

San Francisco Estuary Institute

7770 Pardee Lane, 2nd Floor • Oakland, CA 94621-1424
Office (510) 746-SFEI (7334) • Fax (510) 746-7300



MEMORANDUM

Date: March 16, 2010

To: RMP Technical Review Committee

From: Susan Klosterhaus, SFEI

Subject: RMP Support for the AXYS Analytical CEC Pro Bono Pilot Study

Background

In collaboration with the RMP, SCCWRP, the State Water Board, and several federal agencies, the NOAA Mussel Watch Program is conducting the 'CECs Early Warning Network: California Pilot Project' in 2010 to determine which CECs will be added to the NOAA Mussel Watch Program target analyte list in future years. Mussel sample collections are on-going statewide, with the first set of samples scheduled for analysis beginning in May 2010. Though many of the CECs proposed for analysis in the statewide effort have been previously analyzed in abiotic matrices, for some, particularly the pharmaceuticals and personal care products (PPCPs), methods for their analysis in tissues have not been well developed and it is not known whether they are bioaccumulative in bivalves. To resolve some of this uncertainty and possibly develop a more focused analyte list, AXYS Analytical has donated \$55,000 towards the analysis of perfluorinated compounds (PFCs), alkylphenols, and a broad suite of pharmaceuticals and personal care products (PPCPs) in San Francisco Bay sediment, water, and resident mussels. The use of Bay samples as a 'test case' is providing the RMP with a large quantity of CEC data specific to the Bay at a substantially reduced cost while also supporting the statewide Mussel Watch effort.

Approach

In December of 2009 and January of 2010, co-located samples of sediment, surface water, and resident mussels (the invasive, ribbed horse mussel *Geukensia demissa*) were collected from five sites in San Francisco Bay and sent to AXYS for analysis of PFCs, alkylphenols, and PPCPs. Samples were collected from Cooley Landing (Lower South Bay), Eden Landing (South Bay), Foster City (South Bay), San Leandro Bay (Central Bay), and Richmond/Bruener Marsh (San Pablo Bay). Some data has already been received and AXYS plans to have all the data submitted by the end of March.

Request for support and estimated costs

We are seeking funding assistance from the RMP for data QA review and data reporting, including preparation of a technical report.

Table 1 lists the costs associated with each task. Support for the scope of work development and field collections have been billed to SFEI and the RMP (management task).

Table 1. Costs for AXYS CEC Mussel Watch Project

Task	Cost	Billing Status
Scope of work development	~\$1,700	All billed to SFEI
Field sampling and logistics (includes field support from Andy Cohen and Applied Marine Sciences and permitting fees)	~\$9,000	~\$7,000 billed to RMP* ~\$2,000 billed to SFEI
Laboratory analyses (Tables 2, 3, 4)	\$55,000	Donated by AXYS Analytical
Project management	\$1,700	RMP support requested
Data QA review	\$11,140	RMP support requested
Data interpretation, reporting, presentations	\$15,000	RMP support requested
Total Requested	\$27,840	

* most of this was in the form of labor owed to RMP by AMS due to a previous billing error.

Timeframe

Data review will be completed by the end of April 2010. Data interpretation and reporting will begin in April with a final report completed by the end of 2010.

Table 2. Perfluorinated Compounds, Alkylphenols and Alkylphenoethoxylates Analyzed

Perfluorinated Compounds	Alkylphenols and Alkylphenoethoxylates
Perfluorobutanoate (PFBA)	Nonylphenol (NP)
Perfluoropentanoate (PFPeA)	4-Nonylphenol monoethoxylate (NP1EO)
Perfluorohexanoate (PFHxA)	4-Nonylphenol diethoxylate (NP2EO)
Perfluoroheptanoate (PFHpA)	Octylphenol (OP)
Perfluorooctanoate (PFOA)	
Perfluorononanoate (PFNA)	
Perfluorodecanoate (PFDA)	
Perfluoroundecanoate (PFUnA)	
Perfluorododecanoate (PFDoA)	
Perfluorobutanesulfonate (PFBS)	
Perfluorohexanesulfonate (PFHxS)	
Perfluorooctanesulfonate (PFOS)	
Perfluorooctane sulfonamide (PFOSA)	

Table 3. Pharmaceuticals and Personal Care Products (PPCPs) Analyzed

Analyte
<i>List 1 - Acid Extraction in Positive Ionization</i>
Acetaminophen
Ampicillin
Azithromycin
Caffeine
Carbadox
Carbamazepine
Cefotaxime
Ciprofloxacin
Clarithromycin
Clinafloxacin
Cloxacillin
Dehydronifedipine
Digoxigenin
Digoxin
Diltiazem
1,7-Dimethylxanthine
Diphenhydramine
Enrofloxacin
Erythromycin-H2O
Flumequine
Fluoxetine
Lincomycin
Lomefloxacin
Miconazole
Norfloxacin
Norgestimate
Ofloxacin
Ormetoprim
Oxacillin
Oxolinic acid
Penicillin G
Penicillin V
Roxithromycin
Sarafloxacin
Sulfachloropyridazine
Sulfadiazine
Sulfadimethoxine
Sulfamerazine
Sulfamethazine
Sulfamethizole
Sulfamethoxazole
Sulfanilamide
Sulfathiazole
Thiabendazole
Trimethoprim
Tylosin
Virginiamycin

<i>List 3 - Acid Extraction in Negative Ionization</i>
Bisphenol A
Furosemide
Gemfibrozil
Glipizide
Glyburide
Hydrochlorothiazide
2-hydroxy-ibuprofen
Ibuprofen
Naproxen
Triclocarban
Triclosan
Warfarin

<i>List 4 - Acid Extraction in Negative Ionization</i>
Albuterol
Amphetamine
Atenolol
Atorvastatin
Cimetidine
Clonidine
Codeine
Cotinine
Enalapril
Hydrocodone
Metformin
Oxycodone
Ranitidine
Triamterene

List 5 - Acid Extraction in Positive Ionization
Alprazolam
Amitriptyline
Amlodipine
Benzoylcegonine
Benztropine
Betamethasone
Cocaine
DEET
Desmethyldiltiazem
Diazepam
Fluocinonide
Fluticasone propionate
Hydrocortisone
10-hydroxy-amitriptyline
Meprobamate
Methylprednisolone
Metoprolol
Norfluoxetine
Norverapamil
Paroxetine
Prednisolone
Prednisone
Promethazine
Propoxyphene
Propranolol
Sertraline
Simvastatin
Theophylline
Trenbolone
Trenbolone acetate
Valsartan
Verapamil