STATE OF DELAWARE PROFESSIONAL SERVICES AGREEMENT
CONTRACT NO. NAT14190-WATAR

This Agreement ("Agreement") is entered into as of October 1, 2014 and will end on October 1, 2017 with two (2) optional extensions for a period of one (1) year for each extension. This Agreement is between the State of Delaware, Department of Natural Resources and Environmental Control, Division of Watershed Stewardship, Watershed Assessment Section ("Delaware"), and AXYS Analytical Services, with offices at 2045 Mills Road West, Sidney, British Columbia, Canada V8L 5X2 ("AXYS").

WHEREAS, Delaware desires to obtain certain specialized services to test filters, resins, surface water, sediment, and biota samples collected from Delaware watersheds for the presence and concentration of various chemical contaminants; and

WHEREAS, AXYS desires to provide such services to Delaware on the terms set forth below;

WHEREAS, Delaware and AXYS represent and warrant that each party has full right, power and authority to enter into and perform under this Agreement;

FOR AND IN CONSIDERATION OF the premises and mutual agreements herein, Delaware and AXYS agree as follows:

1. Services.

1.1 AXYS shall perform for Delaware the services specified in Appendix 1 to this Agreement (Request for Proposals for Professional Services Watershed Approach to Toxics Assessment and Restoration Issued by Department of Natural Resources and Environmental Control Contract Number NAT14190-WATAR), attached hereto and made a part hereof. Entering into this Agreement entitles AXYS to receive task orders from Delaware during the Agreement period when Delaware requires professional services on an "as and when" requested basis by Delaware. The task order will request that AXYS submit a proposal to Delaware for the professional services requested in the task order. AXYS's proposal shall be based on AXYS's technical and financial bids established as part of this Agreement (as detailed in the attached Appendix 2 of this Agreement - AXYS Analytical Services Response to DNREC RFP for Professional Services Watershed Approach to Toxics Assessment and Restoration, Contract # NAT14190-WATAR). If Delaware and AXYS reach agreement on the proposal, it shall be set forth in an Addendum which shall be attached to this Agreement and made a part hereof. As used herein, the term "Agreement" shall include all Addenda entered into hereunder, unless the two terms are used separately and the context indicates otherwise.

1.2 Any conflict or inconsistency between the provisions of the following documents shall be resolved by giving precedence to such documents in the following order: (a) this Agreement (including any amendments or modifications thereto); (b) any Addenda to this Agreement; (c) Delaware's request for proposals, attached hereto as Appendix 1; and (d) AXYS's response to the request for proposals, attached hereto as Appendix 2. The aforementioned documents are specifically incorporated into this Agreement and made a part hereof.

1.3 Delaware may, at any time, by written order, make changes in the scope of this Agreement and in the services or work to be performed. No services for which additional compensation may be charged

by AXYS shall be furnished without the written authorization of Delaware. When Delaware desires any addition or deletion to the deliverables or a change in the Services to be provided under this Agreement, it shall notify AXYS, who shall then submit to Delaware a "Change Order" for approval authorizing said change. The Change Order shall state whether the change shall cause an alteration in the price or the time required by AXYS for any aspect of its performance under this Agreement. Pricing of changes shall be consistent with those established within this Agreement.

1.4 AXYS will not be required to make changes to its scope of work that result in AXYS's costs exceeding the current unencumbered budgeted appropriations for the services. Any claim of either party for an adjustment under Section 1 of this Agreement shall be asserted in the manner specified in the writing that authorizes the adjustment.

2. Payment for Services and Expenses.

2.1 The term of the initial contract shall be from October 1, 2014 through October 1, 2017. AXYS may submit a letter to Delaware which requests that the term of the initial contract be extended for an additional one year period year from October 1, 2017 to October 1, 2018. AXYS's letter must be received by Delaware no later than sixty (60) days prior to the expiration of the initial contract. Delaware will respond to AXYS in writing prior to the expiration of the initial contract whether the term of the contract has been extended for a one year period. AXYS may submit a similar letter no later than sixty (60) days prior to the end of the first one year extension which requests a second one year extension. Delaware will respond to AXYS in writing prior to the expiration of the first extension whether the term of the contract has been extended for a second one year period.

2.2 Delaware will pay AXYS for the performance of services described in any Addendum. Payment shall be made based on satisfactory completion of analyte groups, by matrix and watershed. Delaware has no obligation to pay AXYS for any services under this Agreement unless an Addendum has been signed by Delaware and AXYS, and Delaware has issued a purchase order for the services called for in the Addendum.

2.3 Delaware's obligation to pay AXYS for the performance of services under the initial term of this Agreement will not exceed the fixed fee amount of $1,000,000. Each Addendum entered into under this Agreement shall be the subject of a separate purchase order. It is expressly understood that the work defined in any Addendum to this Agreement must be completed by AXYS and it shall be AXYS's responsibility to ensure that hours and tasks are properly budgeted so that all services are completed for the agreed upon fixed fee. Delaware's total liability for all charges for services that may become due under any Addendum to this Agreement is limited to the total maximum expenditure(s) authorized in Delaware's purchase order(s) to AXYS for such Addendum.

2.4 AXYS shall submit monthly invoices to Delaware in sufficient detail to support the services provided. Delaware agrees to pay those invoices within thirty (30) days of receipt. In the event Delaware disputes a portion of an invoice, Delaware agrees to pay the undisputed portion of the invoice within thirty (30) days of receipt and to provide AXYS a detailed statement of Delaware's position on the disputed portion of the invoice within thirty (30) days of receipt. Delaware's failure to pay any amount of an invoice that is not the subject of a good-faith dispute within thirty (30) days of receipt shall entitle AXYS to charge interest on the overdue portion at no more than 1.0% per month or 12% per annum. All payments will be sent to AXYS, 2045 Mills Road West, Sidney, British Columbia, Canada V8L 5X2.

2.5 Unless provided otherwise in an Addendum, all expenses incurred in the performance of the services are to be paid by AXYS. If an Addendum specifically provides for expense reimbursement, AXYS shall be reimbursed only for reasonable expenses incurred by AXYS in the performance of the services, including, but not necessarily limited to, travel and lodging expenses, communications charges, and computer time and supplies.

2.6 Delaware is a sovereign entity, and shall not be liable for the payment of federal, state and local sales, use and excise taxes, including any interest and penalties from any related deficiency, which may become due and payable as a consequence of this Agreement.

2.7 Delaware shall subtract from any payment made to AXYS all damages, costs and expenses

caused by AXYS's negligence, resulting from or arising out of errors or omissions in AXYS's work products, which have not been previously paid to AXYS.

2.8 Invoices shall be submitted to: Richard Greene, Delaware Department of Natural Resources and Environmental Control, Division of Watershed Stewardship, Watershed Assessment Section, 820 Silver Lake Blvd., Suite 220, Dover, DE 19904-2464.

3. Responsibilities of AXYS.

3.1 AXYS shall be responsible for the professional quality, technical accuracy, timely completion, and coordination of all services furnished by AXYS, its subcontractors and its and their principals, officers, employees and agents under this Agreement. In performing the specified services, AXYS shall follow practices consistent with generally accepted professional and technical standards. AXYS shall be responsible for ensuring that all services, products and deliverables furnished pursuant to this Agreement comply with the standards promulgated by the Department of Technology and Information ("DTI") published at http://dti.delaware.gov/, and as modified from time to time by DTI during the term of this Agreement. If any service, product or deliverable furnished pursuant to this Agreement does not conform with DTI standards, AXYS shall, at its expense and option either (1) replace it with a conforming equivalent or (2) modify it to conform with DTI standards. AXYS shall be and remain liable in accordance with the terms of this Agreement and applicable law for all damages to Delaware caused by AXYS's failure to ensure compliance with DTI standards.

3.2 It shall be the duty of the AXYS to assure that all products of its effort are technically sound and in conformance with all pertinent Federal, State and Local statutes, codes, ordinances, resolutions and other regulations. AXYS will not produce a work product that violates or infringes on any copyright or patent rights. AXYS shall, without additional compensation, correct or revise any errors or omissions in its work products.

3.3 Permitted or required approval by Delaware of any products or services furnished by AXYS shall not in any way relieve AXYS of responsibility for the professional and technical accuracy and adequacy of its work. Delaware's review, approval, acceptance, or payment for any of AXYS's services herein shall not be construed to operate as a waiver of any rights under this Agreement or of any cause of action arising out of the performance of this Agreement, and AXYS shall be and remain liable in accordance with the terms of this Agreement and applicable law for all damages to Delaware caused by AXYS's performance or failure to perform under this Agreement.

3.4 AXYS shall appoint a Project Manager who will manage the performance of services. All of the services specified by any Addendum to this Agreement shall be performed by the Project Manager, or by AXYS's associates and employees under the personal direction of the Project Manager.

3.5 Designation of the project manager is subject to review and approval by Delaware. All analytical work conducted will be performed by qualified AXYS staff as per ISO 170125 and NELAP requirements, with demonstration of competence in assigned tasks. Work conducted will be supervised and reviewed as per internal AXYS quality assurance procedures, documented in the AXYS Quality Manual or other task specific Standard Operating Procedures. Should the staff need to be diverted off the project for what are now unforeseeable circumstances, AXYS will notify Delaware immediately and work out a transition plan that is acceptable to both parties, as well as agree to an acceptable replacement plan to fill or complete the work assigned to this project staff position. Replacement project management persons are subject to review and approval by Delaware. If AXYS fails to make a required replacement within 30 days, Delaware may terminate this Agreement, or any Addendum hereto, for default. Upon receipt of written notice from Delaware that an employee of AXYS is unsuitable to Delaware for good cause, AXYS shall remove such employee from the performance of services and substitute in his/her place a suitable employee.

3.6 AXYS shall furnish to Delaware's designated representative copies of all correspondence to

regulatory agencies for review prior to mailing such correspondence.

3.7 AXYS agrees that its officers and employees will cooperate with Delaware in the performance of services under any Addendum to this Agreement and will be available for consultation with Delaware at such reasonable times with advance notice as to not conflict with their other responsibilities.

3.8 AXYS has or will retain such employees as it may need to perform the services required by this Agreement. Such employees shall not be employed by Delaware or any other political subdivision of Delaware.

3.9 AXYS will not use Delaware's name, either express or implied, in any of its advertising or sales materials without Delaware's express written consent.

3.10 The rights and remedies of Delaware provided for in this Agreement are in addition to any other rights and remedies provided by law.

4. Time Schedule.

4.1 A project schedule must be included as part of any Addendum under this Agreement.

4.2 Any delay of services or change in sequence of tasks must be approved in writing by Delaware.

4.3 In the event that AXYS fails to complete the services within the time specified in any Addendum, or with such additional time as may be granted in writing by Delaware, or fails to prosecute the work, or any separable part thereof, with such diligence as will insure its completion within the time specified in any Addendum to this Agreement or any extensions thereof, Delaware shall suspend the payments scheduled as set forth in the project Addendum.

5. State Responsibilities.

5.1 In connection with AXYS's provision of the Services, Delaware shall perform those tasks and fulfill those responsibilities specified in any Addendum.

5.2 Delaware agrees that its officers and employees will cooperate with AXYS in the performance of services under this Agreement and will be available for consultation with AXYS at such reasonable times with advance notice as to not conflict with their other responsibilities.

5.3 The services performed by AXYS under this Agreement shall be subject to review for compliance with the terms of this Agreement by Delaware's designated representatives. Delaware representatives may delegate any or all responsibilities under the Agreement to appropriate staff members, and shall so inform AXYS by written notice before the effective date of each such delegation.

5.4 The review comments of Delaware's designated representatives may be reported in writing as needed to AXYS. It is understood that Delaware's representatives' review comments do not relieve AXYS from the responsibility for the professional and technical accuracy of all work delivered under this Agreement.

5.5 Delaware shall, without charge, furnish to or make available for examination or use by AXYS as

it may request, any data which Delaware has available, including as examples only and not as a limitation:

a. Copies of reports, surveys, records, and other pertinent documents;
b. Copies of previously prepared reports, job specifications, surveys, records, ordinances, codes, regulations, other document, and information related to the services specified by any Addendum to this Agreement.

AXYS shall return any original data provided by Delaware.

5.6 Delaware shall assist AXYS in obtaining data on documents from public officers or agencies and from private citizens and business firms whenever such material is necessary for the completion of the services specified in any Addendum to this Agreement.

5.7 AXYS will not be responsible for accuracy of information or data supplied by Delaware or other sources to the extent such information or data would be relied upon by a reasonably prudent contractor.

5.8 Delaware agrees not to use AXYS's name, either express or implied, in any of its advertising or sales materials. AXYS reserves the right to reuse the nonproprietary data and the analysis of industry-related information in its continuing analysis of the industries covered.

6. Work Product.

6.1 All materials, information, documents, and reports, whether finished, unfinished, or draft, developed, prepared, completed, or acquired by AXYS for Delaware relating to the services to be performed hereunder shall become the property of Delaware and shall be delivered to Delaware's designated representative upon completion or termination of this Agreement, whichever comes first. AXYS shall not be liable for damages, claims, and losses arising out of any reuse of any work products on any other project conducted by Delaware. Delaware shall have the right to reproduce all documentation supplied pursuant to this Agreement.

6.2 AXYS retains all title and interest to the data it furnished and/or generated pursuant to this Agreement. Retention of such title and interest does not conflict with Delaware's rights to the materials, information and documents developed in performing the project. Upon final payment, Delaware shall have a perpetual, nontransferable, non-exclusive paid-up right and license to use, copy, modify and prepare derivative works of all materials in which AXYS retains title, whether individually by AXYS or jointly with Delaware. Any and all source code developed in connection with the services provided will be provided to Delaware, and the aforementioned right and license shall apply to source code. The parties will cooperate with each other and execute such other documents as may be reasonably deemed necessary to achieve the objectives of this Section.

6.3 In no event shall AXYS be precluded from developing for itself, or for others, materials that are competitive with the Deliverables, irrespective of their similarity to the Deliverables. In addition, AXYS shall be free to use its general knowledge, skills and experience, and any ideas, concepts, know-how, and techniques within the scope of its consulting practice that are used in the course of providing the services.

6.4 Notwithstanding anything to the contrary contained herein or in any attachment hereto, any and all intellectual property or other proprietary data owned by AXYS prior to the effective date of this Agreement ("Preexisting Information") shall remain the exclusive property of AXYS even if such Preexisting Information is embedded or otherwise incorporated into materials or products first produced as a result of this Agreement or used to develop such materials or products. Delaware's rights under this section shall not apply to any Preexisting Information or any component thereof regardless of form or media.

7. Confidential Information.

To the extent permissible under 29 *Del. C.* § 10001, et seq., the parties to this Agreement shall preserve in strict confidence any information, reports or documents obtained, assembled or prepared in connection with the performance of this Agreement.

8. Warranty.

8.1 AXYS warrants that its services will be performed in a good and workmanlike manner. AXYS agrees to re-perform any work not in compliance with this warranty brought to its attention within a reasonable time after that work is performed.

8.2 Third-party products within the scope of this Agreement are warranted solely under the terms and conditions of the licenses or other agreements by which such products are governed. With respect to all third-party products and services purchased by AXYS for Delaware in connection with the provision of the Services, AXYS shall pass through or assign to Delaware the rights AXYS obtains from the manufacturers and/or vendors of such products and services (including warranty and indemnification rights), all to the extent that such rights are assignable.

9. Indemnification; Limitation of Liability.

9.1 AXYS shall indemnify and hold harmless the State, its agents and employees, from any and all liability, suits, actions or claims, together with all reasonable costs and expenses (including attorneys' fees) directly arising out of (A) the negligence or other wrongful conduct of the AXYS, its agents or employees, or (B) AXYS's breach of any material provision of this Agreement not cured after due notice and opportunity to cure, provided as to (A) or (B) that (i) AXYS shall have been notified promptly in writing by Delaware of any notice of such claim; and (ii) AXYS shall have the sole control of the defense of any action on such claim and all negotiations for its settlement or compromise.

9.2 If Delaware promptly notifies AXYS in writing of a third party claim against Delaware that any Deliverable infringes a copyright or a trade secret of any third party, AXYS will defend such claim at its expense and will pay any costs or damages that may be finally awarded against Delaware. AXYS will not indemnify Delaware, however, if the claim of infringement is caused by (1) Delaware's misuse or modification of the Deliverable; (2) Delaware's failure to use corrections or enhancements made available by AXYS; (3) Delaware's use of the Deliverable in combination with any product or information not owned or developed by AXYS; (4) Delaware's distribution, marketing or use for the benefit of third parties of the Deliverable or (5) information, direction, specification or materials provided by Client or any third party. If any Deliverable is, or in AXYS's opinion is likely to be, held to be infringing, AXYS shall at its expense and option either (a) procure the right for Delaware to continue using it, (b) replace it with a noninfringing equivalent, (c) modify it to make it noninfringing. The

foregoing remedies constitute Delaware's sole and exclusive remedies and AXYS's entire liability with respect to infringement.

9.3 Delaware agrees that AXYS' total liability to Delaware for any and all damages whatsoever arising out of or in any way related to this Agreement from any cause, including but not limited to contract liability or AXYS negligence, errors, omissions, strict liability, breach of contract or breach of warranty shall not, in the aggregate, exceed fees paid to AXYS.

10. Employees.

10.1 AXYS has and shall retain the right to exercise full control over the employment, direction, compensation and discharge of all persons employed by AXYS in the performance of the services hereunder; provided, however, that it will, subject to scheduling and staffing considerations, attempt to honor Delaware's request for specific individuals.

10.2 Except as the other party expressly authorizes in writing in advance, neither party shall solicit, offer work to, employ, or contract with, whether as a partner, employee or independent contractor, directly or indirectly, any of the other party's Personnel during their participation in the services or during the twelve (12) months thereafter. For purposes of this Section 10.2, "Personnel" includes any individual or company a party employs as a partner, employee or independent contractor and with which a party comes into direct contact in the course of the services.

11. Independent Contractor.

11.1 It is understood that in the performance of the services herein provided for, AXYS shall be, and is, an independent contractor, and is not an agent or employee of Delaware and shall furnish such services in its own manner and method except as required by this Agreement. AXYS shall be solely responsible for, and shall indemnify, defend and save Delaware harmless from all matters relating to the payment of its employees, including compliance with social security, withholding and all other wages, salaries, benefits, taxes, exactions, and regulations of any nature whatsoever.

11.2 AXYS acknowledges that AXYS and any subcontractors, agents or employees employed by AXYS shall not, under any circumstances, be considered employees of Delaware, and that they shall not be entitled to any of the benefits or rights afforded employees of Delaware, including, but not limited to, sick leave, vacation leave, holiday pay, Public Employees Retirement System benefits, or health, life, dental, long-term disability or workers' compensation insurance benefits. Delaware will not provide or pay for any liability or medical insurance, retirement contributions or any other benefits for or on behalf of Delaware or any of its officers, employees or other agents.

11.3 AXYS shall be responsible for providing liability insurance for its personnel.

11.4 As an independent contractor, AXYS has no authority to bind or commit Delaware. Nothing herein shall be deemed or construed to create a joint venture, partnership, fiduciary or agency relationship between the parties for any purpose.

12. Suspension.

12.1 Delaware may suspend performance by AXYS under this Agreement, or any Addendum hereto,

for such period of time as Delaware, at its sole discretion, may prescribe by providing written notice to AXYS at least 30 working days prior to the date on which Delaware wishes to suspend. Upon such suspension, Delaware shall pay AXYS its compensation, based on the percentage of the project completed and earned until the effective date of suspension, less all previous payments. AXYS shall not perform further work under this Agreement, or any Addendum hereto, to which the suspension applies, after the effective date of suspension until receipt of written notice from Delaware to resume performance.

12.2 In the event Delaware suspends performance by AXYS for any cause other than the error or omission of the AXYS, for an aggregate period in excess of 30 days, AXYS shall be entitled to an equitable adjustment of the compensation payable to AXYS under this Agreement, or any Addendum hereto to which the suspension applies, to reimburse AXYS for additional costs occasioned as a result of such suspension of performance by Delaware based on appropriated funds and approval by Delaware.

13. Termination.

13.1 This Agreement, or any Addendum hereto, may be terminated in whole or in part by either party in the event of substantial failure of the other party to fulfill its obligations under this Agreement through no fault of the terminating party; but only after the other party is given:

a. Not less than 30 calendar days written notice of intent to terminate; and
b. An opportunity for consultation with the terminating party prior to termination.

13.2 This Agreement, or any Addendum hereto, may be terminated in whole or in part by Delaware for its convenience, but only after AXYS is given:

a. Not less than 30 calendar days written notice of intent to terminate; and
b. An opportunity for consultation with Delaware prior to termination.

13.3 If termination for default is effected by Delaware, Delaware will pay AXYS that portion of the compensation which has been earned as of the effective date of termination but:

a. No amount shall be allowed for anticipated profit on performed or unperformed services or other work, and
b. Any payment due to AXYS at the time of termination may be adjusted to the extent of any additional costs occasioned to Delaware by reason of AXYS's default.
c. Upon termination for default, Delaware may take over the work and prosecute the same to completion by agreement with another party or otherwise. In the event AXYS shall cease conducting business, Delaware shall have the right to make an unsolicited offer of employment to any employees of AXYS assigned to the performance of the Agreement, or any Addendum hereto, notwithstanding the provisions of Section 10.2.

13.4 If after termination for failure of AXYS to fulfill contractual obligations it is determined that AXYS has not so failed, the termination shall be deemed to have been effected for the convenience of Delaware.

13.5 The rights and remedies of Delaware and AXYS provided in this section are in addition to any

other rights and remedies provided by law or under this Agreement.

13.6 Gratuities.

13.6.1 Delaware may, by written notice to AXYS, terminate this Agreement, or any Addendum hereto, if it is found after notice and hearing by Delaware that gratuities (in the form of entertainment, gifts, or otherwise) were offered or given by AXYS or any agent or representative of AXYS to any officer or employee of Delaware with a view toward securing a contract or securing favorable treatment with respect to the awarding or amending or making of any determinations with respect to the performance of this Agreement.

13.6.2 In the event this Agreement, or any Addendum hereto, is terminated as provided in 13.6.1 hereof, Delaware shall be entitled to pursue the same remedies against AXYS it could pursue in the event of a breach of this Agreement by AXYS.

13.6.3 The rights and remedies of Delaware provided in Section 13.6 shall not be exclusive and are in addition to any other rights and remedies provided by law or under this Agreement.

14. Severability.

If any term or provision of this Agreement is found by a court of competent jurisdiction to be invalid, illegal or otherwise unenforceable, the same shall not affect the other terms or provisions hereof or the whole of this Agreement, but such term or provision shall be deemed modified to the extent necessary in the court's opinion to render such term or provision enforceable, and the rights and obligations of the parties shall be construed and enforced accordingly, preserving to the fullest permissible extent the intent and agreements of the parties herein set forth.

15. Assignment; Subcontracts.

15.1 Any attempt by AXYS to assign or otherwise transfer any interest in this Agreement without the prior written consent of Delaware shall be void. Such consent shall not be unreasonably withheld.

15.2 Services specified by this Agreement shall not be subcontracted by AXYS, without prior written approval of Delaware.

15.3 Approval by Delaware of AXYS's request to subcontract or acceptance of or payment for subcontracted work by Delaware shall not in any way relieve AXYS of responsibility for the professional and technical accuracy and adequacy of the work. All subcontractors shall adhere to all applicable provisions of this Agreement.

15.4 AXYS shall be and remain liable for all damages to Delaware caused by negligent performance or non-performance of work under this Agreement by AXYS, its subcontractor or its sub-subcontractor.

15.5 The compensation due shall not be affected by Delaware's approval of the AXYS's request to subcontract.

16. Force Majeure.

Neither party shall be liable for any delays or failures in performance due to circumstances beyond its reasonable control.

17. Non-Appropriation of Funds.

17.1 Validity and enforcement of this Agreement is subject to appropriations by the General Assembly of the specific funds necessary for contract performance. Should such funds not be so appropriated, Delaware may immediately terminate this Agreement, or any Addendum hereto, and absent such action this Agreement, or any Addendum hereto, shall be terminated as to any obligation of the State requiring the expenditure of money for which no specific appropriation is available and received, at the end of the last fiscal year for which no appropriation is available or upon the exhaustion of funds.

17.2 Notwithstanding any other provisions of this Agreement, this Agreement shall terminate and Delaware's obligations under it shall be extinguished at the end of the fiscal year in which Delaware fails to appropriate monies for the ensuing fiscal year sufficient for the payment of all amounts which will then become due.

18. State of Delaware Business License.

The requirement that AXYS have a Delaware business license was determined by the Delaware Division of Revenue to not apply because: 1) AXYS does not have a physical place of business in the State of Delaware; 2) AXYS does not have any employees in the State of Delaware; and 3) AXYS will not be entering the State of Delaware to perform their services under this Agreement, or any Addendum hereto. Should any of these conditions change during the term of this Agreement to invalidate the Delaware Division of Revenue's determination, AXYS will notify Delaware and will promptly obtain a Delaware business license.

19. Complete Agreement.

19.1 This Agreement, its Appendices, and any Addendum hereto shall constitute the entire agreement between Delaware and AXYS with respect to the subject matter of this Agreement and shall not be modified or changed without the express written consent of the parties. The provisions of this agreement supersede all prior oral and written quotations, communications, agreements and understandings of the parties with respect to the subject matter of this Agreement.

19.2 If the scope of any provision of this Agreement is too broad in any respect whatsoever to permit enforcement to its full extent, then such provision shall be enforced to the maximum extent permitted by law, and the parties hereto consent and agree that such scope may be judicially modified accordingly and that the whole of such provisions of the Agreement shall not thereby fail, but the scope of such provision shall be curtailed only to the extent necessary to conform to the law.

19.3 AXYS may not order any product requiring a purchase order prior to Delaware's issuance of such order. Each Appendix and any Addendum, except as its terms otherwise expressly provide, shall be a complete statement of its subject matter and shall supplement and modify the terms and conditions of this Agreement for the purposes of that engagement only. No other agreements,

representations, warranties or other matters, whether oral or written, shall be deemed to bind the parties hereto with respect to the subject matter hereof.

20. Miscellaneous Provisions.

20.1 In performance of this Agreement, AXYS shall comply with all applicable federal, state and local laws, ordinances, codes and regulations. AXYS shall solely bear the costs of permits and other relevant costs required in the performance of this Agreement.

20.2 Neither this Agreement, or any Addendum hereto, may be modified or amended except by the mutual written agreement of the parties. No waiver of any provision of this Agreement, or any Addendum hereto, shall be effective unless it is in writing and signed by the party against which it is sought to be enforced.

20.3 The delay or failure by either party to exercise or enforce any of its rights under this Agreement, or any Addendum hereto, shall not constitute or be deemed a waiver of that party's right thereafter to enforce those rights, nor shall any single or partial exercise of any such right preclude any other or further exercise thereof or the exercise of any other right.

20.4 AXYS covenants that it presently has no interest and that it will not acquire any interest, direct or indirect, which would conflict in any manner or degree with the performance of services required to be performed under this Agreement. AXYS further covenants, to its knowledge and ability, that in the performance of said services no person having any such interest shall be employed.

20.5 AXYS acknowledges that Delaware has an obligation to ensure that public funds are not used to subsidize private discrimination. AXYS recognizes that if they refuse to hire or do business with an individual or company due to reasons of race, color, gender, ethnicity, disability, national origin, age, or any other protected status, Delaware may declare AXYS in breach of the Agreement, terminate the Agreement, and designate AXYS as non-responsible.

20.6 AXYS warrants that no person or selling agency has been employed or retained to solicit or secure this Agreement upon an agreement or understanding for a commission, or a percentage, brokerage or contingent fee. For breach or violation of this warranty, Delaware shall have the right to annul this contract without liability or at its discretion deduct from the contract price or otherwise recover the full amount of such commission, percentage, brokerage or contingent fee.

20.7 This Agreement was drafted with the joint participation of both parties and shall be construed neither against nor in favor of either, but rather in accordance with the fair meaning thereof.

20.8 AXYS shall maintain all public records, as defined by 29 *Del. C.* § 502(7), relating to this Agreement and its deliverables for the time and in the manner specified by the Delaware Division of Archives, pursuant to the Delaware Public Records Law, 29 *Del. C.* Ch. 5. During the term of this Agreement, authorized representatives of Delaware may inspect or audit AXYS's performance and records pertaining to this Agreement at the AXYS business office during normal business hours.

21. Insurance.

21.1 AXYS shall maintain, at a minimum, the following insurance, or its equivalent, during the term

of this Agreement:

A. Worker's Compensation and Employer's Liability Insurance in accordance with applicable law, **and**

B. Comprehensive General Liability - $1,000,000.00 per person/$3,000,000 per occurrence, **and**

C. Medical/Professional Liability - $1,000,000.00 per person/$3,000,000 per occurrence; or

D. Miscellaneous Errors and Omissions - $1,000,000.00 per person/$3,000,000 per occurrence, or

E. Product Liability - $1,000,000.00 per person/$3,000,000 per occurrence, **and**

F. If required to transport state employees, Automotive Liability Insurance covering all automotive units used in the work with limits of not less than $100,000 each person and $300,000 each accident as to bodily injury and $25,000 as to property damage to others.

21.2. AXYS shall provide forty-five (45) days written notice of cancellation or material change of any policies.

21.3. Before any work is done pursuant to this Agreement, the Certificate of Insurance and/or copies of the insurance policies, referencing the contract number stated herein, shall be filed with the State. The certificate holder is as follows: AXYS Analytical Services, 2045 Mills Road West, Sidney, British Columbia, Canada V8L 5X2

22. Assignment of Antitrust Claims.

As consideration for the award and execution of this Agreement by the State, AXYS hereby grants, conveys, sells, assigns, and transfers to Delaware all of its right, title and interest in and to all known or unknown causes of action it presently has or may now or hereafter acquire under the antitrust laws of the United States and the State of Delaware, relating to the particular goods or services purchased or acquired by the State pursuant to this Agreement.

23. Governing Law.

This Agreement shall be governed by and construed in accordance with the laws of the State of Delaware, except where Federal Law has precedence. AXYS consents to jurisdiction venue in the State of Delaware.

24. Notices.

Any and all notices required by the provisions of this Agreement shall be in writing and shall be mailed, certified or registered mail, return receipt requested. All notices shall be sent to the following addresses:

TO DELAWARE: Richard Greene
Delaware Department of Natural Resources and

Environmental Control
Division of Watershed Stewardship
Watershed Assessment Section
820 Silver Lake Blvd., Suite 220
Dover, DE 19904-2464

TO AXYS:

Richard Grace
AXYS Analytical Services Ltd.
2045 Mills Road West
Sidney, BC Canada V8L 5X2

SIGNATURE PAGE TO FOLLOW

IN WITNESS THEREOF, the Parties hereto have caused this Agreement to be duly executed as of the date and year first above written.

Original on File

Witness

Date: 9/25/14

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

Original on File

Name: David Small

Title: Secretary

Date: 9/25/14

Original on File

Witness

Date: 11-SEP-2014

AXYS ANALYTICAL SERVICES

Original on File

Name: RICHARD GRACE

Title: PRESIDENT

Date: 11-SEPT-2014

APPENDIX 1
REQUEST FOR PROPOSALS FOR PROFESSIONAL SERVICES
WATERSHED APPROACH TO TOXICS ASSESSMENT AND RESTORATION
ISSUED BY DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
CONTRACT NUMBER NAT14190-WATER

REQUEST FOR PROPOSALS FOR PROFESSIONAL SERVICES
WATERSHED APPRAOCH TO TOXICS ASSESSMENT AND RESTORATION
ISSUED BY DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
CONTRACT NUMBER NAT14190-WATAR

I. Overview

The State of Delaware Department of Natural Resources and Environmental Control, seeks professional services for outsourced specialty laboratory services. This request for proposals ("RFP") is issued pursuant to 29 *Del. C.* §§ 6981 and 6982.

The proposed schedule of events subject to the RFP is outlined below:

Public Notice	Date: August 8, 2014
Deadline for Questions	Date: August 13, 2014 at 4:00PM (Local Time)
Response to Questions Posted by:	Date: August 19, 2014
Deadline for Receipt of Proposals	Date: August 29, 2014 at 1:00 PM (Local Time)
Estimated Notification of Award	Date: within 90-days

Each proposal must be accompanied by a transmittal letter which briefly summarizes the proposing firm's interest in providing the required professional services. The transmittal letter must also clearly state and justify any exceptions to the requirements of the RFP which the applicant may have taken in presenting the proposal. (Applicant exceptions must also be recorded on Attachment 3). The State of Delaware reserves the right to deny any and all exceptions taken to the RFP requirements.

MANDATORY PREBID MEETING

A mandatory pre-bid meting has not been established for this Request for Proposal.

II. General Information

A. Background and Nature of Work

The State of Delaware Department of Natural Resources and Environmental Control (DNREC) has developed a multi-year program to assess toxic contamination in the State's waters, sediments and biota on a watershed scale. The name of the program is Watershed Approach to Toxic Assessment and Restoration (WATAR). In support of the program, DNREC requires certain specialty laboratory services not available through DNREC's laboratory or through other laboratories currently under contract with the state.

B. Statement of Work

The full State of Work appears as Appendix A of this RFP. Briefly, the work entails specialty laboratory services for filter, resin, sediment, water, and tissue samples on an "as and when" requested basis by DNREC. Analytes of interest include polychlorinated biphenyl (PCB) congeners, dioxins and furans, parent and alkylated polyaromatic hydrocarbons (PAHs), and organochlorine pesticides. Required detection limits appear in Appendix B of this RFP.

III. Required Information

The following information shall be provided in each proposal in the order listed below. Failure to respond to any request for information within this proposal may result in rejection of the proposal at the sole discretion of the State.

A. Minimum Requirements

1. Provide Delaware license(s) necessary to perform services as identified in the scope of work.

   Prior to the execution of an award document, the successful Vendor shall either furnish the Agency with proof of State of Delaware Business Licensure or initiate the process of application where required.

2. Vendor shall provide responses to the Request for Proposal (RFP) scope of work and clearly identify capabilities as presented in the General Evaluation Requirements below.

3. Complete all appropriate attachments and forms as identified within the RFP.

4. Proof of insurance and amount of insurance shall be furnished to the Agency prior to the start of the contract period and shall be no less than as identified in the bid solicitation, Section D, Item 7, subsection e.

5. Provide response to Employing Delawareans Report (Attachment 9)

6. Bidders must provide the required certifications listed in Appendix C, Part 1, A.1 of this RFP to be considered for a contract. DNREC may declare a bid non-responsive if the required certifications are not completed and submitted as requested.

   Compliance with the certifications submitted to DNREC by the bidders is subject to verification by DNREC during the bid evaluation period (before award of a contract) and after award of a contract. DNREC will have the right to ask for additional information to verify bidders' compliance with the certifications before award of a contract. The bid will be declared non-responsive if any certification made by the Bidder is untrue, whether made knowingly or unknowingly. Failure to comply with the certifications or to comply with the request of DNREC for additional information will also render the bid non-responsive.

   Certifications Precedent to Contract Award: The certifications listed in Appendix C, PART 1, A.1 should be completed and submitted with the bid, but may be submitted afterwards. If any of the required certifications are not completed and submitted as requested, DNREC will so inform the Bidder and provide the Bidder with a time frame within which to meet the requirement. Failure to comply with the requirement within that time period will render the bid non-responsive.

IV. Professional Services RFP Administrative Information

A. RFP Issuance

1. Public Notice
Public notice has been provided in accordance with 29 *Del. C.* §6981.

2. Obtaining Copies of the RFP
This RFP is available in electronic form through the State of Delaware Procurement website at www.bids.delaware.gov . Paper copies of this RFP will not be available.

3. Assistance to Vendors with a Disability
Vendors with a disability may receive accommodation regarding the means of communicating this RFP or participating in the procurement process. For more information, contact the Designated Contact no later than ten days prior to the deadline for receipt of proposals.

4. RFP Designated Contact
All requests, questions, or other communications about this RFP shall be made in writing to the State of Delaware. Address all communications to the person listed below; communications made to other State of Delaware personnel or attempting to ask questions by phone or in person will not be allowed or recognized as valid and may disqualify the vendor. Vendors should rely only on written statements issued by the RFP designated contact.

Richard W. Greene, Ph.D.
State of Delaware DNREC
Division of Watershed Stewardship
820 Silver Lake Blvd., Suite 220
Dover, DE 19904-2464
Richard.greene@state.de.us

To ensure that written requests are received and answered in a timely manner, electronic mail (e-mail) correspondence is acceptable, but other forms of delivery, such as postal and courier services can also be used.

5. Consultants and Legal Counsel
The State of Delaware may retain consultants or legal counsel to assist in the review and evaluation of this RFP and the vendors' responses. Bidders shall not contact the State's consultant or legal counsel on any matter related to the RFP.

6. Contact with State Employees
Direct contact with State of Delaware employees other than the State of Delaware Designated Contact regarding this RFP is expressly prohibited without prior consent. Vendors directly contacting State of Delaware employees risk elimination of their proposal from further consideration. Exceptions exist only for organizations currently doing business in the State who require contact in the normal course of doing that business.

7. **Organizations Ineligible to Bid**
   Any individual, business, organization, corporation, consortium, partnership, joint venture, or any other entity including subcontractors currently debarred or suspended is ineligible to bid. Any entity ineligible to conduct business in the State of Delaware for any reason is ineligible to respond to the RFP.

8. **Exclusions**
   The Proposal Evaluation Team reserves the right to refuse to consider any proposal from a vendor who:
   - **a.** Has been convicted for commission of a criminal offense as an incident to obtaining or attempting to obtain a public or private contract or subcontract, or in the performance of the contract or subcontract:
   - **b.** Has been convicted under State or Federal statutes of embezzlement, theft, forgery, bribery, falsification or destruction of records, receiving stolen property, or other offense indicating a lack of business integrity or business honesty that currently and seriously affects responsibility as a State contractor:
   - **c.** Has been convicted or has had a civil judgment entered for a violation under State or Federal antitrust statutes:
   - **d.** Has violated contract provisions such as;
     1) Knowing failure without good cause to perform in accordance with the specifications or within the time limit provided in the contract; or
     2) Failure to perform or unsatisfactory performance in accordance with terms of one or more contracts;
   - **e.** Has violated ethical standards set out in law or regulation; and
   - **f.** Any other cause listed in regulations of the State of Delaware determined to be serious and compelling as to affect responsibility as a State contractor, including suspension or debarment by another governmental entity for a cause listed in the regulations.

B. RFP Submissions

1. **Acknowledgement of Understanding of Terms**
   By submitting a bid, each vendor shall be deemed to acknowledge that it has carefully read all sections of this RFP, including all forms, schedules and exhibits hereto, and has fully informed itself as to all existing conditions and limitations.

2. **Proposals**
   To be considered, all proposals must be submitted in writing and respond to the items outlined in this RFP. The State reserves the right to reject any non-responsive or non-conforming proposals.

   All properly sealed and marked proposals are to be sent to the State of Delaware and received no later than **1:00 PM (Local Time)** on **August 29, 2014**. The Proposals may be delivered by Express Delivery (e.g., FedEx, UPS, etc.), US Mail, or by hand to:

   Richard W. Greene, Ph.D.
   State of Delaware DNREC
   Division of Watershed Stewardship
   820 Silver Lake Blvd., Suite 220
   Dover, DE 19904-2464

Vendors are directed to clearly print "BID ENCLOSED" and "CONTRACT NO. NAT14190-WATAR" on the outside of the bid submission package.

Any proposal submitted by US Mail shall be sent by either certified or registered mail. Proposals must be received at the above address no later than **1:00 PM (Local Time)** on **August 29, 2014.** Any proposal received after this date shall not be considered and shall be returned unopened. The proposing vendor bears the risk of delays in delivery. The contents of any proposal shall not be disclosed as to be made available to competing entities during the negotiation process.

Upon receipt of vendor proposals, each vendor shall be presumed to be thoroughly familiar with all specifications and requirements of this RFP. The failure or omission to examine any form, instrument or document shall in no way relieve vendors from any obligation in respect to this RFP.

3. **Number of Copies With Mailing of Proposal**
DNREC requests that bidders provide their bid in separately bound sections as follows:

Section 1 – Technical Bid (3 Hard Copies)

Section 2 – Financial Bid (3 Hard Copies)

Section 3 - Certifications (1 Hard Copy)

Section I: Technical Bid - In their technical bid, bidders should explain and demonstrate their understanding of the requirements contained in the bid solicitation and explain how they will meet these requirements. Bidders should demonstrate their capability for carrying out work described in a thorough, concise and clear manner. The Technical bid should address clearly and in sufficient depth the points that are subject to the evaluation criteria against which the bid will be evaluated. Simply repeating the statement contained in the bid solicitation is not sufficient. In order to facilitate the evaluation of the bid, DNREC requests that bidders address and present topics in the order of the evaluation criteria under the same headings. To avoid duplication, bidders may refer to different sections of their bids by identifying the specific paragraph and page number where the subject topic has already been addressed.

Section II: Financial Bid - Bidders must submit their financial bid in U.S. dollars in accordance with Appendix C, PART 2 (Financial Evaluation).

Section III: Certifications - Bidders must submit the certifications required under Part 5.

An electronic copy must also be provided on CD, DVD, or other media disk with the hard copy submission. For DNREC's convenience, electronic copies may also be submitted via electronic mail to Richard.greene@state.de.us. Electronic submission via email does not waive the requirement for hard copy and electronic submission via mail or hand-delivery.

4. **Proposal Modifications**
   Any changes, amendments or modifications to a proposal must be made in writing, submitted in the same manner as the original response and conspicuously labeled as a change, amendment or modification to a previously submitted proposal. Changes, amendments or modifications to proposals shall not be accepted or considered after the hour and date specified as the deadline for submission of proposals.

5. **Proposal Costs and Expenses**
   The State of Delaware will not pay any costs incurred by any Vendor associated with any aspect of responding to this solicitation, including proposal preparation, printing or delivery, attendance at vendor's conference, system demonstrations or negotiation process.

6. **Proposal Expiration Date**
   Prices quoted in the proposal shall remain fixed and binding on the bidder at least through November 29, 2014. The State of Delaware reserves the right to ask for an extension of time if needed.

7. **Late Proposals**
   Proposals received after the specified date and time will not be accepted or considered. To guard against premature opening, sealed proposals shall be submitted, plainly marked with the proposal title, vendor name, and time and date of the proposal opening. Evaluation of the proposals is expected to begin shortly after the proposal due date. To document compliance with the deadline, the proposal will be date and time stamped upon receipt.

8. **Proposal Opening**
   The State of Delaware will receive proposals until the date and time shown in this RFP. Proposals will be opened only in the presence of the State of Delaware personnel. Any unopened proposals will be returned to the submitting Vendor.

   There will be no public opening of proposals but a public log will be kept of the names of all vendor organizations that submitted proposals. The contents of any proposal shall not be disclosed in accordance with Executive Order # 31 and Title 29, Delaware Code, Chapter 100.

9. **Non-Conforming Proposals**
   Non-conforming proposals will not be considered. Non-conforming proposals are defined as those that do not meet the requirements of this RFP. The determination of whether an RFP requirement is substantive or a mere formality shall reside solely within the State of Delaware.

10. **Concise Proposals**
    The State of Delaware discourages overly lengthy and costly proposals. It is the desire that proposals be prepared in a straightforward and concise manner. Unnecessarily elaborate brochures or other promotional materials beyond those sufficient to present a complete and effective proposal are not desired. The State of Delaware's interest is in the quality and responsiveness of the proposal.

11. **Realistic Proposals**

It is the expectation of the State of Delaware that vendors can fully satisfy the obligations of the proposal in the manner and timeframe defined within the proposal. Proposals must be realistic and must represent the best estimate of time, materials and other costs including the impact of inflation and any economic or other factors that are reasonably predictable.

The State of Delaware shall bear no responsibility or increase obligation for a vendor's failure to accurately estimate the costs or resources required to meet the obligations defined in the proposal.

12. Confidentiality of Documents

All documents submitted as part of the vendor's proposal will be deemed confidential during the evaluation process. Vendor proposals will not be available for review by anyone other than the State of Delaware/Proposal Evaluation Team or its designated agents. There shall be no disclosure of any vendor's information to a competing vendor prior to award of the contract.

The State of Delaware is a public agency as defined by state law, and as such, it is subject to the Delaware Freedom of Information Act, 29 *Del. C.* Ch. 100. Under the law, all the State of Delaware's records are public records (unless otherwise declared by law to be confidential) and are subject to inspection and copying by any person. Vendor(s) are advised that once a proposal is received by the State of Delaware and a decision on contract award is made, its contents will become public record and nothing contained in the proposal will be deemed to be confidential except proprietary information.

Vendor(s) shall not include any information in their proposal that is proprietary in nature or that they would not want to be released to the public. Proposals must contain sufficient information to be evaluated and a contract written without reference to any proprietary information. If a vendor feels that they cannot submit their proposal without including proprietary information, they must adhere to the following procedure or their proposal may be deemed unresponsive and will not be recommended for selection. Vendor(s) must submit such information in a separate, sealed envelope labeled "Proprietary Information" with the RFP number. The envelope must contain a letter from the Vendor's legal counsel describing the documents in the envelope, representing in good faith that the information in each document is not "public record" as defined by 29 *Del. C.* § 10002(d), and briefly stating the reasons that each document meets the said definitions.

Upon receipt of a proposal accompanied by such a separate, sealed envelope, the State of Delaware will open the envelope to determine whether the procedure described above has been followed.

13. Multi-Vendor Solutions (Joint Ventures)

Multi-vendor solutions (joint ventures) will be allowed only if one of the venture partners is designated as the "**prime contractor**". The "**prime contractor**" must be the joint venture's contact point for the State of Delaware and be responsible for the joint venture's performance under the contract, including all project management, legal and financial responsibility for the implementation of all vendor systems. If a joint venture is proposed, a copy of the joint venture agreement clearly describing the responsibilities of the partners must be submitted with the proposal. Services

specified in the proposal shall not be subcontracted without prior written approval by the State of Delaware, and approval of a request to subcontract shall not in any way relieve Vendor of responsibility for the professional and technical accuracy and adequacy of the work. Further, vendor shall be and remain liable for all damages to the State of Delaware caused by negligent performance or non-performance of work by its subcontractor or its sub-subcontractor.

Multi-vendor proposals must be a consolidated response with all cost included in the cost summary. Where necessary, RFP response pages are to be duplicated for each vendor.

a. **Primary Vendor**
The State of Delaware expects to negotiate and contract with only one "prime vendor". The State of Delaware will not accept any proposals that reflect an equal teaming arrangement or from vendors who are co-bidding on this RFP. The prime vendor will be responsible for the management of all subcontractors.

Any contract that may result from this RFP shall specify that the prime vendor is solely responsible for fulfillment of any contract with the State as a result of this procurement. The State will make contract payments only to the awarded vendor. Payments to any-subcontractors are the sole responsibility of the prime vendor (awarded vendor).

Nothing in this section shall prohibit the State of Delaware from the full exercise of its options under Section IV.B.16 regarding multiple source contracting.

b. **Sub-contracting**
The vendor selected shall be solely responsible for contractual performance and management of all subcontract relationships. This contract allows subcontracting assignments; however, vendors assume all responsibility for work quality, delivery, installation, maintenance, and any supporting services required by a subcontractor.

Use of subcontractors must be clearly explained in the proposal, and major subcontractors must be identified by name. **The prime vendor shall be wholly responsible for the entire contract performance whether or not subcontractors are used.** Any sub-contractors must be approved by State of Delaware.

c. **Multiple Proposals**
A primary vendor may not participate in more than one proposal in any form. Sub-contracting vendors may participate in multiple joint venture proposals.

14. Sub-Contracting
The vendor selected shall be solely responsible for contractual performance and management of all subcontract relationships. This contract allows subcontracting assignments; however, vendors assume all responsibility for work quality, delivery, installation, maintenance, and any supporting services required by a subcontractor.

Use of subcontractors must be clearly explained in the proposal, and subcontractors must be identified by name. Any sub-contractors must be approved by State of Delaware.

15. Discrepancies and Omissions

Vendor is fully responsible for the completeness and accuracy of their proposal, and for examining this RFP and all addenda. Failure to do so will be at the sole risk of vendor. Should vendor find discrepancies, omissions, unclear or ambiguous intent or meaning, or should any questions arise concerning this RFP, vendor shall notify the State of Delaware's Designated Contact, in writing, of such findings at least ten (10) days before the proposal opening. This will allow issuance of any necessary addenda. It will also help prevent the opening of a defective proposal and exposure of vendor's proposal upon which award could not be made. All unresolved issues should be addressed in the proposal.

Protests based on any omission or error, or on the content of the solicitation, will be disallowed if these faults have not been brought to the attention of the Designated Contact, in writing, at least ten (10) calendar days prior to the time set for opening of the proposals.

a. RFP Question and Answer Process

The State of Delaware will allow written requests for clarification of the RFP. All questions will be consolidated into a single set of responses and posted on the State's website at www.bids.delaware.gov by the date of **August 13th, 4:00PM Local Time**. Vendor names will be removed from questions in the responses released. Questions should be submitted in the following format. Deviations from this format will not be accepted.

Section number

Paragraph number

Page number

Text of passage being questioned

Care should be taken by bidders to explain each question in sufficient detail in order to enable DNREC to provide an accurate answer. Technical inquiries that are of a proprietary nature must be clearly marked "proprietary" at each relevant item. Items identified as "proprietary" will be treated as such except where DNREC determines that the inquiry is not of a proprietary nature. DNREC may edit the questions or may request that the Bidder do so, so that the proprietary nature of the question is eliminated, and the inquiry can be answered with copies to all bidders. Inquiries not submitted in a form that can be distributed to all bidders may not be answered by DNREC.

16. State's Right to Reject Proposals

The State of Delaware reserves the right to accept or reject any or all proposals or any part of any proposal, to waive defects, technicalities or any specifications (whether they be in the State of Delaware's specifications or vendor's response), to sit and act as sole judge of the merit and qualifications of each product offered, or to solicit new proposals on the same project or on a modified project which may include portions of the originally proposed project as the State of Delaware may deem necessary in the best interest of the State of Delaware.

17. State's Right to Cancel Solicitation

The State of Delaware reserves the right to cancel this solicitation at any time during the procurement process, for any reason or for no reason. The State of Delaware makes no commitments expressed or implied, that this process will result in a business transaction with any vendor.

This RFP does not constitute an offer by the State of Delaware. Vendor's participation in this process may result in the State of Delaware selecting your organization to engage in further discussions and negotiations toward execution of a contract. The commencement of such negotiations does not, however, signify a commitment by the State of Delaware to execute a contract nor to continue negotiations. The State of Delaware may terminate negotiations at any time and for any reason, or for no reason.

18. State's Right to Award Multiple Source Contracting

Pursuant to 29 *Del. C.* § 6986, the State of Delaware may award a contract for a particular professional service to two or more vendors if the agency head makes a determination that such an award is in the best interest of the State of Delaware.

19. Notification of Withdrawal of Proposal

Vendor may modify or withdraw its proposal by written request, provided that both proposal and request is received by the State of Delaware prior to the proposal due date. Proposals may be re-submitted in accordance with the proposal due date in order to be considered further.

Proposals become the property of the State of Delaware at the proposal submission deadline. All proposals received are considered firm offers at that time.

20. Revisions to the RFP

If it becomes necessary to revise any part of the RFP, an addendum will be posted on the State of Delaware's website at www.bids.delaware.gov . The State of Delaware is not bound by any statement related to this RFP made by any State of Delaware employee, contractor or its agents.

21. Exceptions to the RFP

Any exceptions to the RFP, or the State of Delaware's terms and conditions, must be recorded on Attachment 3. Acceptance of exceptions is within the sole discretion of the evaluation committee.

22. Award of Contract

The final award of a contract is subject to approval by the State of Delaware. The State of Delaware has the sole right to select the successful vendor(s) for award, to reject any proposal as unsatisfactory or non-responsive, to award a contract to other than the lowest priced proposal, to award multiple contracts, or not to award a contract, as a result of this RFP.

Notice in writing to a vendor of the acceptance of its proposal by the State of Delaware and the subsequent full execution of a written contract will constitute a contract, and no vendor will acquire any legal or equitable rights or privileges until the occurrence of both such events.

a. RFP Award Notifications

After reviews of the evaluation committee report and its recommendation, and once the contract terms and conditions have been finalized, the State of Delaware will award the contract.

The contract shall be awarded to the vendor whose proposal is most advantageous, taking into consideration the evaluation factors set forth in the RFP.

It should be explicitly noted that the State of Delaware is not obligated to award the contract to the vendor who submits the lowest bid or the vendor who receives the highest total point score, rather the contract will be awarded to the vendor whose proposal is the most advantageous to the State of Delaware. The award is subject to the appropriate State of Delaware approvals.

After a final selection is made, the winning vendor will be invited to negotiate a contract with the State of Delaware; remaining vendors will be notified in writing of their selection status.

23. Cooperatives

Vendors, who have been awarded similar contracts through a competitive bidding process with a cooperative, are welcome to submit the cooperative pricing for this solicitation.

C. RFP Evaluation Process

An evaluation team composed of representatives of the State of Delaware will evaluate proposals on a variety of quantitative criteria. Neither the lowest price nor highest scoring proposal will necessarily be selected.

The State of Delaware reserves full discretion to determine the competence and responsibility, professionally and/or financially, of vendors. Vendors are to provide in a timely manner any and all information that the State of Delaware may deem necessary to make a decision.

1. Proposal Evaluation Team

The Proposal Evaluation Team shall be comprised of representatives of the State of Delaware. The Team shall determine which vendors meet the minimum requirements pursuant to selection criteria of the RFP and procedures established in 29 *Del. C.* §§ 6981 and 6982. The Team may negotiate with one or more vendors during the same period and may, at its discretion, terminate negotiations with any or all vendors. The Team shall make a recommendation regarding the award to the Department of Natural Resources and Environmental Control, who shall have final authority, subject to the provisions of this RFP and 29 *Del. C.* § 6982, to award a contract to the successful vendor in the best interests of the State of Delaware.

2. Proposal Selection Criteria

The Proposal Evaluation Team shall assign up to the maximum number of points for each Evaluation Item to each of the proposing vendor's proposals. All assignments of points shall be at the sole discretion of the Proposal Evaluation Team.

The proposals shall contain the essential information on which the award decision shall be made. The information required to be submitted in response to this RFP has been determined by the State of Delaware to be essential for use by the Team in the bid evaluation and award process. Therefore, all instructions contained in this RFP shall be met in order to qualify as a responsive and responsible contractor and participate in the Proposal Evaluation Team's consideration for award. Proposals which do not meet or comply with the instructions of this RFP may be considered non-conforming and deemed non-responsive and subject to disqualification at the sole discretion of the Team.

The Team reserves the right to:

- Select for contract or for negotiations a proposal other than that with lowest costs.
- Reject any and all proposals or portions of proposals received in response to this RFP or to make no award or issue a new RFP.
- Waive or modify any information, irregularity, or inconsistency in proposals received.
- Request modification to proposals from any or all vendors during the contract review and negotiation.
- Negotiate any aspect of the proposal with any vendor and negotiate with more than one vendor at the same time.
- Select more than one vendor pursuant to 29 *Del. C.* §6986.

Criteria Weight
All proposals shall be evaluated using the same criteria and scoring process. Refer to Appendix C for the criteria to be used by the Evaluation Team to evaluate proposals.

Vendors are encouraged to review the evaluation criteria and to provide a response that addresses each of the scored items. Evaluators will not be able to make assumptions about a vendor's capabilities so the responding vendor should be detailed in their proposal responses.

3. **Proposal Clarification**
The Evaluation Team may contact any vendor in order to clarify uncertainties or eliminate confusion concerning the contents of a proposal. Proposals may not be modified as a result of any such clarification request.

4. **References**
The Evaluation Team may contact any customer of the vendor, whether or not included in the vendor's reference list, and use such information in the evaluation process. Additionally, the State of Delaware may choose to visit existing installations of comparable systems, which may or may not include vendor personnel. If the vendor is involved in such site visits, the State of Delaware will pay travel costs only for State of Delaware personnel for these visits.

5. **Oral Presentations**
After initial scoring and a determination that vendor(s) are qualified to perform the required services, selected vendors may be invited to make oral presentations to the

Evaluation Team. All vendor(s) selected will be given an opportunity to present to the Evaluation Team.

The selected vendors will have their presentations scored or ranked based on their ability to successfully meet the needs of the contract requirements, successfully demonstrate their product and/or service, and respond to questions about the solution capabilities.

The vendor representative(s) attending the oral presentation shall be technically qualified to respond to questions related to the proposed system and its components. All of the vendor's costs associated with participation in oral discussions and system demonstrations conducted for the State of Delaware are the vendor's responsibility.

D. Contract Terms and Conditions

1. Contract Use by Other Agencies

REF: Title 29, Chapter 6904(e) Delaware Code. If no state contract exists for a certain good or service, covered agencies may procure that certain good or service under another agency's contract so long as the arrangement is agreeable to all parties. Agencies, other than covered agencies, may also procure such goods or services under another agency's contract when the arrangement is agreeable to all parties.

2. Cooperative Use of Award

As a publicly competed contract awarded in compliance with 29 DE Code Chapter 69, this contract is available for use by other states and/or governmental entities through a participating addendum. Interested parties should contact the State Contract Procurement Officer identified in the contract for instruction. Final approval for permitting participation in this contract resides with the Director of Government Support Services and in no way places any obligation upon the awarded vendor(s).

3. General Information

a. The term of the contract between the successful bidder and the State shall be for three years with two (2) optional extensions for a period of one (1) year for each extension.

b. The selected vendor will be required to enter into a written agreement with the State of Delaware. The State of Delaware reserves the right to incorporate standard State contractual provisions into any contract negotiated as a result of a proposal submitted in response to this RFP. Any proposed modifications to the terms and conditions of the standard contract are subject to review and approval by the State of Delaware. Vendors will be required to sign the contract for all services, and may be required to sign additional agreements. **Sample of the State of Delaware's Professional Services Agreement can be found in Appendix E.**

c. The selected vendor or vendors will be expected to enter negotiations with the State of Delaware, which will result in a formal contract between parties. Procurement will be in accordance with subsequent contracted agreement. This RFP and the selected vendor's response to this RFP will be incorporated as part of any formal contract.

d. The State of Delaware's standard contract will most likely be supplemented with the vendor's software license, support/maintenance, source code escrow

agreements, and any other applicable agreements. The terms and conditions of these agreements will be negotiated with the finalist during actual contract negotiations.

e. The successful vendor shall promptly execute a contract incorporating the terms of this RFP within twenty (20) days after award of the contract. No vendor is to begin any service prior to receipt of a State of Delaware purchase order signed by two authorized representatives of the agency requesting service, properly processed through the State of Delaware Accounting Office and the Department of Finance. The purchase order shall serve as the authorization to proceed in accordance with the bid specifications and the special instructions, once it is received by the successful vendor.

f. If the vendor to whom the award is made fails to enter into the agreement as herein provided, the award will be annulled, and an award may be made to another vendor. Such vendor shall fulfill every stipulation embraced herein as if they were the party to whom the first award was made.

4. Collusion or Fraud

Any evidence of agreement or collusion among vendor(s) and prospective vendor(s) acting to illegally restrain freedom from competition by agreement to offer a fixed price, or otherwise, will render the offers of such vendor(s) void.

By responding, the vendor shall be deemed to have represented and warranted that its proposal is not made in connection with any competing vendor submitting a separate response to this RFP, and is in all respects fair and without collusion or fraud; that the vendor did not participate in the RFP development process and had no knowledge of the specific contents of the RFP prior to its issuance; and that no employee or official of the State of Delaware participated directly or indirectly in the vendor's proposal preparation.

Advance knowledge of information which gives any particular vendor advantages over any other interested vendor(s), in advance of the opening of proposals, whether in response to advertising or an employee or representative thereof, will potentially void that particular proposal.

5. Lobbying and Gratuities

Lobbying or providing gratuities shall be strictly prohibited. Vendors found to be lobbying, providing gratuities to, or in any way attempting to influence a State of Delaware employee or agent of the State of Delaware concerning this RFP or the award of a contract resulting from this RFP shall have their proposal immediately rejected and shall be barred from further participation in this RFP.

The selected vendor will warrant that no person or selling agency has been employed or retained to solicit or secure a contract resulting from this RFP upon agreement or understanding for a commission, or a percentage, brokerage or contingent fee. For breach or violation of this warranty, the State of Delaware shall have the right to annul any contract resulting from this RFP without liability or at its discretion deduct from the contract price or otherwise recover the full amount of such commission, percentage, brokerage or contingent fee.

All contact with State of Delaware employees, contractors or agents of the State of Delaware concerning this RFP shall be conducted in strict accordance with the manner, forum and conditions set forth in this RFP.

6. **Solicitation of State Employees**
Until contract award, vendors shall not, directly or indirectly, solicit any employee of the State of Delaware to leave the State of Delaware's employ in order to accept employment with the vendor, its affiliates, actual or prospective contractors, or any person acting in concert with vendor, without prior written approval of the State of Delaware's contracting officer. Solicitation of State of Delaware employees by a vendor may result in rejection of the vendor's proposal.

This paragraph does not prevent the employment by a vendor of a State of Delaware employee who has initiated contact with the vendor. However, State of Delaware employees may be legally prohibited from accepting employment with the contractor or subcontractor under certain circumstances. Vendors may not knowingly employ a person who cannot legally accept employment under state or federal law. If a vendor discovers that they have done so, they must terminate that employment immediately.

7. **General Contract Terms**
   a. **Independent Contractors**
   The parties to the contract shall be independent contractors to one another, and nothing herein shall be deemed to cause this agreement to create an agency, partnership, joint venture or employment relationship between parties. Each party shall be responsible for compliance with all applicable workers compensation, unemployment, disability insurance, social security withholding and all other similar matters. Neither party shall be liable for any debts, accounts, obligations or other liability whatsoever of the other party or any other obligation of the other party to pay on the behalf of its employees or to withhold from any compensation paid to such employees any social benefits, workers compensation insurance premiums or any income or other similar taxes.

   It may be at the State of Delaware's discretion as to the location of work for the contractual support personnel during the project period. The State of Delaware may provide working space and sufficient supplies and material to augment the Contractor's services.

   b. **Temporary Personnel are Not State Employees Unless and Until They are Hired**
   Vendor agrees that any individual or group of temporary staff person(s) provided to the State of Delaware pursuant to this Solicitation shall remain the employee(s) of Vendor for all purposes including any required compliance with the Affordable Care Act by the Vendor. Vendor agrees that it shall not allege, argue, or take any position that individual temporary staff person(s) provided to the State pursuant to this Solicitation must be provided any benefits, including any healthcare benefits by the State of Delaware and Vendor agrees to assume the total and complete responsibility for the provision of any healthcare benefits required by the Affordable Care Act to aforesaid individual temporary staff person(s). In the event that the Internal Revenue Service, or any other third party governmental entity determines that the State of Delaware is a dual employer or the sole employer of any individual temporary staff person(s)

provided to the State of Delaware pursuant to this Solicitation, Vendor agrees to hold harmless, indemnify, and defend the State to the maximum extent of any liability to the State arising out of such determinations.

Notwithstanding the content of the preceding paragraph, should the State of Delaware subsequently directly hire any individual temporary staff employee(s) provided pursuant to this Solicitation, the aforementioned obligations to hold harmless, indemnify, and defend the State of Delaware shall cease and terminate for the period following the date of hire. Nothing herein shall be deemed to terminate the Vendor's obligation to hold harmless, indemnify, and defend the State of Delaware for any liability that arises out of compliance with the ACA prior to the date of hire by the State of Delaware. Vendor will waive any separation fee provided an employee works for both the vendor and hiring agency, continuously, for a three (3) month period and is provided thirty (30) days written notice of intent to hire from the agency. Notice can be issued at second month if it is the State's intention to hire.

c. Licenses and Permits

In performance of the contract, the vendor will be required to comply with all applicable federal, state and local laws, ordinances, codes, and regulations. The cost of permits and other relevant costs required in the performance of the contract shall be borne by the successful vendor. The vendor shall be properly licensed and authorized to transact business in the State of Delaware as provided in 30 *Del. C.* § 2502.

Prior to receiving an award, the successful vendor shall either furnish the State of Delaware with proof of State of Delaware Business Licensure or initiate the process of application where required. An application may be requested in writing to: Division of Revenue, Carvel State Building, P.O. Box 8750, 820 N. French Street, Wilmington, DE 19899 or by telephone to one of the following numbers: (302) 577-8200—Public Service, (302) 577-8205—Licensing Department.

Information regarding the award of the contract will be given to the Division of Revenue. Failure to comply with the State of Delaware licensing requirements may subject vendor to applicable fines and/or interest penalties.

d. Notice

Any notice to the State of Delaware required under the contract shall be sent by registered mail to:

Richard W. Greene, Ph.D.
State of Delaware DNREC
Division of Watershed Stewardship
820 Silver Lake Blvd., Suite 220
Dover, DE 19904-2464

e. Indemnification

1. General Indemnification

By submitting a proposal, the proposing vendor agrees that in the event it is awarded a contract, it will indemnify and otherwise hold harmless the State of

Delaware, its agents and employees from any and all liability, suits, actions, or claims, together with all costs, expenses for attorney's fees, arising out of the vendor's, its agents and employees' performance work or services in connection with the contract, regardless of whether such suits, actions, claims or liabilities are based upon acts or failures to act attributable, whole or part, to the State, its employees or agents.

2. **Proprietary Rights Indemnification**
Vendor shall warrant that all elements of its solution, including all equipment, software, documentation, services and deliverables, do not and will not infringe upon or violate any patent, copyright, trade secret or other proprietary rights of any third party. In the event of any claim, suit or action by any third party against the State of Delaware, the State of Delaware shall promptly notify the vendor in writing and vendor shall defend such claim, suit or action at vendor's expense, and vendor shall indemnify the State of Delaware against any loss, cost, damage, expense or liability arising out of such claim, suit or action (including, without limitation, litigation costs, lost employee time, and counsel fees) whether or not such claim, suit or action is successful.

If any equipment, software, services (including methods) products or other intellectual property used or furnished by the vendor (collectively ""Products") is or in vendor's reasonable judgment is likely to be, held to constitute an infringing product, vendor shall at its expense and option either:

a. Procure the right for the State of Delaware to continue using the Product(s);
b. Replace the product with a non-infringing equivalent that satisfies all the requirements of the contract; or
c. Modify the Product(s) to make it or them non-infringing, provided that the modification does not materially alter the functionality or efficacy of the product or cause the Product(s) or any part of the work to fail to conform to the requirements of the Contract, or only alters the Product(s) to a degree that the State of Delaware agrees to and accepts in writing.

f. Insurance

1. Vendor recognizes that it is operating as an independent contractor and that it is liable for any and all losses, penalties, damages, expenses, attorney's fees, judgments, and/or settlements incurred by reason of injury to or death of any and all persons, or injury to any and all property, of any nature, arising out of the vendor's negligent performance under this contract, and particularly without limiting the foregoing, caused by, resulting from, or arising out of any act of omission on the part of the vendor in their negligent performance under this contract.
2. The vendor shall maintain such insurance as will protect against claims under Worker's Compensation Act and from any other claims for damages for personal injury, including death, which may arise from operations under this contract. The vendor is an independent contractor and is not an employee of the State of Delaware.

3. During the term of this contract, the vendor shall, at its own expense, also carry insurance minimum limits as follows:

a.	Commercial General Liability	$1,000,000 per occurrence / $3,000,000 aggregate

And at least one of the following, as outlined below:

b.	Medical or Professional Liability	$1,000,000 per occurrence / $3,000,000 aggregate
c	Misc. Errors and Omissions	$1,000,000 per occurrence / $3,000,000 aggregate
d	Product Liability	$1,000,000 per occurrence / $3,000,000 aggregate

The successful vendor must carry (a) and at least one of (b), (c), or (d) above, depending on the type of Service or Product being delivered.

If the contractual service requires the transportation of departmental clients or staff, the vendor shall, in addition to the above coverage's, secure at its own expense the following coverage;

a.	Automotive Liability (Bodily Injury)	$100,000/$300,000
b.	Automotive Property Damage (to others)	$ 25,000

4. The vendor shall provide a Certificate of Insurance (COI) as proof that the vendor has the required insurance. The COI shall be provided prior to agency contact prior to any work being completed by the awarded vendor(s).
5. The State of Delaware shall not be named as an additional insured.
6. Should any of the above described policies be cancelled before expiration date thereof, notice will be delivered in accordance with the policy provisions.

g. Performance Requirements

The selected Vendor will warrant that it possesses, or has arranged through subcontractors, all capital and other equipment, labor, materials, and licenses necessary to carry out and complete the work hereunder in compliance with any and all Federal and State laws, and County and local ordinances, regulations and codes.

h. Vendor Emergency Response Point of Contact

The awarded vendor(s) shall provide the name(s), telephone, or cell phone number(s) of those individuals who can be contacted twenty four (24) hours a day, seven (7) days a week where there is a critical need for commodities or services when the Governor of the State of Delaware declares a state of emergency under the Delaware Emergency Operations Plan or in the event of a local emergency or disaster where a state governmental entity requires the services of the vendor. Failure to provide this information could render the proposal as non-responsive.

In the event of a serious emergency, pandemic or disaster outside the control of the State, the State may negotiate, as may be authorized by law, emergency performance from the Contractor to address the immediate needs of the State, even if not contemplated under the original Contract or procurement. Payments are subject to appropriation and other payment terms.

i. Warranty

The Vendor will provide a warranty that the deliverables provided pursuant to the contract will function as designed for a period of no less than one (1) year from the date of system acceptance. The warranty shall require the Vendor correct, at its own expense, the setup, configuration, customizations or modifications so that it functions according to the State's requirements.

j. Costs and Payment Schedules

All contract costs must be as detailed specifically in the Vendor's cost proposal. No charges other than as specified in the proposal shall be allowed without written consent of the State of Delaware. The proposal costs shall include full compensation for all taxes that the selected vendor is required to pay.

The State of Delaware will require a payment schedule based on defined and measurable milestones. Payments for services will not be made in advance of work performed. The State of Delaware may require holdback of contract monies until acceptable performance is demonstrated (as much as 25%).

k. Penalties

The State of Delaware may include in the final contract penalty provisions for non-performance, such as liquidated damages.

l. Termination of Contract

The contract resulting from this RFP may be terminated as follows by Department of Natural Resources and Environmental Control.

1. **Termination for Cause**: If, for any reasons, or through any cause, the Vendor fails to fulfill in timely and proper manner its obligations under this Contract, or if the Vendor violates any of the covenants, agreements, or stipulations of this Contract, the State shall thereupon have the right to terminate this contract by giving written notice to the Vendor of such termination and specifying the effective date thereof, at least twenty (20) days before the effective date of such termination. In that event, all finished or unfinished documents, data, studies, surveys, drawings, maps, models, photographs, and reports or other material prepared by the Vendor under this Contract shall, at the option of the State, become its property, and the Vendor shall be entitled to receive just and equitable compensation for any satisfactory work completed on such documents and other materials which is usable to the State.

   On receipt of the contract cancellation notice from the State, the Vendor shall have no less than five (5) days to provide a written response and may identify a method(s) to resolve the violation(s). A vendor response shall not effect or prevent the contract cancellation unless the State provides a written acceptance of the vendor response. If the State does accept the Vendor's method and/or action plan to correct the identified deficiencies, the State will define the time by which the Vendor must fulfill its corrective obligations. Final retraction of the

State's termination for cause will only occur after the Vendor successfully rectifies the original violation(s). At its discretion the State may reject in writing the Vendor's proposed action plan and proceed with the original contract cancellation timeline.

2. **Termination for Convenience**: The State may terminate this Contract at any time by giving written notice of such termination and specifying the effective date thereof, at least twenty (20) days before the effective date of such termination. In that event, all finished or unfinished documents, data, studies, surveys, drawings, models, photographs, reports, supplies, and other materials shall, at the option of the State, become its property and the Vendor shall be entitled to receive compensation for any satisfactory work completed on such documents and other materials, and which is usable to the State.
3. **Termination for Non-Appropriations**: In the event the General Assembly fails to appropriate the specific funds necessary to enter into or continue the contractual agreement, in whole or part, the agreement shall be terminated as to any obligation of the State requiring the expenditure of money for which no specific appropriation is available at the end of the last fiscal year for which no appropriation is available or upon the exhaustion of funds. This is not a termination for convenience and will not be converted to such.

m. Non-discrimination

In performing the services subject to this RFP the vendor, as set forth in Title 19 Delaware Code Chapter 7 section 711, will agree that it will not discriminate against any employee or applicant with respect to compensation, terms, conditions or privileges of employment because of such individual's race, marital status, genetic information, color, age, religion, sex, sexual orientation, gender identity, or national origin. The successful vendor shall comply with all federal and state laws, regulations and policies pertaining to the prevention of discriminatory employment practice. Failure to perform under this provision constitutes a material breach of contract.

n. Covenant against Contingent Fees

The successful vendor will warrant that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement of understanding for a commission or percentage, brokerage or contingent fee excepting bona-fide employees, bona-fide established commercial or selling agencies maintained by the Vendor for the purpose of securing business. For breach or violation of this warranty the State of Delaware shall have the right to annul the contract without liability or at its discretion to deduct from the contract price or otherwise recover the full amount of such commission, percentage, brokerage or contingent fee.

o. Vendor Activity

No activity is to be executed in an off shore facility, either by a subcontracted firm or a foreign office or division of the vendor. The vendor must attest to the fact that no activity will take place outside of the United States in its transmittal letter. Failure to adhere to this requirement is cause for elimination from future consideration.

p. Vendor Responsibility

The State will enter into a contract with the successful Vendor(s). The successful Vendor(s) shall be responsible for all products and services as required by this ITB whether or not the Vendor or its subcontractor provided final fulfillment of the order. Subcontractors, if any, shall be clearly identified in the Vendor's proposal by completing Attachment 6, and are subject the approval and acceptance of Department of Natural Resources and Environmental Control.

q. Personnel, Equipment and Services

1. The Vendor represents that it has, or will secure at its own expense, all personnel required to perform the services required under this contract.
2. All of the equipment and services required hereunder shall be provided by or performed by the Vendor or under its direct supervision, and all personnel, including subcontractors, engaged in the work shall be fully qualified and shall be authorized under State and local law to perform such services.
3. None of the equipment and/or services covered by this contract shall be subcontracted without the prior written approval of the State. Only those subcontractors identified in Attachment 6 are considered approved upon award. Changes to those subcontractor(s) listed in Attachment 6 must be approved in writing by the State.

r. Fair Background Check Practices

Pursuant to 29 Del. C. §6909B and effective November 4, 2014 the State does not consider the criminal record, criminal history, credit history or credit score of an applicant for state employment during the initial application process unless otherwise required by state and/or federal law. Vendors doing business with the State are encouraged to adopt fair background check practices. Vendors can refer to 19 Del. C. §711(g) for applicable established provisions.

s. Work Product

All materials and products developed under the executed contract by the vendor are the sole and exclusive property of the State. The vendor will seek written permission to use any product created under the contract.

t. Contract Documents

The RFP, the purchase order, the executed contract and any supplemental documents between the State of Delaware and the successful vendor shall constitute the contract between the State of Delaware and the vendor. In the event there is any discrepancy between any of these contract documents, the following order of documents governs so that the former prevails over the latter: contract, State of Delaware's RFP, Vendor's response to the RFP and purchase order. No other documents shall be considered. These documents will constitute the entire agreement between the State of Delaware and the vendor.

u. Applicable Law

The laws of the State of Delaware shall apply, except where Federal Law has precedence. The successful vendor consents to jurisdiction and venue in the State of Delaware.

In submitting a proposal, Vendors certify that they comply with all federal, state and local laws applicable to its activities and obligations including:

1. the laws of the State of Delaware;
2. the applicable portion of the Federal Civil Rights Act of 1964;
3. the Equal Employment Opportunity Act and the regulations issued there under by the federal government;
4. a condition that the proposal submitted was independently arrived at, without collusion, under penalty of perjury; and
5. that programs, services, and activities provided to the general public under resulting contract conform with the Americans with Disabilities Act of 1990, and the regulations issued there under by the federal government.

If any vendor fails to comply with (1) through (5) of this paragraph, the State of Delaware reserves the right to disregard the proposal, terminate the contract, or consider the vendor in default.

The selected vendor shall keep itself fully informed of and shall observe and comply with all applicable existing Federal and State laws, and County and local ordinances, regulations and codes, and those laws, ordinances, regulations, and codes adopted during its performance of the work.

v. Severability

If any term or provision of this Agreement is found by a court of competent jurisdiction to be invalid, illegal or otherwise unenforceable, the same shall not affect the other terms or provisions hereof or the whole of this Agreement, but such term or provision shall be deemed modified to the extent necessary in the court's opinion to render such term or provision enforceable, and the rights and obligations of the parties shall be construed and enforced accordingly, preserving to the fullest permissible extent the intent and agreements of the parties herein set forth.

w. Scope of Agreement

If the scope of any provision of the contract is determined to be too broad in any respect whatsoever to permit enforcement to its full extent, then such provision shall be enforced to the maximum extent permitted by law, and the parties hereto consent and agree that such scope may be judicially modified accordingly and that the whole of such provisions of the contract shall not thereby fail, but the scope of such provisions shall be curtailed only to the extent necessary to conform to the law.

x. Affirmation

The Vendor must affirm that within the past five (5) years the firm or any officer, controlling stockholder, partner, principal, or other person substantially involved in the contracting activities of the business is not currently suspended or debarred and is not a successor, subsidiary, or affiliate of a suspended or debarred business.

y. Audit Access to Records

The Vendor shall maintain books, records, documents, and other evidence pertaining to this Contract to the extent and in such detail as shall adequately reflect performance hereunder. The Vendor agrees to preserve and make available to the State, upon request, such records for a period of five (5) years

from the date services were rendered by the Vendor. Records involving matters in litigation shall be retained for one (1) year following the termination of such litigation. The Vendor agrees to make such records available for inspection, audit, or reproduction to any official State representative in the performance of their duties under the Contract. Upon notice given to the Vendor, representatives of the State or other duly authorized State or Federal agency may inspect, monitor, and/or evaluate the cost and billing records or other material relative to this Contract. The cost of any Contract audit disallowances resulting from the examination of the Vendor's financial records will be borne by the Vendor. Reimbursement to the State for disallowances shall be drawn from the Vendor's own resources and not charged to Contract cost or cost pools indirectly charging Contract costs.

z. Other General Conditions

1. **Current Version** – "Packaged" application and system software shall be the most current version generally available as of the date of the physical installation of the software.
2. **Current Manufacture** – Equipment specified and/or furnished under this specification shall be standard products of manufacturers regularly engaged in the production of such equipment and shall be the manufacturer's latest design. All material and equipment offered shall be new and unused.
3. **Volumes and Quantities** – Activity volume estimates and other quantities have been reviewed for accuracy; however, they may be subject to change prior or subsequent to award of the contract.
4. **Prior Use** – The State of Delaware reserves the right to use equipment and material furnished under this proposal prior to final acceptance. Such use shall not constitute acceptance of the work or any part thereof by the State of Delaware.
5. **Status Reporting** – The selected vendor will be required to lead and/or participate in status meetings and submit status reports covering such items as progress of work being performed, milestones attained, resources expended, problems encountered and corrective action taken, until final system acceptance.
6. **Regulations** – All equipment, software and services must meet all applicable local, State and Federal regulations in effect on the date of the contract.
7. **Changes** – No alterations in any terms, conditions, delivery, price, quality, or specifications of items ordered will be effective without the written consent of the State of Delaware.
8. **Purchase Orders** – Agencies that are part of the First State Financial (FSF) system are required to identify the contract number NAT14190-WATAR on all Purchase Orders (P.O.) and shall complete the same when entering P.O. information in the state's financial reporting system.
9. **Additional Terms and Conditions** – The State of Delaware reserves the right to add terms and conditions during the contract negotiations.

E. RFP Miscellaneous Information

1. No Press Releases or Public Disclosure

The State of Delaware reserves the right to pre-approve any news or broadcast advertising releases concerning this solicitation, the resulting contract, the work performed, or any reference to the State of Delaware with regard to any project or contract performance. Any such news or advertising releases pertaining to this solicitation or resulting contract shall require the prior express written permission of the State of Delaware.

The State will not prohibit or otherwise prevent the awarded vendor(s) from direct marketing to the State of Delaware agencies, departments, municipalities, and/or any other political subdivisions, however, the Vendor shall not use the State's seal or imply preference for the solution or goods provided.

2. Definitions of Requirements

To prevent any confusion about identifying requirements in this RFP, the following definition is offered: The words *shall*, will and/or *must* are used to designate a mandatory requirement. Vendors must respond to all mandatory requirements presented in the RFP. Failure to respond to a mandatory requirement may cause the disqualification of your proposal.

3. Production Environment Requirements

The State of Delaware requires that all hardware, system software products, and application software products included in proposals be currently in use in a production environment by a least three other customers, have been in use for at least six months, and have been generally available from the manufacturers for a period of six months. Unreleased or beta test hardware, system software, or application software will not be acceptable.

F. Attachments

The following attachments and appendixes shall be considered part of the solicitation:

- Attachment 1 – No Proposal Reply Form
- Attachment 2 – Non-Collusion Statement
- Attachment 3 – Exceptions
- Attachment 4 – Confidentiality and Proprietary Information
- Attachment 5 – Business References
- Attachment 6 – Subcontractor Information Form
- Attachment 7 – Monthly Usage Report
- Attachment 8 – Subcontracting (2nd Tier Spend) Report
- Attachment 9 – Employing Delawareans Report
- Attachment 10 – Office of Supplier Diversity Application
- Appendix A – Statement of Work
- Appendix B – Target Analytes and Required Detection Limits (Range)
- Appendix C – Evaluation Criteria and Basis of Selection
- Appendix D – Example of BEST VALUE Determination
- Appendix E – Example Professional Services Agreement

STATE OF DELAWARE
Department of Natural Resources and Environmental Control

IMPORTANT – PLEASE NOTE

- **Attachments 2, 3, 4, 5 and 9 must be included in your proposal**
- Attachment 6 must be included in your proposal if subcontractors will be involved
- Attachments 7 and 8 represent required reporting on the part of awarded vendors. Those bidders receiving an award will be provided with active spreadsheets for reporting.

REQUIRED REPORTING

One of the primary goals in administering this contract is to keep accurate records regarding its actual value/usage. This information is essential in order to update the contents of the contract and to establish proper bonding levels if they are required. The integrity of future contracts revolves around our ability to convey accurate and realistic information to all interested parties.

A complete and accurate Usage Report (Attachment 7) shall be furnished in an **Excel format and submitted electronically**, no later than the 15th (or next business day after the 15th day) of each month, detailing the purchasing of all items on this contract. The reports shall be submitted and sent as an attachment to vendorusage@state.de.us. Submitted reports shall contain accurate descriptions of the products, goods or services procured, purchasing agency information, including the six-digit department and organization code, quantities procured and prices paid. Any exception to this mandatory requirement or failure to submit complete reports, or in the format required, may result corrective action, up to and including the possible cancellation of the award. Failure to provide the report with the minimum required information may also negate any contract extension clauses. Additionally, Vendors who are determined to be in default of this mandatory report requirement may have such conduct considered against them, in assessment of responsibility, in the evaluation of future proposals.

AGENCIES MAY NOT REMOVE SUBCONTRACTING 2ND TIER REPORTS – required by Executive Order.

In accordance with Executive Order 44, the State of Delaware is committed to supporting its diverse business industry and population. The successful Vendor will be required to accurately report on the participation by Diversity Suppliers which includes: minority (MBE), woman (WBE), veteran owned business (VOBE), or service disabled veteran owned business (SDVOBE) under this awarded contract. The reported data elements shall include but not be limited to; name of state contract/project, the name of the Diversity Supplier, Diversity Supplier contact information (phone, email), type of product or service provided by the Diversity Supplier and any minority, women, veteran, or service disabled veteran certifications for the subcontractor (State OSD certification, Minority Supplier Development Council, Women's Business Enterprise Council, VetBiz.gov). The format used for Subcontracting 2nd Tier report is shown as in Attachment 8.

Accurate 2nd tier reports shall be submitted to the contracting Agency's Office of Supplier Diversity at vendorusage@state.de.us on the 15th (or next business day) of the month following each quarterly period. For consistency quarters shall be considered to end the last day of March, June, September and December of each calendar year. Contract spend during the covered periods shall result in a report even if the contract has expired by the report due date.

STATE OF DELAWARE
Department of Natural Resources and Environmental Control

Attachment 1

NO PROPOSAL REPLY FORM

Contract No. NAT14190-WATAR
Contract Title: Watershed Approach to Toxics Assessment and Restoration

To assist us in obtaining good competition on our Request for Proposals, we ask that each firm that has received a proposal, but does not wish to bid, state their reason(s) below and return in a clearly marked envelope displaying the contract number. This information will not preclude receipt of future invitations unless you request removal from the Vendor's List by so indicating below, or do not return this form or bona fide proposal.

Unfortunately, we must offer a "No Proposal" at this time because:

_____ 1. We do not wish to participate in the proposal process.

_____ 2. We do not wish to bid under the terms and conditions of the Request for Proposal document. Our objections are:

_____

_____

_____ 3. We do not feel we can be competitive.

_____ 4. We cannot submit a Proposal because of the marketing or franchising policies of the manufacturing company.

_____ 5. We do not wish to sell to the State. Our objections are:

_____

_____

_____ 6. We do not sell the items/services on which Proposals are requested.

_____ 7. Other:_____

_____

_____ _____
FIRM NAME SIGNATURE

_____ We wish to remain on the Vendor's List **for these goods or services**.

_____ We wish to be deleted from the Vendor's List **for these goods or services**.

STATE OF DELAWARE

Department of Natural Resources and Environmental Control

Attachment 2

CONTRACT NO.: **NAT14190-WATAR**
CONTRACT TITLE: **Watershed Approach to Toxics Assessment and Restoration**
OPENING DATE: **August 29, 2014 at 1:00 PM (Local Time)**

NON-COLLUSION STATEMENT

This is to certify that the undersigned Vendor has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal, **and further certifies that it is not a sub-contractor to another Vendor who also submitted a proposal as a primary Vendor in response to this solicitation** submitted this date to the State of Delaware, Department of Natural Resources and Environmental Control.

It is agreed by the undersigned Vendor that the signed delivery of this bid represents the Vendor's acceptance of the terms and conditions of this solicitation including all specifications and special provisions.

NOTE: Signature of the authorized representative **MUST** be of an individual who legally may enter his/her organization into a formal contract with the State of Delaware, Department of Natural Resources and Environmental Control.

COMPANY NAME _____ Check one)

	Corporation
	Partnership
	Individual

NAME OF AUTHORIZED REPRESENTATIVE
(Please type or print) _____

SIGNATURE _____ TITLE _____

COMPANY ADDRESS _____

PHONE NUMBER _____ FAX NUMBER _____

EMAIL ADDRESS _____

FEDERAL E.I. NUMBER _____ STATE OF DELAWARE LICENSE NUMBER _____

COMPANY CLASSIFICATIONS: CERT. NO.: _____	Certification type(s)	Circle all that apply	
	Minority Business Enterprise (MBE)	Yes	No
	Woman Business Enterprise (WBE)	Yes	No
	Disadvantaged Business Enterprise (DBE)	Yes	No
	Veteran Owned Business Enterprise (VOBE)	Yes	No
	Service Disabled Veteran Owned Business Enterprise (SDVOBE)	Yes	No

[The above table is for informational and statistical use only.]

PURCHASE ORDERS SHOULD BE SENT TO:
(COMPANY NAME) _____

ADDRESS _____

CONTACT _____

PHONE NUMBER _____ FAX NUMBER _____

EMAIL ADDRESS _____

AFFIRMATION: Within the past five years, has your firm, any affiliate, any predecessor company or entity, owner, Director, officer, partner or proprietor been the subject of a Federal, State, Local government suspension or debarment?

YES _____ NO _____ if yes, please explain _____

THIS PAGE SHALL HAVE ORIGINAL SIGNATURE, BE NOTARIZED AND BE RETURNED WITH YOUR PROPOSAL

SWORN TO AND SUBSCRIBED BEFORE ME this _____ day of _____, 20 _____

STATE OF DELAWARE

Department of Natural Resources and Environmental Control

Notary Public _____ My commission expires _____

City of _____ County of _____ State of _____

STATE OF DELAWARE
Department of Natural Resources and Environmental Control

Attachment 3

Contract No. NAT14190-WATAR
Contract Title: Watershed Approach to Toxics Assessment and Restoration

EXCEPTION FORM

Proposals must include all exceptions to the specifications, terms or conditions contained in this RFP. If the vendor is submitting the proposal without exceptions, please state so below.

☐ By checking this box, the Vendor acknowledges that they take no exceptions to the specifications, terms or conditions found in this RFP.

Paragraph # and page #	Exceptions to Specifications, terms or conditions	Proposed Alternative

Note: use additional pages as necessary.

STATE OF DELAWARE

Department of Natural Resources and Environmental Control

Attachment 4

Contract No. NAT14190-WATAR
Contract Title: Watershed Approach to Toxics Assessment and Restoration

CONFIDENTIAL INFORMATION FORM

☐ By checking this box, the Vendor acknowledges that they are not providing any information they declare to be confidential or proprietary for the purpose of production under 29 Del. C. ch. 100, Delaware Freedom of Information Act.

Confidentiality and Proprietary Information

Note: use additional pages as necessary.

STATE OF DELAWARE

Department of Natural Resources and Environmental Control

Attachment 5

Contract No. NAT14190-WATAR
Contract Title: Watershed Approach to Toxics Assessment and Restoration

BUSINESS REFERENCES

List a minimum of three business references, including the following information:

- Business Name and Mailing address
- Contact Name and phone number
- Number of years doing business with
- Type of work performed

Please do not list any State Employee as a business reference. If you have held a State contract within the last 5 years, please provide a separate list of the contract(s).

1.	**Contact Name & Title:**	
	Business Name:	
	Address:	
	Email:	
	Phone # / Fax #:	
	Current Vendor (YES or NO):	
	Years Associated & Type of Work Performed:	

2.	**Contact Name & Title:**	
	Business Name:	
	Address:	
	Email:	
	Phone # / Fax #:	
	Current Vendor (YES or NO):	
	Years Associated & Type of Work Performed:	

3.	**Contact Name & Title:**	
	Business Name:	
	Address:	
	Email:	
	Phone # / Fax #:	
	Current Vendor (YES or NO):	
	Years Associated & Type of Work Performed:	

STATE OF DELAWARE PERSONNEL MAY NOT BE USED AS REFERENCES.

STATE OF DELAWARE

Department of Natural Resources and Environmental Control

Attachment 6

SUBCONTRACTOR INFORMATION FORM

<table>
<tr><th colspan="4">PART I – STATEMENT BY PROPOSING VENDOR</th></tr>
<tr><td>1. CONTRACT NO.
NAT14190-WATAR</td><td colspan="2">2. Proposing Vendor Name:</td><td>3. Mailing Address</td></tr>
<tr><td colspan="2">4. SUBCONTRACTOR</td><td colspan="2"></td></tr>
<tr><td colspan="2">a. NAME</td><td colspan="2">4c. Company OSD Classification:

Certification Number: _____</td></tr>
<tr><td colspan="2">b. Mailing Address:</td><td colspan="2">4d. Women Business Enterprise ☐ Yes ☐ No
4e. Minority Business Enterprise ☐ Yes ☐ No
4f. Disadvantaged Business Enterprise ☐ Yes ☐ No
4g. Veteran Owned Business Enterprise ☐ Yes ☐ No
4h. Service Disabled Veteran Owned Business Enterprise ☐ Yes ☐ No</td></tr>
<tr><td colspan="4">5. DESCRIPTION OF WORK BY SUBCONTRACTOR</td></tr>
<tr><td>6a. NAME OF PERSON SIGNING
6b. TITLE OF PERSON SIGNING</td><td colspan="2">7. BY (Signature)</td><td>8. DATE SIGNED</td></tr>
<tr><th colspan="4">PART II – ACKNOWLEDGEMENT BY SUBCONTRACTOR</th></tr>
<tr><td>9a. NAME OF PERSON SIGNING
9b. TITLE OF PERSON SIGNING</td><td colspan="2">10. BY (Signature)</td><td>11. DATE SIGNED</td></tr>
</table>

* Use a separate form for each subcontractor

STATE OF DELAWARE
Department of Natural Resources and Environmental Control

Attachment 7

STATE OF DELAWARE
MONTHLY USAGE REPORT

SAMPLE REPORT - FOR ILLUSTRATION PURPOSES ONLY

State of Delaware									
Monthly Usage Report									
Supplier Name:				Enter Contract No.	**Report Start Date:**				
Contact Name:					**Report End Date:**				
Contact Phone:					**Today's Date:**				
Agency Name or School District	**Division or Name of School**	**Budget Code**	**UNSPSC**	**Item Description**	**Contract Item Number**	**Unit of Measure**	**Qty**	**Contract Proposal Price/Rate**	**Total Spend**
									$0.00
									$0.00
									$0.00
									$0.00
									$0.00
									$0.00
									$0.00
									$0.00
									$0.00
									$0.00
									$0.00
									$0.00

Note: A copy of the Usage Report will be sent by electronic mail to the Awarded Vendor. The report shall be submitted electronically in **EXCEL** and sent as an attachment to vendorusage@state.de.us. It shall contain the six-digit department and organization code for each agency and school district.

STATE OF DELAWARE

Department of Natural Resources and Environmental Control

Attachment 8

SAMPLE REPORT - FOR ILLUSTRATION PURPOSES ONLY

State of Delaware															
Subcontracting (2nd tier) Quarterly Report															
Prime Name:							**Report Start Date:**								
Contract Name/Number							**Report End Date:**								
Contact Name:							**Today's Date:**								
Contact Phone:							*Minimum Required		Requested detail						
Vendor Name*	**Vendor TaxID***	**Contract Name/ Number***	**Vendor Contact Name***	**Vendor Contact Phone***	**Report Start Date***	**Report End Date***	**Amount Paid to Subcontractor***	**Work Performed by Subcontractor UNSPSC**	**M/WBE Certifying Agency**	**Veteran /Service Disabled Veteran Certifying Agency**	**2nd tier Supplier Name**	**2nd tier Supplier Address**	**2nd tier Supplier Phone Number**	**2nd tier Supplier email**	**Description of Work Performed**	**2nd tier Supplier Tax Id**

Note: A copy of the Subcontracting Quarterly Report will be sent by electronic mail to the Awarded Vendor.

Completed reports shall be saved in an Excel format, and submitted to the following email address: vendorusage@state.de.us

STATE OF DELAWARE

Department of Natural Resources and Environmental Control

Attachment 9

Contract No. NAT14190-WATAR
Contract Title: Watershed Approach to Toxics Assessment and Restoration

EMPLOYING DELAWAREANS REPORT

As required by House Bill # 410 (Bond Bill) of the 146th General Assembly and under Section 30, No bid for any public works or professional services contract shall be responsive unless the prospective bidder discloses its reasonable, good-faith determination of:

1. Number of employees reasonable anticipated to be employed on the project: _____

2. Number and percentage of such employees who are bona fide legal residents of Delaware: _____

   Percentage of such employees who are bona fide legal residents of Delaware: _____

3. Total number of employees of the bidder: _____

4. Total percentage of employees who are bona fide resident of Delaware: _____

If subcontractors are to be used:

1. Number of employees who are residents of Delaware: _____

2. Percentage of employees who are residents of Delaware: _____

"Bona fide legal resident of this State" shall mean any resident who has established residence of at least 90 days in the State.

Attachment 10

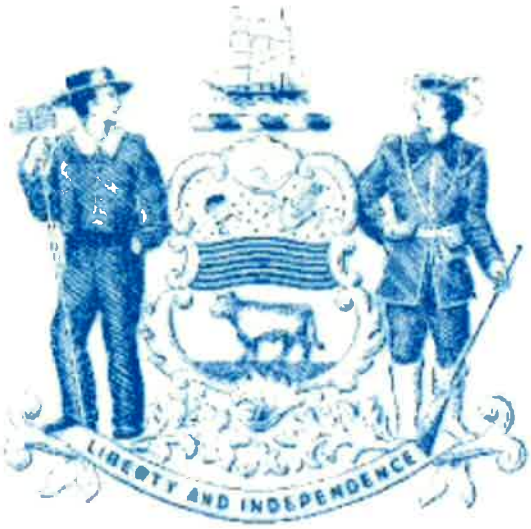
State of Delaware

Office of Supplier Diversity
Certification Application

The most recent application can be downloaded from the following site:
http://gss.omb.delaware.gov/osd/certify.shtml

Submission of a completed Office of Supplier Diversity (OSD) application is optional and does not influence the outcome of any award decision.

The minimum criteria for certification require the entity must be at least 51% owned and actively managed by a person or persons who are eligible: minorities, women, veterans, and/or service disabled veterans. Any one or all of these categories may apply to a 51% owner.



Complete application and mail, email or fax to:

Office of Supplier Diversity (OSD)
100 Enterprise Place, Suite 4
Dover, DE 19904-8202
Telephone: (302) 857-4554 Fax: (302) 677-7086
Email: osd@state.de.us
Web site: http://gss.omb.delaware.gov/osd/index.shtml

STATE OF DELAWARE

Department of Natural Resources and Environmental Control

THE OSD ADDRESS IS FOR OSD APPLICATIONS ONLY.
NO BID RESPONSE PACKAGES WILL BE ACCEPTED BY THE OSD.

STATE OF DELAWARE
Department of Natural Resources and Environmental Control

APPENDIX A
STATEMENT OF WORK

1. **General:** To provide analytical services, including the results of the analysis for DNREC on an as and when requested during the period of the Contract. The analysis will be performed on filter, XAD resin, water, sediment or tissue samples, as and when requested, for some or all of the suites as listed herein. The water, sediment, and tissue (fish) samples will be collected from State of Delaware watersheds to determine the levels of target analytes (PCB Congeners, Dioxin and Furan congeners, OC pesticides and metabolites, and parent and alkylated PAHs) in support of ongoing DNREC activities in the WATAR program. The WATAR program has unique requirements including:

a) An ability to achieve very low detection and quantification limits (with correspondingly low and demonstrated blank level control limits) in whole water samples and in water samples separated into filter and XAD resin portions.
b) An ability to determine target analyte levels in both dissolved and particulate bound phases of water samples collected.
c) The laboratory must have existing procedures to process large volume water samples, submitted in 15-25L carboys provided by the laboratory. Carboys must be processed at the laboratory to produce particulate bound fractions of target analytes on glass wound or glass fiber filters and dissolved phase fractions of target analytes on XAD resin. The purpose of utilizing carboys for sampling is to increase amount of target analyte in each phase to determine target analyte partitioning. There will be one carboy for each sample and all analysis must be performed from that sample. The ability of a laboratory to produce a common extract from filters and XAD for all analysis is required. The ability of a laboratory to fractionate extracts on clean-up columns after extraction, such that splitting of extracts is minimized, is strongly desired to provide the lowest possible detection limits.
d) The use of isotope dilution or internal standard methods is required to maximize detection limit capability and accuracy of results.

Approximately 40% of the samples will be XAD resin or glass wound filter, 20% water, 20% sediment, and 20% tissue (primarily fish).

2. **Analyses Required:** The following analyses must be completed by the successful bidder:

a) Analysis of glass wound filter, XAD resin, water, sediment, and tissue by EPA 1668A (full 209) congeners. Analysis of whole water samples are to be based on nominal 2.5-L grab samples and shall conform to protocols established by the Delaware River Basin Commission (DRBC).
b) Analysis of glass wound filter, XAD resin, water, sediment, and tissue by EPA 1613B.
c) Analysis of glass wound filter, XAD resin, water, sediment, and tissue for OC pesticides using isotope dilution and HRMS (modified EPA 1699 or an equivalent).
d) Analysis of glass wound filter, XAD resin, water, sediment, and tissue for PAH and alkylated PAH compounds by EPA 8270C/D or EPA 1625 (application of isotope dilution to EPA 8270 / EPA 625).
e) Homogenization of tissue for subsequent analysis by established laboratory procedures.
f) Pre-cleaning of filters and filter columns / holders, XAD resin and XAD resin columns and carboys by established laboratory procedures to meet established blank control levels.
g) Processing of Carboy water samples by established laboratory procedures to produce filter and XAD resin samples for subsequent analysis of each by specified methods.

3. **Tasks:** The analytical services requested may include some or all of the following tasks:

a) Preparation of XAD resin and columns including purchasing resin, cleaning resin, cleaning columns, cleaning retaining rings, cleaning fittings; packing columns with XAD resin. Proofing of columns and media should be performed as per existing analytical procedures specified by the laboratory. Resin and columns are to be supplied by the contractor and included in costs.
b) Supply, cleaning, proofing and shipment of carboys sampling devices to DNREC.
c) Processing of returned carboy samples in the laboratory to produce glass wound filter (particulate) and XAD resin (dissolved phase) samples for subsequent analysis for PCBs, Dioxins and Furans, OC Pesticides, and PAHs + alkylated PAHs.
d) Extraction of XAD resin samples, in batches up to 15 samples, for subsequent analysis for PCBs, Dioxins and Furans, OC Pesticides, and PAHs + alkylated PAHs.
e) Extraction of Glass fibre filters (suspended sediment) samples, in batches up to 15 samples at a time, for subsequent analysis of PCBs, Dioxins and Furans, OC Pesticides, and PAHs and alkylated PAHs. Results to be reported on a pg/L or ng/L basis.
f) Extraction of whole water samples or filtered water samples from approx. 2.5L nominal samples for PCBs, Dioxins and Furans, OC Pesticides, and PAHs and alkylated PAHs.
g) Homogenization of tissue samples as required.
h) Analysis of fish tissue or other tissue as directed. Analyses required are PCB congeners, Dioxins and Furans, OC Pesticides, and PAHs plus alkylated PAHs. Moisture and % lipid will be performed on each sample. Results will be reported as pg/g or ng/g wet weight basis.
i) Analysis of sediment samples for PCB congeners, Dioxins and Furans, OC Pesticides, and PAHs plus alkylated PAHs. Moisture determination will be performed for each sample. Results will be reported as pg/g or ng/g dry weight basis.
j) Analyte lists are supplied in Appendix B. Typical detection limits shall be no greater than those detailed in Appendix B and should account for any effects of matrix on the detection system and for recovery achieved through the analytical work-up. A limited number of samples may require multiple analysis per extraction.

Field duplicates are to be considered as samples. Method blanks, laboratory control samples, and laboratory replicate analyses are to be conducted as part of contractors QA/QC program, and not to be considered as samples submitted.

4. **Data & Information Deliverables:** Data reports are to be forwarded to DNREC within 8 weeks following receipt of samples. This is to include:

a) EPA Level IV Data Package per Analytical Batch. Must be on paginated CD in PDF format.
b) Excel based EDD worksheet with all sample identification, results, QC, and flagging results.
c) DNREC EQuIS EDD format.
d) For each format required, the bidding Laboratory is to provide example products from one of the requested tests. All data should be reported to estimated detection limits similar to those specified in EPA 1668A/C and EPA 1613B (based on signal to noise ratio for each mass required for each parameter).

APPENDIX B
TARGET ANALYTES AND REQUESTED DETECTION LIMITS (RANGE)

Matrix	Water	Sediment	Tissue	Resin	Filter
Units	pg/L	pg/g	pg/g	pg/L	pg/L
Sample Size	2.5 L	10 g	10 g	20 L	20 L
209 PCB Congeners	0.5 – 1.0	0.1 - 0.2	0.1 - 0.2	0.05 – 0.10	0.05 – 0.10
2,3,7,8-Substituted Dioxins and Furans	0.2 – 0.4	0.05 - 0.10	0.05 - 0.10	0.025 – 0.05	0.025 – 0.05
Organochlorine Pesticides (see target **List 1** below)	40 - 80	10 - 20	10 - 20	5 - 10	5 - 10
Organochlorine Pesticides (see target **List 2** below)	200	50	50	25	25
Organochlorine Pesticides (see target **List 3** below)	400	100	100	50	50
Polyaromatic Hydrocarbons and Alkylated Homologs (see target list below)	400 - 800	500 - 1000	100 - 200	250 - 500	250 - 500

TARGET LIST OF ORGANOCHLORINE PESTICIDES

Target Organochlorine Pesticides include List 1, 2 and 3.

List 1	List 2	List 3
Hexachlorobenzene	HCH, delta	Technical Toxaphene
HCH, alpha	Heptachlor Epoxide	Methoxychlor
HCH, beta	alpha-Endosulfan	
HCH, gamma	Dieldrin	
Heptachlor	Endrin	
Aldrin	beta-Endosulfan	
Chlordane, oxy-	Endosulfan Sulfate	
Chlordane, gamma (trans)	Endrin Aldehyde	
Chlordane, alpha (cis)	Endrin Ketone	
Nonachlor, trans-		
Nonachlor, cis-		
2,4'-DDD		
4,4'-DDD		
2,4'-DDE		
4,4'-DDE		
2,4'-DDT		
4,4'-DDT		
Mirex		

TARGET LIST OF POLYAROMATIC HYDROCARBONS (PAHs) AND ALKYLATED HOMOLOGS

Target PAHs include List 1, 2 and 3.

List 1 – Standard PAH Parents and Select Alkylated PAHs	List 2 – Additional Alkylated PAHs	List 3 – Extended Alkylated PAHs
Naphthalene	1-methylnaphthalene	C1-Biphenyls
Acenaphthylene	C1-Naphthalenes	C2-Biphenyls
Acenaphthene	1,2-Dimethylnaphthalene	C1-Acenaphthenes
Fluorene	C2-Naphthalenes	2-Methylfluorene
Phenanthrene	2,3,6-Trimethylnaphthalene	C1-Fluorenes
Anthracene	C3-Naphthalenes [1]	1,7-Dimethylfluorene
Fluoranthene	1,4,6,7-Tetramethylnaphthalene	C2-Fluorenes
Pyrene	C4-Naphthalenes	C3-Fluorenes
Benz(a)anthracene	2-Methylphenanthrene	2/3-Methyldibenzothiophenes
Chrysene	3-Methylphenanthrene	C1-Dibenzothiophene
Benzo(b)fluoranthene	9/4-Methylphenanthrenes	2,4-Dimethyldibenzothiophene
Benzo(j/k)fluoranthenes	2-Methylanthracene	C2-Dibenzothiophene
Benzofluoranthenes	C1-Phenanthrenes/Anthracenes	C3-Dibenzothiophene
Benzo(e)pyrene	1,7-Dimethylphenanthrene	C4-Dibenzothiophene
Benzo(a)pyrene	1,8-Dimethylphenanthrene	3-Methylfluoranthene/Benzo(a)fluorene
Perylene	2,6-Dimethylphenanthrene	C1-Fluoranthenes/Pyrenes
Dibenzo(ah)anthracene	3,6-Dimethylphenanthrene	C2-Fluoranthenes/Pyrenes
Indeno(1,2,3-cd)pyrene	C2-Phenanthrenes/Anthracenes	C3-Fluoranthenes/Pyrenes
Benzo(ghi)perylene	1,2,6-Trimethylphenanthrene	C4-Fluoranthenes/Pyrenes
2-Methylnaphthalene	C3-Phenanthrenes/Anthracenes	1-Methylchrysene
2,6-Dimethylnaphthalene	Retene	5/6-Methylchrysenes
2,3,5-Trimethylnaphthalene	C4-Phenanthrenes/Anthracenes	C1-Benz(a)anthracenes/Chrysenes
1-Methylphenanthrene	Biphenyl	5,9-Dimethylchrysene
Dibenzothiophene		C2-Benz(a)anthracenes/Chrysenes
		C3-Benz(a)anthracenes/Chrysenes
		C4-Benz(a)anthracenes/Chrysenes
		7-Methylbenzo(a)pyrene
		C1-Benzofluoranthenes/Benzopyrenes
		C2-Benzofluoranthenes/Benzopyrenes

APPENDIX C
EVALUATION CRITERIA AND BASIS OF SELECTION

I. TECHNICAL EVALUATION CRITERIA

A. Mandatory Requirements: Any proposal which fails to meet the following mandatory requirements will be deemed non-responsive and will receive no further consideration. The words "shall", "must", "essential", "will" and "required" in the RFP are to be interpreted as mandatory requirements. The Bidder must include sufficient details and documentation at time of bid closing to demonstrate its experience and ability to meet the following mandatory criteria.

1. Bidder must have relevant accreditations from a recognized accrediting body (State, NELAP, or ISO 17025) for all parameters specified in the following matrices:

   - Dioxins and Furans by 1613B in Aqueous, Solid, and Tissue matrices;
   - PCB Congeners by EPA 1668A/C - Aqueous, Solid and Tissue matrices;
   - HRMS OC Pesticides based on EPA 1699 or equivalent - Aqueous, Solid and Tissue matrices; and
   - PAHs and Alkylated PAHs by EPA 8270 C/D or EPA 1625 – Aqueous, Solid, and Tissue matrices.

   The bidder should provide a list of 3rd party proficiency testing or inter-calibration exercises completed for each test in these matrices. The bidder should provide reports demonstrating proficiency in each test for aqueous, solid, and tissue matrices.

2. Bidder must demonstrate a minimum of 3 years experience in preparation and handling of XAD resin and glass wound filters for each analytical test requested. Bidder should describe standard operation operating procedures in this area with defined blank acceptance criteria.

3. Bidder must have 3 years experience in performing all organic contaminants analysis requested, at detection levels compliant with those requested, in glass wound filter, XAD, aqueous, solid, and tissue matrices.

4. Bidder must provide proof of lab performance from XAD and glass wound filters created from carboy samples from the past 12 months including lab blank results derived from resin extract, for parameters of interest, and including the recovery of surrogates added at the extraction step for each analysis.

5. Bidder must submit a description of detection limits for each test and matrix requested – including all individual parameters and congeners within each test.

6. Bidder must have 3 years experience in performing analysis of any or all of the parameters listed from a single sample of resin, glass wound filter, water, sediment or tissue (i.e., common extraction and fractionation).

B. Point-Rated Criteria: Bidders who meet the mandatory criteria above will then be evaluated based upon the point-rated criteria described below. The maximum possible score for technical merit is 100 points. Bids which score 65 points or less for technical merit will be eliminated from further consideration.

1. Demonstrated experience with ultra- trace analyses for all tests and parameters identified in Appendix A, utilizing XAD resin samples and glass wound filter matrices – **20 Points**.

2. Demonstrated experience in processing samples similar to those found in Delaware River Basin waters for all listed analytes for water, tissue, and sediment – **20 Points.** ***Action - Submit a summary of previous relevant work including experience in processing samples similar to those found in Delaware River Basin waters***.

3. Demonstrated ability to achieve appropriate detection limits and laboratory blanks to meet data quality objectives. Blank correction or subtractions for determination of sample concentration are not to be used. – **20 Points.** ***Action - Submit recent (within the last year) Detection Limits and blank QC acceptance data (QC acceptance limits based on mean plus two standard deviations from multiple method blank) for whole water methods, tissue and sediment methods for all methods and parameters requested***.

4. Demonstrated the extent of the use of labelled surrogates spikes for quantification by isotope dilution / recovery correction within all analytical methods. Include QC acceptance criteria for surrogate recovery and OPR (Ongoing Precision and Recovery) samples for each method. Preference will be given for methodologies that utilize C13 or other stable isotopes labelled surrogates to assess and ensure data quality. - **10 Points.** ***Action - Identify all surrogates and applicable QC acceptance criteria for each method requested***.

5. Effectiveness of quality control program as demonstrated in relevant Performance Evaluation studies – **10 Points.** ***Action - Provide a list of all/ Performance Evaluation studies and scores within the last 3 years for all methods and matrices available***.

6. Bidders organization and personnel assigned to work with DNREC, their relevant experience in similar projects, contract supervision plus facilities and equipment. – **10 Points.** ***Action - The Bidder should demonstrate the background experience and resource capabilities of its organization and key personnel as it relates to this requirement.***

7. Demonstrate the capacity of generating sample data in the Level IV data packages, excel based formats, and DNREC EQuIS Database formats. – **10 Points.** ***Action - Provide details and examples of current reporting formats using analysis requested in this RFP***.

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II. FINANCIAL EVALUATION

Bidder must submit their financial bid in the tabular format that follows. The usage numbers provided below are estimates and are provided for evaluation purposes only. Bidders must provide a price for all items detailed below even if there is no estimated usage given. Prices are to be firm unit prices in U.S. Dollars and will be evaluated as such.

Item	Description	Estimated Usage Per Year	Unit Price (EACH)	Unit Price x Est. Usage per Year
1	Carboy supply, cleaning, proofing, and shipment to DNREC	20		
2	Carboy processing to produce glass wound filter samples and XAD resin samples from DNREC-submitted Carboys. Includes preparation of columns to hold filters and XAD. Includes media cost and proofing costs.	20		
3	Analysis of Glass Wound Filters for PCB congeners by EPA 1668A; dioxins & furans by EPA 1613B; and OC Pesticides by EPA 1699 or equivalent, all from a common extract.	25		
4	Analysis of XAD Resin for PCB congeners by EPA 1668A; dioxins & furans by EPA 1613B; and OC Pesticides by EPA 1699 or equivalent, all from a common extract.	25		
5	Analysis of 2.5L whole water or filtered water samples for PCB congeners by EPA 1668A.	40		
6	Analysis of 2.5L whole water or filtered water samples for dioxins & furans by EPA 1613B.	20		
7	Analysis of 2.5L whole water or filtered water samples for target OC Pesticides by EPA 1699 or equivalent.	20		
8	Analysis of 2.5L whole water or filtered water samples for target PAH compounds by EPA 8270 C/D modified by EPA 1625.	25		
9	Analysis of Sediment for PCB congeners by EPA 1668A; dioxins & furans by EPA 1613B; OC Pesticides by EPA 1699 or equivalent; and target PAH compounds by EPA 8270 C/D modified by EPA 1625. Includes moisture determination.	25		
10	Tissue Homogenization	25		
11	Analysis of Tissue for PCB congeners by EPA 1668A; dioxins & furans by EPA 1613B; OC Pesticides by EPA 1699 or equivalent; and target PAH compounds by EPA 8270 C/D modified by EPA 1625. Includes moisture determination and gravimetric lipid content as per EPA 1613B.	30		

The price used in the financial evaluation will be the total aggregate cost of the Estimated Usages multiplied by the firm unit prices. Firm unit prices shall be constant for an assumed 3 year contract.

DNREC will be responsible for paying all transportation charges for sample shipment to the contract laboratory. The laboratory will be responsible for freight costs for Carboys, bottles, coolers, and packaging materials to DNREC.

Pricing for analytical costs should include provision of required reports in the analytical unit costs. This includes Level IV data packages, DNREC EQuIS EDDs, and Excel-based reporting.

III. BASIS OF SELECTION

1. **General:** To be declared responsive, a bid must:

   a) Comply with all the requirements of the bid solicitation; and
   b) Meet all mandatory technical evaluation criteria; and
   c) Obtain the required minimum of 65 points overall for the technical evaluation criteria which are subject to point rating. The rating is performed on a scale of 100 points.

   Bids not meeting (a) or (b) or (c) will be declared non-responsive.

2. **Best Value:** Among the responsive bids, a possible Contract award will be based on the bid that represents the BEST VALUE. BEST VALUE will be determined by a combination of technical points (75% weighting) and price (25% weighting). BEST VALUE is the bid with the highest Total Points calculated using the following equation:

$$\text{Total Points} = \left(\frac{TP_i}{TP_{\max}} \times 75 \right) + \left(\frac{P_{\min}}{P_i} \times 25 \right)$$

   The terms in the above equation are defined as follows:

   TP_i = Technical Points received by bidder i based on the Technical Evaluation Criteria;

   P_i = Price offered by bidder i based on the Financial Evaluation;

   $TP_{\max}$ = Maximum Technical Points received among all responsive bidders; and

   $P_{\min}$ = Minimum price offered among all responsive bidders.

   Using the above equation, the highest weighted technical points are 75 and the highest weighted price points are 25. The highest possible Total Points is 100.

   The Bidder achieving the highest Total Points based upon the above equation and underlying technical evaluation criteria and price will be considered the BEST VALUE to DNREC and recommended for award.

   Appendix D provides a hypothetical example of a BEST VALUE determination.

APPENDIX D
EXAMPLE OF BEST VALUE DETERMINATION

The hypothetical example below assumes that three bids are received, each meeting the mandatory criteria/requirements and the minimum required technical score.

BEST VALUE weighting: 75 points Technical; 25 points Price. BEST VALUE is the bid with the highest Total Points where Total Points equals the sum of weighted Technical Points and weighted Price Points. Maximum possible Total Points equals 100 points.

	Bid #1	**Bid #2**	**Bid #3**
Technical Score	90.0*	82.5	72.5
Bid Price	$60,000	$54,000	$48,000**
Weighted Technical Points	$\left(\frac{90}{90}\times 75\right)=75$	$\left(\frac{82.5}{90}\times 75\right)=68.8$	$\left(\frac{72.5}{90}\times 75\right)=60.4$
Weighted Price Points	$\left(\frac{48}{60}\times 25\right)=20$	$\left(\frac{48}{54}\times 25\right)=22.2$	$\left(\frac{48}{48}\times 25\right)=25$
Total Points	$75+20=95$	$68.8+22.2=91$	$60.4+25=85.4$

* Highest Technical Score
** Lowest price proposal

Contract would be awarded to Bid #1 based on the highest Total Points.

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STATE OF DELAWARE

Department of Natural Resources and Environmental Control

APPENDIX E
SAMPLE STATE OF DELAWARE PROFESSIONAL SERVICES AGREEMENT

PROFESSIONAL SERVICES AGREEMENT

This Agreement ("Agreement") is entered into as of "Effective Date" and will end on "End Date", by and between the State of Delaware, Department of Natural Resources and Environmental Control, Division of Watershed Stewardship, Watershed Assessment Section ("Delaware"), and XYZ Analytical Services, with offices at "Address".

WHEREAS, Delaware desires to obtain certain specialized services to test filters, resins, surface water, sediment, and biota samples collected from Delaware watersheds for the presence and concentration of various chemical contaminants; and

WHEREAS, XYZ desires to provide such services to Delaware on the terms set forth below;

WHEREAS, Delaware and XYZ represent and warrant that each party has full right, power and authority to enter into and perform under this Agreement;

FOR AND IN CONSIDERATION OF the premises and mutual agreements herein, Delaware and XYZ agree as follows:

1. Services.

1.1 XYZ shall perform for Delaware the services specified in Appendix 1 to this Agreement, attached hereto and made a part hereof.

1.2 Any conflict or inconsistency arising in conjunction with services rendered shall be resolved based upon provisions in this Agreement (including any appendices, amendments or modifications thereto).

1.3 Delaware may, at any time, by written order, make changes in the scope of this Agreement and in the services or work to be performed. No services for which additional compensation may be charged by XYZ shall be furnished without the written authorization of Delaware. When Delaware desires any addition or deletion to the deliverables or a change in the Services to be provided under this Agreement, it shall notify XYZ, who shall then submit to Delaware a "Change Order" for approval authorizing said change. The Change Order shall state whether the change shall cause an alteration in the price or the time required by XYZ for any aspect of its performance under this Agreement. Pricing of changes shall be consistent with those established within this Agreement.

1.4 XYZ will not be required to make changes to its scope of work that result in XYZ's costs exceeding the current unencumbered budgeted appropriations for the services. Any claim of either party for an adjustment under Section 1 of this Agreement shall be asserted in the manner specified in the writing that authorizes the adjustment.

2. Payment for Services and Expenses.

2.1 The term of the initial contract shall be from Start Date through End Date.

2.2 Delaware will pay XYZ for the performance of services described in Appendix 1, Statement of Work. Payment shall be made based on satisfactory completion of analyte groups, by matrix and watershed.

2.3 Delaware's obligation to pay XYZ for the performance of services described in Appendix 1, Statement of Work will not exceed the fixed fee amount of $XXX,,000. It is expressly understood that the work defined in Appendix 1 to this Agreement must be completed by XYZ and it shall be XYZ's responsibility to ensure that hours and tasks are properly budgeted so that all services are completed for the agreed upon fixed fee. Delaware's total liability for all charges for services that may become due under this Agreement is limited to the total maximum expenditure(s) authorized in Delaware's purchase order(s) to XYZ.

2.4 XYZ shall submit invoices to Delaware in sufficient detail to support the services provided. Delaware agrees to pay those invoices within thirty (30) days of receipt. In the event Delaware disputes a portion of an invoice, Delaware agrees to pay the undisputed portion of the invoice within thirty (30) days of receipt and to provide XYZ a detailed statement of Delaware's position on the disputed portion of the invoice within thirty (30) days of receipt. Delaware's failure to pay any amount of an invoice that is not the subject of a good-faith dispute within thirty (30) days of receipt shall entitle XYZ to charge interest on the overdue portion at no more than 1.0% per month or 12% per annum. All payments will be sent to XYZ, address.

2.5 Unless provided otherwise in an Appendix, all expenses incurred in the performance of the services are to be paid by XYZ. If an Appendix specifically provides for expense reimbursement, XYZ shall be reimbursed only for reasonable expenses incurred by XYZ in the performance of the services, including, but not necessarily limited to, travel and lodging expenses, communications charges, and computer time and supplies.

2.6 Delaware is a sovereign entity, and shall not be liable for the payment of federal, state and local sales, use and excise taxes, including any interest and penalties from any related deficiency, which may become due and payable as a consequence of this Agreement.

2.7 Delaware shall subtract from any payment made to XYZ all damages, costs and expenses caused by XYZ's negligence, resulting from or arising out of errors or omissions in XYZ's work products, which have not been previously paid to XYZ.

2.8 Invoices shall be submitted to: Richard Greene, Delaware Department of Natural Resources and Environmental Control, Division of Watershed Stewardship, Watershed Assessment Section, 820 Silver Lake Blvd., Suite 220, Dover, DE 19904-2464.

3. Responsibilities of XYZ.

3.1 XYZ shall be responsible for the professional quality, technical accuracy, timely completion, and coordination of all services furnished by XYZ, its subcontractors and its and their principals, officers, employees and agents under this Agreement. In performing the specified services, XYZ shall follow practices consistent with generally accepted professional and technical standards. XYZ shall be responsible for ensuring that all services, products and deliverables furnished pursuant to this Agreement comply with the standards promulgated by the Department of Technology and Information ("DTI") published at http://dti.delaware.gov/, and as modified from time to time by DTI during the term of this Agreement. If any service, product or deliverable furnished pursuant to this Agreement does not conform with DTI standards, XYZ shall, at its expense and option either (1) replace it with a conforming equivalent or (2) modify it to conform with DTI standards. XYZ shall be and remain liable in accordance with the terms of this Agreement and applicable law for all damages to Delaware caused by XYZ's failure to ensure compliance with DTI standards.

3.2 It shall be the duty of the XYZ to assure that all products of its effort are technically sound and in conformance with all pertinent Federal, State and Local statutes, codes, ordinances, resolutions and other regulations. XYZ will not produce a work product that violates or infringes on any copyright or patent rights. XYZ shall, without additional compensation, correct or revise any errors or omissions in its work products.

3.3 Permitted or required approval by Delaware of any products or services furnished by XYZ shall not in any way relieve XYZ of responsibility for the professional and technical accuracy and adequacy of its work. Delaware's review, approval, acceptance, or payment for any of XYZ's services herein shall not be construed to operate as a waiver of any rights under this Agreement or of any cause of action arising out of the performance of this Agreement, and XYZ shall be and remain liable in accordance with the terms of this Agreement and applicable law for all damages to Delaware caused by XYZ's performance or failure to perform under this Agreement.

3.4 XYZ shall appoint a Project Manager who will manage the performance of services. All of the services specified by this Agreement shall be performed by the Project Manager, or by XYZ's associates and employees under the personal direction of the Project Manager.

3.5 Designation of the project manager is subject to review and approval by Delaware. All analytical work conducted will be performed by qualified XYZ staff as per ISO 170125 and NELAP requirements, with demonstration of competence in assigned tasks. Work conducted will be supervised and reviewed as per internal XYZ quality assurance procedures, documented in the XYZ Quality Manual or other task specific Standard Operating Procedures. Should the staff need to be diverted off the project for what are now unforeseeable circumstances, XYZ will notify Delaware immediately and work out a transition plan that is acceptable to both parties, as well as agree to an acceptable replacement plan to fill or complete the work assigned to this project staff position. Replacement project management persons are subject to review and approval by Delaware. If XYZ fails to make a required replacement within 30 days, Delaware may terminate this Agreement for default. Upon receipt of written notice from Delaware that an employee of XYZ is unsuitable to Delaware for

good cause, XYZ shall remove such employee from the performance of services and substitute in his/her place a suitable employee.

3.6 XYZ shall furnish to Delaware's designated representative copies of all correspondence to regulatory agencies for review prior to mailing such correspondence.

3.7 XYZ agrees that its officers and employees will cooperate with Delaware in the performance of services under this Agreement and will be available for consultation with Delaware at such reasonable times with advance notice as to not conflict with their other responsibilities.

3.8 XYZ has or will retain such employees as it may need to perform the services required by this Agreement. Such employees shall not be employed by Delaware or any other political subdivision of Delaware.

3.9 XYZ will not use Delaware's name, either express or implied, in any of its advertising or sales materials without Delaware's express written consent.

3.10 The rights and remedies of Delaware provided for in this Agreement are in addition to any other rights and remedies provided by law.

4. Time Schedule.

4.1 A project schedule is included in Appendix 1.

4.2 Any delay of services or change in sequence of tasks must be approved in writing by Delaware.

4.3 In the event that XYZ fails to complete the project or any phase thereof within the time specified in the Contract, or with such additional time as may be granted in writing by Delaware, or fails to prosecute the work, or any separable part thereof, with such diligence as will insure its completion within the time specified in this Agreement or any extensions thereof, Delaware shall suspend the payments scheduled as set forth in Appendix 1.

5. State Responsibilities.

5.1 In connection with XYZ's provision of the Services, Delaware shall perform those tasks and fulfill those responsibilities specified in Appendix 1.

5.2 Delaware agrees that its officers and employees will cooperate with XYZ in the performance of services under this Agreement and will be available for consultation with XYZ at such reasonable times with advance notice as to not conflict with their other responsibilities.

5.3 The services performed by XYZ under this Agreement shall be subject to review for compliance with the terms of this Agreement by Delaware's designated representatives. Delaware representatives may delegate any or all responsibilities under the Agreement to appropriate staff members, and shall

so inform XYZ by written notice before the effective date of each such delegation.

5.4 The review comments of Delaware's designated representatives may be reported in writing as needed to XYZ. It is understood that Delaware's representatives' review comments do not relieve XYZ from the responsibility for the professional and technical accuracy of all work delivered under this Agreement.

5.5 Delaware shall, without charge, furnish to or make available for examination or use by XYZ as it may request, any data which Delaware has available, including as examples only and not as a limitation:

a. Copies of reports, surveys, records, and other pertinent documents;
b. Copies of previously prepared reports, job specifications, surveys, records, ordinances, codes, regulations, other document, and information related to the services specified by this Agreement.

XYZ shall return any original data provided by Delaware.

5.6 Delaware shall assist XYZ in obtaining data on documents from public officers or agencies and from private citizens and business firms whenever such material is necessary for the completion of the services specified by this Agreement.

5.7 XYZ will not be responsible for accuracy of information or data supplied by Delaware or other sources to the extent such information or data would be relied upon by a reasonably prudent contractor.

5.8 Delaware agrees not to use XYZ's name, either express or implied, in any of its advertising or sales materials. XYZ reserves the right to reuse the nonproprietary data and the analysis of industry-related information in its continuing analysis of the industries covered.

6. Work Product.

6.1 All materials, information, documents, and reports, whether finished, unfinished, or draft, developed, prepared, completed, or acquired by XYZ for Delaware relating to the services to be performed hereunder shall become the property of Delaware and shall be delivered to Delaware's designated representative upon completion or termination of this Agreement, whichever comes first. XYZ shall not be liable for damages, claims, and losses arising out of any reuse of any work products on any other project conducted by Delaware. Delaware shall have the right to reproduce all documentation supplied pursuant to this Agreement.

6.2 XYZ retains all title and interest to the data it furnished and/or generated pursuant to this Agreement. Retention of such title and interest does not conflict with Delaware's rights to the materials, information and documents developed in performing the project. Upon final payment, Delaware shall have a perpetual, nontransferable, non-exclusive paid-up right and license to use, copy,

modify and prepare derivative works of all materials in which XYZ retains title, whether individually by XYZ or jointly with Delaware. Any and all source code developed in connection with the services provided will be provided to Delaware, and the aforementioned right and license shall apply to source code. The parties will cooperate with each other and execute such other documents as may be reasonably deemed necessary to achieve the objectives of this Section.

6.3 In no event shall XYZ be precluded from developing for itself, or for others, materials that are competitive with the Deliverables, irrespective of their similarity to the Deliverables. In addition, XYZ shall be free to use its general knowledge, skills and experience, and any ideas, concepts, know-how, and techniques within the scope of its consulting practice that are used in the course of providing the services.

6.4 Notwithstanding anything to the contrary contained herein or in any attachment hereto, any and all intellectual property or other proprietary data owned by XYZ prior to the effective date of this Agreement ("Preexisting Information") shall remain the exclusive property of XYZ even if such Preexisting Information is embedded or otherwise incorporated into materials or products first produced as a result of this Agreement or used to develop such materials or products. Delaware's rights under this section shall not apply to any Preexisting Information or any component thereof regardless of form or media.

7. Confidential Information.

To the extent permissible under 29 *Del. C.* § 10001, et seq., the parties to this Agreement shall preserve in strict confidence any information, reports or documents obtained, assembled or prepared in connection with the performance of this Agreement.

8. Warranty.

8.1 XYZ warrants that its services will be performed in a good and workmanlike manner. XYZ agrees to re-perform any work not in compliance with this warranty brought to its attention within a reasonable time after that work is performed.

8.2 Third-party products within the scope of this Agreement are warranted solely under the terms and conditions of the licenses or other agreements by which such products are governed. With respect to all third-party products and services purchased by XYZ for Delaware in connection with the provision of the Services, XYZ shall pass through or assign to Delaware the rights XYZ obtains from the manufacturers and/or vendors of such products and services (including warranty and indemnification rights), all to the extent that such rights are assignable.

9. Indemnification; Limitation of Liability.

9.1 XYZ shall indemnify and hold harmless the State, its agents and employees, from any and all liability, suits, actions or claims, together with all reasonable costs and expenses (including attorneys' fees) directly arising out of (A) the negligence or other wrongful conduct of the XYZ, its agents or

employees, or (B) XYZ's breach of any material provision of this Agreement not cured after due notice and opportunity to cure, provided as to (A) or (B) that (i) XYZ shall have been notified promptly in writing by Delaware of any notice of such claim; and (ii) XYZ shall have the sole control of the defense of any action on such claim and all negotiations for its settlement or compromise.

9.2 If Delaware promptly notifies XYZ in writing of a third party claim against Delaware that any Deliverable infringes a copyright or a trade secret of any third party, XYZ will defend such claim at its expense and will pay any costs or damages that may be finally awarded against Delaware. XYZ will not indemnify Delaware, however, if the claim of infringement is caused by (1) Delaware's misuse or modification of the Deliverable; (2) Delaware's failure to use corrections or enhancements made available by XYZ; (3) Delaware's use of the Deliverable in combination with any product or information not owned or developed by XYZ; (4) Delaware's distribution, marketing or use for the benefit of third parties of the Deliverable or (5) information, direction, specification or materials provided by Client or any third party. If any Deliverable is, or in XYZ's opinion is likely to be, held to be infringing, XYZ shall at its expense and option either (a) procure the right for Delaware to continue using it, (b) replace it with a noninfringing equivalent, (c) modify it to make it noninfringing. The foregoing remedies constitute Delaware's sole and exclusive remedies and XYZ's entire liability with respect to infringement.

9.3 Delaware agrees that XYZ' total liability to Delaware for any and all damages whatsoever arising out of or in any way related to this Agreement from any cause, including but not limited to contract liability or XYZ negligence, errors, omissions, strict liability, breach of contract or breach of warranty shall not, in the aggregate, exceed fees paid to XYZ.

10. Employees.

10.1 XYZ has and shall retain the right to exercise full control over the employment, direction, compensation and discharge of all persons employed by XYZ in the performance of the services hereunder; provided, however, that it will, subject to scheduling and staffing considerations, attempt to honor Delaware's request for specific individuals.

10.2 Except as the other party expressly authorizes in writing in advance, neither party shall solicit, offer work to, employ, or contract with, whether as a partner, employee or independent contractor, directly or indirectly, any of the other party's Personnel during their participation in the services or during the twelve (12) months thereafter. For purposes of this Section 10.2, "Personnel" includes any individual or company a party employs as a partner, employee or independent contractor and with which a party comes into direct contact in the course of the services.

11. Independent Contractor.

11.1 It is understood that in the performance of the services herein provided for, XYZ shall be, and is, an independent contractor, and is not an agent or employee of Delaware and shall furnish such services in its own manner and method except as required by this Agreement. XYZ shall be solely responsible for, and shall indemnify, defend and save Delaware harmless from all matters relating to the payment of its employees, including compliance with social security, withholding and all other

wages, salaries, benefits, taxes, exactions, and regulations of any nature whatsoever.

11.2 XYZ acknowledges that XYZ and any subcontractors, agents or employees employed by XYZ shall not, under any circumstances, be considered employees of Delaware, and that they shall not be entitled to any of the benefits or rights afforded employees of Delaware, including, but not limited to, sick leave, vacation leave, holiday pay, Public Employees Retirement System benefits, or health, life, dental, long-term disability or workers' compensation insurance benefits. Delaware will not provide or pay for any liability or medical insurance, retirement contributions or any other benefits for or on behalf of Delaware or any of its officers, employees or other agents.

11.3 XYZ shall be responsible for providing liability insurance for its personnel.

11.4 As an independent contractor, XYZ has no authority to bind or commit Delaware. Nothing herein shall be deemed or construed to create a joint venture, partnership, fiduciary or agency relationship between the parties for any purpose.

12. Suspension.

12.1 Delaware may suspend performance by XYZ under this Agreement for such period of time as Delaware, at its sole discretion, may prescribe by providing written notice to XYZ at least 30 working days prior to the date on which Delaware wishes to suspend. Upon such suspension, Delaware shall pay XYZ its compensation, based on the percentage of the project completed and earned until the effective date of suspension, less all previous payments. XYZ shall not perform further work under this Agreement after the effective date of suspension. XYZ shall not perform further work under this Agreement after the effective date of suspension until receipt of written notice from Delaware to resume performance.

12.2 In the event Delaware suspends performance by XYZ for any cause other than the error or omission of the XYZ, for an aggregate period in excess of 30 days, XYZ shall be entitled to an equitable adjustment of the compensation payable to XYZ under this Agreement to reimburse XYZ for additional costs occasioned as a result of such suspension of performance by Delaware based on appropriated funds and approval by Delaware.

13. Termination.

13.1 This Agreement may be terminated in whole or in part by either party in the event of substantial failure of the other party to fulfill its obligations under this Agreement through no fault of the terminating party; but only after the other party is given:

a. Not less than 30 calendar days written notice of intent to terminate; and
b. An opportunity for consultation with the terminating party prior to termination.

13.2 This Agreement may be terminated in whole or in part by Delaware for its convenience, but only after XYZ is given:

a. Not less than 30 calendar days written notice of intent to terminate; and
b. An opportunity for consultation with Delaware prior to termination.

13.3 If termination for default is effected by Delaware, Delaware will pay XYZ that portion of the compensation which has been earned as of the effective date of termination but:

a. No amount shall be allowed for anticipated profit on performed or unperformed services or other work, and
b. Any payment due to XYZ at the time of termination may be adjusted to the extent of any additional costs occasioned to Delaware by reason of XYZ's default.
c. Upon termination for default, Delaware may take over the work and prosecute the same to completion by agreement with another party or otherwise. In the event XYZ shall cease conducting business, Delaware shall have the right to make an unsolicited offer of employment to any employees of XYZ assigned to the performance of the Agreement, notwithstanding the provisions of Section 10.2.

13.4 If after termination for failure of XYZ to fulfill contractual obligations it is determined that XYZ has not so failed, the termination shall be deemed to have been effected for the convenience of Delaware.

13.5 The rights and remedies of Delaware and XYZ provided in this section are in addition to any other rights and remedies provided by law or under this Agreement.

13.6 Gratuities.

13.6.1 Delaware may, by written notice to XYZ, terminate this Agreement if it is found after notice and hearing by Delaware that gratuities (in the form of entertainment, gifts, or otherwise) were offered or given by XYZ or any agent or representative of XYZ to any officer or employee of Delaware with a view toward securing a contract or securing favorable treatment with respect to the awarding or amending or making of any determinations with respect to the performance of this Agreement.

13.6.2 In the event this Agreement is terminated as provided in 13.6.1 hereof, Delaware shall be entitled to pursue the same remedies against XYZ it could pursue in the event of a breach of this Agreement by XYZ.

13.6.3 The rights and remedies of Delaware provided in Section 13.6 shall not be exclusive and are in addition to any other rights and remedies provided by law or under this Agreement.

14. Severability.

If any term or provision of this Agreement is found by a court of competent jurisdiction to be invalid,

illegal or otherwise unenforceable, the same shall not affect the other terms or provisions hereof or the whole of this Agreement, but such term or provision shall be deemed modified to the extent necessary in the court's opinion to render such term or provision enforceable, and the rights and obligations of the parties shall be construed and enforced accordingly, preserving to the fullest permissible extent the intent and agreements of the parties herein set forth.

15. Assignment; Subcontracts.

15.1 Any attempt by XYZ to assign or otherwise transfer any interest in this Agreement without the prior written consent of Delaware shall be void. Such consent shall not be unreasonably withheld.

15.2 Services specified by this Agreement shall not be subcontracted by XYZ, without prior written approval of Delaware.

15.3 Approval by Delaware of XYZ's request to subcontract or acceptance of or payment for subcontracted work by Delaware shall not in any way relieve XYZ of responsibility for the professional and technical accuracy and adequacy of the work. All subcontractors shall adhere to all applicable provisions of this Agreement.

15.4 XYZ shall be and remain liable for all damages to Delaware caused by negligent performance or non-performance of work under this Agreement by XYZ, its subcontractor or its sub-subcontractor.

15.5 The compensation due shall not be affected by Delaware's approval of the XYZ's request to subcontract.

16. Force Majeure.

Neither party shall be liable for any delays or failures in performance due to circumstances beyond its reasonable control.

17. Non-Appropriation of Funds.

17.1 Validity and enforcement of this Agreement is subject to appropriations by the General Assembly of the specific funds necessary for contract performance. Should such funds not be so appropriated Delaware may immediately terminate this Agreement, and absent such action this Agreement shall be terminated as to any obligation of the State requiring the expenditure of money for which no specific appropriation is available, at the end of the last fiscal year for which no appropriation is available or upon the exhaustion of funds.

17.2 Notwithstanding any other provisions of this Agreement, this Agreement shall terminate and Delaware's obligations under it shall be extinguished at the end of the fiscal year in which Delaware fails to appropriate monies for the ensuing fiscal year sufficient for the payment of all amounts which will then become due.

18. State of Delaware Business License.

XYZ and all subcontractors represent that they are properly licensed and authorized to transact business in the State of Delaware as provided in 30 *Del. C.* § 2301.

19. Complete Agreement.

19.1 This agreement and its Appendix shall constitute the entire agreement between Delaware and XYZ with respect to the subject matter of this Agreement and shall not be modified or changed without the express written consent of the parties. The provisions of this agreement supersede all prior oral and written quotations, communications, agreements and understandings of the parties with respect to the subject matter of this Agreement.

19.2 If the scope of any provision of this Agreement is too broad in any respect whatsoever to permit enforcement to its full extent, then such provision shall be enforced to the maximum extent permitted by law, and the parties hereto consent and agree that such scope may be judicially modified accordingly and that the whole of such provisions of the Agreement shall not thereby fail, but the scope of such provision shall be curtailed only to the extent necessary to conform to the law.

19.3 XYZ may not order any product requiring a purchase order prior to Delaware's issuance of such order. Each Appendix, except as its terms otherwise expressly provide, shall be a complete statement of its subject matter and shall supplement and modify the terms and conditions of this Agreement for the purposes of that engagement only. No other agreements, representations, warranties or other matters, whether oral or written, shall be deemed to bind the parties hereto with respect to the subject matter hereof.

20. Miscellaneous Provisions.

20.1 In performance of this Agreement, XYZ shall comply with all applicable federal, state and local laws, ordinances, codes and regulations. XYZ shall solely bear the costs of permits and other relevant costs required in the performance of this Agreement.

20.2 Neither this Agreement nor any appendix may be modified or amended except by the mutual written agreement of the parties. No waiver of any provision of this Agreement shall be effective unless it is in writing and signed by the party against which it is sought to be enforced.

20.3 The delay or failure by either party to exercise or enforce any of its rights under this Agreement shall not constitute or be deemed a waiver of that party's right thereafter to enforce those rights, nor shall any single or partial exercise of any such right preclude any other or further exercise thereof or the exercise of any other right.

20.4 XYZ covenants that it presently has no interest and that it will not acquire any interest, direct or indirect, which would conflict in any manner or degree with the performance of services required to be performed under this Agreement. XYZ further covenants, to its knowledge and ability, that in the performance of said services no person having any such interest shall be employed.

20.5 XYZ acknowledges that Delaware has an obligation to ensure that public funds are not used to subsidize private discrimination. XYZ recognizes that if they refuse to hire or do business with an individual or company due to reasons of race, color, gender, ethnicity, disability, national origin, age, or any other protected status, Delaware may declare XYZ in breach of the Agreement, terminate the Agreement, and designate XYZ as non-responsible.

20.6 XYZ warrants that no person or selling agency has been employed or retained to solicit or secure this Agreement upon an agreement or understanding for a commission, or a percentage, brokerage or contingent fee. For breach or violation of this warranty, Delaware shall have the right to annul this contract without liability or at its discretion deduct from the contract price or otherwise recover the full amount of such commission, percentage, brokerage or contingent fee.

20.7 This Agreement was drafted with the joint participation of both parties and shall be construed neither against nor in favor of either, but rather in accordance with the fair meaning thereof.

20.8 XYZ shall maintain all public records, as defined by 29 *Del. C.* § 502(7), relating to this Agreement and its deliverables for the time and in the manner specified by the Delaware Division of Archives, pursuant to the Delaware Public Records Law, 29 *Del. C.* Ch. 5. During the term of this Agreement, authorized representatives of Delaware may inspect or audit XYZ's performance and records pertaining to this Agreement at the XYZ business office during normal business hours.

21. Insurance.

21.1 XYZ shall maintain, at a minimum, the following insurance, or its equivalent, during the term of this Agreement:

A. Worker's Compensation and Employer's Liability Insurance in accordance with applicable law, **and**

B. Comprehensive General Liability - $1,000,000.00 per person/$3,000,000 per occurrence, **and**

C. Medical/Professional Liability - $1,000,000.00 per person/$3,000,000 per occurrence; or

D. Miscellaneous Errors and Omissions - $1,000,000.00 per person/$3,000,000 per occurrence, or

E. Product Liability - $1,000,000.00 per person/$3,000,000 per occurrence, **and**

F. If required to transport state employees, Automotive Liability Insurance covering all automotive units used in the work with limits of not less than $100,000 each person and $300,000 each accident as to bodily injury and $25,000 as to property damage to others.

21.2. XYZ shall provide forty-five (45) days written notice of cancellation or material change of any

policies.

21.3. Before any work is done pursuant to this Agreement, the Certificate of Insurance and/or copies of the insurance policies, referencing the contract number stated herein, shall be filed with the State. The certificate holder is as follows: XYZ Analytical, Ltd. Proof of insurance coverage is included as Attachment 2 to this contract.

22. Assignment of Antitrust Claims.

As consideration for the award and execution of this Agreement by the State, XYZ hereby grants, conveys, sells, assigns, and transfers to Delaware all of its right, title and interest in and to all known or unknown causes of action it presently has or may now or hereafter acquire under the antitrust laws of the United States and the State of Delaware, relating to the particular goods or services purchased or acquired by the State pursuant to this Agreement.

23. Governing Law.

This Agreement shall be governed by and construed in accordance with the laws of the State of Delaware, except where Federal Law has precedence. XYZ consents to jurisdiction venue in the State of Delaware.

24. Notices.

Any and all notices required by the provisions of this Agreement shall be in writing and shall be mailed, certified or registered mail, return receipt requested. All notices shall be sent to the following addresses:

TO DELAWARE:
Richard Greene
Delaware Department of Natural Resources and
Environmental Control
Division of Watershed Stewardship
Watershed Assessment Section
820 Silver Lake Blvd., Suite 220
Dover, DE 19904-2464

TO XYZ:
Name
XYZ Analytical Services
Address

STATE OF DELAWARE

Department of Natural Resources and Environmental Control

SIGNATURE PAGE TO FOLLOW

IN WITNESS THEREOF, the Parties hereto have caused this Agreement to be duly executed as of the date and year first above written.

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

_____
Witness

Name: _____

Title: _____

Date: _____

Date: _____

XYZ ANALYTICAL SERVICES

_____
Witness

Name: _____

Title: _____

Date: _____

Date: _____

APPENDIX 2
AXYS ANALYTICAL SERVICES RESPONSE TO DNREC RFP FOR PROFESSIONAL SERVICES WATERSHED APPROACH TO TOXICS ASSESSMENT AND RESTORATION CONTRACT NUMBER NAT14190-WATER

AXYS | Axys Analytical Services Ltd
2045 MILLS ROAD WEST
SIDNEY, BRITISH COLUMBIA, CANADA V8L 5X2
TEL: (250) 655-5800 FAX: (250) 655-5811
EMAIL: analytical@axys.com

August 27, 2014

Richard W. Greene, Ph.D.
State of Delaware DNREC
Division of Watershed Stewardship
820 Silver Lake Blvd., Suite 220
Dover, DE 19904-2464

AXYS Analytical Services Response to DNREC RFP for Professional Services Watershed Approach to Toxics Assessment and Restoration, Contract # NAT14190-WATAR

Dear Dr. Greene:

AXYS Analytical Services Ltd. is pleased to provide our response to your solicitation for Professional Services Watershed Approach to Toxics Assessment and Restoration, Contract # NAT14190-WATAR and Amendment #1, received August 19th, 2014. As requested, separate technical bid (3 copies), financial bid (3 copies), and certifications (1 copy) have been provided.

AXYS has extensive experience analyzing water (whole and high volume), sediment, and tissue samples for Dioxin/Furans (DX/F) by EPA 1613B, PCB Congeners by EPA 1668A/C, HRMS Organochlorine (OC) Pesticides by EPA 1699 and modified EPA 1699 and PAHs and alkylated PAHs by EPA 8270C/D and 1625. AXYS can also utilize unique co-extraction and fractionation procedures which allow multiple analytes to be analyzed from the same sample aliquot and AXYS has developed high volume water processing which allows water samples, such as the 20L samples requested by DNREC, to be partitioned into dissolved (XAD-2 resin) and particulate (filter) phases. Our extensive experience and unique capabilities make AXYS an ideal candidate to provide the professional services requested in this RFP. The technical bid further highlights and describes our experience and capabilities.

AXYS has one exception to the requirements of the RFP. To ensure speedy compliance with the requirement for a Delaware business license, as per RFP Section III. A. 1, AXYS discussed what was needed and the procedures with Delaware Department of Revenue. Through these discussions AXYS learned that since it does not have a place of business or any employees located in the state of Delaware, the requirement for a business license doesn't apply. If our interpretation of the requirements is incorrect, AXYS will apply for a business license as necessary.

The hard copy of the technical bid contains a summary of the contents for a Level IV data package to maintain brevity. The CD copy contains a full example of the data package, as well as .txt files of the DNREC EQuIS EDD format example.

We trust that the information supplied is complete, accurate, and relevant to your evaluation. The scope of information covered is large. We have attempted to supply information as requested in the RFP and in the format provided. If any additional clarifications or incremental information is required please do not hesitate to contact identified AXYS staff as needed.

We thank you for the opportunity to bid on this work and look forward to continuing success in providing analytical services to Delaware DNREC. Please contact Richard Grace at (905) 484-2314, e-mail rgrace@axys.com for any matters pertaining to this RFP.

Sincerely,

Original on File

for Richard Grace
Director of Sales, Marketing, and Service
AXYS Analytical Services Ltd.
2045 Mills Rd. West
Sidney, B.C.
V8L 5X2

SECTION 1 – TECHNICAL BID

REQUEST FOR PROPOSAL
FOR
PROFESSIONAL SERVICES
WATERSHED APPROACH TO TOXICS ASSESSMENT AND RESTORATION
ISSUED BY DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

CONTRACT NUMBER NAT14190-WATAR

A Proposal
Submitted to:

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ORIGINAL

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MINIMUM REQUIREMENTS FROM RFP SECTION III, A

To ensure speedy compliance with the requirement for a Delaware business license, as per RFP Section III. A. 1, AXYS discussed what was needed and the procedures with Delaware Department of Revenue. Through these discussions AXYS learned that since it does not have a place of business or any employees located in the state of Delaware, the requirement for a business license doesn't apply. If our interpretation of the requirements is incorrect, AXYS will apply for a business license as necessary. The following technical proposal provides responses to the RFP Scope of Work and identifies capabilities.

AXYS has provided all requested forms in the Certifications section of the proposal response and will comply with the insurance requirements from the RFP and Amendment 1 received August 19th, 2014.

A) MANDATORY REQUIREMENTS

1. STATE, NELAP AND ISO 17025 ACCREDITATIONS

AXYS is compliant with the accreditation requirements as requested in RFP NAT14190-WATAR, and Amendment 1 received on August 19th, 2014.

AXYS has accreditation for all requested parameters (in tissue, aqueous and solid matrices) through NELAP, state and ISO 17025 accreditation (from ANSI-ASQ National Accreditation Board (ACLASS) and the Canadian Association for Laboratory Accreditation). A summary of accreditations relevant to this RFP is provided below:

TABLE 1: Accreditations

Test	Matrix	Accreditation Held
Dioxin/Furans by EPA 1613B	Aqueous	ISO 17025 (CALA, ACLASS), NELAP (California DPH, Florida DOH, New Jersey DEP, New York DOH, Virginia DGS), State (Washington DOE, Maine DOH)
	Solid	ISO 17025 (CALA, ACLASS), State (Washington DOE, Maine DOH), NELAP for EPA 8290 (California DPH, Florida DOH, New Jersey DEP, New York DOH, Virginia DGS)
	Tissue	ISO 17025 (CALA), NELAP (Florida DOH)
PCB Congeners by EPA 1668A/C	Aqueous	ISO 17025 (CALA, ACLASS), NELAP (Florida DOH, New Jersey DEP, New York DOH, Virginia DGS), State (Washington DOE, Maine DOH)
	Solid	ISO 17025 (CALA, ACLASS), NELAP (Florida DOH, New Jersey DEP, New York DOH, Virginia DGS), State (Washington DOE, Maine DOH)
	Tissue	ISO 17025 (CALA)
HRMS OC Pesticides based on EPA 1699 or equivalent	Aqueous	ISO 17025 (CALA, ACLASS), NELAP (Florida DOH), State (Washington DOE)
	Solid	ISO 17025 (CALA, ACLASS), NELAP (Florida DOH)
	Tissue	ISO 17025 (CALA)
PAHs and Alkylated PAHs by EPA 8270C/D or EPA 1625	Aqueous	ISO 17025 (CALA, ACLASS), NELAP (California DPH, Florida DOH, New York DOH, Virginia DGS), State (Maine DOH)
	Solid	ISO 17025 (CALA, ACLASS), NELAP (California DPH, Florida DOH, New York DOH, Virginia DGS), State (Maine DOH)
	Tissue	ISO 17025 (CALA)

AXYS is compliant and accredited to ISO 17025 standards. ISO 17025 standards cover all aspects of a laboratories analysis, supporting systems, management, and quality systems. A detailed summary of our accreditation information is attached in Appendix 1. Individual scopes and certificates are available upon request.

AXYS's core business is leadership in the measurement of ultra-trace levels of Persistent Organic Pollutants (POPs) and emerging organic contaminants. Most AXYS analytical methods are performed by HRMS or LC/MS/MS instrumentation as they allow for reliable achievement of detection limits in the ppq or ppt range that is relevant to most POPs or emerging contaminants, particularly in establishing ambient, background, mass balance models, or relevant levels to support risk assessment of these contaminants. As a result, some of the tests AXYS performs do not have individual test accreditation and corresponding performance testing available from an accrediting body as criteria or proficiency testing programs have not been developed. In a number of cases, AXYS develops the reference methods for these tests or methods used by Regulators or scientific bodies for assessment of emerging contaminants. Past work (2005-2006) to develop ultra trace methods for Environment Canada Pacific Region for Multi-Residue (or Current Use) Pesticides by HRMS, Acid Extractable Herbicides by HRMS, and Glyphosate by LC/MS/MS are examples of this leadership. All work performed in analytical areas where no specific test requirements have been established by regulatory bodies is compliant to ISO 17025 standards.

AXYS has demonstrated compliance to ISO 17025 standards through audits by multiple regulatory authorities including:

- Canadian Analytical Laboratory Association (CALA) – last audit October 2013
- State of Florida Department of Health (FLDH) - NELAP Primary Accreditation and ISO 17025 – last audit February 2014 (conducted by ACLASS)
- US EPA National Dioxin Contract audit – June 2014
- URS audit on behalf of US Army Corps of Engineers - June 2008
- Numerous project specific audits by a variety of regulatory and private organizations.

Further information on AXYS quality systems is available on request. This includes access to control documents such as our QA Manual and individual SOPs for methods or procedures on an as needed basis. AXYS invites our customers to perform quality system and method audits.

AXYS's objective is to provide analytical data that meet established standards for consistency, accuracy, defensibility and fitness for purpose, at a fair price, providing the best possible value to the client. AXYS provides services to its clients in a professional, confidential, honest and forthright manner and adheres to the highest levels of business ethics. AXYS management is committed to the following key quality policies that meet or exceed ISO 17025 standards:

1. To continually improve management systems and data quality, a Quality Manager will oversee management of a quality assurance (QA) program. The Quality Manager will be responsible for documenting the QA program in a Quality Manual and the Technical Director will ensure that this manual and supporting documentation are available to all staff. All staff are required to be familiar with the quality system documentation and to implement the policies and procedures in their areas.

2. AXYS quality management policies, procedures and practices will comply with the requirements of the ISO 17025 standard. Procedures for accredited tests will also comply with any additional requirements specified the Canadian Association of Environmental Analytical Laboratories (CAEAL) or the National Environmental Laboratory Accreditation Conference (NELAC), as appropriate. Internal audits will be performed to ensure compliance with the documented quality practices, which incorporate the above standards.

3. Management systems will ensure that sufficient resources and trained staff are available to meet contractual commitments.

4. Staff will be trained in analytical methods, data integrity procedures, ethical and legal responsibilities, security procedures and in the purpose and use of the QA/QC program. Staff training records are maintained.

5. Documented sample handling and security procedures will ensure sample integrity from time of sample receipt to acceptance of the final data report.

6. AXYS will use validated, reliable and rugged test methods. Method precision, accuracy, detection limits and uncertainty estimates will be determined using recognized procedures. Method and laboratory performance will be monitored against established statistical control limits. AXYS will participate in interlaboratory comparison studies and performance evaluation programs, where available, to continually monitor the accuracy of data.

7. Samples will be analyzed in batches containing quality control (QC) samples. The results of batch QC samples will be used to assess the sample data quality and are routinely provided to clients with sample results.

8. Only materials, reagents and supplies that meet required quality specifications will be used. Standard solutions used in methods will be validated against primary solutions of known purity and concentration.

9. To ensure traceability of results, only Class A volumetric glassware and syringes with demonstrated accuracy (bias and precision) are used for the preparation of standard solutions, spiking of standard solutions to samples and all other volumetric measurements that can influence analytical accuracy. The accuracy of balances and thermometers is traceable to ISO17025 compliant calibration.

10. Data will be handled in accordance with documented data management protocols that ensure reports and statements to clients are accurate, impartial, include any necessary opinions and interpretations, and protect client and data confidentiality. Staff will receive training in data integrity procedures and sign binding confidentiality and legal and ethical responsibility agreements.

11. A company wide security program will ensure security of samples, data, records and laboratory premises.

12. Records will be stored in a permanent form and retained on file following systematic data archival procedures in a secure environment. Hardcopy records (or exact electronic image) will be retained for a minimum of five years. Electronic data are retained for a minimum of ten years.

Appendix 2 contains a 3 year history of proficiency testing / Intercalibration exercises for all requested tests and matrices. A summary of results for each study is included. Full reports have not been included for brevity sake (reports are typically hundreds of pages long), but are available upon request.

2. XAD-2 RESIN AND GLASS WOUND FILTER PREPARATION AND HANDLING EXPERIENCE

AXYS has been active in the preparation and handling of XAD-2 resin, glass wound filters and other high volume sampling media since 1984. AXYS has prepared over 5000 columns and

filters for this purpose. AXYS has gained significant experience in this area that is critical to the use of resin and other Solid Phase Extraction (SPE media to capture and measure trace contaminants from large sample sizes. XAD-2 media and glass wound filter selection and preparation is a custom procedure. Preparation requirements are determined through communication between project managers and our clients to understand their data quality requirements and program objectives. Key points that must be reviewed in these discussions include:

- Target analysis of resin and filter (multiple analyses may be required)
- Detection limit requirements
- Detection limit requirements vs. XAD–2 proofing specifications and typical method blank levels
- Confirmation of sampling volume to ensure detection will be achieved
- Resin amount and column size
- Required field spikes and appropriate levels to monitor resin capture
- Extraction protocol (separate or combined filters and resins, custom extraction fluids)
- Unique clean-up procedures required
- If analysis is unique to an individual client, confirmation of recovery criteria
- Other client specific data quality objectives
- Tubing requirements

Appropriate use of XAD-2 and other resin media allows capture and recovery of trace contaminants to move detection limits very low (generally 100 – 1000X lower than the base analytical method) or to accurately measure time average mean levels of samples collected continuously over longer periods of time than many other sample collection methods.

AXYS has provided preparation and analysis of high volume water sampling on XAD-2 resin media to a wide variety of clients. Examples include:

- State of Delaware (DNREC) - XAD and Glass Wound filter analysis (reported by fraction) for high volume (200-400L) and 20L carboy (XAD and glass wound filter portions created at AXYS) samples. Sediment and tissue samples are also analyzed. Samples are analyzed for 1613B Dioxins and Furans, full 209 PCB Congeners by EPA 1668A/C, OC Pesticides by HRMS, and PAHs + alkylated PAHs. Co-extraction and subsequent on column fractionation is performed in all matrices for Dioxins and Furans, PCB Congeners, and OC pesticides. Published results from 2009 sampling are available. Work is on-going with 3 Delaware tributary stream monitored per year.
- US FWS 2011 to present – High volume sampling analysis (XAD and Glass Wound Filter) of State of Ohio Great Lakes AOCs for PCB Congeners and OC Pesticides. Co-extraction and on-column fractionation was used in this application as well as on-going tissue analysis in a wide variety of tissue projects under a 5 year standing offer contract awarded to AXYS in 2012.
- San Francisco Estuary Institute (TMDL Regional Monitoring Program) 2002 to present– XAD analysis of PCBs, Dioxins and Furans, OC Pesticides, PBDEs, PAHs, Pyrethroids and Carbamates. The same compounds are also measured in sediment and whole water. 1668A PCBs, 1613B Dioxins and Furans, 1699 OC Pesticides, 1614 PBDEs, and PAHs are all co-extracted. Subsequent on-column fractionation is performed form Filter and XAD samples for methods 1668A, 1613B, 1699, and 1614.
- Environment Canada (CCIW) 2004 to Present - Great Lakes Monitoring Program – XAD Resin and Filter and subsequent co-extraction and fractionation is performed for the analysis of Dioxins and Furans, PCB Congeners, PBDEs, Chloronaphthalenes, OC Pesticides, and PAHs. Perfluorinated compounds in water were also routinely performed.
- Environment Canada (Pacific Region) 2005 to Present – Fraser River – XAD and Filter analysis include PCB Congeners, Dioxins and Furans, PBDEs, OC Pesticides. Other analyses include Current Use Pesticides by HRMS in Water and Sediments, Glyphosate

in Water by LC/MS/MS, Acid Extractable Herbicides in Water and Sediments by HRMS, and Pharmaceutical and Personal Care Products (PPCP) by LC/MS/MS

- Portland Harbor / Columbia River / Willamette River TMDL / Natural Resource Damage Assessment 2007 / 2008 – AXYS performed analysis for Integral Consulting for work performed in this action. XAD resin analyses include Dioxins and Furans, PCB Congeners, OC Pesticides, and PAHs. These analyses are also performed on sediments and whole water.
- CClean / Kinnetic Laboratories / Applied Marine Sciences 2002 to Present – Technical organization representing stakeholders for Monterey Bay TMDL. AXYS performs analysis of high volume automated buoys creating XAD and glass filter samples for analysis by AXYS. Work is on-going with 3 sampling events per year. Analytes include 1613B Dioxins and Furans, 1668A PCB congeners, HRMS OC pesticides, 1614 PBDEs, and PAHs + alkylated PAHs. At a lesser frequency, pyrethroids are measured from separate XAD and glass wound filter columns.
- U.S. EPA – All TMDL / NRDA work plans and results for above U.S. applications are reviewed by U.S. EPA Regional or National Water Quality Group. In addition AXYS was contracted by the U.S. EPA to develop reference methods such as EPA 1668 (PCB congeners by HRMS), EPA 1614 (PBDE congeners), EPA 1694 (PPCP by LC MS/MS), EPA 1699 (MRES Pesticides by HRMS, originally developed and published with Environment Canada) and EPA 1698 (Hormones and Sterols). Current 2014 XAD-2 and Glass Wound Filter analysis (EPA Region 4) is for EPA 1613B and EPA 1668A.

AXYS has experience with the following Resin and SPE media:

- Polyurethane foam (PUF) cartridges
- Macroreticular polymeric resins (Amberlite XAD–2, XAD–4, XAD–7)
- Empore C18 and DVB disks
- Glass Fibre Filter (used to capture sediments and sediment bound analytes prior to water contacting XAD–2 resin)
- Polar Organic Chemical Integrative Sampler (POCIS)
- Polyethylene device (PEL or PED)
- Semi-permeable Membrane Device (SPMD)
- Continuous Low-level Aquatic Monitoring (C.L.A.M.)

For active sampling of semi-polar organic compounds, our experience has proven that XAD-2 provides the best blend of capture efficiency, reliability of removal of analytes during extraction, ease of cleaning, minimization of contamination from virgin media, structural integrity during sampling to prevent by-pass of the media (allowing for escape of target analytes), and cost. XAD-2 resin is generally proceeded in sampling devices by a glass fibre filter cartridge which captures solids and solid bound analytes (1 and 0.5 micron nominal are the most frequently used filter sizes, though a variety of other sizes may be selected to meet specific project objectives). Resin and filter may be extracted, analyzed, and reported together (combined) or extracted, analyzed, and reported separately to produce separate results from the filter and resin. This latter option is used to differentiate between "particle bound" and soluble/ water dispersible forms of an analyte.

XAD-2 combined with glass fibre filters have traditionally been used for semi-volatile non-polar compounds such as OC pesticides, PCBs, dioxins and furans, and PAHs. XAD-2 may also be used to collect perfluorinated compounds, acid extractable herbicides, pyrethroids, current use pesticides (including OP pesticides), carbamates, and glyphosates. Other resins may be preferable for more polar compounds, such as XAD-7 for PFC analysis. Resin selection is dependent on the number of different analysis desired from one given sample.

Full method SOPs regarding XAD resin preparation, cleaning, and validation are available to Delaware DNREC for review upon request. A general description of steps AXYS

performs in preparing XAD-2 resin and filters prior to packing in columns supplied by either AXYS or our clients is as follows:

- Size sorting of XAD-2 resin to remove debris and ruptured beads through sieving in sequential stainless trays. Removal of debris and ruptured beads reduces PAH and other hydrocarbon contamination that could affect these analyses or other analysis detection limits through chromatographic interference or additional clean-up column loading. Failure to remove the debris and smaller particles may create flow disparities and issues in the column, compromising the operability of the unit by plugging or channeling.
- 48 hour soxhlet extraction in Acetone as a batch. Resin batches are up to 2.5 kg of resin. Filter batches require 1 soxhlet for every 2 filters.
- Removal of Acetone, subsequent 96 hour soxhlet extraction in DCM.
- Extracts are removed (1 liter representative sample from resin extract DCM, 1 liter from one representative filter extract) and proceed to analysis.
- Standard proofing analysis is to perform full method analysis for PAHs (EPA 8270 modified, including alkylated PAHs), Chlorinated Dioxins and Furans (EPA 1613B), PCBs (EPA 1668A/C), PBDEs (EPA 1614A) and OC pesticides by HRMS as a default. Other tests may be performed if required by the clients prior to shipment or extracts may be retained for analysis with samples when returned from the field. The selection of default analysis for proofing prior to analysis is based on historical data indicating potential for blank contamination of resin or filters. XAD-2 resin contains PAHs when purchased. No known "clean" supply of this resin exists. PCB and PBDE contamination may occur through handling and transport of the material prior to its arrival at AXYS. PBDE levels in XAD-2 resin are variable and are dependent on the batch manufacturing procedure of the single current supplier of XAD-2 resin. Dioxin and furan contamination would be introduced through the analytical process. In low risk contamination cases, such as polychlorinated naphthalenes, it is most common to analyze a retained extract with the field samples.
- Upon completion of the analysis results are quantified. Meeting AXYS internal criteria or client specific requirements allows for packing of cleaned and proofed columns to occur. Failure to meet requirements requires re-cleaning of the batch.
- Cleaned and proofed columns (triple solvent rinsed, analysis to confirm from acetone and DCM rinses) are then packed with customer specified resins volumes. For this project, the columns would be used for in house processing by AXYS SOP SLA-076 "XAD-2 Extraction of Large Volume Water Samples". This SOP is available upon request.
- C13 labeled spikes (field spikes used to monitor capture and extraction efficiency), at levels determined as appropriate with the client, are added to the resin through micro syringe addition. Appendix 3, Table 1 to 4 of the proposal contain loading studies which demonstrate the retention, recovery and efficiency of XAD-2 resin. The provided loading study was conducted using an Infiltrex, however the same retention, recovery and efficiency would apply to work conducted using alternate processing, such as procedures included in AXYS SOP SLA-076 For each project, the amount and types of surrogates are determined through communication between the client and the AXYS project manager.

Specifications for clean proofed resin are attached as Appendix 4.

3. EXPERIENCE IN ULTRA TRACE ANALYSIS OF ORGANIC CONTAMINANTS IN GLASS WOUND FILTER, XAD, AQUEOUS, SOLID, AND TISSUE MATRICES

AXYS has extensive experience performing ultra trace analysis of organic contaminants in glass wound filter, XAD resin, aqueous, solid and tissue matrices. AXYS has been performing

Dioxin/Furan analysis since 1984, PCB Congener analysis since 1993, HRMS OC pesticide analysis since 1998, and PAH, alkylated PAH and alkylated PAH group analysis since 1996. Each year AXYS performs thousands of these analyses, in a variety of matrices, including tissue, solid and aqueous (whole water and high volume) samples.

A selection of examples demonstrating AXYS experience in ultra trace analysis, in the matrices requested in the RFP, can be found in Table 2. Further examples, including publications, can be found in Table 5, 6 and 7.

TABLE 2: Ultra Trace Analysis Experience

Delaware Department of Natural Resources & Environmental Control (DNREC) 820 Silver Lake Blvd, Suite 220 Dover, DE	2004 to present. Analysis of tissue, sediment and high volume water samples to support TMDL work on POPs in the Delaware River and the POP contributions from tributaries to create a mass balance. Analyses included 20L samples of water were collected in "Pop Cans" and processed at AXYS. XAD and filter fractions were created at AXYS for subsequent Dioxin/Furan by EPA 1613B, PCB congener by EPA 1668A, and OC pesticide analysis by mod. 8081 and GC/HRMS (based on EPA 1699). Filter and XAD resin were analyzed separately. Fractionation of extracts was employed. Variations in POPs concentrations were compared to water organic carbon and TSS levels to support POPs "uptake" models to biota. Multiple fish and sediment surveys for 1613B Dioxins and Furans, 1668A PCB Congeners, and HRMS OC pesticides.
Delaware River Basin Commission (DRBC) 25 State Police Drive West Trenton, NJ	2001 to present. Multiple projects including analysis of whole water samples, XAD-2 high volume waters and filters, sediment, and biota from the Delaware River Basin for OC Pesticides by HRMS, PCB Congeners by 1668A, PBDEs by 1614, PFCs, and emerging contaminants. Analyses support TMDL efforts and fish consumption guidelines.
San Francisco Estuary Institute 4911 Central Ave Richmond, CA	1998 – present. In support of RMP projects, AXYS has analyzed tissues (mussels, sport fish, eggs), large volume water samples which have been partitioned into dissolved (XAD-2 resin) and particulate (filter) phases, whole water samples (2, 4 and 8L), whole water and sediments for analyses including PCBs by 1668A, Dioxin/Furans by 1613B, OC Pesticides by GC/HRMS, PAHs and alkylated PAH, PBDEs by 1614, and PFCs. Total samples analyzed exceeds 4,000 samples since 2006.
Washington Dept. of Ecology 7411 Beach Drive East Port Orchard, WA	1998 to Present – 6-12 contracts each year for the analysis of POPs (Dioxins and Furans, PCB Congeners, OC Pesticides, PCNs, Chloroparaffins, PBDEs) and CECs (PFCs, PPCPs, Hormones and Sterols). Matrices include fish tissue, marine and freshwater sediments, filtered sediments, SPMDs, POCIS, groundwater, precipitation, and whole water.
Maine Dept of Environmental Protection 28 Tyson Dr Augusta, ME	2006 to present – Multiple projects under multi-year Master Contracts for the analysis of Dioxins and Furans, PCB Congeners, PBDE congeners, OC Pesticides, PAHs, PFCs and PPCPs in fish tissue, lobster and crab tissue, water, biosolids, and sediments. All work utilized co-extraction and subsequent on-column fractionation for POP analysis.

Alaska Department of Environmental Conservation 5251 Dr. Martin Luther King Jr. Ave Anchorage, AK	2004 to present – Multiple projects under multi-year Master Contracts. Primary analysis is focused on 1613B Dioxins and Furans, 1668A PCB Congeners, HRMS OC Pesticides, 1614 PBDEs in fish tissue. CEC investigations include PFCs, PPCPs, and Hormones and Sterols in fish tissue and POTW discharge. All tissue work utilized co-extraction and subsequent on-column fractionation for POP analysis.
US EPA (Office of Water and Various EPA Regions)	U.S. EPA – National Fish Study (published 2009) – Homogenization of 5000 fish into 5 fish composites for analysis. Analysis of over 1000 fish for Dioxins, PCB by 1668A, and PBDEs. 2002 to present. Development and/or validation of EPA Reference Methods. Examples include development of EPA Method 1614 for PBDEs by HRMS, validation of EPA method 1668A for PCBs, development of EPA 1699 HRMS method for Current Use Pesticides, development of EPA 1694 for PPCPs by LC-MS/MS, and development of EPA 1698 for Sterols and Hormones by GC/HRMS. 2005 to present. GLNPO and U.S. EPA National Dioxin Project for Superfund/Contaminated Sites. Multiple projects including support of the Superfund program through analysis of Dioxins and Furans and PCBs in water, soil, sediment, sludge, fish tissue, ash, and high volume XAD columns/filters from sites across the US.

4. LAB PERFORMANCE FROM XAD AND GLASS WOUND FILTERS CREATED FROM CARBOY SAMPLES

Dioxin/Furan, PCB Congener and OC Pesticide lab blank data from XAD-2 resin and glass wound filters created from carboy samples are included in Appendix 5. Data was generated during the past 12 months. Lab blanks have been processed as per AXYS SOP SLA-076, which generates XAD-2 resin and glass wound filters from carboys. Percent recovery data for both client standards in XAD-2 resin data (standards added prior to processing) and surrogate standards (added prior to the extraction step) have been included. Note that only dioxin/furan and PCB congener analysis routinely have client standards so only those analyses have client standard data, however all analyses and both matrices have surrogate standards.

The lab blank data presented represents client specific requirements, which may include splitting of extracts. When extracts are split, the blank acceptance criteria needs to take this into account. Blank levels may be manipulated by altering sampling volumes and extract volumes.

5. DETECTION LIMITS

AXYS meets the detection limits requirements from Appendix B of the RFP. Full target lists by method, method detection limits (MDLs), reporting limits based on the Lowest Method Calibration Limit (LMCL) and typically achieved sample detection limits (SDLs) are included in Appendix 6. A summary table of SDLs and LMCLs is provided below. As described below, AXYS

proposes to report data to the SDL. Detection limits are presented based on default standard sizes. Blank correction or subtraction is not used at AXYS.

TABLE 3: Detection Limits

Test	Whole Water	Solid	Tissue	XAD-2 resin/filter
Parameters	2.5L	10g dry weight	10g wet weight	20L
PCB Congener	0.4-0.8 pg/L (SDL) 1.6-3.2 pg/L (LMCL)	0.1-0.2 pg/g (SDL) 0.4-0.8 pg/g (LMCL)	0.1-0.2 pg/g (SDL) 0.4-0.8 pg/g (LMCL)	0.05-0.1 pg/L (SDL) 0.2-0.4 pg/L (LMCL)
Dioxin/Furan	0.2 pg/L (SDL) 0.8-8.0 pg/L (LMCL)	0.05 pg/g (SDL) 0.2-2 pg/g (LMCL)	0.05 pg/g (SDL) 0.2-2 pg/g (LMCL)	0.025 pg/L (SDL) 0.1-1pg/L (LMCL)
OC Pesticide – List 1	40-80 pg/L (SDL) 800-1600 pg/L (LMCL)	10-20 pg/g (SDL) 200-400 pg/g (LMCL)	10-20 pg/g (SDL) 200-400 pg/g (LMCL)	5-10 pg/L (SDL) 100-200 pg/L (LMCL)
OC Pesticide – List 2	200 pg/L (SDL) 600-800 pg/L (LMCL)	50 pg/g (SDL) 160-200 pg/g (LMCL)	50 pg/g (SDL) 160-200 pg/g (LMCL)	25 pg/L (SDL) 80-100 pg/L (LMCL)
OC Pesticide – List 3	400 pg/L (SDL)	100 pg/g (SDL)	100 pg/g (SDL)	50 pg/L (SDL)
PAH and Alkylated PAH	400-800 pg/L (SDL) 2000 pg/L (LMCL)	500-1000 pg/g (SDL) 2500 pg/g (LMCL)	100-200 pg/g (SDL) 500 pg/g (LMCL)	250-500 pg/L (SDL) 1250 pg/L (LMCL)

MDLs, LMCLs and SDLs are presented based on a set sample size and extract volume. These can be altered by performing incremental clean-up, increasing sample size analyzed, decreasing the final extract volume and/or increasing the injection volume.

AXYS proposes that detection limits for HRMS and GC/MS analysis (PCB, OC Pesticide, DX, PAH) are reported based on individual sample detection limits (SDLs) as specified in EPA 1600 series methods such as 1613B, 1668A, and 1614. Specifications within these methods are based on signal to noise ratio (1:2.5). This is consistent with Delaware DNREC practices. HRMS and GC/MS analyses with serial isotope dilution and relative recovery correction are generally reported to a sample detection limit (SDL), which is determined individually for every sample analysis run and accounts for any effect of matrix. A SDL is determined by converting the are equivalent of 3 times the estimated chromatographic noise height to a concentration in the same manner that target peak responses are converted to final concentrations. SDLs are only valid below the LMCL where the linear response to the x-axis has been established. SDLs may often be lower than MDLs.

The detection limits for XAD-2 resin are based on XAD-2 resin MDL studies for DX/F, PCB, and PAHs. OC pesticide XAD-2 resin detection limits are based on absolute detection limits determined in the whole water methods. The process used to convert whole water detection limits into XAD-2 resin detection limits is as follows:

- Method detection limits are calculated based on the standard amount of water used in a whole water sample. Generally this is 1 liter but may be as low as 250 mL for some LC/MS/MS tests. The protocol for calculating these MDLs are specified in the EPA Register 40 CFR, Part 136, Appendix B, no iteration. These are calculated for most tests on yearly basis. The results are expressed in units/L.

- The results from this method of calculation are then expressed as absolute detection limits (i.e. 0.1 pg/L becomes 0.1 pg absolute providing the same size is at least greater than the sample size used to calculate the MDL).
- Delaware DNREC provided a sample size of 20 L for the XAD-2 resin so the absolute detection limit is divided by 20 L to provide detection limits in ng/L.
- Use of serial isotope dilution methods and the use of "Sample Specific Detection Limits" or "Estimated Sample Detection Limits" using QC and quantification methods specified in HRMS reference methods allow for defensible results. Key components in these methods are the use of internal standards and the application of relative response factors to correct for matrix loss of surrogates and the use of signal to noise ratios in peak determination.

6. EXPERIENCE IN PERFORMING ANALYSIS OF MULTIPLE PARAMETERS FROM A SINGLE SAMPLE

AXYS has over 20 years experience analyzing multiple parameters from a single sample aliquot. Table 4 includes select examples of analysis of multiple parameters from a single sample. All programs used co-extraction and subsequent on-column fractionation where multiple analyses were required. On-column fractionation was applied to 1613B Dioxins and Furans, 1668A/C PCB congeners, HRMS OC pesticides, and 1614 PBDEs. Further examples of co-extraction analyses are included in Tables 6 and 7.

TABLE 4: Analysis of Multiple Parameters from a Single Sample

Delaware Department of Natural Resources & Environmental Control (DNREC) 820 Silver Lake Blvd, Suite 220 Dover, DE	2004 to present. Analysis of tissue, sediment and high volume water samples to support TMDL work on POPs contributions in the Delaware River and the POP contributions from tributaries to create a mass balance. Analyses included 20L samples of water were collected in "Pop Cans" and processed at AXYS. XAD and filter fractions were created at AXYS for subsequent Dioxin/Furan by EPA 1613B, PCB congener by EPA 1668A, and OC pesticide analysis by mod. 8081 and GC/HRMS (based on EPA 1699). Filter and XAD resin were analyzed separately. Fractionation of extracts using AXYS co-extraction procedures have been used for multiple projects involving tissue, sediment and aqueous samples.
Delaware River Basin Commission (DRBC) 25 State Police Drive West Trenton, NJ	2001 to present. Multiple projects including high volume sampling with filters and XAD columns to determine Dioxin and Furan, PCB, and OC Pesticide levels in the Delaware River and tributaries. Analysis of filters and XAD is separate and employs fractionation. In addition, 20L samples of water are collected in "Pop Cans" and processed at AXYS. XAD and filter fractions are collected at AXYS for subsequent PCB congener analysis.
Maine Dept of Environmental Protection 28 Tyson Dr Augusta, ME	2006 to present – Multiple projects under multi-year Master Contracts for the analysis of Dioxins and Furans, PCB Congeners, PBDE congeners, OC Pesticides, PAHs, PFCs and PPCPs in fish tissue, lobster and crab tissue, water, biosolids, and sediments. All work utilized co-extraction and subsequent on-column fractionation for POP analysis.
Alaska Department of Environmental Conservation 5251 Dr. Martin Luther King Jr. Ave	2004 to present – Multiple projects under multi-year Master Contracts. Primary analysis is focused on 1613B Dioxins and Furans, 1668A PCB Congeners, HRMS OC Pesticides, 1614

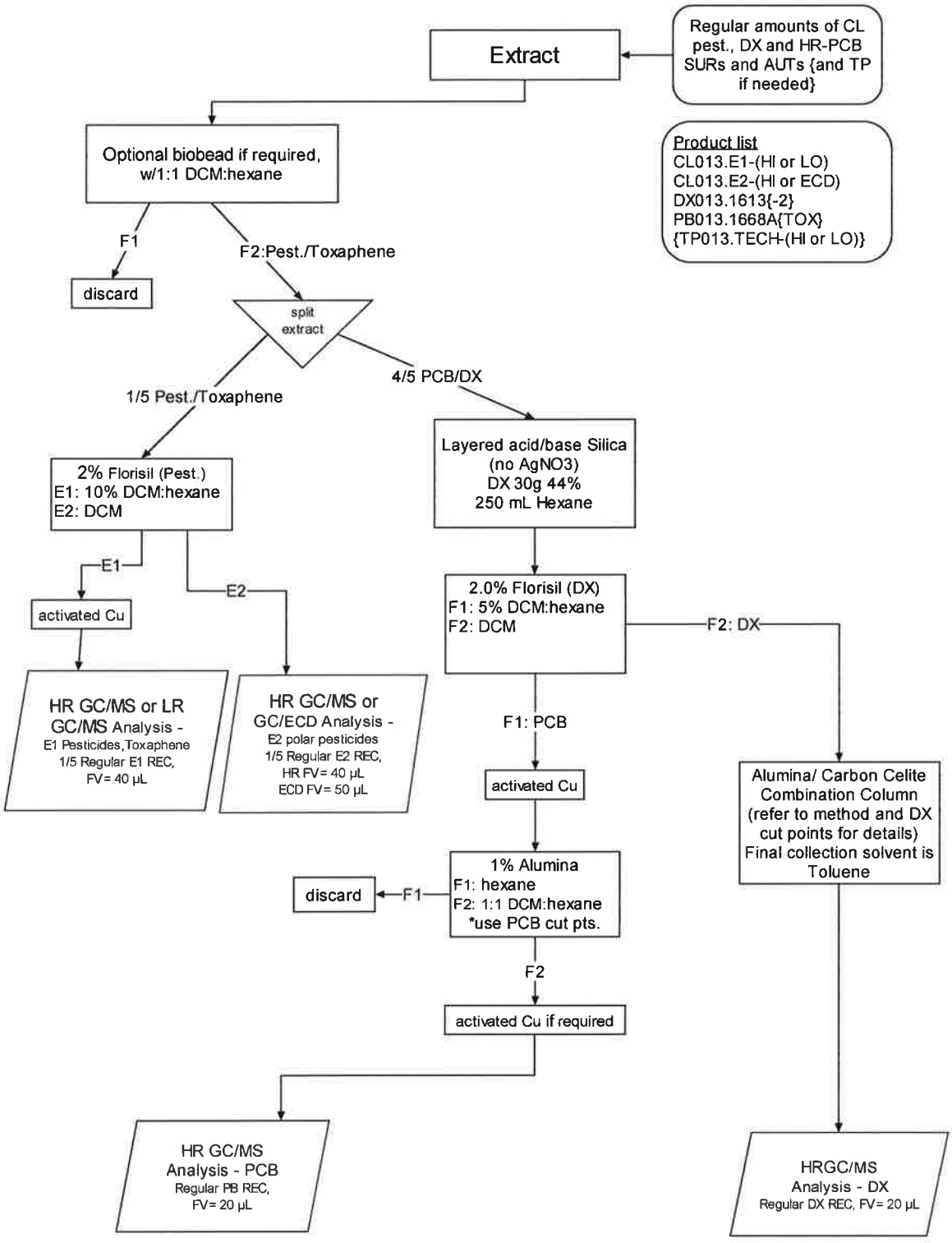
Anchorage, AK	PBDEs in fish tissue. CEC investigations include PFCs, PPCPs, and Hormones and Sterols in fish tissue and POTW discharge. All tissue work utilized co-extraction and subsequent on-column fractionation for POP analysis.

AXYS employs unique technology that allows for extraction of multiple methods from the sample of resin, filter, tissue, sediment, or water. The net result of this capability is that single samples can be extracted as one, providing the following benefits:

- Elimination of expense and time to collect multiple samples to analyze multiple tests. In AXYS's support of Delaware DNREC's WATAR program, Dioxins and Furans, PCB Congeners, and OC Pesticides have been analyzed from the same sample aliquot for multiple matrices.
- Detection limits are maintained as per the original single method detection limits when performing multiple analyses from the same sample. This is accomplished by concentrating the analytes in fractions as opposed to splitting extracts. The advantage in detection limits can be used to measure to lower levels or to minimize sampling volumes (hence collection times) in the field.
- If sample sizes can be minimized during field collection, the interferences resulting from organic matter and other non-target pollutants will be present in lesser degrees. Less clean-up is then required for samples. This reduces the risk of loss of surrogate or standard during processing, creating a more reliable analysis.

The preparation of extracts by concentrating analytes in fractions prevents loss of detection limits by splitting of extracts (for example – a sample that requires a split of an extract to perform a Dioxin and Furan analysis and an OC Pesticide analysis will have it's detection limits doubled through the splitting process. A sample that is fractionated will not suffer a loss of detection limit). See Figure 1 below for an example of the process for analysis of PCDD/PCDF, PCBs, and OC Pesticides from the same sample. The process remains the same regardless of matrix within an analysis group. Clean-up options may vary as appropriate for the analysis group.

FIGURE 1: Co-extraction Clean-up Procedures for PCDD/PCDF, PCBs, and Pesticides in Non-Tissue Matrices



B) POINT RATED CRITERIA

1. EXPERIENCE WITH ULTRA-TRACE ANALYSIS OF APPENDIX A PARAMETERS IN XAD RESIN AND GLASS WOUND FILTER MATRICES

AXYS has been active in the analysis of high volume water samples from filter and XAD resins since 1984. Significant experience has been gained in the following areas;

- Analysis of filters and XAD resin from high volume water sampling (20 – 1,000L). AXYS has vast experience in the analysis of filters and XAD extracted and analyzed separately or from combined extracts from both media. AXYS has experience with a large variety of filter types, XAD types and other dissolved phase capture media, and many different types of sampling devices. In addition, AXYS has experience in program design, preparation, and analysis of multiple filters and XAD samples in parallel and series configurations to establish operating limits of sampling procedures.
- Early work through the 80's and 90's focused on legacy Persistent Organic Pollutants such as PCBs, dioxins and furans, OC pesticides, and PAHs (parent and alkylated). In the late 90's to present day AXYS has expanded this work in custom programs to include PCNs, chlorinated paraffins, PBDEs, pyrethroids, multi-residue pesticides, nonylphenols, PFCs and extracts used for open scan investigative work by GC/MS and advanced semi-quantitative instrumental procedures (variations of multi-dimensional chromatography, TOF, high mass resolution instruments) .
- AXYS has significant experience in performing multiple analyses from a common filter or XAD samples. AXYS fractionation methods in clean-up steps allow for analysis of multiple target groups from one extract without sacrificing detection limit capability required by splitting extracts for multiple tests. Common tests performed from a single sample and extract include PCBs, dioxins and furans (brominated and chlorinated), OC pesticides, and PBDEs. Program specific extraction plans, cleanup plans, and solvent exchange allow this to occur, all with recovery corrected analysis using isotope dilution. This ability reduces the number of samples or water volume required during field campaigns. The potential reduction in water volume reduces time and operability issues in collecting samples, creating a cost reduction in sampling and a higher percentage of successful samples. The reduction in the number of samples required to analyze multiple tests by fractionation during cleanup reduces the amount of samples required for many programs. This produces significant cost reductions as the process of collecting samples, particularly from ships, is very high.
- A core competence of AXYS is the development of new analytical methods. This is demonstrated in the development of such reference methods for the U.S. EPA Office of Water as EPA 1668A/C (PCB congeners by HRMS), EPA 1614 (PBDE congeners), EPA 1699 (MRES Pesticides by HRMS), EPA 1694 (PPCP by LC MS/MS), and EPA 1698 (Hormones and Sterols). Our expertise in method development and application of new analysis of emerging compounds to high volume analysis can be applied to Delaware DNREC needs in current work.

Though published literature regarding high volume sampling is limited, the following peer reviewed publications or technical forum presentations (co-authored by regulatory bodies) from AXYS are available for review. Each demonstrates AXYS competence and experience in the field of high volume sampling with filter / XAD combinations in support of the analysis of legacy or POP analytes and contaminants of emerging concern.

TABLE 5: High Volume Sampling Publications and Presentations

Title	Author(s)/Editor(s)	Reference
Modeling Water Column Partitioning of PCBs to Natural Organic Matter and Black Carbon	Greene, R., Di Toro, D., Farley, K., Phillips, K., **Tomey, C.**	Environ. Sci. Technol. (2013) 47, 6408-6414
Mass Budget of Polybrominated Diphenyl Ethers in San Francisco Bay, CA	Oram, J.J, McKee, L. J., Werme, C.E., Connor, M. S., Oros, D.R., **Grace, R.,** Rodigari, F	Environmental International 34 (2008) 1137-1147
Pyrethroids, Pyrethrins, and Piperonyl Butoxide in Surface Water by HRGC/HRMS	**Woudneh, M**, Oros, D.R.	Journal of Chromatography A, 1135 (2006) 71-77
Isotope Dilution HRGC/HRMS Method for Analysis of Selected Acidic Herbicides in Surface Water	**Woudneh, M,** Sekela, M, Tuominen, T, Gledhill, M	Journal of Chromatography A, 1133 (2006) 293-299
Determination of Perfluorinated Organics in Surface Waters to pg/L levels by Large Volume Solid Phase Extraction with XAD-2	**Hamilton, M., Surridge, B., Haviland, L. Kline, J. Fowler, B.R.**	SETAC North America 27th Annual Meeting, Montreal, Nov 5-9, 2006
Levels and Distribution of Polybrominated Diphenyl Ethers in Water, Surface Sediments and Bivalves from the San Francisco Estuary	Oros, Daniel; **Hoover, D.**, Rodigari, Francois; Crane, D.; Sericano, Jose	Environ. Sci. Technol. 2005, 39, 33-41
An Innovative Approach to High Resolution GC/MS Analysis in Support of a PCB TMDL Study for the Delaware Estuary	**Hoover, D., Hamilton, M.C.,** Cavallo, G.J., Santoro, E.D.	4th National Monitoring Conference, Chattanooga, May 17-20, 2004
PCDDs/PCDFs in Ambient Waters of the San Francisco Estuary	Yee, D., Davis, J., **Brooks, G., Hoover, D.,** Silverbush, B.	SETAC North American 24th Annual Meeting, Austin, TX, Nov 9-13, 2003
Large volume sampling for trace organic pollutants in surface and wastewaters	Litten, S., **Hamilton, M.C., Hoover, D., Fowler, B.**	224th ACS National Meeting, Boston, MA, Aug 2002
Identification of a Novel PCB Source Through Analysis of 209 Congeners by US EPA Modified Method 1668	Litten, S., **Fowler, B., Luszniak, D.**	Chemosphere 46 (2002) 1457-1459
Fingerprinting Dioxin/Furans in Suspended Solids from Ambient Waters & Wastewater Discharges in NY/NJ Harbor & Hudson River	Litten, S., **Fowler, B.**	Organohalogen Compounds Vol. 51 (2001), 130-134
Establishing Baseline Levels of PBDEs in Lake Ontario Surface Waters	Luckey, F., **Fowler, B.**, Litten, S.	3rd Annual Workshop on Brominated Flame Retardants in the Environment, Burlington, ON, Aug 23-24, 2001
Determination of PCDD/PCDF & 209 PCB Congeners in NY Harbor & Hudson Basin Using Filtration / XAD Integrating Samplers & US EPA Methods 1668 & 1613B	Litten, S., **Fowler, B., Luszniak, D.**	Dioxin 2000, 20th International Symposium on Halogenated Environmental Organic Pollutants and POPs, Aug 14-17, 2000.

The vast majority of AXYS experience in high volume sampling and analysis using XAD resins and filters is not published in literature, though it is available directly from the organizations identified in the following examples of experience through their internal documentation and public information services. Specific contacts can be supplied upon request. The following programs and clients represent examples of AXYS experience in various aspects of high volume sampling and subsequent analysis. All programs utilized co-extraction of filters and XAD-2 resin for multiple analyte groups. All programs used co-extraction and subsequent on-column fractionation where multiple analysis were required. On-column fractionation was applied to 1613B Dioxins and Furans, 1668A/C PCB congeners, HRMS OC pesticides, and 1614 PBDEs.

TABLE 6: XAD-2 Resin and Filter Experience

Delaware Department of Natural Resources & Environmental Control (DNREC) 820 Silver Lake Blvd, Suite 220 Dover, DE	2004 to present. Analysis of tissue, sediment and high volume water samples to support TMDL work on POPs contributions in the Delaware River and the POP contributions from tributaries to create a mass balance. Analyses included 20L samples of water were collected in "Pop Cans" and processed at AXYS. XAD and filter fractions were created at AXYS for subsequent Dioxin/Furan by EPA 1613B, PCB congener by EPA 1668A, and OC pesticide analysis by mod. 8081 and GC/HRMS (based on EPA 1699). Filter and XAD resin were analyzed separately. Fractionation of extracts was employed. Variations in POPs concentrations were compared to water organic carbon and TSS levels to support POPs "uptake" models to biota.
Delaware River Basin Commission (DRBC) 25 State Police Drive West Trenton, NJ	2001 to present. Multiple projects including high volume sampling with filters and XAD columns to determine Dioxin and Furan, PCB, and OC Pesticide levels in the Delaware River and tributaries. Analysis of filters and XAD is separate and employs fractionation. In addition, 20L samples of water are collected in "Pop Cans" and processed at AXYS. XAD and filter fractions are collected at AXYS for subsequent PCB congener analysis.
Louis Berger Group (work previously completed with Malcolm Pirnie Inc.) 565 Taxter Rd Elmsford, NY	2005 to present. Multiple projects including as a subcontractor for analysis in support of US Army Corps of Engineers – Kansas City District and oversight by US EPA Region 2 regarding the Passaic River assessment prior to remediation. Work has included analysis of PCBs by 1668A, Dioxins, organochlorine pesticides, technical toxaphene, PAHs and Alkylated PAHs in sediment, aqueous samples (1L, 20L and 100L), columns and filters for Lower Passaic River Restoration Project and Hudson River Baseline Monitoring. Ongoing projects include collection of 20 L water samples that are subsequently processed at AXYS into XAD and filter portions for analysis of PCB by EPA 1668A and PAHs and alkylated PAHs.
Minnesota Pollution Control Agency 520 Lafayette Road North St. Paul, MN	1996 to present. Various projects including analysis of over 100 high volume water samples collected on XAD-2 columns and filters for Dioxins, select Mono to tri Dioxins, PAHs, pesticides, and PCBs. Analysis of sediment, water, and fish tissue for a variety of contaminants including PBDEs, Dioxins, Brominated dioxins, pyrethroids, alkylphenols and PFCs complimented the high volume analysis.
Environment Canada	2001 to present – High volume water sampling supporting

Canada Centre for Inland Waters 867 Lakeshore Rd. Burlington, ON, Canada	Remedial Action Plan for Areas of Concern (AOC) and Great Lakes mass balance for POPs. . AXYS prepared and analyzed high volume water samples (150 to 400 L samples collected on XAD-2 columns/filters) of water for PCBs by 1668A, PBDEs, OC pesticides by GC/HRMS and GCMS, PAHs and alkylated PAHs, alkylphenols, PCNs, and chloroparaffins. Analysis performed demonstrate successful experience with a wide range of analyte groups and the use of fractionation on single extracts to maximize detection limits and information collected from single field samples.
Integral Consulting, Inc. 319 SW Washington St. Suite 1150 Portland OR	2007 – 2008 AXYS was involved in analysis of POPs (Dioxins, PCBs, OC Pesticides) for the Lower Willamette Group remedial action of the Portland Harbour Superfund Site in Portland, Oregon. Analyses on XAD and filters included PCBs 1668A and Dx 1613B, OC pesticides by GC/HRMS, and PAHs during 6 low and high run-off events consisting of 20-50 high volume samples each. Filters and XAD were analyzed separately. Fractionation of OC, PCB, and Dioxin extracts was employed. Analysis also included multiple water, tissue, and sediments analysis episodes.
San Francisco Estuary Institute 4911 Central Ave Richmond, CA	1998 to present. Analysis of PCBs, Dioxins, OC Pesticides, alkylated PAHs, and PBDEs during annual RMP sampling to support TMDL investigations and monitoring in the San Francisco Estuary. XAD-2 / filter analysis is completed on an annual basis at 25 to 40 sites. A combination of separate filter and XAD analysis is used. Fractionation of OC pesticide, PCB, and PBDE extracts is employed. 2-5 analyte groups are measured each year, varying on a 2 year basis.
CClean / contracted through Kinnetic Laboratories / Applied Marine Sciences 307 Washington St. Santa Cruz, CA	2002 to present - Multi-member monitoring board for Monterey Bay CA. with technical oversight by CClean organization. Kinnetic laboratories performs high volume sample collection through automated samplers over one month timeframes. Quarterly analysis of XAD-2 / Filters collected in Monterey Bay, CA including river tributaries and sites proximal to POTW, industrial, and agricultural sources to the bay are performed by AXYS. High volume sampling analysis includes Dioxins and Furans, PCB congeners, OC pesticides, PBDEs, and alkylated PAHs. Filter and XAD extracts are combined, then fractionated. Analysis is augmented by SPMD samples, POCIS samples for PPCPs and PFCs, and grab water samples and tissue samples for all analytes
New York State Department of Environmental Conservation 625 Broadway Albany NY	1996 to 2006. Multiple projects, including CARP and multiple Great Lakes initiatives. Analysis of thousands of XAD columns and filters, PISCES and PEL extracts, soil, sediment, water, fish tissue, fish liver, eggs, mink liver, river otter plasma and blood for a wide variety of analyses including PCB congeners by 1668A and GCMS, PAHs, alkylated PAHs, OC Pesticides by GCMS and GC/HRMS, Dioxins, PBDEs, PFCs, and retinols. Analysis of Lake Ontario surface water samples collected on XAD-2 resin for PCBs, dioxins, and pesticides in 1999 resulted in a joint publication "Establishing baseline levels of PBDEs in Lake Ontario Surface Water".
Western Lake Superior Sanitary	2003 to present. Quarterly analysis of XAD-2 columns and

District 2626 Courtland Street Duluth, MN	filters, effluent, and biosolids for PCBs by 1668A, PBDEs, and Dioxins. Samples are collected from Lake Superior offshore waters, Duluth Harbour, and proximal to POTW outfalls. Separate filter and XAD analysis are performed. Brominated dioxins are included at a lesser frequency.
Orsanco (Ohio River Valley Water Sanitation Commission) 5735 Kellogg Avenue Cincinnati, OH	2002 to 2010. High Volume sampling with filters and XAD columns to determine Dioxin and Furan levels and PCB levels in the Ohio River mainstream and tributaries. Separate analysis of filters and XAD columns is performed. Sampling has occurred in parallel and series to establish reproducibility of sampling and breakthrough of analytes vs. sampling speed. Current on-going work is PCB source trackdown by tributary and source.
Environment Canada-Pacific Region #201 - 401 Burrard St. Vancouver, BC	2000 to present. Automated samplers are used to collect 70 to 200L high volume samples using filters and XAD columns. Over 450 samples have been analyzed for PCB, PBDE, Acid Extractable Herbicides, OC Pesticides, Multi-residue pesticides, Nonylphenols, PAH and alkylated PAH and hormones/sterols to determine levels in the Fraser River.
Institute of Ocean Sciences (IOS) 9860 West Saanich Road Sidney, BC	2000 to present. Multiple projects including OC Pesticides, Multi-residue pesticide and AEH analysis of XAD-2 resin and filters for high volume sampling project (20L to 600L). 2000 to present. Analysis of aquatic samples - freshwater and marine fish, invertebrates, marine mammals, blubber, micro and macro algae, aqueous and solid samples for a wide variety of analysis including DX/F by 1613B, PCBs by 1668A, OC Pesticides by GCMS and GC/HRMS, PFCs, AEH, PCNs, PBDEs, Multi-Residue pesticides and PAHs.
EPA (Office of Water and Various EPA Regions)	2000 to present – various contracts for preparation of XAD and Glass Wound Filter media with subsequent analysis for Dioxins and Furans and PCB congeners.
USF&WS (Great Lakes Division)	2010-2011 – XAD and Glass Wound Filter Preparation and Analysis of AOC waters for PCB congeners and OC pesticides.

2. EXPERIENCE WITH SAMPLES SIMILAR TO THOSE FOUND IN THE DELAWARE RIVER BASIN FOR REQUESTED ANALYTES IN WATER, TISSUE AND SEDIMENT

AXYS has been active in the analysis of tissue, water (whole and high volume) and sediment in the Delaware River Basin since 2001;

- AXYS has vast experience in the analysis of water, tissue and sediment analysis by HRMS, GC/MS SIM and LC MS/MS instruments. In all methods, isotope dilution and subsequent quantification through recovery correction are used, and very strong positive identification criteria from multiple ion fragments or MRM transitions based on both target analytes and labeled surrogates. Specificity is maximized in all instrument methods and cleanup methods are designed to meet method criteria in actual matrices. The combination of all of these factors produces reliable and defensible sample specific detection limits at very low levels. AXYS detection limits are commonly 10-1000X lower

than standard analytical methods used for determination of contaminated industrial sites or regulatory water values such as the Clean Water Act. AXYS detection limits and positive identification criteria are suitable for determination of ambient levels of pollutants, mass balance work, and risk assessment.

- Early work through the 80's and 90's focused on legacy Persistent Organic Pollutants such as PCBs, dioxins and furans, OC pesticides, and PAHs (parent and alkylated) analyzed by HRMS or GC/MS SIM methods, as appropriate, for the analytes and the needs of the clients. In the late 90's to present day AXYS has expanded our HRMS and GC/MS SIM methods to include PBDEs and other BFRs, PCNs, Chlorinated Paraffins, PBBs, pyrethroids, multi-residue pesticides, nonylphenols, hormones and sterols, and acid extractable herbicides. Since 2003, AXYS has been a leader in developing LC MS/MS methodologies to support the analysis of PFCs, fluorotelomer alcohols, low level carbamates, low level glyphosates, PPCPs, hormones, parabens, BPA, HBCDD, and TBBPA.
- AXYS has significant experience in performing multiple analyses from a single sample. AXYS fractionation methods in clean-up steps allow for analysis of multiple target groups from one extract without sacrificing detection limit capability required by splitting extracts for multiple tests. Common tests performed from a single sample and extract include PCBs, dioxins and furans (brominated and chlorinated), OC pesticides, PBDEs, and PCNs. Program specific extraction plans, cleanup plans, and solvent exchange allow this to occur, all with recovery corrected analysis using isotope dilution. This ability reduces the amount of sample required for collection during field campaigns or the amount of material required from archived sediments for temporal monitoring.
- AXYS is a leader in POPs and CEC analysis in both the United States and Canada. AXYS is major supplier of analytical services to the U.S. EPA and Environment Canada, as well as state and provincial agencies. Work conducted by AXYS will meet Delaware DNREC criteria.
- A core competence of AXYS is the development of new analytical methods. This is demonstrated in the development of such reference methods as EPA 1668 (PCB congeners by HRMS), EPA 1614 (PBDE congeners), EPA 1699 (MRES Pesticides by HRMS), EPA 1694 (PPCP by LC MS/MS), and EPA 1698 (Hormones and Sterols). Our expertise in method development and application of new analysis of emerging compounds to water and sediment analysis can be applied to Delaware DNRECs needs in current work.

The vast majority of AXYS experience in tissue, water and sediment analysis is available directly from the organizations identified in the following examples of experience through their internal documentation and public information services. Specific contacts can be supplied upon request. The following programs and clients represent examples of AXYS experience in analysis of PCB congeners by EPA 1668A, Dioxin/furans by EPA 1613B, OC Pesticides, and parent and alkylated PAHs in tissue, water (whole and high volume) and sediment samples or in relevant method development with regulatory agencies;

TABLE 7: Relevant Water, Tissue and Sediment Sample Analysis Experience

Delaware Department of Natural Resources & Environmental Control (DNREC) 820 Silver Lake Blvd, Suite 220 Dover, DE	2004 to present. Analysis of tissue, sediment and high volume water samples to support TMDL work on POPs in the Delaware River and the POP contributions from tributaries to create a mass balance. Analyses included 20L samples of water were collected in "Pop Cans" and processed at AXYS. XAD and filter fractions were created at AXYS for subsequent Dioxin/Furan by EPA 1613B, PCB congener by EPA 1668A, and OC pesticide analysis by mod. 8081 and GC/HRMS (based on EPA 1699). Filter and XAD resin were analyzed

	separately. Fractionation of extracts was employed. Variations in POPs concentrations were compared to water organic carbon and TSS levels to support POPs "uptake" models to biota. Multiple fish and sediment surveys for 1613B Dioxins and Furans, 1668A PCB Congeners, and HRMS OC pesticides.
Delaware River Basin Commission (DRBC) 25 State Police Drive West Trenton, NJ	2001 to present. Multiple projects including analysis of whole water samples, XAD-2 high volume waters and filters, sediment, and biota from the Delaware River Basin for OC Pesticides by HRMS, PCB Congeners by 1668A, PBDEs by 1614, PFCs, and emerging contaminants. Analyses support TMDL efforts and fish consumption guidelines.
Philadelphia Water Department 1500 East Hunting Park Avenue Philadelphia, PA	2005 – present. PCB analysis of aqueous and solid samples, using DRBC PCB analytical requirements, for NPDES permit compliance.
Washington Dept. of Ecology 7411 Beach Drive East Port Orchard, WA	1998 to Present – 6-12 contracts each year for the analysis of POPs (Dioxins and Furans, PCB Congeners, OC Pesticides, PCNs, Chloroparaffins, PBDEs) and CECs (PFCs, PPCPs, Hormones and Sterols). Matrices include fish tissue, marine and freshwater sediments, filtered sediments, SPMDs, POCIS, groundwater, precipitation, and whole water.
Maine Dept of Environmental Protection 28 Tyson Dr Augusta, ME	2006 to present – Multiple projects under multi-year Master Contracts for the analysis of Dioxins and Furans, PCB Congeners, PBDE congeners, OC Pesticides, PAHs, PFCs and PPCPs in fish tissue, lobster and crab tissue, water, biosolids, and sediments. All work utilized co-extraction and subsequent on-column fractionation for POP analysis.
Alaska Department of Environmental Conservation 5251 Dr. Martin Luther King Jr. Ave Anchorage, AK	2004 to present – Multiple projects under multi-year Master Contracts. Primary analysis is focused on 1613B Dioxins and Furans, 1668A PCB Congeners, HRMS OC Pesticides, 1614 PBDEs in fish tissue. CEC investigations include PFCs, PPCPs, and Hormones and Sterols in fish tissue and POTW discharge. All tissue work utilized co-extraction and subsequent on-column fractionation for POP analysis.
USGS Great Lakes Restoration Initiative 2630 Fanta Reed Road La Crosse, WI	2010 to present – Assessment of POPs in Great Lakes reference sites and AOCs. Work included analysis of Dioxins and Furans, PCB Congeners, OC Pesticides, PFCs and PBDEs in swallow tissue, eggs, serum, and diet. All tissue work utilized co-extraction and subsequent on-column fractionation for POP analysis.
US EPA Related Projects	U.S. EPA – National Fish Study (published 2009) – Homogenization of 5000 fish into 5 fish composites for analysis. Analysis of over 1000 fish for Dioxins, PCB by 1668A, and PBDEs. 2002 to present. Development and/or validation of EPA Reference Methods. Examples include development of EPA Method 1614 for PBDEs by HRMS, validation of EPA method 1668A for PCBs, development of EPA 1699 HRMS method for Current Use Pesticides, development of EPA 1694 for PPCPs by LC-MS/MS, and development of EPA 1698 for Sterols and Hormones by GC/HRMS. 2006 to 2009. Multiple projects – AXYS has analyzed PBDEs, PCBs, Dx/F, MRES, PPCPs, Sterols and Hormones, and Acid

	Extractable Herbicides in POTW matrices. 4 projects consisting of 10-20 analysis of each test per matrix to validate method applicability to POTW matrices. POTW sites were nationwide and included discharges into the Delaware River Basin. 2005 to present. GLNPO and U.S. EPA National Dioxin Project for Superfund/Contaminated Sites. Multiple projects including support of the Superfund program through analysis of Dioxins and Furans and PCBs in water, soil, sediment, sludge, fish tissue, ash, and high volume XAD columns/filters from sites across the US.
San Francisco Estuary Institute 4911 Central Ave Richmond, CA	1998 – present. In support of RMP projects, AXYS has analyzed tissues (mussels, sport fish, eggs), large volume water samples which have been partitioned into dissolved (XAD-2 resin) and particulate (filter) phases, whole water samples (2, 4 and 8L), and sediments for analyses including PCBs by 1668A, Dioxin/Furans by 1613B, OC Pesticides by GC/HRMS, PAHs and alkylated PAH, PBDEs by 1614, and PFCs. Total samples analyzed exceeds 4,000 samples since 2006.
Minnesota Pollution Control Agency 520 Lafayette Road North St. Paul, MN	1996 to present. Various projects including analysis of sediment, water, and fish tissue for a variety of contaminants including dioxin/furans, PCB congeners, PBDEs, Brominated dioxins, pyrethroids, alkylphenols and PFCs. Since 2004, AXYS has analyzed PFCs, PBDEs, Pyrethroids, and PAHs for Minnesota in water, soil, sediment, municipal effluent, municipal biosolids, landfill leachates and sludges, ambient and landfill air and gas, fish tissue and tree swallow eggs and tissues in ambient and highly contaminated environments.
New York State Department of Environmental Conservation 625 Broadway Albany NY	1996 to present. Multiple projects, including some Great Lakes initiatives. Analysis of thousands of XAD columns and filters, PISCES extracts, soil, sediment, water, fish tissue, fish liver, eggs, mink liver, river otter plasma and blood for a wide variety of analyses including PCB congeners by 1668A and GCMS, PAHs, alkylated PAHs, OC Pesticides by GCMS and GC/HRMS, Dioxins, PBDEs, PFCs, and retinols. Analysis of Lake Ontario surface water samples collected on XAD-2 resin for PCBs, dioxins, and pesticides in 1999 resulted in a joint publication "Establishing baseline levels of PBDEs in Lake Ontario Surface Water".

3. DEMONSTRATED ABILITY TO ACHIEVE DETECTION LIMITS AND LAB BLANKS TO MEET DATA QUALITY OBJECTIVES

AXYS has the ability to meet or exceed all detection limit requirements from the RFP Appendix B. Detection limits for water, solids, and tissues are attached in Appendix 6. Method Detection Limits are measured based on a set sample size, however these can be altered by

analyzing a larger sample size. XAD detection limits are presented on a 20 L sample size, since that is the provided sample size for the Delaware DNREC work.

Detection limits are calculated using EPA Register CFR 40, Part 136, Appendix B. AXYS proposes that detection limits for HRMS and GC/MS analysis are reported based on individual sample detection limits (SDLs) as specified in EPA 1600 series methods such as 1613B, 1668A, and 1614. Specifications within these methods are based on signal to noise ratio (1:2.5). All HRMS and GC/MS methods that use C13 labeled internal standards and Relative Response Factors for quantification would be reported using SDLs.

AXYS does not blank correct data in the calculation of detection limits or data reporting. AXYS also does not use subtraction in the determination of detection limits or data reporting. Tables 8 to 11 contain Lab Blank QC specifications. Blank limits are provided on an absolute basis (for example pg absolute) and need to be divided by the sample size to determine the matrix specific limit. Blank specifications are generated from the mean of multiple method blanks with a minimum of 2 standard deviations. The lower limit for blank acceptance criteria for a specific project may be derived by manipulating based on factors such as the sample size and extract volume. For example, the TCDD blank limit for a 1L sample is 0.5 pg/L, however if the sample volume is increased to 2.5L, the blank limit would be 0.5 pg absolute divided by 2.5 L for a limit of 0.2 pg/L.

TABLE 8: Lab Blank Acceptance Criteria for Dioxins/Furans

	Lab Blank criteria (pg abs)
2,3,7,8-TCDD	0.5
2,3,7,8-TCDF	0.5
1,2,3,7,8-PeCDD	1.0
1,2,3,7,8-PeCDF	1.0
2,3,4,7,8-PeCDF	1.0
1,2,3,4,7,8-HxCDD	1.0
1,2,3,6,7,8-HxCDD	1.0
1,2,3,7,8,9-HXCDD	1.0
1,2,3,4,7,8-HxCDF	1.0
1,2,3,6,7,8-HxCDF	1.0
1,2,3,7,8,9-HxCDF	1.0
2,3,4,6,7,8-HxCDF	1.0
1,2,3,4,6,7,8-HpCDD	1.0
1,2,3,4,6,7,8-HpCDF	1.0
1,2,3,4,7,8,9-HpCDF	1.0
OCDD	5.0
OCDF	5.0

Higher levels acceptable where all sample concentrations are > 10X the blank concentrations.

TABLE 9: Lab Blank Acceptance Criteria for PCB Congeners

PCB Congener	Lab blank criteria (pg abs)
PCB 77, 81, 114, 123, 126, 169	2
PCB 156, 157, 167, 189	10
All other individual PCB congeners or coelutions	50
Sum of all 209 congeners	300

Higher levels acceptable where all sample concentrations are > 10X the blank concentrations.

TABLE 10: Lab Blank Acceptance Criteria for E1 and E2 Chlorinated Pesticides

Analyte	Procedural Blank Level	Analyte:	Procedural Blank Level
	ng		ng
Hexachlorobenzene	<0.1	Delta-HCH	<0.5
alpha-HCH	<0.2	Heptachlor epoxide	<0.5
beta-HCH	<0.2	alpha-Endosulphan	<0.5
gamma-HCH	<0.2	Dieldrin	<0.5
delta-HCH *	n.a.	Endrin	<0.5
Heptachlor	<0.2	Endosulphan sulphate	<0.5
Aldrin	<0.2	Endrin ketone	<0.5
Oxychlordane	<0.2	beta-Endosulphan	<0.5
trans-Chlordane	<0.1	Endrin aldehyde	<0.5
cis-Chlordane	<0.1	Methoxychlor	<1
o,p'-DDE	<0.1		
p,p'-DDE	<0.1		
trans-Nonachlor	<0.1		
cis-Nonachlor	<0.1		
o,p'-DDD	<0.1		
p,p'-DDD	<0.1		
o,p'-DDT	<0.1		
p,p'-DDT	<0.1		
Mirex	<0.1		
Technical Toxaphene	<0.5		

* Delta-HCH normally will elute primarily in the E2 fraction and can be quantified solely from this fraction. Recoveries of delta-HCH may be reported as the sum of the E1 and E2 recoveries if significant concentrations of delta-HCH are observed in the E1 fraction.

TABLE 11: Lab Blank Acceptance Criteria for PAHs and Alkylated PAHs

	Procedural Blank Level		
MATRIX	**Solid**	**Aqueous**	**Tissue**
Analyte:	**ng absolute**	**ng absolute**	**ng absolute**
Naphthalene	<10	<10	<50
Acenaphthylene	<5	<5	<5
Acenaphthene	<5	<5	<5
Fluorene	<5	<5	<5
Phenanthrene	<10	<10	<10
Anthracene	<5	<5	<5
Fluoranthene	<5	<5	<5
Pyrene	<5	<5	<5
Benz(a)anthracene	<1.9	<1	<0.9
Chrysene	<3.0	<1	<1.3
Benzo(b)fluoranthene	<4.2	<0.6	<1.6
Benzo(j/k)fluoranthenes	<2.1	<0.4	<1.2
Benzo(e)pyrene	<5	<5	<5
Benzo(a)pyrene	<3.6	<0.9	<0.7
Perylene	<10	<10	<10
Dibenzo(ah)anthracene	<2.8	<0.7	<0.7
Indeno(1,2,3-cd)pyrene	<2.8	<0.8	<1.5
Benzo(ghi)perylene	<2.4	<0.9	<0.7
Biphenyl	<5	<5	<5
Dibenzothiophene	<5	<5	<5
1-Methylnaphthalene	<5 [1]	<5 [1]	<5 [1]
2-Methylnaphthalene	<5 [1]	<5 [1]	<5 [1]
2,6-Dimethylnaphthalene	<10 [1]	<10 [1]	<10 [1]
1,2-Dimethylnaphthalene	<10 [1]	<10 [1]	<10 [1]
2,3,5-Trimethylnaphthalene	<10 [1]	<10 [1]	<10 [1]
2,3,6-Trimethylnaphthalene	<10 [1]	<10 [1]	<10 [1]
1,4,6,7-Tetramethyl-naphthalene	<10 [1]	<10 [1]	<10 [1]
2-Methylanthracene	<5	<5	<5
3-Methylphenanthrene	<10	<10	<10
2-Methylphenanthrene	<10	<10	<10
9/4-Methylphenanthrenes	<10	<10	<10
1-Methylphenanthrene	<10	<10	<10
3,6-Dimethylphenanthrene	<10	<10	<10
2,6-Dimethylphenanthrene	<10	<10	<10
1,7-Dimethyl-phenanthrene [2]	<10	<10	<10
1,8-Dimethylphenanthrene	<10	<10	<10
1,2,6-Trimethyl-phenanthrene	<10	<10	<10
Retene	<5	<5	<5
2-Methylfluorene	<5	<5	<5
1,7-Dimethylfluorene	<5	<5	<5

	Procedural Blank Level		
MATRIX	**Solid**	**Aqueous**	**Tissue**
Analyte:	**ng absolute**	**ng absolute**	**ng absolute**
2/3-Methyldibenzothiophenes	<10	<10	<10
2,4-Dimethyl-dibenzothiophene	<5	<5	<5
3-Methylfluoranthene [3]/Benzo(a)fluorene	<5	<5	<5
5/6-Methylchrysenes	<5	<5	<5
1-Methylchrysene	<5	<5	<5
5,9-Dimethylchrysene [4]	<5	<5	<5
7-Methylbenzo(a)pyrene	<5	<5	<5
C1-Biphenyls	< 50	< 50	< 50
C2-Biphenyls	< 250	< 250	< 250
C1-Naphthalenes	< 10	< 10	< 10
C2-Naphthalenes	< 50	< 50	< 50
C3-Naphthalenes	< 15	< 15	< 15
C4-Naphthalenes	< 25	< 25	< 25
C1-Acenaphthenes	< 10	< 10	< 10
C1-Fluorenes	< 25	< 25	< 25
C2-Fluorenes	< 50	< 50	< 50
C3-Fluorenes	< 20	< 20	< 20
C1-Dibenzothiophenes	< 5	< 5	< 5
C2-Dibenzothiophenes	< 10	< 10	< 10
C3-Dibenzothiophenes	< 15	< 15	< 15
C4-Dibenzothiophenes	< 25	< 25	< 25
C1-Phenanthrenes/ Anthracenes	< 15	< 15	< 15
C2-Phenanthrenes/ Anthracenes	< 15	< 15	< 15
C3-Phenanthrenes/ Anthracenes	< 25	< 25	< 25
C4-Phenanthrenes/ Anthracenes	< 25	< 25	< 25
C1-Fluoranthenes /Pyrenes	< 15	< 15	< 15
C2-Fluoranthenes/ Pyrenes	< 15	< 15	< 15
C3-Fluoranthenes/ Pyrenes	< 5	< 5	< 5
C4-Fluoranthenes/ Pyrenes	< 5	< 5	< 5
C1-Benz(a)anthracenes/ Chrysenes	< 5	< 5	< 5
C2-Benz(a)anthracenes/ Chrysenes	< 10	< 10	< 10
C3-Benz(a)anthracenes/ Chrysenes	< 10	< 10	< 10
C4-Benz(a)anthracenes/ Chrysenes	< 15	< 15	< 15
C1-Benzofluoranthenes/ Benzopyrenes	< 15	< 15	< 15
C2-Benzofluoranthenes/ Benzopyrenes	< 15	< 15	< 15

[1] Procedural blank level limits don't apply for naphthalene and alkylated naphthalene from XAD-2 resin.

4. DEMONSTRATED USE OF C13 OR OTHER LABELED SURROGATES AND QC ACCEPTANCE CRITERIA

AXYS utilizes C13 labeled surrogates as internal or recovery standards in all analyses. C13 or deuterated standards must have the following characteristics to be used:

- Appropriate purity
- Produce desirable and unique fragments or MRM transitions with sufficient response to produce desired detection limits. The fragments or transitions selected from these surrogates be reliably measured and free from common interferences.
- Stable at conditions used
- Contain enough C13 material to have a significant enough mass difference from the native standard for chromatographic purposes
- If available, 2 sources of each standard is desirable

Tables 12 to 16 contain Ongoing Precision and Recovery (OPR) sample and surrogate recovery QC specifications for each requested method.

TABLE 12: QC Acceptance Criteria for Dioxins/Furans

	OPR (%)	Labelled Compound (% rec. in sample)	
		Warning Limits	Control Limits
Native Compound			
2,3,7,8-TCDD	70-130	-	-
2,3,7,8-TCDF	75-130	-	-
1,2,3,7,8-PeCDD	70-130	-	-
1,2,3,7,8-PeCDF	80-130	-	-
2,3,4,7,8-PeCDF	70-130	-	-
1,2,3,4,7,8-HxCDD	70-130	-	-
1,2,3,6,7,8-HxCDD	76-130	-	-
1,2,3,7,8,9-HXCDD	70-130	-	-
1,2,3,4,7,8-HxCDF	72-130	-	-
1,2,3,6,7,8-HxCDF	84-130	-	-
1,2,3,7,8,9-HxCDF	78-130	-	-
2,3,4,6,7,8-HxCDF	70-130	-	-
1,2,3,4,6,7,8-HpCDD	70-130	-	-
1,2,3,4,6,7,8-HpCDF	82-122	-	-
1,2,3,4,7,8,9-HpCDF	78-130	-	-
OCDD	78-130	-	-
OCDF	70-130	-	-
Surrogate Standards			
$^{13}C_{12}$-2,3,7,8-TCDD	25-130	40-120	25-130
$^{13}C_{12}$-2,3,7,8-TCDF	25-130	40-120	24-130
$^{13}C_{12}$-1,2,3,7,8-PeCDD	25-150	40-120	25-130
$^{13}C_{12}$-1,2,3,7,8-PeCDF	25-130	40-120	24-130
$^{13}C_{12}$-2,3,4,7,8-PeCDF	25-130	40-120	21-130

$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	25-130	40-120	32-130
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	25-130	40-120	28-130
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	25-130	40-120	26-130
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	25-130	40-120	26-123
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	25-130	40-120	29-130
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	25-130	40-120	28-130
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	26-130	40-120	23-130
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	25-130	40-120	28-130
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	25-130	40-120	26-130
$^{13}C_{12}$-OCDD	25-130	25-120	17-130
Cleanup Standard			
$^{37}Cl_4$-2,3,7,8-TCDD	31-130	40-120	35-130

* For comparability with EPA 1613B the precision specification for IPR is stated as %SD (=standard deviation relative to the fortification level).

TABLE 13: QC Criteria for E1 Chlorinated Pesticides

Analyte	Acceptable Matrix Spike
	% Recovery
Hexachlorobenzene	70-130
alpha-HCH	70-130
beta-HCH	70-130
gamma-HCH	70-130
delta-HCH *	n.a.
Heptachlor	70-130
Aldrin	70-130
Oxychlordane	70-130
trans-Chlordane	70-130
cis-Chlordane	70-130
o,p'-DDE	70-130
p,p'-DDE	70-130
trans-Nonachlor	70-130
cis-Nonachlor	70-130
o,p'-DDD	70-130
p,p'-DDD	70-130
o,p'-DDT	70-130
p,p'-DDT	70-130
Mirex	70-130
Technical Toxaphene	60-150

* Delta-HCH normally will elute primarily in the E2 fraction and can be quantified solely from this fraction. Recoveries of delta-HCH may be reported as the sum of the E1 and E2 recoveries if significant concentrations of delta-HCH are observed in the E1 fraction.

** Extract volumes may range from 20 µL to 200 µL. To avoid excessive loss of volatile compounds, where recovery of volatile compounds is critical, extract volumes lower than 100 µL are not recommended.

Table 13 (continued)

SURROGATE STANDARD RECOVERIES	% RECOVERY RANGES (ALL MATRICES)
$^{13}C_6$-Hexachlorobenzene	20-150
$^{13}C_6$-beta-HCH	30-150
$^{13}C_6$-delta-HCH[1]	n.a.
$^{13}C_6$-gamma-HCH	30-150
$^{13}C_{10}$-Heptachlor	30-150
$^{13}C_{12}$-Aldrin	30-150
$^{13}C_{10}$-Oxychlordane	30-200
$^{13}C_{10}$-trans-Chlordane	30-200
$^{13}C_{12}$-o,p'-DDE	40-150
$^{13}C_{12}$-p,p'-DDE	40-150
$^{13}C_{10}$-trans-Nonachlor	30-150
$^{13}C_{10}$-cis-Nonachlor	30-150
$^{13}C_{12}$-p,p'-DDD	40-150
$^{13}C_{12}$-o,p'-DDT	40-150
$^{13}C_{12}$-p,p'-DDT	40-150
$^{13}C_{10}$-Mirex	30-150
$^{13}C_{12}$-PCB 159	40-130

TABLE 14: QC Criteria for E2 Chlorinated Pesticides

Analyte:	Acceptable Matrix Spike % Recovery[2]
Delta-HCH	60-130
Heptachlor epoxide	60-130
alpha-Endosulphan	70-130
Dieldrin	60-130
Endrin	60-130
Endosulphan sulphate	70-130
Endrin ketone	60-130
beta-Endosulphan	70-130
Endrin aldehyde	50-130
Methoxychlor	60-130

[1] Delta-HCH normally will elute primarily in the E2 fraction and can be quantified solely from this fraction. Recoveries of ^{13}C-delta-HCH may be reported as the sum of the E1 and E2 recoveries if significant concentrations of ^{13}C-delta-HCH are observed in the E1 fraction.

[1] Extract volumes may range from 20 µL to 200 µL. To avoid excessive loss of volatile compounds, where recovery of volatile compounds is critical, extract volumes lower than 100 µL are not recommended.

[2] Recoveries quoted are guidelines only and vary according to matrix. Consult detailed method performance data available with method documentation for specific criteria.

Note: Custom QC criteria protocols apply for non-routine targets (e.g. dacthal or oxadiazon) **and must be defined *a priori* in Project Notes.**

Table 14 (continued)

SURROGATE STANDARD RECOVERIES:	**% RECOVERY RANGES ALL MATRICES**
$^{13}C_6$-delta-HCH	30-150
$^{13}C_{12}$-Dieldrin	30-150
$^{13}C_{12}$-Endrin	30-150
$^{13}C_{12}$-Endrin aldehyde	30-150
$^{13}C_{10}$-Heptachlor epoxide	30-150
$^{13}C_{12}$-Methoxychlor	30-150
$^{13}C_9$-alpha-Endosulphan	30-150
$^{13}C_9$-beta-Endosulphan	30-150

TABLE 15: QC Acceptance Criteria according to EPA method 1668A for PCB Congeners

Congener	Cong. No. [2]	OPR [1] (%)		Labelled compound [1] % recovery in samples	
		Warning limits	Acceptance limits	Warning limits	Acceptance limits
2-MoCB	1	70-130	50-150	-	-
4-MoCB	3	70-130	50-150	-	-
2,2'-DiCB	4	70-130	50-150	-	-
4,4'-DiCB	15	70-130	50-150	-	-
2,2'6-TrCB	19	70-130	50-150	-	-
3,4,4'-TrCB	37	70-130	50-150	-	-
2,2'6,6'TeCB	54	70-130	50-150	-	-
3,3',4,4'-TeCB	77	70-130	50-150	-	-
3,4,4',5-TeCB	81	70-130	50-150	-	-
2,2',4,6,6'-PeCB	104	70-130	50-150	-	-
2,3,3',4,4'-PeCB	105	70-130	50-150	-	-
2,3,4,4',5-PeCB	114	70-130	50-150	-	-
2,3',4,4',5-PeCB	118	70-130	50-150	-	-
2',3,4,4',5-PeCB	123	70-130	50-150	-	-
3,3',4,4',5-PeCB	126	70-130	50-150	-	-
2,2',4,4',6,6'-HxCB	155	70-130	50-150	-	-
2,3,3',4,4',5-HxCB [3]	156	70-130	50-150	-	-
2,3,3',4,4',5'-HxCB [3]	157	70-130	50-150	-	-
2,3',4,4',5,5'-HxCB	167	70-130	50-150	-	-
3,3',4,4',5,5'-HxCB	169	70-130	50-150	-	-
2,2',3,4',5,6,6'-HpCB	188	70-130	50-150	-	-
2,3,3',4,4',5,5'-HpCB	189	70-130	50-150	-	-
2,2',3,3',5,5',6,6'-OcCB	202	70-130	50-150	-	-
2,3,3',4,4',5,5',6-OcCB	205	70-130	50-150	-	-
2,2',3,3',4,4',5,5',6-NoCB	206	70-130	50-150	-	-

Congener	Cong. No.[2]	OPR[1] (%)		Labelled compound[1] % recovery in samples	
		Warning limits	Acceptance limits	Warning limits	Acceptance limits
2,2',3,3,'4,5,5',6,6'-NoCB	208	70-130	50-150	-	-
DeCB	209	70-130	50-150	-	-
Labeled Compounds					
$^{13}C_{12}$-2-MoCB	1L	15-140	15-140	15-130	15-150
$^{13}C_{12}$-4-MoCB	3L	15-140	15-140	15-130	15-150
$^{13}C_{12}$-2,2'-DiCB	4L	30-140	30-140	25-130	25-150
$^{13}C_{12}$-4,4'-DiCB	15L	30-140	30-140	25-130	25-150
$^{13}C_{12}$-2,2',6-TrCB	19L	30-140	30-140	30-130	25-150
$^{13}C_{12}$-3,4,4'-TrCB	37L	30-140	30-140	30-130	25-150
$^{13}C_{12}$-2,2',6,6'-TeCB	54L	30-140	30-140	30-130	25-150
$^{13}C_{12}$-3,3',4,4'-TCB	77L	30-140	30-140	30-130	25-150
$^{13}C_{12}$-3,4,4',5-TeCB	81L	30-140	30-140	30-130	25-150
$^{13}C_{12}$-2,2',4,6,6'-PeCB	104L	30-140	30-140	40-130	25-150
$^{13}C_{12}$-2,3,3',4,4'-PeCB	105L	30-140	30-140	40-130	25-150
$^{13}C_{12}$-2,3,4,4',5-PeCB	114L	30-140	30-140	40-130	25-150
$^{13}C_{12}$-2,3',4,4',5-PeCB	118L	30-140	30-140	40-130	25-150
$^{13}C_{12}$-2',3,4,4',5-PeCB	123L	30-140	30-140	40-130	25-150
$^{13}C_{12}$-3,3',4,4',5-PeCB	126L	30-140	30-140	40-130	25-150
$^{13}C_{12}$-2,2',4,4',6,6'-HxCB	155L	30-140	30-140	40-130	25-150
$^{13}C_{12}$-2,3,3',4,4',5-HxCB[3]	156L	30-140	30-140	40-130	25-150
$^{13}C_{12}$-2,3,3',4,4',5'-HxCB[3]	157L	30-140	30-140	40-130	25-150
$^{13}C_{12}$-2,3',4,4',5,5'-HxCB	167L	30-140	30-140	40-130	25-150
$^{13}C_{12}$-3,3',4,4',5,5'-HxCB	169L	30-140	30-140	40-130	25-150
$^{13}C_{12}$-2,2',3,3',4,4',5-HpCB	170L	30-140	30-140	40-130	25-150
$^{13}C_{12}$-2,2',3,4,4',5,5'-HpCB	180L	30-140	30-140	40-130	25-150
$^{13}C_{12}$-2,2',3,4',5,6,6'-HpCB	188L	30-140	30-140	40-130	25-150
$^{13}C_{12}$-2',3,3',4,4',5,5'-HpCB	189L	30-140	30-140	40-130	25-150
$^{13}C_{12}$-2,2',3,3',5,5',6,6'-OcCB	202L	30-140	30-140	40-130	25-150
$^{13}C_{12}$-2,3,3',4,4',5,5',6-OcCB	205L	30-140	30-140	40-130	25-150
$^{13}C_{12}$-2,2',3,3',4,4',5,5',6-NoCB	206L	30-140	30-140	40-130	25-150
$^{13}C_{12}$-2,2',3,3',4,5,5',6,6'-NoCB	208L	30-140	30-140	40-130	25-150
$^{13}C_{12}$-2,2',3,3',4,4',5,5',6,6'-DeCB	209L	30-140	30-140	40-130	25-150
Cleanup Standards					
$^{13}C_{12}$-2,4,4'-TriCB	28L	40-125	40-125	40-130	30-135
$^{13}C_{12}$-2,3,3',5,5'-PeCB	111L	40-125	40-125	40-130	30-135
$^{13}C_{12}$-2,2',3,3',5,5',6-HpCB	178L	40-125	40-125	40-130	30-135

[1] QC acceptance criteria for IPR, OPR, and samples based on a 20 µL extract final volume
[2] Suffix "L" indicates labelled compound.
[3] PCBs 156 and 157 are tested as the sum of two concentrations

TABLE 16: PAHs - QC Acceptance Criteria

MATRIX Analyte:	Acceptable Matrix Spike % Recovery
Naphthalene	70-130
Acenaphthylene	70-140
Acenaphthene	70-130
Fluorene	60-140
Phenanthrene	70-130
Anthracene	70-130
Fluoranthene	70-130
Pyrene	70-130
Benz(a)anthracene	70-130
Chrysene	70-130
Benzo(b)fluoranthene	70-130
Benzo(j/k)fluoranthenes	70-130
Benzo(e)pyrene	70-130
Benzo(a)pyrene	70-130
Perylene	70-130
Dibenzo(ah)anthracene	70-130
Indeno(1,2,3-cd)pyrene	70-130
Benzo(ghi)perylene	70-130
Biphenyl	70-130
Dibenzothiophene	60-140
1-Methylnaphthalene	70-130
2-Methylnaphthalene	70-130
2,6-Dimethylnaphthalene	70-130
1,2-Dimethylnaphthalene	60-140
2,3,5-Trimethylnaphthalene	50-150
2,3,6-Trimethylnaphthalene	50-150
1,4,6,7-Tetramethyl-naphthalene	50-200
2-Methylanthracene	50-150
3-Methylphenanthrene	N.A.
2-Methylphenanthrene	50-150
9/4-Methylphenanthrenes	N.A.
1-Methylphenanthrene	50-150
3,6-Dimethylphenanthrene	50-150
2,6-Dimethylphenanthrene	N.A.
1,7-Dimethyl-phenanthrene [2]	50-150
1,8-Dimethylphenanthrene	N.A.
1,2,6-Trimethyl-phenanthrene	50-150
Retene	50-150
2-Methylfluorene	50-150
1,7-Dimethylfluorene	50-150
2/3-Methyldibenzothiophenes	50-150

MATRIX Analyte:	Acceptable Matrix Spike % Recovery
2,4-Dimethyl-dibenzothiophene	50-150
3-Methylfluoranthene [3]/ Benzo(a)fluorene	50-150
5/6-Methylchrysenes	50-150
1-Methylchrysene	50-150
5,9-Dimethylchrysene [4]	50-150
7-Methylbenzo(a)pyrene	50-150
C1-Biphenyls	
C2-Biphenyls	
C1-Naphthalenes	
C2-Naphthalenes	
C3-Naphthalenes	
C4-Naphthalenes	
C1-Acenaphthenes	
C1-Fluorenes	
C2-Fluorenes	
C3-Fluorenes	
C1-Dibenzothiophenes	
C2-Dibenzothiophenes	
C3-Dibenzothiophenes	
C4-Dibenzothiophenes	
C1-Phenanthrenes/ Anthracenes	
C2-Phenanthrenes/ Anthracenes	
C3-Phenanthrenes/ Anthracenes	
C4-Phenanthrenes/ Anthracenes	
C1-Fluoranthenes /Pyrenes	
C2-Fluoranthenes/ Pyrenes	
C3-Fluoranthenes/ Pyrenes	
C4-Fluoranthenes/ Pyrenes	
C1-Benz(a)anthracenes/ Chrysenes	
C2-Benz(a)anthracenes/ Chrysenes	
C3-Benz(a)anthracenes/ Chrysenes	
C4-Benz(a)anthracenes/ Chrysenes	
C1-Benzofluoranthenes/ Benzopyrenes	
C2-Benzofluoranthenes/ Benzopyrenes	

* Detection limits quoted are those routinely achieved. Detection limits for alkylated PAH Compound Totals are based on detection of a single component.

[1] Procedural blank level limits don't apply for naphthalene and alkylated naphthalene from XAD-2 resin.

[2] Due to limited availability of 1,7-dimethylphenanthrene standard, this compound may be absent from OPR samples.

[3] Due to limited availablilty of 3-methylfluoranthene standard, this compound may be absent from OPR samples. It may be substituted by 2-methylfluoranthene as the exemplar alkylfluoranthene in the OPR.

[4] Due to limited availablilty of 5,9-dimethylchrysene standard, this compound may be absent from OPR samples. It may be substituted by other alternative dimethylchrysene isomers as the exemplar C2/C3/C4-benz(a)anthracene/chrysene in the OPR; in such cases the recovery specification for 5,9-dimethylchrysene would not apply.

NOTE: Reference samples are unavailable for Alkylated PAH Compound Totals, data acceptability evaluation is based on recoveries of the associated individual alkylated PAH compounds

Table 16 (cont'd)

SURROGATE STANDARD RECOVERIES:	**% RECOVERY RANGES ALL MATRICES**
d_8-naphthalene	15 – 130
d_8-acenaphthylene	20 – 130
d_{10}-phenanthrene	30 – 130
d_{10}-fluoranthene	30 – 130
d_{12}-benz[a]anthracene	30 – 130
d_{12}-chrysene	30 – 130
d_{12}-benzo[b]fluoranthene	30 – 130
d_{12}-benzo[k]fluoranthene	30 – 130
d_{12}-benzo[a]pyrene	30 – 130
d_{12}-perylene	30 – 130
d_{14}-dibenz[ah]anthracene	30 – 130
d_{12}-indeno[1,2,3-cd]pyrene	30 – 130
d_{12}-benzo[ghi]perylene	30 – 130
d_{10}-2-methylnaphthalene	20 – 130
d_{12}-2,6-dimethylnaphthalene	20 – 130
d_{10}-biphenyl	15 – 130
d_8-dibenzothiophene	30 – 130

5. EFFECTIVENESS OF QUALITY CONTROL PROGRAM DEMONSTRATED IN PERFORMANCE EVALUATION STUDIES

AXYS benchmarks the accuracy, precision, reliability, and reproducibility vs. blind standards and vs. other analytical organizations through participation in Performance Evaluation studies whenever possible. A three-year history of Performance Evaluation studies that AXYS participates in is included in Appendix 2.

The vast majority of Performance Evaluation forums available to AXYS are in the biota and human serum fields. It should also be noted that Proficiency Evaluation programs are often single event programs that are no longer offered. Results are offered in Appendix 2 where the study produces a clear grading of the result. Most studies that do not produce a clear grading require reading the entire report. Generally these reports are 40-60 pages in length. Reports of

this nature are not included as a courtesy to the reader. All reports are available in hardcopy or electronically on request. Many Performance Evaluation studies are available for tissue, serum, varying forms of biota, and foodstuffs. AXYS participates in these as the knowledge gained from these studies assists in all other matrices. AXYS is committed to the following long-term programs that deal directly with analytes and matrices of interest to this RFP. Please note that no Performance Evaluation programs are available for resin analysis from high volume water samples.

6. AXYS ORGANIZATIONAL STRUCTURE AND PERSONNEL, EXPERIENCE IN PROJECT MANAGEMENT, CONTRACT SUPERVISION, FACILITIES AND EQUIPMENT

a) AXYS Organizational Structure and Project Management / Contract Supervision Team

AXYS relies on a designated project manager to serve as the designated day to day point of contact to our clients. At a project level, the project manager is responsible for assisting with technical, contractual compliance issues, and logistical interactions with the client on the expected work, as outlined by the Account Manager. The Account Manager consults with the client authorities to provide contractual definition and compliance, assignment of AXYS resources to support contractual and technical service requirements, volumes and requirements regarding samples, types of analyses to be completed, method selection, subcontractors, reporting of data, special needs or custom procedures, and maintains records of all correspondence and conversations. The project manager is responsible for communicating these needs and required timeframes for scheduling of work to our laboratory staff, and serves as a technical resource for our clients. The project manager has wide authority to call on further technical resources if required. All AXYS project managers have the ability to validate data and communicate technical information to our clients at an appropriate technical level. For major accounts, AXYS designates a technical and management team to support the project manager and client. The project manager may call on these resources as required.

AXYS project managers and client service representatives (including sample reception) have been in their current positions for an average of 8 years.

AXYS has assigned Cynthia Tomey as the designated project manager for Delaware DNREC work and is backed up by an equally qualified project management staff including Kalai Pillay (Client Services Manager). Cynthia has been performing this function for Delaware DNREC since 2007. Prior to project management at AXYS, Cynthia was a data validation specialist in AXYS operations. Cynthia will be able to provide immediate technical assistance to Delaware DRNEC at a comprehensive level. She has similar duties with other clients including US EPA, US Fish and Wildlife Service, San Francisco Estuary Institute, and Spokane River Regional Toxics Task Force.

The following brief biographies are of the key AXYS team members and managers that would be involved in the Delaware DNREC.

Project Manager – Cynthia Tomey, B.Sc.

Ms. Tomey has been with AXYS since 2004, and has held progressive positions within our Sample Preparation Group, Primary Validation Group, and Secondary Validation Group, to her current position as project manager. As a project manager, Cynthia is responsible for ensuring that all contractual requirements are satisfied, including sample handling and methodology requirements, QA/QC specifications and delivery of results. She has been the project manager

for Delaware DNREC since 2007, including a project on the Christina Basin TMDL that resulted in the following publication:

Greene, R., Di Toro, D., Farley, K., Phillips, K., **Tomey, C**. *Modeling Water Column Partitioning of PCBs to Natural Organic Matter and Black Carbon.* Environ. Sci. Technol. 2013, 47, 6408-6414

Director Sales, Marketing, and Service - - Account Manager -Richard Grace, B.Sc.

Mr. Grace will provide overall management for this contract through assignment from his staff and active participation in the execution of this contract. Mr. Grace has been responsible for the management of service provision for analytical and field studies for 25 years. Current duties at AXYS as Director – Sales, Marketing, and Service, and as account manager for Delaware DRNEC, both since 2006, is responsible for assignment of personnel and resources to support all customer projects and the development of product offerings. Prior to AXYS, Mr. Grace was employed at Maxxam Analytics Inc. from 2000 to 2006 as National Environmental Sales Manager and Senior Operations Manager (Ontario Environmental, Microbiological, Air, Food, Petroleum divisions). From 1985 to 1998 Mr. Grace worked in variety of progressive technical and managerial functions in the specialty chemical industry with Nalco Chemical Company, providing engineering services and the evaluation of process additives in major industries with a focus on water quality.

Supporting Resources:

Client Services Manager - Kalai Pillay, B.Sc.

Mr. Pillay is assigned to provide project management back-up and support to Cynthia Tomey in the event of holidays, illness, or as a resource to manage workload variations. Mr. Pillay has been with AXYS for 10 years including 3 years providing data validation and / or supervising our data validation group. From 2006 to 2012 Mr. Pillay has been a project manager for AXYS, with notable assignments for US Fish and Wildlife Service and Environment Canada where he has served as project manager for many key projects.

Director of Operations – Shea Hewage, B.Sc.

Ms. Hewage is responsible for all laboratory analysis at AXYS, and the client services group, with a staff of 60 analysts, supervisors, and managers under her supervision. All analysts are cross trained in a variety of different methods to create a competent, flexible workforce capable of meeting all method and defined client specifications on a routine basis. Ms. Hewage has been with AXYS for 23 years and has been active in all AXYS analytical endeavours in the Persistent Organic Pollutant and emerging contaminant field during that time. Reporting to the president, as Lab Director, Ms. Hewage is responsible and accountable for production at AXYS. Ms. Hewage assigns and directs laboratory resources to execute analysis of client samples by defined analytical and QA/QC procedures and fully trained analysts. Timing of analysis is based on inputs from project management to meet defined client requirements.

VP Quality Assurance – Dale Hoover, B.Sc.

Mr. Hoover is director of AXYS Quality Assurance and has been with AXYS for 24 years. As the Director of Quality Assurance Mr. Hoover operates independently of AXYS daily operations and is accountable for developing standards for quality and for administering a quality program to ensure these standards are adhered to. Mr. Hoover is a certified auditor for compliance to ISO 17025 standards. As a private industry auditor in CALA he performs audits of public sector laboratories in the trace organics and general management categories. Mr. Hoover has the overall responsibility for ensuring that AXYS' systems provide accurate, defensible results at standards appropriate for their intended use. Mr. Hoover brings considerable expertise in standards of data quality and is available to bring this expertise to the team to insure the most defensible of data.

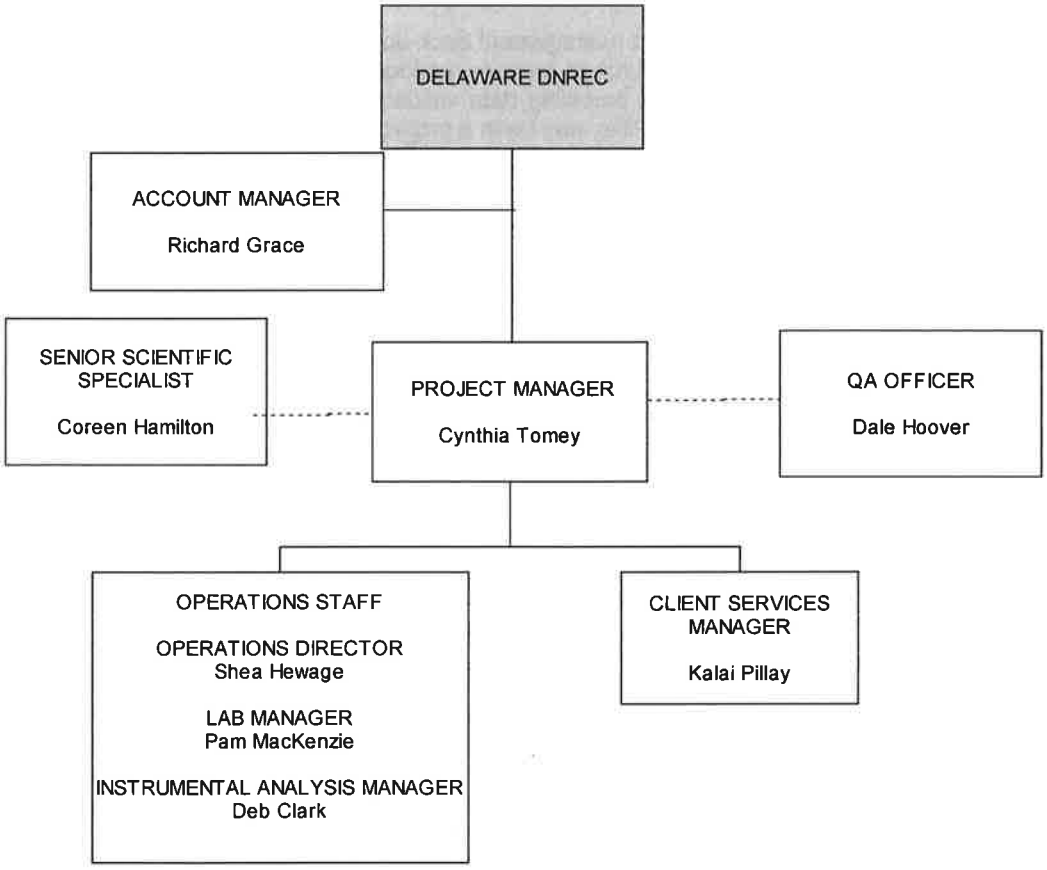
Senior Scientist and Technical Specialist – Coreen Hamilton, PhD.

Designated as a technical resource for this contract, Dr. Hamilton has a PhD in analytical chemistry and has been at AXYS since 1984. Dr. Hamilton is also a faculty member at the University of Victoria and teaches third and fourth year analytical chemistry. Over the past 29 years Dr. Hamilton has held a variety of senior technical and managerial positions at AXYS. She has been instrumental in much of the analytical development at AXYS that would include analysis of naphthenic acids, extended alkylated PAHs, PBDEs, nonylphenols, brominated dioxin/furans and sterols. She specializes in high volume and passive sampling and analysis. Currently Dr. Hamilton is assigned as technical support to specific analytical and method development projects.

While we have outlined individual responsibilities, we must emphasize that any problems that may arise are handled in a team approach, drawing upon the knowledge and experience of all AXYS scientists.

Figure 2 illustrates the project organizational flow chart for Delaware DNREC work. The overall AXYS organizational charts are attached as Appendix 7.

FIGURE 2: DELAWARE DNREC WORKING RELATIONSHIP FLOW CHART



b) Facilities and Equipment

AXYS has modern laboratories, which provide ample space, facilities and equipment to conduct trace level organic analyses. AXYS has eight self-contained, limited-access, wet chemistry laboratories (8000 sq ft), each equipped with its own high-flow fume hood(s) and each supplied with treated fresh air to isolate each lab's environment while maintaining optimal air quality in each room. Four of these labs are equipped with HEPA filters and approved exhaust systems for handling human biological samples. The five instrument laboratories (7000 sq ft) are isolated from the wet chemistry laboratories and each is also equipped with climate controls, separate power sources and limited security access. There are dedicated sample receiving and sample preparation/homogenization areas as well as two walk-in coolers and four walk-in freezers to provide clean, appropriate work and storage areas for all samples and extracts. With office space and meeting rooms the total area of AXYS facilities is ~22,000 sq ft.

AXYS currently operates six high resolution mass spectrometer systems (GC/HRMS), including five Micromass AutoSpec Ultima GC/HRMS systems and one Micromass Premier system. The GC/HRMS capabilities are focused on dioxin/furan analyses, PCB congeners, organochlorine pesticides and various brominated compounds. There are four low resolution (quadrupole) GC/MS systems which analyze PCBs, OC pesticides, PAHs, nonylphenols, and sterols. AXYS also operates five liquid chromatography systems with tandem mass spectrometric detection (LC/MS/MS); Micromass Quattro Ultimas. These instruments are used for analysis of perfluorinated chemicals, glyphosate, carbamates, triclosan, mono phthalate esters, bisphenol A and its metabolites, pharmaceuticals, naphthenic acids, and hormones. All of the mass spectrometer systems are equipped with auto samplers and all instruments are staffed for multiple daily shifts.

At AXYS samples are stored in freezer or refrigerator rooms, isolated from the main laboratories. Temperatures in walk-in freezers are maintained at between -20°C to -25°C. All freezers and their temperatures are electronically monitored 24 hours a day by a commercial security firm to ensure sample integrity.

AXYS currently operates the following instruments relevant to Delaware DNREC work:

TABLE 17: Instruments

1	Micromass AutoSpec Ultima Series V High Resolution Mass Spectrometer System equipped with a Hewlett Packard 5890 Series II High Resolution Gas Chromatograph, a CTC A200S autosampler and an Alpha workstation.
2	Micromass AutoSpec Ultima Series M High Resolution Mass Spectrometer Systems equipped with a Hewlett Packard 6890 series High Resolution Gas Chromatograph, a CTC A200S autosampler and an Alpha workstation.
2	Micromass AutoSpec Ultima Series M High Resolution Mass Spectrometer Systems equipped with a Hewlett Packard 6890N series High Resolution Gas Chromatograph, a CTC GC-PAL autosampler and an Alpha workstation.
2	Agilent 5973 Network Mass Selective Detectors equipped with an Agilent 6890N Network Gas Chromatograph, a CTC GC-PAL series autosampler and a workstation running Chemstation software.
1	Agilent 6890N Gas Chromatograph equipped with two Agilent G2397A Electron Capture Detectors, an Agilent 7683 autosampler and a workstation running Chemstation software.
1	HP 5972 Network Mass Selective Detectors equipped with an HP 5890 Series II Gas Chromatograph, a CTC A200SE autosampler and a workstation running Chemstation software.
1	Waters Premier Series High Resolution Mass Spectrometer System equipped with a Hewlett Packard 6890N series High Resolution Gas Chromatograph, a CTC GC-PAL autosampler and an Alpha workstation.
1	Agilent 6890N Network Gas Chromatograph with an Agilent 5975 Network Mass Selective Detector, a CTC GC-PAL series auto sampler and a workstation running Chemstation software.

7. LEVEL IV DATA PACKAGE, EXCEL BASED FORMATS AND DNREC EQUIS DATABASE FORMAT CAPABILITY

AXYS currently provides EDD transfers in over 40 formats and languages including complex relational databases such as EQUIS 4 – file. AXYS has previously provided data electronically to Delaware DNREC in both Excel based electronic data deliverable (EDD) format and Level IV data package. AXYS has been working with Delaware DNREC staff to develop the DNREC EQuIS format and has provided examples of both the Excel based EDD format and the draft DNREC EQuIS format in Appendix 8. A description of the contents for a Level IV data package have been included in the hard copy response for the RFP, but to maintain brevity, a full example data package has only been included on the CD. All examples are for Dioxin/Furan however AXYS would be happy to supply EDD and data package examples for all analyses upon request.

AXYS successfully and routinely provides EQuIS data to multiple clients, based on the customized requirements (field definitions and valid values menus) defined by that client. The DNREC EQuIS EDD required for the analyses requested in this RFP will require some fine tuning to be ready for use, however this process is largely complete. At present, there are a number of valid values that must be discussed to finalize the AXYS DNREC EQuIS EDD. AXYS also recognizes that the DNREC EQuIS requirements may change over time. AXYS is committed to updating our DNREC EDD programming to match ongoing changes over time.

Currently AXYS is aware of a number of valid values, normally reported in the Excel based EDDs historically supplied to DNREC, that are not available in the current DNREC EQuIS EDD format. These are primarily associated with incremental C-labelled surrogates used in AXYS analysis, and parameters reported from mathematical functions based on analytical results. Examples of parameters which must be addressed include;

- Labelled field surrogates utilized in XAD analysis.
- TEQ calculations at ½ and full detection limit values for non-detect compounds.
- Homologue totals for PCBs.
- Time of analysis – currently dates are used for this field as opposed to time of day. Dates are more appropriate for the analysis performed by AXYS.

Through use of the data checker utility provided, AXYS will be able to identify all situations where valid values may not exist to support those parameters historically requested by DNREC. The issues may be addressed in 3 ways;

- The parameter without a valid value is not reported by AXYS
- A valid value is added to the DNREC EQuIS EDD valid values menu that will allow DNREC to receive the value exported by AXYS.
- A convention on how to report a particular field is agreed upon by AXYS and DNREC, if the field description or valid value match is not exact.

Upon award, AXYS would recommend engaging DNREC IT and project staff to address the minor formatting issues currently noted.

APPENDIX 1
ACCREDITATION

AXYS Analytical Services Ltd - Accreditation Summary

file ref.: ACC-101 Rev.14

	Pulp	Serum	Solids										Tissue						Urine	Water	Water, Drinking				Water, Non-Potable								
Compound Class	CALA	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ACLASS	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ACLASS	CALA	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	ACLASS	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ACLASS
BPA and MPE																			Y														
HBCDD		Y																		Y													
OC Pesticides		Y	Y	Y	Y			Y	Y		Y	Y	Y							Y					Y	Y			Y	Y	Y	Y	Y
PAH			Y	Y	Y			Y	Y		Y	Y	Y							Y					Y	Y			Y	Y		Y	Y
Parabens																			Y														
PBDPE		Y	Y										Y							Y											Y		
PCB		Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y							Y					Y	Y		Y	Y	Y	Y	Y	Y
PCDDF	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y		Y					Y	Y		Y	Y	Y	Y	Y	Y
PFC		Y	Y		Y	Y	Y					Y	Y	Y	Y	Y		Y		Y	Y	Y	Y	Y		Y	Y	Y					Y
PPCP			Y								Y									Y												Y	
Targeted Metabolites													Y																				
TBBPA		Y																															

Legend

BPA and mPE	Bisphenol A and mono-Phthalate Esters
HBCDD	Hexabromocyclododecane
OC Pesticides	Organochlorine Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PBDPE	Polybrominated diphenylethers
PCB	Polychlorinated Biphenyls
PCDDF	Polychlorinated dibenzodioxins/furans
PFC	Perfluorinated Compounds
PPCP	Pharmaceutical and Personal Care Products
TBBPA	Tetrabromobisphenol A
CALA	Canadian Association for Laboratory Accreditation Inc., Lab ID A2637
California DPH	California Department of Public Health, Lab ID 2911
Florida DOH	Florida Department of Health, Lab ID E871007
Minnesota DOH	Minnesota Department of Health, Lab ID 232-999-430
New Jersey DEP	New Jersey Department of Environmental Protection, Lab ID CANA005
New York DOH	New York Department of Health, Lab ID 11674
Washington DE	Washington Department of Ecology, Lab ID C404
Virginia DGS	Virginia Department of General Services, Division of Consolidated Laboratory Services, Lab ID 460224
Maine DOH	Maine Center for Disease Control and Prevention, Department of Health and Human Services, Lab ID CN00003
ACLASS	ANSI-ASQ National Accreditation Board, certificate AT-1861

APPENDIX 2
PERFORMANCE EVALUATION AND INTERCALIBRATION STUDIES

AXYS Analytical Services Ltd.

PERFORMANCE EVALUATION TESTING AND INTERLABORATORY COMPARISON EXERCISES

MAY 2011 TO MAY 2014

PROGRAM	DATE	ANALYSIS	MATRIX	SCORE
RTC, LPTP14-S2 (3388)	MAY 2014	**Dioxin/Furan**	Soil and tissue	Acceptable 54/54
RTC, WP14-2 (3385)	MAY 2014	**Dioxin/Furan**	Water	Acceptable 28/28
Phenova Solids Study HW0114 (3383)	MAR 2014	**PCB** (HR/MS and GC/MS), **OC Pesticides** (HR/MS and GC/MS), **PAH**	Solids	Acceptable 93/93
PFAS ILS 2013 (3377)	FEB 2014	PFC, Fluorotelomer sulfonates	Water, sediment, fish tissue	Acceptable 15/20 (preliminary results)
CALA Winter 2014 Study (3381)	FEB 2014	**PCB** (GC/MS), **OC Pesticides** HR/MS and GC/MS), **PAHs**	Solids and Water	Acceptable 68/68
Phenova Water Study WP0114 (3379)	FEB 2014	**PCB** (HR/MS and GC/MS), **OC Pesticides** (HR/MS and GC/MS), **PAH**, PFC	Water	Acceptable 75/75
CALA Fall 2013 Study (3376)	NOV 2013	**OC Pesticides** (HR/MS and GC/MS)	Water	Acceptable 30/30
RTC, LPTP13-S4 (3375)	NOV 2013	**Dioxin/Furan**	Soil and Tissue	Acceptable 53/53
German External Quality Assessment Scheme, G-EQUAS 52, 2013 (3374)	NOV 2013	**PCB** (HR/MS), **OC Pesticides** (HR/MS), PEM, BPA, PFC	Urine and Serum	Report Pending
RTC, WP13-4 (3373)	NOV 2013	**Dioxin/Furan**	Water	Acceptable 28/28
Quebec Toxicology, AMAP Ring Test Round 3 (2013) (3372)	NOV 2013	**PCB** (HR/MS), **OC Pesticides** (HR/MS), PBDE, PFC	Human Serum	Acceptable 66/67
New York State Department of Environmental Conservation, PE Samples (4681)	SEP 2013	OC pesticide (GC/MS), **PCB** (HR/MS), HBCD, TBBPA, PBDPE	Tissue	Acceptable 100% Passed Contract Requirement
Phenova Solids Study HW0713 (3371)	JUL 2013	**PCB** (HR/MS and GC/MS), **OC Pesticides** (HR/MS and GC/MS), **PAHs**	Solids	Acceptable 94/94
CALA Summer 2013 Study (3369)	JUN 2013	**PCB** (GC/MS), **OC Pesticides** (HR/MS and GC/MS), **PAH**	Solids and Water	Acceptable 66/67
Phenova Water Study WP0613 (3368)	JUN 2013	**PCB** (HR/MS and GC/MS), **OC Pesticides** (HR/MS and GC/MS), **PAH**	Water	Acceptable 74/75
U.S. Fish and Wildlife Service, PE Samples (9946)	MAY 2013	**PCB** (GC/MS), **OC Pesticides** (GC/MS)	Soil and Tissue	Acceptable 81% Passed Contract Requirement
Quebec Toxicology, AMAP Ring Test Round 2 (2013) (3367)	APR 2013	**PCB** (HR/MS), **OC Pesticides** (HR/MS), PBDE, PFC	Human Serum	Satisfactory 91/93
RTC, LPTP13-S2 (3366)	APR 2013	**Dioxin/Furan**	Soil, Tissue	Acceptable 54/54
German External Quality Assessment Scheme, G-EQUAS 51, 2013 (3365)	MAR 2013	**PCB** (HR/MS), **OC Pesticides** (HR/MS), PEM, BPA, PFC	Urine and Serum	Acceptable 36/36

AXYS Analytical Services Ltd.

PROGRAM	DATE	ANALYSIS	MATRIX	SCORE
RTC, WP13-2 (3364)	MAR 2013	**Dioxin/Furan**	Water	Acceptable 28/28
Quebec Toxicology, AMAP Ring Test Round 1 (2013) (3363)	MAR 2013	PFC	Human Serum	Satisfactory 17/18
Phenova Solids Study HW013 (3362)	MAR 2013	**PCB** (HR/MS and GC/MS), **OC Pesticides** (HR/MS and GC/MS), **PAHs**	Solids	Acceptable 94/94
InterCIND QA/QC Study, 1st Round (3360)	MAR 2013	**Dioxin/Furan**, **PCB** (HR/MS), PBDPE	Sediment	Satisfactory 162/162
CALA Winter 2013 Study (3359)	JAN 2013	**PCB** (GC/MS), **OC Pesticides** (HR/MS and GC/MS), **PAH**	Solids and Water	Acceptable 31/31
Phenova Water Study WP0113 (3358)	FEB 2013	**PCB** (HR/MS and GC/MS), **OC Pesticides** (HR/MS and GC/MS), PFC, **PAHs**	Water	Acceptable 74/75
Ontario Ministry of the Environment, Laboratory Services Branch Northern Contaminants Program III, MOE Interlaboratory Study for NCP III – Phase 7 (3357)	DEC 2012	**PCDD/F** + DL**PCB**, **PCB** (HR/MS), **OC Pesticides** (HR/MS), PFC, PBDE, PCN	Tissue or Extract	Satisfactory (scores 92%, 74%, 85%, 85%, 59%, 67% respectively)
RTC, LPTP12-S4 (3355)	NOV 2012	**PCDD/F**	Soil and Tissue	Acceptable 54/54
German External Quality Assessment Scheme, G-EQUAS 50 (3354)	DEC 2012	**PCB** (HR/MS), **OC Pesticides** (HR/MS), PEM, BPA, PFC	Urine and Serum	Acceptable 35/36
Institut national de sante publique du Quebec , AMAP R 2012-03 (3353)	JUN 2012	**PCB** (HR/MS), **OC Pesticides** (HR/MS), PBDE, PFC , **Dioxin/Furans**	Human Serum	Acceptable 116/117
RTC, WP12-4 (3352)	NOV 2012	**PCDD/F**	Water	Acceptable 28/28
Phenova Solids Study HW0712 (3351)	AUG 2012	**PCB** (HR/MS and GC/MS), **OC Pesticides** (HR/MS and GC/MS), **PAHs**	Solids	Acceptable 74/74
Phenova Water Study WP0712 (3349)	AUG 2012	**PCB** (HR/MS and GC/MS), **OC Pesticides** (HR/MS and GC/MS), PFC, **PAHs**	Water	Acceptable 76/77
CALA, Summer 2012 Study (3348)	JUL 2012	**PCB** (GC/MS), **OC Pesticides** (HR/MS and GC/MS), **PAHs**	Solids and Water	Acceptable 67/68
Wibby Environmental Water Study FT-09825 (3347)	MAY 2012	**PAHs**	Water	Acceptable 16/16
USFW, PE Samples (3346)	APR 2012	**PCB** (GC/MS), **PCDD/F**, **OC Pesticides** (GC/MS), **PAHs**	Soil and Tissue	Acceptable, Passed Contract Requirement
RTC, LPTP12-S2 (3345)	JUN 2012	**PCDD/F**	Soil and Tissue	Acceptable 54/54
Institut national de sante publique du Quebec , AMAP R 2012-02 (3344)	JUN 2012	**PCB** (HR/MS), **OC Pesticides** (HR/MS), PBDE, PFC	Human Serum	Acceptable 97/98
Environment Canada, Naphthenic Acids Interlaboratory Calibration Study 2012 (3343)	APR 2012	Naphthenic Acids	Water	No formal score given – judgement satisfactory

AXYS Analytical Services Ltd.

PROGRAM	DATE	ANALYSIS	MATRIX	SCORE
RTC, WP12-2 (3342)	MAY 2012	**PCDD/F**	Water	Acceptable 28/28
German External Quality Assessment Scheme, G-EQUAS 49, 2012 (3341)	MAY 2012	**PCB** (HR/MS), **OC Pesticides** (HR/MS), PEM, BPA, PFC	Urine and Serum	Acceptable 17/18
Wibby Environmental Water Study WP0112 (3340)	FEB 2012	**PCB** (HR/MS and GC/MS), **OC Pesticides** (HR/MS and GC/MS), PFC, **PAHs**, HCB	Water and Soil	Acceptable 150/150
Institut national de sante publique du Quebec, AMAP R 2012-01 (3339)	MAR 2012	**PCB** (HR/MS), **OC Pesticides** (HR/MS), PBDPE, PFC	Serum	Acceptable 32/34
CALA, Winter 2012 Study (3337)	FEB 2012	**PCB** (GC/MS), **OC Pesticides** (HR/MS and GC/MS), **PAH**	Solid and Water	Acceptable 52/52
Wibby Environmental Water Study ID: RR-08990 (3336)	DEC 2011	PFC	Water	Acceptable 58/58
G-EQUAS 48, German External Quality Assessment Scheme (3335)	DEC 2011	**PCB** (HR/MS), **OC Pesticides** (HR/MS), PFC, BPA, PE Metabolites	Urine and Bovine Serum	Acceptable 16/18
Ontario Ministry of the Environment, Laboratory Services Branch Northern Contaminants Program III, MOE Interlaboratory Study for NCP III – Phase 6 (3334)	DEC 2011	**PCB** (HR/MS), **PCDD/F** & dioxin-like **PCB**, **OC Pesticides** (HR/MS), PBDE, PFC	Tissue or Extract	Satisfactory 76% - 88%
RTC, LPTP11-S4 (3333)	DEC 2011	**PCDD/F**	Soil	Acceptable 27/27
NIST, Interlab Comparison – Deepwater Horizon Natural Damage Assessment (3332)	NOV 2011	**PAH**	Blood and serum	No formal score given – judgement satisfactory
RTC, WP11-4 (3331)	NOV 2011	**PCDD/F**	Water	Acceptable 28/28
Institute for Env. Studies, 5th ILS on PFASs Food, Environmental (3329)	OCT 2011	PFC, FTS	Tissue	Conventional laboratory performance scores not assigned - judgement satisfactory
International Intercalibration – Round 16 (3325)	AUG 2012	**PCDD/F**, **PCB** (HR/MS), PBDE.	Sediment, Solution	Satisfactory 285/285
Resource Technology Corporation Proficiency Testing Program (3322)	JUN 2011	**PCDD/F**	Soil	Acceptable 28/28
Quebec Toxicology, AMAP Ring Test Round 2 (2011) (3321)	JUN 2011	**PCB** (HR/MS), **OC Pesticides** (HR/MS), PBDE, PFC	Serum	Satisfactory 4/5
Resource Technology Corporation Proficiency Testing Program (3320)	MAY 2011	**PCDD/F**	Water	Acceptable 28/28

APPENDIX 3
INFILTREX 300 USER'S MANUAL

2013 to 2014 Dioxin/Furan XAD Proof Data

Surrogate standard data reported in % Recovery

DX/F XAD Proof Acceptance Specifications			Client ID	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD
			AXYS ID	L13328-48	L13328-55	L13328-56	L13328-59	L13328-60	L13328-64 R	L13328-66	L13328-66 I
			Matrix	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD
			Date Analyzed	09/01/2013 6:45:33 PM	09/08/2013 7:11:11 PM	15/03/2013 3:36:28 PM	29/01/2014 3:37:58 AM	29/01/2014 4:33:11 AM	18/05/2014 8:34:16 AM	06/06/2014 3:21:32 AM	10/06/2014 3:58:45 AM
			Conc Units	pg/sample	pg/sample	ng/mL	pg/sample	pg/sample	pg/sample	pg/sample	pg/sample
			SAMPLE SIZE	1.000 sample	1.000 sample	1.000 mL	1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample
PCDD/F	XAD-2 Resin										
2,3,7,8-TCDD	0.5	pg	2,3,7,8-TCDD	ND 0.1062	ND 0.5000	ND 0.07032	ND 0.3089	ND 0.3075	ND 0.1474	ND 0.6652	ND 0.1468
1,2,3,7,8-PeCDD	0.5	pg	1,2,3,7,8-PECDD	0.1269	ND 0.5000	ND 0.3976	ND 0.1603	ND 0.3415	ND 0.1999	ND 1.455	ND 0.2662
1,2,3,4,7,8-HxCDD	0.5	pg	1,2,3,4,7,8-HXCDD	ND 0.2057	ND 0.5000	ND 6.090	ND 0.1946	ND 0.1917	ND 0.1619	ND 1.066	ND 0.1401
1,2,3,6,7,8-HxCDD	0.5	pg	1,2,3,6,7,8-HXCDD	ND 0.2001	ND 0.5000	ND 4.499	ND 0.1901	NDR 0.2161	ND 0.1871	ND 1.003	0.197
1,2,3,7,8,9-HxCDD	0.5	pg	1,2,3,7,8,9-HXCDD	ND 0.2050	ND 0.5000	ND 5.475	ND 0.1958	ND 0.1935	ND 0.1850	ND 1.078	NDR 0.1930
1,2,3,4,6,7,8-HpCDD	1.0	pg	1,2,3,4,6,7,8-HPCDD	NDR 0.5064	ND 0.5000	NDR 0.6187	0.523	NDR 0.6433	0.3784	ND 1.306	0.464
OCDD	1.0	pg	OCDD	ND 0.2056	ND 0.5000	ND 0.2902	NDR 0.3202	NDR 0.2984	NDR 0.2057	ND 1.626	NDR 0.3920
2,3,7,8-TCDF	0.5	pg	2,3,7,8-TCDF	ND 0.1264	ND 0.5000	ND 0.04149	ND 0.2012	ND 0.1885	NDR 0.1414	ND 0.3966	ND 0.1337
1,2,3,7,8-PeCDF	0.5	pg	1,2,3,7,8-PECDF	ND 0.1053	ND 0.5000	ND 0.1001	ND 0.2580	NDR 0.2312	ND 0.1318	ND 0.8598	NDR 0.1920
2,3,4,7,8-PeCDF	0.5	pg	2,3,4,7,8-PECDF	0.2681	ND 0.5000	ND 1.031	ND 0.2427	0.2955	NDR 0.3603	ND 0.8135	NDR 0.2520
1,2,3,4,7,8-HxCDF	0.5	pg	1,2,3,4,7,8-HXCDF	ND 0.1093	ND 0.5000	ND 7.656	NDR 0.1362	NDR 0.1470	ND 0.1377	ND 0.6486	ND 0.1319
1,2,3,6,7,8-HxCDF	0.5	pg	1,2,3,6,7,8-HXCDF	ND 0.1093	ND 0.5000	ND 8.700	ND 0.08442	0.1578	ND 0.1413	ND 0.6109	ND 0.1297
1,2,3,7,8,9-HxCDF	0.5	pg	1,2,3,7,8,9-HXCDF	ND 0.1333	ND 0.5000	ND 0.04113	ND 0.1157	ND 0.1884	ND 0.1033	ND 0.8345	ND 0.1487
2,3,4,6,7,8-HxCDF	0.5	pg	2,3,4,6,7,8-HXCDF	ND 0.1000	ND 0.5000	ND 0.09218	NDR 0.09239	NDR 0.2294	ND 0.1015	ND 0.6329	0.179
1,2,3,4,6,7,8-HpCDF	0.5	pg	1,2,3,4,6,7,8-HPCDF	ND 0.1732	ND 0.5000	NDR 49.48	NDR 0.2245	NDR 0.4766	ND 0.1242	ND 0.6912	0.205
1,2,3,4,7,8,9-HpCDF	0.5	pg	1,2,3,4,7,8,9-HPCDF	ND 0.2455	ND 0.5000	ND 0.7497	NDR 0.1516	ND 0.2337	ND 0.1049	ND 1.017	ND 0.1866
OCDF	1.0	pg	OCDF	ND 0.2272	ND 0.5000	ND 0.1716	NDR 0.2999	0.432	ND 0.09332	ND 1.220	NDR 0.1830
				% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
			13C-2,3,7,8-TCDD	99.25	96.69	49.91	52.67	52.98	71.53	77.57	75.49
			13C-1,2,3,7,8-PECDD	106.8	99.64	10.35	54.02	55.38	65.28	68.9	74.72
			13C-1,2,3,4,7,8-HXCDD	86.51	93.08	0.6917	52.25	50.08	54.91	75.35	73.04
			13C-1,2,3,6,7,8-HXCDD	83.69	90.33	0.6995	53.19	49.78	51.42	79.05	69.74
			13C-1,2,3,4,6,7,8-HPCDD	80.49	92.6	3.402	50.77	46.2	67.54	69.58	77.47
			13C-OCDD	56.58	95.26	16.86	46.13	41.11	63.76	58.01	77.61
			13C-2,3,7,8-TCDF	81.02	95.52	47.45	51.62	52.69	70.34	72.86	69.89
			13C-1,2,3,7,8-PECDF	92.99	97.02	44.04	51.53	52.41	62.42	59.93	71.1
			13C-2,3,4,7,8-PECDF	91.01	105.5	3.71	50.5	52.22	55.19	64.97	71.04
			13C-1,2,3,4,7,8-HXCDF	78.71	85.56	0.21	49.47	46.27	41.79	69.27	64.91
			13C-1,2,3,6,7,8-HXCDF	76.92	84.76	0.2143	51.28	47.18	38.92	61.82	65.58
			13C-1,2,3,7,8,9-HXCDF	79.33	98.77	50.37	48.68	44.46	73.66	67.2	65.89
			13C-2,3,4,6,7,8-HXCDF	82.91	88	16.34	48.99	46.76	56.74	69.78	67.37
			13C-1,2,3,4,6,7,8-HPCDF	77.46	87.13	0.2266	49.13	46.06	42.75	63.72	66.24
			13C-1,2,3,4,7,8,9-HPCDF	69.15	90.49	3.59	45.79	42.86	71.02	57.82	67.8

2013 to 2014 PCB Congener XAD Proof Data

Surrogate standard data reported in % Recovery

			Client ID	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD
			AXYS ID	L13328-48	L13328-49	L13328-50	L13328-52	L13328-55	L13328-56	L13328-59	L13328-61 I	L13328-64
			Matrix	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD
			Date Analyzed	10/01/2013 10:47:49 PM	16/01/2013 2:35:53 AM	24/01/2013 3:24:54 PM	14/02/2013 2:05:11 AM	08/03/2013 2:12:47 AM	15/03/2013 4:34:08 PM	28/01/2014 2:48:51 PM	07/02/2014 1:25:29 PM	07/05/2014 4:21:57 PM
			Conc Units	pg/sample	pg/sample	pg/sample	pg/sample	pg/sample	pg/sample	pg/sample	pg/sample	pg/sample
			SAMPLE SIZE	1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample
PCB XAD Proof Acceptance Specifications												
PCB Congeners	XAD-2 Resin											
PCB-1	50	pg	CL1-PCB-1	NDR 0.3660	ND 0.4123	ND 0.3352	0.532	ND 0.9131	NDR 1.449	ND 0.5000	NDR 0.4170	0.774
PCB-2	50	pg	CL1-PCB-2	0.269	0.623	NDR 0.3890	ND 0.2146	ND 1.093	NDR 0.8990	ND 0.5000	ND 0.3506	1.716
PCB-3	50	pg	CL1-PCB-3	0.766	0.97	ND 0.3780	NDR 0.4220	ND 1.068	NDR 2.545	NDR 0.7610	ND 0.3221	2.434
PCB-4	50	pg	CL2-PCB-4	ND 0.9504	ND 2.665	ND 1.903	ND 1.647	ND 4.518	ND 3.045	ND 1.213	ND 2.067	ND 2.312
PCB-5	50	pg	CL2-PCB-5	ND 0.8030	ND 1.757	ND 1.398	ND 1.001	ND 3.127	ND 2.095	ND 0.9996	ND 1.439	ND 1.321
PCB-6	50	pg	CL2-PCB-6	ND 0.7352	ND 1.586	ND 1.215	ND 0.8860	ND 2.839	ND 1.851	ND 0.8919	ND 1.280	ND 1.158
PCB-7	50	pg	CL2-PCB-7	ND 0.7627	ND 1.632	ND 1.241	ND 0.9030	ND 2.871	ND 1.885	ND 0.9234	ND 1.325	ND 1.220
PCB-8	50	pg	CL2-PCB-8	NDR 1.346	ND 1.463	ND 1.096	NDR 1.312	ND 2.621	NDR 2.784	NDR 1.124	ND 1.201	1.718
PCB-9	50	pg	CL2-PCB-9	ND 0.7176	ND 1.572	ND 1.219	ND 0.8806	ND 2.768	ND 1.827	ND 0.8744	ND 1.252	ND 1.149
PCB-10	50	pg	CL2-PCB-10	ND 0.7478	ND 1.611	ND 1.225	ND 0.8891	ND 2.810	ND 1.858	ND 0.8719	ND 1.262	ND 1.105
PCB-11	50	pg	CL2-PCB-11	12.08	7.925	9.749	9.7	6.538	29.68	10.26	13.21	39.02
PCB-12/13	50	pg	CL2-PCB-12/13	ND 0.7705	ND 1.672	ND 1.373	ND 0.9604	ND 2.976	ND 2.115	ND 0.9833	ND 1.436	ND 1.360
PCB-14	50	pg	CL2-PCB-14	ND 0.7349	ND 1.583	ND 1.300	ND 0.9070	ND 2.878	ND 1.944	ND 0.9210	ND 1.313	ND 1.230
PCB-15	50	pg	CL2-PCB-15	ND 0.6911	ND 1.966	ND 1.694	ND 1.037	ND 3.079	ND 2.061	ND 0.8789	ND 1.335	ND 1.452
PCB-16	50	pg	CL3-PCB-16	NDR 0.6730	ND 0.7456	ND 0.9953	ND 0.5607	ND 2.217	NDR 1.152	ND 0.5000	ND 0.7161	ND 0.6420
PCB-17	50	pg	CL3-PCB-17	NDR 0.4180	ND 0.6324	ND 0.9088	ND 0.4946	ND 1.839	ND 0.9273	ND 0.5000	ND 0.5792	ND 0.5346
PCB-30/18	50	pg	CL3-PCB-30/18	1.254	ND 0.5343	ND 0.7383	1.305	ND 1.497	2.226	0.702	NDR 1.296	1.146
PCB-19	50	pg	CL3-PCB-19	ND 0.3878	ND 0.7718	ND 1.015	ND 0.6616	ND 1.839	ND 0.9043	ND 0.5000	ND 0.7016	ND 0.6569
PCB-28/20	50	pg	CL3-PCB-28/20	2.057	0.988	1.342	5.622	ND 1.490	4.624	2.386	3.061	3.817
PCB-21/33	50	pg	CL3-PCB-21/33	1.124	0.54	0.823	0.812	ND 1.517	2.173	0.98	1.507	1.883
PCB-22	50	pg	CL3-PCB-22	0.814	ND 0.4752	0.61	NDR 0.9280	ND 1.653	NDR 1.745	1.014	NDR 1.028	NDR 1.369
PCB-23	50	pg	CL3-PCB-23	ND 0.3846	ND 0.4627	ND 0.4858	ND 0.4618	ND 1.671	ND 1.133	ND 0.5000	ND 0.4438	ND 0.3494
PCB-24	50	pg	CL3-PCB-24	ND 0.3064	ND 0.4827	ND 0.6703	ND 0.3656	ND 1.376	ND 0.6929	ND 0.5000	ND 0.4283	ND 0.3851
PCB-25	50	pg	CL3-PCB-25	ND 0.3208	ND 0.4014	ND 0.4009	ND 0.3810	ND 1.315	ND 0.9368	ND 0.5000	ND 0.3745	ND 0.2984
PCB-26/29	50	pg	CL3-PCB-26/29	0.6	ND 0.4413	ND 0.4827	NDR 0.8220	ND 1.520	ND 1.099	ND 0.5000	ND 0.4128	NDR 0.4910
PCB-27	50	pg	CL3-PCB-27	ND 0.2750	ND 0.4544	ND 0.6126	ND 0.3540	ND 1.221	ND 0.6304	ND 0.5000	ND 0.4059	ND 0.3710
PCB-31	50	pg	CL3-PCB-31	1.561	0.69	NDR 1.038	2.919	ND 1.413	NDR 3.659	1.743	2.245	2.796
PCB-32	50	pg	CL3-PCB-32	NDR 0.4700	ND 0.4204	ND 0.4516	ND 0.4218	ND 1.434	ND 1.041	ND 0.5000	0.395	NDR 0.6490
PCB-34	50	pg	CL3-PCB-34	ND 0.3648	ND 0.4419	ND 0.4928	ND 0.4679	ND 1.558	ND 1.117	ND 0.5000	ND 0.4086	ND 0.3276
PCB-35	50	pg	CL3-PCB-35	ND 0.3786	ND 0.4552	ND 0.4868	ND 0.5022	ND 1.611	ND 1.273	ND 0.5000	ND 0.4656	0.447
PCB-36	50	pg	CL3-PCB-36	ND 0.3505	ND 0.4163	ND 0.4724	ND 0.4586	ND 1.489	ND 1.111	ND 0.5000	ND 0.4152	ND 0.3361
PCB-37	50	pg	CL3-PCB-37	NDR 0.3940	ND 0.4572	ND 0.5509	0.574	ND 1.974	ND 1.226	NDR 0.5760	NDR 0.7560	1.085
PCB-38	50	pg	CL3-PCB-38	ND 0.3651	ND 0.4328	ND 0.4903	ND 0.4479	ND 1.464	ND 1.093	ND 0.5000	ND 0.4372	ND 0.3553
PCB-39	50	pg	CL3-PCB-39	ND 0.3552	ND 0.4238	ND 0.4821	ND 0.4450	ND 1.493	ND 1.095	ND 0.5000	ND 0.4282	ND 0.3477
PCB-41/40/71	50	pg	CL4-PCB-41/40/71	NDR 1.323	NDR 0.5140	ND 0.7953	1.369	ND 2.120	ND 1.046	NDR 1.120	ND 0.6989	1.369
PCB-42	50	pg	CL4-PCB-42	ND 0.5411	NDR 0.1130	ND 0.8032	ND 0.8642	ND 2.271	ND 1.044	ND 0.5000	ND 0.7327	0.73
PCB-43	50	pg	CL4-PCB-43	ND 0.5911	ND 0.09490	ND 0.9966	ND 0.9893	ND 2.699	ND 1.228	ND 0.5000	ND 0.7894	ND 0.6187
PCB-44/47/65	50	pg	CL4-PCB-44/47/65	3.047	NDR 1.349	NDR 2.820	6.07	2.532	4.039	5.691	6.956	4.049
PCB-45/51	50	pg	CL4-PCB-45/51	0.616	NDR 0.1790	ND 0.8107	ND 0.8857	ND 2.020	ND 1.026	NDR 0.9900	NDR 1.279	ND 0.5293
PCB-46	50	pg	CL4-PCB-46	ND 0.5801	ND 0.09320	ND 0.9543	ND 1.033	ND 2.362	ND 1.198	ND 0.5000	ND 0.8085	ND 0.6171
PCB-48	50	pg	CL4-PCB-48	ND 0.5080	NDR 0.1630	ND 0.8004	ND 0.8721	ND 2.126	ND 1.051	ND 0.5000	ND 0.7024	0.669
PCB-69/49	50	pg	CL4-PCB-69/49	1.182	NDR 0.4230	ND 0.6776	NDR 4.082	ND 1.769	NDR 1.384	NDR 1.060	NDR 1.205	1.393
PCB-50/53	50	pg	CL4-PCB-50/53	ND 0.4737	ND 0.07610	ND 0.7729	ND 0.8724	ND 1.949	ND 1.004	ND 0.5000	ND 0.6562	ND 0.5020
PCB-52	50	pg	CL4-PCB-52	NDR 2.375	NDR 1.078	NDR 1.448	5.775	ND 1.907	3.493	NDR 1.883	NDR 1.753	4.2
PCB-54	50	pg	CL4-PCB-54	ND 0.2745	ND 0.06840	ND 0.6129	ND 0.7729	ND 1.441	ND 0.6897	ND 0.5000	ND 0.5332	ND 0.4265
PCB-55	50	pg	CL4-PCB-55	ND 0.5284	ND 0.2809	ND 0.8418	ND 0.7788	ND 2.306	ND 1.514	ND 0.5000	ND 0.6591	ND 0.6642
PCB-56	50	pg	CL4-PCB-56	0.806	NDR 0.3030	ND 0.8761	1.015	ND 2.340	ND 1.449	NDR 0.7200	NDR 0.6540	1.058
PCB-57	50	pg	CL4-PCB-57	ND 0.4921	ND 0.2852	ND 0.8382	ND 0.7520	ND 1.995	ND 1.421	ND 0.5000	ND 0.6011	ND 0.5999
PCB-58	50	pg	CL4-PCB-58	ND 0.5149	ND 0.2721	ND 0.8871	ND 0.7968	ND 2.054	ND 1.482	ND 0.5000	ND 0.6191	ND 0.6254
PCB-59/62/75	50	pg	CL4-PCB-59/62/75	ND 0.3725	NDR 0.09900	ND 0.5891	ND 0.6446	ND 1.564	ND 0.7908	ND 0.5000	ND 0.5296	ND 0.4102
PCB-60	50	pg	CL4-PCB-60	ND 0.5252	ND 0.2773	ND 0.8540	1.195	ND 2.257	ND 1.424	ND 0.5000	ND 0.6563	0.701
PCB-61/70/74/76	50	pg	CL4-PCB-61/70/74/76	2.798	NDR 1.165	1.782	9.234	ND 2.099	5.561	3.011	3.445	5.265
PCB-63	50	pg	CL4-PCB-63	ND 0.4701	ND 0.2597	ND 0.8029	ND 0.7268	ND 1.937	ND 1.366	ND 0.5000	ND 0.5801	ND 0.5943
PCB-64	50	pg	CL4-PCB-64	0.916	0.375	ND 0.5658	3.142	ND 1.535	NDR 0.9760	NDR 0.7710	1.041	NDR 1.155

PCB-66	50	pg	CL4-PCB-66	1.148	NDR 0.4900	1.019	6.333	ND 2.110	NDR 2.164	NDR 1.549	1.887	2.34
PCB-67	50	pg	CL4-PCB-67	ND 0.4350	ND 0.2453	ND 0.7262	ND 0.6867	ND 1.774	ND 1.257	ND 0.5000	ND 0.5421	ND 0.5535
PCB-68	50	pg	CL4-PCB-68	ND 0.4677	ND 0.2954	ND 0.8171	ND 0.7382	ND 1.851	ND 1.314	0.899	0.859	ND 0.5708
PCB-72	50	pg	CL4-PCB-72	ND 0.4557	ND 0.2885	ND 0.7926	ND 0.7116	ND 1.828	ND 1.311	ND 0.5000	ND 0.5502	ND 0.5539
PCB-73	50	pg	CL4-PCB-73	ND 0.3816	ND 0.06160	ND 0.5820	ND 0.6583	ND 1.511	ND 0.7869	ND 0.5000	ND 0.5431	ND 0.4292
PCB 77	2	pg	CL4-PCB-77	ND 0.4964	ND 0.2797	ND 0.9668	ND 0.7992	ND 2.193	ND 1.497	ND 0.5000	ND 0.6095	ND 0.7130
PCB-78	50	pg	CL4-PCB-78	ND 0.5287	ND 0.2621	ND 0.8954	ND 0.7628	ND 2.125	ND 1.433	ND 0.5000	ND 0.6531	ND 0.6681
PCB-79	50	pg	CL4-PCB-79	ND 0.4256	ND 0.2296	ND 0.7388	ND 0.6260	ND 1.722	ND 1.130	ND 0.5000	ND 0.5401	ND 0.5480
PCB-80	50	pg	CL4-PCB-80	ND 0.4732	ND 0.2497	ND 0.7890	ND 0.6853	ND 1.946	ND 1.269	ND 0.5000	ND 0.5782	ND 0.5980
PCB 81	2	pg	CL4-PCB-81	ND 0.4863	ND 0.2610	ND 0.9177	ND 0.7119	ND 2.249	ND 1.435	ND 0.5000	ND 0.6050	ND 0.6423
PCB-82	50	pg	CL5-PCB-82	ND 0.9764	ND 0.3694	ND 1.078	ND 0.7795	ND 2.107	ND 1.290	ND 0.5000	ND 0.9716	ND 0.8931
PCB-83/99	50	pg	CL5-PCB-83/99	1.228	ND 0.3318	ND 1.009	4.146	ND 1.943	ND 1.149	NDR 0.5850	ND 0.8447	1.321
PCB-84	50	pg	CL5-PCB-84	ND 0.9410	ND 0.3779	ND 1.141	ND 0.8512	ND 2.109	ND 1.350	ND 0.5000	ND 0.9729	ND 0.8707
PCB-117/116/85	50	pg	CL5-PCB-117/116/85	ND 0.7142	ND 0.2832	ND 0.8182	NDR 1.868	ND 1.595	ND 0.9952	ND 0.5000	ND 0.7296	ND 0.6635
PCB-108/119/86/97/125/8	50	pg	CB-108/119/86/97/125/87	NDR 2.729	0.987	ND 0.8433	NDR 2.475	ND 1.642	NDR 2.887	NDR 1.827	ND 0.7393	2.32
PCB-88/91	50	pg	CL5-PCB-88/91	ND 0.8236	ND 0.3256	ND 0.9755	NDR 0.7550	ND 1.847	ND 1.185	ND 0.5000	ND 0.8452	ND 0.7716
PCB-89	50	pg	CL5-PCB-89	ND 0.8790	ND 0.3491	ND 1.005	ND 0.7782	ND 1.991	ND 1.262	ND 0.5000	ND 0.8899	ND 0.8193
PCB-113/90/101	50	pg	CL5-PCB-113/90/101	NDR 2.806	0.95	1.487	4.508	ND 1.644	4.001	1.706	NDR 1.653	NDR 4.236
PCB-92	50	pg	CL5-PCB-92	ND 0.8448	ND 0.3288	ND 0.9926	0.744	ND 1.911	ND 1.184	ND 0.5000	ND 0.8637	ND 0.7778
PCB-95/100/93/102/98	50	pg	CL5-PCB-95/100/93/102/98	1.729	NDR 1.096	ND 0.9576	NDR 2.098	ND 2.218	NDR 2.757	NDR 1.032	NDR 1.110	2.019
PCB-94	50	pg	CL5-PCB-94	ND 0.8817	ND 0.3658	ND 1.088	ND 0.8022	ND 2.516	ND 1.298	ND 0.5000	ND 0.9166	ND 0.8143
PCB-96	50	pg	CL5-PCB-96	ND 0.4557	ND 0.1113	ND 0.5230	ND 0.5758	ND 2.806	ND 0.6776	ND 0.5000	ND 0.6669	ND 0.4485
PCB-103	50	pg	CL5-PCB-103	ND 0.7024	ND 0.3040	ND 0.8794	ND 0.6577	ND 2.014	ND 1.062	ND 0.5000	ND 0.7250	ND 0.6551
PCB-104	50	pg	CL5-PCB-104	ND 0.3701	ND 0.1191	ND 0.6903	ND 0.5442	ND 1.545	ND 0.6151	ND 0.5000	ND 0.6374	ND 0.4413
PCB-105	50	pg	CL5-PCB-105	NDR 0.8760	ND 0.3098	ND 0.7831	1.912	ND 1.985	ND 1.418	NDR 0.6320	ND 0.5948	1.225
PCB-106	50	pg	CL5-PCB-106	ND 0.6719	ND 0.3226	ND 0.7174	ND 0.6718	ND 1.658	ND 1.226	ND 0.5000	ND 0.6286	ND 0.5408
PCB-107/124	50	pg	CL5-PCB-107/124	ND 0.7383	ND 0.3427	ND 0.7990	ND 0.7507	ND 1.854	ND 1.352	ND 0.5000	ND 0.6488	ND 0.5805
PCB-109	50	pg	CL5-PCB-109	ND 0.6463	ND 0.3001	ND 0.7428	ND 0.6578	ND 1.596	ND 1.153	ND 0.5000	ND 0.6075	ND 0.5394
PCB-110/115	50	pg	CL5-PCB-110/115	NDR 2.937	NDR 1.016	1.219	4.122	ND 1.444	3.733	1.559	NDR 1.323	3.253
PCB-111	50	pg	CL5-PCB-111	ND 0.6474	ND 0.2478	ND 0.7361	ND 0.5305	ND 1.441	ND 0.8967	ND 0.5000	ND 0.6566	ND 0.5990
PCB-112	50	pg	CL5-PCB-112	ND 0.6201	ND 0.2598	ND 0.7084	ND 0.5292	ND 1.376	ND 0.8985	ND 0.5000	ND 0.6616	ND 0.6000
PCB 114	2	pg	CL5-PCB-114	ND 0.6103	ND 0.3220	ND 0.7727	ND 0.6634	ND 2.074	ND 1.368	ND 0.5000	ND 0.5798	ND 0.5615
CL5-PCB-118	50	pg	CL5-PCB-118	1.916	0.485	NDR 1.355	3.343	ND 1.946	3.632	1.184	1.317	3.057
CL5-PCB-120	50	pg	CL5-PCB-120	ND 0.5976	ND 0.2358	ND 0.6993	ND 0.5003	ND 1.349	ND 0.8327	ND 0.5000	ND 0.6068	ND 0.5775
CL5-PCB-121	50	pg	CL5-PCB-121	ND 0.6282	ND 0.2538	ND 0.7223	ND 0.5456	ND 1.424	ND 0.9157	ND 0.5000	ND 0.6420	ND 0.5818
CL5-PCB-122	50	pg	CL5-PCB-122	ND 0.7711	ND 0.3480	ND 0.8593	ND 0.7806	ND 1.940	ND 1.404	ND 0.5000	ND 0.6768	ND 0.6296
PCB 123	2	pg	CL5-PCB-123	ND 0.6222	ND 0.3665	ND 0.8292	ND 0.7554	ND 2.025	ND 1.395	ND 0.5000	ND 0.5943	ND 0.6234
PCB 126	2	pg	CL5-PCB-126	ND 0.7491	ND 0.3708	ND 0.8866	ND 0.8997	ND 1.970	ND 1.490	ND 0.5000	ND 0.6463	ND 0.7785
PCB-127	50	pg	CL5-PCB-127	ND 0.7326	ND 0.3115	ND 0.8024	ND 0.7123	ND 1.728	ND 1.295	ND 0.5000	ND 0.6437	ND 0.6042
PCB-128/166	50	pg	CL6-PCB-128/166	ND 1.142	NDR 0.2340	ND 1.002	ND 0.8596	ND 1.746	ND 1.366	ND 0.5000	ND 0.9190	0.782
PCB-138/163/129/160	50	pg	CL6-PCB-138/163/129/160	2.784	1.062	1.656	4.42	ND 1.699	NDR 4.585	1.555	NDR 1.617	5.027
PCB-130	50	pg	CL6-PCB-130	ND 1.436	ND 0.1107	ND 1.274	ND 0.8979	ND 2.102	ND 1.672	ND 0.5000	ND 1.098	ND 0.9564
PCB-131	50	pg	CL6-PCB-131	ND 1.285	ND 0.1219	ND 1.176	ND 0.8617	ND 1.998	ND 1.584	ND 0.5000	ND 1.071	ND 0.8972
PCB-132	50	pg	CL6-PCB-132	ND 1.348	NDR 0.2210	ND 1.261	ND 0.9024	ND 2.187	ND 1.652	0.548	ND 1.077	1.511
PCB-133	50	pg	CL6-PCB-133	ND 1.263	ND 0.1087	ND 1.154	ND 0.8348	ND 1.920	ND 1.495	ND 0.5000	ND 1.007	ND 0.8717
PCB-134/143	50	pg	CL6-PCB-134/143	ND 1.273	ND 0.1224	ND 1.190	ND 0.8678	ND 2.096	ND 1.550	ND 0.5000	ND 1.024	ND 0.8926
PCB-151/135/154	50	pg	CL6-PCB-151/135/154	ND 0.8931	0.389	ND 0.9992	NDR 0.6240	ND 1.905	2.19	NDR 0.7030	ND 0.9792	1.483
PCB-136	50	pg	CL6-PCB-136	ND 0.6314	0.184	ND 0.7507	ND 0.4669	ND 1.413	ND 0.6943	ND 0.5000	ND 0.7427	ND 0.5358
PCB-137	50	pg	CL6-PCB-137	ND 1.337	ND 0.1057	ND 1.178	ND 0.8217	ND 1.968	ND 1.559	ND 0.5000	ND 0.9939	ND 0.9634
PCB-139/140	50	pg	CL6-PCB-139/140	ND 1.173	NDR 0.1220	ND 1.072	ND 0.7770	ND 1.906	ND 1.440	ND 0.5000	ND 0.9358	ND 0.8001
PCB-141	50	pg	CL6-PCB-141	ND 1.290	NDR 0.1740	ND 1.067	NDR 0.8250	ND 1.982	ND 1.435	ND 0.5000	ND 1.002	1.087
PCB-142	50	pg	CL6-PCB-142	ND 1.321	ND 0.1186	ND 1.207	ND 0.8895	ND 2.041	ND 1.608	ND 0.5000	ND 1.050	ND 0.8875
PCB-144	50	pg	CL6-PCB-144	ND 0.9043	ND 0.1089	ND 0.9999	ND 0.6157	ND 1.902	ND 0.9199	ND 0.5000	ND 0.9742	ND 0.7155
PCB-145	50	pg	CL6-PCB-145	ND 0.6686	ND 0.08760	ND 0.8104	ND 0.4885	ND 1.487	ND 0.7518	ND 0.5000	ND 0.7987	ND 0.5672
PCB-146	50	pg	CL6-PCB-146	ND 1.159	ND 0.09490	ND 1.033	1.244	ND 1.747	ND 1.363	ND 0.5000	ND 0.9427	0.978
PCB-147/149	50	pg	CL6-PCB-147/149	NDR 1.970	NDR 0.6840	NDR 1.193	2.289	ND 1.669	2.955	1.331	ND 0.9500	4.09
PCB-148	50	pg	CL6-PCB-148	ND 0.9089	ND 0.1109	ND 1.021	ND 0.6219	ND 1.992	ND 0.9299	ND 0.5000	ND 0.9984	ND 0.7446
PCB-150	50	pg	CL6-PCB-150	ND 0.6416	ND 0.08460	ND 0.7734	ND 0.4605	ND 1.445	ND 0.7040	ND 0.5000	ND 0.7593	ND 0.5496
PCB-152	50	pg	CL6-PCB-152	ND 0.6014	ND 0.08050	ND 0.7202	ND 0.4502	ND 1.365	ND 0.6880	ND 0.5000	ND 0.7403	ND 0.5215
PCB-153/168	50	pg	CL6-PCB-153/168	3.02	NDR 0.8960	NDR 1.419	5.053	NDR 1.548	4.309	1.464	1.129	4.692
PCB-155	50	pg	CL6-PCB-155	ND 0.4170	NDR 0.08800	ND 0.7921	ND 0.3797	ND 1.475	ND 0.5892	ND 0.5000	ND 0.6032	ND 0.4195
PCB 156/157	10	pg	CL6-PCB-156/157	ND 1.157	NDR 0.1260	ND 1.056	ND 0.7642	ND 1.521	ND 1.373	ND 0.5000	ND 0.9726	ND 0.8431
PCB-158	50	pg	CL6-PCB-158	ND 0.8770	0.122	ND 0.7857	ND 0.5444	ND 1.342	ND 1.090	ND 0.5000	ND 0.7151	ND 0.6056
PCB-159	50	pg	CL6-PCB-159	ND 0.9456	ND 0.07460	ND 0.8340	ND 0.5704	ND 1.393	ND 1.151	ND 0.5000	ND 0.7612	ND 0.6545
PCB-161	50	pg	CL6-PCB-161	ND 0.8766	ND 0.07350	ND 0.8050	ND 0.5754	ND 1.352	ND 1.094	ND 0.5000	ND 0.7191	ND 0.6117
PCB-162	50	pg	CL6-PCB-162	ND 0.9845	ND 0.07860	ND 0.8447	ND 0.6075	ND 1.441	ND 1.168	ND 0.5000	ND 0.7769	ND 0.6617

PCB-164	50	pg	CL6-PCB-164	ND 0.9521	ND 0.07780	ND 0.8412	ND 0.6030	ND 1.492	ND 1.150	ND 0.5000	ND 0.8002	ND 0.6347
PCB-165	50	pg	CL6-PCB-165	ND 1.023	ND 0.08620	ND 0.9356	ND 0.6664	ND 1.587	ND 1.252	ND 0.5000	ND 0.8271	ND 0.6751
PCB 167	10	pg	CL6-PCB-167	ND 0.8716	ND 0.06330	ND 0.7350	ND 0.4810	ND 1.237	ND 1.029	ND 0.5000	ND 0.6940	ND 0.5759
PCB 169	2	pg	CL6-PCB-169	ND 1.014	ND 0.07180	ND 0.8397	ND 0.5347	ND 1.196	ND 1.151	ND 0.5000	ND 0.7391	ND 0.7394
PCB-170	50	pg	CL7-PCB-170	ND 0.9969	ND 0.1326	ND 1.144	NDR 1.389	ND 1.669	ND 1.134	ND 0.5000	ND 1.016	ND 0.8937
PCB-171/173	50	pg	CL7-PCB-171/173	ND 0.9167	NDR 0.2000	ND 1.156	ND 0.5583	ND 2.085	ND 1.159	ND 0.5000	ND 0.9413	ND 0.8664
PCB-172	50	pg	CL7-PCB-172	ND 0.8895	NDR 0.1200	ND 1.155	ND 0.5528	ND 2.011	ND 1.149	ND 0.5000	ND 0.9499	ND 0.8786
PCB-174	50	pg	CL7-PCB-174	ND 0.8842	NDR 0.1510	ND 1.086	ND 0.5046	ND 1.934	ND 1.107	ND 0.5000	ND 0.8642	1.288
PCB-175	50	pg	CL7-PCB-175	ND 0.8062	ND 0.1091	ND 1.021	ND 0.4674	ND 1.821	ND 1.030	ND 0.5000	ND 0.8341	ND 0.7697
PCB-176	50	pg	CL7-PCB-176	ND 0.5710	ND 0.08320	ND 0.7592	ND 0.3771	ND 1.373	ND 0.7771	ND 0.5000	ND 0.6207	ND 0.5833
PCB-177	50	pg	CL7-PCB-177	ND 0.8978	ND 0.1185	ND 1.095	ND 0.5403	ND 1.998	ND 1.123	ND 0.5000	ND 0.8995	ND 0.8115
PCB-178	50	pg	CL7-PCB-178	ND 0.8339	ND 0.1141	ND 1.069	ND 0.5310	ND 1.883	ND 1.057	ND 0.5000	ND 0.8688	ND 0.8031
PCB-179	50	pg	CL7-PCB-179	ND 0.5566	ND 0.08080	ND 0.7432	NDR 0.4130	ND 1.363	ND 0.7528	ND 0.5000	ND 0.6141	ND 0.5775
PCB-180/193	50	pg	CL7-PCB-180/193	1.302	0.457	ND 0.9100	2.817	ND 1.328	2.06	NDR 0.9170	NDR 1.105	2.336
PCB-181	50	pg	CL7-PCB-181	ND 0.8739	NDR 0.1490	ND 1.079	ND 0.5290	ND 1.988	ND 1.099	ND 0.5000	ND 0.8904	ND 0.8221
PCB-182	50	pg	CL7-PCB-182	ND 0.8165	ND 0.1071	ND 1.014	ND 0.4884	ND 1.859	ND 1.026	ND 0.5000	ND 0.8337	ND 0.7787
PCB-183/185	50	pg	CL7-PCB-183/185	ND 0.8020	NDR 0.3450	ND 0.9996	NDR 1.063	ND 1.847	1.173	ND 0.5000	ND 0.8379	NDR 1.649
PCB-184	50	pg	CL7-PCB-184	ND 0.5563	ND 0.08140	ND 0.7380	ND 0.3688	ND 1.351	ND 0.7541	ND 0.5000	ND 0.6045	ND 0.5667
PCB-186	50	pg	CL7-PCB-186	ND 0.6175	ND 0.08780	ND 0.8044	ND 0.4067	ND 1.473	ND 0.8278	ND 0.5000	ND 0.6611	ND 0.6177
PCB-187	50	pg	CL7-PCB-187	NDR 1.328	NDR 0.3870	ND 0.9871	NDR 1.927	ND 1.758	1.889	NDR 0.6390	ND 0.7935	2.325
PCB-188	50	pg	CL7-PCB-188	ND 0.4493	ND 0.08690	ND 0.8573	ND 0.3598	ND 1.548	ND 0.7212	ND 0.5000	ND 0.5849	ND 0.5566
PCB-189	10	pg	CL7-PCB-189	ND 0.7027	ND 0.05430	ND 0.7391	ND 0.4845	ND 2.237	ND 1.836	ND 0.5000	ND 0.9880	ND 0.6829
PCB-190	50	pg	CL7-PCB-190	ND 0.6744	ND 0.08910	ND 0.8718	ND 0.4005	ND 1.455	ND 0.9086	ND 0.5000	ND 0.7169	ND 0.6114
PCB-191	50	pg	CL7-PCB-191	ND 0.6233	ND 0.08830	ND 0.8427	ND 0.3926	ND 1.450	ND 0.8640	ND 0.5000	ND 0.6979	ND 0.6364
PCB-192	50	pg	CL7-PCB-192	ND 0.7029	ND 0.09660	ND 0.9112	ND 0.4463	ND 1.664	ND 0.9621	ND 0.5000	ND 0.7643	ND 0.7033
PCB-194	50	pg	CL8-PCB-194	ND 0.9295	ND 0.06260	ND 0.9409	0.671	ND 1.973	ND 1.761	ND 0.5000	ND 1.338	ND 0.9319
PCB-195	50	pg	CL8-PCB-195	ND 0.9481	ND 0.06980	ND 0.9572	ND 0.5387	ND 2.251	ND 1.832	ND 0.5000	ND 1.385	ND 0.9700
PCB-196	50	pg	CL8-PCB-196	ND 1.016	ND 0.1207	ND 1.172	ND 0.5660	ND 2.073	ND 1.032	ND 0.5000	ND 0.9133	ND 0.9486
PCB-197/200	50	pg	CL8-PCB-197/200	ND 0.6895	ND 0.09080	ND 0.8210	ND 0.4226	ND 1.657	ND 0.7163	ND 0.5000	ND 0.6668	ND 0.7296
PCB-198/199	50	pg	CL8-PCB-198/199	ND 1.054	NDR 0.3020	ND 1.234	NDR 0.8610	ND 2.199	ND 1.036	ND 0.5000	ND 0.9428	ND 0.9483
PCB-201	50	pg	CL8-PCB-201	ND 0.6866	ND 0.08940	ND 0.8063	ND 0.4177	ND 1.681	ND 0.7223	ND 0.5000	ND 0.6520	ND 0.7222
PCB-202	50	pg	CL8-PCB-202	ND 0.6953	NDR 0.1610	ND 1.020	ND 0.5028	ND 1.862	ND 0.8261	ND 0.5000	ND 0.7127	ND 0.8232
PCB-203	50	pg	CL8-PCB-203	ND 1.001	ND 0.1149	ND 1.136	NDR 0.6210	ND 2.021	ND 0.9942	ND 0.5000	ND 0.9095	ND 0.9059
PCB-204	50	pg	CL8-PCB-204	ND 0.7001	ND 0.09230	ND 0.8278	ND 0.4309	ND 1.693	ND 0.7192	ND 0.5000	ND 0.6720	ND 0.7512
PCB-205	50	pg	CL8-PCB-205	ND 0.7276	ND 0.05440	ND 0.7579	ND 0.4442	ND 1.604	ND 1.474	ND 0.5000	ND 0.9672	ND 0.8662
PCB-206	50	pg	CL9-PCB-206	ND 1.394	ND 0.4670	ND 1.700	ND 0.7078	ND 3.043	ND 2.165	ND 0.5000	ND 1.625	ND 1.408
PCB-207	50	pg	CL9-PCB-207	ND 1.054	ND 0.3451	ND 1.161	ND 0.5011	ND 2.483	ND 1.648	ND 0.5000	ND 1.236	ND 0.9539
PCB-208	50	pg	CL9-PCB-208	ND 0.9770	ND 0.4009	ND 1.309	ND 0.5507	ND 2.526	ND 1.710	ND 0.5000	ND 1.212	ND 0.9810
PCB-209	50	pg	CL10-PCB-209	ND 1.161	NDR 1.281	NDR 1.109	0.944	ND 1.280	NDR 1.253	NDR 0.6290	NDR 1.070	0.918
				% Recovery	**% Recovery**	**% Recovery**	**% Recovery**	**% Recovery**	**% Recovery**	**% Recovery**	**% Recovery**	**% Recovery**
			13C-CL1-PCB-1	62.33	35.58	62.05	47.38	34.85	55.13	43.2	50.13	18.37
			13C-CL1-PCB-3	65.59	40.05	67.07	58.66	35.43	59.19	49.36	57.72	22.49
			13C-CL2-PCB-4	66.12	41.73	63.98	43.41	34.15	61.15	49.53	54.99	23.64
			13C-CL2-PCB-15	76.24	51.51	74.7	66.86	42.8	70.85	61.61	74.56	39.35
			13C-CL3-PCB-19	72.46	47.24	61.73	49.43	45.75	90.1	67.46	66.04	36.44
			13C-CL3-PCB-37	86.89	69.62	95.58	68.74	55.91	63.47	64.17	84.09	57.73
			13C-CL4-PCB-54	79.54	53.66	72.52	45.67	54.63	70.94	58.16	66.13	44.19
			13C-CL4-PCB-77	82.12	72.59	100	65.67	64.67	63.76	75.4	92.42	65.98
			13C-CL4-PCB-81	83.49	72.01	95.74	65.5	61.33	65.95	76.7	92.61	64.06
			13C-CL5-PCB-104	86.41	63.74	77.08	66.47	55.02	87.61	69.33	80.81	61.19
			13C-CL5-PCB-105	88.34	78.5	103.2	65.21	77.85	69.09	70.62	84.86	76.18
			13C-CL5-PCB-114	89.61	78.79	99.89	71.34	76.26	69.73	68.84	82.04	71.89
			13C-CL5-PCB-118	90.33	78.51	99.1	70.55	77.32	70.12	70.57	83.5	72.43
			13C-CL5-PCB-123	91.71	75.06	97.75	69.76	80.31	71.46	71.71	85.02	71.67
			13C-CL5-PCB-126	85.9	74.93	109.7	63.87	82.43	70.23	69.93	88.22	68.35
			13C-CL6-PCB-155	88.38	65.88	75.35	80.22	59.19	99.19	76.49	90.89	71.82
			13C-CL6-PCB-156/157	82.31	74.31	102.5	74.62	91.77	79.04	81.26	93.04	76.15
			13C-CL6-PCB-167	85.98	77.68	97.5	83.98	92.11	83.67	82.37	93.75	75.86
			13C-CL6-PCB-169	76.01	70.51	108.7	80.64	98.78	81.22	84.21	100.9	67.14
			13C-CL7-PCB-170	85.69	73.07	88.39	73.64	85.38	77.22	90	93.55	88.69
			13C-CL7-PCB-180	86.01	74.95	84.57	83.94	84.43	75.28	88.6	92.64	91.7
			13C-CL7-PCB-188	96.65	79.15	71.59	85.16	54.29	96.52	75.64	90	86.78
			13C-CL7-PCB-189	85.06	78.87	93.21	79.53	75.49	82.35	69.92	87.59	84.61
			13C-CL8-PCB-202	89.63	74.62	79.42	81.47	58.55	98.01	89.4	99.52	87.23
			13C-CL8-PCB-205	83.34	75.33	91.88	81.63	84.79	80.61	81.07	93.03	81.05

13C-CL9-PCB-206	75.19	71.24	94.2	79.84	102.3	97.16	90.97	98.26	81.11
13C-CL9-PCB-208	87.27	75.36	86.59	79.62	92.54	93.26	92.35	98.31	92.64
13C-CL10-PCB-209	71.34	67.86	92.79	81.84	111.5	124.8	102.5	109.7	88.94

2013 to 2014 PBDE Congener XAD Proof Data

Surrogate standard data reported in % Recovery

			Client ID	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD
			AXYS ID	L13328-48	L13328-55	L13328-56	L13328-56 R	L13328-57	L13328-58	L13328-59	L13328-60	L13328-61	L13328-62	L13328-63	L13328-64	L13328-66
			Matrix	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD
			Date Analyzed	11/01/2013 2:37:51 AM	08/03/2013 1:15:16 PM	19/03/2013 1:49:57 AM	05/04/2013 1:06:03 PM	05/04/2013 2:04:34 PM	20/09/2013 6:25:49 PM	28/01/2014 4:34:11 AM	28/01/2014 5:32:21 AM	11/02/2014 1:57:15 PM	18/02/2014 2:18:51 AM	13/03/2014 12:52:52 PM	07/05/2014 7:13:04 PM	09/06/2014 8:01:33 PM
			Conc Units	pg/sample	pg/sample	pg/sample	pg/sample	pg/sample	pg/sample	pg/sample	pg/sample	pg/sample	pg/sample	pg/sample	pg/sample	pg/sample
			SAMPLE SIZE	1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample
PBDE XAD Proof Acceptance Specifications																
PBDE Congeners	**XAD-2 Resin**															
DPE-7	10	pg	BR2-DPE-7	ND 0.6520	ND 0.5935	ND 0.1553	ND 0.06920	0.063	ND 0.6426	ND 0.5348	ND 0.3082	ND 0.1181	ND 0.3234	ND 0.3131	NDR 0.08500	ND 0.2749
DPE-8/11	20	pg	BR2-DPE-8/11	ND 0.4886	ND 0.4356	NDR 0.5460	NDR 0.4050	NDR 0.4345	ND 0.4697	ND 0.4027	ND 0.2327	NDR 0.8518	ND 0.2429	NDR 0.8140	NDR 0.1610	NDR 0.3210
DPE-10	10	pg	BR2-DPE-10	ND 0.7661	ND 0.6830	NDR 0.5750	NDR 1.334	NDR 0.8140	ND 0.7575	ND 0.6259	ND 0.3608	ND 0.1342	ND 0.3802	ND 0.3282	ND 0.05040	ND 0.3435
DPE-12/13	20	pg	BR2-DPE-12/13	NDR 1.260	ND 0.3779	NDR 0.2810	0.263	NDR 0.7950	ND 0.4014	NDR 0.3530	NDR 0.3660	NDR 1.233	ND 0.2015	0.467	NDR 0.4330	NDR 0.2410
DPE-15	10	pg	BR2-DPE-15	0.464	ND 0.3097	NDR 0.7920	NDR 0.3790	NDR 0.9030	NDR 0.4090	NDR 0.8340	NDR 1.254	NDR 1.030	NDR 0.8923	NDR 1.358	NDR 0.5993	NDR 1.040
DPE-17/25	20	pg	BR3-DPE-17/25	ND 1.065	ND 0.7205	NDR 1.851	NDR 1.169	1.85	0.782	NDR 0.7230	1.397	1.043	NDR 0.4535	2.819	NDR 1.376	NDR 2.795
DPE-28/33	20	pg	BR3-DPE-28/33	NDR 1.992	1.275	3.016	2.213	3.624	1.462	NDR 1.471	3.725	2.713	2.001	10.33	4.838	NDR 7.972
DPE-30	10	pg	BR3-DPE-30	ND 1.159	ND 0.7549	ND 0.08520	ND 0.05900	ND 0.08610	NDR 0.2490	ND 0.5671	ND 0.5503	ND 0.1334	ND 0.2567	ND 0.3527	ND 0.05620	NDR 0.2570
DPE-32	10	pg	BR3-DPE-32	ND 0.8974	ND 0.8369	ND 0.06950	ND 0.04750	ND 0.07090	ND 0.1112	ND 0.4650	ND 0.4510	ND 0.1048	ND 0.1885	ND 0.2884	ND 0.04190	NDR 0.5540
DPE-35	10	pg	BR3-DPE-35	ND 0.9864	ND 0.4416	NDR 0.09700	0.053	NDR 0.09700	NDR 0.1960	ND 0.3732	ND 0.3619	ND 0.08900	ND 0.1531	ND 0.2518	NDR 0.2270	NDR 0.2860
DPE-37	10	pg	BR3-DPE-37	1.944	NDR 2.512	NDR 1.482	0.895	0.8	NDR 0.5160	1.113	NDR 1.197	NDR 1.943	ND 0.1450	1.681	2.374	ND 0.07990
DPE-47	300	pg	BR4-DPE-47	42.75	29.68	160.5	105.3	180.3	53.59	49.41	175.5	79.63	66.23	295.7	152.2	206.8
DPE-49	10	pg	BR4-DPE-49	NDR 1.526	NDR 0.6300	3.537	2.709	4.035	NDR 1.877	NDR 2.446	NDR 5.791	NDR 3.182	NDR 1.317	9.484	4.493	NDR 8.875
DPE-66	10	pg	BR4-DPE-66	0.83	ND 0.08670	NDR 3.210	NDR 2.360	3.789	1.263	NDR 1.317	4.305	1.743	2.302	NDR 8.253	5.42	5.568
DPE-71	10	pg	BR4-DPE-71	NDR 0.2910	NDR 0.4880	NDR 0.4300	NDR 0.4650	NDR 0.9450	NDR 0.6130	NDR 2.721	NDR 2.584	NDR 1.310	ND 0.2876	NDR 1.929	NDR 1.074	NDR 1.292
DPE-75	10	pg	BR4-DPE-75	NDR 0.2710	0.149	NDR 0.2250	0.255	NDR 0.3200	NDR 0.2870	ND 0.9116	ND 0.7325	NDR 0.2509	ND 0.2250	NDR 0.6469	NDR 0.4480	NDR 1.011
DPE-77	10	pg	BR4-DPE-77	ND 0.04230	NDR 0.09250	ND 0.007700	ND 0.003700	NDR 0.06800	NDR 0.1990	ND 0.5681	ND 0.6547	0.161	ND 0.1742	ND 0.5166	NDR 0.1020	NDR 0.6050
DPE-85	20	pg	BR5-DPE-85	NDR 1.612	NDR 1.532	3.27	2.947	4.382	2.292	1.457	4.239	1.764	2.818	7.378	4.139	NDR 5.376
DPE-99	300	pg	BR5-DPE-99	32.77	19.73	109	72.72	113.8	46.65	36.72	123.6	55.29	46.66	209.9	111.3	153.2
DPE-100	50	pg	BR5-DPE-100	5.257	4.566	20.64	14.78	21.77	9.285	7.706	23.14	10.37	10.04	29.55	21.66	30.2
DPE-105	20	pg	BR5-DPE-105	ND 0.5480	ND 0.2672	NDR 0.2990	ND 0.1391	ND 0.2222	NDR 0.5540	ND 1.693	ND 1.156	ND 0.3591	ND 0.7956	ND 3.291	ND 0.6446	NDR 1.013
DPE-116	20	pg	BR5-DPE-116	ND 0.6878	ND 0.2841	ND 0.2989	NDR 0.3310	ND 0.3743	NDR 0.3840	ND 2.212	ND 1.552	ND 0.4383	ND 0.6912	ND 4.303	ND 0.6137	NDR 1.516
DPE-119	10	pg	BR5-DPE-119/120	ND 0.4859	NDR 0.3040	NDR 0.3250	ND 0.1060	NDR 0.3610	NDR 0.3660	ND 1.382	ND 0.9697	ND 0.2541	ND 0.6031	ND 2.340	NDR 0.4140	NDR 1.284
DPE-126	20	pg	BR5-DPE-126	ND 0.2547	ND 0.1264	ND 0.09680	0.072	ND 0.1021	0.334	ND 0.8902	ND 0.6214	0.345	NDR 0.3270	ND 1.833	ND 0.2147	1.079
DPE-138/166	20	pg	BR6-DPE-138/166	ND 2.145	ND 1.590	NDR 1.937	NDR 0.9200	NDR 1.123	NDR 1.416	ND 5.202	ND 2.149	ND 0.3072	ND 2.411	ND 5.607	NDR 1.022	ND 1.080
DPE-140	20	pg	BR6-DPE-140	ND 1.479	ND 1.101	NDR 0.3630	0.318	0.213	NDR 0.4840	ND 3.286	ND 1.358	ND 0.4836	ND 1.385	ND 1.902	NDR 0.3660	NDR 1.648
DPE-153	20	pg	BR6-DPE-153	NDR 3.902	NDR 2.317	10.25	5.663	10.89	5.938	4.716	12.52	3.932	NDR 5.122	16	9.292	13.14
DPE-154	20	pg	BR6-DPE-154	NDR 2.298	NDR 1.243	6.31	4.026	6.333	4.302	3.105	7.739	3.556	NDR 3.547	11.98	5.931	10.46
DPE-155	20	pg	BR6-DPE-155	ND 1.082	ND 0.7826	NDR 1.002	NDR 0.7940	NDR 0.9400	NDR 0.5190	ND 2.187	NDR 2.289	NDR 1.909	NDR 4.851	NDR 2.277	NDR 1.115	NDR 1.793
DPE-181	20	pg	BR7-DPE-181	NDR 0.5693	ND 0.1170	NDR 0.1600	NDR 0.09300	ND 0.01880	ND 0.04440	ND 0.3553	ND 1.960	ND 1.609	ND 3.672	ND 6.707	NDR 0.7560	NDR 0.5900
DPE-183	20	pg	BR7-DPE-183	NDR 2.296	1.167	9.776	4.379	10.6	NDR 3.476	NDR 3.619	9.683	3.562	3.526	19.25	9.21	13.07
DPE-190	20	pg	BR7-DPE-190	NDR 0.5090	NDR 1.199	1.024	NDR 0.2015	NDR 0.1430	NDR 2.036	ND 4.217	ND 3.596	ND 2.994	ND 4.930	ND 14.18	ND 1.058	ND 0.8210
DPE-206	100	pg	BR8-DPE-206	17.83	NDR 9.646	19.87	NDR 32.72	60.71	42.66	45.47	NDR 120.8	54.88	23.06	NDR 201.6	141	238.9
DPE-207	250	pg	BR8-DPE-207	32.05	NDR 19.97	14.53	47.16	78.37	NDR 76.32	67.66	197.8	73.55	27.23	NDR 213.8	178.7	425.3
DPE-208	150	pg	BR8-DPE-208	NDR 20.02	NDR 14.30	NDR 19.44	27.8	45.42	NDR 55.61	43.8	135.7	42.73	NDR 17.63	148.9	153.2	295.4
DPE-209	2500	pg	BR10-DPE-209	255.5	172.3	760.8	714.2	1,186.00	462.4	512.3	1,571.00	598.9	NDR 669.2	2,664.00	1,544.00	2,973.00
				% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
			13C-BR2-DPE-15	81.48	74.79	46.56	75.89	76.66	73.55	74.8	77.52	89.73	56.48	70.22	56.34	79.66
			13C-BR3-DPE-28	84.28	78.35	65.92	81.61	83.54	98.07	88.65	90.13	107.7	65.96	77.86	68.96	88.67
			13C-BR4-DPE-47	89.51	83.17	81.02	91.23	99.47	80.33	88.78	87.58	103.5	70.22	89.96	76.54	88.41
			13C-BR4-DPE-77	93.47	91.72	101.2	93.22	97.5	93.66	77.35	78.92	84.73	66.47	68.69	61.04	78.78
			13C-BR5-DPE-99	92.86	81.45	76.97	87.19	86.2	85.14	81.25	84.14	89.36	79.28	53.22	69.09	79.72
			13C-BR5-DPE-100	86.66	74.34	75.55	84.47	86.32	82.6	82.48	82.97	92.24	23.82	55.49	85.33	84.51
			13C-BR5-DPE-126	92.76	80.42	114.2	91.67	86.27	129.6	85.51	70.17	73.91	111.3	41.76	85.3	80.61
			13C-BR6-DPE-153	81.94	78.91	95.02	93.08	100.3	48.8	83.66	77.04	87.94	53.25	25.87	79.65	107.4
			13C-BR6-DPE-154	81.23	77.63	92.35	94.04	101.3	49.92	77.52	72.85	88.12	20.84	29.24	76.28	124.1
			13C-BR7-DPE-183	83.65	72.3	81.33	83.16	89.45	78.34	78.04	88.04	88.97	64.07	45.19	71.11	92.86
			13C-BR8-DPE-197	73.00	79.23	45.2	75.52	77.47	71.63	84.22	85.64	83.38	67.41	50.52	68.15	76.91
			13C-BR10-DPE-209	44.68	45.3	19.21	68.54	75.71	40.26	62.43	87.96	82.12	27.13	35.67	59.47	58.38

2013 to 2014 OC Pesticide (by HRMS) XAD Proof Data

Surrogate standard data reported in % Recovery

OC Pesticide XAD Proof Acceptance Specifications			Client ID	XAD	XAD	XAD	XAD	XAD	XAD	XAD
			AXYS ID	L13328-55	L13328-58	L13328-59	L13328-60	L13328-61	L13328-64	L13328-66
			Matrix	XAD	XAD	XAD	XAD	XAD	XAD	XAD
			Date Analyzed	12/03/2013 4:37:43 PM	23/09/2013 4:22:08 PM	28/01/2014 10:04:37 AM	28/01/2014 10:41:38 AM	07/02/2014 9:43:27 PM	08/05/2014 4:01:42 PM	11/06/2014 5:43:21 PM
			Conc Units	ng/sample	ng/sample	ng/sample	ng/sample	ng/sample	ng/sample	ng/sample
			SAMPLE SIZE	1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample
OC Pestcides	**XAD-2 Resin**									
HCH, delta	0.1	ng	DELTA-HCH	NDR 0.001000	ND 0.007100	NDR 0.004000	ND 0.004200	ND 0.002839	NDR 0.004000	NDR 0.006266
Heptachlor-Epoxide	0.1	ng	HEPTACHLOR-EPOXIDE	ND 0.001000	ND 0.007700	0.002	NDR 0.002000	ND 0.0001312	ND 0.0007000	NDR 0.0007000
alpha-Endosulphan	0.1	ng	ALPHA-ENDOSULPHAN	NDR 0.02200	NDR 0.1280	NDR 0.1160	NDR 0.1030	NDR 0.08321	NDR 0.1160	NDR 0.08539
Dieldrin	0.1	ng	DIELDRIN	ND 0.001000	ND 0.01310	ND 0.006400	ND 0.008100	ND 0.004894	NDR 0.001000	ND 0.001522
Endrin	0.1	ng	ENDRIN	ND 0.001800	ND 0.01800	ND 0.008400	ND 0.009500	ND 0.005755	NDR 0.004000	NDR 0.007159
beta-Endosulphan	0.2	ng	BETA-ENDOSULPHAN	NDR 0.04400	NDR 0.2170	NDR 0.2110	NDR 0.1870	NDR 0.1909	NDR 0.2030	NDR 0.1804
Endosulphan-Sulphate	0.1	ng	ENDOSULPHAN-SULPHATE	ND 0.006400	ND 0.07420	ND 0.03460	ND 0.03890	ND 0.02563	ND 0.0003000	ND 0.006020
Endrin-Aldehyde	0.1	ng	ENDRIN-ALDEHYDE	ND 0.003300	ND 0.03130	NDR 0.03000	NDR 0.006000	ND 0.008146	NDR 0.003000	0.001702
Endrin-Kelone	0.1	ng	ENDRIN-KETONE	ND 0.001700	ND 0.009900	ND 0.004400	ND 0.004900	ND 0.005272	ND 0.003800	ND 0.0007060
Hexachlorobenzene	0.2	ng	HCB	0.005	0.016	0.013	0.037	0.155	0.01704	0.02093
HCH, alpha	0.1	ng	ALPHA-HCH	ND 0.001800	NDR 0.01400	ND 0.001300	ND 0.001200	ND 0.002100	ND 0.003160	NDR 0.0006470
Methoxychlor	0.1	ng	METHOXYCHLOR	NDR 0.003000	ND 0.01950	NDR 0.01400	NDR 0.01400	ND 0.009207	NDR 0.006000	NDR 0.03738
HCH, beta	0.1	ng	BETA-HCH	ND 0.003900	ND 0.006600	ND 0.001600	ND 0.001400	ND 0.002400	ND 0.002989	0.000578
HCH, gamma	0.1	ng	GAMMA-HCH	ND 0.002800	ND 0.004400	ND 0.001600	ND 0.001400	ND 0.002400	ND 0.003883	NDR 0.002029
Heptachlor	0.1	ng	HEPTACHLOR	NDR 0.007000	NDR 0.006000	NDR 0.003000	NDR 0.004000	NDR 0.002000	NDR 0.003639	NDR 0.005951
Aldrin	0.1	ng	ALDRIN	NDR 0.003000	ND 0.002200	NDR 0.004000	NDR 0.004000	NDR 0.003000	NDR 0.003504	NDR 0.004837
Octachlorostyrene	0.1	ng	CL8-STYRENE	ND 0.002000	ND 0.002400	NDR 0.001000	NDR 0	NDR 0.004000	ND 0.0004570	NDR 0.0003690
Chlordane, oxy-	0.1	ng	OXYCHLORDANE	ND 0.01230	ND 0.009400	NDR 0.005000	NDR 0.01000	ND 0.003600	NDR 0.007534	NDR 0.005590
Chlordane, gamma (trans)	0.1	ng	T-CHLORDANE	NDR 0.006000	NDR 0.007000	NDR 0.004000	NDR 0.009000	NDR 0.007000	NDR 0.004220	NDR 0.006018
Chlordane, alpha (cis)	0.1	ng	C-CHLORDANE	ND 0.003300	ND 0.003700	ND 0.001500	0.003	ND 0.001100	0.001657	0.001764
Nonachlor, trans-	0.1	ng	T-NONACHLOR	ND 0.004500	0.008	NDR 0.006000	NDR 0.008000	NDR 0.006000	NDR 0.004352	NDR 0.006215
Nonachlor, cis-	0.1	ng	C-NONACHLOR	ND 0.005100	NDR 0.01600	NDR 0.006000	NDR 0.007000	NDR 0.007000	NDR 0.004336	NDR 0.006096
2,4'-DDD	0.1	ng	2,4'-DDD	ND 0.003600	ND 0.01080	ND 0.001400	ND 0.001000	ND 0.001600	ND 0.001679	NDR 0.006113
4,4'-DDD	0.1	ng	4,4'-DDD	ND 0.004600	ND 0.01390	ND 0.001800	ND 0.001300	ND 0.002100	ND 0.002036	ND 0.0009640
2,4'-DDE	0.1	ng	2,4'-DDE	ND 0.001300	ND 0.004500	ND 0.002200	ND 0.001100	ND 0.0008000	ND 0.001429	ND 0.0003940
4,4'-DDE	0.1	ng	4,4'-DDE	ND 0.001700	ND 0.005900	NDR 0.003000	0.006	NDR 0.002000	NDR 0.006278	0.005502
2,4'-DDT	0.1	ng	2,4'-DDT	NDR 0.06100	ND 0.01910	ND 0.002200	NDR 0.009000	ND 0.002400	NDR 0.006320	NDR 0.01117
4,4'-DDT	0.1	ng	4,4'-DDT	ND 0.01050	ND 0.02160	ND 0.002500	0.005	ND 0.002800	0.003654	0.004448
Mirex	0.1	ng	MIREX	ND 0.001200	ND 0.001300	NDR 0.001000	0.001	NDR 0.001000	NDR 0.0005430	NDR 0.0008830
TCMX	0.1	ng	TCMX	ND 0.0008000	ND 0.001700	ND 0.0009000	NDR 0.001000	NDR 0.003000	ND 0.001032	ND 0.0002940
				% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
			13C6-DELTA-HCH	101.3	113.3	64.5	46.98	40.02	39.22	57.15
			13C-HEPTACHLOR-EPOXIDE	96.73	144.5	48.09	37.34	79.68	43.62	76.84
			13C9-ALPHA-ENDOSULPHAN	90.59	114.1	73.4	75.11	57.86	48.21	93.86
			13C12-DIELDRIN	96.57	97.12	66.37	59.87	50.63	55.83	93.17
			13C12-ENDRIN	96.86	168.2	113.2	110.1	68.59	59.72	137.6
			13C9-BETA-ENDOSULPHAN	94.95	102.6	80.77	81.08	52.28	55.83	99.21
			13C12-ENDRIN-ALDEHYDE	72.37	93.34	67.27	62.28	78.02	87.6	128
			13C12-METHOXYCHLOR	68.88	107.5	135.1	153.8	89.25	59.98	111.7
			13C-HCB	18.82	45.89	48.86	46.74	55.16	28.97	37.43
			13C-BETA-HCH	12.11	40.87	76.33	79.5	101.7	62.19	64.99
			13C-GAMMA-HCH	14.09	60.84	66.45	69.19	87.74	44.87	60.24
			13C-DELTA-HCH	0.4632	0.092	18	34.1	49.43	63.4	19.95
			13C-HEPTACHLOR	20.18	68.31	76.43	80	85.78	46.58	74.37
			13C-ALDRIN	14.38	56.89	66.59	69.78	91.49	49.44	61.62
			13C-OXYCHLORDANE	30.79	70.88	61.15	94.26	124	68.98	102.9
			13C-T-CHLORDANE	97.62	76.47	80.37	85.19	87.07	69.18	72.74
			13C-T-NONACHLOR	94.31	75.73	79.05	83.09	84.54	69.47	70.82
			13C-C-NONACHLOR	103.6	78.04	79.12	80.13	82.21	76.25	75.07
			13C-O,P-DDE	86.62	81.62	90	96.36	87.33	69.47	66.5
			13C-P,P-DDE	91.7	83.12	99.73	105.4	88.92	76.17	74.33
			13C-P,P-DDD	131.3	99.36	114.8	137.6	118.5	89.54	99.52
			13C-O,P-DDT	108.7	103.8	117.1	133.2	99.66	77.64	101.6
			13C-P,P-DDT	110.6	112.7	125.1	145.9	114.2	89.75	111.5
			13C-MIREX	92.87	71.69	74.12	72.88	80.26	73.56	73.85

2013 to 2014 PAH XAD Proof Data

Surrogate standard data reported in % Recovery

			XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD
			L13328-50	L13328-52	L13328-54	L13328-55	L13328-57	L13328-58	L13328-59	L13328-60	L13328-61	L13328-62	L13328-63	L13328-64	L13328-65
			XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD	XAD
			24/01/2013 6:16:00 PM	13/02/2013 6:26:00 PM	27/02/2013 5:30:00 PM	09/03/2013 3:58:00 AM	04/04/2013 1:08:00 AM	23/09/2013 3:17:00 PM	27/01/2014 5:05:00 PM	27/01/2014 5:54:00 PM	06/02/2014 4:36:00 AM	18/02/2014 9:45:00 PM	13/03/2014 1:15:00 AM	08/05/2014 2:28:00 PM	05/06/2014 4:14:00 PM
			ng/sample	ng/sample	ng/sample	ng/sample	ng/sample	ng/sample	ng/sample	ng/sample	ng/sample	ng/sample	ng/sample	ng/sample	ng/sample
PAH XAD Proof Acceptance Specifications			1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample	1.000 sample
PAHs	XAD-2 Resin														
C2-Phenanthrene/Anthracene	5	ng	1.32	1.855	5.232	1.059	1.812	3.134	2.103	3.365	1.882	4.306	3.431	1.88	6.284
C1-Phenanthrene/Anthracene	5	ng	1.305	1.024	ND	0.2767	1.04	ND	0.3579	2.284	1.245	0.3665	1.915	1.036	4.01
C1 Naphthalene	10	ng	5.739	3.749	5.246	1.901	4.234	8.263	4.82	13.22	3.551	3.128	3.418	5.052	3.605
C2-Naphthalene	10	ng	3.989	4.019	5.72	1.962	5.999	6.608	4.24	10.28	4.783	21.61	5.832	9.532	20.75
C3-Naphthalene	10	ng	20.37	22.29	8.276	0.4793	10.89	22.63	36.5	24.47	7.86	5.586	10.1	18.83	20.71
C4-Naphthalene	10	ng	12.73	13.51	9.25	NDR 0.4914	16.26	45.55	8.57	15.3	15.12	9.065	16.36	52.75	15.95
C4-Phenanthrene/Anthracene	5	ng	2.353	5.335	5.791	3.854	5.722	12.35	25.38	23.18	9.883	7.597	9.064	7.195	39.82
Naphthalene	30	ng	10.16	13.91	17.31	11.84	20.06	50.4	29.19	37.97	14.65	15.79	17.84	25.4	70.8
Acenaphthylene	1	ng	ND 0.2301	ND 0.1718	ND 0.2345	ND 0.2659	ND 0.1644	ND 0.3822	ND 0.4006	ND 0.3443	NDR 0.1417	NDR 0.2534	ND 0.2127	ND 0.3390	ND 0.5228
Acenaphthene	1	ng	ND 0.2979	ND 0.4009	NDR 0.9361	ND 0.2863	NDR 0.4053	ND 0.6018	NDR 0.6905	NDR 5.616	NDR 1.694	NDR 6.793	NDR 2.654	NDR 1.860	ND 0.6858
Fluorene	1	ng	0.263	0.3108	ND 0.1400	ND 0.1605	ND 0.2992	ND 2.942	ND 0.2206	NO 0.5258	0.1964	NDR 0.3364	NDR 0.3804	0.2803	NDR 0.3614
Phenanthrene	5	ng	1.645	2.28	0.6647	0.8108	3.102	1.531	1.542	3.28	1.763	2.313	3.226	1.822	4.249
Anthracene	1	ng	0.2912	NDR 0.4065	NDR 0.2997	NDR 0.2056	NDR 0.4306	ND 0.3082	NDR 0.4545	1.127	0.5096	0.3253	NDR 0.7577	NDR 0.2909	NDR 1.136
Fluoranthene	1	ng	0.5557	0.6689	NDR 0.2588	0.2849	1.016	0.3513	1.258	1.82	1.844	2.856	2.83	1.024	NDR 1.724
Pyrene	1	ng	0.4887	0.7381	NDR 0.3673	NDR 0.1995	1.003	0.4798	3.006	4.457	4.731	6.991	6.116	0.6931	NDR 1.120
Benzo(a)anthracene	1	ng	ND 0.1588	ND 0.06480	NDR 0.1234	ND 0.1467	ND 0.09130	0.2694	NDR 0.1475	ND 0.2149	NDR 0.1420	NDR 0.1596	0.1052	ND 0.1836	ND 0.2024
Chrysene	1	ng	ND 0.1818	0.1482	NDR 0.2404	ND 0.1532	NDR 0.1911	0.2988	0.1851	NDR 0.3056	0.3043	0.4418	0.3819	0.1669	NDR 0.3928
Benzofluoranthenes	1	ng	0.5353	ND 0.07060	NDR 0.3448	ND 0.6477	NO 0.1989	0.5282	ND 0.2548	ND 0.1831	0.1259	NDR 0.2257	0.2141	ND 0.2961	ND 0.4435
Benzofluoranthenes	1	ng	ND 0.07510	NDR 0.09090	ND 0.2766	ND 0.7045	ND 0.2249	ND 0.1685	ND 0.3008	ND 0.2065	ND 0.1108	ND 0.1278	ND 0.1321	ND 0.3274	ND 0.4809
Benzo(e)pyrene	1	ng	ND 0.09520	ND 0.1244	ND 0.3284	ND 0.8775	ND 0.2797	NDR 0.2091	ND 0.3548	NDR 0.3796	0.3408	0.5275	0.3932	ND 0.4502	ND 0.6689
Benzo(a)pyrene	1	ng	ND 0.1014	ND 0.1131	ND 0.3561	ND 0.9483	ND 0.3050	ND 0.2148	ND 0.3869	ND 0.2844	NDR 0.1926	0.4474	0.3112	ND 0.4654	ND 0.7082
Perylene	5	ng	ND 0.1010	NDR 0.6286	NDR 0.5934	NDR 2.587	NDR 0.5982	0.9547	1.66	2.241	2.028	NDR 0.2537	1.064	ND 0.4560	ND 0.7120
Dibenz(a,h)anthracene	1	ng	ND 0.08870	NDR 0.2216	ND 0.3047	ND 0.3141	NO 0.4361	ND 0.8338	NDR 0.4562	NDR 0.4861	ND 0.1435	ND 0.1783	NDR 0.2070	ND 0.5009	ND 0.6068
Indeno(1,2,3-cd)pyrene	1	ng	ND 0.1776	NDR 0.1665	ND 0.4399	ND 0.6846	ND 0.5316	ND 0.8233	NDR 0.5094	NDR 0.5401	NDR 0.3128	NDR 0.4443	NDR 0.4454	ND 0.2895	ND 0.5258
Benzo(ghi)perylene	1	ng	ND 0.1785	ND 0.09050	ND 0.3993	ND 0.6193	ND 0.5420	ND 0.5920	NDR 0.5235	NDR 0.4587	NDR 0.5149	1.088	0.7128	ND 0.2747	ND 0.4998
2-Methylnaphthalene	10	ng	2.008	1.236	2.924	0.8187	1.57	4.733	1.259	1.932	1.227	1.077	1.303	1.357	NDR 2.706
1-Methylnaphthalene	10	ng	3.701	2.511	2.322	1.082	2.664	3.53	3.562	11.29	2.325	2.051	2.114	3.694	3.605
Biphenyl	5	ng	2.168	1.023	1.466	NDR 0.5211	1.273	1.176	1.021	3.224	1.825	2.457	1.709	3.499	NDR 5.367
1,2-Dimethylnaphthalene	10	ng	ND 0.6521	ND 0.6141	ND 0.4550	ND 0.4576	ND 0.5737	ND 2.128	ND 0.8278	NO 0.4119	ND 0.2192	ND 0.3644	ND 0.2652	ND 1.345	ND 1.111
2,6-Dimethylnaphthalene	10	ng	ND 0.5215	ND 0.4893	0.5664	ND 0.3666	ND 0.4593	NO 1.704	ND 0.6712	NDR 0.5139	NDR 0.5052	NDR 0.5913	0.5887	ND 1.075	NDR 1.058
2,3,6-Trimethylnaphthalene	10	ng	NDR 5.680	NDR 6.047	NDR 1.832	NDR 0.3243	NDR 8.509	NDR 7.099	NDR 11.67	NDR 7.420	NDR 2.223	NDR 0.9872	NDR 2.975	NDR 5.935	NDR 0.7973
2,3,5-Trimethylnaphthalene	10	ng	ND 0.4798	0.569	NDR 0.6374	ND 0.2787	0.5478	ND 3.955	NDR 0.3754	ND 0.8958	0.3276	NDR 0.5586	NDR 0.4342	ND 0.4214	NDR 2.377
Dibenzothiophene	1	ng	0.5115	0.2528	NDR 0.2386	ND 0.1161	NDR 0.2837	ND 33.11	ND 0.3346	NDR 0.3205	0.5145	NDR 0.4376	0.4191	0.3898	NDR 0.5838
3-Methylphenanthrene	5	ng	0.3223	0.5014	ND 0.3473	NDR 0.1797	0.5294	ND 1.313	ND 0.2582	NDR 0.6695	0.1986	NDR 0.5929	0.6193	0.4501	NDR 0.7717
2-Methylphenanthrene	5	ng	0.4994	0.5228	ND 0.3481	0.2767	NDR 0.6858	ND 1.293	NDR 0.3519	1.128	0.3404	NDR 1.486	NDR 1.291	0.5458	2.934
2-Methylanthracene	5	ng	ND 0.1859	NDR 0.2691	ND 0.3479	ND 0.1803	ND 0.2215	ND 1.356	ND 0.2663	ND 0.2255	0.1215	ND 0.2517	0.1776	ND 0.3889	NDR 1.067
9/4-Methylphenanthrene	5	ng	0.199	NDR 0.2623	ND 0.3473	ND 0.1783	NDR 0.3787	ND 1.313	0.3579	0.5942	0.3356	NDR 0.7770	0.6797	ND 0.3852	1.076
1-Methylphenanthrene	5	ng	0.2642	NDR 0.4071	ND 0.3458	NDR 0.2270	0.5109	ND 1.293	ND 0.2537	0.5621	0.2493	0.3665	0.4384	ND 0.3839	ND 0.7204
Retene	1	ng	ND 0.3996	0.4883	ND 0.5375	NDR 0.6088	ND 0.7639	ND 0.9040	NDR 1.667	NDR 2.247	NDR 0.5965	ND 0.4634	1.052	ND 1.244	2.381
			% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
			7.758	9.796	30.12	31.62	33.28	36.06	47.77	32.62	55.86	52.77	43.48	12.67	26.93
			12.45	14.56	37.4	39.71	38.41	41.28	56.05	38.03	62.54	57.98	52.31	17.22	35.78
			19.85	23.14	45.29	44.69	45.56	49.21	64.34	47.22	69.87	63.63	59.26	19.72	45.08
			19.43	22.48	46.32	45.01	47.36	47.89	62.56	44.78	68.18	64.67	58.41	20.09	43.15
			24.81	29.89	48.25	48.85	49.64	51.34	62.64	37.91	65.18	47.77	54.85	19.86	52.27
			56.57	60.63	71.42	68.43	77.04	71.43	77.62	54.21	81.75	82.08	75.41	34.49	75.04
			58.57	61.6	72.09	71	76.59	73.21	82.73	70.12	87.75	85.32	81.16	37.48	77.12
			79.56	72.73	76.55	86.37	84.23	82.5	90.75	84.13	93.47	93.67	82.35	44.45	83.77
			89.24	72.57	79.95	88.57	84.18	75.38	94.92	86.37	96.54	94.85	93.58	41.26	81.16
			89.78	74.43	79.23	86.3	84.52	75.2	94.8	86.72	99.37	98.23	90.86	42.89	80.64
			85.62	75.19	75.18	90.36	82.27	77.47	92.37	84.74	95.59	99.77	93.47	42.2	84.67
			85.38	74.09	74.15	90.76	84.25	79.68	91.73	83.8	97.62	96.08	89.57	42.33	82.86
			82.12	71.62	73.89	88.02	79.77	78.17	87.32	75.86	91.29	87.24	85.39	35.25	72.19
			83.95	74.55	74.52	90.51	80.1	77.86	87.39	75.25	91.19	88.49	85.2	38.01	75.06
			80.78	68.86	77.3	87.67	82.04	78.59	93.49	84.93	95.76	98.59	90.86	36.5	80.05
			89.53	70.51	76.77	88.96	81.14	80.73	93.65	83.56	94.49	96.11	92.24	35.82	83.6
			91.29	73.11	76.01	90.86	83.83	82.54	93.31	82.92	95.34	97.65	90.96	36.72	83.56

APPENDIX 4
XAD-2 RESIN PROOF METHOD SPECIFICATIONS

Maximum Allowable Amounts in Sampling Media, Sample Container, and Solvent Proofs

Results are stated in amount per proof test. For XAD 70 g is analyzed, for wound filters one filter is analyzed.

For solvent the amount typically used per analysis is proofed.

TABULATED DATA FORMAT 1
Use this template if data is tabulated with toxic PCB and long list PCB mixed together

PCBs	All Media, Containers & Solvent	Homog. Equipment
Sum 209 PCB congeners	100 pg	200 pg
PCB-1	50 pg	50 pg
PCB-2	50 pg	50 pg
PCB-3	50 pg	50 pg
PCB-4	50 pg	50 pg
PCB-5	50 pg	50 pg
PCB-6	50 pg	50 pg
PCB-7	50 pg	50 pg
PCB-8	50 pg	50 pg
PCB-9	50 pg	50 pg
PCB-10	50 pg	50 pg
PCB-11	50 pg	50 pg
PCB-12/13	50 pg	50 pg
PCB-14	50 pg	50 pg
PCB-15	50 pg	50 pg
PCB-16	50 pg	50 pg
PCB-17	50 pg	50 pg
PCB-30/18	50 pg	50 pg
PCB-19	50 pg	50 pg
PCB-28/20	50 pg	50 pg
PCB-21/33	50 pg	50 pg
PCB-22	50 pg	50 pg
PCB-23	50 pg	50 pg
PCB-24	50 pg	50 pg
PCB-25	50 pg	50 pg
PCB-26/29	50 pg	50 pg
PCB-27	50 pg	50 pg
PCB-31	50 pg	50 pg
PCB-32	50 pg	50 pg
PCB-34	50 pg	50 pg
PCB-35	50 pg	50 pg
PCB-36	50 pg	50 pg
PCB-37	50 pg	50 pg
PCB-38	50 pg	50 pg
PCB-39	50 pg	50 pg
PCB-41/40/71	50 pg	50 pg
PCB-42	50 pg	50 pg
PCB-43	50 pg	50 pg
PCB-44/47/65	50 pg	50 pg
PCB-45/51	50 pg	50 pg
PCB-46	50 pg	50 pg
PCB-48	50 pg	50 pg
PCB-69/49	50 pg	50 pg
PCB-50/53	50 pg	50 pg
PCB-52	50 pg	50 pg
PCB-54	50 pg	50 pg
PCB-55	50 pg	50 pg
PCB-56	50 pg	50 pg
PCB-57	50 pg	50 pg
PCB-58	50 pg	50 pg
PCB-59/62/75	50 pg	50 pg
PCB-60	50 pg	50 pg
PCB-61/70/74/76	50 pg	50 pg
PCB-63	50 pg	50 pg
PCB-64	50 pg	50 pg
PCB-66	50 pg	50 pg
PCB-67	50 pg	50 pg
PCB-68	50 pg	50 pg
PCB-72	50 pg	50 pg
PCB-73	50 pg	50 pg
PCB 77	**2 pg**	**2 pg**
PCB-78	50 pg	50 pg
PCB-79	50 pg	50 pg
PCB-80	50 pg	50 pg
PCB 81	**2 pg**	**2 pg**
PCB-82	50 pg	50 pg
PCB-83/99	50 pg	50 pg
PCB-84	50 pg	50 pg
PCB-117/116/85	50 pg	50 pg
PCB-108/119/86/97/125/87	50 pg	50 pg
PCB-88/91	50 pg	50 pg
PCB-89	50 pg	50 pg
PCB-113/90/101	50 pg	50 pg
PCB-92	50 pg	50 pg
PCB-95/100/93/102/98	50 pg	50 pg
PCB-94	50 pg	50 pg
PCB-96	50 pg	50 pg

TABULATED DATA FORMAT 2
Use this template if data is tabulated with the toxic PCB are separated from long list PCBs

PCBs	All Media, Containers & Solvent	Homog. Equipment
PCB 81	2 pg	2 pg
PCB 77	2 pg	2 pg
PCB 123	2 pg	2 pg
PCB 114	2 pg	2 pg
PCB 126	2 pg	2 pg
PCB 167	10 pg	10 pg
PCB 156/157	10 pg	10 pg
PCB 169	2 pg	2 pg
PCB 189	10 pg	10 pg
Any other PCB congener	50 pg	50 pg
Sum 209 PCB congeners	100 pg	200 pg

PCB-103	50 pg	50 pg
PCB-104	50 pg	50 pg
PCB-105	50 pg	50 pg
PCB-106	50 pg	50 pg
PCB-107/124	50 pg	50 pg
PCB-109	50 pg	50 pg
PCB-110/115	50 pg	50 pg
PCB-111	50 pg	50 pg
PCB-112	50 pg	50 pg
PCB 114	**2 pg**	**2 pg**
CL5-PCB-118	50 pg	50 pg
CL5-PCB-120	50 pg	50 pg
CL5-PCB-121	50 pg	50 pg
CL5-PCB-122	50 pg	50 pg
PCB 123	**2 pg**	**2 pg**
PCB 126	**2 pg**	**2 pg**
PCB-127	50 pg	50 pg
PCB-128/166	50 pg	50 pg
PCB-138/163/129/160	50 pg	50 pg
PCB-130	50 pg	50 pg
PCB-131	50 pg	50 pg
PCB-132	50 pg	50 pg
PCB-133	50 pg	50 pg
PCB-134/143	50 pg	50 pg
PCB-151/135/154	50 pg	50 pg
PCB-136	50 pg	50 pg
PCB-137	50 pg	50 pg
PCB-139/140	50 pg	50 pg
PCB-141	50 pg	50 pg
PCB-142	50 pg	50 pg
PCB-144	50 pg	50 pg
PCB-145	50 pg	50 pg
PCB-146	50 pg	50 pg
PCB-147/149	50 pg	50 pg
PCB-148	50 pg	50 pg
PCB-150	50 pg	50 pg
PCB-152	50 pg	50 pg
PCB-153/168	50 pg	50 pg
PCB-155	50 pg	50 pg
PCB 156/157	**10 pg**	**10 pg**
PCB-158	50 pg	50 pg
PCB-159	50 pg	50 pg
PCB-161	50 pg	50 pg
PCB-162	50 pg	50 pg
PCB-164	50 pg	50 pg
PCB-165	50 pg	50 pg
PCB 167	**10 pg**	**10 pg**
PCB 169	**2 pg**	**2 pg**
PCB-170	50 pg	50 pg
PCB-171/173	50 pg	50 pg
PCB-172	50 pg	50 pg
PCB-174	50 pg	50 pg
PCB-175	50 pg	50 pg
PCB-176	50 pg	50 pg
PCB-177	50 pg	50 pg
PCB-178	50 pg	50 pg
PCB-179	50 pg	50 pg
PCB-180/193	50 pg	50 pg
PCB-181	50 pg	50 pg
PCB-182	50 pg	50 pg
PCB-183/185	50 pg	50 pg
PCB-184	50 pg	50 pg
PCB-186	50 pg	50 pg
PCB-187	50 pg	50 pg
PCB-188	50 pg	50 pg
PCB-189	**10 pg**	**10 pg**
PCB-190	50 pg	50 pg
PCB-191	50 pg	50 pg
PCB-192	50 pg	50 pg
PCB-194	50 pg	50 pg
PCB-195	50 pg	50 pg
PCB-196	50 pg	50 pg
PCB-197/200	50 pg	50 pg
PCB-198/199	50 pg	50 pg
PCB-201	50 pg	50 pg
PCB-202	50 pg	50 pg
PCB-203	50 pg	50 pg
PCB-204	50 pg	50 pg
PCB-205	50 pg	50 pg
PCB-206	50 pg	50 pg
PCB-207	50 pg	50 pg
PCB-208	50 pg	50 pg
PCB-209	50 pg	50 pg

Criteria are formatted so that they may be pasted directly into tabulated proof data

Maximum Allowable Amounts in Sampling Media, Sample Container, and Solvent Proofs

Results are stated in amount per proof test. For XAD 70 g is analyzed, for wound filters one filter is analyzed.

For solvent the amount typically used per analysis is proofed.

Chlorinated Pesticides	All Media, Containers & Solvent	Homog. Equipment
TCMX	0.1 ng	0.1 ng
HCH, delta	0.1 ng	0.2 ng
Hexachlorobenzene	0.2 ng	0.2 ng
HCH, alpha	0.1 ng	0.2 ng
HCH, beta	0.1 ng	0.2 ng
HCH, gamma	0.1 ng	0.2 ng
Heptachlor	0.1 ng	0.2 ng
Aldrin	0.1 ng	0.2 ng
Octachlorostyrene	0.1 ng	0.2 ng
Chlordane, oxy-	0.1 ng	0.2 ng
Chlordane, gamma (trans)	0.1 ng	0.1 ng
Chlordane, alpha (cis)	0.1 ng	0.1 ng
Nonachlor, trans-	0.1 ng	0.1 ng
Nonachlor, cis-	0.1 ng	0.1 ng
2,4'-DDD	0.1 ng	0.1 ng
4,4'-DDD	0.1 ng	0.1 ng
2,4'-DDE	0.1 ng	0.1 ng
4,4'-DDE	0.1 ng	0.1 ng
2,4'-DDT	0.1 ng	0.1 ng
4,4'-DDT	0.1 ng	0.1 ng
Photomirex	0.1 ng	0.1 ng
Mirex	0.1 ng	0.1 ng
delta-HCH	0.1 ng	1.0 ng
Heptachlor-Epoxide	0.1 ng	1.0 ng
alpha-Endosulphan	0.1 ng	1.0 ng
Dieldrin	0.1 ng	1.0 ng
Endrin	0.1 ng	1.0 ng
beta-Endosulphan	0.2 ng	1.0 ng
Endosulphan-Sulphate	0.1 ng	1.0 ng
Endrin-Aldehyde	0.1 ng	1.0 ng
Endrin-Ketone	0.1 ng	1.0 ng
Methoxychlor	0.1 ng	5.0 ng

Maximum Allowable Amounts in Sampling Media, Sample Container, and Solvent Proofs

Results are stated in amount per proof test. For XAD 70 g is analyzed,
for wound filters one filter is analyzed.
For solvent the amount typically used per analysis is proofed.

	Containers & Solvent	Homog. Equipment
PCDD/F		
2,3,7,8-TCDD, for blood	0.2 pg	0.5 pg
2,3,7,8-TCDD, for all other matrices	0.5 pg	0.5 pg
1,2,3,7,8-PeCDD	0.5 pg	1.0 pg
1,2,3,4,7,8-HxCDD	0.5 pg	1.0 pg
1,2,3,6,7,8-HxCDD	0.5 pg	1.0 pg
1,2,3,7,8,9-HxCDD	0.5 pg	1.0 pg
1,2,3,4,6,7,8-HpCDD	1.0 pg	1.0 pg
OCDD	1.0 pg	5.0 pg
2,3,7,8-TCDF, for blood	0.2 pg	0.5 pg
2,3,7,8-TCDF, for all other matrices	0.5 pg	0.5 pg
1,2,3,7,8-PeCDF	0.5 pg	1.0 pg
2,3,4,7,8-PeCDF	0.5 pg	1.0 pg
1,2,3,4,7,8-HxCDF	0.5 pg	1.0 pg
1,2,3,6,7,8-HxCDF	0.5 pg	1.0 pg
1,2,3,7,8,9-HxCDF	0.5 pg	1.0 pg
2,3,4,6,7,8-HxCDF	0.5 pg	1.0 pg
1,2,3,4,6,7,8-HpCDF	0.5 pg	1.0 pg
1,2,3,4,7,8,9-HpCDF	0.5 pg	1.0 pg
OCDF	1.0 pg	5.0 pg

Maximum Allowable Amounts in Sampling Media, Sample Container, and Solvent Proofs

Results are stated in amount per proof test. For XAD 70 g is analyzed, for wound filters one filter is analyzed.

For solvent the amount typically used per analysis is proofed.

	XAD	All Media, Container & Solvent	Homog. Equipment
PAH			
1-Methylnaphthalene	10 ng	10 ng	
1-Methylphenanthrene	5 ng	5 ng	
Naphthalene	30 ng	10 ng	10 ng
Acenaphthylene	1 ng	1 ng	5 ng
Acenaphthene	1 ng	1 ng	5 ng
C2-Phenanthrene/Anthracene	5 ng	5 ng	
Fluorene	1 ng	1 ng	5 ng
Phenanthrene	5 ng	5 ng	10 ng
Anthracene	1 ng	1 ng	5 ng
C1-Phenanthrene/Anthracene	5 ng	5 ng	
Fluoranthene	1 ng	1 ng	5 ng
Pyrene	1 ng	1 ng	5 ng
Benzo(a)anthracene	1 ng	1 ng	5 ng
Benzo(ghi)fluoranthene	1 ng	1 ng	
Benzo(c)phenanthrene	1 ng	1 ng	
Chrysene	1 ng	1 ng	5 ng
Benzofluoranthenes	1 ng	1 ng	5 ng
Benzo(e)pyrene	1 ng	1 ng	5 ng
Benzo(a)pyrene	1 ng	1 ng	5 ng
Perylene	5 ng	5 ng	5 ng
Dibenzo(ah)anthracene	1 ng	1 ng	5 ng
Indeno(1,2,3,cd)pyrene	1 ng	1 ng	5 ng
Benzo(ghi)perylene	1 ng	1 ng	5 ng
2-Methylnaphthalene	10 ng	10 ng	
C1 Naphthalenes	10 ng	10 ng	
Biphenyl	5 ng	5 ng	
C2-Naphthalene	10 ng	10 ng	
Dimethylnaphthalenes	10 ng	10 ng	
1,2-Dimethylnaphthalene	10 ng	10 ng	
2,6-Dimethylnaphthalene	10 ng	10 ng	
C3-Naphthalene	10 ng	10 ng	
2,3,6-Trimethylnaphthalene	10 ng	10 ng	
2,3,5-Trimethylnaphthalene	10 ng	10 ng	
C4-Naphthalene	10 ng	10 ng	
Dibenzothiophene	1 ng	1 ng	
3-Methylphenanthrene	5 ng	5 ng	
2-Methylphenanthrene	5 ng	5 ng	
2-Methylanthracene	5 ng	5 ng	
9/4-Methylphenanthrene	5 ng	5 ng	
Retene	1 ng	1 ng	
C4-Phenanthracene/Anthracene	5 ng	5 ng	

Criteria are fomatted so that they may be pasted directly into tabulated proof data.

APPENDIX 5
XAD-2 RESIN AND FILTER LAB BLANK DATA GENERATED FROM CARBOY SAMPLES

DIOXIN/FURAN XAD-2 RESIN LAB BLANKS

AXYS ID	WG44930-101	WG44930-102	WG46605-101	WG46605-106	WG46606-101	WG46606-106
Matrix	XAD	XAD	XAD	XAD	XAD	XAD
Date Analyzed	12/10/2013 3:47:36 PM	12/10/2013 4:42:51 PM	12/03/2014 2:13:53 PM	12/03/2014 3:09:01 PM	13/03/2014 1:51:15 AM	13/03/2014 2:46:29 AM
Conc Units	pg/L	pg/L	pg/L	pg/L	pg/L	pg/L
SAMPLE SIZE	20.00 L	20.00 L	20.00 L	20.00 L	20.00 L	20.00 L
2,3,7,8-TCDD	< 0.06286	< 0.06286	< 0.05175	< 0.05075	NDR 0.05895	< 0.05025
1,2,3,7,8-PECDD	< 0.06286	< 0.06286	< 0.05175	< 0.05075	< 0.05025	< 0.05025
1,2,3,4,7,8-HXCDD	NDR 0.08038	< 0.06286	< 0.05175	< 0.05075	< 0.05025	< 0.05025
1,2,3,6,7,8-HXCDD	NDR 0.09012	< 0.06286	NDR 0.05981	< 0.05075	< 0.05025	< 0.05025
1,2,3,7,8,9-HXCDD	NDR 0.06935	NDR 0.06389	< 0.05175	< 0.05075	< 0.05025	< 0.05025
1,2,3,4,6,7,8-HPCDD	0.09987	NDR 0.08161	NDR 0.08291	0.1443	NDR 0.09671	NDR 0.09012
OCDD	NDR 0.1959	0.3106	NDR 0.1730	0.2767	NDR 0.2514	NDR 0.2705
2,3,7,8-TCDF	< 0.06286	NDR 0.1055	< 0.05175	< 0.05075	< 0.05025	< 0.05025
1,2,3,7,8-PECDF	< 0.06286	< 0.06286	< 0.05175	< 0.05075	< 0.05025	< 0.05025
2,3,4,7,8-PECDF	NDR 0.07461	< 0.06286	0.09187	NDR 0.05705	NDR 0.05047	NDR 0.05516
1,2,3,4,7,8-HXCDF	NDR 0.07821	< 0.06286	< 0.05175	< 0.05075	< 0.05025	< 0.05025
1,2,3,6,7,8-HXCDF	NDR 0.06398	< 0.06286	< 0.05175	< 0.05075	< 0.05025	< 0.05025
1,2,3,7,8,9-HXCDF	NDR 0.08673	NDR 0.09441	< 0.05175	< 0.05075	< 0.05025	< 0.05025
2,3,4,6,7,8-HXCDF	NDR 0.06898	< 0.06286	< 0.05175	< 0.05075	< 0.05025	< 0.05025
1,2,3,4,6,7,8-HPCDF	0.08627	0.08392	NDR 0.05893	< 0.05075	NDR 0.05465	< 0.06169
1,2,3,4,7,8,9-HPCDF	NDR 0.06361	< 0.06286	< 0.05175	< 0.05075	< 0.05025	< 0.06169
OCDF	0.1087	NDR 0.1016	NDR 0.09305	0.07147	< 0.05025	< 0.05025
TOTAL TETRA-DIOXINS	< 0.06286	< 0.06286	< 0.05175	< 0.05075	< 0.05025	< 0.05025
TOTAL PENTA-DIOXINS	< 0.06286	< 0.06286	< 0.05175	< 0.05075	< 0.05025	< 0.05025
TOTAL HEXA-DIOXINS	< 0.06286	< 0.06286	< 0.05175	< 0.05075	< 0.05025	< 0.05025
TOTAL HEPTA-DIOXINS	0.09987	< 0.06286	< 0.05175	0.1443	< 0.05025	< 0.05025
TOTAL TETRA-FURANS	< 0.06286	< 0.06286	< 0.05175	< 0.05075	< 0.05025	< 0.05025
TOTAL PENTA-FURANS	< 0.06286	< 0.06286	0.09187	< 0.05075	< 0.05025	< 0.05025
TOTAL HEXA-FURANS	< 0.06286	< 0.06286	< 0.05175	< 0.05075	< 0.05025	< 0.05025
TOTAL HEPTA-FURANS	0.08627	0.08392	< 0.05175	< 0.05075	< 0.05025	< 0.06169
SURROGATE STANDARDS	%REC	%REC	%REC	%REC	%REC	%REC
13C-2,3,7,8-TCDD	71	75	59	61	48	63
13C-1,2,3,7,8-PECDD	92	98	69	71	65	78
13C-1,2,3,4,7,8-HXCDD	77	73	64	67	60	69
13C-1,2,3,6,7,8-HXCDD	79	77	66	67	61	70
13C-1,2,3,4,6,7,8-HPCDD	82	90	69	73	58	88
13C-OCDD	72	83	60	60	45	74
13C-2,3,7,8-TCDF	70	72	55	59	56	61
13C-1,2,3,7,8-PECDF	81	87	75	72	63	67
13C-2,3,4,7,8-PECDF	80	86	55	59	55	62
13C-1,2,3,4,7,8-HXCDF	80	72	67	68	60	72
13C-1,2,3,6,7,8-HXCDF	78	74	72	71	60	71
13C-1,2,3,7,8,9-HXCDF	73	71	65	63	62	84
13C-2,3,4,6,7,8-HXCDF	76	74	63	65	63	69
13C-1,2,3,4,6,7,8-HPCDF	81	83	75	75	72	93
13C-1,2,3,4,7,8,9-HPCDF	73	87	63	65	58	77
37CL-2,3,7,8-TCDD	78	78	55	60	48	63
CLIENT STANDARDS	%REC	%REC	%REC	%REC	%REC	%REC
13C6-1,2,3,4-TCDD	104	99.8	102	112	108	108

PCB CONGENER XAD-2 RESIN LAB BLANKS

AXYS ID	WG44930-101	WG44930-102	WG45131-101 L	WG45131-102 L	WG45311-101	WG45311-102
Matrix	XAD	XAD	XAD	XAD	XAD	XAD
Date Analyzed	16/10/2013 4:22:36 PM	16/10/2013 5:26:44 PM	30/01/2014 12:15:02 PM	30/01/2014 1:19:06 PM	15/01/2014 11:45:07 AM	15/01/2014 12:49:11 PM
Conc Units	pg/L	pg/L	pg/L	pg/L	pg/L	pg/L
SAMPLE SIZE	20.00 L	20.00 L	20.00 L	20.00 L	20.00 L	19.00 L
CL1-PCB-1	0.573	1.05	NDR 0.4480	NDR 0.7140	NDR 0.3010	0.584
CL1-PCB-2	0.404	0.716	NDR 0.3910	0.665	NDR 0.3600	0.721
CL1-PCB-3	NDR 0.9320	NDR 1.472	NDR 0.5750	0.751	NDR 0.5450	NDR 0.7880
CL2-PCB-4	< 0.4039	< 0.5258	< 1.429	< 1.649	< 0.6702	< 0.8622
CL2-PCB-5	< 0.2854	< 0.3308	< 0.9130	< 0.9192	< 0.4637	< 0.6463
CL2-PCB-6	< 0.2583	< 0.2994	< 0.8340	< 0.8397	< 0.4061	< 0.5661
CL2-PCB-7	< 0.2629	NDR 0.4710	< 0.8652	< 0.8711	< 0.4191	< 0.5842
CL2-PCB-8	< 0.2421	1.086	NDR 0.8640	1.551	< 0.3707	1.124
CL2-PCB-9	< 0.2590	< 0.3002	< 0.8157	< 0.8213	< 0.4096	< 0.5709
CL2-PCB-10	< 0.2624	< 0.3041	< 0.8116	< 0.8171	< 0.4065	< 0.5666
CL2-PCB-11	2.339	14.43	11.42	26.02	2.408	10.29
CL2-PCB-12/13	< 0.2803	< 0.3249	< 0.9348	< 0.9412	< 0.4502	< 0.6276
CL2-PCB-14	< 0.2648	< 0.3069	< 0.8507	< 0.8566	< 0.4194	< 0.5847
CL2-PCB-15	< 0.3153	1.083	< 0.7674	1.443	< 0.3944	NDR 0.8950
CL3-PCB-16	NDR 0.1820	NDR 0.5210	NDR 0.2800	NDR 0.6820	< 0.2127	0.63
CL3-PCB-17	0.164	NDR 0.4910	< 0.1993	0.687	< 0.1820	NDR 0.7380
CL3-PCB-30/18	0.253	0.919	0.545	NDR 1.377	0.333	1.818
CL3-PCB-19	< 0.1356	NDR 0.1330	< 0.3202	< 0.2377	< 0.2438	NDR 0.2170
CL3-PCB-28/20	0.625	2.478	1.925	4.349	0.709	3.491
CL3-PCB-21/33	0.401	1.476	NDR 0.7420	2.105	0.313	1.446
CL3-PCB-22	0.224	NDR 0.9650	0.639	1.676	NDR 0.2460	1.303
CL3-PCB-23	< 0.08290	< 0.07530	< 0.1531	< 0.1302	< 0.1698	< 0.1203
CL3-PCB-24	< 0.09100	< 0.07460	< 0.1543	< 0.1282	< 0.1308	< 0.1222
CL3-PCB-25	0.081	NDR 0.1770	< 0.1299	0.331	< 0.1421	0.248
CL3-PCB-26/29	0.112	0.361	NDR 0.2240	0.6	< 0.1628	0.622
CL3-PCB-27	< 0.08260	< 0.06770	< 0.1377	NDR 0.1480	< 0.1279	NDR 0.1350
CL3-PCB-31	0.954	2.152	1.124	2.958	0.585	2.77
CL3-PCB-32	0.136	NDR 0.3480	0.258	0.718	< 0.1556	0.653
CL3-PCB-34	< 0.08030	< 0.07290	< 0.1473	< 0.1253	< 0.1641	< 0.1162
CL3-PCB-35	< 0.08440	0.28	NDR 0.1960	0.438	< 0.1727	0.272
CL3-PCB-36	< 0.07720	< 0.07000	< 0.1452	< 0.1235	< 0.1563	< 0.1107
CL3-PCB-37	0.211	0.721	NDR 0.4250	1.118	0.188	1.582
CL3-PCB-38	< 0.08250	< 0.07490	< 0.1517	< 0.1291	< 0.1645	< 0.1165
CL3-PCB-39	< 0.07940	< 0.07210	< 0.1491	0.977	< 0.1610	0.234
CL4-PCB-41/40/71	0.194	0.926	0.537	NDR 1.294	NDR 0.2760	2.892
CL4-PCB-42	< 0.1319	NDR 0.3550	NDR 0.2330	NDR 0.5500	< 0.1955	1.083
CL4-PCB-43	< 0.1546	< 0.1452	< 0.1781	< 0.1733	< 0.2206	< 0.1988
CL4-PCB-44/47/65	NDR 1.184	11.77	1.644	3.463	0.484	6.369
CL4-PCB-45/51	0.277	2.412	NDR 0.2520	NDR 0.5950	< 0.1985	NDR 0.8070
CL4-PCB-46	< 0.1477	< 0.1387	< 0.1887	NDR 0.2100	< 0.2307	< 0.2078
CL4-PCB-48	< 0.1281	NDR 0.2650	< 0.1636	NDR 0.5090	< 0.1940	0.837
CL4-PCB-69/49	NDR 0.1770	0.959	NDR 0.5440	NDR 1.488	0.252	2.343
CL4-PCB-50/53	< 0.1204	NDR 0.1820	< 0.1553	NDR 0.4130	< 0.1919	NDR 0.4170
CL4-PCB-52	NDR 0.4550	2.051	1.375	2.971	0.521	3.533
CL4-PCB-54	< 0.09490	< 0.09540	< 0.1522	< 0.1256	< 0.1548	< 0.1401
CL4-PCB-55	< 0.1596	< 0.1453	< 0.1958	< 0.2090	< 0.1687	< 0.2053
CL4-PCB-56	NDR 0.2260	0.739	NDR 0.4450	1.139	0.246	3.817
CL4-PCB-57	< 0.1450	< 0.1320	< 0.1818	< 0.1940	< 0.1553	< 0.1890
CL4-PCB-58	< 0.1600	< 0.1457	< 0.1857	< 0.1982	< 0.1573	< 0.1914
CL4-PCB-59/62/75	< 0.09570	NDR 0.1230	NDR 0.1280	NDR 0.3540	< 0.1490	0.381
CL4-PCB-60	< 0.1641	0.32	0.445	0.772	< 0.1661	1.384
CL4-PCB-61/70/74/76	NDR 0.6050	3.006	2.169	5.439	0.81	11.69
CL4-PCB-63	< 0.1489	< 0.1355	< 0.1780	< 0.1900	< 0.1513	NDR 0.2760
CL4-PCB-64	< 0.09340	0.644	NDR 0.5090	NDR 1.017	0.208	2.068
CL4-PCB-66	0.317	1.237	1.318	3.085	NDR 0.3880	6.365
CL4-PCB-67	< 0.1366	< 0.1243	< 0.1677	< 0.1789	< 0.1394	< 0.1697
CL4-PCB-68	0.149	1.664	< 0.1731	NDR 0.6070	< 0.1513	0.408
CL4-PCB-72	< 0.1419	< 0.1292	< 0.1742	< 0.1859	< 0.1523	< 0.1854
CL4-PCB-73	< 0.09510	< 0.08930	< 0.1291	< 0.1256	< 0.1539	< 0.1386
CL4-PCB-77	< 0.1624	NDR 0.1930	< 0.1597	0.351	< 0.1483	NDR 1.320
CL4-PCB-78	< 0.1563	< 0.1423	< 0.1885	< 0.2012	< 0.1684	< 0.2049
CL4-PCB-79	< 0.1317	< 0.1199	< 0.1604	< 0.1712	< 0.1381	< 0.1681
CL4-PCB-80	< 0.1481	< 0.1348	< 0.1750	< 0.1868	< 0.1478	< 0.1798
CL4-PCB-81	< 0.1567	< 0.1390	< 0.1609	< 0.1774	< 0.1475	< 0.1738
CL5-PCB-82	< 0.1277	NDR 0.3090	< 0.2466	0.322	< 0.2169	1.587
CL5-PCB-83/99	0.288	1.218	1.62	2.503	NDR 0.2240	4.46
CL5-PCB-84	< 0.1291	0.602	NDR 0.3460	0.68	< 0.2238	NDR 2.081
CL5-PCB-117/116/85	< 0.09860	0.34	NDR 0.4400	0.557	< 0.1622	NDR 1.638
CB-108/119/86/97/125/87	NDR 0.5620	NDR 1.776	NDR 1.166	2.24	NDR 0.3450	5.847
CL5-PCB-88/91	< 0.1141	NDR 0.3590	< 0.2224	NDR 0.3310	< 0.1955	1.072
CL5-PCB-89	< 0.1212	< 0.1613	< 0.2310	< 0.2350	< 0.2030	< 0.2537
CL5-PCB-113/90/101	NDR 0.4420	2.361	1.27	2.567	0.482	7.433
CL5-PCB-92	< 0.1135	0.357	0.357	NDR 0.5520	< 0.1883	1.3

L5-PCB-95/100/93/102/98	NDR 0.4390	1.94	NDR 1.159	2.324	0.305	4.994
CL5-PCB-94	< 0.1233	< 0.1641	< 0.2461	< 0.2503	< 0.2126	< 0.2656
CL5-PCB-96	< 0.08700	< 0.07960	< 0.1236	< 0.1159	< 0.1972	< 0.1381
CL5-PCB-103	< 0.09840	< 0.1309	< 0.1964	< 0.1998	< 0.1721	< 0.2151
CL5-PCB-104	< 0.08130	< 0.07760	< 0.1393	< 0.1149	< 0.1928	< 0.1362
CL5-PCB-105	NDR 0.3950	NDR 0.6250	0.49	NDR 1.051	0.225	4.069
CL5-PCB-106	< 0.08260	< 0.1075	< 0.1639	< 0.2116	< 0.1510	< 0.2079
CL5-PCB-107/124	< 0.09330	< 0.1214	< 0.1795	< 0.2316	< 0.1643	NDR 0.4080
CL5-PCB-109	< 0.08830	< 0.1149	< 0.1634	< 0.2109	< 0.1496	0.717
CL5-PCB-110/115	NDR 0.4330	2.157	1.53	2.612	NDR 0.5040	10.06
CL5-PCB-111	< 0.08770	< 0.1168	< 0.1700	< 0.1729	< 0.1486	< 0.1857
CL5-PCB-112	< 0.08170	< 0.1087	< 0.1670	< 0.1698	< 0.1406	< 0.1757
CL5-PCB-114	< 0.08960	< 0.1180	< 0.1512	< 0.1936	< 0.1399	0.329
CL5-PCB-118	0.403	NDR 1.319	NDR 1.462	NDR 3.180	NDR 0.5080	8.592
CL5-PCB-120	< 0.08240	< 0.1097	< 0.1578	< 0.1605	< 0.1389	< 0.1736
CL5-PCB-121	< 0.08670	< 0.1154	< 0.1700	< 0.1729	< 0.1461	< 0.1825
CL5-PCB-122	< 0.09520	< 0.1239	< 0.1831	< 0.2363	< 0.1770	< 0.2437
CL5-PCB-123	< 0.09720	< 0.1242	< 0.1573	< 0.2075	< 0.1543	< 0.2134
CL5-PCB-126	< 0.1006	< 0.1320	< 0.1623	< 0.2329	< 0.1594	< 0.2164
CL5-PCB-127	< 0.08870	< 0.1155	< 0.1743	< 0.2249	< 0.1655	< 0.2278
CL6-PCB-128/166	< 0.1529	0.217	NDR 0.2520	0.602	< 0.1998	2.004
CL6-PCB-138/163/129/160	0.523	1.82	NDR 2.313	NDR 4.406	NDR 0.6480	11.31
CL6-PCB-130	< 0.1890	< 0.1531	< 0.2327	0.323	< 0.2420	NDR 0.6780
CL6-PCB-131	< 0.1866	< 0.1512	< 0.2192	< 0.2848	< 0.2283	< 0.2709
CL6-PCB-132	< 0.1883	0.607	NDR 0.4110	NDR 0.8280	< 0.2421	3.133
CL6-PCB-133	< 0.1764	< 0.1429	< 0.2142	< 0.2783	< 0.2228	< 0.2644
CL6-PCB-134/143	< 0.1827	< 0.1480	< 0.2240	< 0.2910	< 0.2250	0.521
CL6-PCB-151/135/154	NDR 0.1390	0.624	0.565	1.207	< 0.1974	3.023
CL6-PCB-136	< 0.09590	0.249	NDR 0.2400	NDR 0.3050	< 0.1525	1.109
CL6-PCB-137	< 0.1917	< 0.1553	< 0.2191	< 0.2847	< 0.2283	NDR 0.6590
CL6-PCB-139/140	< 0.1650	< 0.1337	< 0.2052	< 0.2666	< 0.2107	< 0.2500
CL6-PCB-141	< 0.1665	0.351	NDR 0.3590	0.795	< 0.2133	2.072
CL6-PCB-142	< 0.1776	< 0.1439	< 0.2254	< 0.2928	< 0.2324	< 0.2757
CL6-PCB-144	< 0.1217	< 0.1117	< 0.2308	0.325	< 0.2001	0.392
CL6-PCB-145	< 0.1025	< 0.09410	< 0.1914	< 0.2009	< 0.1599	< 0.2265
CL6-PCB-146	< 0.1535	NDR 0.2250	0.535	0.812	< 0.1986	1.652
CL6-PCB-147/149	0.348	1.482	1.182	2.596	0.37	7.536
CL6-PCB-148	< 0.1274	< 0.1170	< 0.2364	< 0.2482	< 0.1997	< 0.2830
CL6-PCB-150	< 0.09820	< 0.09010	< 0.1832	< 0.1924	< 0.1557	< 0.2207
CL6-PCB-152	< 0.09140	< 0.08390	< 0.1735	< 0.1822	< 0.1472	< 0.2086
CL6-PCB-153/168	NDR 0.4380	1.519	2.721	6.447	NDR 0.5920	8.911
CL6-PCB-155	< 0.07910	< 0.07400	< 0.1536	< 0.1365	< 0.1308	0.231
CL6-PCB-156/157	< 0.1438	0.141	0.21	0.317	< 0.2066	1.555
CL6-PCB-158	< 0.1208	NDR 0.2080	NDR 0.2440	NDR 0.5110	< 0.1581	NDR 1.229
CL6-PCB-159	< 0.1300	< 0.1053	< 0.1552	< 0.2016	< 0.1682	< 0.1996
CL6-PCB-161	< 0.1279	< 0.1036	< 0.1558	< 0.2024	< 0.1614	< 0.1915
CL6-PCB-162	< 0.1334	< 0.1081	< 0.1591	< 0.2067	< 0.1746	< 0.2072
CL6-PCB-164	< 0.1249	NDR 0.1310	< 0.1582	NDR 0.2770	< 0.1678	0.795
CL6-PCB-165	< 0.1437	< 0.1164	< 0.1763	< 0.2291	< 0.1863	< 0.2211
CL6-PCB-167	< 0.1126	< 0.09000	< 0.1311	< 0.1672	< 0.1527	0.565
CL6-PCB-169	< 0.1297	< 0.1047	< 0.1372	< 0.2004	< 0.1671	< 0.1933
CL7-PCB-170	< 0.1484	NDR 0.3080	< 0.2168	NDR 0.7140	< 0.2093	2.714
CL7-PCB-171/173	< 0.1464	< 0.1484	< 0.2132	NDR 0.4270	< 0.2130	NDR 1.087
CL7-PCB-172	< 0.1474	< 0.1494	< 0.2028	< 0.2412	< 0.2153	0.631
CL7-PCB-174	NDR 0.1800	0.697	NDR 0.6000	NDR 1.244	NDR 0.2890	NDR 3.588
CL7-PCB-175	< 0.1338	< 0.1357	< 0.1978	< 0.2353	< 0.1879	< 0.2429
CL7-PCB-176	< 0.1012	< 0.1026	< 0.1501	< 0.1785	< 0.1441	NDR 0.2890
CL7-PCB-177	< 0.1426	NDR 0.2980	< 0.2088	NDR 0.7050	< 0.2104	NDR 1.919
CL7-PCB-178	< 0.1390	< 0.1409	< 0.2039	NDR 0.3610	< 0.1981	NDR 0.5280
CL7-PCB-179	< 0.09820	0.221	NDR 0.1960	0.434	< 0.1419	1.056
CL7-PCB-180/193	0.247	1.477	NDR 1.410	3.97	NDR 0.4030	6.258
CL7-PCB-181	< 0.1385	< 0.1404	< 0.2025	< 0.2408	< 0.2041	< 0.2637
CL7-PCB-182	< 0.1319	< 0.1337	< 0.1944	< 0.2312	< 0.1914	< 0.2473
CL7-PCB-183/185	< 0.1333	0.5	0.773	NDR 1.124	< 0.1912	2.34
CL7-PCB-184	< 0.09800	< 0.09930	< 0.1479	< 0.1759	< 0.1415	< 0.1829
CL7-PCB-186	< 0.1065	< 0.1080	< 0.1600	< 0.1902	< 0.1540	< 0.1990
CL7-PCB-187	NDR 0.2010	NDR 0.8530	NDR 1.396	2.345	NDR 0.2780	4.434
CL7-PCB-188	< 0.08720	< 0.08910	< 0.1390	< 0.1520	< 0.1430	< 0.1871
CL7-PCB-189	< 0.2744	< 0.1356	< 0.1816	< 0.2058	< 0.1667	< 0.1793
CL7-PCB-190	< 0.1067	< 0.1081	< 0.1550	< 0.1844	< 0.1691	0.674
CL7-PCB-191	< 0.1083	< 0.1098	< 0.1554	< 0.1849	< 0.1606	< 0.2075
CL7-PCB-192	< 0.1181	< 0.1198	< 0.1716	< 0.2041	< 0.1749	< 0.2261
CL8-PCB-194	< 0.1633	0.398	NDR 0.4870	0.885	< 0.2102	NDR 1.745
CL8-PCB-195	< 0.1759	NDR 0.2020	< 0.2307	NDR 0.3900	< 0.2162	0.565
CL8-PCB-196	< 0.1234	0.531	0.582	1.137	< 0.2790	NDR 0.7930
CL8-PCB-197/200	< 0.09300	0.325	NDR 0.2670	0.541	< 0.2061	NDR 0.4850
CL8-PCB-198/199	NDR 0.1610	1.374	1.597	4.333	< 0.2890	2.605
CL8-PCB-201	< 0.09140	NDR 0.1710	< 0.1499	NDR 0.3800	< 0.2007	0.437
CL8-PCB-202	< 0.09430	NDR 0.3240	NDR 0.2300	0.628	< 0.2315	NDR 0.6330
CL8-PCB-203	< 0.1203	1.153	1.276	NDR 2.541	< 0.2663	1.696
CL8-PCB-204	< 0.09240	< 0.08570	< 0.1492	< 0.2062	< 0.2016	< 0.2256
CL8-PCB-205	< 0.1421	< 0.09110	< 0.1638	< 0.1877	< 0.1652	< 0.1544

CL9-PCB-206	< 0.2131	NDR 0.5310	0.552	1.359	< 0.3792	1.413
CL9-PCB-207	< 0.1687	NDR 0.1790	< 0.2374	NDR 0.5020	< 0.2924	< 0.2493
CL9-PCB-208	< 0.1735	0.439	NDR 0.4880	1.013	< 0.2814	NDR 0.5100
CL10-PCB-209	0.106	NDR 0.1870	< 0.1796	< 0.1885	< 0.2129	NDR 1.045
SURROGATE STANDARDS	**%REC**	**%REC**	**%REC**	**%REC**	**%REC**	**%REC**
13C-CL1-PCB-1	23	23	25	25	24	32
13C-CL1-PCB-3	25	27	30	41	30	41
13C-CL2-PCB-4	32	31	33	47	32	41
13C-CL2-PCB-15	41	48	54	88	50	56
13C-CL3-PCB-19	38	39	46	69	44	53
13C-CL3-PCB-37	63	69	64	79	65	74
13C-CL4-PCB-54	45	46	45	59	50	57
13C-CL4-PCB-77	79	88	86	93	81	92
13C-CL4-PCB-81	79	88	87	93	82	93
13C-CL5-PCB-104	67	64	58	73	58	64
13C-CL5-PCB-105	86	86	79	84	80	89
13C-CL5-PCB-114	82	81	75	80	75	81
13C-CL5-PCB-118	82	84	77	81	74	83
13C-CL5-PCB-123	83	84	76	82	75	83
13C-CL5-PCB-126	89	90	84	82	80	90
13C-CL6-PCB-155	70	69	62	76	59	65
13C-CL6-PCB-156/157	76	77	80	80	78	86
13C-CL6-PCB-167	78	79	81	85	78	85
13C-CL6-PCB-169	77	78	86	81	82	92
13C-CL7-PCB-170	80	83	85	91	83	86
13C-CL7-PCB-180	81	82	83	92	81	85
13C-CL7-PCB-188	66	68	64	83	61	62
13C-CL7-PCB-189	91	96	73	75	72	75
13C-CL8-PCB-202	88	90	78	92	65	68
13C-CL8-PCB-205	77	80	82	83	80	88
13C-CL9-PCB-206	74	76	86	87	81	86
13C-CL9-PCB-208	72	77	82	90	80	84
13C-CL10-PCB-209	93	95	106	107	88	97
13C-CL3-PCB-28	62	62	52	73	58	62
13C-CL5-PCB-111	76	71	78	86	77	80
13C-CL7-PCB-178	86	82	87	91	74	81
CLIENT STANDARDS						
13C-CL3-PCB-31	92.9	83.0	75.1		89.0	90.6
13C-CL5-PCB-95	90.7	82.7	79.8		94.5	91.1
13C-CL6-PCB-153	97.1	92.8	94.1		94.8	97.5

E1 AND E2 FRACTION HRMS OC PESTICIDE XAD-2 RESIN LAB BLANKS

AXYS ID	WG44930-101	WG44930-102	WG45131-101	WG45131-102	WG45311-102
Matrix	XAD	XAD	XAD	XAD	XAD
Date Analyzed	08/10/2013 2:53:24 AM	08/10/2013 3:30:10 AM	23/11/2013 5:39:31 PM	23/11/2013 6:16:26 PM	24/11/2013 2:52:33 AM
Conc Units	ng/L	ng/L	ng/L	ng/L	ng/L
SAMPLE SIZE	20.00 L	20.00 L	20.00 L	19.00 L	19.00 L
HCB	< 0.003843	0.008345	NDR 0.007118	0.009494	0.00632
ALPHA-HCH	< 0.006866	< 0.004000	< 0.003564	< 0.004232	< 0.004247
BETA-HCH	< 0.01621	< 0.005879	< 0.003564	< 0.004232	< 0.004247
GAMMA-HCH	< 0.008801	< 0.004000	< 0.003687	< 0.004232	< 0.004247
HEPTACHLOR	< 0.01052	< 0.005723	< 0.003564	< 0.004232	< 0.004247
ALDRIN	< 0.006495	< 0.004183	< 0.003564	< 0.004232	< 0.004247
OXYCHLORDANE	< 0.03208	< 0.01771	< 0.01560	< 0.004232	< 0.004247
T-CHLORDANE	< 0.007893	0.01377	< 0.004251	0.006994	0.005911
C-CHLORDANE	< 0.008905	0.01146	< 0.004619	< 0.004232	NDR 0.004320
T-NONACHLOR	< 0.01026	0.008532	< 0.006366	0.004616	0.004365
C-NONACHLOR	< 0.01439	< 0.007656	NDR 0.01466	NDR 0.004281	< 0.004247
2,4'-DDD	< 0.01234	< 0.006544	< 0.01164	< 0.005052	< 0.004247
4,4'-DDD	< 0.01539	< 0.008166	< 0.01733	< 0.007522	< 0.005676
2,4'-DDE	< 0.01022	< 0.006041	< 0.004175	< 0.004232	< 0.004247
4,4'-DDE	< 0.01200	< 0.006800	< 0.005907	0.004392	< 0.004247
2,4'-DDT	< 0.02153	< 0.01176	< 0.02940	< 0.01304	< 0.008190
4,4'-DDT	< 0.02390	< 0.01327	< 0.03487	< 0.01706	< 0.01034
MIREX	< 0.004000	< 0.004000	< 0.003564	< 0.004232	< 0.004247
	%REC	%REC	%REC	%REC	%REC
13C-HCB	34	50	24	37	34
13C-BETA-HCH	25	38	46	62	64
13C-GAMMA-HCH	44	57	32	40	48
13C-HEPTACHLOR	57	74	28	47	62
13C-ALDRIN	52	69	26	52	59
13C-OXYCHLORDANE	63	93	41	67	115
13C-T-CHLORDANE	61	70	48	71	74
13C-T-NONACHLOR	61	71	43	69	74
13C-C-NONACHLOR	63	73	52	75	77
13C-O,P-DDE	66	69	47	73	77
13C-P,P-DDE	67	70	49	82	82
13C-P,P-DDD	64	79	54	87	92
13C-O,P-DDT	67	80	47	77	92
13C-P,P-DDT	69	81	53	76	99
13C-MIREX	64	72	50	78	84

AXYS ID	WG44930-101	WG44930-102	WG45131-101 W	WG45131-102	WG45311-102
Matrix	XAD	XAD	XAD	XAD	XAD
Date Analyzed	09/10/2013 11:08:45 AM	09/10/2013 11:49:56 AM	08/01/2014 1:55:42 PM	03/12/2013 12:25:22 AM	04/12/2013 11:54:10 PM
Conc Units	ng/L	ng/L	ng/L	ng/L	ng/L
SAMPLE SIZE	20.00 L	20.00 L	20.00 L	19.00 L	19.00 L
DELTA-HCH	< 0.01000	< 0.01000	0.0193	< 0.01058	< 0.01062
HEPTACHLOR-EPOXIDE	< 0.01000	< 0.01000	0.02933	< 0.01058	< 0.01062
ALPHA-ENDOSULPHAN	< 0.04347	< 0.02820	NDR 0.06325	NDR 0.01243	NDR 0.01878
DIELDRIN	< 0.01124	< 0.01000	0.02891	< 0.01058	< 0.01062
ENDRIN	< 0.02030	< 0.01016	0.03582	< 0.01058	< 0.01062
BETA-ENDOSULPHAN	< 0.06994	NDR 0.05981	NDR 0.09597	NDR 0.04152	NDR 0.03402
ENDOSULPHAN-SULPHATE	< 0.06125	< 0.03585	NDR 0.06614	< 0.01058	< 0.01062
ENDRIN-ALDEHYDE	< 0.01532	< 0.01077	NDR 0.06256	< 0.01058	< 0.01062
ENDRIN-KETONE	< 0.01310	< 0.01000	NDR 0.02842	< 0.01058	< 0.01062
METHOXYCHLOR	< 0.02000	< 0.02914	0.04647	< 0.02115	< 0.02123
	%REC	%REC	%REC	%REC	%REC
13C6-DELTA-HCH	45	53	51	38	47
13C-HEPTACHLOR-EPOXIDE	65	79	60	80	59
13C9-ALPHA-ENDOSULPHAN	55	56	42	40	76
13C12-DIELDRIN	59	66	88	72	88
13C12-ENDRIN	69	85	86	81	95
13C9-BETA-ENDOSULPHAN	55	60	54	32	75
13C12-ENDRIN-ALDEHYDE	67	94	78	85	96
13C12-METHOXYCHLOR	74	106	60	76	92

DIOXIN/FURAN FILTER LAB BLANKS

AXYS ID	WG44928-101	WG44928-102	WG45130-101	WG45130-102	WG45377-101	WG45377-102
Matrix	FILTER	FILTER	FILTER	FILTER	FILTER	FILTER
Date Analyzed	13/10/2013 2:03:57 AM	13/10/2013 2:59:11 AM	17/11/2013 7:14:47 AM	17/11/2013 8:10:03 AM	16/11/2013 8:55:26 AM	16/11/2013 9:50:40 AM
Conc Units	pg/L	pg/L	pg/L	pg/L	pg/L	pg/L
SAMPLE SIZE	20.00 L	20.00 L	20.00 L	20.00 L	20.00 L	20.00 L
2,3,7,8-TCDD	< 0.06285	< 0.06271	NDR 0.09837	NDR 0.1152	0.1606	NDR 0.1025
1,2,3,7,8-PECDD	< 0.06285	< 0.06271	< 0.08869	< 0.06142	NDR 0.1614	< 0.06169
1,2,3,4,7,8-HXCDD	NDR 0.06558	< 0.06271	< 0.06178	< 0.06142	0.1344	< 0.06169
1,2,3,6,7,8-HXCDD	< 0.06285	< 0.06271	< 0.06178	< 0.06142	NDR 0.1117	< 0.06169
1,2,3,7,8,9-HXCDD	NDR 0.08106	< 0.06271	< 0.06178	< 0.06142	0.165	< 0.06169
1,2,3,4,6,7,8-HPCDD	NDR 0.07842	0.09567	NDR 0.06592	< 0.06142	0.2371	NDR 0.07222
OCDD	0.1193	NDR 0.1404	0.286	NDR 0.3023	NDR 0.5356	0.2203
2,3,7,8-TCDF	< 0.06285	NDR 0.1192	< 0.06178	< 0.06142	NDR 0.07258	< 0.06169
1,2,3,7,8-PECDF	0.0667	< 0.06271	< 0.06178	< 0.06142	0.1152	< 0.06169
2,3,4,7,8-PECDF	NDR 0.09300	< 0.06271	< 0.06178	< 0.06142	NDR 0.1171	< 0.06169
1,2,3,4,7,8-HXCDF	0.07944	< 0.06271	< 0.06178	< 0.06142	NDR 0.1852	< 0.06169
1,2,3,6,7,8-HXCDF	< 0.06285	< 0.06271	< 0.06178	< 0.06142	0.1542	< 0.06169
1,2,3,7,8,9-HXCDF	NDR 0.07257	< 0.06271	< 0.06178	< 0.06142	0.1359	< 0.06169
2,3,4,6,7,8-HXCDF	< 0.06285	< 0.06271	< 0.06178	< 0.06142	0.1187	< 0.06169
1,2,3,4,6,7,8-HPCDF	NDR 0.07010	NDR 0.1524	NDR 0.1301	NDR 0.07857	0.2651	NDR 0.08149
1,2,3,4,7,8,9-HPCDF	0.06445	< 0.06271	< 0.06178	< 0.06142	NDR 0.1331	< 0.06169
OCDF	NDR 0.09308	< 0.06271	NDR 0.07444	0.08492	0.3147	0.07133
TOTAL TETRA-DIOXINS	< 0.06285	< 0.06271	< 0.06178	< 0.06142	< 0.06248	< 0.06169
TOTAL PENTA-DIOXINS	< 0.06285	< 0.06271	< 0.08869	< 0.06142	< 0.06248	< 0.06169
TOTAL HEXA-DIOXINS	< 0.06285	< 0.06271	< 0.06178	< 0.06142	< 0.06248	< 0.06169
TOTAL HEPTA-DIOXINS	< 0.06285	0.09567	< 0.06178	< 0.06142	< 0.06248	< 0.06169
TOTAL TETRA-FURANS	< 0.06285	< 0.06271	0.2124	< 0.06142	< 0.06248	< 0.06169
TOTAL PENTA-FURANS	0.0667	< 0.06271	< 0.06178	< 0.06142	< 0.06248	< 0.06169
TOTAL HEXA-FURANS	0.07944	< 0.06271	< 0.06178	< 0.06142	< 0.06248	< 0.06169
TOTAL HEPTA-FURANS	0.06445	< 0.06271	< 0.06178	< 0.06142	< 0.06248	< 0.06169
	%REC	%REC	%REC	%REC	%REC	%REC
13C-2,3,7,8-TCDD	78	108	73	60	73	69
13C-1,2,3,7,8-PECDD	99	144	65	80	86	84
13C-1,2,3,4,7,8-HXCDD	81	114	75	72	71	73
13C-1,2,3,6,7,8-HXCDD	85	120	78	74	76	78
13C-1,2,3,4,6,7,8-HPCDD	86	127	93	80	88	81
13C-OCDD	72	120	80	67	79	67
13C-2,3,7,8-TCDF	74	103	70	62	76	68
13C-1,2,3,7,8-PECDF	89	130	85	79	84	79
13C-2,3,4,7,8-PECDF	80	113	74	69	79	77
13C-1,2,3,4,7,8-HXCDF	74	101	62	62	65	78
13C-1,2,3,6,7,8-HXCDF	82	112	67	72	65	78
13C-1,2,3,7,8,9-HXCDF	65	88	62	51	80	79
13C-2,3,4,6,7,8-HXCDF	74	103	65	72	83	76
13C-1,2,3,4,6,7,8-HPCDF	71	103	72	68	68	86
13C-1,2,3,4,7,8,9-HPCDF	66	96	73	63	89	79
37CL-2,3,7,8-TCDD	82	116	84	78	81	77

PCB CONGENER FILTER LAB BLANKS

AXYS ID	WG44928-101 W	WG44928-102 W	WG45130-101 W	WG45130-102 I	WG46278-101 W	WG46278-102	WG46278-102 W
Matrix	FILTER	FILTER	FILTER	FILTER	FILTER	FILTER	FILTER
Date Analyzed	08/01/2014 11:27:38 AM	08/01/2014 12:31:48 PM	17/12/2013 10:49:55 PM	10/12/2013 12:54:38 PM	20/02/2014 1:01:20 AM	06/02/2014 1:38:56 AM	20/02/2014 2:05:26 AM
Conc Units	pg/L	pg/L	pg/L	pg/L	pg/L	pg/L	pg/L
SAMPLE SIZE	20.00 L	20.00 L	20.00 L	20.00 L	20.00 L	19.00 L	19.00 L
Cl1-PCB-1	< 0.4900	< 0.6063	< 1.072	0.24	2.34	0.6655	1.263
Cl1-PCB-2	NDR 0.5630	< 0.6046	< 1.193	0.175	1.034	0.8203	< 0.8775
Cl1-PCB-3	NDR 1.197	NDR 1.235	NDR 1.124	NDR 0.2840	1.98	0.6139	1.175
Cl2-PCB-4	< 1.385	< 1.422	< 2.720	< 0.3571	< 5.705	0.4644	< 5.364
Cl2-PCB-5	< 1.204	< 1.202	< 2.635	< 0.2730	< 5.457	< 0.2943	< 5.012
Cl2-PCB-6	< 1.073	< 1.072	< 2.296	< 0.2386	< 4.350	< 0.2410	< 3.995
Cl2-PCB-7	< 1.099	< 1.097	< 2.320	< 0.2443	< 4.520	< 0.2429	< 4.151
Cl2-PCB-8	< 1.010	< 1.008	< 2.066	0.264	< 4.005	0.5718	< 3.678
Cl2-PCB-9	< 1.088	< 1.087	< 2.266	NDR 0.2860	< 4.672	< 0.2554	< 4.291
Cl2-PCB-10	< 1.096	< 1.094	< 2.217	< 0.2355	< 4.360	< 0.2446	< 4.005
Cl2-PCB-11	NDR 2.221	NDR 1.660	< 2.582	1.367	< 5.774	2.884	< 5.303
Cl2-PCB-12/13	< 1.188	< 1.186	< 2.596	< 0.2544	< 5.582	< 0.2615	< 5.127
Cl2-PCB-14	< 1.119	< 1.117	< 2.413	< 0.2408	< 4.953	< 0.2597	< 4.549
Cl2-PCB-15	< 1.461	< 1.436	< 2.895	< 0.2556	< 6.884	0.5044	< 6.226
Cl3-PCB-16	< 1.238	< 0.9182	< 2.035	< 0.1493	< 1.807	NDR 0.1527	< 1.752
Cl3-PCB-17	< 1.074	< 0.7967	< 1.932	< 0.1270	< 1.729	NDR 0.4717	< 1.676
Cl3-PCB-30/18	< 0.8772	NDR 0.9900	< 1.592	0.304	< 1.436	0.7445	< 1.392
Cl3-PCB-19	< 1.035	< 0.7834	< 1.652	< 0.1505	< 1.776	0.2717	< 1.905
Cl3-PCB-28/20	NDR 1.983	2.226	2.249	0.481	NDR 1.882	2.933	NDR 1.455
Cl3-PCB-21/33	< 0.6666	NDR 0.5360	< 1.405	0.205	< 1.378	0.3422	< 1.088
Cl3-PCB-22	< 0.7478	< 0.5705	< 1.625	0.161	< 1.634	0.5181	< 1.291
Cl3-PCB-23	< 0.7283	< 0.5556	< 1.530	< 0.09020	< 1.406	< 0.08371	< 1.110
Cl3-PCB-24	< 0.7527	< 0.5583	< 1.450	< 0.09360	< 1.326	< 0.09014	< 1.286
Cl3-PCB-25	< 0.5961	< 0.4548	< 1.244	< 0.07390	< 1.248	0.2727	< 0.9853
Cl3-PCB-26/29	< 0.7033	< 0.5366	< 1.507	< 0.08700	< 1.463	0.457	< 1.156
Cl3-PCB-27	< 0.7552	< 0.5601	< 1.359	< 0.08880	< 1.225	0.08951	< 1.187
Cl3-PCB-31	NDR 1.108	1.52	NDR 1.733	0.281	< 1.396	1.33	< 1.103
Cl3-PCB-32	< 0.6753	< 0.5152	< 1.398	0.126	< 1.343	0.457	< 1.061
Cl3-PCB-34	< 0.7104	< 0.5420	< 1.556	< 0.08910	< 1.541	0.1127	< 1.217
Cl3-PCB-35	< 0.7080	< 0.5402	< 1.531	< 0.08470	< 1.897	< 0.09214	< 1.498
Cl3-PCB-36	< 0.6658	< 0.5080	< 1.380	< 0.07610	< 1.592	< 0.08519	< 1.257
Cl3-PCB-37	< 0.8041	< 0.6039	< 1.764	0.142	< 1.799	0.3928	< 1.366
Cl3-PCB-38	< 0.7041	< 0.5372	< 1.477	< 0.08390	< 1.629	< 0.08708	< 1.286
Cl3-PCB-39	< 0.6850	< 0.5226	< 1.485	< 0.08390	< 1.579	< 0.08603	< 1.247
Cl4-PCB-41/40/71	< 0.8559	< 0.9515	< 1.419	0.162	< 1.725	0.6687	< 1.724
Cl4-PCB-42	< 0.8546	< 0.9501	< 1.288	< 0.1317	< 1.539	0.3433	< 1.538
Cl4-PCB-43	< 1.008	< 1.120	< 1.540	< 0.1568	< 1.726	< 0.1329	< 1.725
Cl4-PCB-44/47/65	< 0.7849	1.834	NDR 2.734	0.461	< 1.537	1.739	< 1.536
Cl4-PCB-45/51	< 0.8708	< 0.9682	< 1.359	NDR 0.1540	< 1.620	NDR 0.2622	< 1.619
Cl4-PCB-46	< 1.005	< 1.117	< 1.503	< 0.1468	< 1.837	< 0.1357	< 1.836
Cl4-PCB-48	< 0.8403	< 0.9342	< 1.377	< 0.1270	< 1.612	0.1643	< 1.611
Cl4-PCB-69/49	< 0.7115	< 0.7910	< 1.143	0.193	< 1.377	NDR 1.109	< 1.376
Cl4-PCB-50/53	< 0.8429	< 0.9371	< 1.304	< 0.1199	< 1.564	0.2148	< 1.563
Cl4-PCB-52	NDR 1.232	1.913	< 1.364	0.358	< 1.598	1.742	< 1.597
Cl4-PCB-54	< 0.5681	< 0.6065	< 0.7515	< 0.09780	< 1.235	< 0.09298	< 1.213
Cl4-PCB-55	< 0.7872	< 0.7634	< 1.479	< 0.1394	< 1.391	< 0.1292	< 1.355
Cl4-PCB-56	< 0.8050	< 0.7808	< 1.512	< 0.1402	< 1.476	0.357	< 1.438
Cl4-PCB-57	< 0.7396	< 0.7173	< 1.437	< 0.1282	< 1.329	< 0.1303	< 1.295
Cl4-PCB-58	< 0.7672	< 0.7440	< 1.543	< 0.1298	< 1.410	< 0.1312	< 1.374
Cl4-PCB-59/62/75	< 0.6378	< 0.7091	< 1.031	< 0.09490	< 1.283	0.1527	< 1.283
Cl4-PCB-60	< 0.7852	< 0.7616	< 1.432	< 0.1384	< 1.449	0.3275	< 1.411
Cl4-PCB-61/70/74/76	NDR 0.9780	NDR 1.185	< 1.398	0.39	NDR 1.367	2.069	< 1.293
Cl4-PCB-63	< 0.7168	< 0.6952	< 1.393	< 0.1215	< 1.330	< 0.1232	< 1.296
Cl4-PCB-64	< 0.6039	< 0.6714	< 0.9613	NDR 0.1130	< 1.189	0.6666	< 1.188
Cl4-PCB-66	< 0.7175	< 0.6959	< 1.425	0.271	< 1.338	1.306	< 1.304
Cl4-PCB-67	< 0.6430	< 0.6237	< 1.184	< 0.1104	< 1.221	< 0.1124	< 1.190
Cl4-PCB-68	< 0.7065	< 0.6853	< 1.372	< 0.1207	< 1.303	< 0.1230	< 1.270
Cl4-PCB-72	< 0.7059	< 0.6846	< 1.374	< 0.1209	< 1.248	< 0.1195	< 1.216
Cl4-PCB-73	< 0.6269	< 0.6970	< 1.027	< 0.09200	< 1.330	< 0.09361	< 1.329
Cl4-PCB-77	< 0.8224	< 0.8136	< 1.631	< 0.1249	< 1.481	0.1506	< 1.501
Cl4-PCB-78	< 0.7641	< 0.7411	< 1.540	< 0.1347	< 1.539	< 0.1313	< 1.499
Cl4-PCB-79	< 0.6388	< 0.6196	< 1.132	< 0.1055	< 1.261	< 0.1105	< 1.229
Cl4-PCB-80	< 0.6862	< 0.6655	< 1.286	< 0.1210	< 1.310	< 0.1198	< 1.276
Cl4-PCB-81	< 0.8067	< 0.7914	< 1.529	< 0.1299	< 1.456	< 0.1282	< 1.382
Cl5-PCB-82	< 1.252	< 0.9092	< 2.148	< 0.2081	< 2.688	< 0.1486	< 2.363
Cl5-PCB-83/99	< 1.167	< 0.8476	< 1.814	< 0.1936	< 2.456	1.811	< 2.158
Cl5-PCB-84	< 1.283	< 0.9315	< 2.179	< 0.2124	< 2.649	< 0.1582	< 2.328
Cl5-PCB-117/116/85	< 0.9447	< 0.6859	< 1.616	< 0.1601	< 2.058	0.2243	< 1.809
Cl5-PCB-108/119/86/97/125/87	< 0.9736	< 0.7069	< 1.598	< 0.1601	< 2.038	0.6592	< 1.791
Cl5-PCB-88/91	< 1.142	< 0.8293	< 1.901	< 0.1816	< 2.269	< 0.1377	< 1.995
Cl5-PCB-89	< 1.201	< 0.8720	< 2.048	< 0.1946	< 2.430	< 0.1494	< 2.136
Cl5-PCB-113/90/101	< 0.9865	< 0.7163	< 1.638	0.269	< 2.052	0.7455	< 1.803
Cl5-PCB-92	< 1.129	< 0.8194	< 1.918	< 0.1842	< 2.355	< 0.1433	< 2.070
L5-PCB-95/100/93/102/98	< 1.107	NDR 1.019	< 1.815	0.212	< 2.169	0.7929	< 1.907
Cl5-PCB-94	< 1.229	< 0.8926	< 2.000	< 0.1965	< 2.406	< 0.1455	< 2.115
Cl5-PCB-96	< 0.8007	< 0.7355	< 1.021	< 0.1314	< 1.465	< 0.1188	< 1.428
Cl5-PCB-103	< 0.9925	< 0.7206	< 1.673	< 0.1578	< 1.969	< 0.1223	< 1.731
Cl5-PCB-104	< 0.6953	< 0.6404	< 0.9559	< 0.1509	< 1.431	< 0.1247	< 1.391
Cl5-PCB-105	< 0.7802	< 0.8409	< 1.579	0.121	< 1.522	0.9751	< 1.518
Cl5-PCB-106	< 0.7363	< 0.7768	< 1.545	< 0.1117	< 1.410	< 0.1031	< 1.460
Cl5-PCB-107/124	< 0.7884	< 0.8317	< 1.732	< 0.1221	< 1.508	< 0.1076	< 1.561
Cl5-PCB-109	< 0.7316	< 0.7719	< 1.653	< 0.1199	< 1.551	NDR 0.1811	< 1.606
Cl5-PCB-110/115	< 0.8219	< 0.5967	NDR 1.921	0.229	< 1.779	0.7192	< 1.563
Cl5-PCB-111	< 0.8284	< 0.6015	< 1.449	< 0.1392	< 1.854	< 0.1053	< 1.629
Cl5-PCB-112	< 0.7882	< 0.5722	< 1.323	< 0.1304	< 1.706	< 0.1014	< 1.499

CL5-PCB-114	< 0.7854	< 0.8066	< 1.497	< 0.1160	< 1.399	< 0.1035	< 1.435
CL5-PCB-118	< 0.7802	< 0.8124	< 1.517	0.277	2.305	2.876	3.161
CL5-PCB-120	< 0.7706	< 0.5595	< 1.361	< 0.1301	< 1.768	< 0.09909	< 1.554
CL5-PCB-121	< 0.8355	< 0.6066	< 1.434	< 0.1401	< 1.760	< 0.1059	< 1.547
CL5-PCB-122	< 0.8503	< 0.8970	< 1.943	< 0.1331	< 1.605	< 0.1132	< 1.662
CL5-PCB-123	< 0.7832	< 0.8408	< 1.586	< 0.1200	< 1.485	< 0.09656	< 1.599
CL5-PCB-126	< 0.9574	< 1.000	< 2.105	< 0.1225	< 1.831	< 0.1251	< 1.937
CL5-PCB-127	< 0.7602	< 0.8020	< 1.767	< 0.1200	< 1.558	< 0.1073	< 1.613
CL6-PCB-128/166	< 0.9530	< 1.304	< 2.318	< 0.1693	< 2.269	0.5286	< 2.292
CL6-PCB-138/163/129/160	< 0.9872	< 1.351	< 2.271	NDR 0.2480	< 2.246	5.596	NDR 5.834
CL6-PCB-130	< 1.227	< 1.679	< 2.939	< 0.2167	< 2.752	< 0.2168	< 2.780
CL6-PCB-131	< 1.220	< 1.670	< 2.825	< 0.2115	< 2.501	< 0.2043	< 2.527
CL6-PCB-132	< 1.227	< 1.680	< 2.843	< 0.2152	< 2.634	< 0.2166	< 2.661
CL6-PCB-133	< 1.111	< 1.521	< 2.677	< 0.1953	< 2.416	< 0.1971	< 2.441
CL6-PCB-134/143	< 1.187	< 1.625	< 2.676	< 0.2024	< 2.460	< 0.2035	< 2.485
CL6-PCB-151/135/154	< 1.003	< 0.8447	< 1.702	< 0.1947	< 2.217	0.3149	< 2.747
CL6-PCB-136	< 0.7733	< 0.6514	< 1.183	< 0.1460	< 1.654	< 0.1166	< 2.049
CL6-PCB-137	< 1.261	< 1.726	< 2.712	< 0.2118	< 2.754	NDR 0.2117	< 2.782
CL6-PCB-139/140	< 1.065	< 1.457	< 2.420	< 0.1828	< 2.266	< 0.1935	< 2.289
CL6-PCB-141	< 1.068	< 1.462	< 2.451	< 0.1869	< 2.294	0.2264	< 2.318
CL6-PCB-142	< 1.179	< 1.614	< 2.680	< 0.2055	< 2.479	< 0.2049	< 2.504
CL6-PCB-144	< 1.009	< 0.8499	< 1.726	< 0.1994	< 2.248	< 0.1538	< 2.784
CL6-PCB-145	< 0.8188	< 0.6897	< 1.310	< 0.1566	< 1.761	< 0.1251	< 2.182
CL6-PCB-146	< 0.9682	< 1.325	< 2.353	< 0.1827	< 2.240	1.521	< 2.263
CL6-PCB-147/149	< 1.043	< 1.428	NDR 2.434	NDR 0.2230	< 2.260	0.6697	< 2.283
CL6-PCB-148	< 1.036	< 0.8726	< 1.763	< 0.2000	< 2.275	< 0.1583	< 2.819
CL6-PCB-150	< 0.7861	< 0.6622	< 1.284	< 0.1494	< 1.654	< 0.1134	< 2.049
CL6-PCB-152	< 0.7403	< 0.6236	< 1.235	< 0.1429	< 1.587	< 0.1156	< 1.967
CL6-PCB-153/168	< 0.8443	< 1.156	< 2.011	NDR 0.2890	< 1.945	10.03	NDR 9.097
CL6-PCB-155	< 0.5607	< 0.4816	< 0.8564	< 0.1296	< 1.363	< 0.08887	< 1.601
CL6-PCB-156/157	< 0.9540	< 1.267	< 2.433	< 0.1613	< 2.632	0.4633	< 2.690
CL6-PCB-158	< 0.7504	< 1.027	< 1.751	< 0.1293	< 1.765	NDR 0.3170	< 1.784
CL6-PCB-159	< 0.7756	< 1.062	< 1.803	< 0.1401	< 1.908	< 0.1431	< 1.927
CL6-PCB-161	< 0.8160	< 1.117	< 1.923	< 0.1327	< 1.756	< 0.1410	< 1.774
CL6-PCB-162	< 0.8039	< 1.100	< 1.968	< 0.1415	< 1.981	< 0.1477	< 2.002
CL6-PCB-164	< 0.7638	< 1.045	< 1.957	< 0.1368	< 1.823	< 0.1503	< 1.842
CL6-PCB-165	< 0.9165	< 1.254	< 2.171	< 0.1596	< 2.033	< 0.1667	< 2.054
CL6-PCB-167	< 0.7428	< 1.083	< 1.642	< 0.1308	< 1.709	NDR 0.3422	< 1.804
CL6-PCB-169	< 0.9459	< 1.268	< 2.104	< 0.1452	< 2.392	< 0.1586	< 2.371
CL7-PCB-170	< 1.060	< 1.425	< 1.754	< 0.2113	< 2.804	NDR 1.138	< 4.454
CL7-PCB-171/173	< 1.032	< 1.399	< 1.785	< 0.2073	< 2.634	NDR 0.2148	< 4.017
CL7-PCB-172	< 1.048	< 1.421	< 1.740	< 0.2086	< 2.719	0.4802	< 4.147
CL7-PCB-174	< 0.9596	< 1.301	< 1.503	NDR 0.1910	< 2.408	NDR 0.3264	< 3.674
CL7-PCB-175	< 0.9300	< 1.261	< 1.485	< 0.1782	< 2.307	< 0.1712	< 3.519
CL7-PCB-176	< 0.7047	< 0.9555	< 1.208	< 0.1361	< 1.703	< 0.1335	< 2.598
CL7-PCB-177	< 1.005	< 1.362	< 1.656	< 0.1930	< 2.514	0.4823	< 3.834
CL7-PCB-178	< 0.9986	< 1.354	< 1.648	< 0.1880	< 2.398	0.6297	< 3.657
CL7-PCB-179	< 0.6988	< 0.9474	< 1.143	< 0.1349	< 1.654	< 0.1308	< 2.522
CL7-PCB-180/193	< 0.8298	< 1.077	< 1.330	0.186	< 2.220	4.421	3.796
CL7-PCB-181	< 0.9786	< 1.327	< 1.689	< 0.1984	< 2.515	< 0.1796	< 3.837
CL7-PCB-182	< 0.9174	< 1.244	< 1.552	< 0.1799	< 2.236	< 0.1690	< 3.411
CL7-PCB-183/185	< 0.9380	< 1.272	< 1.578	< 0.1836	< 2.319	0.9793	< 3.537
CL7-PCB-184	< 0.7028	< 0.9529	< 1.175	< 0.1327	< 1.621	< 0.1316	< 2.473
CL7-PCB-186	< 0.7645	< 1.037	< 1.279	< 0.1449	< 1.817	< 0.1426	< 2.771
CL7-PCB-187	< 0.8999	< 1.220	< 1.573	NDR 0.2180	< 2.209	3.193	< 3.369
CL7-PCB-188	< 0.5881	< 0.8360	< 0.9572	< 0.1243	< 1.529	< 0.1216	< 2.292
CL7-PCB-189	< 1.350	< 1.133	< 1.903	< 0.1448	< 2.146	< 0.1535	< 1.912
CL7-PCB-190	< 0.7525	< 1.020	< 1.233	< 0.1509	< 2.146	< 0.1437	< 3.274
CL7-PCB-191	< 0.7480	< 1.014	< 1.239	< 0.1501	< 2.027	< 0.1384	< 3.092
CL7-PCB-192	< 0.8373	< 1.135	< 1.400	< 0.1672	< 2.297	< 0.1555	< 3.503
CL8-PCB-194	< 1.133	< 0.9870	< 1.845	< 0.1925	< 2.509	0.6265	< 2.181
CL8-PCB-195	< 1.254	< 1.092	< 2.174	< 0.2075	< 2.590	0.2169	< 2.251
CL8-PCB-196	< 1.158	< 1.548	< 1.643	< 0.2455	< 2.763	0.338	< 3.714
CL8-PCB-197/200	< 0.8599	< 1.149	< 1.218	< 0.1756	< 1.962	< 0.1475	< 2.638
CL8-PCB-198/199	< 1.221	< 1.632	< 1.707	< 0.2553	< 2.867	NDR 1.430	< 3.854
CL8-PCB-201	< 0.8439	< 1.128	< 1.158	< 0.1763	< 1.917	NDR 0.2064	< 2.577
CL8-PCB-202	< 0.8176	< 1.102	< 1.344	< 0.1887	< 1.989	< 0.1629	< 2.637
CL8-PCB-203	< 1.103	< 1.474	< 1.540	< 0.2328	< 2.678	NDR 0.7845	< 3.600
CL8-PCB-204	< 0.8464	< 1.131	< 1.150	< 0.1757	< 1.945	< 0.1482	< 2.615
CL8-PCB-205	< 1.004	< 0.8682	< 1.406	< 0.1535	< 2.186	< 0.1444	< 1.922
CL9-PCB-206	< 1.805	< 1.690	< 3.018	< 0.3081	< 3.670	0.3275	< 3.769
CL9-PCB-207	< 1.238	< 1.229	< 2.533	< 0.2233	< 2.429	< 0.1782	< 2.529
CL9-PCB-208	< 1.232	< 1.275	< 2.519	< 0.2210	< 2.484	NDR 0.1853	< 2.596
CL10-PCB-209	< 0.8714	< 0.9512	< 1.077	< 0.1590	< 3.302	NDR 0.3043	< 2.658
	%REC	**%REC**	**%REC**	**%REC**	**%REC**	**%REC**	**%REC**
13C-CL1-PCB-1	51	47	55	29	39	32	38
13C-CL1-PCB-3	61	56	61	33	43	30	45
13C-CL2-PCB-4	61	55	54	33	49	46	48
13C-CL2-PCB-15	72	67	58	42	50	59	52
13C-CL3-PCB-19	61	61	56	36	41	47	40
13C-CL3-PCB-37	80	78	63	57	57	73	70
13C-CL4-PCB-54	65	65	63	41	52	55	58
13C-CL4-PCB-77	93	90	71	71	72	86	78
13C-CL4-PCB-81	93	91	72	67	73	86	80
13C-CL5-PCB-104	72	71	70	49	52	54	58
13C-CL5-PCB-105	91	91	71	77	69	88	78
13C-CL5-PCB-114	86	86	66	66	67	76	73
13C-CL5-PCB-118	90	87	70	69	71	76	75
13C-CL5-PCB-123	90	91	67	68	71	86	76
13C-CL5-PCB-126	91	92	66	75	67	79	75
13C-CL6-PCB-155	75	73	73	56	56	55	58
13C-CL6-PCB-156/157	78	81	64	71	67	64	62
13C-CL6-PCB-167	84	82	70	73	73	67	70
13C-CL6-PCB-169	82	82	71	75	65	66	63

13C-CL7-PCB-170	91	94	80	77	78	80	83
13C-CL7-PCB-180	91	95	81	75	73	75	82
13C-CL7-PCB-188	70	70	67	61	57	56	67
13C-CL7-PCB-189	85	90	68	76	65	70	74
13C-CL8-PCB-202	73	79	69	69	56	60	64
13C-CL8-PCB-205	79	88	84	75	67	73	75
13C-CL9-PCB-206	75	81	83	71	62	71	72
13C-CL9-PCB-208	80	78	75	73	66	71	72
13C-CL10-PCB-209	93	96	115	85	55	72	73
13C-CL3-PCB-28	77	74	67	58	65	67	66
13C-CL5-PCB-111	82	81	75	76	66	72	69
13C-CL7-PCB-178	82	80	79	85	69	65	66

E1 FRACTION OC PESTICIDE FILTER LAB BLANKS

AXYS ID	WG44928-101	WG44928-102	WG45130-101	WG45130-102	WG46278-101 RX	WG46278-102 RX
Matrix	FILTER	FILTER	FILTER	FILTER	FILTER	FILTER
Date Analyzed	07/10/2013 5:03:24 PM	07/10/2013 5:40:18 PM	16/11/2013 4:58:00 AM	16/11/2013 5:34:57 AM	30/01/2014 12:42:13 AM	30/01/2014 1:19:27 AM
Conc Units	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L
SAMPLE SIZE	20.00 L	20.00 L	20.00 L	20.00 L	20.00 L	19.00 L
HCB	NDR 0.003210	0.00235	0.049	NDR 0.005000	NDR 0.009014	NDR 0.003096
ALPHA-HCH	< 0.004000	< 0.004000	< 0.005100	< 0.01460	NDR 0.009326	< 0.004371
BETA-HCH	< 0.004000	< 0.007552	< 0.006600	< 0.01540	NDR 0.008440	< 0.004371
GAMMA-HCH	< 0.004000	< 0.004330	< 0.006800	< 0.01960	0.009609	< 0.004371
DELTA-HCH	< 0.3461	< 0.2111	< 0.03590	< 0.1442	NDR 0.02239	< 0.01402
HEPTACHLOR	< 0.004000	< 0.008291	< 0.007500	< 0.02190	NDR 0.006863	< 0.004371
ALDRIN	< 0.004000	< 0.005299	< 0.004100	< 0.01200	0.01068	< 0.004371
OXYCHLORDANE	< 0.01484	< 0.02508	< 0.02310	< 0.05510	NDR 0.01775	< 0.004371
T-CHLORDANE	< 0.004000	< 0.004886	< 0.005900	< 0.02220	NDR 0.007384	< 0.004371
C-CHLORDANE	< 0.004000	< 0.005512	< 0.006600	< 0.02470	NDR 0.005776	< 0.004371
T-NONACHLOR	< 0.004638	< 0.006394	< 0.008400	< 0.02990	0.007205	< 0.004371
C-NONACHLOR	< 0.005224	< 0.01020	< 0.02040	< 0.02930	0.005144	< 0.004371
2,4'-DDD	< 0.004827	< 0.006942	< 0.009400	< 0.01940	< 0.009569	< 0.009284
4,4'-DDD	< 0.006024	< 0.008662	< 0.01160	< 0.02410	< 0.01199	< 0.01163
2,4'-DDE	< 0.004000	< 0.005557	< 0.005000	< 0.01020	< 0.004082	< 0.004371
4,4'-DDE	0.009038	< 0.006479	< 0.006000	< 0.01450	< 0.004787	< 0.004590
2,4'-DDT	< 0.009077	< 0.01239	< 0.02020	< 0.04090	< 0.01466	< 0.01396
4,4'-DDT	< 0.009380	< 0.01432	< 0.02170	< 0.04660	< 0.01675	< 0.01638
MIREX	< 0.004000	< 0.004000	< 0.003716	< 0.004172	< 0.004082	< 0.004371
	%REC	%REC	%REC	%REC	%REC	%REC
13C-HCB	58	46	47	26	48	51
13C-BETA-HCH	52	31	39	29	65	78
13C-GAMMA-HCH	68	52	36	22	57	61
13C-DELTA-HCH	0	1	7	3	10	13
13C-HEPTACHLOR	73	61	48	33	60	62
13C-ALDRIN	71	57	43	31	57	63
13C-OXYCHLORDANE	81	73	53	45	68	90
13C-T-CHLORDANE	70	60	50	47	62	66
13C-T-NONACHLOR	67	61	47	44	61	62
13C-C-NONACHLOR	69	61	55	48	70	71
13C-O,P-DDE	80	62	52	51	62	70
13C-P,P-DDE	78	66	55	50	64	74
13C-P,P-DDD	75	66	63	56	57	59
13C-O,P-DDT	73	68	56	51	60	64
13C-P,P-DDT	80	67	63	53	62	63
13C-MIREX	67	61	60	53	54	56

E2 FRACTION OC PESTICIDE FILTER LAB BLANKS

Client ID	Lab Blank	Lab Blank	Lab Blank	PROCESSING BLANK	Lab Blank	Lab Blank	Lab Blank	Lab Blank
AXYS ID	WG44928-101	WG44928-102	WG45130-101	WG45130-102	WG45377-101	WG45377-102	WG46278-101 RX	WG46278-102 RX
Matrix	FILTER	FILTER	FILTER	FILTER	FILTER	FILTER	FILTER	FILTER
Date Analyzed	08/10/2013 7:06:03 PM	08/10/2013 7:47:13 PM	01/12/2013 11:40:25 AM	01/12/2013 12:21:00 PM	05/12/2013 10:58:39 AM	05/12/2013 11:39:19 AM	01/02/2014 5:52:52 AM	01/02/2014 6:34:06 AM
Conc Units	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L
SAMPLE SIZE	20.00 L	20.00 L	20.00 L	20.00 L	20.00 L	19.00 L	20.00 L	19.00 L
DELTA-HCH	< 0.01000	< 0.01000	< 0.009290	< 0.01043	< 0.01027	< 0.01013	< 0.01021	< 0.01093
HEPTACHLOR-EPOXIDE	< 0.01000	< 0.01000	< 0.009290	< 0.01043	< 0.01027	< 0.01013	< 0.01021	< 0.01093
ALPHA-ENDOSULPHAN	NDR 0.03389	NDR 0.02582	NDR 0.02700	NDR 0.01900	NDR 0.01428	< 0.01013	< 0.03970	< 0.03013
DIELDRIN	< 0.01000	< 0.01000	< 0.009290	< 0.01043	< 0.01027	< 0.01013	< 0.01233	< 0.01093
ENDRIN	< 0.01945	< 0.01000	< 0.009290	< 0.01043	< 0.01027	< 0.01013	< 0.04512	< 0.01988
BETA-ENDOSULPHAN	NDR 0.04716	NDR 0.04204	< 0.009290	NDR 0.03000	NDR 0.01685	< 0.01013	< 0.01021	< 0.05399
ENDOSULPHAN-SULPHATE	< 0.03406	< 0.02274	< 0.009290	< 0.01043	< 0.01027	< 0.01013	< 0.01021	< 0.05443
ENDRIN-ALDEHYDE	< 0.01000	< 0.01018	< 0.009300	< 0.01043	< 0.01027	< 0.01013	< 0.02590	< 0.01793
ENDRIN-KETONE	< 0.01305	< 0.01000	< 0.009290	< 0.01043	< 0.01027	< 0.01013	< 0.04749	< 0.02170
METHOXYCHLOR	< 0.02000	< 0.03461	< 0.01858	< 0.02086	< 0.02053	< 0.02025	< 0.03650	< 0.02948
	%REC	%REC	%REC	%REC	%REC	%REC	%REC	%REC
13C6-DELTA-HCH	84	78	51	73	79	51	45	31
13C-HEPTACHLOR-EPOXIDE	100	103	40	51	89	94	35	65
13C9-ALPHA-ENDOSULPHAN	78	79	54	80	71	69	35	40
13C12-DIELDRIN	79	74	64	83	79	82	35	49
13C12-ENDRIN	44	84	44	90	45	55	17	33
13C9-BETA-ENDOSULPHAN	60	77	36	64	53	77		35
13C12-ENDRIN-ALDEHYDE	96	66	63	76	114	123	36	74
13C12-METHOXYCHLOR	108	109	68	96	104	70	38	63

APPENDIX 6
DETECTION LIMITS

Note: Detection limits provided are for demonstration purposes only. This is an uncontrolled document and may not be the most current information. All project detection capabilities should be confirmed with a project manager.

DEFINITIONS

Method Detection Limit (MDL)- determined as specified by EPA Fed. Reg. 40 CFR Part 136 Appendix B (no iteration option). The 99% confidence level MDL is determined based on analysis of a minimum of 7 replicate matrix spikes fortified at 1-5 times the estimated detection limit. MDL is determined as required based on accreditation, contract and workload requirements. **The MDL determination is a general demonstration of method detection limit. It is performed at a particular time, using a set of sample prepared using clean matrix, and may not account for all matrix effects encountered in environmental samples.**

Sample Detection Limit (SDL) – determined by converting the area equivalent of 3.0 times (2.5 times for EPA 1600 series methods) the estimated chromatographic noise height to a concentration in the same manner that target peak responses are converted to final concentrations. Determined individually for every sample analysis run. The SDL accounts for any effect of matrix on the detection system and for recovery achieved through the analytical work-up. **It does not account for any lab background input.**

Reporting Limit (RL) – the **lowest** concentration value that AXYS routinely reports for the method. AXYS defines RLs for LC analyses as equal to the greater of lowest calibration standard or the SDL. For GC methods, RLs are equal to the SDL, or a value greater than the SDL determined to meet client needs.

Lower Method Calibration Limit (LMCL) - determined by prorating the concentration of the lowest calibration limit for sample size and extract volume. The following equation is used. ((lowest level cal conc.) x (extract volume))/sample size

Quantification by Linearity or Linear Regression- A multi-point calibration series (linearity) is analyzed at a frequency of up to 90 days. Prior to analyzing samples, the mid-point calibration standard (CALVER) is analyzed. If the CALVER meets method acceptance criteria, demonstrating that the instrument is in a state of control, Relative Response Factors (RRFs) from the linearity are used for quantification. Quantification by linearity is appropriate for analyses where analytes are not comprised of mixtures or patterns and where there is not a large disparity in abundance of compounds.

Quantification by Bracketing Calibration - Bracketing calibration uses RRFs that are generated from analyzing a calibration standard immediately before the sample is run and confirmed immediately afterwards. These two must be within +/- 20% and the mean RRF of these two is used to quantify the analytes. A sensitivity calibration is also analyzed to ensure sensitivity of the instrument. Bracketing calibration quantification produces data with increased accuracy at a sample and batch level. Bracketing calibration quantification is appropriate for methods where analytes are comprised of patterns and for tests where there is a disparity in the abundance of compounds, such as sterols and hormones, as it allows for better control of analytes. A linearity has limited applicability for tests which are comprised of patterns or mixtures such as PAHs, Alkylphenols, Toxaphene and Naphthenic Acids, because the lower calibration standards will lose response of the minor peaks from the pattern.

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AXYS Analytical Services Ltd.

USEPA 1613B
TYPICAL DETECTION LIMITS, METHOD DETECTION LIMITS, LOW CALIBRATION LIMITS, and REPORTING LIMITS
for Chlorinated Dioxins and Furans

AXYS Method:	MLA-012
Instrument Type:	High Resolution GC/MS
MDL Protocol:	Federal Register 40 CFR Part 136, Appendix B, no deviation
Quantification:	Linearity

Matrix	WATER/EFFLUENT					SOLID/SEDIMENT/BIOSOLIDS					TISSUE					XAD-2 RESIN					FILTER				
Units/Sample Size	pg/L based on 2.5 L sample					pg/g based on 10g sample					pg/g based on 10g sample					pg/L based on 20L sample					pg/L based on 20L sample				
Default Extract Volume	20uL					20uL					20uL					20uL					20uL				
Analyte *Dioxins*	Typical SDL	MDL	LMCL based on CS-1	LMCL based on High Sensitivity CS-0.2	RL[1]	Typical SDL	MDL	LMCL based on CS-1	LMCL based on High Sensitivity CS-0.2	RL[1]	Typical SDL	MDL	LMCL based on CS-1	LMCL based on High Sensitivity CS-0.2	RL[1]	Typical SDL	MDL	LMCL based on CS-1	LMCL based on High Sensitivity CS-0.2	RL[1]	Typical SDL	Estimated MDL	LMCL based on CS-1	LMCL based on High Sensitivity CS-0.2	RL[1]
2,3,7,8-TCDD	0.20	0.25	4.0	0.8	0.20	0.05	0.062	1.0	0.2	0.05	0.05	0.037	1.00	0.20	0.05	0.025	0.03	0.5	0.1	0.025	0.025	0.03	0.50	0.10	0.025
1,2,3,7,8-PeCDD	0.20	0.36	20.0	4.0	0.20	0.05	0.18	5.0	1.0	0.05	0.05	0.040	5.00	1.00	0.05	0.025	0.04	2.5	0.5	0.025	0.025	0.06	2.50	0.50	0.025
1,2,3,4,7,8-HxCDD	0.20	0.4	20.0	4.0	0.20	0.05	0.078	5.0	1.0	0.05	0.05	0.025	5.00	1.00	0.05	0.025	0.1	2.5	0.5	0.025	0.025	0.04	2.50	0.50	0.025
1,2,3,6,7,8-HxCDD	0.20	0.4	20.0	4.0	0.20	0.05	0.10	5.0	1.0	0.05	0.05	0.069	5.00	1.00	0.05	0.025	0.04	2.5	0.5	0.025	0.025	0.05	2.50	0.50	0.025
1,2,3,7,8,9-HxCDD	0.20	1.0	20.0	4.0	0.20	0.05	0.093	5.0	1.0	0.05	0.05	0.11	5.00	1.00	0.05	0.025	0.06	2.5	0.5	0.025	0.025	0.06	2.50	0.50	0.025
1,2,3,4,6,7,8-HpCDD	0.20	0.33	20.0	4.0	0.20	0.05	0.10	5.0	1.0	0.05	0.05	0.081	5.00	1.00	0.05	0.025	0.04	2.5	0.5	0.025	0.025	0.05	2.50	0.50	0.025
OCDD	0.20	1.1	40	8.0	0.20	0.05	0.30	10.0	2.0	0.05	0.05	0.063	10.0	2.00	0.05	0.025	0.2	5.0	1.0	0.025	0.025	0.25	5.00	1.00	0.025
Furans	Typical SDL	MDL	LMCL based on CS-1	LMCL based on High Sensitivity CS-0.2	RL[1]	Typical SDL	MDL	LMCL based on CS-1	LMCL based on High Sensitivity CS-0.2	RL[1]	Typical SDL	MDL	LMCL based on CS-1	LMCL based on High Sensitivity CS-0.2	RL[1]	Typical SDL	MDL	LMCL based on CS-1	LMCL based on High Sensitivity CS-0.2	RL[1]	Typical SDL	Estimated MDL	LMCL based on CS-1	LMCL based on High Sensitivity CS-0.2	RL[1]
2,3,7,8-TCDF	0.20	0.29	4.0	0.8	0.20	0.05	0.044	1.0	0.2	0.05	0.05	0.037	1.00	0.20	0.05	0.025	0.03	0.5	0.1	0.025	0.025	0.02	0.50	0.10	0.025
1,2,3,7,8-PeCDF	0.20	0.5	20.0	4.0	0.20	0.05	0.21	5.0	1.0	0.05	0.05	0.078	5.00	1.00	0.05	0.025	0.02	2.5	0.5	0.025	0.025	0.11	2.50	0.50	0.025
2,3,4,7,8-PeCDF	0.20	0.5	20.0	4.0	0.20	0.05	0.12	5.0	1.0	0.05	0.05	0.041	5.00	1.00	0.05	0.025	0.02	2.5	0.5	0.025	0.025	0.06	2.50	0.50	0.025
1,2,3,4,7,8-HxCDF	0.20	0.38	20.0	4.0	0.20	0.05	0.077	5.0	1.0	0.05	0.05	0.067	5.00	1.00	0.05	0.025	0.04	2.5	0.5	0.025	0.025	0.04	2.50	0.50	0.025
1,2,3,6,7,8-HxCDF	0.20	0.3	20.0	4.0	0.20	0.05	0.13	5.0	1.0	0.05	0.05	0.043	5.00	1.00	0.05	0.025	0.03	2.5	0.5	0.025	0.025	0.07	2.50	0.50	0.025
1,2,3,7,8,9-HxCDF	0.20	0.4	20.0	4.0	0.20	0.05	0.11	5.0	1.0	0.05	0.05	0.036	5.00	1.00	0.05	0.025	0.02	2.5	0.5	0.025	0.025	0.05	2.50	0.50	0.025
2,3,4,6,7,8-HxCDF	0.20	0.5	20.0	4.0	0.20	0.05	0.094	5.0	1.0	0.05	0.05	0.088	5.00	1.00	0.05	0.025	0.02	2.5	0.5	0.025	0.025	0.05	2.50	0.50	0.025
1,2,3,4,6,7,8-HpCDF	0.20	0.5	20.0	4.0	0.20	0.05	0.20	5.0	1.0	0.05	0.05	0.078	5.00	1.00	0.05	0.025	0.02	2.5	0.5	0.025	0.025	0.10	2.50	0.50	0.025
1,2,3,4,7,8,9-HpCDF	0.20	0.5	20.0	4.0	0.20	0.05	0.14	5.0	1.0	0.05	0.05	0.078	5.00	1.00	0.05	0.025	0.04	2.5	0.5	0.025	0.025	0.07	2.50	0.50	0.025
OCDF	0.20	1.5	40.0	8.0	0.20	0.05	0.14	10.0	2.0	0.05	0.05	0.14	10.0	2.00	0.05	0.025	0.1	5.0	1.0	0.025	0.025	0.07	5.00	1.00	0.025

Notes [1] Reporting Limit (RL) is the lowest concentration routinely reported for the method.
RLs are set to minimize potential for false positive detection or the requirement to qualify results very close to detection limit and in some cases may exceed the sample specific detection limit (SDL) achieved

AXYS Analytical Services Ltd.

USEPA 1668A
TYPICAL DETECTION LIMITS, METHOD DETECTION LIMITS, LOW CALIBRATION LIMITS, AND REPORTING LIMITS
for PCBs

AXYS Method: MLA 010
Instrument Type: High Resolution GC/MS
MDL Protocol: Federal Register 40 CFR Part 136, Appendix B no iteration
Quantification: Multi-point calibration for toxic congeners and window defining compounds at each level of chlorination and single point calibration for other compounds, as per EPA Method

Matrix	WATER/EFFLUENT					SOIL/SEDIMENT/BIOSOLIDS/ASH					TISSUE					XAD-2 RESIN					FILTER				
Units/Sample Size	pg/L based on 2.5 L sample					pg/g based on 10g sample					pg/g based on 10g sample					pg/L based on 20L sample					pg/L based on 20L sample				
Default Extract Volume	20uL					20uL					20uL					20uL					20uL				
Analyte	Typical SDL	MDL	LMCL based on CS-1	LMCL based on High Sensitivity CS-0.5	RL[1]	Typical SDL	MDL	LMCL based on CS-1	LMCL based on High Sensitivity CS-0.5	RL[1]	Typical SDL	MDL	LMCL based on CS-1	LMCL based on High Sensitivity CS-0.5	RL[1]	Typical SDL	MDL	LMCL based on CS-1	LMCL based on High Sensitivity CS-0.5	RL[1]	Typical SDL	Estimated MDL	LMCL based on CS-1	LMCL based on High Sensitivity CS-0.5	RL[1]
CL1-PCB-1	0.4	0.7	8.0	1.6	0.2	0.1	0.21	2.0	0.4	0.05	0.1	0.21	2.0	0.4	0.05	0.05	0.05	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL1-PCB-2	0.4	0.9	8.0	1.6	0.2	0.1	0.19	2.0	0.4	0.05	0.1	0.10	3.0	0.4	0.05	0.05	0.13	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL1-PCB-3	0.4	1.8	8.0	1.6	0.2	0.1	2.39	2.0	0.4	0.05	0.1	0.97	3.0	0.4	0.05	0.05	0.30	1.0	0.2	0.025	0.05	1.3	1.0	0.2	0.025
CL2-PCB-4	0.8	0.6	8.0	1.6	0.2	0.2	0.12	2.0	0.4	0.05	0.2	0.07	2.0	0.4	0.05	0.10	0.06	1.0	0.2	0.025	0.10	0.1	1.0	0.2	0.025
CL2-PCB-5	0.8	0.4	8.0	1.6	0.2	0.2	0.18	2.0	0.4	0.05	0.2	0.18	2.0	0.4	0.05	0.10	0.05	1.0	0.2	0.025	0.10	0.1	1.0	0.2	0.025
CL2-PCB-6	0.8	0.7	8.0	1.6	0.2	0.2	0.18	2.0	0.4	0.05	0.2	0.08	3.0	0.4	0.05	0.10	0.05	1.0	0.2	0.025	0.10	0.1	1.0	0.2	0.025
CL2-PCB-7	0.8	0.8	8.0	1.6	0.2	0.2	0.26	2.0	0.4	0.05	0.2	0.18	2.0	0.4	0.05	0.10	0.08	1.0	0.2	0.025	0.10	0.1	1.0	0.2	0.025
CL2-PCB-8	0.8	1.1	8.0	1.6	0.2	0.2	0.21	2.0	0.4	0.05	0.2	0.15	2.0	0.4	0.05	0.10	0.08	1.0	0.2	0.025	0.10	0.1	1.0	0.2	0.025
CL2-PCB-9	0.8	1.1	8.0	1.6	0.2	0.2	0.18	2.0	0.4	0.05	0.2	0.13	2.0	0.4	0.05	0.10	0.08	1.0	0.2	0.025	0.10	0.1	1.0	0.2	0.025
CL2-PCB-10	0.8	0.8	8.0	1.6	0.2	0.2	0.22	2.0	0.4	0.05	0.2	0.17	2.0	0.4	0.05	0.10	0.10	1.0	0.2	0.025	0.10	0.1	1.0	0.2	0.025
CL2-PCB-11	0.8	1.7	8.0	1.6	0.2	0.2	0.91	2.0	0.4	0.05	0.2	0.40	2.0	0.4	0.05	0.10	0.7	1.0	0.2	0.025	0.10	0.5	1.0	0.2	0.025
CL2-PCB-12/13	0.8	1.0	8.0	1.6	0.2	0.2	0.37	2.0	0.4	0.05	0.2	0.25	2.0	0.4	0.05	0.10	0.10	1.0	0.2	0.025	0.10	0.2	1.0	0.2	0.025
CL2-PCB-14	0.8	0.5	8.0	1.6	0.2	0.2	0.23	2.0	0.4	0.05	0.2	0.14	2.0	0.4	0.05	0.10	0.06	1.0	0.2	0.025	0.10	0.1	1.0	0.2	0.025
CL2-PCB-15	0.8	1.2	8.0	1.6	0.2	0.2	0.21	2.0	0.4	0.05	0.2	0.65	2.0	0.4	0.05	0.10	0.12	1.0	0.2	0.025	0.10	0.1	1.0	0.2	0.025
CL3-PCB-16	0.4	1.2	8.0	1.6	0.2	0.1	0.33	2.0	0.4	0.05	0.1	0.20	2.0	0.4	0.09	0.05	0.11	1.0	0.2	0.025	0.05	0.3	1.0	0.2	0.025
CL3-PCB-17	0.4	0.9	8.0	1.6	0.2	0.1	0.63	2.0	0.4	0.05	0.1	0.34	2.0	0.4	0.09	0.03	0.11	1.0	0.2	0.025	0.05	0.3	1.0	0.2	0.025
CL3-PCB-18	0.4	0.8	8.0	1.6	0.2	0.1	0.27	2.0	0.4	0.05	0.1	0.43	2.0	0.4	0.05	0.05	0.13	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL3-PCB-21/33	0.4	1.9	8.0	1.6	0.2	0.1	0.69	2.0	0.4	0.05	0.1	0.42	2.0	0.4	0.05	0.03	0.06	1.0	0.2	0.025	0.05	0.3	1.0	0.2	0.025
CL3-PCB-22	0.4	0.8	8.0	1.6	0.2	0.1	0.27	2.0	0.4	0.05	0.1	0.16	3.0	0.4	0.05	0.05	0.05	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL3-PCB-23	0.4	1.0	8.0	1.6	0.2	0.1	0.36	2.0	0.4	0.05	0.1	0.83	3.0	0.4	0.09	0.05	0.08	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL3-PCB-24	0.4	0.8	8.0	1.6	0.2	0.1	0.33	2.0	0.4	0.05	0.1	0.44	2.0	0.4	0.09	0.05	0.11	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
CL3-PCB-25	0.4	0.8	8.0	1.6	0.2	0.1	0.27	2.0	0.4	0.05	0.1	0.33	2.0	0.4	0.05	0.05	0.03	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL3-PCB-26/29	0.4	1.9	8.0	1.6	0.2	0.1	0.40	2.0	0.4	0.05	0.1	0.53	2.0	0.4	0.09	0.05	0.06	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
CL3-PCB-27	0.4	2.7	8.0	1.6	0.2	0.1	0.29	2.0	0.4	0.05	0.1	0.26	2.0	0.4	0.05	0.05	0.10	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL3-PCB-28/20	0.4	2.7	8.0	1.6	0.2	0.1	0.53	2.0	0.4	0.05	0.1	0.46	2.0	0.4	0.09	0.05	0.12	1.0	0.2	0.025	0.05	0.3	1.0	0.2	0.025
CL3-PCB-30/18	0.4	1.3	8.0	1.6	0.2	0.1	0.40	2.0	0.4	0.05	0.1	0.48	2.0	0.4	0.09	0.05	0.13	1.0	0.2	0.025	0.05	0.3	1.0	0.2	0.025
CL3-PCB-31	0.4	1.6	8.0	1.6	0.2	0.1	0.26	2.0	0.4	0.05	0.1	0.30	2.0	0.4	0.09	0.05	0.11	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL3-PCB-32	0.4	0.8	8.0	1.6	0.2	0.1	0.27	2.0	0.4	0.05	0.1	0.31	2.0	0.4	0.09	0.05	0.05	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL3-PCB-34	0.4	0.7	8.0	1.6	0.2	0.1	0.25	2.0	0.4	0.05	0.1	0.39	2.0	0.4	0.09	0.05	0.11	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL3-PCB-35	0.4	1.0	8.0	1.6	0.2	0.1	0.33	2.0	0.4	0.05	0.1	0.33	2.0	0.4	0.09	0.05	0.13	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
CL3-PCB-36	0.4	0.4	8.0	1.6	0.2	0.1	0.37	2.0	0.4	0.05	0.1	0.15	2.0	0.4	0.09	0.05	0.13	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
CL3-PCB-37	0.4	1.0	8.0	1.6	0.2	0.1	0.13	2.0	0.4	0.05	0.1	0.39	2.0	0.4	0.09	0.05	0.09	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL3-PCB-38	0.4	0.7	8.0	1.6	0.2	0.1	0.26	2.0	0.4	0.05	0.1	0.26	2.0	0.4	0.09	0.05	0.14	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL3-PCB-39	0.4	0.5	8.0	1.6	0.2	0.1	0.32	2.0	0.4	0.05	0.1	0.26	2.0	0.4	0.09	0.05	0.08	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
CL4-PCB-41/40/71	0.4	3.4	8.0	1.6	0.2	0.1	1.24	2.0	0.4	0.05	0.1	1.09	2.0	0.4	0.09	0.05	0.20	1.0	0.2	0.025	0.05	0.6	1.0	0.2	0.025
CL4-PCB-42	0.4	2.8	8.0	1.6	0.2	0.1	0.97	2.0	0.4	0.05	0.1	0.45	2.0	0.4	0.09	0.05	0.18	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
CL4-PCB-43	0.4	0.8	8.0	1.6	0.2	0.1	0.48	2.0	0.4	0.05	0.1	0.48	2.0	0.4	0.09	0.05	0.26	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
CL4-PCB-44/47/65	0.4	3.5	8.0	1.6	0.2	0.1	0.72	2.0	0.4	0.05	0.1	0.84	2.0	0.4	0.09	0.05	0.30	1.0	0.2	0.025	0.05	0.4	1.0	0.2	0.025
CL4-PCB-45/51	0.4	1.8	8.0	1.6	0.2	0.1	0.43	2.0	0.4	0.05	0.1	0.44	2.0	0.4	0.09	0.05	0.16	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
CL4-PCB-46	0.4	0.3	8.0	1.6	0.2	0.1	0.26	2.0	0.4	0.05	0.1	0.19	2.0	0.4	0.09	0.05	0.17	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL4-PCB-48	0.4	1.1	8.0	1.6	0.2	0.1	0.36	2.0	0.4	0.05	0.1	0.25	2.0	0.4	0.09	0.05	0.16	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
CL4-PCB-50/53	0.4	1.3	8.0	1.6	0.2	0.1	0.46	2.0	0.4	0.05	0.1	0.46	2.0	0.4	0.09	0.05	0.32	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
CL4-PCB-52	0.4	3.0	8.0	1.6	0.2	0.1	0.28	2.0	0.4	0.05	0.1	0.26	2.0	0.4	0.09	0.05	0.11	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL4-PCB-54	0.4	0.8	8.0	1.6	0.2	0.1	0.33	2.0	0.4	0.05	0.1	0.34	2.0	0.4	0.09	0.05	0.07	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
CL4-PCB-55	0.4	0.6	8.0	1.6	0.2	0.1	0.31	2.0	0.4	0.05	0.1	0.26	2.0	0.4	0.09	0.05	0.19	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
CL4-PCB-56	0.4	1.9	8.0	1.6	0.2	0.1	0.39	2.0	0.4	0.05	0.1	0.52	2.0	0.4	0.09	0.05	0.15	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
CL4-PCB-57	0.4	1.1	8.0	1.6	0.2	0.1	0.17	2.0	0.4	0.05	0.1	0.30	2.0	0.4	0.09	0.05	0.15	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL4-PCB-58	0.4	1.1	8.0	1.6	0.2	0.1	0.26	2.0	0.4	0.05	0.1	0.34	2.0	0.4	0.09	0.05	0.20	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL4-PCB-59/62/75	0.4	3.0	8.0	1.6	0.2	0.1	1.21	2.0	0.4	0.05	0.1	0.85	2.0	0.4	0.09	0.05	0.30	1.0	0.2	0.025	0.05	0.6	1.0	0.2	0.025
CL4-PCB-60	0.4	0.7	8.0	1.6	0.2	0.1	0.27	3.0	0.4	0.05	0.1	0.44	2.0	0.4	0.09	0.05	0.36	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL4-PCB-61/70/74/76	0.4	8.0	8.0	1.6	0.2	0.1	1.18	2.0	0.4	0.05	0.1	0.83	2.0	0.4	0.09	0.05	0.7	1.0	0.2	0.025	0.05	0.6	1.0	0.2	0.025
CL4-PCB-63	0.4	1.0	8.0	1.6	0.2	0.1	0.40	2.0	0.4	0.05	0.1	0.23	2.0	0.4	0.09	0.05	0.26	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
CL4-PCB-64	0.4	1.4	8.0	1.6	0.2	0.1	0.44	2.0	0.4	0.05	0.1	0.29	2.0	0.4	0.09	0.05	0.14	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
CL4-PCB-66	0.4	2.6	8.0	1.6	0.2	0.1	0.23	2.0	0.4	0.05	0.1	0.35	2.0	0.4	0.09	0.05	0.34	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL4-PCB-67	0.4	1.0	8.0	1.6	0.2	0.1	0.17	2.0	0.4	0.05	0.1	0.31	2.0	0.4	0.09	0.05	0.18	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL4-PCB-68	0.4	1.2	8.0	1.6	0.2	0.1	0.37	2.0	0.4	0.05	0.1	0.34	2.0	0.4	0.09	0.05	0.15	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
CL4-PCB-69/49	0.4	2.4	8.0	1.6	0.2	0.1	0.67	2.0	0.4	0.05	0.1	0.34	2.0	0.4	0.09	0.05	0.22	1.0	0.2	0.025	0.05	0.3	1.0	0.2	0.025
CL4-PCB-72	0.4	1.3	8.0	1.6	0.2	0.1	0.27	2.0	0.4	0.05	0.1	0.29	2.0	0.4	0.09	0.05	0.11	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL4-PCB-73	0.4	0.7	8.0	1.6	0.2	0.1	0.32	2.0	0.4	0.05	0.1	0.18	2.0	0.4	0.09	0.05	0.23	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
CL4-PCB-77	0.4	0.6	8.0	1.6	0.2	0.1	0.11	2.0	0.4	0.05	0.1	0.21	2.0	0.4	0.09	0.05	0.13	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL4-PCB-78	0.4	0.8	8.0	1.6	0.2	0.1	0.27	2.0	0.4	0.05	0.1	0.15	2.0	0.4	0.09	0.05	0.12	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL4-PCB-79	0.4	0.7	8.0	1.6	0.2	0.1	0.26	2.0	0.4	0.05	0.1	0.23	2.0	0.4	0.09	0.05	0.14	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL4-PCB-80	0.4	1.4	8.0	1.6	0.2	0.1	0.25	2.0	0.4	0.05	0.1	0.29	2.0	0.4	0.09	0.05	0.13	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL4-PCB-81	0.4	0.8	8.0	1.6	0.2	0.1	0.16	2.0	0.4	0.05	0.1	0.23	2.0	0.4	0.09	0.05	0.16	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL5-PCB-82	0.4	1.1	8.0	1.6	0.2	0.1	0.51	3.0	0.4	0.05	0.1	0.25	2.0	0.4	0.09	0.05	0.21	1.0	0.2	0.025	0.05	0.3	1.0	0.2	0.025
CL5-PCB-83/99	0.4	8.6	8.0	1.6	0.2	0.1	1.27	2.0	0.4	0.05	0.1	0.83	2.0	0.4	0.09	0.05	0.33	1.0	0.2	0.025	0.05	0.6	1.0	0.2	0.025
CL5-PCB-84	0.4	2.5	8.0	1.6	0.2	0.1	0.69	2.0	0.4	0.05	0.1	0.56	2.0	0.4	0.09	0.05	0.44	1.0	0.2	0.025	0.05	0.3	1.0	0.2	0.025
CL5-PCB-86/97	0.4	2.5	8.0	1.6	0.2	0.1	1.19	2.0	0.4	0.05	0.1	0.91	2.0	0.4	0.09	0.05	0.26	1.0	0.2	0.025	0.05	0.6	1.0	0.2	0.025
CL5-PCB-87	0.4	1.0	8.0	1.6	0.2	0.1	0.69	2.0	0.4	0.05	0.1	0.59	2.0	0.4	0.09	0.05	0.13	1.0	0.2	0.025	0.05	0.3	1.0	0.2	0.025
CL5-PCB-92	0.4	2.0	8.0	1.6	0.2	0.1	0.48	2.0	0.4	0.05	0.1	0.55	2.0	0.4	0.09	0.05	0.06	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
CL5-PCB-94	0.4	1.7	8.0	1.6	0.2	0.1	0.61	2.0	0.4	0.05	0.1	0.49	2.0	0.4	0.09	0.05	0.11	1.0	0.2	0.025	0.05	0.3	1.0	0.2	0.025
CL5-PCB-95/100/93/98	0.4	6.7	8.0	1.6	0.2	0.1	3.14	2.0	0.4	0.05	0.1	1.98	2.0	0.4	0.09	0.05	0.45	1.0	0.2	0.025	0.05	1.8	1.0	0.2	0.025
CL5-PCB-96	0.4	1.3	8.0	1.6	0.2	0.1	0.37	3.0	0.4	0.05	0.1	0.43	2.0	0.4	0.09	0.05	0.30	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
CL5-PCB-103	0.4	1.7	8.0	1.6	0.2	0.1	0.46	2.0	0.4	0.05	0.1	0.30	2.0	0.4	0.09	0.05	0.18	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
CL5-PCB-104	0.4	1.1	8.0	1.6	0.2	0.1	0.26	2.0	0.4	0.05	0.1	0.43	2.0	0.4	0.09	0.05	0.14	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL5-PCB-105	0.4	3.9	8.0	1.6	0.2	0.1	0.17	2.0	0.4	0.05	0.1	0.27	2.0	0.4	0.09	0.05	0.17	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
CL5-PCB-106	0.4	1.3	8.0	1.6	0.2	0.1	0.36	2.0	0.4	0.05	0.1	0.39	2.0	0.4	0.09	0.05	0.23	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
CL5-PCB-107/124	0.4	1.8	8.0	1.6	0.2	0.1	0.71	2.0	0.4	0.05	0.1	0.39	2.0	0.4	0.09	0.05	0.06	1.0	0.2	0.025	0.05	0.4	1.0	0.2	0.025
CL5-PCB-108/119/86/97/125/87	0.4	8.9	8.0	1.6	0.2	0.1	3.98	2.0	0.4	0.05	0.1	2.36	2.0	0.4	0.09	0.05	0.42	1.0	0.2	0.025	0.05	2.0	1.0	0.2	0.025
CL5-PCB-109	0.4	1.7	8.0	1.6	0.2	0.1	0.24	2.0	0.4	0.05	0.1	0.31	2.0	0.4	0.09	0.05	0.15	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL5-PCB-110/115	0.4	9.7	8.0	1.6	0.2	0.1	1.28	2.0	0.4	0.05	0.1	0.64	2.0	0.4	0.09	0.05	0.22	1.0	0.2	0.025	0.05	0.6	1.0	0.2	0.025
CL5-PCB-111	0.4	0.8	8.0	1.6	0.2	0.1	0.39	2.0	0.4	0.05	0.1	0.34	2.0	0.4	0.09	0.05	0.06	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
CL5-PCB-112	0.4	0.8	8.0	1.6	0.2	0.1	0.27	2.0	0.4	0.05	0.1	0.44	2.0	0.4	0.09	0.05	0.11	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL5-PCB-113/90/101	0.4	7.2	8.0	1.6	0.2	0.1	1.85	2.0	0.4	0.05	0.1	1.71	2.0	0.4	0.09	0.05	0.38	1.0	0.2	0.025	0.05	0.8	1.0	0.2	0.025
CL5-PCB-114	0.4	0.6	8.0	1.6	0.2	0.1	0.25	2.0	0.4	0.05	0.1	0.30	2.0	0.4	0.09	0.05	0.13	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL5-PCB-117/116/85	0.4	3.3	8.0	1.6	0.2	0.1	1.87	2.0	0.4	0.05	0.1	1.12	2.0	0.4	0.09	0.05	0.13	1.0	0.2	0.025	0.05	0.8	1.0	0.2	0.025
CL5-PCB-118	0.4	7.0	8.0	1.6	0.2	0.1	0.26	2.0	0.4	0.05	0.1	0.29	2.0	0.4	0.09	0.05	0.13	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL5-PCB-120	0.4	0.9	8.0	1.6	0.2	0.1	0.42	2.0	0.4	0.05	0.1	0.17	2.0	0.4	0.09	0.05	0.16	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
CL5-PCB-121	0.4	0.9	8.0	1.6	0.2	0.1	0.86	2.0	0.4	0.05	0.1	0.58	2.0	0.4	0.09	0.05	0.13	1.0	0.2	0.025	0.05	0.4	1.0	0.2	0.025
CL5-PCB-122	0.4	0.9	8.0	1.6	0.2	0.1	0.20	2.0	0.4	0.05	0.1	0.20	2.0	0.4	0.09	0.05	0.18	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
CL5-PCB-123	0.4	1.4	8.0	1.6	0.2	0.1	0.44	2.0	0.4	0.05	0.1	0.39	2.0	0.4	0.09	0.05	0.37	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
CL5-PCB-126	0.4	0.8	8.0	1.6	0.2	0.1	0.22	2.0	0.4	0.05	0.1	0.12	2.0	0.4	0.09	0.05	0.10	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025

Matrix	WATER/EFFLUENT					SOIL/SEDIMENT/BIOSOLIDS/ASH					TISSUE					XAD-2 RESIN					FILTER				
Units/Sample Size	pg/L based on 2.5 L sample					pg/g based on 10g sample					pg/g based on 10g sample					pg/L based on 2/3 sample					pg/L based on 2/3 sample				
Default Extract Volume	20uL					20uL					20uL					20uL					20uL				
Analyte	Typical SDL	MDL	LMCL based on CS-1	LMCL based on High Sensitivity CS-0.2	RL[1]	Typical SDL	MDL	LMCL based on CS-1	LMCL based on High Sensitivity CS-0.2	RL[1]	Typical SDL	MDL	LMCL based on CS-1	LMCL based on High Sensitivity CS-0.2	RL[1]	Typical SDL	MDL	LMCL based on CS-1	LMCL based on High Sensitivity CS-0.2	RL[1]	Typical SDL	Estimated MDL	LMCL based on CS-1	LMCL based on High Sensitivity CS-0.2	RL[1]
C1,5-PCB-127	0.4	1.1	8.0	1.6	0.2	0.1	0.56	2.0	0.4	0.05	0.1	0.27	2.0	0.4	0.05	0.05	0.12	1.0	0.2	0.025	0.05	0.3	1.0	0.2	0.025
C1,5-PCB-126/166	0.4	2.4	8.0	1.6	0.2	0.1	0.48	2.0	0.4	0.05	0.1	0.40	2.0	0.4	0.05	0.05	0.13	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,5-PCB-130	0.4	1.4	8.0	1.6	0.2	0.1	0.41	2.0	0.4	0.05	0.1	0.11	2.0	0.4	0.05	0.05	0.14	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,5-PCB-131	0.4	1.9	8.0	1.6	0.2	0.1	0.42	2.0	0.4	0.05	0.1	0.26	2.0	0.4	0.05	0.05	0.13	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,5-PCB-132	0.4	2.4	8.0	1.6	0.2	0.1	0.69	2.0	0.4	0.05	0.1	0.39	2.0	0.4	0.05	0.05	2.20	1.0	0.2	0.025	0.05	0.3	1.0	0.2	0.025
C1,5-PCB-133	0.4	0.9	8.0	1.6	0.2	0.1	0.42	2.0	0.4	0.05	0.1	0.23	2.0	0.4	0.05	0.05	0.16	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,5-PCB-134/143	0.4	1.6	8.0	1.6	0.2	0.1	0.63	2.0	0.4	0.05	0.1	0.32	2.0	0.4	0.05	0.05	0.16	1.0	0.2	0.025	0.05	0.3	1.0	0.2	0.025
C1,5-PCB-136	0.4	1.1	8.0	1.6	0.2	0.1	0.37	2.0	0.4	0.05	0.1	0.22	2.0	0.4	0.05	0.05	0.14	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,5-PCB-137	0.4	1.2	8.0	1.6	0.2	0.1	0.56	2.0	0.4	0.05	0.1	0.31	2.0	0.4	0.05	0.05	0.19	1.0	0.2	0.025	0.05	0.3	1.0	0.2	0.025
C1,5-PCB-138/163/129/160	0.4	6.3	8.0	1.6	0.2	0.1	0.83	2.0	0.4	0.05	0.1	0.79	2.0	0.4	0.05	0.05	0.33	1.0	0.2	0.025	0.05	0.4	1.0	0.2	0.025
C1,5-PCB-139/140	0.4	1.6	8.0	1.6	0.2	0.1	0.72	2.0	0.4	0.05	0.1	0.40	2.0	0.4	0.05	0.05	0.19	1.0	0.2	0.025	0.05	0.4	1.0	0.2	0.025
C1,5-PCB-141	0.4	1.3	8.0	1.6	0.2	0.1	0.44	2.0	0.4	0.05	0.1	0.33	2.0	0.4	0.05	0.05	0.18	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,5-PCB-142	0.4	0.7	8.0	1.6	0.2	0.1	0.33	2.0	0.4	0.05	0.1	0.18	2.0	0.4	0.05	0.05	0.21	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,5-PCB-144	0.4	0.9	8.0	1.6	0.2	0.1	0.58	2.0	0.4	0.05	0.1	0.20	2.0	0.4	0.05	0.05	0.10	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,5-PCB-145	0.4	0.9	8.0	1.6	0.2	0.1	0.56	2.0	0.4	0.05	0.1	0.34	2.0	0.4	0.05	0.05	0.10	1.0	0.2	0.025	0.05	0.3	1.0	0.2	0.025
C1,5-PCB-146	0.4	1.9	8.0	1.6	0.2	0.1	0.51	2.0	0.4	0.05	0.1	0.43	2.0	0.4	0.05	0.05	0.20	1.0	0.2	0.025	0.05	0.3	1.0	0.2	0.025
C1,5-PCB-147/149	0.4	3.7	8.0	1.6	0.2	0.1	0.86	2.0	0.4	0.05	0.1	0.47	2.0	0.4	0.05	0.05	0.25	1.0	0.2	0.025	0.05	0.5	1.0	0.2	0.025
C1,5-PCB-148	0.4	1.1	8.0	1.6	0.2	0.1	0.81	2.0	0.4	0.05	0.1	0.28	2.0	0.4	0.05	0.05	0.18	1.0	0.2	0.025	0.05	0.3	1.0	0.2	0.025
C1,5-PCB-150	0.4	1.8	8.0	1.6	0.2	0.1	0.74	2.0	0.4	0.05	0.1	0.25	2.0	0.4	0.05	0.05	0.20	1.0	0.2	0.025	0.05	0.3	1.0	0.2	0.025
C1,5-PCB-151/135/154	0.4	1.8	8.0	1.6	0.2	0.1	1.10	2.0	0.4	0.05	0.1	0.56	2.0	0.4	0.05	0.05	0.25	1.0	0.2	0.025	0.05	0.6	1.0	0.2	0.025
C1,5-PCB-152	0.4	1.1	8.0	1.6	0.2	0.1	0.39	2.0	0.4	0.05	0.1	0.27	2.0	0.4	0.05	0.05	0.21	1.0	0.2	0.025	0.05	0.3	1.0	0.2	0.025
C1,5-PCB-153/168	0.4	3.5	8.0	1.6	0.2	0.1	0.73	2.0	0.4	0.05	0.1	0.51	2.0	0.4	0.05	0.05	0.24	1.0	0.2	0.025	0.05	0.4	1.0	0.2	0.025
C1,5-PCB-155	0.4	1.1	8.0	1.6	0.2	0.1	0.75	2.0	0.4	0.05	0.1	0.43	2.0	0.4	0.05	0.05	0.18	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
C1,5-PCB-156/157	0.4	1.4	16.0	3.2	0.2	0.1	0.40	4.0	0.8	0.05	0.1	0.22	4.0	0.8	0.05	0.05	0.28	2.0	0.4	0.025	0.05	0.2	2.0	0.4	0.025
C1,5-PCB-158	0.4	1.3	8.0	1.6	0.2	0.1	0.39	2.0	0.4	0.05	0.1	0.27	2.0	0.4	0.05	0.05	0.56	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,5-PCB-159	0.4	1.4	8.0	1.6	0.2	0.1	0.30	2.0	0.4	0.05	0.1	0.26	2.0	0.4	0.05	0.05	0.11	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
C1,5-PCB-161	0.4	1.0	8.0	1.6	0.2	0.1	0.54	2.0	0.4	0.05	0.1	0.25	2.0	0.4	0.05	0.05	0.19	1.0	0.2	0.025	0.05	0.3	1.0	0.2	0.025
C1,5-PCB-162	0.4	1.2	8.0	1.6	0.2	0.1	0.33	2.0	0.4	0.05	0.1	0.16	2.0	0.4	0.05	0.05	0.12	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,5-PCB-164	0.4	1.5	8.0	1.6	0.2	0.1	0.20	2.0	0.4	0.05	0.1	0.29	2.0	0.4	0.05	0.05	0.16	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
C1,5-PCB-165	0.4	1.2	8.0	1.6	0.2	0.1	0.37	2.0	0.4	0.05	0.1	0.21	2.0	0.4	0.05	0.05	0.06	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,5-PCB-167	0.4	0.6	8.0	1.6	0.2	0.1	0.40	2.0	0.4	0.05	0.1	0.24	2.0	0.4	0.05	0.05	0.10	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,5-PCB-169	0.4	0.7	8.0	1.6	0.2	0.1	0.14	2.0	0.4	0.05	0.1	0.13	2.0	0.4	0.05	0.05	0.26	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
C1,7-PCB-172	0.4	1.0	8.0	1.6	0.2	0.1	0.31	2.0	0.4	0.05	0.1	0.26	2.0	0.4	0.05	0.05	0.20	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,7-PCB-171/173	0.4	2.3	8.0	1.6	0.2	0.1	0.64	2.0	0.4	0.05	0.1	0.18	2.0	0.4	0.05	0.05	0.40	1.0	0.2	0.025	0.05	0.3	1.0	0.2	0.025
C1,7-PCB-172	0.4	1.0	8.0	1.6	0.2	0.1	0.48	2.0	0.4	0.05	0.1	0.18	2.0	0.4	0.05	0.05	0.25	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,7-PCB-174	0.4	0.8	8.0	1.6	0.2	0.1	0.45	2.0	0.4	0.05	0.1	0.29	2.0	0.4	0.05	0.05	0.18	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,7-PCB-175	0.4	1.0	8.0	1.6	0.2	0.1	0.37	2.0	0.4	0.05	0.1	0.28	2.0	0.4	0.05	0.05	0.21	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,7-PCB-176	0.4	0.8	8.0	1.6	0.2	0.1	0.32	2.0	0.4	0.05	0.1	0.18	2.0	0.4	0.05	0.05	0.17	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,7-PCB-177	0.4	1.4	8.0	1.6	0.2	0.1	0.81	2.0	0.4	0.05	0.1	0.56	2.0	0.4	0.05	0.05	0.34	1.0	0.2	0.025	0.05	0.4	1.0	0.2	0.025
C1,7-PCB-178	0.4	1.3	8.0	1.6	0.2	0.1	0.27	2.0	0.4	0.05	0.1	0.17	2.0	0.4	0.05	0.05	0.29	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
C1,7-PCB-179	0.4	0.7	8.0	1.6	0.2	0.1	0.29	2.0	0.4	0.05	0.1	0.13	2.0	0.4	0.05	0.05	0.13	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
C1,7-PCB-180/193	0.4	1.8	8.0	1.6	0.2	0.1	0.55	2.0	0.4	0.05	0.1	0.38	2.0	0.4	0.05	0.05	0.18	1.0	0.2	0.025	0.05	0.3	1.0	0.2	0.025
C1,7-PCB-181	0.4	1.1	8.0	1.6	0.2	0.1	0.41	2.0	0.4	0.05	0.1	0.29	2.0	0.4	0.05	0.05	0.24	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,7-PCB-182	0.4	1.3	8.0	1.6	0.2	0.1	0.67	2.0	0.4	0.05	0.1	0.24	2.0	0.4	0.05	0.05	0.18	1.0	0.2	0.025	0.05	0.3	1.0	0.2	0.025
C1,7-PCB-183/185	0.4	1.2	8.0	1.6	0.2	0.1	0.38	2.0	0.4	0.05	0.1	0.48	2.0	0.4	0.05	0.05	0.29	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,7-PCB-184	0.4	0.5	8.0	1.6	0.2	0.1	0.27	2.0	0.4	0.05	0.1	0.18	2.0	0.4	0.05	0.05	0.12	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
C1,7-PCB-186	0.4	0.6	8.0	1.6	0.2	0.1	0.21	2.0	0.4	0.05	0.1	0.23	2.0	0.4	0.05	0.05	0.21	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,7-PCB-187	0.4	1.5	8.0	1.6	0.2	0.1	0.35	2.0	0.4	0.05	0.1	0.30	2.0	0.4	0.05	0.05	0.08	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,7-PCB-188	0.4	0.5	8.0	1.6	0.2	0.1	0.24	2.0	0.4	0.05	0.1	0.27	2.0	0.4	0.05	0.05	0.22	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
C1,7-PCB-189	0.4	0.8	8.0	1.6	0.2	0.1	0.33	2.0	0.4	0.05	0.1	0.27	2.0	0.4	0.05	0.05	0.13	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,7-PCB-190	0.4	1.2	8.0	1.6	0.2	0.1	0.35	2.0	0.4	0.05	0.1	0.31	2.0	0.4	0.05	0.05	0.16	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,7-PCB-191	0.4	1.1	8.0	1.6	0.2	0.1	0.43	2.0	0.4	0.05	0.1	0.27	2.0	0.4	0.05	0.05	0.18	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,7-PCB-192	0.4	0.8	8.0	1.6	0.2	0.1	0.38	2.0	0.4	0.05	0.1	0.22	2.0	0.4	0.05	0.05	0.19	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,8-PCB-194	0.4	1.5	8.0	1.6	0.2	0.1	0.42	2.0	0.4	0.05	0.1	0.21	2.0	0.4	0.05	0.05	0.25	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,8-PCB-195	0.4	1.6	8.0	1.6	0.2	0.1	0.54	2.0	0.4	0.05	0.1	0.30	2.0	0.4	0.05	0.05	0.23	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,8-PCB-196	0.4	0.9	8.0	1.6	0.2	0.1	0.38	2.0	0.4	0.05	0.1	0.26	2.0	0.4	0.05	0.05	0.41	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,8-PCB-197/200	0.4	4.5	8.0	1.6	0.2	0.1	1.06	2.0	0.4	0.05	0.1	0.68	2.0	0.4	0.05	0.05	0.38	1.0	0.2	0.025	0.05	0.5	1.0	0.2	0.025
C1,8-PCB-198/199	0.4	1.5	8.0	1.6	0.2	0.1	0.61	2.0	0.4	0.05	0.1	0.37	2.0	0.4	0.05	0.05	1.3	1.0	0.2	0.025	0.05	0.3	1.0	0.2	0.025
C1,8-PCB-201	0.4	0.9	8.0	1.6	0.2	0.1	0.48	2.0	0.4	0.05	0.1	0.29	2.0	0.4	0.05	0.05	0.29	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,9-PCB-202	0.4	0.8	8.0	1.6	0.2	0.1	0.19	2.0	0.4	0.05	0.1	0.20	2.0	0.4	0.05	0.05	0.20	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
C1,9-PCB-203	0.4	1.2	8.0	1.6	0.2	0.1	0.32	2.0	0.4	0.05	0.1	0.15	2.0	0.4	0.05	0.05	0.19	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,9-PCB-204	0.4	0.9	8.0	1.6	0.2	0.1	0.28	2.0	0.4	0.05	0.1	0.14	2.0	0.4	0.05	0.05	0.19	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
C1,9-PCB-205	0.4	1.1	8.0	1.6	0.2	0.1	0.27	2.0	0.4	0.05	0.1	0.13	2.0	0.4	0.05	0.05	0.14	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
C1,9-PCB-206	0.4	0.9	8.0	1.6	0.2	0.1	0.16	2.0	0.4	0.05	0.1	0.19	2.0	0.4	0.05	0.05	0.33	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
C1,9-PCB-207	0.4	0.8	8.0	1.6	0.2	0.1	0.34	2.0	0.4	0.05	0.1	0.19	2.0	0.4	0.05	0.05	0.22	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025
C1,9-PCB-208	0.4	0.5	8.0	1.6	0.2	0.1	0.24	2.0	0.4	0.05	0.1	0.26	2.0	0.4	0.05	0.05	0.20	1.0	0.2	0.025	0.05	0.1	1.0	0.2	0.025
C1,10-PCB-209	0.4	0.9	8.0	1.6	0.2	0.1	0.32	2.0	0.4	0.05	0.1	0.13	2.0	0.4	0.05	0.05	0.26	1.0	0.2	0.025	0.05	0.2	1.0	0.2	0.025

Notes [1] Reporting Limit (RL) is the lowest concentration routinely reported for the method
RLs are set to minimize potential for false positive detection or the requirement to qualify
results very close to detection limit and in some cases may exceed the sample specific detection limit (SDL) achieved

AXYS Analytical Services Ltd.

TYPICAL DETECTION LIMITS, METHOD DETECTION LIMITS AND LOW CALIBRATION LIMITS for OC Pesticides by GC/HRMS

AXYS Method: MLA-028
Instrument Type: High Resolution GC/MS
MDL Protocol: Federal Register 40 CFR Part 136, Appendix B, no iteration
Quantification: AXYS default is linearity, bracketing option available

Matrix	WATER/EFFLUENT			SOIL/SEDIMENT/BIOSOLIDS			TISSUE			XAD-2 RESIN / FILTER	
Units/Sample Size	ng/L based on 2.5L sample			ng/g based on 10g sample			ng/g based on 10g sample			ng/L based on 20L	
Default Extract Volume	200uL			200uL			200uL			200uL	
Analytes *E1 Pesticides* [1]	Typical SDL	MDL	LMCL based on Low Cal.	Typical SDL	MDL	LMCL based on Low Cal.	Typical SDL	MDL	LMCL based on Low Cal.	Typical SDL	LMCL based on Low Cal.
Hexachlorobenzene	0.04	0.04	0.8	0.01	0.008	0.2	0.01	0.004	0.2	0.005	0.10
HCH, alpha	0.08	0.05	1.6	0.02	0.013	0.4	0.02	0.008	0.4	0.010	0.20
HCH, beta	0.08	0.04	1.6	0.02	0.018	0.4	0.02	0.007	0.4	0.010	0.20
HCH, gamma	0.08	0.03	1.6	0.02	0.012	0.4	0.02	0.007	0.4	0.010	0.20
Heptachlor	0.08	0.06	0.8	0.02	0.009	0.2	0.02	0.007	0.2	0.010	0.10
Aldrin	0.08	0.07	1.6	0.02	0.014	0.4	0.02	0.008	0.4	0.010	0.20
Chlordane, oxy-	0.08	0.11	1.6	0.02	0.021	0.4	0.02	0.015	0.4	0.010	0.20
Chlordane, gamma (trans)	0.08	0.04	1.6	0.02	0.010	0.4	0.02	0.006	0.4	0.010	0.20
Chlordane, alpha (cis)	0.08	0.04	1.6	0.02	0.008	0.4	0.02	0.008	0.4	0.010	0.20
Nonachlor, trans-	0.08	0.03	1.6	0.02	0.009	0.4	0.02	0.008	0.4	0.010	0.20
Nonachlor, cis-	0.08	0.11	1.6	0.02	0.009	0.4	0.02	0.018	0.4	0.010	0.20
2,4'-DDD	0.08	0.02	0.8	0.02	0.004	0.2	0.02	0.004	0.2	0.010	0.10
4,4'-DDD	0.08	0.02	0.8	0.02	0.004	0.2	0.02	0.003	0.2	0.010	0.10
2,4'-DDE	0.08	0.03	0.8	0.02	0.002	0.2	0.02	0.004	0.2	0.010	0.10
4,4'-DDE	0.08	0.02	0.8	0.02	0.002	0.2	0.02	0.007	0.2	0.010	0.10
2,4'-DDT	0.08	0.03	0.8	0.02	0.004	0.2	0.02	0.006	0.2	0.010	0.10
4,4'-DDT	0.08	0.02	0.8	0.02	0.006	0.2	0.02	0.006	0.2	0.010	0.10
Mirex	0.08	0.02	0.8	0.02	0.003	0.2	0.02	0.007	0.2	0.010	0.10
Technical Toxaphene [2,3]	0.40	NA [4]	NA [5]	0.10	NA [4]	NA [5]	0.10	NA [4]	NA [5]	0.050	NA [5]
E2 Pesticides	Typical SDL	MDL	LMCL based on Low Cal.	Typical SDL	MDL	LMCL based on Low Cal.	Typical SDL	MDL	LMCL based on Low Cal.	Typical SDL	LMCL based on Low Cal.
HCH, delta	0.2	0.02	0.8	0.05	0.006	0.20	0.05	0.003	0.20	0.025	0.10
Heptachlor Epoxide	0.2	0.09	0.6	0.05	0.009	0.16	0.05	0.010	0.16	0.025	0.08
alpha-Endosulphan	0.2	0.10	0.6	0.05	0.013	0.16	0.05	0.022	0.16	0.025	0.08
Dieldrin	0.2	0.02	0.6	0.05	0.008	0.16	0.05	0.005	0.16	0.025	0.08
Endrin	0.2	0.04	0.6	0.05	0.007	0.16	0.05	0.012	0.16	0.025	0.08
beta-Endosulphan	0.2	0.10	0.6	0.05	0.015	0.16	0.05	0.033	0.16	0.025	0.08
Endosulphan Sulphate	0.2	0.09	0.6	0.05	0.019	0.16	0.05	0.017	0.16	0.025	0.08
Endrin Aldehyde	0.2	0.08	0.6	0.05	0.023	0.16	0.05	0.033	0.16	0.025	0.08
Endrin Ketone	0.2	0.07	0.6	0.05	0.008	0.16	0.05	0.009	0.16	0.025	0.08
Methoxychlor	0.4	0.02	0.6	0.10	0.003	0.16	0.10	0.002	0.16	0.050	0.08

Notes: [1] Hexachlorobutadiene, Octachlorostyrene, and Chlorobenzenes can be analyzed upon request
[2] Technical Toxaphene is available upon request.
[3] Multi-component mixture SDL estimates are based on the detection of a single component in the mixture.
[4] MDL not applicable for the multi-component mixture since detectability is based on detection of a single component in the mixture
[5] NA = LMCL not applicable for multi-component mixture where detection threshhold is based on detection of a single component of the mixture

AXYS Analytical Services Ltd.

TYPICAL DETECTION LIMITS, METHOD DETECTION LIMITS AND LOW CALIBRATION LIMITS for Parent PAHs and Alkylated PAHs by GC/MS

AXYS Method: MLA-021
Instrument Type: Low Resolution GC/MS
MDL Protocol: Federal Register 40 CFR Part 136, Appendix B, no iteration
Quantification: AXYS default is linearity. Full bracketing calibration option is available

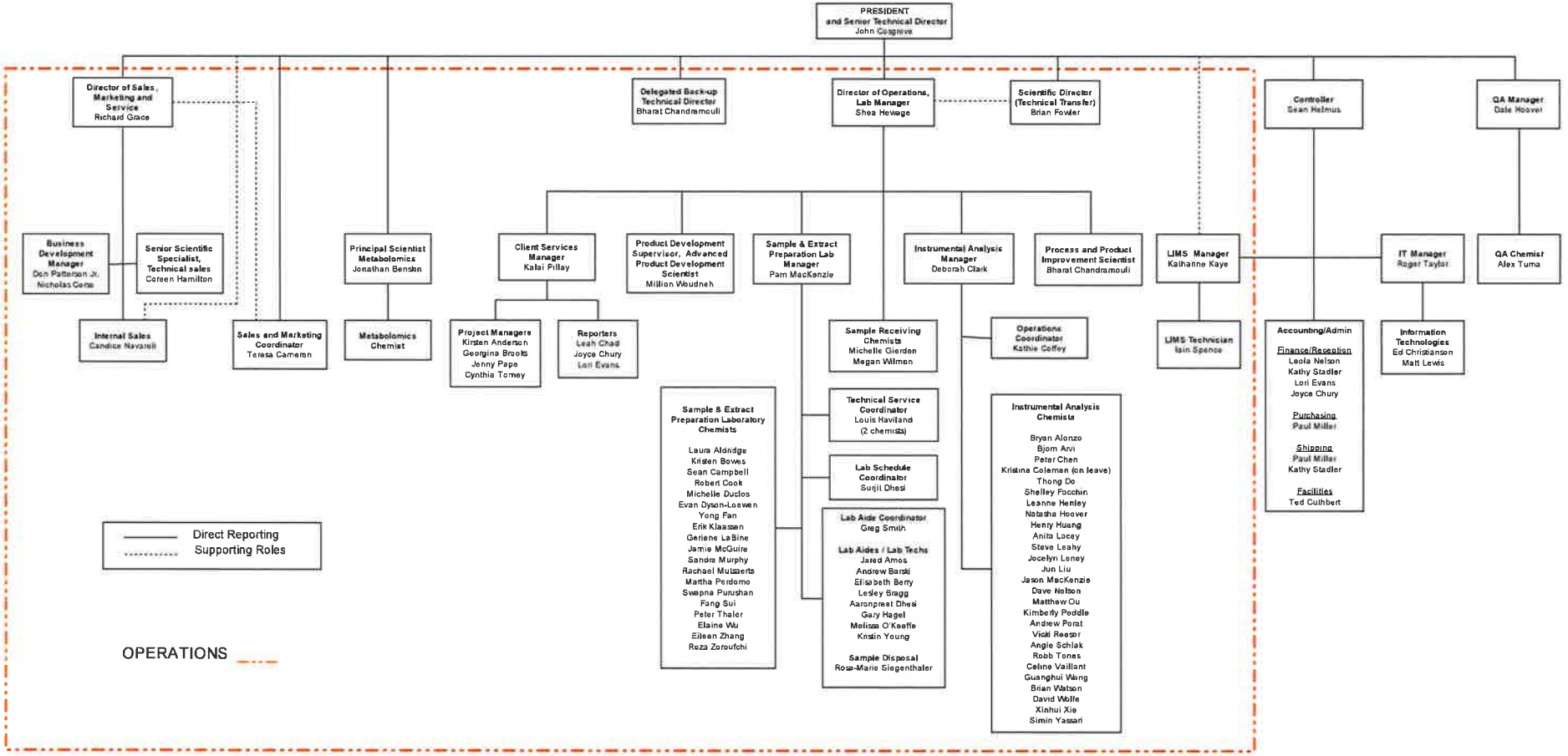
Matrix		WATER/EFFLUENT			SOIL/SEDIMENT/BIOSOLIDS			TISSUE			FILTER			XAD-2 RESIN		
Units/Sample Size		ng/L based on 2.5L sample			ng/g based on 10g dry weight sample			ng/g based on 10g sample			ng/L based on 20 L			ng/L based on 20 L		
Default Extract Volume		100uL			500uL			100uL			500uL			500uL		
Analyte *List 1 - Standard PAH Parents and Select Alkylated PAHs determined by linearity method*		Typical SDL	MDL	LMCL based on Low Cal.	Typical SDL	MDL	LMCL based on Low Cal.	Typical SDL	MDL	LMCL based on Low Cal.	Typical SDL	Estimated MDL	LMCL based on Low Cal.	Typical SDL	MDL	LMCL based on Low Cal.
Naphthalene [1]		0.4	0.37	2.0	0.5	0.87	2.5	0.1	1.14	0.5	0.25	2	1.25	0.25	1.8 [3]	1.25
Acenaphthylene		0.4	0.42	2.0	0.5	0.40	2.5	0.1	0.07	0.5	0.25	0.3	1.25	0.25	0.3	1.25
Acenaphthene		0.4	0.58	2.0	0.5	0.51	2.5	0.1	0.35	0.5	0.25	NA [3]	1.25	0.25	NA [3]	1.25
Fluorene		0.4	0.41	2.0	0.5	0.34	2.5	0.1	0.28	0.5	0.25	1	1.25	0.25	11	1.25
Phenanthrene		0.4	0.35	2.0	0.5	0.19	2.5	0.1	0.09	0.5	0.25	0.4	1.25	0.25	0.4	1.25
Anthracene		0.4	0.38	2.0	0.5	0.36	2.5	0.1	0.08	0.5	0.25	0.4	1.25	0.25	0.4	1.25
Fluoranthene		0.4	0.37	2.0	0.5	0.25	2.5	0.1	0.15	0.5	0.25	0.2	1.25	0.25	0.2	1.25
Pyrene		0.4	0.34	2.0	0.5	0.16	2.5	0.1	0.12	0.5	0.25	0.2	1.25	0.25	0.2	1.25
Benz(a)anthracene		0.4	0.41	2.0	0.5	0.22	2.5	0.1	0.09	0.5	0.25	0.1	1.25	0.25	0.1	1.25
Chrysene		0.4	0.47	2.0	0.5	0.17	2.5	0.1	0.56	0.5	0.25	0.2	1.25	0.25	0.2	1.25
Benzo(b)fluoranthene		0.4	0.39	2.0	0.5	0.27	2.5	0.1	0.05	0.5	0.25	0.3	1.25	0.25	0.3	1.25
Benzo(j/k)fluoranthenes		0.4	0.44	2.0	0.5	0.22	2.5	0.1	0.11	0.5	0.25	0.3	1.25	0.25	0.3	1.25
Benzofluoranthenes		0.4	NA [3]	2.0	0.5	NA [3]	2.5	0.1	NA [3]	0.5	0.25	NA [3]	1.25	0.25	NA [3]	1.25
Benzo(e)pyrene		0.4	0.40	2.0	0.5	0.21	2.5	0.1	0.17	0.5	0.25	0.3	1.25	0.25	0.3	1.25
Benzo(a)pyrene		0.4	0.44	2.0	0.5	0.18	2.5	0.1	0.10	0.5	0.25	0.1	1.25	0.25	0.1	1.25
Perylene		0.8	0.37	2.0	1.0	0.17	2.5	0.2	0.10	0.5	0.5	0.1	1.25	0.5	0.1	1.25
Dibenzo(ah)anthracene		0.8	0.45	2.0	1.0	0.24	2.5	0.2	0.11	0.5	0.5	0.1	1.25	0.5	0.1	1.25
Indeno(1,2,3-cd)pyrene		0.8	0.40	2.0	1.0	0.17	2.5	0.2	0.14	0.5	0.5	0.1	1.25	0.5	0.1	1.25
Benzo(ghi)perylene		0.8	0.37	2.0	1.0	0.25	2.5	0.2	0.05	0.5	0.5	0.1	1.25	0.5	0.1	1.25
2-Methylnaphthalene [1]		0.8	0.36	2.0	1.0	0.60	2.5	0.2	0.30	0.5	0.5	NA [3]	1.25	0.5	NA [3]	1.25
2,6-Dimethylnaphthalene [1]		0.8	0.42	2.0	1.0	0.57	2.5	0.2	0.30	0.5	0.5	NA [3]	1.25	0.5	NA [3]	1.25
2,3,5-Trimethylnaphthalene [1]		0.8	0.44	2.0	1.0	0.47	2.5	0.2	0.34	0.5	0.5	NA [3]	1.25	0.5	NA [3]	1.25
1-Methylphenanthrene		0.8	0.53	2.0	1.0	0.22	2.5	0.2	0.12	0.5	0.5	NA [3]	1.25	0.5	NA [3]	1.25
Dibenzothiophene		0.8	0.31	2.0	1.0	0.25	2.5	0.2	0.10	0.5	0.5	NA [3]	1.25	0.5	NA [3]	1.25
List 2 - Alkylated PAHs determined by linearity method		Typical SDL	MDL	LMCL based on Low Cal.	Typical SDL	MDL	LMCL based on Low Cal.	Typical SDL	MDL	LMCL based on Low Cal.	Typical SDL	Estimated MDL	LMCL based on Low Cal.	Typical SDL	MDL	LMCL based on Low Cal.
1-Methylnaphthalene [1]		0.8	0.36	2.0	1.0	0.66	2.5	0.2	0.50	0.5	0.5	NA [3]	1.25	0.5	NA [3]	1.25
C1-Naphthalenes [1]	2	0.8	0.36	NA [4]	1.0	0.73	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
1,2-Dimethylnaphthalene [1]		0.8	0.33	2.0	1.0	0.42	2.5	0.2	0.23	0.5	0.5	NA [3]	1.25	0.5	NA [3]	1.25
C2-Naphthalenes [1]	2	0.8	0.37	NA [4]	1.0	0.50	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
2,3,6-Trimethylnaphthalene [1]		0.8	0.35	2.0	1.0	0.53	2.5	0.2	0.35	0.5	0.5	NA [3]	1.25	0.5	NA [3]	1.25
C3-Naphthalenes [1]	2	0.8	0.40	NA [4]	1.0	0.50	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
1,4,6,7-Tetramethylnaphthalene [1]		0.8	0.52	2.0	1.0	0.68	2.5	0.2	0.50	0.5	0.5	NA [3]	1.25	0.5	NA [3]	1.25
C4-Naphthalenes [1]	2	0.8	0.52	NA [4]	1.0	0.68	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
2-Methylphenanthrene		0.8	0.50	2.0	1.0	0.18	2.5	0.2	0.16	0.5	0.5	NA [3]	1.25	0.5	NA [3]	1.25
3-Methylphenanthrene		0.8	NA [3]	NA [4]	1.0	NA [3]	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
9/4-Methylphenanthrenes		0.8	NA [3]	NA [4]	1.0	NA [3]	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
2-Methylanthracene		0.8	0.53	2.0	1.0	0.40	2.5	0.2	0.20	0.5	0.5	NA [3]	1.25	0.5	NA [3]	1.25
C1-Phenanthrenes/Anthracenes	2	0.8	0.52	NA [4]	1.0	0.27	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
1,7-Dimethylphenanthrene		0.8	0.24	2.0	1.0	0.14	2.5	0.2	0.16	0.5	0.5	NA [3]	1.25	0.5	NA [3]	1.25
1,8-Dimethylphenanthrene		0.8	NA [3]	NA [4]	1.0	NA [3]	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
2,6-Dimethylphenanthrene		0.8	NA [3]	NA [4]	1.0	NA [3]	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
3,6-Dimethylphenanthrene		0.8	0.30	2.0	1.0	0.25	2.5	0.2	0.11	0.5	0.5	NA [3]	1.25	0.5	NA [3]	1.25
C2-Phenanthrenes/Anthracenes	2	0.8	0.27	NA [4]	1.0	0.19	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
1,2,6-Trimethylphenanthrene		0.8	0.41	2.0	1.0	0.11	2.5	0.2	0.04	0.5	0.5	NA [3]	1.25	0.5	NA [3]	1.25
C3-Phenanthrenes/Anthracenes	2	0.8	0.41	NA [4]	1.0	0.11	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
Retene		0.8	0.52	2.0	1.0	0.24	2.5	0.2	0.10	0.5	0.5	NA [3]	1.25	0.5	NA [3]	1.25
C4-Phenanthrenes/Anthracenes	2	0.8	0.52	NA [4]	1.0	0.24	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
Biphenyl		0.8	0.49	2.0	1.0	0.56	2.5	0.2	0.14	0.5	0.5	NA [3]	1.25	0.5	NA [3]	1.25
List 3 - Extended alkylated PAHs determined by linearity		Typical SDL	MDL	LMCL based on Low Cal.	Typical SDL	MDL	LMCL based on Low Cal.	Typical SDL	MDL	LMCL based on Low Cal.	Typical SDL	Estimated MDL	LMCL based on Low Cal.	Typical SDL	MDL	LMCL based on Low Cal.
C1-Biphenyls	2	0.8	0.49	NA [4]	1.0	0.56	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
C2-Biphenyls	2	0.8	0.49	NA [4]	1.0	0.56	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
C1-Acenaphthenes	2	0.4	0.58	NA [4]	0.5	0.51	NA [4]	0.1	NA [3]	NA [4]	0.25	NA [3]	NA [4]	0.25	NA [3]	NA [4]
2-Methylfluorene		0.8	0.31	2.0	1.0	0.27	2.5	0.2	0.69	0.5	0.5	NA [3]	1.25	0.5	NA [3]	1.25

Matrix		WATER/EFFLUENT			SOIL/SEDIMENT/BIOSOLIDS			TISSUE			FILTER			XAD-2 RESIN		
Units/Sample Size		ng/L based on 2.5L sample			ng/g based on 10g dry weight sample			ng/g based on 10g sample			ng/L based on 20 L			ng/L based on 20 L		
Default Extract Volume		100uL			500uL			100uL			500uL			500uL		
Analyte *List 1 - Standard PAH Parents and Select Alkylated PAHs determined by linearity method*		Typical SDL	MDL	LMCL based on Low Cal.	Typical SDL	MDL	LMCL based on Low Cal.	Typical SDL	MDL	LMCL based on Low Cal.	Typical SDL	Estimated MDL	LMCL based on Low Cal.	Typical SDL	MDL	LMCL based on Low Cal.
C1-Fluorenes	[2]	0.8	0.31	NA [4]	1.0	0.27	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
1,7-Dimethylfluorene		0.8	0.58	2.0	1.0	0.17	2.5	0.2	NA [3]	0.5	0.5	NA [3]	1.25	0.5	NA [3]	1.25
C2-Fluorenes	[2]	0.8	0.58	NA [4]	1.0	0.17	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
C3-Fluorenes	[2]	0.8	0.58	NA [4]	1.0	0.17	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
2/3-Methyldibenzothiophenes		0.8	0.41	2.0	1.0	0.26	2.5	0.2	0.08	0.5	0.5	NA [3]	1.25	0.5	NA [3]	1.25
C1-Dibenzothiophene	[2]	0.8	0.41	NA [4]	1.0	0.26	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
2,4-Dimethyldibenzothiophene		0.8	0.45	2.0	1.0	0.26	2.5	0.2	0.14	0.5	0.5	NA [3]	1.25	0.5	NA [3]	1.25
C2-Dibenzothiophene	[2]	0.8	0.45	NA [4]	1.0	0.26	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
C3-Dibenzothiophene	[2]	0.8	0.45	NA [4]	1.0	0.26	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
C4-Dibenzothiophene	[2]	0.8	0.45	NA [4]	1.0	0.26	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
3-Methylfluoranthene/Benzo(a)fluorene		0.8	0.20	2.0	1.0	0.32	2.5	0.2	NA [3]	0.5	0.5	NA [3]	1.25	0.5	NA [3]	1.25
C1-Fluoranthenes/Pyrenes	[2]	0.8	0.20	NA [4]	1.0	0.32	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
C2-Fluoranthenes/Pyrenes	[2]	0.8	0.20	NA [4]	1.0	0.32	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
C3-Fluoranthenes/Pyrenes	[2]	0.8	0.20	NA [4]	1.0	0.32	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
C4-Fluoranthenes/Pyrenes	[2]	0.8	0.20	NA [4]	1.0	0.32	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
1-Methylchrysene		0.8	0.14	2.0	1.0	0.23	2.5	0.2	NA [3]	0.5	0.5	NA [3]	1.25	0.5	NA [3]	1.25
5/6-Methylchrysenes		0.8	0.12	2.0	1.0	0.17	2.5	0.2	NA [3]	0.5	0.5	NA [3]	1.25	0.5	NA [3]	1.25
C1-Benz(a)anthracenes/Chrysenes	[2]	0.8	0.13	NA [4]	1.0	0.20	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
5,9-Dimethylchrysene		0.8	0.47	2.0	1.0	0.18	2.5	0.2	0.10	0.5	0.5	NA [3]	1.25	0.5	NA [3]	1.25
C2-Benz(a)anthracenes/Chrysenes	[2]	0.8	0.47	NA [4]	1.0	0.18	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
C3-Benz(a)anthracenes/Chrysenes	[2]	0.8	0.47	NA [4]	1.0	0.18	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
C4-Benz(a)anthracenes/Chrysenes	[2]	0.8	0.47	NA [4]	1.0	0.18	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
7-Methylbenzo(a)pyrene		0.8	0.46	2.0	1.0	0.15	2.5	0.2	0.12	0.5	0.5	NA [3]	1.25	0.5	NA [3]	1.25
C1-Benzofluoranthenes/Benzopyrenes	[2]	0.8	0.46	NA [4]	1.0	0.15	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]
C2-Benzofluoranthenes/Benzopyrenes	[2]	0.8	0.46	NA [4]	1.0	0.15	NA [4]	0.2	NA [3]	NA [4]	0.5	NA [3]	NA [4]	0.5	NA [3]	NA [4]

Notes
[1] Concentrations of compounds in XAD-2 resin are estimated maximum values as naphthalenes may be formed by XAD-2 resin decomposition.
[2] Multi-component mixture SDL estimates are based on the detection of a single component in the mixture.
[3] NA = MDL not available, compound not included in the MDL study
[4] NA = LMCL not applicable to multi-component mixtures or single point calibration protocol.

APPENDIX 7
ORGANIZATIONAL CHART

AXYS ANALYTICAL SERVICES LTD. - ORGANIZATIONAL CHART



APPENDIX 8
DATA REPORTING FORMAT EXAMPLES

Data Package Contents

i. Cover page
ii. Title page
iii. Narrative
iv. Method Summary (as available)
v. AXYS Correlation Table (correlates AXYS ID with client ID)
vi. Individual Sample Receiving Forms
    - Client Chain of Custody
    - FedEx waybill
    - AXYS Sample Receiving Record
    - Custody Seals
    - Field Notes
    - AXYS Login Chain of Custody
    - Selective Documentation Between AXYS and Client- only as requested.
vii. Sample Preparation/Pretreatment Records
viii. Analysis Workup Sheets
ix. Sample Data
x. QC Sample Data including the following:
    - Procedural Blank
    - OPRs/SPMs
    - MS/MSD, CRM (if required)
xi. Instrument QC Run list for each "set" or bundle of related QC. Each set or bundle may include:
    - Run List
    - Mass resolutions, opening and closing (HRMS only)
    - Run Table
    - Linearity (Form 3s, if present in run)
    - Calibration Verification. Forms 4 and 6, opening only unless closing required.
    - Isomer Specificity (Form 5 (Dx) or single page from PCB chromatogram)
    - Full Calibration form 3A/B (PCB)
    - Client Standard (if applicable)
xii. Raw Data
    - Sample Raw Data with chromatograms.
    - Laboratory blank raw data and chromatograms.
    - OPR/SPM (or MS/MSD, CRM) raw data and chromatograms.
    - Instrumental raw data and chromatograms
        -Run List
        -Linearity, with OpusQuan RRF summary sheet
        -Calibration Verification
        -Window Resolutions (Dx only)
        -Client Standards (if applicable)
xiii. Accreditation Scope

AXYS Generic Excel Based Format

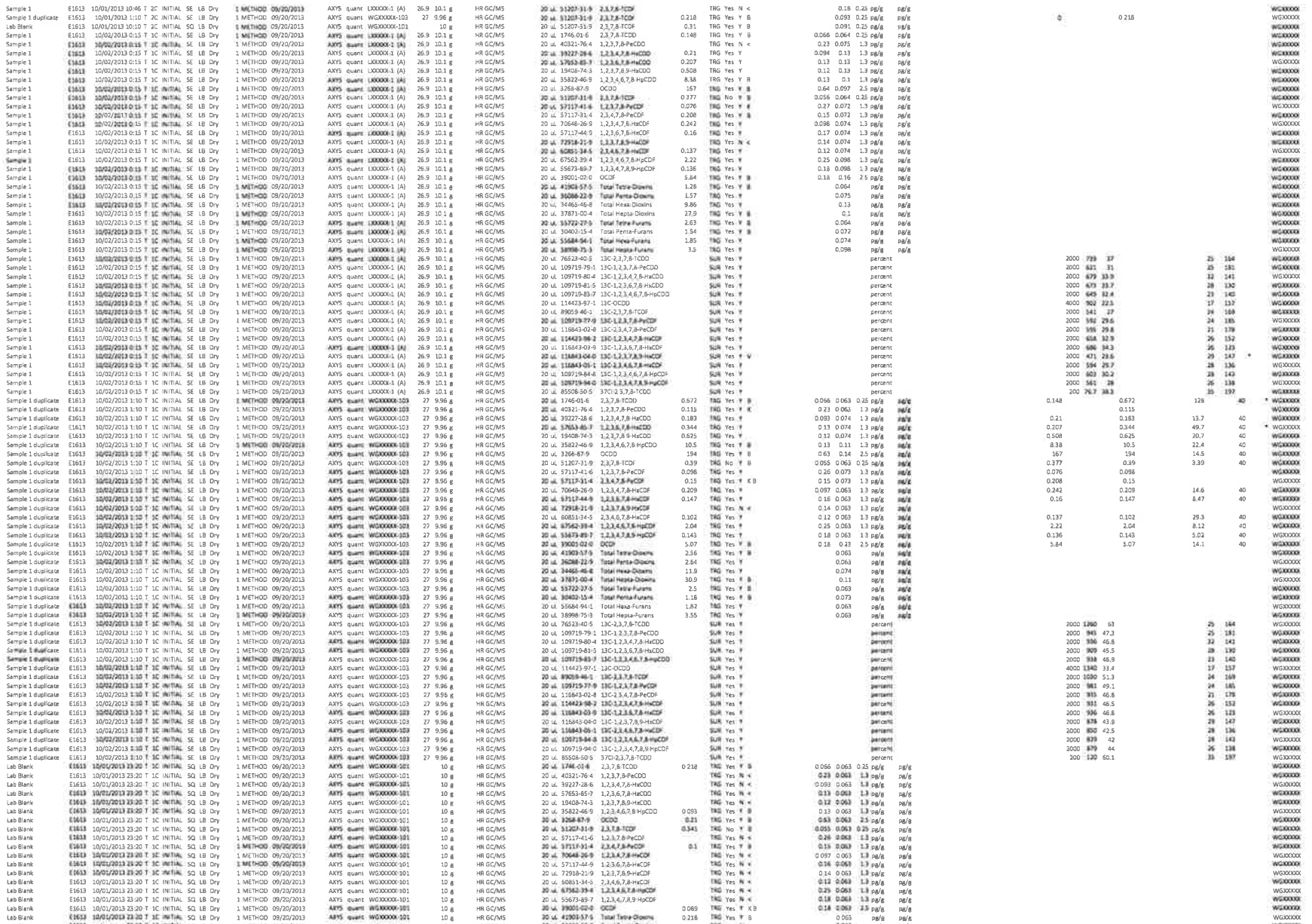
CLIENT_ID	Sample 1		Lab Blank (101)		Spiked Matrix (102)
Matrix Description	XAD				
Axys ID	LXXXX-1		WGXXXX-101		WGXXXX-102
WORKGROUP	WGXXXX		WGXXXX		WGXXXX
Sample Size	20L		20L		
UNITS	flag pg/L	pg/L (RL)	flag pg/L	pg/L (RL)	flag % Recovery -
2,3,7,8-TCDD	<	0.054	K B 0.059	0.05	93.9
1,2,3,7,8-PECDD	<	0.054	<	0.05	99.6
1,2,3,4,7,8-HXCDD	<	0.054	<	0.05	99.1
1,2,3,6,7,8-HXCDD	<	0.054	<	0.05	102
1,2,3,7,8,9-HXCDD	<	0.054	<	0.05	98.5
1,2,3,4,6,7,8-HPCDD	K B 0.832	0.054	K B 0.097	0.05	96.6
OCDD	B 12.3	0.054	K B 0.251	0.05	91.7
2,3,7,8-TCDF (225)					
2,3,7,8-TCDF	<	0.054	<	0.05	100
1,2,3,7,8-PECDF	<	0.054	<	0.05	93.1
2,3,4,7,8-PECDF	<	0.054	K B 0.05	0.05	97
1,2,3,4,7,8-HXCDF	<	0.054	<	0.05	91.1
1,2,3,6,7,8-HXCDF	<	0.054	<	0.05	98.4
1,2,3,7,8,9-HXCDF	<	0.054	<	0.05	101
2,3,4,6,7,8-HXCDF	<	0.054	<	0.05	89.3
1,2,3,4,6,7,8-HPCDF	K B 0.221	0.054	K B 0.055	0.05	106
1,2,3,4,7,8,9-HPCDF	<	0.054	<	0.05	93.9
OCDF	K 0.283	0.054	<	0.05	84.3
TOTAL TETRA-DIOXINS	<	0.054	<	0.05	
TOTAL PENTA-DIOXINS	<	0.054	<	0.05	
TOTAL HEXA-DIOXINS	0.146	0.054	<	0.05	
TOTAL HEPTA-DIOXINS	<	0.054	<	0.05	
TOTAL TETRA-FURANS	<	0.054	<	0.05	
TOTAL PENTA-FURANS	0.055	0.054	<	0.05	
TOTAL HEXA-FURANS	0.179	0.054	<	0.05	
TOTAL HEPTA-FURANS	0.203	0.054	<	0.05	
13C-2,3,7,8-TCDD (% Recovery)	64.4		48.2		61.4
13C-1,2,3,7,8-PECDD (% Recovery)	78.5		64.7		86.1
13C-1,2,3,4,7,8-HXCDD (% Recovery)	76.4		60.1		61.9
13C-1,2,3,6,7,8-HXCDD (% Recovery)	77.6		61.3		67.3
13C-1,2,3,4,6,7,8-HPCDD (% Recovery)	84.9		57.8		59.3
13C-OCDD (% Recovery)	78.8		45.5		50.6
13C-2,3,7,8-TCDF (% Recovery)	62.9		55.6		61.4
13C-1,2,3,7,8-PECDF (% Recovery)	81.7		63.3		85.1
13C-2,3,4,7,8-PECDF (% Recovery)	63		55.3		60.9
13C-1,2,3,4,7,8-HXCDF (% Recovery)	79.4		60		64
13C-1,2,3,6,7,8-HXCDF (% Recovery)	84.2		59.8		62.3
13C-1,2,3,7,8,9-HXCDF (% Recovery)	72.4		61.7		62.3
13C-2,3,4,6,7,8-HXCDF (% Recovery)	77.7		62.9		64.9
13C-1,2,3,4,6,7,8-HPCDF (% Recovery)	81.1		71.7		89.8
13C-1,2,3,4,7,8,9-HPCDF (% Recovery)	77.2		57.8		50.3
37CL-2,3,7,8-TCDD (% Recovery)	64.2		48.2		60.4
13C6-1,2,3,4-TCDD (% Recovery)	112		108		
WHO 1998 TOTAL (TEQ ND=0)	0.00123		0		
WHO 1998 TOTAL (TEQ ND=1/2 DL)	0.0925		0.0845		
WHO 2005 TOTAL (TEQ ND=0)	0.00369		0		
WHO 2005 TOTAL (TEQ ND=1/2 DL)	0.089		0.079		

Sample 1	E1613	10/01/2013 10:46	T	2C	INITIAL	Analysis	WGXXXXX
Sample 1 Duplicate	E1613	10/01/2013 11:23	T	2C	INITIAL	Analysis	WGXXXXX
Lab Blank	E1613	10/01/2013 10:10	T	2C	INITIAL	Analysis	WGXXXXX
Sample 2	E1613	10/02/2013 0:15	T	1C	INITIAL	Analysis	WGXXXXX
Sample 2 Duplicate	E1613	10/02/2013 1:10	T	1C	INITIAL	Analysis	WGXXXXX
Lab Blank	E1613	10/01/2013 23:20	T	1C	INITIAL	Analysis	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	Analysis	WGXXXXX

DNREC EQuIS EDD FORMAT
WGXXXXXDX.Batch_v3

AXYS	Sample 1	Sample 1	SE	N	Field		WGXXXXX	09/10/2013 9:30	State line	LXXXXX	09/18/2013	UNKNOWN	SC	N
AXYS	Lab Blank	Lab Blank	SQ	LB	Lab		WGXXXXX	09/20/2013 08:00:00			09/20/2013			N
AXYS	Sample 1 duplicate	Sample 1 duplicate	SE	LR	Field	Sample 1	WGXXXXX	09/10/2013 9:30	State line	LXXXXX	09/18/2013	UNKNOWN	SC	N
AXYS	Spiked Matrix	Spiked Matrix	SQ	BS	Lab		WGXXXXX	09/20/2013 08:00:00			09/20/2013			N

DNREC EQuIS EDD Format
WGXXXXXDX.Sample_V3 file



Lab Blank	E1613	10/01/2013 23:20	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-101	10 g	HR GC/MS	20 uL	38998-75-3	Total Hepta-Furans	TRG	Yes	N	*	0.063	pg/g	pg/g						WGXXXXX
Lab Blank	E1613	10/01/2013 23:20	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-101	10 g	HR GC/MS	20 uL	76523-40-5	13C-2,3,7,8-TCDD	SUR	Yes	Y			percent		2000	1560	77.8	25	164	WGXXXXX
Lab Blank	E1613	10/01/2013 23:20	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-101	10 g	HR GC/MS	20 uL	109719-79-1	13C-1,2,3,7,8-PeCDD	SUR	Yes	Y			percent		2000	1540	76.8	25	181	WGXXXXX
Lab Blank	E1613	10/01/2013 23:20	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-101	10 g	HR GC/MS	20 uL	109719-80-4	13C-1,2,3,4,7,8-HxCDD	SUR	Yes	Y			percent		2000	1880	93.9	32	141	WGXXXXX
Lab Blank	E1613	10/01/2013 23:20	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-101	10 g	HR GC/MS	20 uL	109719-81-5	13C-1,2,3,6,7,8-HxCDD	SUR	Yes	Y			percent		2000	1950	97.6	28	130	WGXXXXX
Lab Blank	E1613	10/01/2013 23:20	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-101	10 g	HR GC/MS	20 uL	109719-83-7	13C-1,2,3,4,6,7,8-HpCDD	SUR	Yes	Y			percent		2000	1560	78	23	140	WGXXXXX
Lab Blank	E1613	10/01/2013 23:20	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-101	10 g	HR GC/MS	20 uL	114423-97-1	13C-OCDD	SUR	Yes	Y			percent		4000	2030	50.8	17	157	WGXXXXX
Lab Blank	E1613	10/01/2013 23:20	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-101	10 g	HR GC/MS	20 uL	89059-46-1	13C-2,3,7,8-TCDF	SUR	Yes	Y			percent		2000	1610	80.5	24	169	WGXXXXX
Lab Blank	E1613	10/01/2013 23:20	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-101	10 g	HR GC/MS	20 uL	109719-77-9	13C-1,2,3,7,8-PeCDF	SUR	Yes	Y			percent		2000	1530	76.4	24	185	WGXXXXX
Lab Blank	E1613	10/01/2013 23:20	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-101	10 g	HR GC/MS	20 uL	116843-02-8	13C-2,3,4,7,8-PeCDF	SUR	Yes	Y			percent		2000	1430	71.6	21	178	WGXXXXX
Lab Blank	E1613	10/01/2013 23:20	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-101	10 g	HR GC/MS	20 uL	114423-98-2	13C-1,2,3,4,7,8-HxCDF	SUR	Yes	Y			percent		2000	1870	93.6	26	152	WGXXXXX
Lab Blank	E1613	10/01/2013 23:20	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-101	10 g	HR GC/MS	20 uL	116843-03-9	13C-1,2,3,6,7,8-HxCDF	SUR	Yes	Y			percent		2000	2020	101	26	123	WGXXXXX
Lab Blank	E1613	10/01/2013 23:20	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-101	10 g	HR GC/MS	20 uL	116843-04-0	13C-1,2,3,7,8,9-HxCDF	SUR	Yes	Y			percent		2000	1430	71.5	29	147	WGXXXXX
Lab Blank	E1613	10/01/2013 23:20	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-101	10 g	HR GC/MS	20 uL	116843-05-1	13C-2,3,4,6,7,8-HxCDF	SUR	Yes	Y			percent		2000	1560	77.8	28	136	WGXXXXX
Lab Blank	E1613	10/01/2013 23:20	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-101	10 g	HR GC/MS	20 uL	109719-84-8	13C-1,2,3,4,6,7,8-HpCDF	SUR	Yes	Y			percent		2000	1510	75.6	28	143	WGXXXXX
Lab Blank	E1613	10/01/2013 23:20	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-101	10 g	HR GC/MS	20 uL	109719-94-0	13C-1,2,3,4,7,8,9-HpCDF	SUR	Yes	Y			percent		2000	1410	70.6	26	138	WGXXXXX
Lab Blank	E1613	10/01/2013 23:20	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-101	10 g	HR GC/MS	20 uL	85508-50-5	37Cl-2,3,7,8-TCDD	SUR	Yes	Y			percent		200	148	73.8	35	197	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	1746-01-6	2,3,7,8-TCDD	SC	Yes	Y			percent		10	9.81	98.1	67	158	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	40321-76-4	1,2,3,7,8-PeCDD	SC	Yes	Y			percent		50	47.4	94.8	70	142	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	39227-28-6	1,2,3,4,7,8-HxCDD	SC	Yes	Y			percent		50	48.1	96.1	70	164	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	57653-85-7	1,2,3,6,7,8-HxCDD	SC	Yes	Y			percent		50	48.6	97.2	76	134	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	19408-74-3	1,2,3,7,8,9-HxCDD	SC	Yes	Y			percent		50	44.2	88.5	64	162	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	35822-46-9	1,2,3,4,6,7,8-HpCDD	SC	Yes	Y			percent		50	47	93.9	70	140	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	3268-87-9	OCDD	SC	Yes	Y			percent		100	93.8	93.8	78	144	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	51207-31-9	2,3,7,8-TCDF	SC	Yes	Y			percent		10	9.75	97.5	75	158	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	57117-41-6	1,2,3,7,8-PeCDF	SC	Yes	Y			percent		50	47.6	95.1	80	134	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	57117-31-4	2,3,4,7,8-PeCDF	SC	Yes	Y			percent		50	47.6	95.2	68	160	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	70648-26-9	1,2,3,4,7,8-HxCDF	SC	Yes	Y			percent		50	46.6	93.2	72	134	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	57117-44-9	1,2,3,6,7,8-HxCDF	SC	Yes	Y			percent		50	44.3	88.7	84	130	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	72918-21-9	1,2,3,7,8,9-HxCDF	SC	Yes	Y			percent		50	47.7	95.3	78	130	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	60851-34-5	2,3,4,6,7,8-HxCDF	SC	Yes	Y			percent		50	46.4	92.9	70	156	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	67562-39-4	1,2,3,4,6,7,8-HpCDF	SC	Yes	Y			percent		50	51.5	103	82	122	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	55673-89-7	1,2,3,4,7,8,9-HpCDF	SC	Yes	Y			percent		50	46.9	93.9	78	138	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	39001-02-0	OCDF	SC	Yes	Y			percent		100	92.8	92.8	63	170	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	76523-40-5	13C-2,3,7,8-TCDD	SUR	Yes	Y			percent		100	87.5	87.5	20	175	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	109719-79-1	13C-1,2,3,7,8-PeCDD	SUR	Yes	Y			percent		100	90.6	90.6	21	227	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	109719-80-4	13C-1,2,3,4,7,8-HxCDD	SUR	Yes	Y			percent		100	98.5	98.5	21	193	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	109719-81-5	13C-1,2,3,6,7,8-HxCDD	SUR	Yes	Y			percent		100	98.7	98.7	25	163	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	109719-83-7	13C-1,2,3,4,6,7,8-HpCDD	SUR	Yes	Y			percent		100	90.2	90.2	26	166	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	114423-97-1	13C-OCDD	SUR	Yes	Y			percent		200	134	66.8	13	198.5	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	89059-46-1	13C-2,3,7,8-TCDF	SUR	Yes	Y			percent		100	91.7	91.7	22	152	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	109719-77-9	13C-1,2,3,7,8-PeCDF	SUR	Yes	Y			percent		100	92.3	92.3	21	192	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	116843-02-8	13C-2,3,4,7,8-PeCDF	SUR	Yes	Y			percent		100	88.7	88.7	13	328	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	114423-98-2	13C-1,2,3,4,7,8-HxCDF	SUR	Yes	Y			percent		100	95.6	95.6	19	202	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	116843-03-9	13C-1,2,3,6,7,8-HxCDF	SUR	Yes	Y			percent		100	103	103	21	159	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	116843-04-0	13C-1,2,3,7,8,9-HxCDF	SUR	Yes	Y			percent		100	81.6	81.6	17	205	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	116843-05-1	13C-2,3,4,6,7,8-HxCDF	SUR	Yes	Y			percent		100	88.5	88.5	22	176	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	109719-84-8	13C-1,2,3,4,6,7,8-HpCDF	SUR	Yes	Y			percent		100	84.3	84.3	21	158	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	109719-94-0	13C-1,2,3,4,7,8,9-HpCDF	SUR	Yes	Y			percent		100	81.5	81.5	20	186	WGXXXXX
Spiked Matrix	E1613	10/01/2013 20:36	T	1C	INITIAL	SQ	LB	Dry	1 METHOD	09/20/2013	AXYS	quant	WGXXXXX-102	20 uL	HR GC/MS	20 uL	85508-50-5	37Cl-2,3,7,8-TCDD	SUR	Yes	Y			percent		10	8.6	86	21	191	WGXXXXX

DNREC EQuIS EDD FORMAT
WGXXXXXDX.TestResultQC_v3

SECTION 2 – FINANCIAL BID

REQUEST FOR PROPOSAL
FOR
PROFESSIONAL SERVICES
WATERSHED APPROACH TO TOXICS ASSESSMENT AND RESTORATION
ISSUED BY DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

CONTRACT NUMBER NAT14190-WATAR

A Proposal
Submitted to:

Richard W. Greene, Ph.D.
State of Delaware DNREC
Division of Watershed Stewardship
820 Silver Lake Blvd., Suite 220
Dover, DE 19904-2464

Prepared by:

AXYS ANALYTICAL SERVICES LTD.
2045 Mills Road West
Sidney, BC Canada V8L 5X2
Richard Grace – (905) 484-2314 (rgrace@axys.com)
Teresa Cameron – (250) 655-5800 (tcameron@axys.com)

DUE DATE: August 29, 2014, 1:00 PM ET

ORIGINAL

II. FINANCIAL EVALUATION

Bidder must submit their financial bid in the tabular format that follows. The usage numbers provided below are estimates and are provided for evaluation purposes only. Bidders must provide a price for all items detailed below even if there is no estimated usage given. Prices are to be firm unit prices in U.S. Dollars and will be evaluated as such.

Item	Description	Estimated Usage Per Year	Unit Price (EACH)	Unit Price x Est. Usage per Year
1	Carboy supply, cleaning, proofing, and shipment to DNREC	20	200	4,000
2	Carboy processing to produce glass wound filter samples and XAD resin samples from DNREC-submitted Carboys. Includes preparation of columns to hold filters and XAD. Includes media cost and proofing costs.	20	300	6,000
3	Analysis of Glass Wound Filters for PCB congeners by EPA 1668A; dioxins & furans by EPA 1613B; and OC Pesticides by EPA 1699 or equivalent, all from a common extract.	25	2,050	51,250
4	Analysis of XAD Resin for PCB congeners by EPA 1668A; dioxins & furans by EPA 1613B; and OC Pesticides by EPA 1699 or equivalent, all from a common extract.	25	2,050	51,250
5	Analysis of 2.5L whole water or filtered water samples for PCB congeners by EPA 1668A.	40	825	33,000
6	Analysis of 2.5L whole water or filtered water samples for dioxins & furans by EPA 1613B.	20	625	12,500
7	Analysis of 2.5L whole water or filtered water samples for target OC Pesticides by EPA 1699 or equivalent.	20	750	15,000
8	Analysis of 2.5L whole water or filtered water samples for target PAH compounds by EPA 8270 C/D modified by EPA 1625.	25	575	14,375
9	Analysis of Sediment for PCB congeners by EPA 1668A; dioxins & furans by EPA 1613B; OC Pesticides by EPA 1699 or equivalent; and target PAH compounds by EPA 8270 C/D modified by EPA 1625. Includes moisture determination.	25	2,650	66,250
10	Tissue Homogenization	25	50	1,250
11	Analysis of Tissue for PCB congeners by EPA 1668A; dioxins & furans by EPA 1613B; OC Pesticides by EPA 1699 or equivalent; and target PAH compounds by EPA 8270 C/D modified by EPA 1625. Includes moisture determination and gravimetric lipid content as per EPA 1613B.	30	2,675	80,250

The price used in the financial evaluation will be the total aggregate cost of the Estimated Usages multiplied by the firm unit prices. Firm unit prices shall be constant for an assumed 3 year contract.

SECTION 3 – CERTIFICATIONS

REQUEST FOR PROPOSAL
FOR
PROFESSIONAL SERVICES
WATERSHED APPROACH TO TOXICS ASSESSMENT AND RESTORATION
ISSUED BY DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

CONTRACT NUMBER NAT14190-WATAR

A Proposal
Submitted to:

Richard W. Greene, Ph.D.
State of Delaware DNREC
Division of Watershed Stewardship
820 Silver Lake Blvd., Suite 220
Dover, DE 19904-2464

Prepared by:

AXYS ANALYTICAL SERVICES LTD.
2045 Mills Road West
Sidney, BC Canada V8L 5X2
Richard Grace – (905) 484-2314 (rgrace@axys.com)
Teresa Cameron – (250) 655-5800 (tcameron@axys.com)

DUE DATE: August 29, 2014, 1:00 PM ET

STATE OF DELAWARE

Department of Natural Resources and Environmental Control

Attachment 2

CONTRACT NO.: **NAT14190-WATAR**
CONTRACT TITLE: **Watershed Approach to Toxics Assessment and Restoration**
OPENING DATE: **August 29, 2014 at 1:00 PM (Local Time)**

NON-COLLUSION STATEMENT

This is to certify that the undersigned Vendor has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal, **and further certifies that it is not a sub-contractor to another Vendor who also submitted a proposal as a primary Vendor in response to this solicitation** submitted this date to the State of Delaware, Department of Natural Resources and Environmental Control.

It is agreed by the undersigned Vendor that the signed delivery of this bid represents the Vendor's acceptance of the terms and conditions of this solicitation including all specifications and special provisions.

NOTE: Signature of the authorized representative **MUST** be of an individual who legally may enter his/her organization into a formal contract with the State of Delaware, Department of Natural Resources and Environmental Control.

COMPANY NAME AXYS Analytical Services Ltd. (Check one)

X	Corporation
	Partnership
	Individual

NAME OF AUTHORIZED REPRESENTATIVE
(Please type or print) Sean Helmus

SIGNATURE Original on File TITLE Controller

COMPANY ADDRESS 2045 Mills Road West, Sidney, BC Canada V8L 5X2

PHONE NUMBER 250-655-5800 FAX NUMBER 250-655-5811

EMAIL ADDRESS shelmus@axys.com

FEDERAL E.I. NUMBER 98-0164200 STATE OF DELAWARE LICENSE NUMBER N/A

COMPANY CLASSIFICATIONS: CERT. NO.:	Certification type(s)	Circle all that apply
	Minority Business Enterprise (MBE)	Yes (No)
	Woman Business Enterprise (WBE)	Yes (No)
	Disadvantaged Business Enterprise (DBE)	Yes (No)
	Veteran Owned Business Enterprise (VOBE)	Yes (No)
	Service Disabled Veteran Owned Business Enterprise (SDVOBE)	Yes (No)

[The above table is for informational and statistical use only.]

PURCHASE ORDERS SHOULD BE SENT TO:
(COMPANY NAME) AXYS Analytical Services Ltd.

ADDRESS 2045 Mills Road West, Sidney, BC Canada V8L 5X2

CONTACT Richard Grace

PHONE NUMBER 905-484-2314 FAX NUMBER 250-655-5811

EMAIL ADDRESS rgrace@axys.com

AFFIRMATION: Within the past five years, has your firm, any affiliate, any predecessor company or entity, owner, Director, officer, partner or proprietor been the subject of a Federal, State, Local government suspension or debarment?

YES _____ NO X if yes, please explain _____

THIS PAGE SHALL HAVE ORIGINAL SIGNATURE, BE NOTARIZED AND BE RETURNED WITH YOUR PROPOSAL

SWORN TO AND SUBSCRIBED BEFORE ME this 19 day of August, 20 14

STATE OF DELAWARE

Original on File

artment of Natural Resources and Environmental Control

Notary Public _____ My commission expires does not expire

City of _____ County of _____ ~~State~~ of _____

Province of British Columbia

DAMON O'BRIEN
9830 Fourth Street
Sidney BC V8L 2Z3
Barrister & Solicitor

STATE OF DELAWARE
Department of Natural Resources and Environmental Control

Attachment 3

Contract No. NAT14190-WATAR
Contract Title: Watershed Approach to Toxics Assessment and Restoration

EXCEPTION FORM

Proposals must include all exceptions to the specifications, terms or conditions contained in this RFP. If the vendor is submitting the proposal without exceptions, please state so below.

☐ By checking this box, the Vendor acknowledges that they take no exceptions to the specifications, terms or conditions found in this RFP.

Paragraph # and page #	Exceptions to Specifications, terms or conditions	Proposed Alternative
Section III,A,1,pg.2	AXYS does not have a location or employees in the state of Delaware so this requirement does not apply as per Delaware Dept of Revenue	If interpretation is incorrect, AXYS would obtain a business license.

Note: use additional pages as necessary.

STATE OF DELAWARE

Department of Natural Resources and Environmental Control

Attachment 4

Contract No. NAT14190-WATAR
Contract Title: Watershed Approach to Toxics Assessment and Restoration

CONFIDENTIAL INFORMATION FORM

☒ By checking this box, the Vendor acknowledges that they are not providing any information they declare to be confidential or proprietary for the purpose of production under 29 Del. C. ch. 100, Delaware Freedom of Information Act.

Confidentiality and Proprietary Information

Note: use additional pages as necessary.

STATE OF DELAWARE

Department of Natural Resources and Environmental Control

Attachment 5

Contract No. NAT14190-WATAR
Contract Title: Watershed Approach to Toxics Assessment and Restoration

BUSINESS REFERENCES

List a minimum of three business references, including the following information:

- Business Name and Mailing address
- Contact Name and phone number
- Number of years doing business with
- Type of work performed

Please do not list any State Employee as a business reference. If you have held a State contract within the last 5 years, please provide a separate list of the contract(s).

1.	**Contact Name & Title:**	Greg Cavallo - Geologist
	Business Name:	Delaware River Basin Commission
	Address:	25 State Police Drive
		West Trenton, NJ, 08628-0360
	Email:	gcavallo@drbc.state.nj.us
	Phone # / Fax #:	(609) 883-3800 ext 270
	Current Vendor (YES or NO):	Yes
	Years Associated & Type of Work Performed:	2001 - present - Analysis of water, sediment, and biota samples for PCBs by 1668, Dx/F by 1613, OC Pesticides by mod EPA 1699 and mod 8081, PBDE by 1614, PPCP by 1694 and PFCs
2.	**Contact Name & Title:**	Don Yee - Environmental Scientist
	Business Name:	San Francisco Estuary Institute
	Address:	4911 Central Avenue
		Richmond, CA,94804
	Email:	donald@sfei.org
	Phone # / Fax #:	(510) 746-7369
	Current Vendor (YES or NO):	Yes
	Years Associated & Type of Work Performed:	1998-present - 6000 analyses conducted to date in water, sediment, biota, high volume water sample, XAD-2 resin and filters for PCB by 1668, Dx/F by 1613, HRMS OC pesticides, GCMS PAHs, PBDE by 1614, Pesticides by 1699 and PFCs
3.	**Contact Name & Title:**	Bill Scruton -
	Business Name:	Minnesota Pollution Control Agency
	Address:	520 Lafayette Road North
		St. Paul, MN, 55155-4194
	Email:	Bill.Scruton@state.mn.us
	Phone # / Fax #:	(651) 757-2579
	Current Vendor (YES or NO):	Yes
	Years Associated & Type of Work Performed:	2001-present - Analysis of water, soil/sediment, biota and WWTP samples for Dx/F by 1613, PFC, PCBs by 1668A, PAHs, OC Pesticides, PBDE by 1614, GCMS Alkylphenols, Brominated Dx/F and Pyrethroids

STATE OF DELAWARE PERSONNEL MAY NOT BE USED AS REFERENCES.

Only a brief synopsis of each project has been provided here due to the limited available space for text. Further information for each of these references has been provided in the technical proposal document in the expanded experience tables.

STATE OF DELAWARE

Department of Natural Resources and Environmental Control

Attachment 9

Contract No. NAT14190-WATAR
Contract Title: Watershed Approach to Toxics Assessment and Restoration

EMPLOYING DELAWAREANS REPORT

As required by House Bill # 410 (Bond Bill) of the 146th General Assembly and under Section 30, No bid for any public works or professional services contract shall be responsive unless the prospective bidder discloses its reasonable, good-faith determination of:

1. Number of employees reasonable anticipated to be employed on the project: 70
2. Number and percentage of such employees who are bona fide legal residents of Delaware: 0

   Percentage of such employees who are bona fide legal residents of Delaware: 0
3. Total number of employees of the bidder: 94
4. Total percentage of employees who are bona fide resident of Delaware: 0

If subcontractors are to be used:

1. Number of employees who are residents of Delaware: N/A *
2. Percentage of employees who are residents of Delaware: N/A

"Bona fide legal resident of this State" shall mean any resident who has established residence of at least 90 days in the State.

*SUBCONTRACTORS WILL NOT BE USED FOR THIS PROJECT

ADDENDUM 1

AXYS Analytical Services Ltd. (AXYS)
PROPOSAL for Task Order #1 - Contract NAT14190

A Proposal
Submitted to:

Richard W. Green, Ph.D.
State of Delaware DNREC
Division of Watershed Stewardship
820 Silver Lake Blvd., Suite 220
Dover, DE 19904-2464

Prepared by:

AXYS ANALYTICAL SERVICES LTD.
2045 Mills Road West
Sidney, BC Canada V8L 5X2

Richard Grace – (905) 484-2314 (rgrace@axys.com)
Cynthia Tomey – (250) 655-5812 (ctomey@axys.com)

Sept.15, 2014

A) SCOPE OF WORK AND COSTS FOR TASK #1

This proposal covers work identified in Task Order #1 – Delaware Contract NAT14190 – WATAR Revision 1 Excel spreadsheet. This is attached and includes specified samples, matrices, costs, and anticipated timing of sample collection. AXYS has reviewed the scope of work and cost structure and can confirm that all line item costs are correct. Items identified as "contingency" are understood to be options in the execution of the work and may occur in whole, in part, or may not be utilized. All unit costs are unaffected by use or lack thereof regarding contingency samples.

Sampling of Army Creek (scheduled week of Oct. 6, 2014) and Appoquinimink River (scheduled week of Oct. 27, 2014) will constitute the source of samples. Sampling supplies (carboys, bottles, jars, coolers, associated packing – referred to as "supplies") will be provided by AXYS and sent to a destination designated by DNREC project personnel. "Supplies" are included in the cost of analysis provided. Samples will be returned, per sampling event, by DNREC for next day delivery. Freight costs for the return of samples will be paid by DNREC. Arrangements on shipment of "supplies" and returning samples will be coordinated by DNREC and AXYS project management staff.

Table 1 provides information on AXYS methods to be used. Full descriptions of all methods are available in the AXYS RFP response of Aug.29, 2014. In all instances, AXYS will use protocols aligned with previous WATAR work, unless changes in sample handling are mutually agreed upon. The following notes apply in the execution of the work;

1) Co-extraction and fractionation processes, as per AXYS MLA 013 will be applied to XAD-2, filter, sediment, and tissue matrices for AXYS methods MLA 010, MLA 017, and MLA 028. Pricing for these combined tests is as per the RFP and attached excel spreadsheet.
2) Processing of Carboy samples to produce XAD-2 and Filter samples will be as per AXYS SLA 076.
3) Related proofing and cleaning processing for XAD-2 resin, glass wound filter, and Carboys are detailed in the AXYS RFP response of Aug.29, 2014
4) Aqueous samples may be filtered or unfiltered at the discretion of DNREC.
5) All sediment and tissue samples will include a moisture determination.
6) All tissue samples will include a gravimetric lipid determination.
7) Tissue samples are expected to be received from DNREC homogenized.
8) Reporting charges (level IV data package, DNREC EQiUS compliant EDD, and AXYS excel based formats (Generic 3) are included in the unit costs. Final tests of AXYS DNREC EQiUS formats will be complete prior to Oct.6, 2014.
9) All work will be scheduled and completed as per AXYS / DNREC mutual agreement, reached communication at project kick-off meetings and subsequent technical and progress reviews. Should change from original schedules be necessary, for reasons such as allowance for contingency samples, or completion of any remedial analytical work or rework identified during the execution of the work, DNREC will be consulted and changes to schedule will be confirmed as acceptable.
10) The anticipated scope of work will be reviewed in a formal kick-off meeting with DNREC staff (as determined by Rick Greene) prior to Oct.1, 2014 to confirm all requirements and schedules.
11) Confirmation of completion of all contractual and commercial matters, including contracts and Task orders is expected to be complete by Oct. 1, 2014.
12) Further information regarding contracts, task orders, or incremental technical information should be directed to Richard Grace (rgrace@axys.com)
13) Total value of Task Order 1, with all contingency sample options exercised, will not exceed $272,450.

Table 1: Analytical Methods by Matrix

Test	AXYS Method Specified In RFP Response of Aug. 29, 2014	Applicable Matrices for AXYS Method
Dioxin/Furans by EPA 1613B	AXYS MLA 017	Aqueous , Tissue, Sediments, XAD-2, Glass Wound Filter
PCB Congeners by EPA 1668A/C	AXYS MLA 010	Aqueous , Tissue, Sediments, XAD-2, Glass Wound Filter
HRMS OC Pesticides based on EPA 1699 or equivalent	AXYS MLA 028	Tissue, sediment, XAD-2, Glass Wound Filter, Aqueous
PAHs and Alkylated PAHs by EPA 8270C/D + EPA 1625	AXYS MLA 021	Aqueous, Tissue, Sediment

B) AXYS ORGANIZATIONAL STRUCTURE AND PERSONNEL, AND SCHEDULING

AXYS relies on a designated project manager to serve as the designated day to day point of contact to our clients. At a project level, the project manager is responsible for assisting with technical, contractual compliance issues, and logistical interactions with the client on the expected work, as outlined by the Account Manager. The Account Manager consults with the client authorities to provide contractual definition and compliance, assignment of AXYS resources to support contractual and technical service requirements, volumes and requirements regarding samples, types of analyses to be completed, method selection, subcontractors, reporting of data, special needs or custom procedures, and maintains records of all correspondence and conversations. The project manager is responsible for communicating these needs and required timeframes for scheduling of work to our laboratory staff, and serves as a technical resource for our clients. The project manager has wide authority to call on further technical resources if required. All AXYS project managers have the ability to validate data and communicate technical information to our clients at an appropriate technical level. For major accounts, AXYS designates a technical and management team to support the project manager and client. The project manager may call on these resources as required.

AXYS has assigned Cynthia Tomey as the designated project manager for Delaware DNREC work and is backed up by an equally qualified project management staff including Kalai Pillay (Client Services Manager). Cynthia has been performing this function for Delaware DNREC since 2007. Prior to project management at AXYS, Cynthia was a data validation specialist in AXYS operations. Cynthia will be able to provide immediate technical assistance to Delaware DRNEC at a comprehensive level. She has similar duties with other clients including US EPA, US Fish and Wildlife Service, San Francisco Estuary Institute, and Spokane River Regional Toxics Task Force.

The following brief biographies are of the key AXYS team members and managers that would be involved in the Delaware DNREC.

Project Manager – Cynthia Tomey, B.Sc.

Ms. Tomey has been with AXYS since 2004, and has held progressive positions within our Sample Preparation Group, Primary Validation Group, and Secondary Validation Group, to her current position as project manager. As a project manager, Cynthia is responsible for ensuring that all contractual requirements are satisfied, including sample handling and methodology requirements, QA/QC specifications and delivery of results. She has been the project manager for Delaware DNREC since 2007, including a project on the Christina Basin TMDL that resulted in the following publication:

Greene, R., Di Toro, D., Farley, K., Phillips, K., **Tomey, C**. *Modeling Water Column Partitioning of PCBs to Natural Organic Matter and Black Carbon.* Environ. Sci. Technol. 2013, 47, 6408-6414

Director Sales, Marketing, and Service - - Account Manager -Richard Grace, B.Sc.

Mr. Grace will provide overall management for this contract through assignment from his staff and active participation in the execution of this contract. Mr. Grace has been responsible for the management of service provision for analytical and field studies for 25 years. Current duties at AXYS as Director – Sales, Marketing, and Service, and as account manager for Delaware DRNEC, both since 2006, is responsible for assignment of personnel and resources to support all customer projects and the development of product offerings. Prior to AXYS, Mr. Grace was employed at Maxxam Analytics Inc. from 2000 to 2006 as National Environmental Sales Manager and Senior Operations Manager (Ontario Environmental, Microbiological, Air, Food, Petroleum divisions). From 1985 to 1998 Mr. Grace worked in variety of progressive technical and managerial functions in the specialty chemical industry with Nalco Chemical Company, providing engineering services and the evaluation of process additives in major industries with a focus on water quality.

Supporting Resources:

Client Services Manager - Kalai Pillay, B.Sc.

Mr. Pillay is assigned to provide project management back-up and support to Cynthia Tomey in the event of holidays, illness, or as a resource to manage workload variations. Mr. Pillay has been with AXYS for 10 years including 3 years providing data validation and / or supervising our data validation group. From 2006 to 2012 Mr. Pillay has been a project manager for AXYS, with notable assignments for US Fish and Wildlife Service and Environment Canada where he has served as project manager for many key projects.

Director of Operations – Shea Hewage, B.Sc.

Ms. Hewage is responsible for all laboratory analysis at AXYS, and the client services group, with a staff of 60 analysts, supervisors, and managers under her supervision. All analysts are cross trained in a variety of different methods to create a competent, flexible workforce capable of meeting all method and defined client specifications on a routine basis. Ms. Hewage has been with AXYS for 23 years and has been active in all AXYS analytical endeavours in the Persistent Organic Pollutant and emerging contaminant field during that time. Reporting to the president, as Lab Director, Ms. Hewage is responsible and accountable for production at AXYS. Ms. Hewage assigns and directs laboratory resources to execute analysis of client samples by defined analytical and QA/QC procedures and fully trained analysts. Timing of analysis is based on inputs from project management to meet defined client requirements.

VP Quality Assurance – Dale Hoover, B.Sc.

Mr. Hoover is director of AXYS Quality Assurance and has been with AXYS for 24 years. As the Director of Quality Assurance Mr. Hoover operates independently of AXYS daily operations and is accountable for developing standards for quality and for administering a quality program to ensure these standards are adhered to. Mr. Hoover is a certified auditor for compliance to ISO

17025 standards. As a private industry auditor in CALA he performs audits of public sector laboratories in the trace organics and general management categories. Mr. Hoover has the overall responsibility for ensuring that AXYS' systems provide accurate, defensible results at standards appropriate for their intended use. Mr. Hoover brings considerable expertise in standards of data quality and is available to bring this expertise to the team to insure the most defensible of data.

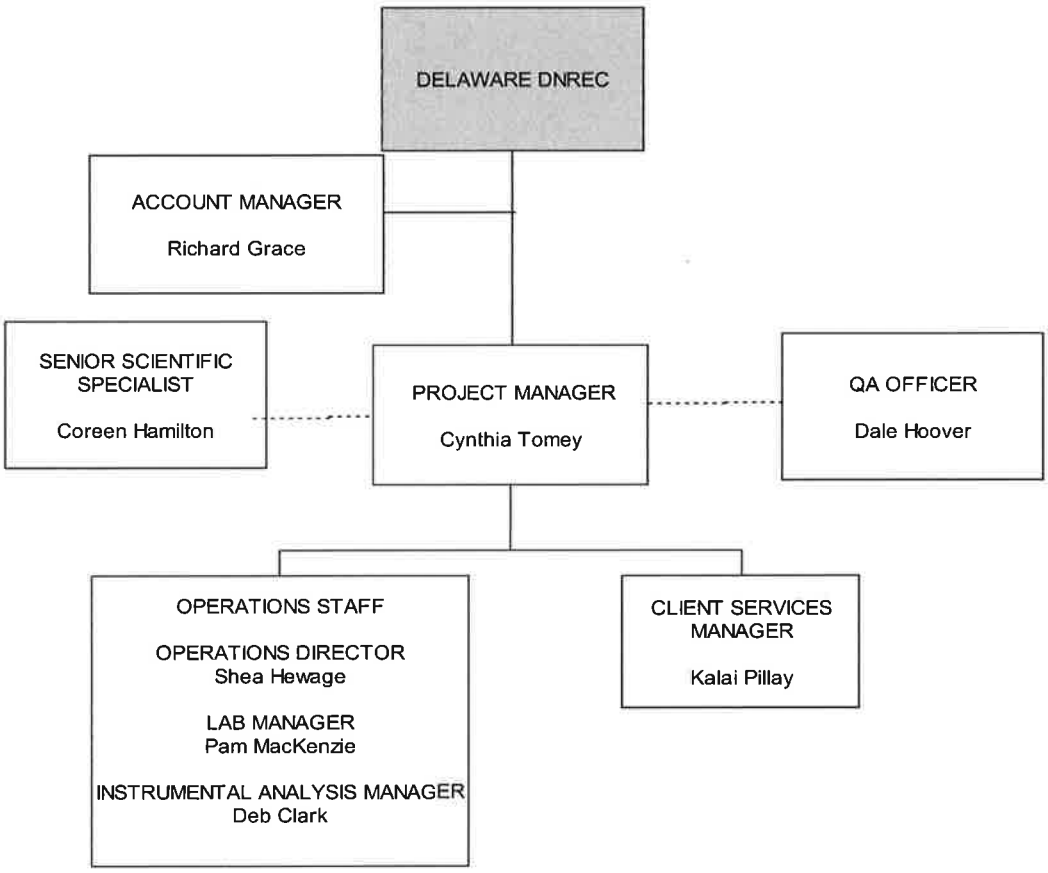
Senior Scientist and Technical Specialist – Coreen Hamilton, PhD.

Designated as a technical resource for this contract, Dr. Hamilton has a PhD in analytical chemistry and has been at AXYS since 1984. Dr. Hamilton is also a faculty member at the University of Victoria and teaches third and fourth year analytical chemistry. Over the past 29 years Dr. Hamilton has held a variety of senior technical and managerial positions at AXYS. She has been instrumental in much of the analytical development at AXYS that would include analysis of naphthenic acids, extended alkylated PAHs, PBDEs, nonylphenols, brominated dioxin/furans and sterols. She specializes in high volume and passive sampling and analysis. Currently Dr. Hamilton is assigned as technical support to specific analytical and method development projects.

While we have outlined individual responsibilities, we must emphasize that any problems that may arise are handled in a team approach, drawing upon the knowledge and experience of all AXYS scientists.

Figure 1 illustrates the project organizational flow chart for Delaware DNREC work. The overall AXYS organizational charts were attached as Appendix 8 in the original RFP response.

Figure 1: DELAWARE DNREC WORKING RELATIONSHIP FLOW CHART



TASK ORDER 1: Delaware Contract NAT14190-WATAR_rev1

Summary of Samples to be Analyzed by AXYS in Support of 2014 WATAR Sampling Campaign

Prepared by: Rick Greene, Delaware DNREC, Watershed Assessment

Date: September 10, 2014

Samples from Army Creek watershed scheduled for collection week of October 6, 2014.

Samples from Appoquinimink watershed scheduled for collection week of October 27, 2014.

Watershed	Station	Sample ID	STORET	Latitude	Longitude	Surface Water, 15-25L for PCB, DxF & OC Pest from Filters	Surface Water, 15-25L for PCB, DxF & OC Pest from XAD2	Surface Water, 2.5L for Whole Water PCBs	Surface Water, 2.5L for Filtered Water PCBs	Surface Water, 2.5L for Whole Water DxF	Surface Water, 2.5L for Whole Water OC Pest	Surface Water, 2.5L for Whole Water PAHs	Surface Water, 2.5L for Filtered Water PAHs	Sediments PCBs, DxF, OC Pest, PAHs & Moisture	Fish Tissue PCBs, DxF, OC Pest, PAHs & Lipid
Army Creek	Army Creek at Route 9		114011	39.651811	-75.588246	1	2	1	1			1	1	1	1
	Army Pond		na	39.651945	-75.607168	1	1					1	1	1	1
	Army Creek at Route 13		114021	39.648890	-75.621261	1	1					1	1	1	1
	Unnamed trib at RR Bridge East of Route 13		114031	39.651662	-75.618486	1	1					1	1	1	
	Unnamed trib at Route 13 Near Airport Industrial Park		114041	39.662596	-75.607386	1	1					1	1	1	
	Unnamed trib at Route 13 Near Route 40		114051	39.652248	-75.618398	1	1					1	1	1	
	Field Duplicates					1	1					1	1	1	
	Equipment/Rinsate Blanks							2		2	2	2			1
	Contingency					2	2	4	4	2	2	4	4		2
Appoquinimink	Appoquinimink River at Mouth		109091	39.449126	-75.578927	1	1					1	1	1	1
	Appoquinimink River at Route 9		109121	39.465000	-75.611364	1	2	1	1			1	1	1	1
	Appoquinimink River at Route 299 (Odessa)		109051	39.452991	-75.653966	1	1					1	1	1	1
	Noxontown Pond Overflow at Road 38		109131	39.434407	-75.682975	1	1					1	1	1	1
	Upstream of Noxontown Pond at Route 71		109221	39.408455	-75.699056	1	1					1	1	1	
	Drawyer Creek at Route 13		109071	39.470221	-75.651824	1	1					1	1	1	1
	Shallcross Lake Overflow at Road 428		109191	39.483323	-75.671149	1	1					1	1	1	
	Dove Nest Branch at Road 430		109201	39.462588	-75.688102	1	1					1	1	1	1
	Silver Lake Overflow at Road 442		109031	39.438725	-75.693194	1	1					1	1	1	1
	Unnamed Trib Upstream of Silver Lake at Route 71		109251	39.431000	-75.709600	1	1					1	1	1	
	Field Duplicates					1	1					1	1	1	
	Equipment/Rinsate Blanks							4		4	4	4			1
	Contingency					2	2	4	4	4	4	4	4		4
					Number of Analyses =	22	24	16	10	12	12	32	26	18	18
					Unit Cost =	$2,050.00	$2,050.00	$825.00	$825.00	$625.00	$750.00	$575.00	$575.00	$2,650.00	$2,675.00
					Cost for Analyses =	$45,100.00	$49,200.00	$13,200.00	$8,250.00	$7,500.00	$9,000.00	$18,400.00	$14,950.00	$47,700.00	$48,150.00
					Carboy-Related Unit Cost =	$500.00									
					Carboy-Related Cost =	$11,000.00							**Total Analysis Cost**		
					Total Analysis Cost + Carboy-Related Cost =	$272,450.00							$261,450.00		

Notes:

1. Surface Water, 15-25-L samples will be collected by DNREC into pre-cleaned and proofed stainless steel carboys. Samples will be collected using a peristaltic pump and platinum-cured silicon tubing. The tubing will be purged prior to sample collection. Carboys will be shipped to AXYS Analytical for separation into particulate and dissolved phase PCB, DxF, and OC pesticide fractions.

2. Surface Water, 2.5-L samples for whole water and dissolved PCBs will be collected by DNREC into factory-sealed and certified amber bottles equipped with Teflon lids. At the indicated stations, 2 samples will be collected: one will be analyzed for PCBs on a "whole water" basis; the other will be filtered and the filtrate will be analyzed for dissolved PCBs. Filtering and analysis will be performed at AXYS Analytical. Certain of these 2.5-L samples will serve as a "check" on results obtained from the 15-25-L carboy samples. Others will serve various contingencies.

3. Surface Water, 2.5-L samples for whole water and dissolved PAHs will be collected by DNREC into factory-sealed and certified amber bottles equipped with Teflon lids. At the indicated stations, 2 samples will be collected: one will be analyzed for PAHs on a "whole water" basis; the other will be filtered and the filtrate will be analyzed for dissolved PAHs. Filtering and analysis will be performed at AXYS Analytical.

4. Surface Sediment for PCBs, DxF, OC Pesticides and PAH: Samples will be composites consisting of 3 surface grabs combined in equal parts from the center, right and left sides at the station cross-section. These samples will be analyzed by AXYS Analytical.

5. Fish samples will be composites of 5 individual fish collected at the station. Species will not be mixed to form composites. All fish in a composite shall be of similar size. The target species for tide water stations will be channel catfish and white perch. The target species for non-tidal stations will be largemouth bass. Other species will be accepted for analysis on a case-by-case basis depending on species collected. Fish samples will be prepared as fillets or otherwise as edible portions depending on species. DNREC ELS will prepare all samples for analysis. Analyses for organic compounds will be performed by AXYS Analytical.