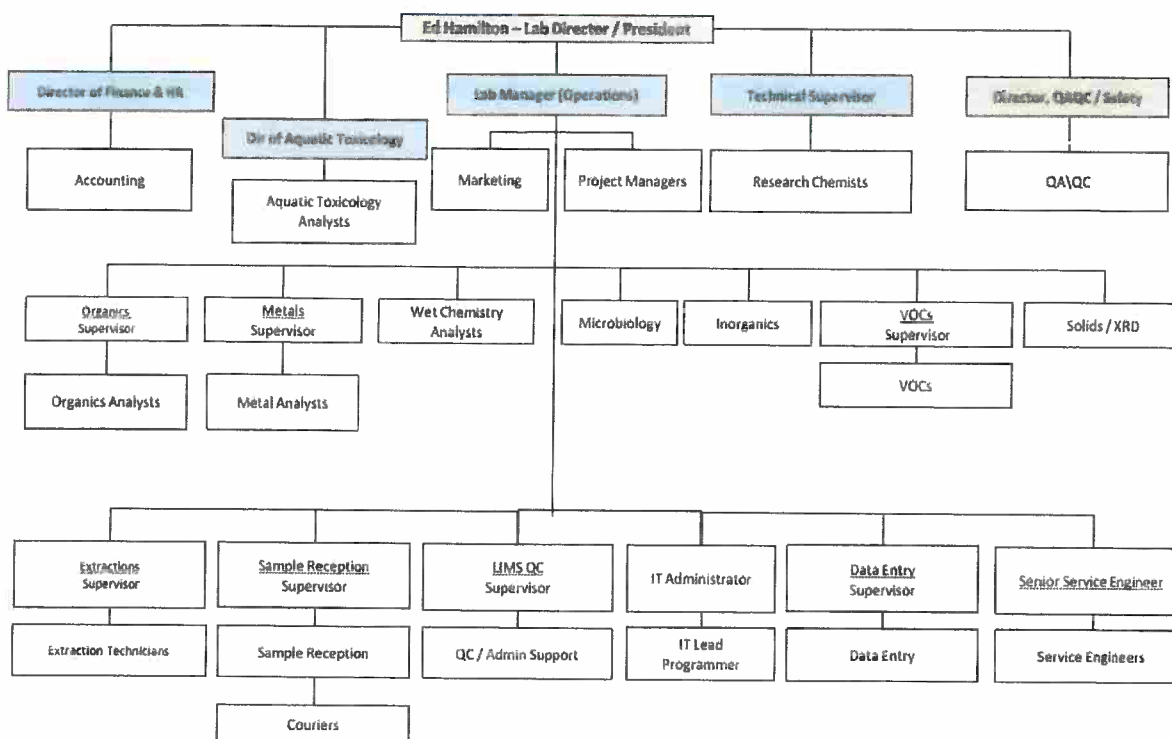
City of Merced / MAI & RBI Organizational Chart



Scope of Work

FIGURE 2. MAI ORGANIZATIONAL CHART

McC Campbell Analytical Organizational Chart 2018



Scope of Work

CHAPTER 7 PROPOSAL EXCEPTIONS

The level of effort associated with TRE and TIE services are unpredictable and are event specific. The MAI team will address each event on a case-by-case basis. Our experienced team is highly skilled in identifying causes of toxicity and developing cost-effective solutions. We will work diligently to resolve the issue as efficiently as possible, and within budget, on a time and materials basis.

Scope of Work

CHAPTER 8 PROPOSAL COST SHEET FOR TESTING TO BE PERFORMED FROM JULY 2019 -JUNE 2021

Scope	Labor Categories	Quantity	Unit Cost	Extended Rate
Acute Fathead Minnow Effluent Bioassay (EPA 2000.0)	Acute Bioassay Testing – Compliance Testing	24	\$ 357	\$ 8,568
Chronic <i>Selenastrum capricornutum</i> Effluent Bioassay (EPA 1003.0)	Chronic Bioassay Testing – Compliance Testing	8	\$ 695	\$ 5,560
Chronic <i>Selenastrum capricornutum</i> Reference Toxicant Test	Chronic Bioassay Testing – Compliance Testing	8	\$420	\$ 3,360
Chronic <i>Ceriodaphnia dubia</i> Effluent Bioassay (EPA 1002.0)	Chronic Bioassay Testing – Compliance Testing	8	\$ 795	\$ 6,360
Chronic <i>Ceriodaphnia dubia</i> Reference Toxicant Test	Chronic Bioassay Testing – Compliance Testing	8	\$760	\$ 6,080
Chronic Fathead Minnow Effluent Bioassay (EPA 1000.0)	Chronic Bioassay Testing – Compliance Testing	8	\$ 825	\$ 6,600
Chronic Fathead Minnow Reference Toxicant Test	Chronic Bioassay Testing – Compliance Testing	8	\$ 600	\$ 4,800
Courier Delivery Fee	Sample Delivery – Extra Mile Delivery	40	\$ 165	\$ 6,600

Scope of Work

CHAPTER 9 CERTIFICATIONS AND STATEMENTS

Current MAI California State ELAP (certification #1644) and NELAP certification from the state of Oregon (certification #4033) are attached in **Attachment D**. The Results from our most recent performance testing are presented in **Attachment E**.

MAI and RBI insurance coverage meets or exceeds the minimum General Liability requirements described in the RFP and a copy of our certificate of insurance is provided in **Attachment F**.

CHAPTER 10 MAI TOXICITY TESTING REFERENCES ARE AVAILABLE FROM:

City of Palo Alto: Samantha Bialorucki, (650) 329-2334, samantha.bialorucki@cityofpaloalto.org

- Monthly chronic fathead minnow NPDES testing

Rodeo Sanitary District: Andrew Alva, (510) 799-2970, alvaa@rodeosd.org

- Monthly acute rainbow trout flow-through bioassay
- Semi-annual chronic *Ceriodaphnia dubia* bioassay

City of Modesto Water Quality Control Facility: Melissa Holden, (209) 577-6275, mvaughn@modestogov.com

- Quarterly acute fathead minnow bioassay
- Quarterly chronic *Selenastrum capricornutum*, *Ceriodaphnia dubia* and fathead minnow bioassays

City of Burlingame Wastewater Treatment Facility - Veolia North America: Mike Thompson, (650) 342-3727, michael.thompson3@veolia.com

- Monthly acute fathead minnow flow-through bioassay
- Semi-annual chronic *Ceriodaphnia dubia* bioassay

Sewerage Agency of Southern Marin: Nimisha Patel, (415) 384-4821, npatel@cityofmillvalley.org

- Semi-annual chronic *Americamysis bahia* bioassay

Sanitary District No. 5 Wastewater Treatment Plant: Tim O'Day, (415) 453-1501, today@Sani5.org

- Annual chronic *Americamysis bahia* bioassay

RBI TRE REFERENCES ARE AVAILABLE FROM:

City of Stockton: Deedee A. Antipas, Deputy Director, Wastewater (209) 937-7425

- NPDES Toxicity Reduction Evaluation Services

City of Turlock: David Huff, WQC Division Manager (209) 668-5599 dhuff@turlock.ca.us

- NPDES Toxicity Reduction Evaluation Services



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MCCAMPBELL ANALYTICAL, INC.

FEE PROPOSAL



FOR

REQUEST for PROPOSAL

**Bioassay Laboratory Services, Fiscal Years
2019/2021**

FOR

CITY OF MERCED

Submitted April 19, 2019

EXHIBIT B



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QUOTATION for ANALYTICAL SERVICES

Requested By: Jeremy Geiger
New Client File: Pending (NCF)
City of Merced Public Works

Merced, CA 95341

geigerj@cityofmerced.org

Project: Merced NPDES Testing July 2019 - June 2021

Quote ID: 192480

Prepared DATE: April 17, 2019

Expiration DATE: July 01, 2021

Assigned PM: Drew Gantner

Prepared By: Drew Gantner

Test Name	Test Method	TAT	Matrix	Qty	Unit Price	Total
Tests:						
Acute 96-hr Static 48-hr Renewal Screen w/ FHM	EPA 2000.0	10 Days	Water	24	\$357.00	\$8,568.00
Chronic Selenastrum capricornutum 100% Conc.	EPA 1003.0	12 Days	Effluent	8	\$695.00	\$5,560.00
Chronic Selenastrum capricornutum Ref Tox	EPA 1003.0	12 Days	Water	8	\$420.00	\$3,360.00
Chronic Ceriodaphnia dubia 100% Concentration	EPA 1002.0	12 Days	Effluent	8	\$795.00	\$6,360.00
Chronic Ceriodaphnia dubia Ref Tox	EPA 1002.0	12 Days	Water	8	\$760.00	\$6,080.00
Chronic Fathead Minnow 100% Concentration	EPA1000.0	12 Days	Effluent	8	\$825.00	\$6,600.00
Chronic Fathead Minnow Ref Tox	EPA1000.0	12 Days	Water	8	\$600.00	\$4,800.00
Fix-Rate Items:						
Courier Trip				40	\$165.00	\$6,600.00

Tests SubTotal: \$41,328.00

Fix-Rate Items SubTotal: \$6,600.00

TOTAL: \$47,928.00



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UCMR4

Method / Analysis	Description	List Price
200.8	UCMR4 Metals by MS (Germanium and Manganese)	50
525.3	UCMR4 SVOCs by GC-MS	256
530	UCMR4 SVOCs by GC-MS	220
541	UCMR4 Alcohols by GC-MS	167
544	UCMR4 Microcystins & Nodularin by LC-MS	400
545	UCMR4 Cylindrospermopsin and Anatoxin-a by LC-MS	300
546	UCMR4 ELISA Total Microcystins	100
552.3	UCMR4 Haloacetic Acid by GC-MS	200
300.1	Bromide by IC	28
5310B	Total Organic Carbon (TOC) SM5310 B	39

Drinking Water Chromatography

Method / Analysis	Description	List Price
505	OC Pesticides and PCBs by L-LE and GC-ECD	139
505	PCBs by L-LE and GC-ECD	56
505	PCBs by L-LE and GC-ECD (low level, 0.1 µg/L)	84
515.3	OC Acidic Herbicides by L-LE, Derivatization & GC-ECD	167
522	1,4-Dioxane by SPE and GC-MS; UCRM3	145
524.2	HVOCs by P&T and GC-MS	80
524.2	TTHMs (Total Trihalomethanes) by P&T and GC-MS	80
524.2	VOCs by P&T and GC-MS	100
524.2	VOCs by P&T and GC-MS, Open Scan (Up to 5 PEAKS, 10\$ ea. addl.)	135
524.3	EDB, DBCP & 1,2,3-TCP (0.005 µg/L) by GC-MS (SIM Mode)	135
524.3	TTHMs (Total Trihalomethanes) by P&T and GC-MS	80
524.3	VOCs by GC-MS; UCRM3	135
525.2	ON/P Pesticides by L-LE and GC-NPD	145
525.2	SVOCs by L-SE and GC-MS	256
531.1	Carbamates by HPLC w/ Derivatization	189
531.2	Carbamates by HPLC w/ Derivatization (regulated)	189
532m	Azoxystrobin, Fludioxonil & Penoxsulam	178
532m	Clopyralid & Imazapyr by SPE and HPLC	178
532m	Fenhexamide & Oxyfluorfen by SPE and HPLC	178
532	Phenyl Ureas by SPE and HPLC	178
532	Phenyl Ureas by SPE and HPLC (low level, 0.1 µg/L)	200
537	Perfluorinated Alkyl Acids by SPE and LC/MS/MS; UCRM3	306
539	Hormones by SPE and LC-ESI-MS/MS; UCRM3	361
547	Glyphosate by HPLC w/ Derivatization	134 w/ 167 s
548.1	Endothall by GC-MS	145
549.2	Diquat and Paraquat by LSE and HPLC	145
550.1m	Nonylphenol by SPE and HPLC	123
552.2	HAAs by LLE and GC-ECD	167
SM6040Dm	Geosmin & MIB (0.5 - 2.0 ng/L)	256



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Effluent Water Chromatography

Method / Analysis	Description	List Price
608	OC Pesticides and PCBs by L-LE and GC-ECD	139
608	OC Pesticides and PCBs by L-LE and GC-ECD (low level, 0.0004 µg/L w/Florasil)	178
608	OC Pesticides and PCBs by L-LE and GC-ECD (low level, 0.001 µg/L w/GPC)	223
608	PCBs by L-LE and GC-ECD	56
610	PAHs/ PNAs by L-LE and HPLC	145
610	PAHs/ PNAs by L-LE and HPLC (low level, 0.004 µg/L)	200
613	2,3,7,8-TCDD only by HRGC-HRMS, (5.0 pg/L)	300
614	Nitrogen-Phosphorous Pesticides by GC-MS	145
624	Acrolein, Acrylonitrile & 2-CEVE by P&T and GC-MS	*80
624	HVOCs and/or Aromatics by P&T and GC-MS	*80
624	TTHMs (Total Trihalomethanes) by P&T and GC-MS	*80
624	VOCs by P&T and GC-MS excluding Acrolein & 2-CEVE	*100
625	PAHs/ PNAs by L-LE or SPE and GC-MS	145
625	PAHs/ PNAs and Phenols by L-LE or SPE and GC-MS	200
625	Phenols by L-LE or SPE and GC-MS	145
625	SVOCs by L-LE or SPE and GC-MS	256
1613	2,3,7,8-TCDD by HRGC-HRMS, 5.0 pg/L & 0.5 pg/g (W/ S RL)	300
1613	Full List Dioxins & Dibenzofurans by HRGC-HRMS	550
1668	PCBs by HRGC-HRMS, 12 Dioxin-like WHO Toxic Congeners	700
1668	PCBs by HRGC-HRMS, 40 or 66 Effluent Congeners	770
1668	PCBs by HRGC-HRMS, Full 209 Congeners	875
BAAQMD 33	CS ₂ Extractable C8-C14 Compounds by GC-FID	139

Hazardous Waste, Soils, Groundwater Chromatography

Method / Analysis	Description	List Price
8015B/ m	TPH Fuel Finger Print (quantitative & qualitative) by Direct Injection GC-FID	100
8015D	TPH as Methane in ug/Kg (emissions testing)	84
8015Bm	TPH Multi- Range (d, g, mo, k, jf, bo, other) by Direct Injection GC-FID	*67
8015B / 8021B	TPH(g, ss, ag) - MBTEX by P & T and GC-FID/PID	*50
8081A	OC Pesticides by GC-ECD	84
8081A	OC Pesticides by GC-ECD (low level; ESLs) *Clean Up fee included	*204
8081A / 8082	OC Pesticides + PCBs by GC-ECD	139
8081A / 8082	OC Pesticides + PCBs by GC-ECD (low level; ESLs) *Clean Up fee included	*259
8082	PCB Aroclors Only by GC-ECD	56
8082	PCB Aroclors in Waste Oil by GC-ECD w/ Clean Up (2 mg/L RL) *Clean Up fee included	*140
8082m	PBBs & PBDEs by GC-MS	178
8141A	ON/P Pesticides by GC-NPD. Analyzed by E8270 GC-MS	145
8151A	OC Acidic Herbicides by GC-ECD	167
8260Bm	1,4-Dioxane by GC-MS (SIM Mode), 0.5 µg/L & 0.02 mg/kg (W/ S RL)	*135
8260B	Acrolein, Acrylonitrile & 2-CEVE by P&T and GC-MS	*80
8260B	Appendix IX / Appendix II Volatiles	*200
8260B	HVOCs and/or Aromatics by P&T and GC-MS	*100
8260B	MBTEX / MTBE by P&T and GC-MS	*80
8260B	MTBE Only by GC-MS	*80
8260B	Oxygenates ± EDB-12DCA by P&T and GC-MS	*100



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8260B	VOCs by P&T and GC-MS excluding Acrolein & 2-CEVE	* 100
8260B	VOCs by P&T and GC-MS, Open Scan (Up to 5 PEAKS, 10\$ ea. addl.)	* 135
8270C	Phenols Only by GC-MS	123
8270C	PNAs / PAHs Only by GC-MS SIM Mode	123
8270C	ON/P Pesticides by GC-NPD. 8141 equivalent	145
8270C	SVOCs by GC-MS	200
8270C	SVOCs by GC-MS (low level; ESLs) *Clean Up fee included	*284
8270C	SVOCs by GC-MS Open Scan (Up to 5 PEAKS, 10\$ ea. addl.)	230
8280A	2,3,7,8-TCDD by HRGC-HRMS, 5.0 pg/L & 5.0 pg/g (W/ S RL)	300
8280A	Full List Dioxins & Dibenzofurans by HRGC-HRMS	550
8290A	2,3,7,8-TCDD by HRGC-HRMS, 5.0 pg/L & 5.0 pg/g (W/ S RL)	300
8290A	Full List Dioxins & Dibenzofurans by HRGC/HRMS	550
8310	PNAs / PAHs by HPLC	145
8310m / SM 10200	Chlorophyll a & b by HPLC	89
8315A	Carbonyls by HPLC	167
8315A	Formaldehyde by LCMS	167
8315A	Acrolein & 3-Hydroxypropanal by HPLC w/ Field Derivatization (SFEI 108)	167
8316	Acrylamide, Acrylonitrile and Acrolein by HPLC	178
8318	Carbamates by HPLC	145
8330m	Diflubenuron & Propiconazole by HPLC	167
8330	Nitroaromatics & Nitramines by HPLC	145
8332	Nitroglycerin by HPLC	145

Metals

200.8/6020A (ICP-MS), 200.7/6010C (ICP-OES), 245.2/7470 (CV Hg), 1631E (CVAF Hg), NIOSH		
Groups / Analysis	Description	List Price
503 Metals (Biosolids)	As, Cd, Cr, Cu, Pb, Hg, Mo, Ni, Se, Zn	100
CAM17 (ICP-MS)	Ag, As, Ba, Be, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Sb, Se, Ti, V, Zn	123
IOC – DW Metals	Al, As, Ba, Be, Cd, Cr, Cu, Pb, Hg, Ni, Sb, Se, Ti	110
PP13	Ag, As, Be, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Se, Ti, Zn	112
RCRA8	Ag, As, Ba, Cd, Cr, Hg, Pb, Se	89
LUFT5	Cd, Cr, Ni, Pb, Zn	56
ICP / ICP-MS, Common Metal	Ex, Al, Ag.; generally, special extraction cost is additional – see Extractions	28 1 st , 12 ea. addl.
ICP / ICP-MS, Uncommon Metal	Ex, Au, S, P.; generally, special extraction cost is additional – see Extractions	56 ea.
Hg by CVAF	Hg (1631E)	105
Hg by CVAA	Hg (245.2, 7470A, 7471B)	56
Ferrous Iron	SM 3500Fe B4c	67
Lead, organic, total	HML 939-M; CA Title 22, Chapter 11, Appendix 11 (unspecified)	84



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McC Campbell Analytical, Inc. Fee Schedule – City of Merced (01/01/19-12/31/19)

Ion Chromatography

Method / Analysis	Description	List Price
218.6	Chromium VI by IC	39
218.6 – DISTLC, Solids	Chromium VI by IC using DISTLC	95
218.7 - UCRM3 DW	Chromium VI by IC; UCRM3	56
300.1 - UCRM3 DW	Chlorate by IC; UCRM3	56
300.1 / 300.0 –W, S	Common Anions: Cl-, Br-, SO4-2, F-, NO3- as N, NO2- as N, PO4-3 as P; CalTrans or DISTLC are optional soil extractions with extra charges	20+ ea/ 67 for all
300.1 / 300.0-Water	Uncommon Inorganic Anions: I-, S2O3-2, SCN-, IO3-, SO3-2, etc.	67-139+ ea
300.1– Water, Disinf. ByP.	CIO2- (Chlorite), CIO3- (Chlorate), BrO3- (Bromate), Br- (0.005 µg/L)	89 ea
300.1m –VFA	Volatile Fatty Acids: Formic Acid	167
314	Perchlorate (ClO4) by IC	72
7199	Chromium VI by IC; 3060A TTLC (low level, 0.2 mg/Kg)	39 w / 110 s

Microbiology

Method / Analysis	Description	List Price
Aerobes	SM9215AC (SP)	60
Anaerobes	SM9215ABm (SP)	60
Coliforms, Total & E Coli (+/-)	SM9223 B (EST), Idexx Colilert	39
Coliforms, Total & E Coli (Enum)	SM9223 B (EST), Idexx Quanti Tray	50
Coliforms, Total & E Coli	SM9221 BF (MTF)	50
Coliforms, Total & E Coli, Biosolids	SM9223 B (EST – Idexx Colilert); SM9221 B (MTF/MPN); for Sewage/Bio-Solids, 2-4 tray test	75
Coliforms, Total & E Coli & FC	SM9221BEF (MTF)	84
Total Coliforms only	SM9222 B (MF) for Drinking, Recreational and Waste Waters	55
E Coli	9221BF (MTF)	39
Fecal Coliform	SM9221 E (MTF/MPN); SM9222 D (MF)	39
Fecal Coliform (+/-)	SM9221 E (MTF/MPN)	39
Enterococci	Idexx Enterolert (EST)	39
Enterococci	SM9230 B (MTF/MPN)	50
Fecal Streptococci	SM9230 B (MTF/MPN)	39
Fungi, Mold, Yeast	SM9610B	39
Heterotrophs (HPC)	Idexx Simplate; SM9215 AC (SP); SM9215 AB (PP) for Drinking and Natural Waters, 1-2 tray test	39
Heterotrophs (HPC), Biosolids	Idexx Simplate; SM9215 C (Spread Plate); SM9215 B (Pour Plate) for Sewage and Bio-Solids, 2-4 tray test	78
Iron Related Bacteria (+/-)	SM9240D.1 (BART = Biological Activity Reaction Test)	90
Iron Related Bacteria	SM9240D.1 (BART = Biological Activity Reaction Test)	100
Legionella (+/- or En)	CDC Legiolert Method 01/2005-SM9260J (MF-PP)	133
Pseudomonas aeruginosa	Pseudolert (EST)	67
Salmonella (+/-)	SM9260B - E1682 (Plate) FDA BAM	112
Salmonella	SM9260B - E1682 (Plate) FDA BAM	167
Staphylococcus aureus	SM9213B - FDA BAM	95
Sulfate Reducing Bacteria	SM9240D - SM9240D.4a1	100





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GC-MS-MS, LC-IT, LC-MS-MS Analysis

Method / Analysis	Description	List Price
ASTM D7485	LC-MS-MS for Alkylphenols in Water	200
ASTM D7574	LC-MS-MS for BisPhenol A (BPA) in Water	200
LC-MS-MS	E 6850 for Perchlorate in Water and Soil by LC-MS-MS, See Anions, E6850	quote
LC-MS-MS	E 1694m for Thiourea in Waste Water	200
LC-IT or LC-MS-MS	E 1694 or E536m for Selected N/P Pesticides	quote
ASTM D7485	LC-MS-MS for Alkylphenols in Water	200
ASTM D7574	LC-MS-MS for BisPhenol A (BPA) in Water	200
LC-MS-MS	E 6850 for Perchlorate in Water and Soil by LC-MS-MS, See Anions, E6850	quote
LC-MS-MS	E 1694m for Thiourea in Waste Water	200
LC-IT or LC-MS-MS	E 1694 or E536m for Selected N/P Pesticides	quote

McC Campbell Proprietary Methods

Method / Analysis	Description	List Price
Acrylamide	Acrylamide by LCMS	200
Alcohols	Alcohols by Derivitization & HPLC	167
Amines	Amines & Protonatable Nitrogenous Compounds by Aqueous Injection	200
Amines	Amines & Protonatable Nitrogenous Compounds by LCMS	256
Amygdalin	Amygdalin by LCMS	400
Cyclohexylamine	Cyclohexylamine by LCMS	200
DEHPA	Bis(2-ethylhexyl) Phosphoric Acid	200
Epichlorohydrin	Epichlorohydrin by Derivitization & HPLC	145
EthyleneGlycol	Ethylene Glycol by Derivitization & HPLC	145
Flumioxazin	Flumioxazin by LCMS	180
Imazamox	Imazamox by Derivitization & HPLC	178
Isobornyl Acrylate	Isobornyl Acrylate by LCMS	200
Mesotrione	Mesotrione by LCMS	200
Tributyl phosphate	Tributyl phosphate by LCMS	200
Organic Acids	Various Organic Acids by HPLC-UV	67-139 ea
Organic Lead, speciated	Tetramethyl & Tetraethyl Lead by GC (0.005 mg/Kg soil / 125 ppt water RL)	134
Organic Tin, speciated	Mono-, Di-, Tri- & Tetra-Butyl Tin by GC-MS	180
Isobornyl Acrylate	Isobornyl Acrylate by LCMS	200
Mesotrione	Mesotrione by LCMS	200
Tributyl phosphate	Tributyl phosphate by LCMS	200
Organic Acids	Various Organic Acids by HPLC-UV	67-139 ea
Organic Lead, speciated	Tetramethyl & Tetraethyl Lead by GC (0.005 mg/Kg soil / 125 ppt water RL)	134
Organic Tin, speciated	Mono-, Di-, Tri- & Tetra-Butyl Tin by GC-MS	180



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Wet Chemistry & Oil and Grease

Method / Analysis	Description	List Price
TRPH by IR Spectrometry w/ S.G. Clean Up	418.1, Total Recoverable Petroleum Hydrocarbon by IR w/ Silica Gel Clean Up	84
Total Oil & Grease ± S.G.	9071B, Total Oil & Grease ± Silica Gel Clean Up	50
HEM, Oil and Grease ± S.G.	1664A, HEM, Oil & Grease ± Silica Gel Clean Up	50
Acidity	SM2310 B	20
AGP, ANP, NNP	EPA 600/2-78-054, Acid Generating Potential, Acid Neutralizing Potential, Net Neutralization Potential	178
Alkalinity, total, speciated	SM2320 B / 310.1	20 w, 56 s
Ammonia as N, Colorimetry	350.1 or 350.3 / SM4500-NH3 BG	32 w, 43 s
Ammonia as N, unionized (free)	351.2 / SM4500-NH3 BG (includes pH & T)	49 w, 62 s
Ash (%)	Percent ash by ASTM D2974	67
BOD / cBOD	SM5210 B; Biochemical Oxygen Demand, carbonaceous BOD, 5 Day Test	46
B S & W, approximate	ASTM D 1796-97m; Bottom Sediments & Water as Approximate Vol. Phase Proportions	67
Carbon, DOC	415.3 / SM5310 B; Dissolved Organic Carbon	39
Carbon, IC	415.3 / SM5310 B; Inorganic Carbon (= Σ CO _{2,aq} + HCO ₃ ⁻ + CO ₃ ⁻²)	39 w, 84 s
Carbon, TC	415.3 / SM5310 B / 9060A; Total Carbon	50
Carbon, TOC	415.3 / SM5310 B / 9060A; Total Organic Carbon	39 w, 50 s
Carbon dioxide, aq, free	SM5310 B or 415.3; + pH + SM4500-CO ₂ D calc. at 25°C	39 w, 84 s
Chloride, potentiometric	SM4500-Cl- D / Metrohm 130/3e (only for matrices not amenable to IC)	34
Chlorine, residual / total	SM4500-Cl E / 330.2 Titrimetric / SM4500G (Free & Total Cl)	20
Chlorine, specific form (Chloramine)	SM4500-Cl G DPD Colorimetric	89
COD	410.4 / SM5220 D; Chemical Oxygen Demand	36
Color, Apparent	SM2120 B / E110.2 for DW or WW / Apparent / Non-filtered	18
Color, True	SM2120 B / E110.2 for DW or WW True / Filtered	18
Conductivity	Conductivity, Resistivity & Salinity 120.1 / 9050A / SM2510 B, ASTM D1125A, SSSA	20
Corrosivity	pH, corrosivity = pH >2 and pH <12.5, included in RCI	12
Cyanide, Amenable	9012A / SM 4500-CN G; includes Total Cyanide results	123
Cyanide, Free	SM9016 using micro diffusion cell	123
Cyanide, Total, Auto Distillation	Kelada-01 / 335.4 / 9012A / SM4500-CN- CE	69 w, 78s
Cyanide, Amenable Manual Distillation	9012A, Amenable Base Extractable; includes Total Cyanide results	153
Cyanide, Total Manual Distillation	335.4 / 9012A, Total Base Extractable	89
Cyanide, WAD	Kelada-01 / SM4500-CN- CE; Buffered Weak Acid Dissociable Cyanides	78
Density	ASTM D1475, ASTM D2397m	28 w, 84 s
Dissolved O ₂	360.1 / SM 4500-O G	23
Flashpoint of Liquids	SW1010, included in RCI	45
Fluoride by ISE	E340.2 / SM4500-F- C	120
Foaming Agents (surfactants), anionic	SM5540 C / 425.1; MBAS / Anionic Surfactants	45
Foaming Agents (surfactants), non-ionic	SM5540 BD; CTAS / Non-ionic Surfactants	134
Freezing / Melting Point	MAI, Melting Point of Solids, Freezing Point of Liquids	1101, 300 s
Hardness	SM2340 B & 200.7 by ICP / ICPMS	28
Hardness by Titration	SM2340 C by Titration	28
Hydrogen Peroxide	USP Titanium Oxylate Spectrophotometric method	39
Ignitability of Solids	SW1030, included in RCI	22 screen, 84 def



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McC Campbell Analytical, Inc. Fee Schedule – City of Merced (01/01/19-12/31/19)

Moisture Content of Soils	ASTM D2216-05, ASTM D2974, for organic matter & ash determinations	23
Nitrate + Nitrate by Cd reduction	353.2 / SM4500NO3 E; NO3 +- NO2 by Cd reduction	60
Nitrogen, Organic	351.2 + 350.1 / SM4500-Norg AD + SM4500-NH3 FG; Organic Nitrogen as N (= TKN - Ammonia)	69
Nitrogen, TKN	351.2 ; TKN = Total Kjeldahl Nitrogen as N	38
Nitrogen, total (TOC)	415.3m / 9060Am; Total Nitrogen by combustion & Chemiluminescence / TCD	39 w, 50 s
Odor	140.1 / SM2150 B	17
Odor with Dechlorination	140.1 / SM2150 B + SM4500-CI DE	50
Organic Matter	Percent Organic Matter by ASTM D2974	89
ORP	SM2580 B, Oxidation-Reduction Potential	23 w, 45 s
Ozone	SM4500 O3 B	39
Paint Filter Test	SW9095A	17
pH	150.1 / 9045B&C / 9045C&D / SM4500H+ B, ASTM D4972-13a, CT643-2007	12
pH, field	SM4500H+ B, onsite pH measurement	84
Phenolics, Total	420.4 / 420.1	50
Phosphorous, Dissolved	365.1, 365.3, Dissolved Phosphorous as P	39
Phosphorous, Hydrolyzable	365.1, 365.3, Hydrolyzable Phosphorous as P	39
Phosphorous, Organic	365.1, 365.3, / SM4500-P BEF; Organic (Total - Ortho - Hydrolyzable) Phosphorous as P	39
Phosphorous, Ortho	365.1, 365.3 365.5; SM4500-P BEF / Ortho Phosphorous as P (used when IC is inapplicable)	28
Phosphorous, Total	365.1, 365.3, / SM4500-P BEF; Total Phosphorous as P	39
Reactive Cyanide	SW9010, included in RCI, Positive or Negative	50
Reactive Sulfide	SW9030, included in RCI, Positive or Negative	50
Salinity	SM2520, Salinity by conductivity	20
Silica, Reactive	SM4500-SiO2 D	84
Solids, Total (TS)	SM2540B for Liquids, see Moisture for Solids	23
Solids, Dissolved (TDS)	SM2540C, Total Dissolved Solids	23
Solids, Suspended (TSS)	SM2540D, Total Suspended Solids	23
Solids, Total Volatile or Fixed (TVS, TFS)	SM2540E, SM2540G for Solids	30
Solids, Total Volatile or Fixed Dissolved	SM2540E, SM2540G for Solids (TVDS, TFDS)	30
Solids, Total Volatile or Fixed Suspended	SM2540E, SM2540G for Solids (TVSS, TFSS)	30
Solids, Settleable (SS)	SM2540F	17
Specific Gravity	ASTM D1475, ASTM D2397m	23
Sulfide, aqueous	SM4500-S-2 D / 376.2 I; SM4500-S-2 F; SM4500-S-2 I / distilled	30
Sulfide, solids	SM4500-S-2 D & 9030B; Acid Soluble or Acid Insoluble Sulfides	84
Sulfite by Titration	SM4500-SO3-2 B	23
Sulfur, Total	415.3m / 9060Am; Total Sulfur by combustion & TCD (ICP-MS rec. for aqueous)	56
Tannin & Lignin	SM5550 B	39 w, 56 s
Turbidity	180.1 / SM2130 B	17
UV254	SM5910 B	44
UV Scan	MAI Full Spectrum Scan	150
Water Content	Karl Fischer, SW9000, Water Content of Liquids	89
Vapor Pressure, Reid	ASTM D323, BAAQMD 28 (Requires Storage Temperature)	250
VCC of Coatings	EPA D24, ASTM D2369	75
VCC of Powder Coatings	SCAQMD 316C Draft	80
Visual Estimate of Particle Size	ASTM E112-13; for granular matrices	25
VVC of Electrical Varnish	ASTM D6053	84



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Air Testing

Method/ Analysis	Description	List Price
Air Sampling Pump Rentals	Low (0.05 - 0.2L/min) or high (1-5 L/min) flow	85/week
Alcohols	NIOSH 1403 / 2000m by HPLC-FLD (ST)	167 s, 84 t
Formaldehyde	NIOSH 2016 by HPLC (FST)	167
Helium	ASTM D 1946-90 (Tedlar or summa, summa can extra if not part of TO-15)	167
Helium Leak Check	TO-15 Helium Leak Check	84
Helium Shroud	Helium Shroud Rental	230 1st, 56 ea. Subsq. Smp.
Hexachrome, Particulates	NIOSH 7605 by IC-Colorimetry (Filter)	95
Hydrocarbons, Light	ASTM D 1946-90 / EPA 3C by GC- FID (methane, ethane, ethene, actetylene) (Tedlar / Summa; Summa same price as Tedlar if TO-15 requested)	quote
Hydrogen	ASTM D 1946-90 / EPA 3C by GC-PDD (H2) (Tedlar, Summa)	quote
LEED Gases - Indoor	VOCs + Formaldehyde + 4-PCH + CO from summa	378
Light Gases, Atmospheric	ASTM D 1946-90 / EPA 3C by GC-PDD / TCD (O2, N2, CO, CO2,) (Tedlar / Summa; Summa same price as Tedlar if TO-15 requested)	quote
Light Gases, Atmospheric + Hydrocarbons	ASTM D 1946-90 / EPA 3C by GC-PDD / TCD / FID (O2, N2, CO, CO2, methane, ethane, ethene, actetylene) (Tedlar, Summa)	quote
Metals, Particulates	NIOH 7303 by ICP-MS (Filter)	28 1st, 12 ea. addl
OC & ON Herbicides	NIOSH 5602 (ST, pricing includes tubes)	243
OP Pesticides	NIOSH 5600 (ST, pricing includes tubes)	220
Organic Lead	NIOSH 2534m (Tetramethyl & Tetraethyl Lead) by GC (ST, pricing includes tubes)	127
Particulates, Respirable	NIOSH 0600	28
Particulates, Total	NIOSH 0500	28
PCBs	NIOSH 5503 by GC-ECD (ST)	86
Phenols	NIOSH 2546 by GC-MS SIM mode (ST)	145
PNAs	NIOSH 5506 by HPLC UV-FLD (ST)	145
Silica	NIOSH 7602, Crystalline Silica by IR (Bulk pricing available)	145
TO17 VOCs	TO-17, Soil gas by GC_MS (ST)	200
TPH (g/d)	NIOSH 1550 by GC-FID (ST)	84
TPH (g/d)	TO-17m (ST) TPH gas and Diesel	112
TPH(g) Fractionated	MA DEP APH by GC-MS (Summa); ali-aro frac. of vapor phase TPH	225
VOCs +- TPH(g) soil gas	TO-15, soil gas by GC-MS (Summa)	223, +39
VOCs +- TPH(g) soil gas	TO-15, soil gas by GC-MS (Tedlar)	167, +39
VOCs +- TPH(d) soil gas	TO-17, soil gas by GC-MS (ST)	200, +39
VOCs, IPA only	TO-15, IPA only for soil gas from Tedlar by GC-MS; Client / Lab supplied Tedlar	67 / 84
VOCs, SCAN-SIM, indoor air	TO-15, indoor air by GC-MS, RL= 0.1ppbv (Summa), SIM mode for TO-15 compounds having ESL indoor air limits < 0.1 ppbv	300, +39

*Use of canisters beyond 15 days could increase the risk of having unacceptable initial vacuum at the start of sampling.
 *MAI does not guarantee canister vacuum beyond 15 days.
 *Failure to return media within 30 days of receipt will result in invoicing of the replacement cost of all outstanding media.
 *MAI will charge a cleaning/rental fee of \$56.00 per sample set when equipment is returned to us unused.





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Solids

Method / Analysis	Description	List Price
Asbestos CARB 435	Asbestos 400 point count (.25%RL) by CARB 435	100
Asbestos CARB 435	Asbestos 1000 point count (.1%RL) by CARB 435	200
FTIR for Plastics and Polymer ID	ASTM E1252-98; FTIR ID of plastics and polymers.	167
XRD for Solids ID	Crystalline Solids ID using Powder, Micro-focus or High Angle XRD by USGS OFR 01-041	200
XRF on Solids Composition	Semi Quant XRF scan for gross element composition (Na-U)	150

Aquatic Toxicology

Test Method	Test Organism	Description	List Price
Hazardous Waste Bioassay (CDEG 1988)	Fathead Minnow (<i>Pimephales promelas</i>)	CA Title 22 Hazardous Waste 96h LC50 Screen	340
		CA Title 22 Hazardous Waste 96h LC50 Definitive	530
EPA 2000.0	Fathead Minnow (<i>Pimephales promelas</i>)	Acute 96hr Static Non-Renewal 100% Concentration Only	quote
		Acute 96hr Static Renewal 100% Concentration Only with a 48hr Renewal	quote
		Acute 96hr Static Renewal 100% Concentration Only with Daily Renewals	quote
		Acute 96hr Static Renewal Dilution Series with a 48hr Renewal	quote
EPA 2019.0	Rainbow Trout (<i>Oncorhynchus mykiss</i>)	Acute 96hr Static Non-Renewal 100% Concentration Only	quote
		Acute 96hr Static Renewal 100% Concentration Only with a 48hr Renewal	quote
		Acute 96hr Static Renewal 100% Concentration Only with Daily Renewals	quote
		Acute 96hr Static Renewal Dilution Series with a 48hr Renewal	quote
EPA 2004.0	Sheepshead Minnow (<i>Cyprinodon variegatus</i>)	Acute 96hr Static Non-Renewal 100% Concentration Only	quote
		Acute 96hr Static Renewal 100% Concentration Only with a 48hr Renewal	quote
		Acute 96hr Static Renewal 100% Concentration Only with Daily Renewals	quote
EPA 2002.0	<i>Ceriodaphnia dubia</i>	Acute 96hr Static Non-Renewal 100% Concentration Only	quote
		Acute 96hr Static Renewal 100% Concentration Only with a 48hr Renewal	quote
		Acute 96hr Static Renewal 100% Concentration Only with Daily Renewals	quote
		Acute 96hr Static Renewal Dilution Series with a 48hr Renewal	quote
EPA 2021.0	<i>Daphnia spp.</i> (<i>Daphnia magna</i>)	Acute 48hr Static Renewal Dilution Series with Daily Renewal	quote
		Acute 96hr Static Non-Renewal 100% Concentration Only	quote
		Acute 96hr Static Renewal 100% Concentration Only with a 48hr Renewal	quote
		Acute 96hr Static Renewal 100% Concentration Only with Daily Renewals	quote
EPA 2006.0	Inland Silverside (<i>Menidia beryllina</i>)	Acute 96hr Static Renewal Dilution Series with a 48hr Renewal	quote
		Acute 96hr Static Non-Renewal 100% Concentration Only	quote
		Acute 96hr Static Renewal 100% Concentration Only with a 48hr Renewal	quote
		Acute 96hr Static Renewal 100% Concentration Only with Daily Renewals	quote
EPA 2007.0	Mysid shrimp (<i>Americamysis bahia</i>)	Acute 96hr Static Non-Renewal 100% Concentration Only	quote
		Acute 96hr Static Renewal 100% Concentration Only with a 48hr Renewal	quote
		Acute 96hr Static Renewal 100% Concentration Only with Daily Renewals	quote
		Acute 96hr Static Renewal Dilution Series with a 48hr Renewal	quote
EPA 1003.0 / ASTM E1218-04	Green Algae (<i>Selenastrum</i>)	Chronic 96hr Algal Growth Test - 100% Concentration Only	quote
		Chronic 96hr Algal Growth Test - Dilution Series	quote





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	<i>Capricornutum</i>	Chronic 96hr Algal Growth Test - Reference Toxicant Test	quote
EPA 1002.0	<i>Ceriodaphnia dubia</i>	Chronic 3-brood Survival and Reproduction Test - 100% Concentration Only	quote
		Chronic 3-brood Survival and Reproduction Test - Dilution Series	quote
		Chronic 3-brood Survival and Reproduction Test - Reference Toxicant Test	quote
EPA 1000.0	Fathead Minnow (<i>Pimephales promelas</i>)	Chronic 7-day Survival and Growth Test - 100% Concentration Only	quote
		Chronic 7-day Survival and Growth Test - Dilution Series	quote
		Chronic 7-day Survival and Growth Test - Reference Toxicant Test	quote
EPA 1004.0	Sheepshead Minnow (<i>Cyprinodon variegatus</i>)	Chronic 7-day Survival and Growth Test - 100% Concentration Only	quote
		Chronic 7-day Survival and Growth Test - Dilution Series	quote
		Chronic 7-day Survival and Growth Test - Reference Toxicant Test	quote
EPA 1006.0	Inland Silverside (<i>Menidia beryllina</i>)	Chronic 7-day Survival and Growth Test - 100% Concentration Only	quote
		Chronic 7-day Survival and Growth Test - Dilution Series	quote
		Chronic 7-day Survival and Growth Test - Reference Toxicant Test	quote
EPA 1007.0	Mysid shrimp (<i>Americamysis bahia</i>)	Chronic 7-day Survival and Growth Test - 100% Concentration Only	quote
		Chronic 7-day Survival and Growth Test - Dilution Series	quote
		Chronic 7-day Survival and Growth Test - Reference Toxicant Test	quote
EPA 600/R-95/136	Mussels (<i>Mytilus spp.</i>)	Chronic Embryo-Larval Development and Survival Test - 100% Concentration Only	quote
		Chronic Embryo-Larval Development and Survival Test - Dilution Series	quote
		Chronic Embryo-Larval Development and Survival Test - Reference Toxicant Test	quote

*24-hour and 48-hour tests are available for all acute test methods; please contact us for a price.
*Clients requiring 3-species chronic testing will receive a 10% discount for effluent sample testing.
*Price is for concurrent reference toxicant testing. A 20% discount will apply for clients requesting monthly RT data.

Extractions Preparations

Method / Analysis	Description	List Price
Alumina Bench Column Clean Up (EPA 3630C)	Bench Column Clean Up of solvent extracts, cost depends on complexity	39
Ashing - food	Thermal combustion preparation for food matrices	84
Ashing - soils/solids	Thermal combustion preparation for metals or oxide determinations	28
ASTM C 1580-05	DI Extraction of Soils for Sulfate	84
Bench Testing / Pilot Studies	Customized bench studies to evaluate pilot processes	quote
Cal Trans 417 / 422	DI Extraction for anions in soil (DI STLC may yield higher values)	17
CEC, NH ₄ Ac	EPA 9080; Cation Exchange Capacity inapplicable to calcareous soils	112
CEC, NaAc	EPA 9081; Cation Exchange Capacity that is generally applicable	112
Copper Clean Up	Copper Clean Up to Remove Sulfur	39
ESL Clean Up 8081/8082	ESL Clean-up for method 8081/ 8082	120
Ex. Cations, NH ₄ Ac	Exchangeable Cations using ammonium acetate	39
Filtration	In-house (laboratory) filtration for dissolved metals using 0.45 um filter	7
Florisil Clean Up (EPA 3630C)	Bench Column Clean Up of solvent extracts	39
GPC Clean-up, EPA 3640A	Gel Permeation Clean Up	84
ISM - ITRC	Incremental Sampling Method per the Interstate Technology & Regulatory Council (ITRC)	200
Metals Dissolution	Concentrated oxidizing acids dissolution of solid metals	84
MS/MSD Project specific	Project specific MS/MSDs	2 x analytical cost



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Silica Gel Clean Up, in-a-vial style	Silica Gel Clean Up of solvent extracts, in-a-vial style	5.50 per sample
Silica Gel Bench Column Clean Up	Silica Gel Bench Column Clean Up of solvent extracts (EPA 3630C)	84
STLC	California WET Test	56
DI STLC	California WET Test modified to use DI water	56
ZHE STLC	Zero Head Space California WET Test for Volatiles	112
Whole Rock Dissolution	Fusion of rock / alumino-silicate solids	89
Zemo Diss. HCs ± SG c.u.	Dawn Zemo Methodology for Dissolved HCs ± SG cleanup	quote
TCLP EPA 1311	TCLP; Toxic Characteristic Leaching Procedure	56
ZHE TCLP EPA 1311	Zero Head Space TCLP for Volatiles	112
SPLP EPA 1312	SPLP; Synthetic Precipitation Leaching Procedure	56
EPA 3050B Large Volume	Large volume (70g initial sample weight)	138
*Clean ups and extractions fees are not subject to rush surcharge rates.		
*Clean ups and extractions may extend the TAT.		

Miscellaneous

Method / Analysis	Description	List Price
Air Sampling Pump Rental	Low (0.05 - 0.2L/min) or high (1-5 L/min) flow	85/week
Chromatogram Fee	Chromatograms PDF	15
Compositing	Sample compositing (up to 4:1 free)	5 per sample
Courier – exclusive service	Courier for emergency/urgent picks &/or deliveries	quote
EDF Reporting Fee	CA AB 2886; GeoTracker	28 per report
EDD Reporting Fee	WriteOn, EQUIS, CIWQS, SMARTs, Locus XML, etc.	28 per report
EPA 5035 EnCore sampler	5g EnCore sampler (additional \$5 per sample handling fee applied to analytical)	9 each
Filters & Syringes	One syringe & three 0.45 micron filters for field filtering	12 per sample
Open Scan Fee	The five most significant unidentified peaks in GC-MS chromatogram	20 per peak
Helium Shroud	Helium Shroud Rental	230 1st, 56 ea. Subsq. Smp.
Passive Diffusion Bag (PDB)	PDB filled with DI water	28 each
PM10 Monitor	PDR-1000AN Data Logger for continuous PM10 monitoring	100/day / 300/week
Pulverization Fee	Pulverization of solid matrices	50 per sample
Sample Disposal Fee	Sample Disposal fee soil / solid	1.50 per sample
Sampling Tube	Stainless steel sampling tube	5 each
Sorbent Tube	Single use Sorbent Tube	5 each
Tedlar bag	Tedlar air sampling bag	10 each
Unused Summa	Cleaning Fee - Unused Summa Canister	56 each
*Client is responsible for returning all media in the same condition as when received from MAI. Damaged, (including dented canisters), or unreturned media will be charged to the client as outlined in media agreement under "replacement value". Dented canisters have suspected active surfaces & cannot be used for most air sampling applications; MAI will charge replacement cost. No disassembly of soil gas or indoor air manifolds is permitted.		
* Add \$5 per analysis per sample for "whole container volatiles in soils" analyses (Encore or preserved VOA style).		
RUSH SURCHARGES are as follows:		
MAI offers Same-Day, 1-Day, 2-Day, 3-Day, 4-Day TAT at 150%, 100%, 50%, 25%, 10% markups from standard TAT, respectively on most analyses. All rush TATs must be arranged in advance of sample submission. Our Sample Reception department is open Monday through Friday; 8:00AM- 9:00PM. Please contact our Sales & Marketing team at Sales@mcccampbell.com		



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MCCAMPBELL ANALYTICAL, INC.

FEE PROPOSAL



FOR

REQUEST for PROPOSAL

**Bioassay Laboratory Services, Fiscal Years
2019/2021**

FOR

CITY OF MERCED

Submitted April 19, 2019

EXHIBIT B



McC Campbell Analytical, Inc.

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QUOTATION for ANALYTICAL SERVICES

Requested By: Jeremy Geiger

New Client File: Pending (NCF)

City of Merced Public Works

Merced, CA 95341

Quote ID: 192480

Prepared DATE: April 17, 2019

Expiration DATE: July 01, 2021

Assigned PM: Drew Gantner

Prepared By: Drew Gantner

Project: geigerj@cityofmerced.org
Merced NPDES Testing July 2019 - June 2021

Test Name	Test Method	TAT	Matrix	Qty	Unit Price	Total
Tests:						
Acute 96-hr Static 48-hr Renewal Screen w/ FHM	EPA 2000.0	10 Days	Water	24	\$357.00	\$8,568.00
Chronic Selenastrum capricornutum 100% Conc.	EPA 1003.0	12 Days	Effluent	8	\$695.00	\$5,560.00
Chronic Selenastrum capricornutum Ref Tox	EPA 1003.0	12 Days	Water	8	\$420.00	\$3,360.00
Chronic Ceriodaphnia dubia 100% Concentration	EPA 1002.0	12 Days	Effluent	8	\$795.00	\$6,360.00
Chronic Ceriodaphnia dubia Ref Tox	EPA 1002.0	12 Days	Water	8	\$760.00	\$6,080.00
Chronic Fathead Minnow 100% Concentration	EPA1000.0	12 Days	Effluent	8	\$825.00	\$6,600.00
Chronic Fathead Minnow Ref Tox	EPA1000.0	12 Days	Water	8	\$600.00	\$4,800.00
Fix-Rate Items:						
Courier Trip				40	\$165.00	\$6,600.00

Tests SubTotal: \$41,328.00

Fix-Rate Items SubTotal: \$6,600.00

TOTAL: \$47,928.00



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UCMR4

Method / Analysis	Description	List Price
200.8	UCMR4 Metals by MS (Germanium and Manganese)	50
525.3	UCMR4 SVOCs by GC-MS	256
530	UCMR4 SVOCs by GC-MS	220
541	UCMR4 Alcohols by GC-MS	167
544	UCMR4 Microcystins & Nodularin by LC-MS	400
545	UCMR4 Cylindrospermopsin and Anatoxin-a by LC-MS	300
546	UCMR4 ELISA Total Microcystins	100
552.3	UCMR4 Haloacetic Acid by GC-MS	200
300.1	Bromide by IC	28
5310B	Total Organic Carbon (TOC) SM5310 B	39

Drinking Water Chromatography

Method / Analysis	Description	List Price
505	OC Pesticides and PCBs by L-LE and GC-ECD	139
505	PCBs by L-LE and GC-ECD	56
505	PCBs by L-LE and GC-ECD (low level, 0.1 µg/L)	84
515.3	OC Acidic Herbicides by L-LE, Derivatization & GC-ECD	167
522	1,4-Dioxane by SPE and GC-MS; UCRM3	145
524.2	HVOCs by P&T and GC-MS	80
524.2	TTHMs (Total Trihalomethanes) by P&T and GC-MS	80
524.2	VOCs by P&T and GC-MS	100
524.2	VOCs by P&T and GC-MS, Open Scan (Up to 5 PEAKS, 10\$ ea. addl.)	135
524.3	EDB, DBCP & 1,2,3-TCP (0.005 µg/L) by GC-MS (SIM Mode)	135
524.3	TTHMs (Total Trihalomethanes) by P&T and GC-MS	80
524.3	VOCs by GC-MS; UCRM3	135
525.2	ONP Pesticides by L-LE and GC-NPD	145
525.2	SVOCs by L-SE and GC-MS	256
531.1	Carbamates by HPLC w/ Derivatization	189
531.2	Carbamates by HPLC w/ Derivatization (regulated)	189
532m	Azoxystrobin, Fludioxonil & Penoxsulam	178
532m	Clopyralid & Imazapyr by SPE and HPLC	178
532m	Fenhexamide & Oxyfluorfen by SPE and HPLC	178
532	Phenyl Ureas by SPE and HPLC	178
532	Phenyl Ureas by SPE and HPLC (low level, 0.1 µg/L)	200
537	Perfluorinated Alkyl Acids by SPE and LC/MS/MS; UCRM3	306
539	Hormones by SPE and LC-ESI-MS/MS; UCRM3	361
547	Glyphosate by HPLC w/ Derivatization	134 w/ 167 s
548.1	Endothall by GC-MS	145
549.2	Diquat and Paraquat by LSE and HPLC	145
550.1m	Nonylphenol by SPE and HPLC	123
552.2	HAAs by LLE and GC-ECD	167
SM6040Dm	Geosmin & MIB (0.5 - 2.0 ng/L)	256

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Effluent Water Chromatography

Method / Analysis	Description	List Price
608	OC Pesticides and PCBs by L-LE and GC-ECD	139
608	OC Pesticides and PCBs by L-LE and GC-ECD (low level, 0.0004 µg/L w/Florisisil)	178
608	OC Pesticides and PCBs by L-LE and GC-ECD (low level, 0.001 µg/L w/GPC)	223
608	PCBs by L-LE and GC-ECD	56
610	PAHs/ PNAs by L-LE and HPLC	145
610	PAHs/ PNAs by L-LE and HPLC (low level, 0.004 µg/L)	200
613	2,3,7,8-TCDD only by HRGC-HRMS, (5.0 pg/L)	300
614	Nitrogen-Phosphorous Pesticides by GC-MS	145
624	Acrolein, Acrylonitrile & 2-CEVE by P&T and GC-MS	*80
624	HVOCs and/or Aromatics by P&T and GC-MS	*80
624	TTHMs (Total Trihalomethanes) by P&T and GC-MS	*80
624	VOCs by P&T and GC-MS excluding Acrolein & 2-CEVE	*100
625	PAHs/ PNAs by L-LE or SPE and GC-MS	145
625	PAHs/ PNAs and Phenols by L-LE or SPE and GC-MS	200
625	Phenols by L-LE or SPE and GC-MS	145
625	SVOCs by L-LE or SPE and GC-MS	256
1613	2,3,7,8-TCDD by HRGC-HRMS, 5.0 pg/L & 0.5 pg/g (W/ S RL)	300
1613	Full List Dioxins & Dibenzofurans by HRGC-HRMS	550
1668	PCBs by HRGC-HRMS, 12 Dioxin-like WHO Toxic Congeners	700
1668	PCBs by HRGC-HRMS, 40 or 66 Effluent Congeners	770
1668	PCBs by HRGC-HRMS, Full 209 Congeners	875
BAAQMD 33	CS ₂ Extractable C8-C14 Compounds by GC-FID	139

Hazardous Waste, Soils, Groundwater Chromatography

Method / Analysis	Description	List Price
8015B/ m	TPH Fuel Finger Print (quantitative & qualitative) by Direct Injection GC-FID	100
8015D	TPH as Methane in ug/Kg (emissions testing)	84
8015Bm	TPH Multi- Range (d, g, mo, k, jf, bo, other) by Direct Injection GC-FID	*67
8015B / 8021B	TPH(g, ss, ag) - MBTEX by P & T and GC-FID/PIID	*50
8081A	OC Pesticides by GC-ECD	34
8081A	OC Pesticides by GC-ECD (low level; ESLs) *Clean Up fee included	*204
8081A / 8082	OC Pesticides + PCBs by GC-ECD	139
8081A / 8082	OC Pesticides + PCBs by GC-ECD (low level; ESLs) *Clean Up fee included	*259
8082	PCB Aroclors Only by GC-ECD	56
8082	PCB Aroclors in Waste Oil by GC-ECD w/ Clean Up (2 mg/L RL) *Clean Up fee included	*140
8082m	PBBs & PBDEs by GC-MS	178
8141A	ON/P Pesticides by GC-NPD. Analyzed by E8270 GC-MS	145
8151A	OC Acidic Herbicides by GC-ECD	167
8260Bm	1,4-Dioxane by GC-MS (SIM Mode), 0.5 µg/L & 0.02 mg/kg (W/ S RL)	*135
8260B	Acrolein, Acrylonitrile & 2-CEVE by P&T and GC-MS	*80
8260B	Appendix IX / Appendix II Volatiles	*200
8260B	HVOCs and/or Aromatics by P&T and GC-MS	*100
8260B	MBTEX / MTBE by P&T and GC-MS	*80
8260B	MTBE Only by GC-MS	*80
8260B	Oxygenates ± EDB-12DCA by P&T and GC-MS	*100



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8260B	VOCs by P&T and GC-MS excluding Acrolein & 2-CEVE	* 100
8260B	VOCs by P&T and GC-MS, Open Scan (Up to 5 PEAKS, 10\$ ea. addl.)	* 135
8270C	Phenols Only by GC-MS	123
8270C	PNAs / PAHs Only by GC-MS SIM Mode	123
8270C	ON/P Pesticides by GC-NPD. 8141 equivalent	145
8270C	SVOCs by GC-MS	200
8270C	SVOCs by GC-MS (low level; ESLs) *Clean Up fee included	*284
8270C	SVOCs by GC-MS Open Scan (Up to 5 PEAKS, 10\$ ea. addl.)	230
8280A	2,3,7,8-TCDD by HRGC-HRMS, 5.0 pg/L & 5.0 pg/g (W/ S RL)	300
8280A	Full List Dioxins & Dibenzofurans by HRGC-HRMS	550
8290A	2,3,7,8-TCDD by HRGC-HRMS, 5.0 pg/L & 5.0 pg/g (W/ S RL)	300
8290A	Full List Dioxins & Dibenzofurans by HRGC-HRMS	550
8310	PNAs / PAHs by HPLC	145
8310m / SM 10200	Chlorophyll a & b by HPLC	89
8315A	Carbonyls by HPLC	167
8315A	Formaldehyde by LCMS	167
8315A	Acrolein & 3-Hydroxypropanal by HPLC w/ Field Derivatization (SFEI 108)	167
8316	Acrylamide, Acrylonitrile and Acrolein by HPLC	178
8318	Carbamates by HPLC	145
8330m	Diflubenuron & Propiconazole by HPLC	167
8330	Nitroaromatics & Nitramines by HPLC	145
8332	Nitroglycerin by HPLC	145

Metals

200.8/6020A (ICP-MS), 200.7/6010C (ICP-OES), 245.2/7470 (CV Hg), 1631E (CVAF Hg), NIOSH		
Groups / Analysis	Description	List Price
503 Metals (Biosolids)	As, Cd, Cr, Cu, Pb, Hg, Mo, Ni, Se, Zn	100
CAM17 (ICP-MS)	Ag, As, Ba, Be, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Sb, Se, Tl, V, Zn	123
IOC – DW Metals	Al, As, Ba, Be, Cd, Cr, Cu, Pb, Hg, Ni, Sb, Se, Tl	110
PP13	Ag, As, Be, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Se, Tl, Zn	112
RCRA8	Ag, As, Ba, Cd, Cr, Hg, Pb, Se	89
LUFT5	Cd, Cr, Ni, Pb, Zn	56
ICP / ICP-MS, Common Metal	Ex, Al, Ag.; generally, special extraction cost is additional – see Extractions	28 1 st , 12 ea. addl.
ICP / ICP-MS, Uncommon Metal	Ex, Au, S, P.; generally, special extraction cost is additional – see Extractions	56 ea.
Hg by CVAF	Hg (1631E)	105
Hg by CVAA	Hg (245.2, 7470A, 7471B)	56
Ferrous Iron	SM 3500Fe B4c	67
Lead, organic, total	HML 939-M; CA Title 22, Chapter 11, Appendix 11 (unspeciated)	84



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Ion Chromatography

Method / Analysis	Description	List Price
218.6	Chromium VI by IC	39
218.6 – DISTLC, Solids	Chromium VI by IC using DISTLC	95
218.7 – UCRM3 DW	Chromium VI by IC; UCRM3	56
300.1 – UCRM3 DW	Chlorate by IC; UCRM3	56
300.1 / 300.0 –W, S	Common Anions: Cl-, Br-, SO4-2, F-, NO3- as N, NO2- as N, PO4-3 as P; CalTrans or DISTLC are optional soil extractions with extra charges	20+ ea/ 67 for all
300.1 / 300.0-Water	Uncommon Inorganic Anions: I-, S2O3-2, SCN-, IO3-, SO3-2, etc.	67-139+ ea
300.1– Water, Disinf. ByP.	ClO2- (Chlorite), ClO3- (Chlorate), BrO3- (Bromate), Br- (0.005 µg/L)	89 ea
300.1m –VFA	Volatile Fatty Acids: Formic Acid	167
314	Perchlorate (ClO4) by IC	72
7199	Chromium VI by IC; 3060A TTLC (low level, 0.2 mg/Kg)	39 w / 110 s

Microbiology

Method / Analysis	Description	List Price
Aerobes	SM9215AC (SP)	60
Anaerobes	SM9215ABm (SP)	60
Coliforms, Total & E Coli (+/-)	SM9223 B (EST), Idexx Colilert	39
Coliforms, Total & E Coli (Enum)	SM9223 B (EST), Idexx Quanti Tray	50
Coliforms, Total & E Coli	SM9221 BF (MTF)	50
Coliforms, Total & E Coli, Biosolids	SM9223 B (EST – Idexx Colilert); SM9221 B (MTF/MPN); for Sewage/Bio-Solids, 2-4 tray test	75
Coliforms, Total & E Coli & FC	SM9221BEF (MTF)	84
Total Coliforms only	SM9222 B (MF) for Drinking, Recreational and Waste Waters	55
E Coli	9221BF (MTF)	39
Fecal Coliform	SM9221 E (MTF/MPN); SM9222 D (MF)	39
Fecal Coliform (+/-)	SM9221 E (MTF/MPN)	39
Enterococci	Idexx Enterolert (EST)	39
Enterococci	SM9230 B (MTF/MPN)	50
Fecal Streptococci	SM9230 B (MTF/MPN)	39
Fungi, Mold, Yeast	SM9610B	39
Heterotrophs (HPC)	Idexx Simplate; SM9215 AC (SP); SM9215 AB (PP) for Drinking and Natural Waters, 1-2 tray test	39
Heterotrophs (HPC), Biosolids	Idexx Simplate; SM9215 C (Spread Plate); SM9215 B (Pour Plate) for Sewage and Bio-Solids, 2-4 tray test	78
Iron Related Bacteria (+/-)	SM9240D.1 (BART = Biological Activity Reaction Test)	90
Iron Related Bacteria	SM9240D.1 (BART = Biological Activity Reaction Test)	100
Legionella (+/- or En)	CDC Legiolert Method 01/2005-SM9260J (MF-PP)	133
Pseudomonas aeruginosa	Pseudolert (EST)	67
Salmonella (+/-)	SM9260B - E1682 (Plate) FDA BAM	112
Salmonella	SM9260B - E1682 (Plate) FDA BAM	167
Staphylococcus aureus	SM9213B - FDA BAM	95
Sulfate Reducing Bacteria	SM9240D - SM9240D.4a1	100

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GC-MS-MS, LC-IT, LC-MS-MS Analysis

Method / Analysis	Description	List Price
ASTM D7485	LC-MS-MS for Alkylphenols in Water	200
ASTM D7574	LC-MS-MS for BisPhenol A (BPA) in Water	200
LC-MS-MS	E 6850 for Perchlorate in Water and Soil by LC-MS-MS, See Anions, E6850	quote
LC-MS-MS	E 1694m for Thiourea in Waste Water	200
LC-IT or LC-MS-MS	E 1694 or E536m for Selected N/P Pesticides	quote
ASTM D7485	LC-MS-MS for Alkylphenols in Water	200
ASTM D7574	LC-MS-MS for BisPhenol A (BPA) in Water	200
LC-MS-MS	E 6850 for Perchlorate in Water and Soil by LC-MS-MS, See Anions, E6850	quote
LC-MS-MS	E 1694m for Thiourea in Waste Water	200
LC-IT or LC-MS-MS	E 1694 or E536m for Selected N/P Pesticides	quote

McC Campbell Proprietary Methods

Method / Analysis	Description	List Price
Acrylamide	Acrylamide by LCMS	200
Alcohols	Alcohols by Derivitization & HPLC	167
Amines	Amines & Protonatable Nitrogenous Compounds by Aqueous Injection	200
Amines	Amines & Protonatable Nitrogenous Compounds by LCMS	256
Amygdalin	Amygdalin by LCMS	400
Cyclohexylamine	Cyclohexylamine by LCMS	200
DEHPA	Bis(2-ethylhexyl) Phosphoric Acid	200
Epichlorohydrin	Epichlorohydrin by Derivitization & HPLC	145
EthyleneGlycol	Ethylene Glycol by Derivitization & HPLC	145
Flumioxazin	Flumioxazin by LCMS	180
Imazamox	Imazamox by Derivitization & HPLC	178
Isobornyl Acrylate	Isobornyl Acrylate by LCMS	200
Mesotrione	Mesotrione by LCMS	200
Tributyl phosphate	Tributyl phosphate by LCMS	200
Organic Acids	Various Organic Acids by HPLC-UV	67-139 ea
Organic Lead, speciated	Tetramethyl & Tetraethyl Lead by GC (0.005 mg/Kg soil / 125 ppt water RL)	134
Organic Tin, speciated	Mono-, Di-, Tri- & Tetra-Butyl Tin by GC-MS	180
Isobornyl Acrylate	Isobornyl Acrylate by LCMS	200
Mesotrione	Mesotrione by LCMS	200
Tributyl phosphate	Tributyl phosphate by LCMS	200
Organic Acids	Various Organic Acids by HPLC-UV	67-139 ea
Organic Lead, speciated	Tetramethyl & Tetraethyl Lead by GC (0.005 mg/Kg soil / 125 ppt water RL)	134
Organic Tin, speciated	Mono-, Di-, Tri- & Tetra-Butyl Tin by GC-MS	180



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Wet Chemistry & Oil and Grease

Method / Analysis	Description	List Price
TRPH by IR Spectrometry w/ S.G. Clean Up	418.1, Total Recoverable Petroleum Hydrocarbon by IR w/ Silica Gel Clean Up	84
Total Oil & Grease ± S.G.	9071B, Total Oil & Grease ± Silica Gel Clean Up	50
HEM, Oil and Grease ± S.G.	1664A, HEM, Oil & Grease ± Silica Gel Clean Up	50
Acidity	SM2310 B	20
AGP, ANP, NNP	EPA 600/2-78-054, Acid Generating Potential, Acid Neutralizing Potential, Net Neutralization Potential	178
Alkalinity, total, speciated	SM2320 B / 310.1	20 w, 56 s
Ammonia as N, Colorimetry	350.1 or 350.3 / SM4500-NH3 BG	32 w, 43 s
Ammonia as N, unionized (free)	351.2 / SM4500-NH3 BG (includes pH & T)	49 w, 62 s
Ash (%)	Percent ash by ASTM D2974	67
BOD / cBOD	SM5210 B; Biochemical Oxygen Demand, carbonaceous BOD, 5 Day Test	46
B S & W, approximate	ASTM D 1796-97m; Bottom Sediments & Water as Approximate Vol. Phase Proportions	67
Carbon, DOC	415.3 / SM5310 B; Dissolved Organic Carbon	39
Carbon, IC	415.3 / SM5310 B; Inorganic Carbon (= Σ CO _{2,aq} + HCO ₃ ⁻ + CO ₃ ⁻²)	39 w, 84 s
Carbon, TC	415.3 / SM5310 B / 9060A; Total Carbon	50
Carbon, TOC	415.3 / SM5310 B / 9060A; Total Organic Carbon	39 w, 50 s
Carbon dioxide, aq, free	SM5310 B or 415.3; + pH + SM4500-CO ₂ D calc. at 25oC	39 w, 84 s
Chloride, potentiometric	SM4500-Cl- D / Metrohm 130/3e (only for matrices not amenable to IC)	34
Chlorine, residual / total	SM4500-Cl E / 330.2 Titrimetric / SM4500G (Free & Total Cl)	20
Chlorine, specific form (Chloramine)	SM4500-Cl G DPD Colorimetric	89
COD	410.4 / SM5220 D; Chemical Oxygen Demand	36
Color, Apparent	SM2120 B / E110.2 for DW or WW / Apparent / Non-filtered	18
Color, True	SM2120 B / E110.2 for DW or WW True / Filtered	18
Conductivity	Conductivity, Resistivity & Salinity 120.1 / 9050A / SM2510 B, ASTM D1125A, SSSA	20
Corrosivity	pH, corrosivity = pH >2 and pH <12.5, included in RCI	12
Cyanide, Amenable	9012A / SM 4500-CN G; includes Total Cyanide results	123
Cyanide, Free	SM9016 using micro diffusion cell	123
Cyanide, Total, Auto Distillation	Kelada-01 / 335.4 / 9012A / SM4500-CN- CE	69 w, 78s
Cyanide, Amenable Manual Distillation	9012A, Amenable Base Extractable; includes Total Cyanide results	153
Cyanide, Total Manual Distillation	335.4 / 9012A, Total Base Extractable	89
Cyanide, WAD	Kelada-01 / SM4500-CN- CE; Buffered Weak Acid Dissociable Cyanides	78
Density	ASTM D1475, ASTM D2397m	28 w, 84 s
Dissolved O ₂	360.1 / SM 4500-O G	23
Flashpoint of Liquids	SW1010, included in RCI	45
Fluoride by ISE	E340.2 / SM4500-F- C	120
Foaming Agents (surfactants), anionic	SM5540 C / 425.1; MBAS / Anionic Surfactants	45
Foaming Agents (surfactants), non-ionic	SM5540 BD; CTAS / Non-ionic Surfactants	134
Freezing / Melting Point	MAI, Melting Point of Solids, Freezing Point of Liquids	1101, 300 s
Hardness	SM2340 B & 200.7 by ICP / ICPMS	28
Hardness by Titration	SM2340 C by Titration	28
Hydrogen Peroxide	USP Titanium Oxylate Spectrophotometric method	39
Ignitability of Solids	SW1030, included in RCI	22 screen, 84 def



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Moisture Content of Soils	ASTM D2216-05, ASTM D2974, for organic matter & ash determinations	23
Nitrate + Nitrate by Cd reduction	353.2 / SM4500NO3 E; NO3 +- NO2 by Cd reduction	60
Nitrogen, Organic	351.2 + 350.1 / SM4500-Norg AD + SM4500-NH3 FG; Organic Nitrogen as N (= TKN - Ammonia)	69
Nitrogen, TKN	351.2 ;TKN = Total Kjeldahl Nitrogen as N	38
Nitrogen, total (TOC)	415.3m / 9060Am; Total Nitrogen by combustion & Chemiluminescence / TCD	39 w, 50 s
Odor	140.1 / SM2150 B	17
Odor with Dechlorination	140.1 / SM2150 B + SM4500-CI DE	50
Organic Matter	Percent Organic Matter by ASTM D2974	89
ORP	SM2580 B, Oxidation-Reduction Potential	23 w, 45 s
Ozone	SM4500 O3 B	39
Paint Filter Test	SW9095A	17
pH	150.1 / 9045B&C / 9045C&D / SM4500H+ B, ASTM D4972-13a, CT643-2007	12
pH, field	SM4500H+ B, onsite pH measurement	84
Phenolics, Total	420.4 / 420.1	50
Phosphorous, Dissolved	365.1, 365.3, Dissolved Phosphorous as P	39
Phosphorous, Hydrolyzable	365.1, 365.3, Hydrolyzable Phosphorous as P	39
Phosphorous, Organic	365.1, 365.3, / SM4500-P BEF; Organic (Total - Ortho - Hydrolyzable) Phosphorous as P	39
Phosphorous, Ortho	365.1, 365.3 365.5; SM4500-P BEF / Ortho Phosphorous as P (used when IC is inapplicable)	28
Phosphorous, Total	365.1, 365.3, / SM4500-P BEF; Total Phosphorous as P	39
Reactive Cyanide	SW9010, included in RCI, Positive or Negative	50
Reactive Sulfide	SW9030, included in RCI, Positive or Negative	50
Salinity	SM2520, Salinity by conductivity	20
Silica, Reactive	SM4500-SiO2 D	84
Solids, Total (TS)	SM2540B for Liquids, see Moisture for Solids	23
Solids, Dissolved (TDS)	SM2540C, Total Dissolved Solids	23
Solids, Suspended (TSS)	SM2540D, Total Suspended Solids	23
Solids, Total Volatile or Fixed (TVS, TFS)	SM2540E, SM2540G for Solids	30
Solids, Total Volatile or Fixed Dissolved	SM2540E, SM2540G for Solids (TVDS, TFDS)	30
Solids, Total Volatile or Fixed Suspended	SM2540E, SM2540G for Solids (TVSS, TFSS)	30
Solids, Settleable (SS)	SM2540F	17
Specific Gravity	ASTM D1475, ASTM D2397m	23
Sulfide, aqueous	SM4500-S-2 D / 376.2 /; SM4500-S-2 F; SM4500-S-2 I / distilled	30
Sulfide, solids	SM4500-S-2 D & 9030B; Acid Soluble or Acid Insoluble Sulfides	84
Sulfite by Titration	SM4500-SO3-2 B	23
Sulfur, Total	415.3m / 9060Am; Total Sulfur by combustion & TCD (ICP-MS rec. for aqueous)	56
Tannin & Lignin	SM5550 B	39 w, 56 s
Turbidity	180.1 / SM2130 B	17
UV254	SM5910 B	44
UV Scan	MAI Full Spectrum Scan	150
Water Content	Karl Fischer, SW9000, Water Content of Liquids	89
Vapor Pressure, Reid	ASTM D323, BAAQMD 28 (Requires Storage Temperature)	250
VCC of Coatings	EPA D24, ASTM D2369	75
VCC of Powder Coatings	SCAQMD 316C Draft	80
Visual Estimate of Particle Size	ASTM E112-13; for granular matrices	25
VVC of Electrical Varnish	ASTM D6053	84



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Air Testing

Method/ Analysis	Description	List Price
Air Sampling Pump Rentals	Low (0.05 - 0.2L/min) or high (1-5 L/min) flow	85/week
Alcohols	NIOSH 1403 / 2000m by HPLC-FLD (ST)	167 s, 84 t
Formaldehyde	NIOSH 2016 by HPLC (FST)	167
Helium	ASTM D 1946-90 (Tedlar or summa, summa can extra if not part of TO-15)	167
Helium Leak Check	TO-15 Helium Leak Check	84
Helium Shroud	Helium Shroud Rental	230 1st, 56 ea. Subsq. Smp.
Hexachrome, Particulates	NIOSH 7605 by IC-Colorimetry (Filter)	95
Hydrocarbons, Light	ASTM D 1946-90 / EPA 3C by GC- FID (methane, ethane, ethene, actetylene) (Tedlar / Summa; Summa same price as Tedlar if TO-15 requested)	quote
Hydrogen	ASTM D 1946-90 / EPA 3C by GC-PDD (H2) (Tedlar, Summa)	quote
LEED Gases - Indoor	VOCs + Formaldehyde + 4-PCH + CO from summa	378
Light Gases, Atmospheric	ASTM D 1946-90 / EPA 3C by GC-PDD / TCD (O2, N2, CO, CO2,) (Tedlar / Summa; Summa same price as Tedlar if TO-15 requested)	quote
Light Gases, Atmospheric + Hydrocarbons	ASTM D 1946-90 / EPA 3C by GC-PDD / TCD / FID (O2, N2, CO, CO2, methane, ethane, ethene, actetylene) (Tedlar, Summa)	quote
Metals, Particulates	NIOH 7303 by ICP-MS (Filter)	28 1st, 12 ea. addl
OC & ON Herbicides	NIOSH 5602 (ST, pricing includes tubes)	243
OP Pesticides	NIOSH 5600 (ST, pricing includes tubes)	220
Organic Lead	NIOSH 2534m (Tetramethyl & Tetraethyl Lead) by GC (ST, pricing includes tubes)	127
Particulates, Respirable	NIOSH 0600	28
Particulates, Total	NIOSH 0500	28
PCBs	NIOSH 5503 by GC-ECD (ST)	86
Phenols	NIOSH 2546 by GC-MS SIM mode (ST)	145
PNAs	NIOSH 5506 by HPLC UV-FLD (ST)	145
Silica	NIOSH 7602, Crystalline Silica by IR (Bulk pricing available)	145
TO17 VOCs	TO-17, Soil gas by GC_MS (ST)	200
TPH (g/d)	NIOSH 1550 by GC-FID (ST)	84
TPH (g/d)	TO-17m (ST) TPH gas and Diesel	112
TPH(g) Fractionated	MA DEP APH by GC-MS (Summa); ali-aro frac. of vapor phase TPH	225
VOCs +- TPH(g) soil gas	TO-15, soil gas by GC-MS (Summa)	223, +39
VOCs +- TPH(g) soil gas	TO-15, soil gas by GC-MS (Tedlar)	167, +39
VOCs +- TPH(d) soil gas	TO-17, soil gas by GC-MS (ST)	200, +39
VOCs, IPA only	TO-15, IPA only for soil gas from Tedlar by GC-MS; Client / Lab supplied Tedlar	67/ 84
VOCs, SCAN-SIM, indoor air	TO-15, indoor air by GC-MS, RL= 0.1ppbv (Summa), SIM mode for TO-15 compounds having ESL indoor air limits < 0.1 ppbv	300, +39

*Use of canisters beyond 15 days could increase the risk of having unacceptable initial vacuum at the start of sampling.

*MAI does not guarantee canister vacuum beyond 15 days.

*Failure to return media within 30 days of receipt will result in invoicing of the replacement cost of all outstanding media.

*MAI will charge a cleaning/rental fee of \$56.00 per sample set when equipment is returned to us unused.

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Solids

Method / Analysis	Description	List Price
Asbestos CARB 435	Asbestos 400 point count (.25%RL) by CARB 435	100
Asbestos CARB 435	Asbestos 1000 point count (.1%RL) by CARB 435	200
FTIR for Plastics and Polymer ID	ASTM E1252-98; FTIR ID of plastics and polymers.	167
XRD for Solids ID	Crystalline Solids ID using Powder, Micro-focus or High Angle XRD by USGS OFR 01-041	200
XRF on Solids Composition	Semi Quant XRF scan for gross element composition (Na-U)	150

Aquatic Toxicology

Test Method	Test Organism	Description	List Price
Hazardous Waste Bioassay (CDBG 1988)	Fathead Minnow (<i>Pimephales promelas</i>)	CA Title 22 Hazardous Waste 96h LC50 Screen	340
		CA Title 22 Hazardous Waste 96h LC50 Definitive	530
EPA 2000.0	Fathead Minnow (<i>Pimephales promelas</i>)	Acute 96hr Static Non-Renewal 100% Concentration Only	quote
		Acute 96hr Static Renewal 100% Concentration Only with a 48hr Renewal	quote
		Acute 96hr Static Renewal 100% Concentration Only with Daily Renewals	quote
		Acute 96hr Static Renewal Dilution Series with a 48hr Renewal	quote
EPA 2019.0	Rainbow Trout (<i>Oncorhynchus mykiss</i>)	Acute 96hr Static Non-Renewal 100% Concentration Only	quote
		Acute 96hr Static Renewal 100% Concentration Only with a 48hr Renewal	quote
		Acute 96hr Static Renewal 100% Concentration Only with Daily Renewals	quote
		Acute 96hr Static Renewal Dilution Series with a 48hr Renewal	quote
EPA 2004.0	Sheepshead Minnow (<i>Cyprinodon variegatus</i>)	Acute 96hr Static Non-Renewal 100% Concentration Only	quote
		Acute 96hr Static Renewal 100% Concentration Only with a 48hr Renewal	quote
		Acute 96hr Static Renewal 100% Concentration Only with Daily Renewals	quote
EPA 2002.0	<i>Ceriodaphnia dubia</i>	Acute 96hr Static Non-Renewal 100% Concentration Only	quote
		Acute 96hr Static Renewal 100% Concentration Only with a 48hr Renewal	quote
		Acute 96hr Static Renewal 100% Concentration Only with Daily Renewals	quote
		Acute 96hr Static Renewal Dilution Series with a 48hr Renewal	quote
		Acute 48hr Static Renewal Dilution Series with Daily Renewal	quote
EPA 2021.0	<i>Daphnia spp. (Daphnia magna)</i>	Acute 96hr Static Non-Renewal 100% Concentration Only	quote
		Acute 96hr Static Renewal 100% Concentration Only with a 48hr Renewal	quote
		Acute 96hr Static Renewal 100% Concentration Only with Daily Renewals	quote
		Acute 96hr Static Renewal Dilution Series with a 48hr Renewal	quote
		Acute 48hr Static Renewal Dilution Series with Daily Renewal	quote
EPA 2006.0	Inland Silverside (<i>Menidia beryllina</i>)	Acute 96hr Static Non-Renewal 100% Concentration Only	quote
		Acute 96hr Static Renewal 100% Concentration Only with a 48hr Renewal	quote
		Acute 96hr Static Renewal 100% Concentration Only with Daily Renewals	quote
		Acute 96hr Static Renewal Dilution Series with a 48hr Renewal	quote
EPA 2007.0	Mysid shrimp (<i>Americamysis bahia</i>)	Acute 96hr Static Non-Renewal 100% Concentration Only	quote
		Acute 96hr Static Renewal 100% Concentration Only with a 48hr Renewal	quote
		Acute 96hr Static Renewal 100% Concentration Only with Daily Renewals	quote
		Acute 96hr Static Renewal Dilution Series with a 48hr Renewal	quote
EPA 1003.0 / ASTM E1218-04	Green Algae (<i>Selenastrum</i>)	Chronic 96hr Algal Growth Test - 100% Concentration Only	quote
		Chronic 96hr Algal Growth Test - Dilution Series	quote



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"When Quality Counts"

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McC Campbell Analytical, Inc. Fee Schedule – City of Merced (01/01/19-12/31/19)

	<i>Capricornutum</i>	Chronic 96hr Algal Growth Test - Reference Toxicant Test	quote
EPA 1002.0	<i>Ceriodaphnia dubia</i>	Chronic 3-brood Survival and Reproduction Test - 100% Concentration Only	quote
		Chronic 3-brood Survival and Reproduction Test - Dilution Series	quote
		Chronic 3-brood Survival and Reproduction Test - Reference Toxicant Test	quote
EPA 1000.0	Fathead Minnow (<i>Pimephales promelas</i>)	Chronic 7-day Survival and Growth Test - 100% Concentration Only	quote
		Chronic 7-day Survival and Growth Test - Dilution Series	quote
		Chronic 7-day Survival and Growth Test - Reference Toxicant Test	quote
EPA 1004.0	Sheepshead Minnow (<i>Cyprinodon variegatus</i>)	Chronic 7-day Survival and Growth Test - 100% Concentration Only	quote
		Chronic 7-day Survival and Growth Test - Dilution Series	quote
		Chronic 7-day Survival and Growth Test - Reference Toxicant Test	quote
EPA 1006.0	Inland Silverside (<i>Menidia beryllina</i>)	Chronic 7-day Survival and Growth Test - 100% Concentration Only	quote
		Chronic 7-day Survival and Growth Test - Dilution Series	quote
		Chronic 7-day Survival and Growth Test - Reference Toxicant Test	quote
EPA 1007.0	Mysid shrimp (<i>Americanysis bahia</i>)	Chronic 7-day Survival and Growth Test - 100% Concentration Only	quote
		Chronic 7-day Survival and Growth Test - Dilution Series	quote
		Chronic 7-day Survival and Growth Test - Reference Toxicant Test	quote
EPA 600/R-95/136	Mussels (<i>Mytilus spp.</i>)	Chronic Embryo-Larval Development and Survival Test - 100% Concentration Only	quote
		Chronic Embryo-Larval Development and Survival Test - Dilution Series	quote
		Chronic Embryo-Larval Development and Survival Test - Reference Toxicant Test	quote

*24-hour and 48-hour tests are available for all acute test methods; please contact us for a price.
*Clients requiring 3-species chronic testing will receive a 10% discount for effluent sample testing.
*Price is for concurrent reference toxicant testing. A 20% discount will apply for clients requesting monthly RT data.

Extractions Preparations

Method / Analysis	Description	List Price
Alumina Bench Column Clean Up (EPA 3630C)	Bench Column Clean Up of solvent extracts, cost depends on complexity	39
Ashing - food	Thermal combustion preparation for food matrices	84
Ashing - soils/solids	Thermal combustion preparation for metals or oxide determinations	28
ASTM C 1580-05	DI Extraction of Soils for Sulfate	84
Bench Testing / Pilot Studies	Customized bench studies to evaluate pilot processes	quote
Cal Trans 417 / 422	DI Extraction for anions in soil (DI STLCL may yield higher values)	17
CEC, NH ₄ Ac	EPA 9080; Cation Exchange Capacity inapplicable to calcareous soils	112
CEC, NaAc	EPA 9081; Cation Exchange Capacity that is generally applicable	112
Copper Clean Up	Copper Clean Up to Remove Sulfur	39
ESL Clean Up 8081/8082	ESL Clean-up for method 8081/ 8082	120
Ex. Cations, NH ₄ Ac	Exchangeable Cations using ammonium acetate	39
Filtration	In-house (laboratory) filtration for dissolved metals using 0.45 um filter	7
Florisil Clean Up (EPA 3630C)	Bench Column Clean Up of solvent extracts	39
GPC Clean-up, EPA 3640A	Gel Permeation Clean Up	84
ISM - ITRC	Incremental Sampling Method per the Interstate Technology & Regulatory Council (ITRC)	200
Metals Dissolution	Concentrated oxidizing acids dissolution of solid metals	84
MS/MSD Project specific	Project specific MS/MSDs	2 x analytical cost



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Silica Gel Clean Up, in-a-vial style	Silica Gel Clean Up of solvent extracts, in-a-vial style	5.50 per sample
Silica Gel Bench Column Clean Up	Silica Gel Bench Column Clean Up of solvent extracts (EPA 3630C)	84
STLC	California WET Test	56
DI STLC	California WET Test modified to use DI water	56
ZHE STLC	Zero Head Space California WET Test for Volatiles	112
Whole Rock Dissolution	Fusion of rock / alumino-silicate solids	89
Zemo Diss. HCs ± SG c.u.	Dawn Zemo Methodology for Dissolved HCs ± SG cleanup	quote
TCLP EPA 1311	TCLP; Toxic Characteristic Leaching Procedure	56
ZHE TCLP EPA 1311	Zero Head Space TCLP for Volatiles	112
SPLP EPA 1312	SPLP; Synthetic Precipitation Leaching Procedure	56
EPA 3050B Large Volume	Large volume (70g initial sample weight)	138
*Clean ups and extractions fees are not subject to rush surcharge rates.		
*Clean ups and extractions may extend the TAT.		

Miscellaneous

Method / Analysis	Description	List Price
Air Sampling Pump Rental	Low (0.05 - 0.2L/min) or high (1-5 L/min) flow	85/week
Chromatogram Fee	Chromatograms PDF	15
Compositing	Sample compositing (up to 4:1 free)	5 per sample
Courier – exclusive service	Courier for emergency/urgent picks &/or deliveries	quote
EDF Reporting Fee	CA AB 2886; GeoTracker	28 per report
EDD Reporting Fee	WriteOn, EQuIS, CIWQS, SMARTs, Locus XML, etc.	28 per report
EPA 5035 EnCore sampler	5g EnCore sampler (additional \$5 per sample handling fee applied to analytical)	9 each
Filters & Syringes	One syringe & three 0.45 micron filters for field filtering	12 per sample
Open Scan Fee	The five most significant unidentified peaks in GC-MS chromatogram	20 per peak
Helium Shroud	Helium Shroud Rental	230 1st, 56 ea. Subsq. Smp.
Passive Diffusion Bag (PDB)	PDB filled with DI water	28 each
PM10 Monitor	PDR-1000AN Data Logger for continuous PM10 monitoring	100/day / 300/week
Pulverization Fee	Pulverization of solid matrices	50 per sample
Sample Disposal Fee	Sample Disposal fee soil / solid	1.50 per sample
Sampling Tube	Stainless steel sampling tube	5 each
Sorbent Tube	Single use Sorbent Tube	5 each
Tedlar bag	Tedlar air sampling bag	10 each
Unused Summa	Cleaning Fee - Unused Summa Canister	56 each
*Client is responsible for returning all media in the same condition as when received from MAI. Damaged, (including dented canisters), or unreturned media will be charged to the client as outlined in media agreement under "replacement value". Dented canisters have suspected active surfaces & cannot be used for most air sampling applications; MAI will charge replacement cost. No disassembly of soil gas or indoor air manifolds is permitted.		
* Add \$5 per analysis per sample for "whole container volatiles in soils" analyses (Encore or preserved VOA style).		
RUSH SURCHARGES are as follows:		
MAI offers Same-Day, 1-Day, 2-Day, 3-Day, 4-Day TAT at 150%, 100%, 50%, 25%, 10% markups from standard TAT, respectively on most analyses. All rush TATs must be arranged in advance of sample submission. Our Sample Reception department is open Monday through Friday; 8:00AM- 9:00PM. Please contact our Sales & Marketing team at Sales@mcccampbell.com		



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