# Perfluorochemicals in Mississippi River Pool 2: 2012 Update

Fish, benthic invertebrates, water, and sediment were tested for PFCs in 2012. Results are summarized and compared to previous results from Pool 2.

Minnesota Pollution Control Agency

May 2013

## Authors

Bruce Monson



## Contributors / acknowledgements

Paul Hoff

Phil Monson

Joel Stiras

Harold Wiegner

## Editing and Graphic Design

Cover photo: Upper Midwest Environmental Sciences Center. http://www.umesc.usgs.gov/aerial_photos/s/s31g1_1997ob.html


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## Minnesota Pollution Control Agency

520 Lafayette Road North | Saint Paul, MN 55155-4194 | www.pca.state.mn.us | 651-296-6300

Toll free 800-657-3864 | TTY 651-282-5332


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**Document number:** c-pfc1-21

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# Abbreviations glossary

## Groups

PFCs – perfluorochemicals or perfluorinated compounds
PASs – perfluoroalkyl surfactants
PFCAs – perfluorocarboxylic acid
PFSAs – polyfluorinated alkyl substances
FTOH – fluorotelomer alcohols
PFAAs – perfluoroalkyl acids

## Individual

PFBA – perfluorobutanoic acid (C4 Acid)
PFBS – perfluorobutane sulfonate (C4 Sulfonate)
PFPeA – perfluoropentanoic acid (C5 Acid)
PFHxA – perfluorohexanoic acid (C6 Acid)
PFHxS – perfluorohexane sulfonate (C6 Sulfonate)
PFHpA – perfluoroheptanoic acid (C7 Acid)
PFOA – perfluorooctanoic acid (C8 Acid)
PFOS – perfluorooctane sulfonate (C8 Sulfonate)
PFOSA – perfluorooctane sulfonamide (C8 Sulfonamide, branched)
PFNA – perfluorononanoic acid (C9 Acid)
PFDA – perfluorodecanoic acid (C10 Acid)
PFUnA – perfluoroundecanoic acid (C11 Acid)
PFDoA – perfluorododecanoic acid (C12 Acid)

## Other abbreviations

AFFF – aqueous fire-fighting foam
ECF – electrochemical fluorination
FCA – fish consumption advisory
MDH – Minnesota Department of Health
MDNR – Minnesota Department of Natural Resources
MPCA – Minnesota Pollution Control Agency
WWTP – wastewater treatment plant

# Executive summary


Mississippi River Pool 2 is the 32.5 mile reach between Lock & Dam No. 1 (Ford Dam) and Lock & Dam No. 2 (Hastings Dam), dissecting Minneapolis, St. Paul, and communities south of St. Paul to Hastings. Perfluorochemicals (PFCs) were produced by 3M between the 1950s and 2002 at its manufacturing plant on the river in Cottage Grove, Minnesota. The Minnesota Pollution Control Agency (MPCA) began testing fish from Pool 2 for PFCs in 2004. Results showed high levels of one PFC, perfluorooctane sulfonate (PFOS), in the fish. Since 2004, fish from many lakes and rivers in Minnesota have been tested for PFCs. Several lakes in Twin Cities Metropolitan Area had high PFOS concentrations in the fish that led to fish consumption advisories from the Minnesota Department of Health (MDH) and impairment classifications by the MPCA.

The MDH developed a reference dose for PFOS that is used as the basis for fish consumption advice. Mean PFOS concentrations in fish greater than 40 parts per billion (ppb or nanogram per gram, ng/g) to 200 ppb are assigned meal advice of one meal per week; greater than 200 to 800 ppb, the advice is one meal per month, and above 800 ppb, do not eat. In 2009, freshwater drum from Pool 2 had the highest PFOS concentrations among the five species tested and drum were assigned a consumption advisory of one meal per month, based on a mean PFOS concentration of 229 ppb. Smallmouth bass exceeded the threshold for a meal per month with a mean PFOS concentration of 209 ppb when data from 2004 to 2009 are combined; however, meal advice was not given for this species in Pool 2 because only catch-and-release fishing is allowed (http://www.health.state.mn.us/divs/eh/fish/). Pool 2 had been listed as impaired for PFOS in fish tissue in 2008 because of a meal per month advisory for bluegill sunfish. It stayed on the impaired waters list in 2010 because of the freshwater drum.

This report presents the results of an intensive monitoring of PFCs in fish, benthic macroinvertebrates (sediment-dwelling insects), water, and sediments in 2012, which was a follow-up to the first intensive study in 2009 (MPCA 2010) and a second study conducted by 3M in 2011 (Cardno-Entrix 2011). The sampling protocols for fish and water in 2012 were identical to the 2009 sampling protocols, with the exception that in 2012 the fish-collection runs were georeferenced. Split sampling of water and fish, which occurred in 2009 with 3M, was not repeated in 2012. The sampling protocol by 3M's contractor, Cardno-Entrix, for the 2011 study differed from the 2009 MPCA study in site locations for water samples, number of fish, and species collected. All three studies collected bluegill sunfish, freshwater drum, smallmouth bass, and white bass. Common carp were collected in 2009 and 2012. Drum had not been sampled prior to 2009, because it was not considered a typical sport fish. Based on the Minnesota Department of Natural Resources' (MDNR) observation that drum have been harvested in Pool 2 for human consumption, it was included as a target species in 2009 and subsequent years.

To characterize possible differences within Pool 2, it was divided into four sections for the monitoring in 2009 and 2012 (Figure ES-1). Three water stations in each section were sampled in triplicate in 2009 and 2012, for a total of 12 stations. The 3M study in 2011 divided Pool 2 into ten reaches; three water stations in 10 reaches gave a total of 30 stations in 2011.

Sediment and benthic macroinvertebrates had not been collected in 2009 or 2011. Testing of sediment and invertebrates were added in 2012 to better understand the extent of PFC contamination in the Pool 2 food web, and to further characterize any differences among sampling stations. Fish can potentially swim throughout Pool 2, whereas sediment and the insect nymphs in the sediments are stationary.

The results of fish and water PFOS concentrations are summarized for 2009 and 2012 in Figure ES-1. PFOS was detected in all but two of the 296 fish collected in 2012 from Pool 2. Pool-wide means decreased substantially between 2009 and 2012 for four of the five fish species. Only carp showed an increase in the mean PFOS concentration. The means for each of the four sections in the river indicate the higher pool-wide PFOS concentration for carp in 2012 was caused by an increase in Section 4 despite drops in the mean in the other sections.

The highest PFOS concentrations in fish coincided with the location of the highest water concentrations in Section 4. Of the five targeted fish species in Pool 2, freshwater drum had the highest average PFOS concentration in 2009, while carp had the highest concentration in 2012.

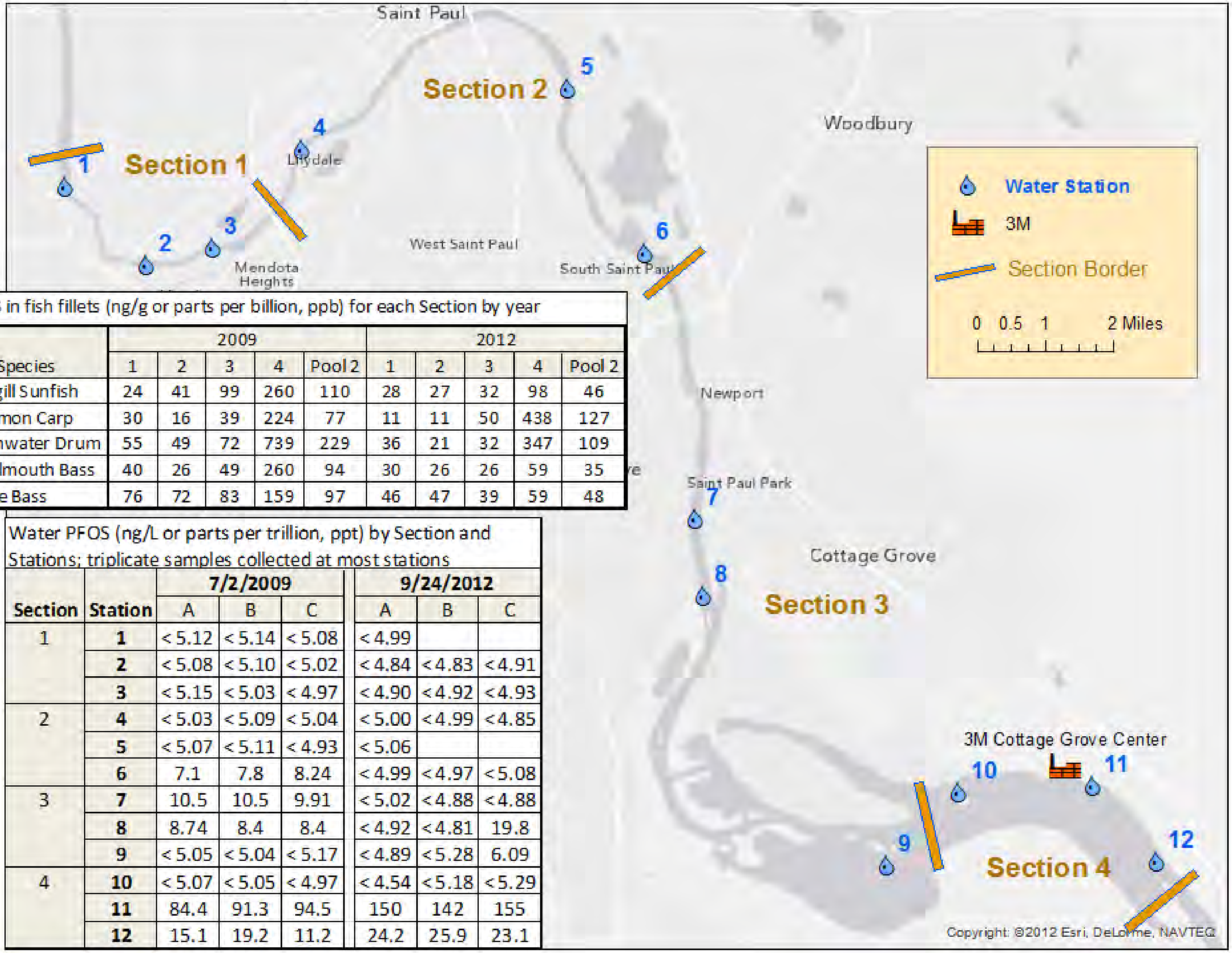
In the water samples from 2012, perfluorobutanoic acid (PFBA) was detected at all 12 water-collection stations. Perfluorooctanoic acid (PFOA) and perfluorohexanoic acid (PFHxA) were detected in Sections 2, 3, and 4. The highest water concentrations of PFCs were found in Section 4 (lower Pool 2). Three other PFCs were detected in Section 4: perfluoropentanoic acid (PFPeA), perfluorobutane sulfonate (PFBS), and perfluorohexane sulfonate (PFHxS).

In 2012, PFOS concentrations in water continued to show a similar geographic pattern to 2009 results. PFOS concentrations in water were generally below the detection limit in the upper 10 sampling stations. Stations 6, 7, and 8, had detectable PFOS concentrations in 2009, but were below detection in 2012 (except for one of the samples at Station 8). PFOS concentrations in water were relatively high at the lower two stations, 11 and 12. Station 11 was immediately downstream of the 3M Cottage Grove Center and Station 12 was farther downstream. PFOS concentrations at the two downstream stations were higher in 2012 than in 2009. In both years, the PFOS concentrations at these two downstream stations were well above the site-specific water quality criteria, 7 ng/L, established in 2009. The reason for the higher concentrations in 2012 is not known, but a comparison of PFOS concentrations and river water levels for 2009, 2011, and 2012 indicated the higher level in 2012 was *not* because of lower flows and less dilution from point source discharges.

Site-specific water quality criteria to protect fish tissue for human consumption are calculated when a water concentration is needed for regulatory purposes. To calculate the water quality criterion, the needed site-specific information is the ratio of fish tissue concentration to water concentration, referred to as the bioaccumulation factor (BAF). BAFs were calculated for PFOS using the water and fish data in 2009 and updated in 2012. Species-specific mean BAFs for PFOS based on the 2012 data ranged from 2700 L/kg to 4600 L/kg; compared to the range of 4000 to 6000 L/Kg from the 2009 data. Lower average BAFs in 2012 compared to 2009 resulted in the site-specific water quality criterion for PFOS in Pool 2 increasing from 7 ng/L to 14 ng/L.

Sediment and benthic invertebrate PFOS concentrations were detectable but relatively low for sites upstream of the 3M Cottage Grove Center (Figure ES-2). The high PFOS concentrations in sediment and invertebrates near Station 11 reinforce the results from fish and water.

In summary, PFOS concentrations in fish have declined in Pool 2; however, PFOS concentrations remain high in fish, invertebrates, sediments, and water from the lower section of Pool 2.




PFOS in fish fillets (ng/g or parts per billion, ppb) for each Section by year

| | 2009 | | | | | 2012 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Fish Species | 1 | 2 | 3 | 4 | Pool 2 | 1 | 2 | 3 | 4 | Pool 2 |
| Bluegill Sunfish | 24 | 41 | 99 | 260 | 110 | 28 | 27 | 32 | 98 | 46 |
| Common Carp | 30 | 16 | 39 | 224 | 77 | 11 | 11 | 50 | 438 | 127 |
| Freshwater Drum | 55 | 49 | 72 | 739 | 229 | 36 | 21 | 32 | 347 | 109 |
| Smallmouth Bass | 40 | 26 | 49 | 260 | 94 | 30 | 26 | 26 | 59 | 35 |
| White Bass | 76 | 72 | 83 | 159 | 97 | 46 | 47 | 39 | 59 | 48 |

Water PFOS (ng/L or parts per trillion, ppt) by Section and Stations; triplicate samples collected at most stations

| | | 7/2/2009 | | | 9/24/2012 | | |
|---|---|---|---|---|---|---|---|
| Section | Station | A | B | C | A | B | C |
| 1 | 1 | < 5.12 | < 5.14 | < 5.08 | < 4.99 | | |
| | 2 | < 5.08 | < 5.10 | < 5.02 | < 4.84 | < 4.83 | < 4.91 |
| | 3 | < 5.15 | < 5.03 | < 4.97 | < 4.90 | < 4.92 | < 4.93 |
| 2 | 4 | < 5.03 | < 5.09 | < 5.04 | < 5.00 | < 4.99 | < 4.85 |
| | 5 | < 5.07 | < 5.11 | < 4.93 | < 5.06 | | |
| | 6 | 7.1 | 7.8 | 8.24 | < 4.99 | < 4.97 | < 5.08 |
| 3 | 7 | 10.5 | 10.5 | 9.91 | < 5.02 | < 4.88 | < 4.88 |
| | 8 | 8.74 | 8.4 | 8.4 | < 4.92 | < 4.81 | 19.8 |
| | 9 | < 5.05 | < 5.04 | < 5.17 | < 4.89 | < 5.28 | 6.09 |
| 4 | 10 | < 5.07 | < 5.05 | < 4.97 | < 4.54 | < 5.18 | < 5.29 |
| | 11 | 84.4 | 91.3 | 94.5 | 150 | 142 | 155 |
| | 12 | 15.1 | 19.2 | 11.2 | 24.2 | 25.9 | 23.1 |

**Figure ES-1. Locations of Sections and Stations and summary tables of mean PFOS concentrations in fish and water**

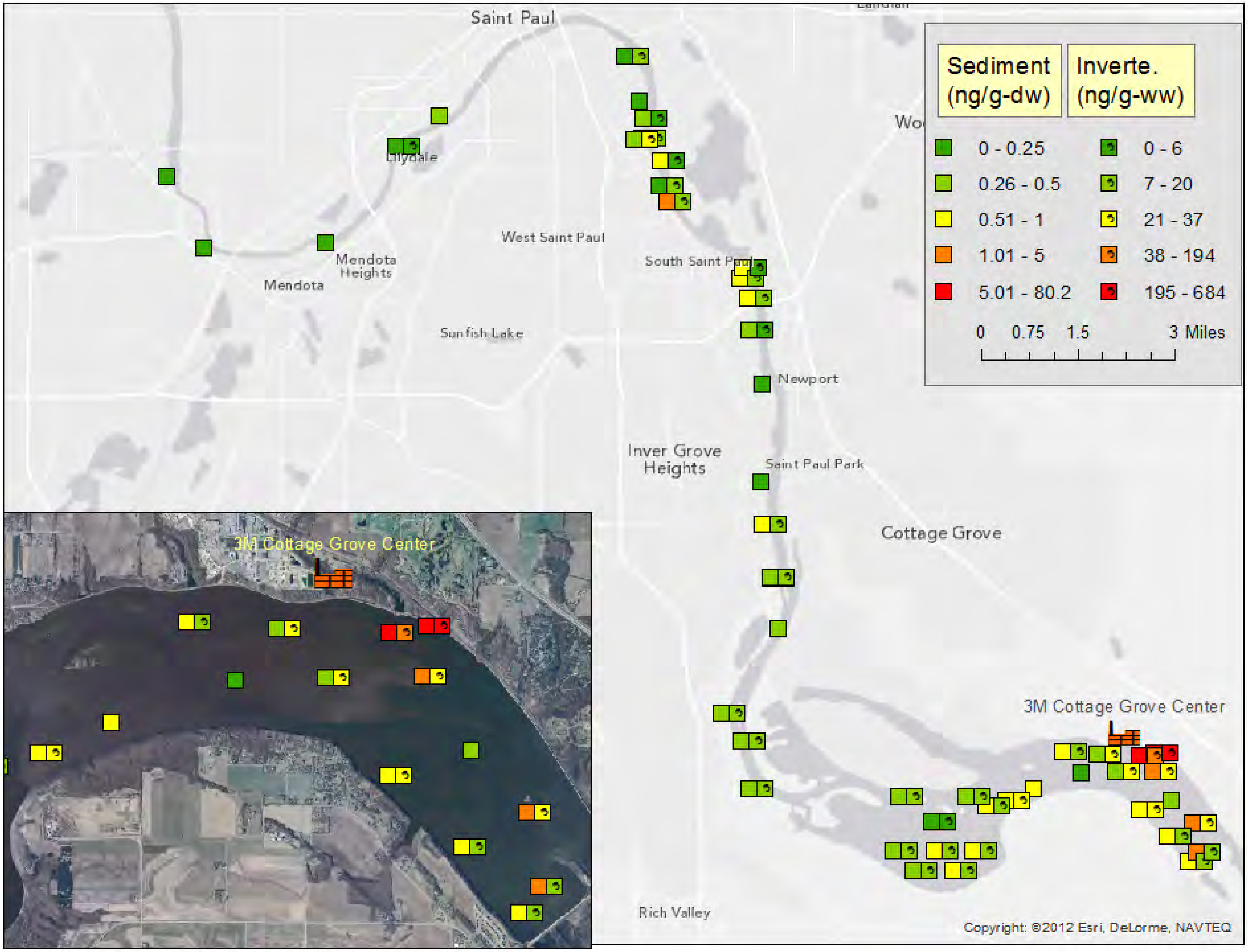



**Figure ES-2. PFOS concentrations in sediment and benthic invertebrates in Pool 2 from 2011-2012**

# Introduction

## What are PFCs and why are they an environmental contaminant?

Perfluorochemicals (PFCs)—also known as perfluorinated compounds—are composed of a carbon chain saturated with fluorine atoms, with a functional group at the end of the chain. The functional groups are typically a sulfonate (-$SO_3$) or a carboxylic acid group (-COOH). The functional group makes the PFC soluble in water (hydrophilic), whereas the carbon chain makes the PFC molecule soluble in lipids (lipophilic) and resistant to water (hydrophobic). The unique properties of PFCs have been exploited for numerous consumer products, most notably fire-fighting foam, stain protection, and non-stick surfaces.

PFCs emerged as a global pollutant in 2001 when scientists reported perfluorooctane sulfonate (PFOS) in wildlife throughout the world (Giesy and Kannan, 2001). Subsequently, PFCs were described as "globally distributed, environmentally persistent, bioaccumulative, and potentially harmful" (Giesy and Kannan, 2002). PFOS was shown to be the predominant PFC in most fish (Houde et al., 2006). Detection limits for PFCs generally range from 2.5 to 5 nanograms per gram (ng/g), or parts per billion (ppb). Although there are naturally occurring fluorinated organic compounds that contain one fluorine atom, all PFCs in the environment are anthropogenic (Giesy and Kannan, 2002).

Rather than being lipophilic like many other persistent organic pollutants (POPs), several studies have suggested that PFCs are proteinophilic (Conder et al., 2008). PFOS behaves very differently from other POPs, having differences in intrinsic factors, such as surface activity, water solubility, non-measurable octanol/water coefficient values, and relatively low bioaccumulation potential.

Fish from contaminated areas may be a significant source of dietary PFOS exposure (Berger et al., 2009). Various toxic endpoints have been measured in laboratory studies of PFCs. Observed effects of low doses of PFOS include decreased high density lipoprotein cholesterol (HDL) and changes in thyroid hormone levels in some animals. Recent studies have reported direct hormonal effects in fish exposed to PFCs in water. In addition to demonstrated direct toxic effects, PFCs might enhance cell membrane permeability of other pollutants (Wang et al., 2009).

## Mississippi River Pool 2

Mississippi River Pool 2 (Figure 1) extends from Lock & Dam No. 2 at Hastings, Minnesota, upstream 32.5 miles to Lock & Dam No. 1 (Ford Dam). The Mississippi confluence with the Minnesota River is at the upper reach of Pool 2 and the confluence with the St. Croix River is just below Lock & Dam No. 2. Within Pool 2, average annual flow is about 15,000 cubic feet per second (cfs). Pool 2 is a receiving-water for the largest publically-owned wastewater treatment plant (WWTP) in Minnesota, the Metropolitan WWTP, with an average discharge of 185 million gallons per day (286 cfs). The Eagles Point WWTP, with an average discharge of 4.2 mgd, is next to the 3M Company Cottage Grove facility at the lower end of Pool 2. The 3M facility discharges industrial process water and cooling water to the Mississippi River, with a combined flow of 8 mgd.

3M Company's Cottage Grove facility was a major manufacturer of PFOS from the 1950's to 2002. Although the facility discontinued production of PFOS, wastewater discharge from the facility continues to contain measurable PFOS concentrations. Discharge from the Metropolitan WWTP also has measureable PFCs because these chemicals have been included in a wide range of consumer and industrial products that have been disposed of in municipal and industrial wastewater systems.

This report characterizes the levels of PFCs in Pool 2 and does not evaluate possible sources of PFCs to Pool 2.

## Why this study?

The MPCA is the state agency responsible for assessing and listing impaired waters for Minnesota, subject to federal U.S. Environmental Protection Agency (EPA) approval. MPCA rules specify that the MPCA shall list waters as impaired if the fish consumption advisory for a lake or river is more restrictive than a meal per week (Minn. R. 7050.0150, subp. 7). Pool 2 had been listed as impaired for mercury and PCBs in fish. Impairment caused by PFOS in fish was added in 2008, based on a one meal per month advisory for bluegill sunfish in 2007. Freshwater drum, first sampled in 2009, also had PFOS levels that warranted a meal per month advisory.

The 2012 sample collection was a follow-up to the 2009 intensive study by the MPCA and the 2011 study by Cardno-Entrix for 3M. The MPCA and the Minnesota Department of Natural Resources (MDNR), with participation of the Minnesota Department of Health (MDH), have analyzed fish and river water for PFCs from Pool 2 since 2004. The 2009 study—which was designed together by 3M, MPCA, MDNR, and MDH—was the first year when the entire 32.5 mile reach of Pool 2 was sampled for PFCs in fish and water. Earlier collections focused on the lower five miles of Pool 2. Of the 367 fish analyzed from 2004 to 2009, 297 (81 percent) were collected in 2009.

To characterize the spatial distribution of PFCs in 2009, Pool 2 was divided into four sections, with Section 1 at the most upstream end and Section 4 above the Hastings Dam (Figure 1). That same monitoring plan was followed in 2012.

The 2011 study conducted by 3M was similar to the 2009 study design except that Pool 2 was divided into ten reaches (instead of four), three water samples were collected in each reach but not at the same location. Carp were not collected in 2011, but the other four species tested in 2009 were collected. Ten fish of each species were collected in each reach, for a total of 400 fish. Compared to the 2009 study, the 2011 sampling design collected 100 of each species instead of 60 of each species and reduced the percentage of fish collected in the lower reach (Section 4) from 25 percent (15/60 per species) to 18 percent (18/100 per species). The report by Cardno-Entrix and a second report by Exponent in November 2011 comparing the 2009 and 2011 results showed PFOS concentrations had declined from 2009 in the four tested fish species. Because of lower PFOS concentrations in 2011, the average PFOS concentration for the combined years dropped below the meal per month advisory threshold to an advisory level of one meal per week.

MPCA did not delist Pool 2 as impaired for PFOS in fish based on the 2011 study because it was not sufficient to indicate a permanent downward trend in the PFOS concentrations and the sampling design in 2011 differed from the 2009 sampling design. Consequently, MPCA conducted the 2012 study, following the same sample design as 2009, to determine if the PFOS concentrations had indeed dropped to lower levels throughout Pool 2.

In addition to collection of fish and water in 2012, the MPCA collected sediments and benthic macroinvertebrates in 2011 and 2012 to better understand the extent of the PFC contamination in Pool 2 and the possible direct source of PFOS in the fish. Unlike fish and water, sediments and insect nymphs living in the sediments are stationary and better represent the specific locations within the river. Freshwater drum and common carp, which had the highest PFOS concentrations in 2009, feed on sediments and benthic invertebrates more so than the other tested fish species.

# Methods

## Fish collection

Because of the long length of Pool 2, it was divided into four sections in the 2009 and 2012 studies for fish and water sampling (Figure 1). Average PFOS concentrations were then compared among sections as well as for all of Pool 2. Description of the four Pool 2 Sections:

*Section 1*: Approximately four river miles from Lock & Dam No. 1 (Ford Dam) to confluence with the Minnesota River.

*Section 2*: Ten river miles from the Minnesota River confluence to the lower channel to Hog Lake and Pig's Eye Lake, but not including Hog and Pig's Eye lakes; Metropolitan (Metro) wastewater treatment plant and Holman Field airport are in this section.

*Section 3*: Approximately 13.5 river miles include Hog Lake and Pig's Eye Lake as well as River, Baldwin, Mooers, and Spring lakes and Lower Grey Cloud Slough.

*Section 4*: The lower five river miles to Lock & Dam No. 2 in Hastings, which includes Spring Lake; Eagles Point wastewater treatment plant and 3M Cottage Grove facility are in this section.

As in the 2009 study, the five target fish species in 2012 were bluegill sunfish (BGS), common carp (C), freshwater drum (FWD), smallmouth bass (SMB), and white bass (WHB).

MDNR collected fish from the entire length of Pool 2 using electroshocking equipment. Collections occurred between July 30, 2012 and September 14, 2012. The beginning and end of each fish-collection run was geo-referenced (latitude and longitude). Each fish was identified by the section and run in which it was collected. Fish were wrapped in aluminum foil and immediately frozen. The frozen fish were labeled with a unique sample ID before shipping overnight to AXYS laboratory.

## Water collection

Water samples were collected at 12 stations—3 stations per section—on September 24, 2012. Three samples at each station were collected as consecutive grab samples in 2 liter polyethylene bottles provided by AXYS. The bottle cap was removed after the bottle was completely immersed below the water surface and allowed to fill completely. The description of 12 water sample stations is as follows:

| Section | Water Station | Description |
|---|---|---|
| 1 | 1 | Main channel at river mile 847 |
| | 2 | Old Minnesota River channel, near river mile 845.4 |
| | 3 | Main channel upstream of confluence with Minnesota River at river mile 844 |
| 2 | 4 | Main channel near boat launch at river mile 842 |
| | 5 | Main channel adjacent to Holman Field at river mile 837 |
| | 6 | Bay south of Pigs Eye Lake near river mile 834 |
| 3 | 7 | Main channel near boat launch; downstream from St. Paul Park Refinery at river mile 829.5 |
| | 8 | Main channel upstream of Island 112 at river mile 827.5 |
| | 9 | Near Spring Lake at river mile 821 |
| 4 | 10 | Main channel, downstream of Grey Cloud Slough at river mile 819 |
| | 11 | Near shoreline, downstream of 3M Cottage Grove discharge, near river mile 817.5 |
| | 12 | Main channel, upstream of Lock & Dam No. 2 at river mile 816 |

## Sediment and benthic macroinvertebrate collection

Sediment samples were collected with a modified Hongve surface-sediment drop corer, with a rubber ball valve at the top (modification by Harold Wiegner, MPCA). Before each collection the corer and stainless steel spatula were washed with methanol (tested and provided by AXYS lab). The top 5 cm of sediment were collected and dispensed into 250 mL polyethylene jars (provided by AXYS lab). Jars were labeled with Site ID, date, and time. The sediment sample was stirred with the spatula and a sub-sample was placed in a 250 mL glass jar (provided by Pace Laboratories) for total organic carbon. All samples were kept on ice in a cooler.

Benthic macroinvertebrates (invertebrates) were collected with a Petite Ponar sampler, which grabs a sediment sample with an area of 6 x 6 inches (152 x 152 mm). The Ponar was dropped from the bow of the boat multiple times as needed to collect a sufficient mass of invertebrates. The sediment sample was deposited into a stainless-steel wash screen (356 x 598 x 192 mm; 500 µm mesh) and rinsed with river water as needed to expose invertebrates. All benthic invertebrates known to live in the sediments (excluding species that lived on or near sediment surface such as amphipods) were removed from the sediments with stainless-steel forceps and placed in a polyethylene 250 mL jar (provided by AXYS lab). The number of Ponar grabs and general description of invertebrates were noted in the field notebook. Invertebrate samples were kept on ice in a cooler. At the end of a sample day, all sediment and invertebrate samples were placed in a freezer until they were shipped to the laboratory.

## Laboratory analysis

AXYS Analytical Services Ltd analyzed all samples for PFCs. Empty coolers were shipped by AXYS to the MPCA for fish samples and coolers with bottles were shipped for other samples. The whole fish shipped to AXYS were measured for length and weight; also, gender and age were recorded. AXYS homogenized fish fillets, with scales off and skin on, which is the protocol used for fish contaminant analysis when results are used for fish consumption advisories.

The USEPA has not yet approved analytical methods for PFCs in matrices (except for drinking water); however, all laboratories conducting PFC analysis on environmental samples use a method of liquid chromatography-electrospray tandem mass spectrometry (LC-MS/MS). Sample homogenization, extraction, and clean-up steps can vary among laboratories. AXYS describes their aqueous method as, *AXYS Method MLA-060: Analytical Procedure for the Analysis of Perfluorinated Organic Compounds in Aqueous Samples by LC-MSIMS* and their tissue method as*, AXYS Method MLA-043: Analytical Procedure for the Analysis of Perfluorinated Organic Compounds in Tissue Samples by LC-MS/MS.*

The reporting level is the limit of quantitation (LOQ), defined as the lowest non-zero calibration standard having accuracy of 100 ±30 percent.

## Quality assurance

In addition to the multiple level quality assurance protocol at AXYS, William Scruton, Quality Assurance Coordinator for MPCA's Environmental Analysis and Outcomes Division, reviewed all data packages from AXYS and identified any results needing to be qualified as an estimate if all QA requirements were not met. Laboratory blank and matrix spike results for each batch (Work Group) and the qualified analytes are tabulated, along with all PFC results, in Appendix A (fish and water) and Appendix B (sediment and benthic macroinvertebrates).

In the 2009 study of PFCs in fish and water from Pool 2 (MPCA 2010), water samples from all 12 stations and 30 randomly-selected fish samples were analyzed by 3M Environmental Laboratory. The 3M-sponsored study in 2011 also split samples of water and fish with AXYS. The high degree of data correlation between the two labs provided confidence in the quality of the results. Because of the positive results from 2009 and 2011, split samples with the 3M Environmental Laboratory were not included in the 2012 study.

# Results and discussion

PFOS concentrations in water, fish, sediment, and benthic macroinvertebrates are presented in this section. Laboratory results for all 13 analyzed PFCs are tabulated in Appendix A for fish and water and Appendix B for sediment and benthic macroinvertebrates.

## Surface water

PFOS concentrations in water were similar in 2009 and 2012 (Table 1). Reporting limits were approximately 5 ng/L in both years. PFOS concentrations were consistently below the detection limit in the upper Stations, 1 to 5. In 2009, measureable PFOS levels at Stations 6, 7, and 8 averaged 7.7, 10.3, and 8.5 ng/L. In 2012, PFOS levels at the three Stations were below the reporting limit, with the exception of one sample at Station 8 (19.8 ng/L). Stations 9 and 10 were below the reporting limit in both years, with the exception of a detectable PFOS concentration in one sample from Station 9 in 2012 (6.09 ng/L).

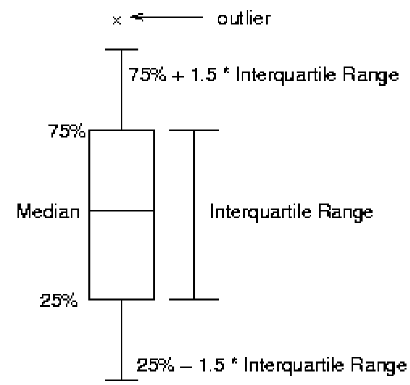
The most noteworthy results were in Stations 11 and 12. Station 11 is immediately downstream of the 3M Cottage Grove Center and the East Cove, which had been dredged in late 2011 to remove PFC-contaminated sediments. Station 12 is farther downstream (Figure 1). PFOS concentrations were similar among the replicates at each Station within each year. The coefficients of variation (standard deviation/mean) were 5.7 percent and 4.4 percent for Station 11 in 2009 and 2012, and 26.4 percent and 5.8 percent for Station 12 in 2009 and 2012. The mean PFOS concentrations increased from 2009 to 2012, from 90.1 ng/L to 149 ng/L at Station 11 and 15.2 ng/L to 24.4 ng/L at Station 12. These were increases of 65 percent and 61 percent, respectively. The 2011 study results for PFOS in water concur with the results from 2012. The most downstream station in the 2011 study was at approximately the same location as Station 11. The water sample, collected on 11 August 2011 had a PFOS concentration of 136 ng/L. Results from all years indicate substantially higher PFOS concentrations in water downstream of the 3M facility compared to upstream.

The increased PFOS concentrations in 2011 and 2012 could have been caused by greater inputs to Pool 2 or inputs could have remained the same, but there was less dilution because of lower water volume (i.e., low river flows). To test the possibility of change in dilution, the water levels at the time of sampling were compared. The closest water level gaging station is U.S. Army Corp of Engineer's CP2 station at South St. Paul. Water level at CP2 was actually very similar on July 2, 2009 and September 24, 2012, but higher on August 11, 2011 (Figure 2). The 24-hour average water levels for the three sample days were 287.2 ft. in 2009, 289.5 ft. in 2011, and 287.1 ft. in 2012. Water level in 2011 was over two feet higher than in 2009 and 2012. Therefore, the water level results do not support an argument that dilution was the reason for differences among years.

## Fish

The goal was to collect 15 of each species in each section, for a total of 60 per species. That goal was met for all but the white bass. In Sections 1 and 4, 13 white bass were collected. Fish-collection runs are shown in Figure 3. Appendix A lists the georeferenced start and stop of each run and the number of fish in each species captured in each run. All results, from 2004 to 2012, were combined for the initial descriptive statistics for the five target species (Table 2). Four of the species have over 200 individual fish measurements. Common carp was the exception with 125 fish tested, mostly because that species was not included in the 2011 study by 3M. Of the 296 fish analyzed for PFCs in 2012, only four fish had PFOS concentrations less than the reporting limit (1.0 ng/g). The highest PFOS concentration, 6,160 ng/g, was measured in a carp from Section 4 in 2012. The next highest, 5,150 ng/g, was measured in a smallmouth bass in 2006. The similarity of the median with the geometric mean rather than the arithmetic mean indicates the distributions of PFOS concentrations are log-normally distributed. White bass had the lowest maximum PFOS concentration, but they had a median concentration approximately double the median of the other four species.

Descriptive statistics by species and year are summarized in Table 3 on page 12. The statistics for all years are presented at the top row for each species. The left side of the table shows values for all of Pool 2, while the right side shows values for the Lower Pool 2. Lower Pool 2 is Section 4 in 2009 and 2012, and Reaches 9 and 10 in 2011. Prior to 2009 all fish were collected in the Lower Pool 2; therefore, the statistics for years 2004-2008 are the same in both sides of the table. Consequently, comparisons among years within a species are best done only for the Lower Pool 2. Smallmouth bass (SMB) had the longest period of record—seven years—followed by bluegill sunfish (BGS), six years, and white bass (WHB), five years. Freshwater drum (FWD) were first collected in 2009. Comparing annual medians in the Lower Pool 2 for each species shows a general decline over time, especially in the most recent two years. Freshwater Drum shows a striking drop from 401 ng/g in 2009 to 22 ng/g and 23 ng/g in 2011 and 2012. Common carp (C) had the lowest median, 15 ng/g, in 2012 and the highest maximum PFOS concentration, 6,160 ng/g.




The distributions of PFOS concentration within species over time are illustrated in box-whisker plots (see diagram at right), which show the median, the interquartile range and outliers (Figure 4, page 17). PFOS concentrations are on a log-10 scale to improve the symmetry of the distributions. Smallmouth bass did not show a trend between 2004 and 2009, but with the addition of 2011 and 2012 there appears to be a downward trend in the PFOS concentrations (Figure 4a). The three years of PFOS in common carp (2005, 2009, and 2012) show a downward trend as well (Figure 4b). The downward trend is not as clear for freshwater drum (Figure 4c); there is a big drop in median PFOS concentration from 2009 to 2011 and 2012, but the ranges of PFOS concentrations in FWD remain similar among the three years.

Comparing the distributions of PFOS by species and section for 2009 and 2012, there was a general shift to the left to lower PFOS concentrations in 2012 (Figure 5). The shifts to the left increased from Section 1 to Section 4 for all species (quantile plots from top to bottom). The exception to this pattern is carp, which shows a large decline in PFOS concentrations in Section 1 and less of a shift in Sections 2 and 3. There was less of a difference among Sections for any given species in 2012 than in 2009, when Section 4 PFOS concentrations were sharply higher than in the three upstream sections. Despite the shift to lower concentrations, all species show the higher PFOS concentrations in Section 4. Bluegill sunfish, carp, and freshwater drum continued to have a few high PFOS concentrations in Section 4.

Looking at the specific fish-collection runs in Section 4 from 2012 shows the high PFOS concentrations (> 400 ng/g) for carp and freshwater drum were in Run 2, located downstream of the 3M Cottage Grove Center (Figure 6; see Figure 3b for a map of the runs in Section 4). The high outlier for bluegill sunfish was in Run 1 (1,020 ng/g), immediately upstream of the 3M center.

## Bioaccumulation factors and site-specific water quality criterion

The MPCA followed EPA guidance and Minnesota rules in calculating bioaccumulation factors (BAFs) and site-specific water quality criterion for PFOS. Water was sampled in each river section at three stations, which were averaged to calculate the PFOS water concentration for that section. Fish were collected from multiple sites within each river section. BAFs for PFOS were calculated for each fish fillet using the PFOS tissue concentration from that fillet divided by the average PFOS water concentration reported from the river section where the fish was captured. PFOS water concentrations in the upper 3 Sections of Pool 2 were predominantly less than the reporting level. For water concentrations below the reporting level, the reporting level was used. The individual BAFs were then combined as a geometric mean (geomean) for each species. (A geometric mean is the $n^{th}$ root (where n is the count of numbers) of the product of the numbers or is alternatively defined as the antilog of the average of log-transformed values.) The final BAF is a geomean of all species geomeans. The BAFs are applied to the equation for calculating a fish consumption criterion (fCC), which is the site-specific water criterion. The equation is

$$fCC = \frac{\text{RfD} + \text{BW} + \text{K}}{\text{IW} + (\text{CR} \times \text{BAF})}$$

where,
RfD = reference dose, 0.00008 mg/kg/d
BW = body weight, 70 kg
K = exposure fraction attributed to water and fish consumption, 0.2
IW = incidental ingestion of water, 0.01 L/d
CR = fish consumption rate, 0.030 Kg/d

This calculation had been done in previous years. An fCC for PFOS in Pool 2 was calculated as 6 ng/L in 2007 using a small dataset (STS Consultants, 2007). Calculations from the 2009 study resulted in an fCC of 7 ng/L. Lower fish tissue concentrations in 2012, while water concentrations remained about the same as in 2009, resulted in lower BAFs and subsequently a higher calculated fCC of 14 ng/L.

## Sediments

Sediment sampling began in late November 2011. The top 5 cm of surface sediments were collected at 50 sites in Pool 2 for PFCs analysis (Figure 7). Another round of sampling occurred in May 2012. A third and final round was completed in October 2012.

PFOS concentrations in sediment were measured in dry samples. AXYS provided percent moisture content of the samples, allowing for calculation of wet weight concentrations. Total organic carbon was measured in the sediment samples by PACE Laboratories and presented as fraction organic carbon ($f_{OC}$).

Moisture content of sediment samples ranged from 21 percent to 62 percent, with a median of 37.5 percent (Table 4). The ranges of moisture content were very similar among the three periods of sample collection and were not significantly different (Kruskal-Wallis One-way ANOVA test statistic: 0.016: p = 0.992). The same was true for fraction organic carbon (Kruskal-Wallis test statistic: 1.594; p = 0.451). The median $f_{OC}$ for the combined samples was 1.0 percent. $f_{OC}$ was less than 2.6 percent in all but one sample; the site on the left bank of river mile 836 in Section 2 (upstream of the Metro WWTP) had an $f_{OC}$ of 12.8 percent.

Sediment PFOS concentrations ranged from less than the reporting limit (< 0.188 ng/g-dw) to 80.2 ng/g-dw, with a median of 0.5 ng/g-dw. One-half the reporting limit was substituted for the eight sediment samples that had dry weight PFOS concentrations less than the reporting limit to calculate the arithmetic and geometric means of dry weight concentrations, but were not used to calculate wet weight concentrations.

Field replicates were collected at five sites; three had duplicate sediment samples and two had triplicate samples (Table 5). The relative standard deviation (RSD = Std. Dev *100/Average) is shown for the measurements in each set of replicates. RSD was reduced when dry weight PFOS concentrations were converted to wet weight. RSD was reduced in four of the five replicate sets when PFOS was converted to per unit organic carbon (ng/g – OC). The exception was the set of triplicate samples from the Metro WWTP discharge channel (MC_1, MC_2, and MC_3). The $f_{OC}$ were sufficiently different among the replicates in the channel to cause an increase in the RSD when PFOS was converted to ng/g-OC.

One site at river mile 828 (Saint Paul Park area) was sampled in November 2011 and in May 2012. The dry weight PFOS concentrations in sediment were 0.33 ng/g and 0.53 ng/g. Percent moisture for the respective samples was 39 percent and 62 percent, resulting in wet weight PFOS concentrations of 0.198 and 0.200 ng/g. The fraction of organic carbon ($f_{oc}$) was 1.17 percent and 2.03 percent, giving PFOS per OC of 27.9 and 25.9 ng/g. The similarity of the PFOS concentrations provided added confidence in the results for sediments.

The highest sediment and invertebrate PFOS concentrations were in samples collected downstream of the 3M Cottage Grove Center, near the East Cove. In November 2011, three sediment samples (Site ID: 517Sed) were collected in that area and another set of duplicate samples were collected in October 2012 (Site ID: K Sed) (Table 5). One of the triplicate samples in 2011 was 80 ng/g-dw, while the other two were 33 ng/g-dw and 41 ng/g-dw. The high concentration also had the highest organic carbon content ($f_{oc}$). Consequently, weighted by organic carbon, the three PFOS concentrations were more similar. The following fall sampling, in October 2012, found much lower sediment PFOS concentrations (8.6 and 6.4 ng/g-dw), although still much higher than seen at any other station in Pool 2. The sediment and invertebrate samples in 2012 were collected in the same vicinity as collections in 2011 but not precisely in the same location as the previous fall, which may explain the differences in PFOS concentrations between sampling events.

The other triplicate set of samples was collected in May 2012 in the Metro WWTP discharge channel. The dry weight PFOS concentrations were 0.581, 0.672, and 0.905 ng/g. Most of the PFOS concentrations in the main channel of Pool 2, upstream and downstream of the discharge, were slightly below those sediment concentrations. Two stations immediately downstream of the Metro Channel had somewhat higher concentrations: 1.58 and 2.07 ng/g-dw in the sediment. A station across the channel from the first downstream station had sediment concentration of less than 0.195 ng/g-dw.

## Benthic invertebrates

Benthic invertebrates were sufficiently abundant at 39 of the 50 sediment stations for PFC analysis. Sediments in the upper half of Pool 2 were sandy and had few invertebrates. The collected invertebrates were primarily larvae of Chironomids (non-biting midges) and Hexagenia (mayflies). PFOS concentrations ranged from 1.7 ng/g-ww to 684 ng/g-ww, with a median of 11.9 ng/g-ww (Table 4). Only two samples had PFOS concentrations greater than 50 ng/g-ww (194 ng/g and 684 ng/g) and they were both collected immediately downstream of the 3M Cottage Grove Center. When PFOS concentrations in benthic invertebrates are compared alongside the PFOS concentrations in sediments, they both show the highest concentrations in the lower section of Pool 2, downstream of the 3M Cottage Grove Center (Figure 8). The invertebrate PFOS concentration at this site in 2011 was the highest measurement among all benthic macroinvertebrate samples. Similar to the relative PFOS concentrations in sediments at these sites, the invertebrate PFOS concentration was lower in 2012 than was measured in 2011, but much higher than any other station in Pool 2. As noted above, different sample locations could explain slight differences between sampling.

The relationship between invertebrate and sediment PFOS concentrations is a significant positive correlation when the relatively high concentrations downstream of 3M are included (Figure 9; log-transformed slope: $p < 0.000$). Excluding the sediment PFOS concentrations greater than 5 ng/g, there appears to be a positive relationship, but a least square regression indicates the slope is not significantly different from zero whether linear or log-transformed (linear: $p = 0.77$; log-log: $p = 0.121$). PFOS concentrations in invertebrates appeared to be higher at low organic carbon content of sediments, but they were not significantly correlated (Pearson $r = 0.082$ or $r = -0.387$ when outliers excluded).

## Conclusions

Compared to 2009 PFOS concentrations in the targeted fish species declined in the last two years (2011 and 2012) of monitoring in Pool 2. PFOS concentrations in water from the Lower Pool 2 did not decline. Consequently, the calculated bioaccumulation factors were lower, which led to a higher site-specific water quality criterion for PFOS: from 7 ng/L calculated from 2009 results to 14 ng/L calculated from 2012 results.

Despite the average decline for all of Pool 2, PFOS concentrations in all tested media—fish, benthic macroinvertebrates, sediment, and water—remain high in the Lower Pool 2, downstream of the 3M Cottage Grove Center.

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For more information on this report contact:

Bruce Monson
Research Scientist
Minnesota Pollution Control Agency
520 Lafayette Road N
St. Paul, MN 55155
Phone: 651-757-2579

Minnesota Pollution Control Agency PFCs
http://www.pca.state.mn.us/cleanup/pfc/index.html

Minnesota Department of Health PFCs
http://www.health.state.mn.us/divs/eh/hazardous/topics/pfcs/index.html

Minnesota Department of Health Fish Consumption Guidelines
http://www.health.state.mn.us/divs/eh/fish/index.html

# Tables

**Table 1. PFOS concentrations (ng/L) in water samples collected at the same twelve stations in 2009 and 2012; A, B, and C refer to consecutive grab samples collected at each station; in 2012 two samples from Stations 1 and 5 were used for laboratory matrix spikes.**

| | 2 July 2009 | | | | 24 September 2012 | | | |
|---|---|---|---|---|---|---|---|---|
| **Station** | A | B | C | Mean | A | B | C | Mean |
| **1** | < 5.12 | < 5.14 | < 5.08 | < DL | < 4.99 | | | < DL |
| **2** | < 5.08 | < 5.10 | < 5.02 | < DL | < 4.84 | < 4.83 | < 4.91 | < DL |
| **3** | < 5.15 | < 5.03 | < 4.97 | < DL | < 4.90 | < 4.92 | < 4.93 | < DL |
| **4** | < 5.03 | < 5.09 | < 5.04 | < DL | < 5.00 | < 4.99 | < 4.85 | < DL |
| **5** | < 5.07 | < 5.11 | < 4.93 | < DL | < 5.06 | | | < DL |
| **6** | 7.1 | 7.8 | 8.24 | 7.7 | < 4.99 | < 4.97 | < 5.08 | < DL |
| **7** | 10.5 | 10.5 | 9.91 | 10.3 | < 5.02 | < 4.88 | < 4.88 | < DL |
| **8** | 8.74 | 8.4 | 8.4 | 8.5 | < 4.92 | < 4.81 | 19.8 | < DL? |
| **9** | < 5.05 | < 5.04 | < 5.17 | < DL | < 4.89 | < 5.28 | 6.09 | < DL? |
| **10** | < 5.07 | < 5.05 | < 4.97 | < DL | < 4.54 | < 5.18 | < 5.29 | < DL |
| **11** | 84.4 | 91.3 | 94.5 | 90.1 | 150 | 142 | 155 | 149 |
| **12** | 15.1 | 19.2 | 11.2 | 15.2 | 24.2 | 25.9 | 23.1 | 24.4 |

**Table 2. Descriptive statistics for PFOS (ng/g -ww) in the five target fish species; combined results for 2004-2012**

| | Statistic | | | | | |
|---|---|---|---|---|---|---|
| Species | N | Minimum | Maximum | Arithmetic Mean | Geometric Mean | Median |
| Bluegill Sunfish (BGS) | 230 | 3.57 | 2097 | 83.0 | 31.4 | 28.6 |
| Common Carp (C) | 125 | 0.995 | 6160 | 107.0 | 21.2 | 23.6 |
| Freshwater Drum (FWD) | 220 | 3.17 | 3580 | 113.1 | 36.9 | 34.1 |
| Smallmouth Bass (SMB) | 246 | 2.37 | 5150 | 99.7 | 40.4 | 32.8 |
| White Bass (WHB) | 219 | 13.0 | 1860 | 80.9 | 62.5 | 59.7 |

**Table 3. PFOS concentrations (ng/g -ww) for each fish species and year from all of Pool 2 (left) and only Lower Pool 2—Section 4 (right); the top row of each species is for all years; results from the study in 2011 used lower Reach 9 and Reach 10 to represent the Lower Pool 2; in 2004-2008 all fish were collected in the Lower Pool 2.**

| | Mississippi Pool 2 (all reaches) | | | | | Lower Pool 2 (Section 4) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Species-Year | N | Min | Max | Arith. Mean | Median | N | Min | Max | Arith. Mean | Median |
| BGS | 230 | 3.6 | 2097 | 83 | 29 | 61 | 4.5 | 2097 | 204 | 46 |
| 2006 | 6 | 30 | 709 | 249 | 195 | 6 | 30 | 709 | 249 | 195 |
| 2007 | 2 | 2001 | 2097 | 2049 | 2049 | 2 | 2001 | 2097 | 2049 | 2049 |
| 2008 | 5 | 102 | 317 | 173 | 157 | 5 | 102 | 317 | 173 | 157 |
| 2009 | 57 | 8.3 | 1350 | 110 | 45 | 15 | 32 | 1350 | 260 | 53 |
| 2011 | 100 | 3.6 | 392 | 36 | 18 | 18 | 4.5 | 305 | 63 | 26 |
| 2012 | 60 | 6.8 | 1020 | 46 | 26 | 15 | 11 | 1020 | 98 | 28 |
| C | 125 | 1.00 | 6160 | 107 | 24 | 35 | 6.0 | 6160 | 315 | 56 |
| 2005 | 5 | 66 | 420 | 216 | 175 | 5 | 66 | 420 | 216 | 175 |
| 2009 | 60 | 4.7 | 1340 | 77 | 28 | 15 | 8.7 | 1340 | 224 | 87 |
| 2012 | 60 | 1.00 | 6160 | 127 | 11 | 15 | 6.0 | 6160 | 438 | 15 |
| FWD | 220 | 3.2 | 3580 | 113 | 34 | 48 | 4.8 | 3580 | 356 | 33 |
| 2009 | 60 | 4.8 | 3580 | 229 | 63 | 15 | 24 | 3580 | 739 | 401 |
| 2011 | 100 | 3.2 | 607 | 46 | 30 | 18 | 4.8 | 607 | 81 | 22 |
| 2012 | 60 | 3.9 | 1580 | 109 | 25 | 15 | 6.0 | 1580 | 347 | 23 |
| SMB | 246 | 2.4 | 5150 | 100 | 33 | 69 | 7.3 | 5150 | 252 | 83 |
| 2004 | 4 | 92 | 985 | 528 | 517 | 4 | 92 | 985 | 528 | 517 |
| 2005 | 6 | 122 | 336 | 201 | 163 | 6 | 122 | 336 | 201 | 163 |
| 2006 | 11 | 19 | 5150 | 793 | 178 | 11 | 19 | 5150 | 793 | 178 |
| 2008 | 5 | 49 | 380 | 162 | 120 | 5 | 49 | 380 | 162 | 120 |
| 2009 | 60 | 13 | 612 | 94 | 41 | 15 | 42 | 612 | 260 | 210 |
| 2011 | 100 | 4.9 | 757 | 39 | 30 | 13 | 9.5 | 757 | 109 | 44 |
| 2012 | 60 | 2.4 | 192 | 35 | 28 | 15 | 8.1 | 192 | 59 | 47 |
| WHB | 219 | 13 | 1860 | 81 | 60 | 50 | 27 | 1860 | 144 | 78 |
| 2004 | 2 | 137 | 139 | 138 | 138 | 2 | 137 | 139 | 138 | 138 |
| 2005 | 5 | 84 | 1860 | 559 | 240 | 5 | 84 | 1860 | 559 | 240 |
| 2009 | 60 | 38 | 764 | 97 | 75 | 15 | 44 | 764 | 159 | 88 |
| 2011 | 96 | 13 | 394 | 64 | 58 | 15 | 41 | 394 | 92 | 71 |
| 2012 | 56 | 20 | 153 | 48 | 42 | 13 | 27 | 153 | 59 | 46 |

**Table 4. Summary statistics for sediment and invertebrate measurements**

| | Statistic | | | | | |
|---|---|---|---|---|---|---|
| Measurement | N | Minimum | Maximum | Arithmetic Mean | Geometric Mean | Median |
| Percent Moisture | 58 | 20.8 | 61.9 | 38.95 | 37.57 | 37.5 |
| Fraction Organic Carbon, $f_{OC}$ (%) | 58 | 0.10 | 12.8 | 1.30 | 0.90 | 1.00 |
| Sediment PFOS dry wt. (ng/g) | 58 | <0.188 | 80.2 | 3.405 | 0.548 | 0.497 |
| Sediment PFOS wet wt. (ng/g)* | 50 | 0.072 | 32.6 | 1.848 | 0.423 | 0.310 |
| Sediment PFOS per OC. (ng/g)* | 50 | 2.3 | 2,823 | 235.3 | 66.5 | 56.1 |
| Invertebrate PFOS wet wt. (ng/g) | 39 | 1.65 | 684 | 35.71 | 13.41 | 11.9 |

*Eight dry weight sediment PFOS concentrations were less than the reporting limit, precluding calculation of wet weight concentrations for those eight.

**Table 5. Replicates of sediment PFOS concentrations with matching invertebrate PFOS concentrations and BSAF**

| Date | Sample ID_Sed | Sed_PFOS_ ng/g_dw | sed_% Moisture | Sed_PFOS ng/g_ww | $f_{OC}$ | Sed_PFOS ng/g _OC |
|---|---|---|---|---|---|---|
| 11/23/11 15:00 | 517 SED1 | 80.2 | 59.3 | 32.64 | 2.84% | 2,824 |
| 11/23/11 15:10 | 517 SED2 | 33.3 | 51.1 | 16.28 | 1.75% | 1,903 |
| 11/23/11 15:18 | 517 SED3 | 41.1 | 52.9 | 19.36 | 1.62% | 2,537 |
| | RSD | 48.8 | 7.9 | 38.2 | 32.4 | 19.5 |
| 10/16/12 15:06 | K SED | 8.58 | 45.8 | 4.65 | 0.98% | 874.2 |
| 10/16/12 15:10 | K SED FD | 6.38 | 43.5 | 3.60 | 0.70% | 916.7 |
| | RSD | 20.8 | 3.6 | 17.9 | 24.1 | 3.4 |
| 10/16/12 11:20 | G SED | 0.601 | 40.6 | 0.357 | 0.95% | 63.0 |
| 10/16/12 11:25 | G SED FD | 0.860 | 45.9 | 0.465 | 1.13% | 76.1 |
| | RSD | 25.1 | 8.7 | 18.6 | 11.9 | 13.4 |
| 10/16/12 13:55 | M SED | 0.203 | 25.9 | 0.150 | 0.36% | 56.2 |
| 10/16/12 13:58 | M SED FD | 0.366 | 28.6 | 0.261 | 0.66% | 55.8 |
| | RSD | 40.5 | 7.0 | 38.1 | 41.1 | 0.6 |
| 05/22/12 14:00 | MC_1_SED | 0.905 | 44.6 | 0.501 | 2.17% | 41.8 |
| 05/22/12 14:05 | MC_2_SED | 0.672 | 32.2 | 0.456 | 1.67% | 40.2 |
| 05/22/12 14:15 | MC_3_SED | 0.581 | 26.8 | 0.425 | 0.59% | 98.6 |
| | RSD | 23.2 | 26.4 | 8.3 | 54.6 | 55.2 |
| 05/23/12 13:55 | P2_525_SED | 0.525 | 61.9 | 0.200 | 2.03% | 25.9 |
| 11/30/11 13:10 | 525 SED | 0.330 | 39.2 | 0.198 | 1.17% | 27.9 |
| | RSD | 33.1 | 31.8 | 0.6 | 37.8 | 5.1 |

# Figures

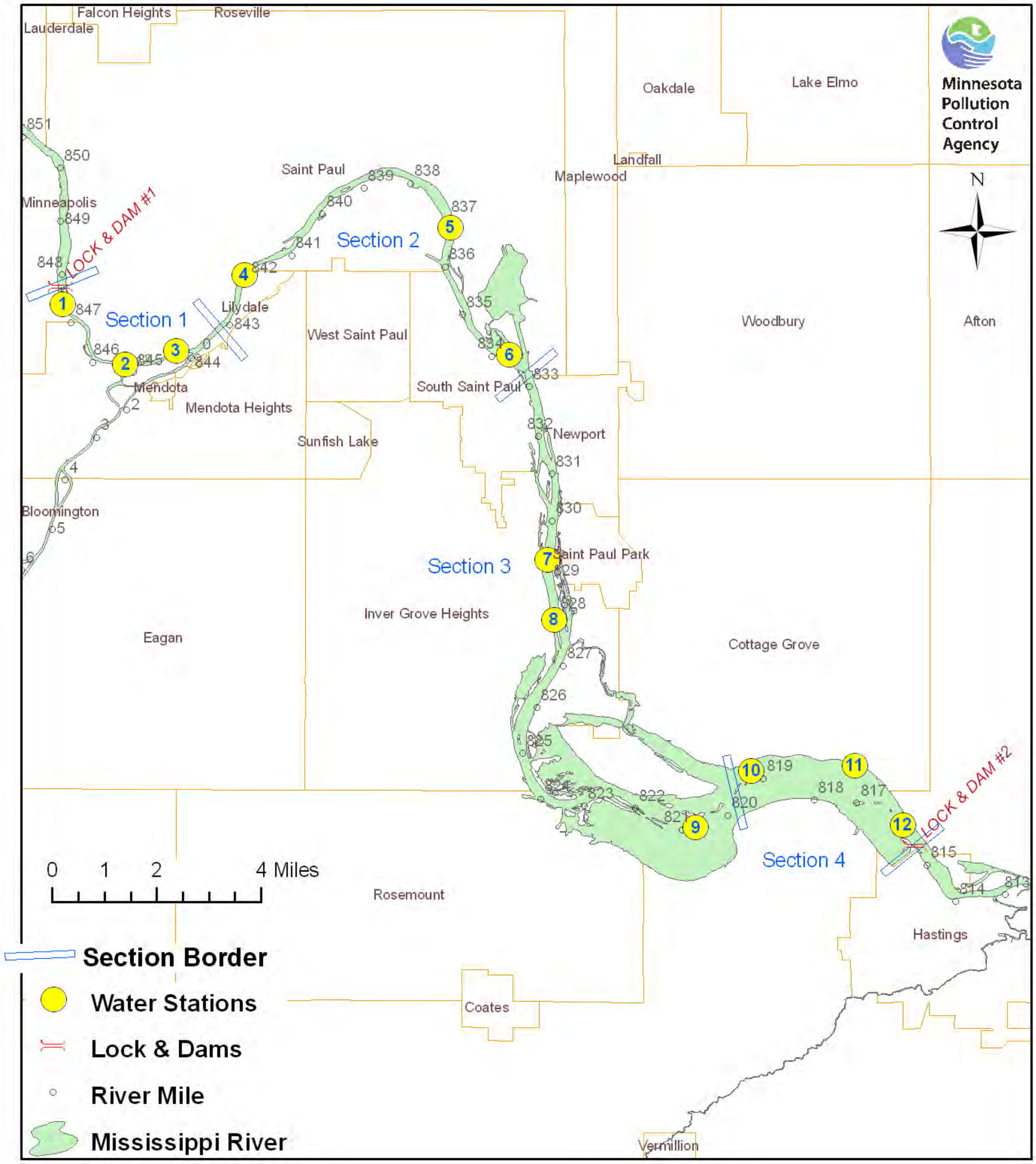


**Figure 1. Pool 2 showing river miles between Lock & Dam No. 1 at river mile 847.6 to Lock & Dam No. 2 at river mile 815.6 (~32.5 miles); shows four sections and PFC water stations for 2009 and 2012**

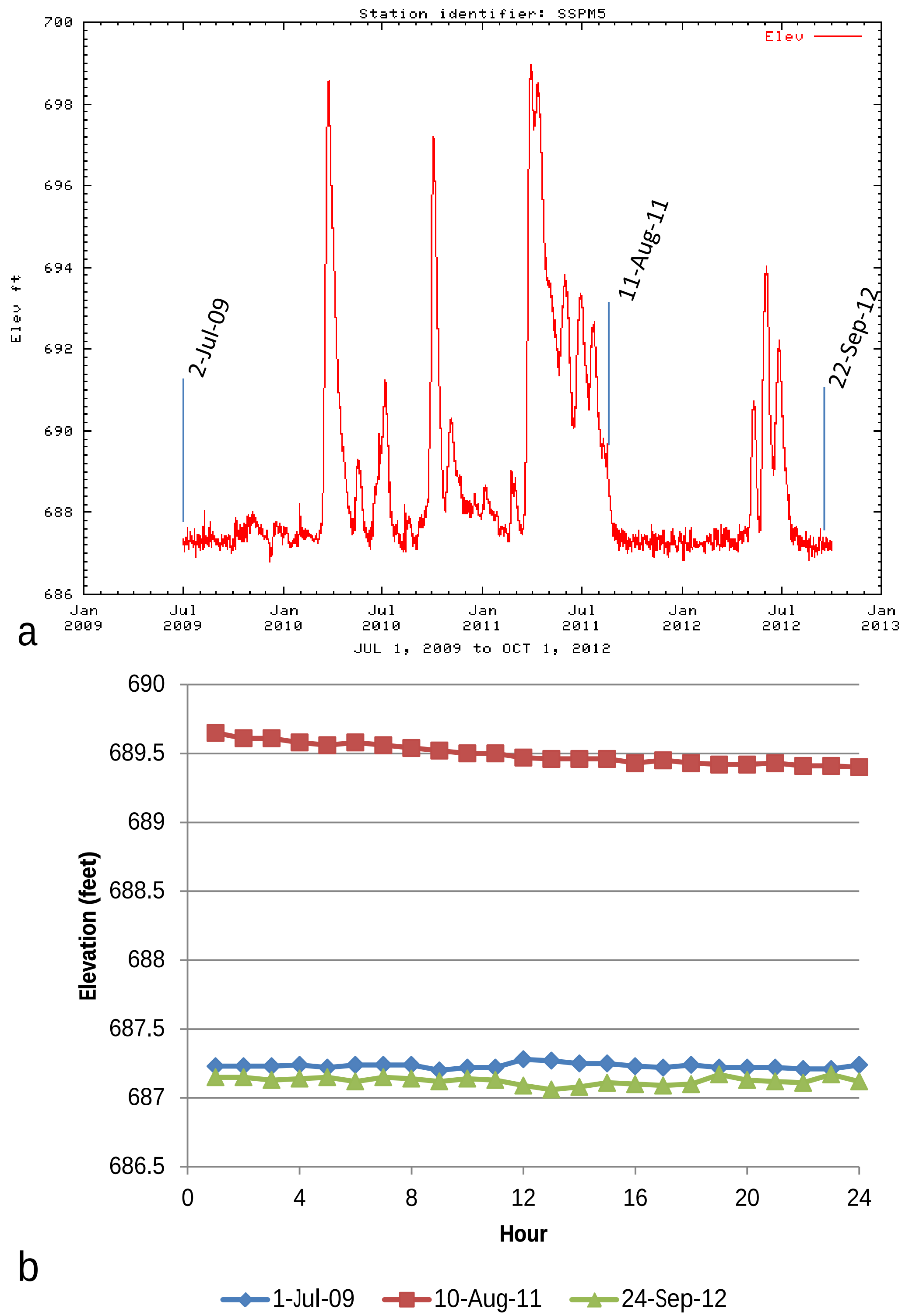


**Figure 2. Water levels at Mississippi River South St. Paul: (a) record between 1 July 2009 and 1 October 2012; (b) hourly water levels on sampling days (http://www.mvp-wc.usace.army.mil/dcp/SSPM5.html)**

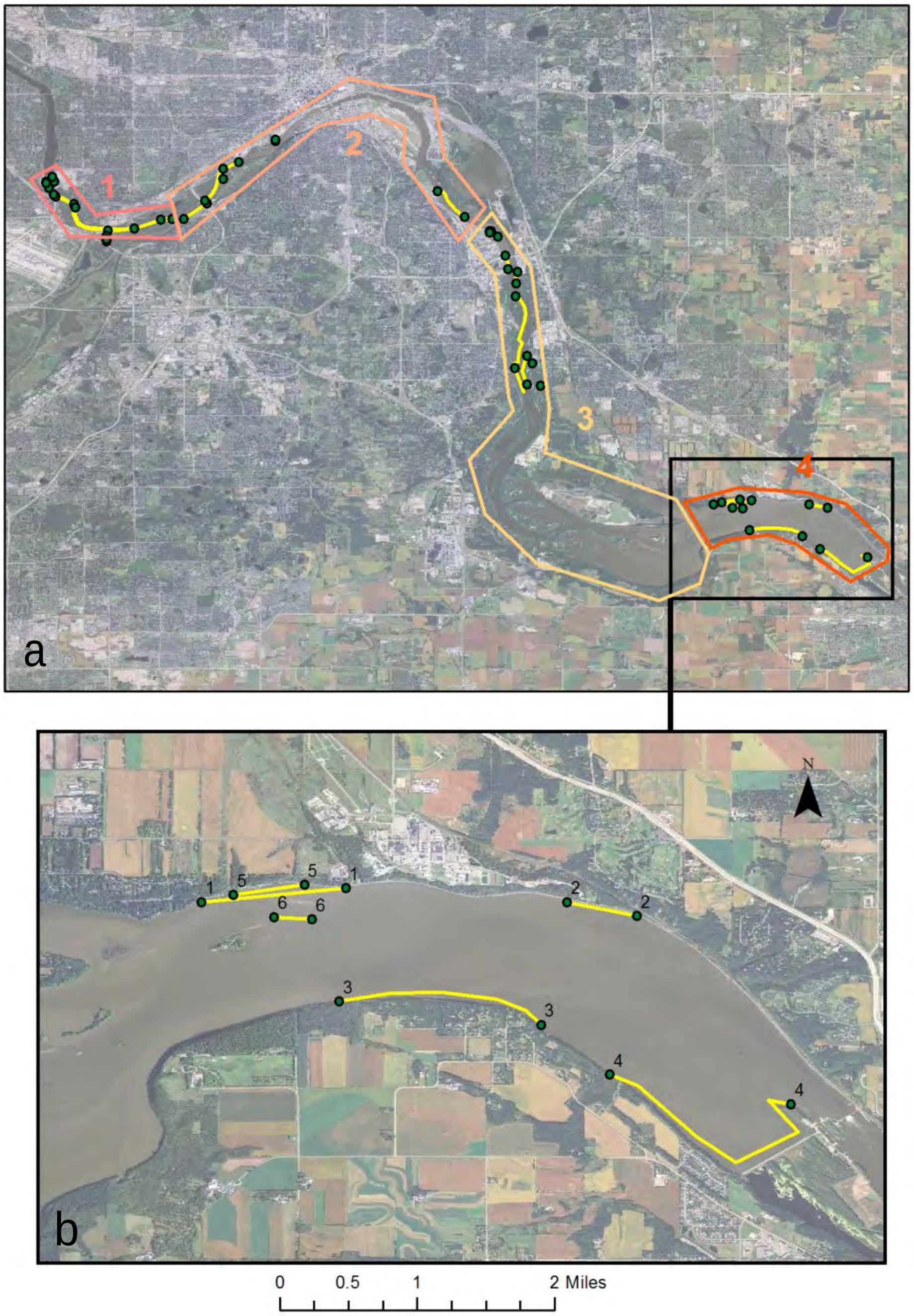


**Figure 3. Fish-collection runs in Pool 2: a. entire Pool 2 showing reaches and runs; b. runs in Section 4**

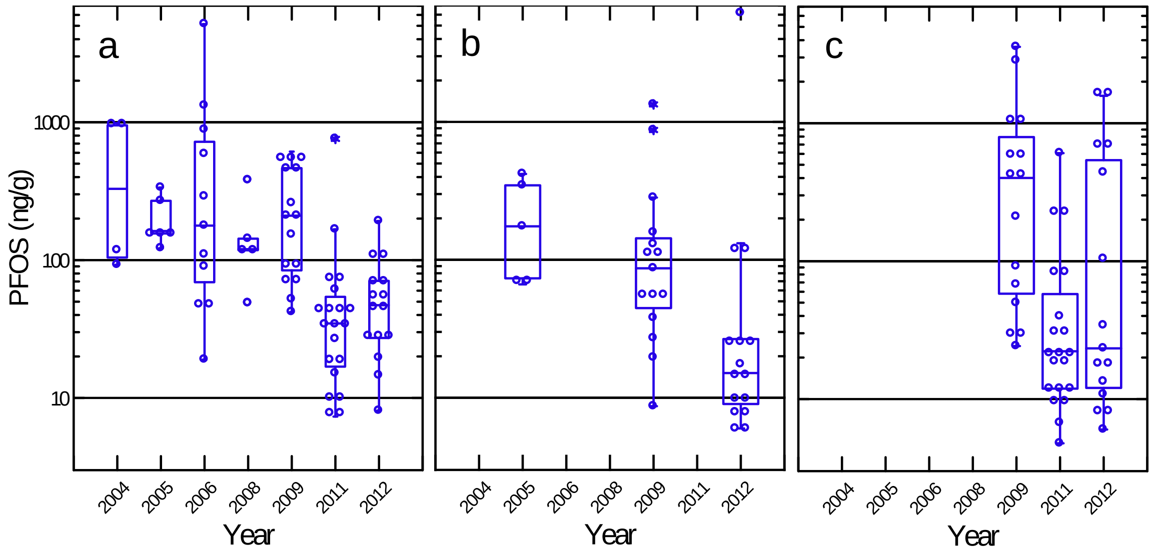

**Figure 4. Box-whisker plots of PFOS concentrations in Lower Pool 2 by year for (a) smallmouth bass, (b) carp, and (c) freshwater drum**

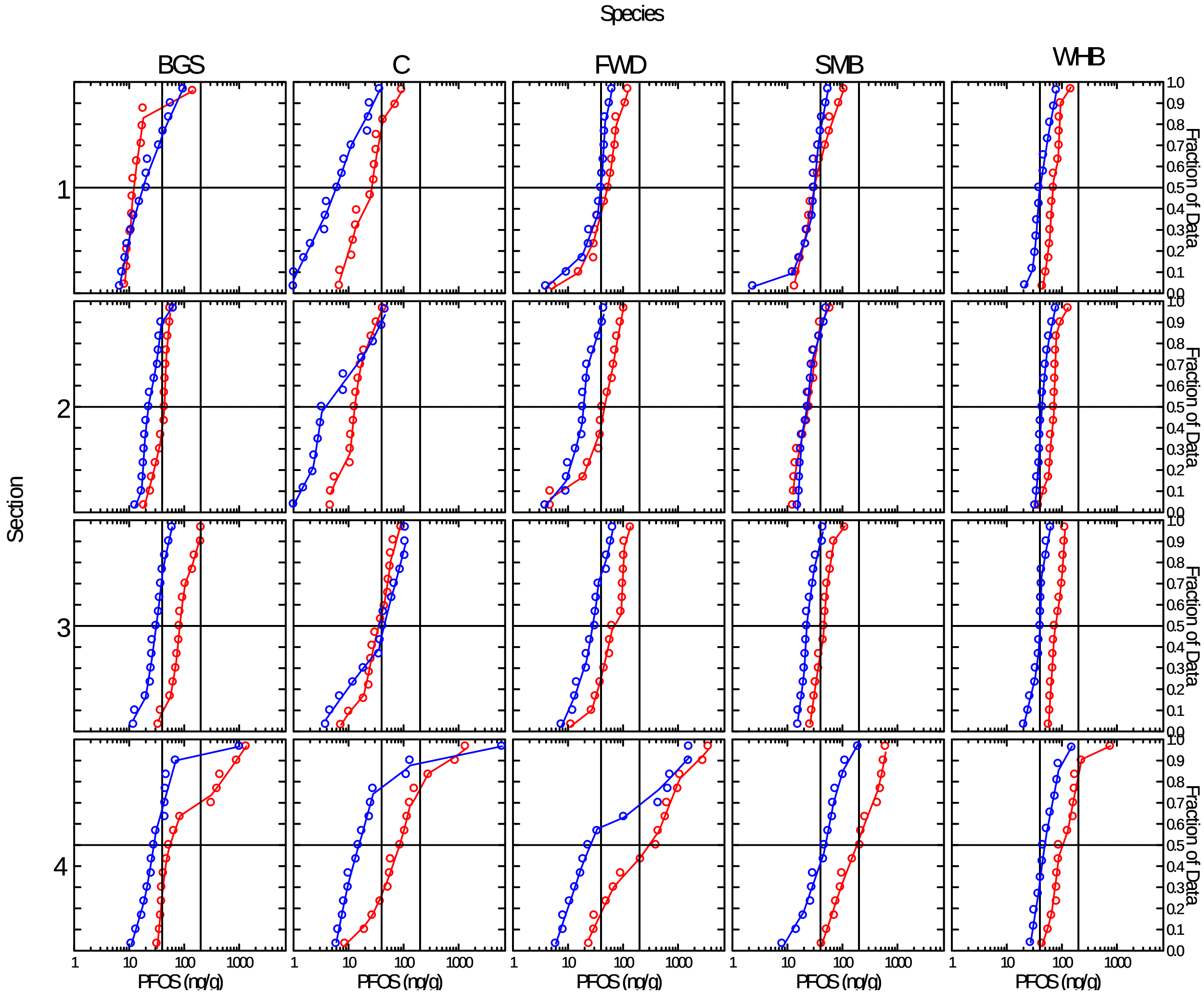


**Figure 5. Species-Section matrix showing distributions of PFOS in 2009 (red) and 2012 (blue); horizontal mid-line is the median; vertical lines are PFOS thresholds of 40 ng/g and 200 ng/g**

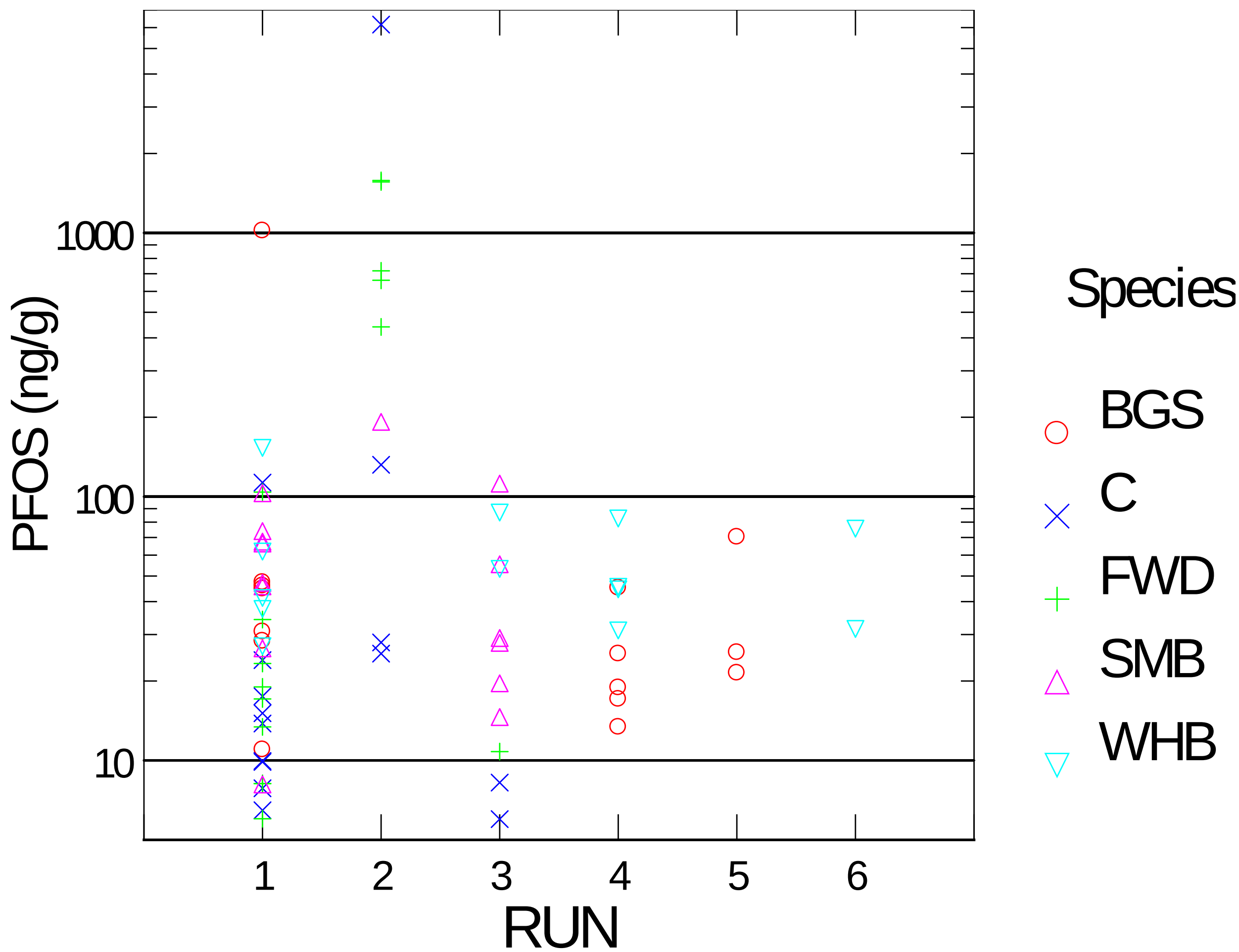


**Figure 6. PFOS concentrations by fish-collection runs in Section 4 (2012)**

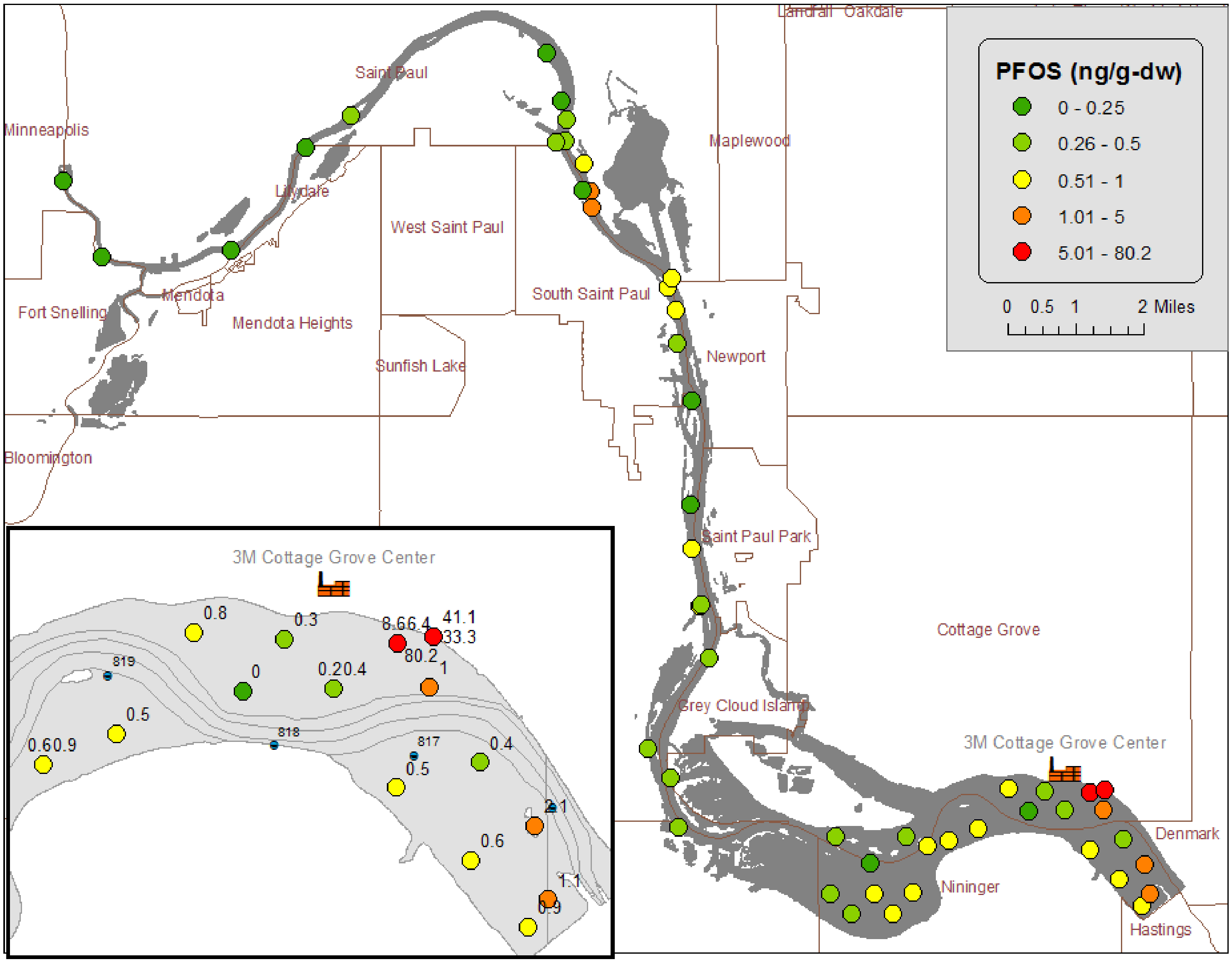


**Figure 7. PFOS concentrations (dry weight) in surface sediments collected between November 2011 and November 2012; concentrations are color coded and insert map shows measured concentrations in Section 4 of Pool 2**

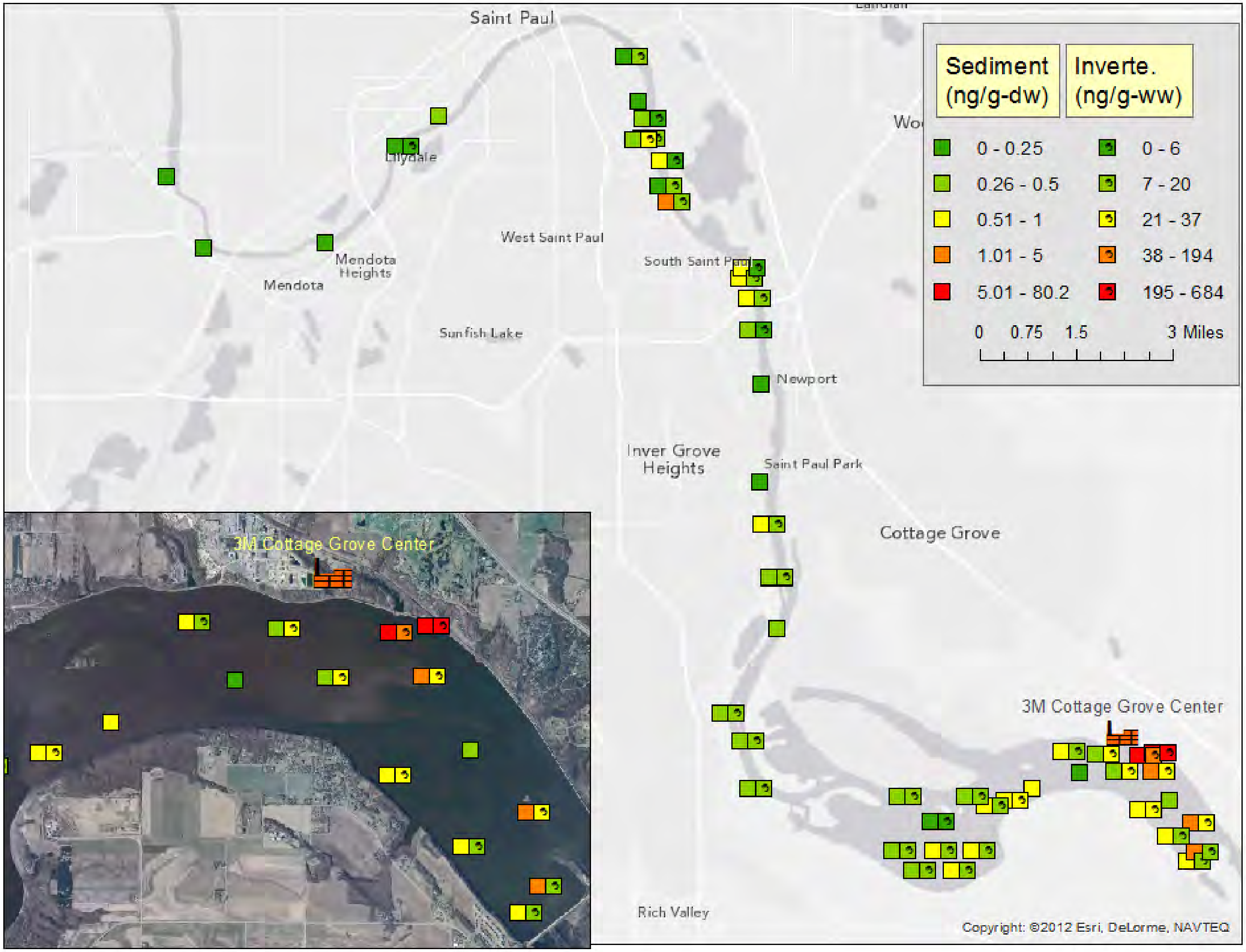


**Figure 8. PFOS concentrations in sediment (ng/g dry weight) and benthic macroinvertebrates (ng/g wet weight)**

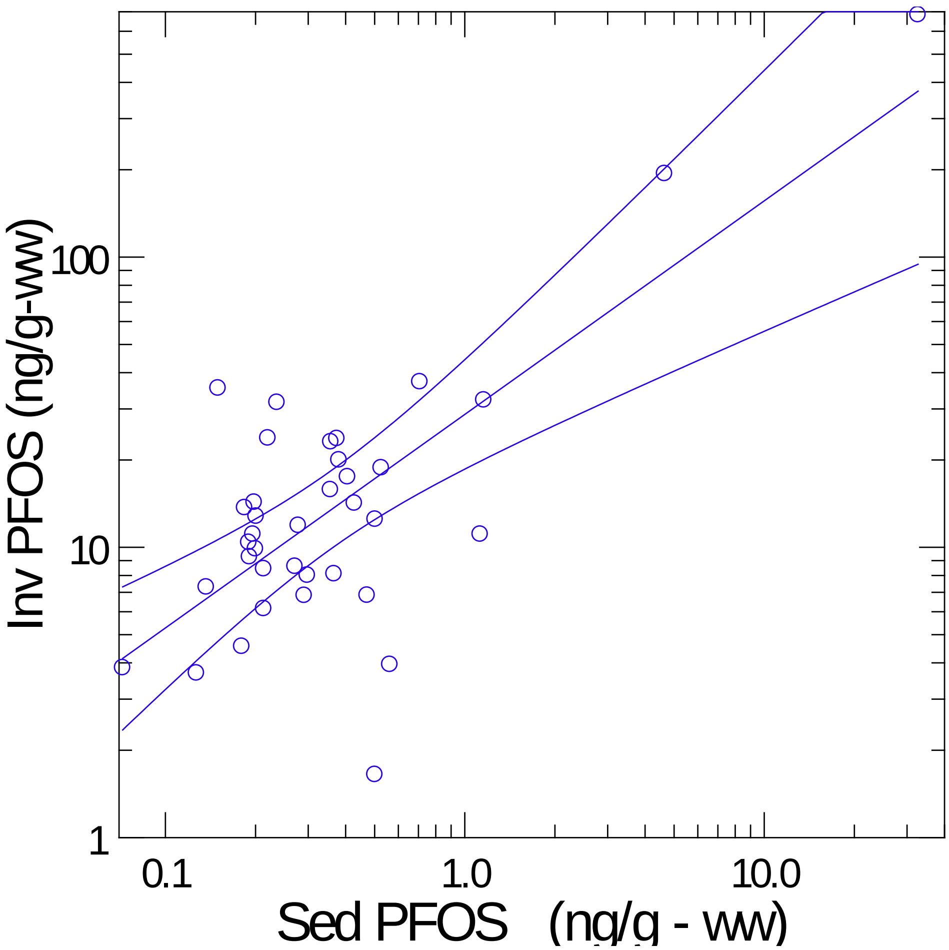


**Figure 9. Relationship between invertebrate and sediment PFOS concentrations (both wet weight and log-scale)**

# Appendix A: Fish and Water Data

**Appendix A-1. PFCs results for fish (ng/g – wet weight)**

| CLIENT ID | WORK GROUP | Sample (g - wet) | PFBA | PFPeA | PFHxA | PFHpA | PFOA | PFNA | PFDA | PFUnA | PFDoA | PFBS | PFHxS | PFOS | PFOSA | QA Review Date | Qualified Analytes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 123076 | WG40901 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | < 1.00 | < 0.600 | 9/26/2012 | |
| 123077 | WG40901 | 2.05 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.976 | < 0.976 | 1.02 | < 0.585 | 9/26/2012 | |
| 123078 | WG40901 | 2.05 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | 0.587 | < 0.488 | < 0.488 | < 0.976 | < 0.976 | 4.01 | < 0.585 | 9/26/2012 | |
| 123079 | WG40901 | 2.03 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.985 | < 0.985 | 7.67 | < 0.591 | 9/26/2012 | |
| 123080 | WG40901 | 2.04 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | 0.564 | < 0.980 | < 0.980 | 6.24 | < 0.588 | 9/26/2012 | |
| 123081 | WG40901 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | 3.84 | < 0.600 | 9/26/2012 | |
| 123082 | WG40901 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | 8.38 | < 0.600 | 9/26/2012 | |
| 123083 | WG40901 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 3.2 | 1.48 | 1.64 | < 0.995 | < 0.995 | 55 | < 0.597 | 9/26/2012 | |
| 123084 | WG40901 | 2.05 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | 2.37 | 1.32 | 1.73 | < 0.976 | < 0.976 | 40.2 | < 0.585 | 9/26/2012 | |
| 123085 | WG40901 | 2.04 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.980 | < 0.980 | 2.37 | < 0.588 | 9/26/2012 | |
| 123086 | WG40901 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 1.46 | 0.603 | 0.983 | < 1.00 | < 1.00 | 16.4 | < 0.600 | 9/26/2012 | |
| 123087 | WG40901 | 2.07 | < 0.483 | < 0.483 | < 0.483 | < 0.483 | < 0.483 | < 0.483 | 1.85 | 0.724 | 0.666 | < 0.966 | < 0.966 | 21.4 | < 0.580 | 9/26/2012 | |
| 123088 | WG40901 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 1.53 | 0.735 | 1.43 | < 1.00 | < 1.00 | 12.5 | < 0.600 | 9/26/2012 | |
| 123089 | WG40901 | 2.05 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | 1.73 | 0.835 | 1.42 | < 0.976 | < 0.976 | 28.2 | < 0.585 | 9/26/2012 | |
| 123090 | WG40901 | 2.04 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | 2.45 | 1.42 | 1.83 | < 0.980 | < 0.980 | 30.2 | < 0.588 | 9/26/2012 | |
| 123091 | WG40901 | 2.05 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | 2.23 | 0.905 | 1.62 | < 0.976 | < 0.976 | 30.1 | < 0.585 | 9/26/2012 | |
| 123092 | WG40901 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 4.1 | 2.3 | 3.91 | < 0.990 | < 0.990 | 50.5 | 0.626 | 9/26/2012 | |
| 123093 | WG40901 | 2.05 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | 1.83 | 1.14 | 1.73 | < 0.976 | < 0.976 | 22.3 | < 0.585 | 9/26/2012 | |
| 123094 | WG40901 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 0.935 | < 0.498 | < 0.498 | < 0.995 | < 0.995 | 18.4 | < 0.597 | 9/26/2012 | |
| 123095 | WG40902 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 0.615 | < 0.495 | < 0.495 | < 0.990 | < 0.990 | 23.8 | < 0.594 | 9/26/2012 | |
| 123096 | WG40902 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 0.586 | < 0.498 | < 0.498 | < 0.995 | < 0.995 | 9.46 | < 0.597 | 9/26/2012 | PFOS, PFDA |
| 123097 | WG40902 | 2.03 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | 1.2 | 0.548 | < 0.493 | < 0.985 | < 0.985 | 44.4 | < 0.591 | 9/26/2012 | |
| 123098 | WG40902 | 2.04 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | 0.781 | 2.2 | 0.829 | 0.727 | < 0.980 | < 0.980 | 36.6 | < 0.588 | 9/26/2012 | |
| 123099 | WG40902 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 0.567 | 0.639 | 1.57 | < 0.995 | < 0.995 | 3.99 | < 0.597 | 9/26/2012 | |
| 123100 | WG40902 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 0.715 | 1.53 | 0.85 | 0.753 | < 1.00 | < 1.00 | 63.3 | < 0.600 | 9/26/2012 | |
| 123101 | WG40902 | 2.03 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | 0.717 | 0.669 | < 0.493 | < 0.493 | < 0.985 | < 0.985 | 24.3 | < 0.591 | 9/26/2012 | |
| 123102 | WG40902 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 1.44 | 0.898 | 1.52 | < 1.00 | < 1.00 | 46.4 | < 0.600 | 9/26/2012 | |
| 123103 | WG40902 | 2.05 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | 0.671 | 1.26 | 0.5 | < 0.488 | < 0.976 | < 0.976 | 46.1 | < 0.585 | 9/26/2012 | |
| 123104 | WG40902 | 2.05 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | 1.75 | 0.866 | 1.23 | < 0.976 | < 0.976 | 56.9 | < 0.585 | 9/26/2012 | |
| 123105 | WG40902 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 1.77 | 0.851 | 1.13 | < 0.995 | < 0.995 | 47.4 | < 0.597 | 9/26/2012 | |

| CLIENT ID | WORK GROUP | Sample (g - wet) | PFBA | PFPeA | PFHxA | PFHpA | PFOA | PFNA | PFDA | PFUnA | PFDoA | PFBS | PFHxS | PFOS | PFOSA | QA Review Date | Qualified Analytes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 123106 | WG40902 | 2.03 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | 1.25 | 0.77 | 1.01 | < 0.985 | < 0.985 | 56.8 | < 0.591 | 9/26/2012 | |
| 123107 | WG40902 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 1.8 | 0.959 | 0.621 | < 0.990 | < 0.990 | 8.51 | < 0.594 | 9/26/2012 | |
| 123108 | WG40902 | 2.03 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | 1.11 | < 0.493 | < 0.493 | < 0.985 | < 0.985 | 20.7 | < 0.591 | 9/26/2012 | |
| 123109 | WG40902 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 0.957 | < 0.495 | < 0.495 | < 0.990 | < 0.990 | 7.46 | < 0.594 | 9/26/2012 | |
| 123110 | WG40902 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 0.903 | < 0.495 | < 0.495 | < 0.990 | < 0.990 | 34.9 | < 0.594 | 9/26/2012 | |
| 123111 | WG40902 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 0.849 | < 0.503 | < 0.503 | < 1.01 | < 1.01 | 21.8 | < 0.603 | 9/26/2012 | |
| 123112 | WG40902 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 2.67 | 1.61 | 0.68 | < 0.990 | < 0.990 | 6.8 | < 0.594 | 9/26/2012 | |
| 123113 | WG40902 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 1.25 | 0.558 | 0.673 | < 1.01 | < 1.01 | 9.29 | < 0.603 | 9/26/2012 | |
| 123114 | WG40903 | 2.03 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | 0.892 | < 0.493 | 0.572 | < 0.985 | < 0.985 | 20.6 | < 0.591 | 9/27/2012 | |
| 123115 | WG40903 | 1.98 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | 1.84 | 0.905 | 0.952 | < 1.01 | < 1.01 | 53.1 | < 0.606 | 9/27/2012 | |
| 123116 | WG40903 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 1.55 | 0.553 | < 0.503 | < 1.01 | < 1.01 | 15.5 | < 0.603 | 9/27/2012 | |
| 123117 | WG40903 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 1.84 | 0.676 | 0.528 | < 1.00 | < 1.00 | 12.2 | < 0.600 | 9/27/2012 | |
| 123118 | WG40903 | 1.98 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | 1.08 | 0.81 | 0.725 | < 1.01 | < 1.01 | 41.8 | < 0.606 | 9/27/2012 | |
| 123119 | WG40903 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 0.78 | < 0.500 | 0.617 | < 1.00 | < 1.00 | 10.9 | < 0.600 | 9/27/2012 | |
| 123120 | WG40903 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 2.0 | 0.934 | 1.14 | < 1.01 | < 1.01 | 96.8 | < 0.603 | 9/27/2012 | |
| 123121 | WG40903 | 2.06 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | 0.982 | 0.553 | 0.591 | < 0.971 | < 0.971 | 24.2 | < 0.583 | 9/27/2012 | PFDoA |
| 123122 | WG40903 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 0.707 | < 0.495 | < 0.495 | < 0.990 | < 0.990 | 22.3 | < 0.594 | 9/27/2012 | |
| 123123 | WG40903 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 1.36 | 0.977 | < 0.498 | < 0.995 | < 0.995 | 41.8 | < 0.597 | 9/27/2012 | |
| 123124 | WG40898 | 2.06 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | 1.2 | < 0.485 | < 0.485 | < 0.971 | < 0.971 | 40 | < 0.485 | 9/26/2012 | |
| 123125 | WG40898 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 0.773 | 0.511 | 0.584 | < 1.01 | < 1.01 | 34.6 | < 0.503 | 9/26/2012 | |
| 123126 | WG40898 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 1.01 | < 1.01 | 3.71 | < 0.503 | 9/26/2012 | |
| 123127 | WG40898 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 0.991 | < 0.498 | < 0.498 | < 0.995 | < 0.995 | 37 | < 0.498 | 9/26/2012 | |
| 123128 | WG40898 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 1.01 | < 1.01 | 11.3 | < 0.503 | 9/26/2012 | |
| 123129 | WG40898 | 2.04 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.980 | < 0.980 | 1.56 | < 0.490 | 9/26/2012 | |
| 123130 | WG40898 | 2.05 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | 1.89 | 0.789 | 1.02 | < 0.976 | < 0.976 | 36.2 | < 0.488 | 9/26/2012 | |
| 123131 | WG40898 | 2.03 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | 2.53 | 1.26 | 1.05 | < 0.985 | < 0.985 | 42.5 | < 0.493 | 9/26/2012 | |
| 123132 | WG40898 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 1.54 | 0.718 | 0.837 | < 0.990 | < 0.990 | 30 | < 0.495 | 9/26/2012 | |
| 123133 | WG40898 | 2.06 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | 1.0 | 2.82 | 1.36 | 1.06 | < 0.971 | < 0.971 | 38.7 | 0.698 | 9/26/2012 | PFOSA |
| 123134 | WG40911 | 1.98 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 1.01 | < 1.01 | 2.06 | < 0.606 | 10/4/2012 | |
| 123135 | WG40911 | 2.06 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | 0.654 | < 0.485 | < 0.485 | < 0.971 | < 0.971 | 23.3 | < 0.583 | 10/4/2012 | |
| 123136 | WG40911 | 2.06 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | 0.668 | 3.62 | 1.54 | 1.22 | < 0.971 | < 0.971 | 80.3 | < 0.583 | 10/4/2012 | |

| CLIENT ID | WORK GROUP | Sample (g - wet) | PFBA | PFPeA | PFHxA | PFHpA | PFOA | PFNA | PFDA | PFUnA | PFDoA | PFBS | PFHxS | PFOS | PFOSA | QA Review Date | Qualified Analytes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 123137 | WG40911 | 2.04 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | 0.865 | 3.01 | 1.6 | 1.84 | < 0.980 | < 0.980 | 55.7 | 3.25 | 10/4/2012 | |
| 123138 | WG40911 | 2.09 | < 0.478 | < 0.478 | < 0.478 | < 0.478 | < 0.478 | < 0.478 | 1.76 | 1.09 | 1.47 | < 0.957 | < 0.957 | 29.6 | < 0.574 | 10/4/2012 | |
| 123139 | WG40911 | 2.06 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | 0.608 | 2.6 | 1.38 | 1.45 | < 0.971 | < 0.971 | 35.4 | < 0.583 | 10/4/2012 | |
| 123140 | WG40911 | 1.98 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 1.01 | < 1.01 | 3.12 | < 0.606 | 10/4/2012 | |
| 123141 | WG40911 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 1.1 | 0.629 | < 0.500 | < 1.00 | < 1.00 | 17.5 | < 0.600 | 10/4/2012 | |
| 123142 | WG40911 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 0.548 | < 0.503 | < 0.503 | < 1.01 | < 1.01 | 28.4 | < 0.603 | 10/4/2012 | |
| 123143 | WG40911 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.990 | < 0.990 | 2.38 | < 0.594 | 10/4/2012 | |
| 123144 | WG40911 | 1.96 | < 0.510 | < 0.510 | < 0.510 | < 0.510 | < 0.510 | < 0.510 | < 0.510 | < 0.510 | < 0.510 | < 1.02 | < 1.02 | 2.82 | < 0.612 | 10/4/2012 | |
| 123145 | WG40911 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 0.506 | < 0.498 | < 0.498 | < 0.995 | < 0.995 | 8.14 | < 0.597 | 10/4/2012 | |
| 123146 | WG40911 | 2.06 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | 1.2 | 5.44 | 2.69 | 2.49 | < 0.971 | < 0.971 | 66.8 | 0.718 | 10/4/2012 | PFOSA |
| 123147 | WG40898 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 0.792 | 4.12 | 2.06 | 1.68 | < 0.995 | < 0.995 | 44.4 | 0.669 | 9/26/2012 | |
| 123148 | WG40898 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 0.568 | 3.28 | 1.56 | 1.25 | < 0.990 | < 0.990 | 41.3 | < 0.495 | 9/26/2012 | |
| 123149 | WG40898 | 2.05 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | 0.57 | 2.37 | 1.44 | 1.4 | < 0.976 | < 0.976 | 35 | < 0.488 | 9/26/2012 | |
| 123150 | WG40898 | 2.05 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | 0.701 | 2.84 | 1.54 | 1.21 | < 0.976 | < 0.976 | 44.5 | 0.793 | 9/26/2012 | |
| 123151 | WG40898 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 0.865 | 4.0 | 1.91 | 1.74 | < 1.01 | < 1.01 | 58.3 | 1.22 | 9/26/2012 | PFOSA |
| 123152 | WG40898 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 0.717 | 4.23 | 2.0 | 2.16 | < 1.00 | < 1.00 | 77.5 | J 0.570 | 9/26/2012 | PFOSA |
| 123153 | WG40898 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 2.53 | 1.12 | 1.08 | < 0.995 | < 0.995 | 40.1 | 1.18 | 9/26/2012 | |
| 123154 | WG41155 | 1.97 | < 2.54 | < 2.54 | < 2.54 | < 2.54 | < 2.54 | < 2.54 | 3.27 | < 2.54 | < 2.54 | < 5.08 | < 5.08 | 47.9 | < 2.54 | 10/15/2012 | |
| 123155 | WG40898 | 2.05 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | 2.15 | 0.964 | 0.725 | < 0.976 | < 0.976 | 39.5 | < 0.488 | 9/26/2012 | |
| 123156 | WG40898 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 0.707 | 3.43 | 2.13 | 1.86 | < 0.995 | < 0.995 | 38.8 | J 0.555 | 9/26/2012 | PFOSA |
| 123157 | WG40903 | 2.03 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | 1.06 | 2.68 | 0.993 | 1.21 | < 0.985 | < 0.985 | 35.5 | < 0.591 | 9/27/2012 | |
| 123158 | WG40903 | 2.15 | < 0.465 | < 0.465 | < 0.465 | < 0.465 | < 0.465 | 0.787 | 2.65 | 1.21 | 1.19 | < 0.930 | < 0.930 | 54 | 0.866 | 9/27/2012 | |
| 123159 | WG40903 | 2.03 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | 1.03 | 3.51 | 1.66 | 1.43 | < 0.985 | < 0.985 | 50.3 | 0.653 | 9/27/2012 | |
| 123160 | WG40903 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 0.755 | 3.24 | 1.49 | 1.44 | < 1.00 | < 1.00 | 32.8 | < 0.600 | 9/27/2012 | |
| 123161 | WG40903 | 2.08 | < 0.481 | < 0.481 | < 0.481 | < 0.481 | < 0.481 | < 0.481 | 1.23 | 0.498 | 0.636 | < 0.962 | < 0.962 | 18.5 | < 0.577 | 9/27/2012 | |
| 123162 | WG40903 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 1.55 | 0.878 | 1.45 | < 0.995 | < 0.995 | 18.6 | < 0.597 | 9/27/2012 | PFDoA |
| 123163 | WG40903 | 2.11 | < 0.474 | < 0.474 | < 0.474 | < 0.474 | < 0.474 | < 0.474 | 0.725 | < 0.474 | 1.26 | < 0.948 | < 0.948 | 9.22 | < 0.569 | 9/27/2012 | PFDoA |
| 123164 | WG40903 | 2.05 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | 0.935 | < 0.488 | 0.997 | < 0.976 | < 0.976 | 9.53 | < 0.585 | 9/27/2012 | |
| 123165 | WG40903 | 1.98 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | 0.599 | < 0.505 | < 0.505 | < 1.01 | < 1.01 | 13.9 | < 0.606 | 9/27/2012 | |
| 123166 | WG40904 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 0.785 | < 0.503 | 0.514 | < 1.01 | < 1.01 | 38.4 | < 0.603 | 9/27/2012 | |
| 123167 | WG40904 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.995 | < 0.995 | 13.8 | < 0.597 | 9/27/2012 | |

| CLIENT ID | WORK GROUP | Sample (g - wet) | PFBA | PFPeA | PFHxA | PFHpA | PFOA | PFNA | PFDA | PFUnA | PFDoA | PFBS | PFHxS | PFOS | PFOSA | QA Review Date | Qualified Analytes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 123168 | WG40904 | 2.03 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.985 | < 0.985 | 15.1 | < 0.591 | 9/27/2012 | |
| 123169 | WG40904 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | 9.95 | < 0.600 | 9/27/2012 | |
| 123170 | WG40904 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 1.3 | 0.76 | 1.75 | < 0.995 | < 0.995 | 113 | 0.774 | 9/27/2012 | PFDoA, PFOSA |
| 123171 | WG40904 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.995 | < 0.995 | 6.47 | < 0.597 | 9/27/2012 | |
| 123172 | WG40904 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 1.01 | < 1.01 | 17.5 | < 0.603 | 9/27/2012 | |
| 123173 | WG40904 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | 24 | < 0.600 | 9/27/2012 | |
| 123174 | WG40904 | 2.00 | 0.689 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | 7.84 | < 0.600 | 9/27/2012 | |
| 123175 | WG40904 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.990 | < 0.990 | 9.87 | < 0.594 | 9/27/2012 | |
| 123176 | WG40904 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 1.64 | 1.79 | 0.688 | < 0.503 | < 1.01 | < 1.01 | 34.2 | < 0.603 | 9/27/2012 | |
| 123177 | WG40904 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 4.37 | 4.4 | 5.19 | < 0.990 | < 0.990 | 17.1 | < 0.594 | 9/27/2012 | |
| 123178 | WG40904 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 0.925 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | 13.4 | < 0.600 | 9/27/2012 | |
| 123179 | WG41230 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 0.692 | 0.567 | 0.569 | < 0.990 | < 0.990 | 19 | < 0.594 | 10/5/2012 | |
| 123180 | WG41230 | 2.03 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | 1.68 | 1.79 | 1.73 | < 0.985 | < 0.985 | 6.01 | < 0.591 | 10/5/2012 | |
| 123181 | WG41230 | 2.05 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | 1.27 | 0.927 | 1.01 | < 0.976 | < 0.976 | 23.3 | < 0.585 | 10/5/2012 | |
| 123182 | WG41230 | 2.03 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | 1.46 | 0.647 | 0.914 | < 0.985 | < 0.985 | 104 | 1.92 | 10/5/2012 | |
| 123183 | WG41230 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 1.53 | 1.4 | 1.66 | < 1.01 | < 1.01 | 8.17 | < 0.603 | 10/5/2012 | |
| 123184 | WG41230 | 1.98 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | 1.74 | 1.6 | 1.52 | < 1.01 | < 1.01 | 8.17 | < 0.606 | 10/5/2012 | |
| 123185 | WG41230 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 2.16 | 1.11 | 0.999 | < 1.00 | < 1.00 | 37.5 | < 0.600 | 10/5/2012 | |
| 123186 | WG41230 | 1.98 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | 1.38 | 4.55 | 2.2 | 2.09 | < 1.01 | < 1.01 | 153 | 2.28 | 10/5/2012 | |
| 123187 | WG40910 | 2.12 | < 0.472 | < 0.472 | < 0.472 | < 0.472 | < 0.472 | 0.777 | 1.43 | 0.707 | 0.602 | < 0.943 | < 0.943 | 27.1 | 0.675 | 9/27/2012 | |
| 123188 | WG40910 | 2.03 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | 0.694 | 2.67 | 1.47 | 1.18 | < 0.985 | < 0.985 | 61.9 | 0.943 | 9/27/2012 | |
| 123189 | WG40910 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 1.27 | 2.91 | 1.49 | 1.26 | < 0.995 | < 0.995 | 41.3 | 0.944 | 9/27/2012 | |
| 123190 | WG40910 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 1.53 | 1.82 | 2.07 | < 1.01 | < 1.01 | 47.1 | 0.798 | 9/27/2012 | PFOS |
| 123191 | WG40910 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 1.74 | 2.15 | 2.43 | < 1.01 | < 1.01 | 67.5 | 2.52 | 9/27/2012 | |
| 123192 | WG40910 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 1.25 | 1.28 | 1.63 | < 0.995 | < 0.995 | 66.4 | < 0.597 | 9/27/2012 | |
| 123193 | WG40910 | 2.28 | < 0.439 | < 0.439 | < 0.439 | < 0.439 | < 0.439 | < 0.439 | 1.59 | 1.08 | 1.49 | < 0.877 | < 0.877 | 74 | 1.14 | 9/27/2012 | |
| 123194 | WG40910 | 2.22 | < 0.450 | < 0.450 | < 0.450 | < 0.450 | < 0.450 | < 0.450 | 0.807 | 1.05 | 1.38 | < 0.901 | < 0.901 | 8.11 | 1.02 | 9/27/2012 | |
| 123195 | WG40910 | 2.07 | < 0.483 | < 0.483 | < 0.483 | < 0.483 | < 0.483 | < 0.483 | 1.33 | 1.5 | 1.86 | < 0.966 | < 0.966 | 45.7 | 1.23 | 9/27/2012 | |
| 123196 | WG40910 | 2.14 | < 0.467 | < 0.467 | < 0.467 | < 0.467 | < 0.467 | < 0.467 | 1.35 | 1.42 | 1.45 | < 0.935 | < 0.935 | 26.6 | 0.811 | 9/27/2012 | |
| 123197 | WG40910 | 2.22 | < 0.450 | < 0.450 | < 0.450 | < 0.450 | < 0.450 | < 0.450 | 1.36 | 2.17 | 5.22 | < 0.901 | < 0.901 | 103 | 2.89 | 9/27/2012 | |
| 123198 | WG40910 | 2.17 | < 0.461 | < 0.461 | < 0.461 | < 0.461 | < 0.461 | < 0.461 | 1.45 | 1.15 | 1.04 | < 0.922 | < 0.922 | 30.8 | < 0.553 | 9/27/2012 | |

| CLIENT ID | WORK GROUP | Sample (g - wet) | PFBA | PFPeA | PFHxA | PFHpA | PFOA | PFNA | PFDA | PFUnA | PFDoA | PFBS | PFHxS | PFOS | PFOSA | QA Review Date | Qualified Analytes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 123199 | WG40910 | 2.23 | < 0.448 | < 0.448 | < 0.448 | < 0.448 | < 0.448 | < 0.448 | 1.08 | 0.985 | 0.82 | < 0.897 | < 0.897 | 44.8 | < 0.538 | 9/27/2012 | |
| 123200 | WG40910 | 2.13 | 1.18 | < 0.469 | < 0.469 | < 0.469 | 0.887 | < 0.469 | 1.93 | 1.04 | 1.17 | 1.3 | < 0.939 | 28.4 | < 0.563 | 9/27/2012 | |
| 123201 | WG40910 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 2.49 | 3.74 | 4.61 | < 0.995 | < 0.995 | 1020 | 6.21 | 9/27/2012 | |
| 123202 | WG40910 | 2.31 | < 0.433 | < 0.433 | < 0.433 | < 0.433 | < 0.433 | < 0.433 | 1.61 | 1.11 | 1.18 | < 0.866 | < 0.866 | 47.4 | < 0.519 | 9/27/2012 | |
| 123203 | WG40910 | 2.08 | < 0.481 | < 0.481 | < 0.481 | < 0.481 | < 0.481 | < 0.481 | 1.04 | 0.823 | 0.751 | < 0.962 | < 0.962 | 46 | < 0.577 | 9/27/2012 | |
| 123204 | WG40910 | 2.04 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | 0.689 | 0.534 | 0.687 | < 0.980 | < 0.980 | 11 | < 0.588 | 9/27/2012 | |
| 123205 | WG40907 | 1.99 | 24.8 | 0.732 | < 0.503 | < 0.503 | 8.89 | 0.505 | 11.5 | 3.41 | 4.6 | < 1.01 | 13.2 | 6160 | 19.5 | 10/4/2012 | PFDoA |
| 123206 | WG40907 | 2.01 | 9.08 | < 1.49 | < 1.49 | < 1.49 | 1.32 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.995 | < 0.995 | 25.4 | 4.53 | 10/4/2012 | |
| 123207 | WG40907 | 2.01 | 11.6 | 0.544 | < 0.498 | < 0.498 | 1.29 | < 0.498 | < 0.498 | < 0.498 | 0.847 | < 0.995 | 1.52 | 28 | 8.74 | 10/4/2012 | PFPeA, PFDoA, PFOSA, PFOS |
| 123208 | WG40907 | 2.02 | 5.96 | < 0.495 | < 0.495 | < 0.495 | 0.67 | < 0.495 | 0.788 | < 0.495 | 0.673 | < 0.990 | < 0.990 | 132 | 4.61 | 10/4/2012 | |
| 123209 | WG40907 | 1.97 | 2.44 | < 0.508 | < 0.508 | < 0.508 | 1.61 | < 0.508 | 6.16 | 4.89 | 26.3 | < 1.02 | 1.49 | 440 | 34.7 | 10/4/2012 | |
| 123210 | WG40907 | 2.00 | 3.96 | < 0.500 | < 0.500 | < 0.500 | 1.13 | < 0.500 | 8.62 | 6.79 | 30.3 | < 1.00 | < 1.00 | 661 | 51.6 | 10/4/2012 | |
| 123211 | WG40907 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 7.78 | 6.14 | 18.1 | < 0.990 | < 0.990 | 718 | 17.1 | 10/4/2012 | |
| 123212 | WG40907 | 1.98 | 0.875 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | 7.02 | 3.01 | 8.85 | < 1.01 | < 1.01 | 1580 | 31.3 | 10/4/2012 | |
| 123213 | WG40907 | 2.02 | 0.845 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 9.64 | 4.59 | 9.62 | < 0.990 | < 0.990 | 1560 | 23.8 | 10/4/2012 | |
| 123214 | WG40907 | 2.00 | 1.37 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 2.05 | 1.75 | 8.59 | < 1.00 | < 1.00 | 192 | 46.9 | 10/4/2012 | PFDoA |
| 123215 | WG40908 | 1.96 | 0.958 | < 0.510 | < 0.510 | < 0.510 | < 0.510 | < 0.510 | 0.729 | < 0.510 | < 0.510 | < 1.02 | < 1.02 | 8.24 | < 0.612 | 9/27/2012 | PFDA |
| 123216 | WG40908 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 0.654 | < 0.503 | < 0.503 | < 1.01 | < 1.01 | 5.99 | < 0.603 | 9/27/2012 | |
| 123217 | WG40908 | 2.14 | < 0.467 | < 0.467 | < 0.467 | < 0.467 | < 0.467 | 0.539 | 1.27 | 0.754 | 0.939 | < 0.935 | < 0.935 | 10.8 | < 0.561 | 9/27/2012 | |
| 123218 | WG40908 | 2.08 | < 0.481 | < 0.481 | < 0.481 | < 0.481 | < 0.481 | < 0.481 | 1.46 | 1.14 | 1.27 | < 0.962 | < 0.962 | 19.6 | 0.713 | 9/27/2012 | |
| 123219 | WG40908 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 2.66 | 2.8 | 3.65 | < 0.995 | < 0.995 | 55.4 | 2.14 | 9/27/2012 | |
| 123220 | WG40908 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 1.71 | 1.13 | 2.02 | < 1.00 | < 1.00 | 112 | 3.45 | 9/27/2012 | |
| 123221 | WG40908 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 1.59 | 0.67 | 0.656 | < 1.00 | < 1.00 | 29.1 | 0.603 | 9/27/2012 | |
| 123222 | WG40908 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 1.22 | 1.53 | 2.0 | < 1.01 | < 1.01 | 14.6 | < 0.603 | 9/27/2012 | |
| 123223 | WG40908 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 1.49 | 1.07 | 1.36 | < 1.01 | < 1.01 | 27.9 | 0.631 | 9/27/2012 | |
| 123224 | WG40908 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 1.92 | 4.28 | 2.0 | 1.46 | < 0.995 | < 0.995 | 87 | 1.17 | 9/27/2012 | |
| 123225 | WG40908 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 0.983 | 2.63 | 0.854 | 0.89 | < 0.995 | < 0.995 | 53.2 | 1.1 | 9/27/2012 | |
| 123226 | WG40908 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 1.06 | 3.0 | 1.42 | 1.36 | < 1.00 | < 1.00 | 45.5 | 1.26 | 9/27/2012 | |
| 123227 | WG40908 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 1.26 | 2.32 | 0.876 | 0.745 | < 0.995 | < 0.995 | 44.5 | 1.6 | 9/27/2012 | |
| 123228 | WG40908 | 2.09 | < 0.478 | < 0.478 | < 0.478 | < 0.478 | < 0.478 | 1.2 | 2.11 | 0.973 | 0.743 | < 0.957 | < 0.957 | 31.1 | 0.834 | 9/27/2012 | |

| CLIENT ID | WORK GROUP | Sample (g - wet) | PFBA | PFPeA | PFHxA | PFHpA | PFOA | PFNA | PFDA | PFUnA | PFDoA | PFBS | PFHxS | PFOS | PFOSA | QA Review Date | Qualified Analytes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 123229 | WG40908 | 2.09 | < 0.478 | < 0.478 | < 0.478 | < 0.478 | < 0.478 | 0.684 | 8.52 | 3.48 | 2.68 | < 0.957 | < 0.957 | 82.6 | < 0.574 | 9/27/2012 | |
| 123230 | WG40908 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 1.54 | 0.626 | 0.595 | < 1.01 | < 1.01 | 18.9 | < 0.603 | 9/27/2012 | |
| 123231 | WG40908 | 2.03 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | 1.07 | 0.626 | < 0.493 | < 0.985 | < 0.985 | 17.1 | < 0.591 | 9/27/2012 | |
| 123232 | WG40908 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 0.72 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | 13.4 | < 0.600 | 9/27/2012 | PFBA |
| 123233 | WG40908 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 1.33 | 1.08 | 0.879 | < 0.995 | < 0.995 | 25.4 | < 0.597 | 9/27/2012 | PFBA, PFDA |
| 123237 | WG40909 | 2.05 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | 1.98 | 1.33 | 1.28 | < 0.976 | < 0.976 | 45.2 | 0.982 | 9/27/2012 | |
| 123238 | WG40904 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 0.734 | 2.03 | 0.872 | 1.09 | < 1.01 | < 1.01 | 41.2 | < 0.603 | 9/27/2012 | PFDoA |
| 123239 | WG40904 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 1.15 | 2.58 | 1.03 | 0.932 | < 1.00 | < 1.00 | 52.2 | 0.801 | 9/27/2012 | |
| 123240 | WG40904 | 2.03 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | 0.546 | < 0.493 | < 0.493 | < 0.985 | < 0.985 | 12.1 | < 0.591 | 9/27/2012 | |
| 123241 | WG40904 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 0.811 | 0.562 | < 0.503 | < 1.01 | < 1.01 | 26.5 | < 0.603 | 9/27/2012 | |
| 123242 | WG40904 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 0.931 | 0.625 | 0.963 | < 0.995 | < 0.995 | 40.4 | < 0.597 | 9/27/2012 | |
| 123243 | WG40904 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 1.75 | 1.02 | 0.97 | < 0.990 | < 0.990 | 53 | < 0.594 | 9/27/2012 | |
| 123244 | WG40905 | 1.98 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | 1.08 | 0.573 | 0.615 | < 1.01 | < 1.01 | 44.9 | < 0.606 | 9/27/2012 | |
| 123245 | WG40905 | 1.99 | 1.77 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 0.943 | < 0.503 | < 0.503 | < 1.01 | < 1.01 | 34.5 | < 0.603 | 9/27/2012 | |
| 123246 | WG40905 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 0.64 | 0.561 | < 0.500 | < 1.00 | < 1.00 | 24.5 | < 0.600 | 9/27/2012 | |
| 123247 | WG40905 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 0.629 | 0.779 | 0.71 | < 0.995 | < 0.995 | 36.2 | < 0.597 | 9/27/2012 | |
| 123248 | WG40905 | 2.08 | < 0.481 | < 0.481 | < 0.481 | < 0.481 | < 0.481 | < 0.481 | 0.976 | 0.94 | 0.934 | < 0.962 | < 0.962 | 60.4 | < 0.577 | 9/27/2012 | |
| 123249 | WG40905 | 2.04 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | 0.493 | < 0.490 | < 0.490 | < 0.980 | < 0.980 | 19.9 | < 0.588 | 9/27/2012 | |
| 123250 | WG40905 | 1.98 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | 1.34 | 0.722 | 0.629 | < 1.01 | < 1.01 | 37.9 | < 0.606 | 9/27/2012 | |
| 123251 | WG40905 | 1.97 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | 0.596 | < 0.508 | < 0.508 | < 1.02 | < 1.02 | 26.1 | < 0.609 | 9/27/2012 | |
| 123252 | WG40905 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 0.956 | 0.556 | 0.593 | < 0.995 | < 0.995 | 31.1 | < 0.597 | 9/27/2012 | |
| 123253 | WG40905 | 1.97 | 1.14 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | 0.705 | 0.627 | 0.52 | < 1.02 | < 1.02 | 25.2 | < 0.609 | 9/27/2012 | |
| 123254 | WG40905 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | 12.8 | < 0.600 | 9/27/2012 | |
| 123255 | WG40905 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 1.01 | 0.835 | 1.87 | < 0.990 | < 0.990 | 40.5 | < 0.594 | 9/27/2012 | |
| 123256 | WG40905 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 0.535 | < 0.503 | < 0.503 | < 1.01 | < 1.01 | 8.13 | < 0.603 | 9/27/2012 | |
| 123257 | WG40905 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.995 | < 0.995 | < 0.995 | < 0.597 | 9/27/2012 | |
| 123258 | WG40905 | 1.98 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 1.01 | < 1.01 | 2.26 | < 0.606 | 9/27/2012 | |
| 123259 | WG40905 | 2.07 | < 0.483 | < 0.483 | < 0.483 | < 0.483 | < 0.483 | < 0.483 | < 0.483 | < 0.483 | < 0.483 | < 0.966 | < 0.966 | 1.52 | < 0.580 | 9/27/2012 | |
| 123260 | WG40905 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.995 | < 0.995 | < 0.995 | < 0.597 | 9/27/2012 | |
| 123261 | WG40905 | 2.06 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | 1.99 | 1.51 | 3.05 | < 0.971 | < 0.971 | 12.9 | < 0.583 | 9/27/2012 | |
| 123262 | WG40905 | 2.04 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | 1.02 | < 0.490 | < 0.490 | < 0.980 | < 0.980 | 18.3 | < 0.588 | 9/27/2012 | |

| CLIENT ID | WORK GROUP | Sample (g - wet) | PFBA | PFPeA | PFHxA | PFHpA | PFOA | PFNA | PFDA | PFUnA | PFDoA | PFBS | PFHxS | PFOS | PFOSA | QA Review Date | Qualified Analytes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 123263 | WG40906 | 1.97 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 1.02 | < 1.02 | 33.2 | < 0.609 | 9/27/2012 | |
| 123264 | WG40906 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 0.98 | < 0.503 | < 0.503 | < 1.01 | < 1.01 | 17.4 | < 0.603 | 9/27/2012 | |
| 123265 | WG40906 | 1.97 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | 1.23 | 0.733 | 0.921 | < 1.02 | < 1.02 | 19.4 | < 0.609 | 9/27/2012 | |
| 123266 | WG40906 | 1.98 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | 1.92 | 0.743 | 0.744 | < 1.01 | < 1.01 | 22.9 | < 0.606 | 9/27/2012 | |
| 123267 | WG40906 | 2.03 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | 0.552 | < 0.493 | < 0.493 | < 0.985 | < 0.985 | 3.88 | < 0.591 | 9/27/2012 | |
| 123268 | WG40906 | 2.03 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | 0.56 | 1.49 | 0.555 | 1.21 | < 0.985 | < 0.985 | 36.3 | < 0.591 | 9/27/2012 | |
| 123269 | WG40906 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 1.29 | 0.707 | 1.25 | < 0.990 | < 0.990 | 18.8 | < 0.594 | 9/27/2012 | |
| 123270 | WG40906 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 0.859 | 0.609 | 0.563 | < 1.01 | < 1.01 | 9.99 | < 0.603 | 9/27/2012 | |
| 123271 | WG40906 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 0.772 | 1.31 | 0.63 | < 0.495 | < 0.990 | < 0.990 | 44.8 | < 0.594 | 9/27/2012 | |
| 123272 | WG40906 | 1.97 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | 0.965 | 2.51 | 1.09 | 0.822 | < 1.02 | < 1.02 | 42.5 | < 0.609 | 9/27/2012 | |
| 123273 | WG40906 | 1.98 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | 1.36 | 0.624 | 0.639 | < 1.01 | < 1.01 | 17.6 | < 0.606 | 9/27/2012 | |
| 123274 | WG40906 | 1.97 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | 1.44 | 0.664 | 0.71 | < 1.02 | < 1.02 | 17.1 | < 0.609 | 9/27/2012 | |
| 123275 | WG40906 | 1.98 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | 1.21 | 0.509 | 0.573 | < 1.01 | < 1.01 | 15.3 | < 0.606 | 9/27/2012 | |
| 123276 | WG40906 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 1.12 | 0.625 | < 0.500 | < 1.00 | < 1.00 | 16.7 | < 0.600 | 9/27/2012 | |
| 123277 | WG40906 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 1.21 | 1.2 | 1.07 | < 1.00 | < 1.00 | 46.7 | < 0.600 | 9/27/2012 | |
| 123278 | WG40906 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.990 | < 0.990 | 3.27 | < 0.594 | 9/27/2012 | |
| 123279 | WG40906 | 1.97 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | 0.809 | < 0.508 | < 0.508 | < 1.02 | < 1.02 | 46.1 | < 0.609 | 9/27/2012 | |
| 123280 | WG40906 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 1.01 | < 1.01 | < 1.01 | < 0.603 | 9/27/2012 | |
| 123281 | WG40906 | 2.03 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | 0.551 | 1.05 | 0.549 | 0.854 | < 0.985 | < 0.985 | 21.7 | < 0.591 | 9/27/2012 | |
| 123282 | WG40907 | 2.05 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | 1.28 | 0.546 | 0.73 | < 0.976 | < 0.976 | 29.5 | < 0.585 | 10/4/2012 | |
| 123283 | WG40907 | 1.97 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | 0.677 | < 0.508 | 0.542 | < 1.02 | < 1.02 | 28.9 | 1.01 | 10/4/2012 | |
| 123284 | WG40907 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 0.638 | < 0.495 | 0.51 | < 0.990 | < 0.990 | 34.4 | 1.36 | 10/4/2012 | |
| 123285 | WG40907 | 1.97 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 1.02 | < 1.02 | 20.5 | < 0.609 | 10/4/2012 | |
| 123286 | WG40907 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.995 | < 0.995 | 23.8 | < 0.597 | 10/4/2012 | |
| 123287 | WG40907 | 1.97 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 1.02 | < 1.02 | 18.9 | < 0.609 | 10/4/2012 | |
| 123288 | WG40907 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 1.01 | < 1.01 | 16.9 | < 0.603 | 10/4/2012 | |
| 123289 | WG40907 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 0.548 | < 0.500 | < 1.00 | < 1.00 | 35.3 | < 0.600 | 10/4/2012 | |
| 123290 | WG40907 | 1.97 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | 2.15 | 1.58 | 2.23 | < 1.02 | < 1.02 | 63.8 | < 0.609 | 10/4/2012 | |
| 123291 | WG40909 | 2.04 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | 1.26 | 0.859 | 1.48 | < 0.980 | < 0.980 | 18 | < 0.588 | 9/27/2012 | |
| 123292 | WG40909 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 0.939 | 0.51 | 0.603 | < 1.01 | < 1.01 | 27.2 | < 0.603 | 9/27/2012 | |
| 123293 | WG40909 | 2.05 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | 1.63 | 1.25 | 2.26 | < 0.976 | < 0.976 | 22.3 | < 0.585 | 9/27/2012 | |

| CLIENT ID | WORK GROUP | Sample (g - wet) | PFBA | PFPeA | PFHxA | PFHpA | PFOA | PFNA | PFDA | PFUnA | PFDoA | PFBS | PFHxS | PFOS | PFOSA | QA Review Date | Qualified Analytes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 123294 | WG40909 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 2.74 | 1.5 | 1.33 | < 0.990 | < 0.990 | 50.9 | < 0.594 | 9/27/2012 | |
| 123295 | WG40909 | 2.04 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | 1.07 | 0.635 | 0.536 | < 0.980 | < 0.980 | 16.4 | < 0.588 | 9/27/2012 | |
| 123296 | WG40909 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 1.33 | 0.748 | < 0.500 | < 1.00 | < 1.00 | 26.6 | < 0.600 | 9/27/2012 | |
| 123297 | WG40909 | 1.98 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | 1.26 | 0.672 | 0.66 | < 1.01 | < 1.01 | 21.5 | < 0.606 | 9/27/2012 | |
| 123298 | WG40909 | 2.05 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | 1.24 | < 0.488 | 0.614 | < 0.976 | < 0.976 | 27.6 | 0.97 | 9/27/2012 | |
| 123299 | WG41230 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 0.666 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | 18.8 | < 0.600 | 10/5/2012 | |
| 123300 | WG41230 | 2.03 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | 0.972 | 0.554 | < 0.493 | < 0.985 | < 0.985 | 42.2 | < 0.591 | 10/5/2012 | |
| 123301 | WG41230 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 3.56 | 2.1 | 3.76 | < 0.990 | < 0.990 | 107 | 0.754 | 10/5/2012 | |
| 123302 | WG41230 | 2.05 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | 0.902 | < 0.488 | < 0.488 | < 0.976 | < 0.976 | 12.1 | < 0.585 | 10/5/2012 | |
| 123303 | WG40910 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 5.5 | 3.73 | 2.43 | < 0.995 | < 0.995 | 106 | < 0.597 | 9/27/2012 | |
| 123304 | WG40909 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 0.53 | < 0.495 | < 0.495 | < 0.990 | < 0.990 | 4.62 | < 0.594 | 9/27/2012 | |
| 123305 | WG41230 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 1.9 | 1.19 | 1.3 | < 0.995 | < 0.995 | 43.2 | < 0.597 | 10/5/2012 | |
| 123306 | WG41077 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 1.21 | 0.91 | 0.959 | < 0.990 | < 0.990 | 35.9 | < 0.594 | 10/11/2012 | PFDoA |
| 123307 | WG41077 | 2.08 | < 0.481 | < 0.481 | < 0.481 | < 0.481 | < 0.481 | < 0.481 | 0.615 | < 0.481 | 0.76 | < 0.962 | < 0.962 | 3.85 | < 0.577 | 10/11/2012 | PFDoA |
| 123308 | WG41077 | 2.03 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | 0.5 | < 0.493 | 2.85 | 1.44 | 0.946 | < 0.985 | < 0.985 | 68.1 | 0.769 | 10/11/2012 | PFDoA, PFOSA |
| 123309 | WG41077 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 2.25 | 0.856 | 1.53 | < 1.00 | < 1.00 | 108 | 0.848 | 10/11/2012 | PFDoA |
| 123310 | WG41077 | 2.04 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.980 | < 0.980 | 6.97 | < 0.588 | 10/11/2012 | PFDoA |
| 123311 | WG41077 | 2.03 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | 2.1 | 1.03 | 1.96 | < 0.985 | < 0.985 | 61.6 | < 0.591 | 10/11/2012 | PFDoA |
| 123312 | WG41077 | 2.03 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | 1.42 | 0.569 | 0.763 | < 0.985 | < 0.985 | 37.7 | < 0.591 | 10/11/2012 | PFDoA |
| 123313 | WG41077 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 1.47 | 0.683 | 1.31 | < 0.990 | < 0.990 | 87.5 | < 0.594 | 10/11/2012 | PFDoA |
| 123314 | WG41078 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 1.85 | 0.919 | 1.47 | < 1.00 | < 1.00 | 50.7 | < 0.600 | 10/19/2012 | |
| 123315 | WG41078 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 1.8 | 1.37 | 2.1 | < 1.00 | < 1.00 | 13.4 | < 0.600 | 10/19/2012 | |
| 123316 | WG41078 | 1.98 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | < 0.505 | 1.58 | 1.07 | 0.624 | < 1.01 | < 1.01 | 38.6 | 1.16 | 10/19/2012 | |
| 123317 | WG41078 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 1.75 | 0.975 | 0.738 | < 1.00 | < 1.00 | 32.8 | 1.41 | 10/19/2012 | |
| 123318 | WG41079 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 1.86 | 0.915 | 0.711 | < 1.01 | < 1.01 | 40.7 | 1.63 | 10/19/2012 | |
| 123319 | WG41079 | 1.96 | < 0.510 | < 0.510 | < 0.510 | < 0.510 | < 0.510 | 0.612 | 2.08 | 1.0 | 0.761 | < 1.02 | < 1.02 | 42.9 | 1.46 | 10/19/2012 | |
| 123320 | WG41079 | 1.94 | < 0.515 | < 0.515 | < 0.515 | < 0.515 | < 0.515 | < 0.515 | 2.23 | 1.34 | 1.34 | < 1.03 | < 1.03 | 41.9 | 1.46 | 10/19/2012 | |
| 123321 | WG41079 | 1.96 | < 0.510 | < 0.510 | < 0.510 | < 0.510 | < 0.510 | 0.774 | 1.42 | 0.615 | < 0.510 | < 1.02 | < 1.02 | 33.5 | 1.85 | 10/19/2012 | |
| 123322 | WG41079 | 2.04 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | 1.94 | 1.15 | 0.699 | < 0.980 | < 0.980 | 26.4 | 0.728 | 10/19/2012 | PFDoA |
| 123323 | WG41079 | 2.04 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | 0.851 | 0.511 | < 0.490 | < 0.980 | < 0.980 | 15.8 | < 0.588 | 10/19/2012 | |
| 123324 | WG41079 | 2.03 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | 1.16 | 0.576 | < 0.493 | < 0.985 | < 0.985 | 15.6 | < 0.591 | 10/19/2012 | |

| CLIENT ID | WORK GROUP | Sample (g - wet) | PFBA | PFPeA | PFHxA | PFHpA | PFOA | PFNA | PFDA | PFUnA | PFDoA | PFBS | PFHxS | PFOS | PFOSA | QA Review Date | Qualified Analytes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 123325 | WG41079 | 1.97 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | 1.06 | 0.847 | 0.83 | < 1.02 | < 1.02 | 20.4 | < 0.609 | 10/19/2012 | |
| 123326 | WG41079 | 2.05 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | 1.94 | 1.32 | 0.865 | < 0.976 | < 0.976 | 44.2 | < 0.585 | 10/19/2012 | |
| 123327 | WG41079 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 0.853 | 2.47 | < 0.498 | < 0.995 | < 0.995 | 50.4 | < 0.597 | 10/19/2012 | |
| 123328 | WG41079 | 1.97 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | < 0.508 | 0.742 | 1.3 | 0.609 | < 0.508 | < 1.02 | < 1.02 | 32.8 | < 0.609 | 10/19/2012 | |
| 123329 | WG41079 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 1.3 | 0.799 | 0.554 | < 1.01 | < 1.01 | 37.9 | 1.62 | 10/19/2012 | PFDoA |
| 123330 | WG41079 | 1.95 | < 0.513 | < 0.513 | < 0.513 | < 0.513 | < 0.513 | < 0.513 | 1.5 | 0.928 | 0.885 | < 1.03 | < 1.03 | 24.5 | < 0.615 | 10/19/2012 | |
| 123331 | WG41079 | 1.96 | < 0.510 | < 0.510 | < 0.510 | < 0.510 | < 0.510 | 0.574 | 1.79 | 1.11 | 0.676 | < 1.02 | < 1.02 | 20.4 | 0.826 | 10/19/2012 | |
| 123332 | WG41079 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 0.802 | 3.77 | 2.19 | 1.86 | < 1.00 | < 1.00 | 62.7 | < 0.600 | 10/19/2012 | |
| 123333 | WG41079 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 1.16 | 2.89 | 1.74 | 1.4 | < 0.990 | < 0.990 | 42.8 | 0.668 | 10/19/2012 | |
| 123334 | WG41079 | 2.03 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | 2.31 | 1.23 | 0.949 | < 0.985 | < 0.985 | 52.8 | 1.31 | 10/19/2012 | |
| 123335 | WG41079 | 2.06 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | 1.01 | 0.625 | < 0.485 | < 0.971 | < 0.971 | 17.9 | < 0.583 | 10/19/2012 | |
| 123336 | WG41079 | 1.96 | < 0.510 | < 0.510 | < 0.510 | < 0.510 | < 0.510 | < 0.510 | 1.03 | 0.649 | < 0.510 | < 1.02 | < 1.02 | 22.7 | < 0.612 | 10/19/2012 | |
| 123337 | WG41079 | 1.95 | < 0.513 | < 0.513 | < 0.513 | < 0.513 | < 0.513 | < 0.513 | 1.69 | 1.27 | 0.875 | < 1.03 | < 1.03 | 29.1 | < 0.615 | 10/19/2012 | |
| 123338 | WG41077 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 0.518 | 4.35 | 1.61 | 9.5 | < 0.995 | < 0.995 | 32.8 | 1.29 | 10/11/2012 | PFDoA |
| 123339 | WG41077 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 0.557 | 3.7 | 1.3 | 2.27 | < 0.995 | < 0.995 | 71.9 | < 0.597 | 10/11/2012 | PFDoA |
| 123340 | WG41077 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 0.971 | 4.37 | 1.64 | 1.95 | < 0.990 | < 0.990 | 61 | 1.46 | 10/11/2012 | PFDoA |
| 123341 | WG41077 | 2.07 | < 0.483 | < 0.483 | < 0.483 | < 0.483 | < 0.483 | 0.643 | 3.09 | 1.29 | 2.11 | < 0.966 | < 0.966 | 46.8 | 0.908 | 10/11/2012 | PFDoA |
| 123342 | WG41077 | 2.03 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | < 0.493 | 0.653 | 2.44 | 0.783 | 1.19 | < 0.985 | < 0.985 | 29.2 | < 0.591 | 10/11/2012 | |
| 123343 | WG41077 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 1.95 | 1.14 | 1.37 | < 1.00 | < 1.00 | 37.8 | < 0.600 | 10/11/2012 | PFDoA |
| 123344 | WG41077 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | < 0.498 | 1.85 | 0.961 | 1.26 | < 0.995 | < 0.995 | 23.3 | < 0.597 | 10/11/2012 | PFDoA |
| 123345 | WG41077 | 2.04 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | 1.2 | 0.693 | 0.836 | < 0.980 | < 0.980 | 18.3 | < 0.588 | 10/11/2012 | |
| 123346 | WG41077 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 1.7 | 0.814 | 0.999 | < 1.01 | < 1.01 | 23.4 | < 0.603 | 10/11/2012 | |
| 123347 | WG41077 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 0.76 | 1.43 | 0.573 | 0.753 | < 1.01 | < 1.01 | 21.8 | < 0.603 | 10/11/2012 | |
| 123348 | WG41077 | 2.05 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | 1.2 | 2.57 | 1.07 | 1.86 | < 0.976 | < 0.976 | 60.1 | < 0.585 | 10/11/2012 | |
| 123349 | WG41077 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 1.29 | 0.655 | 1.0 | < 0.990 | < 0.990 | 25.1 | < 0.594 | 10/11/2012 | |
| 123350 | WG41078 | 1.95 | < 0.513 | < 0.513 | < 0.513 | < 0.513 | < 0.513 | 0.625 | 2.57 | 1.38 | 1.12 | < 1.03 | < 1.03 | 65 | < 0.615 | 10/19/2012 | |
| 123351 | WG41078 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 0.595 | 1.69 | 0.997 | 1.27 | < 1.00 | < 1.00 | 31.8 | < 0.600 | 10/19/2012 | |
| 123352 | WG41078 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 0.842 | 1.14 | 0.565 | < 0.495 | < 0.990 | < 0.990 | 14.5 | < 0.594 | 10/19/2012 | |
| 123353 | WG41078 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 1.49 | 1.26 | 2.12 | < 1.00 | < 1.00 | 35.9 | < 0.600 | 10/19/2012 | |
| 123354 | WG41078 | 2.08 | < 0.481 | < 0.481 | < 0.481 | < 0.481 | < 0.481 | < 0.481 | 1.0 | 0.804 | 1.37 | < 0.962 | < 0.962 | 7.62 | < 0.577 | 10/19/2012 | |
| 123355 | WG41078 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 1.91 | 1.85 | 2.7 | < 0.990 | < 0.990 | 12.3 | < 0.594 | 10/19/2012 | |

| CLIENT ID | WORK GROUP | Sample (g - wet) | PFBA | PFPeA | PFHxA | PFHpA | PFOA | PFNA | PFDA | PFUnA | PFDoA | PFBS | PFHxS | PFOS | PFOSA | QA Review Date | Qualified Analytes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 123356 | WG41078 | 2.04 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | 1.02 | 0.672 | 0.765 | < 0.980 | < 0.980 | 31 | < 0.588 | 10/19/2012 | |
| 123357 | WG41078 | 2.06 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | 1.08 | 0.716 | 1.08 | < 0.971 | < 0.971 | 21.8 | < 0.583 | 10/19/2012 | |
| 123358 | WG41078 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 1.44 | 1.34 | 1.43 | < 1.01 | < 1.01 | 25.5 | < 0.603 | 10/19/2012 | |
| 123359 | WG41078 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 1.15 | 1.02 | 1.0 | < 0.990 | < 0.990 | 21.2 | < 0.594 | 10/19/2012 | |
| 123360 | WG41078 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 1.48 | 0.907 | 0.845 | < 1.00 | < 1.00 | 32.8 | < 0.600 | 10/19/2012 | |
| 123361 | WG41078 | 2.05 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | < 0.488 | 0.713 | < 0.488 | < 0.488 | < 0.976 | < 0.976 | 19.7 | < 0.585 | 10/19/2012 | |
| 123362 | WG41078 | 2.08 | < 0.481 | < 0.481 | < 0.481 | < 0.481 | < 0.481 | < 0.481 | 2.03 | 1.55 | 1.43 | < 0.962 | < 0.962 | 43.5 | < 0.577 | 10/19/2012 | |
| 123363 | WG41078 | 2.06 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | < 0.485 | 0.997 | 0.807 | 0.744 | < 0.971 | < 0.971 | 22.7 | < 0.583 | 10/19/2012 | |
| 123364 | WG41078 | 2.09 | < 0.478 | < 0.478 | < 0.478 | < 0.478 | < 0.478 | < 0.478 | 1.73 | 1.49 | 1.39 | < 0.957 | < 0.957 | 30.3 | < 0.574 | 10/19/2012 | |
| 123365 | WG41078 | 2.04 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | 0.785 | 0.885 | 0.759 | < 0.980 | < 0.980 | 21.9 | < 0.588 | 10/19/2012 | |
| 123366 | WG41790 | 2.08 | < 0.481 | < 0.481 | < 0.481 | < 0.481 | < 0.481 | 1.0 | 3.56 | 1.66 | 1.48 | < 0.962 | < 0.962 | 38.7 | < 0.577 | 12/3/2012 | |
| 123367 | WG41790 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 3 | 1.57 | 1.17 | < 0.990 | < 0.990 | 34.5 | < 0.594 | 12/3/2012 | |
| 123368 | WG41790 | 2.04 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | < 0.490 | 0.656 | 2.29 | 0.877 | 0.861 | < 0.980 | < 0.980 | 46.4 | 0.715 | 12/3/2012 | |
| 123369 | WG41790 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 0.631 | 1.6 | 0.716 | 0.585 | < 0.990 | < 0.990 | 21.4 | < 0.594 | 12/3/2012 | |
| 123370 | WG41790 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 0.812 | 0.874 | 0.524 | < 1.00 | < 1.00 | 21.5 | < 0.600 | 12/3/2012 | |
| 123371 | WG41790 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 1.15 | 0.816 | 0.548 | < 1.00 | < 1.00 | 25.7 | < 0.600 | 12/3/2012 | |
| 123372 | WG41790 | 2.00 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | 1.04 | 1.1 | 0.797 | < 1.00 | < 1.00 | 70.4 | < 0.600 | 12/3/2012 | |
| 123373 | WG41790 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 0.523 | 2.67 | 1.19 | 0.665 | < 1.01 | < 1.01 | 31.5 | < 0.603 | 12/3/2012 | |
| 123374 | WG41790 | 1.99 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | < 0.503 | 1.14 | 4.28 | 1.92 | 1.39 | < 1.01 | < 1.01 | 75.6 | 1.04 | 12/3/2012 | |

## Appendix A-2. PFCs results for water (ng/L)

| CLIENT ID | WORK GROUP | Sample (g - wet) | PFBA | PFPeA | PFHxA | PFHpA | PFOA | PFNA | PFDA | PFUnA | PFDoA | PFBS | PFHxS | PFOS | PFOSA | QA Review Date | Qualified Analytes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1A | WG41442 | 0.501 L | 9.78 | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 4.99 | < 4.99 | < 4.99 | < 2.50 | 11/7/2012 | PFBA |
| 2A | WG41443 | 0.517 L | 10.9 | < 2.42 | < 2.42 | < 2.42 | < 2.42 | < 2.42 | < 2.42 | < 2.42 | < 2.42 | < 4.84 | < 4.84 | < 4.84 | < 2.42 | 11/7/2012 | PFBA |
| 2B | WG41443 | 0.518 L | 9.21 | < 2.41 | < 2.41 | < 2.41 | < 2.41 | < 2.41 | < 2.41 | < 2.41 | < 2.41 | < 4.83 | < 4.83 | < 4.83 | < 2.41 | 11/7/2012 | PFBA |
| 2C | WG41442 | 0.509 L | 10.5 | < 2.46 | < 2.46 | < 2.46 | < 2.46 | < 2.46 | < 2.46 | < 2.46 | < 2.46 | < 4.91 | < 4.91 | < 4.91 | < 2.46 | 11/7/2012 | PFBA |
| 3A | WG41442 | 0.511 L | 10.8 | < 2.45 | < 2.45 | < 2.45 | < 2.45 | < 2.45 | < 2.45 | < 2.45 | < 2.45 | < 4.90 | < 4.90 | < 4.90 | < 2.45 | 11/7/2012 | PFBA |
| 3B | WG41442 | 0.508 L | 10.4 | < 2.46 | < 2.46 | < 2.46 | < 2.46 | < 2.46 | < 2.46 | < 2.46 | < 2.46 | < 4.92 | < 4.92 | < 4.92 | < 2.46 | 11/7/2012 | PFBA |
| 3C | WG41442 | 0.508 L | 9.66 | < 2.46 | < 2.46 | < 2.46 | < 2.46 | < 2.46 | < 2.46 | < 2.46 | < 2.46 | < 4.93 | < 4.93 | < 4.93 | < 2.46 | 11/7/2012 | PFBA |
| 4A | WG41442 | 0.500 L | 9.08 | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 5.00 | < 5.00 | < 5.00 | < 2.50 | 11/7/2012 | PFBA |
| 4B | WG41442 | 0.501 L | 10.4 | < 2.49 | < 2.49 | < 2.49 | < 2.49 | < 2.49 | < 2.49 | < 2.49 | < 2.49 | < 4.99 | < 4.99 | < 4.99 | < 2.49 | 11/7/2012 | PFBA |
| 4C | WG41442 | 0.516 L | 9.81 | < 2.42 | < 2.42 | < 2.42 | < 2.42 | < 2.42 | < 2.42 | < 2.42 | < 2.42 | < 4.85 | < 4.85 | < 4.85 | < 2.42 | 11/7/2012 | PFBA |
| 5A | WG41443 | 0.494 L | 13.6 | < 2.53 | < 2.53 | < 2.53 | 3.58 | < 2.53 | < 2.53 | < 2.53 | < 2.53 | < 5.06 | < 5.06 | < 5.06 | < 2.53 | 11/7/2012 | PFBA |
| 6A | WG41442 | 0.501 L | 21.3 | 2.85 | 4.35 | < 2.49 | 5.02 | < 2.49 | < 2.49 | < 2.49 | < 2.49 | < 4.99 | < 4.99 | < 4.99 | < 2.49 | 11/7/2012 | PFBA |
| 6B | WG41442 | 0.503 L | 19.4 | < 2.49 | 4.22 | 2.64 | 5.23 | < 2.49 | < 2.49 | < 2.49 | < 2.49 | < 4.97 | < 4.97 | < 4.97 | < 2.49 | 11/7/2012 | PFBA |
| 6C | WG41442 | 0.492 L | 19.7 | < 2.54 | 4.47 | < 2.54 | 5.29 | < 2.54 | < 2.54 | < 2.54 | < 2.54 | < 5.08 | < 5.08 | < 5.08 | < 2.54 | 11/7/2012 | PFBA |
| 7A | WG41443 | 0.498 L | 30 | < 2.51 | 4.74 | < 2.51 | 7.69 | < 2.51 | < 2.51 | < 2.51 | < 2.51 | < 5.02 | < 5.02 | < 5.02 | < 2.51 | 11/7/2012 | PFBA |
| 7B | WG41442 | 0.513 L | 29.5 | 2.89 | 4.21 | < 2.44 | 7.59 | < 2.44 | < 2.44 | < 2.44 | < 2.44 | < 4.88 | < 4.88 | < 4.88 | < 2.44 | 11/7/2012 | PFBA |
| 7C | WG41442 | 0.512 L | 26.4 | 2.52 | 4.05 | < 2.44 | 7.55 | < 2.44 | < 2.44 | < 2.44 | < 2.44 | < 4.88 | < 4.88 | < 4.88 | < 2.44 | 11/7/2012 | PFBA |
| 8A | WG41443 | 0.508 L | 37.8 | 3.55 | 5.08 | 2.76 | 8.29 | < 2.46 | < 2.46 | < 2.46 | < 2.46 | < 4.92 | < 4.92 | < 4.92 | < 2.46 | 11/7/2012 | PFBA, PFPeA, PFHxA, PFHpA, PFHxA |
| 8B | WG41443 | 0.520 L | 34.9 | 3.11 | 5.02 | < 2.40 | 8.3 | < 2.40 | < 2.40 | < 2.40 | < 2.40 | < 4.81 | < 4.81 | < 4.81 | < 2.40 | 11/7/2012 | PFBA |
| 8C | WG41443 | 0.510 L | 36 | 3.37 | 5.29 | 3.1 | 8.39 | 3.55 | 15.7 | 60.2 | 117 | < 4.90 | < 4.90 | 19.8 | 208 | 11/7/2012 | PFBA, PFUnA, PFDoA |
| 9A | WG41443 | 0.512 L | 42.8 | 4.24 | 5.93 | 4.34 | 8.26 | < 2.44 | < 2.44 | < 2.44 | < 2.44 | < 4.89 | < 4.89 | < 4.89 | < 2.44 | 11/7/2012 | PFBA, PFPeA, PFHxA, PFHpA, PFHxA |
| 9B | WG41443 | 0.473 L | 44.7 | 4.05 | 6.54 | 3.98 | 8.03 | < 2.64 | < 2.64 | < 2.64 | < 2.64 | < 5.28 | < 5.28 | < 5.28 | < 2.64 | 11/7/2012 | PFBA |
| 9C | WG41443 | 0.492 L | 40.9 | 4.13 | 6.83 | 4.94 | 8.45 | < 2.54 | < 2.54 | < 2.54 | < 2.54 | < 5.08 | < 5.08 | 6.09 | < 2.54 | 11/7/2012 | PFBA |
| 10A | WG41443 | 0.551 L | 47.8 | 4.05 | 6.33 | 4.8 | 8.89 | < 2.27 | < 2.27 | < 2.27 | < 2.27 | < 4.54 | < 4.54 | < 4.54 | < 2.27 | 11/7/2012 | PFBA |
| 10B | WG41443 | 0.483 L | 48.3 | 4.56 | 6.01 | 5.56 | 8.76 | < 2.59 | < 2.59 | < 2.59 | < 2.59 | < 5.18 | < 5.18 | < 5.18 | < 2.59 | 11/7/2012 | PFBA, PFPeA, PFHxA, PFHpA, PFHxA |
| 10C | WG41443 | 0.472 L | 50.7 | 4.34 | 6.56 | 3.96 | 8.51 | < 2.65 | < 2.65 | < 2.65 | < 2.65 | < 5.29 | < 5.29 | < 5.29 | < 2.65 | 11/7/2012 | PFBA |
| 11A | WG41443 | 0.490 L | 300 | 25.3 | 32.8 | 15.5 | 210 | < 2.55 | < 2.55 | < 2.55 | < 2.55 | 31 | 25.7 | 150 | < 2.55 | 11/7/2012 | PFBA |

| CLIENT ID | WORK GROUP | Sample (g - wet) | PFBA | PFPeA | PFHxA | PFHpA | PFOA | PFNA | PFDA | PFUnA | PFDoA | PFBS | PFHxS | PFOS | PFOSA | QA Review Date | Qualified Analytes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11B | WG41443 | 0.458 L | 309 | 23.4 | 31.4 | 15.1 | 202 | < 2.73 | < 2.73 | < 2.73 | < 2.73 | 33.4 | 24.2 | 142 | < 2.73 | 11/7/2012 | PFBA |
| 11C | WG41443 | 0.490 L | 326 | 26.7 | 34.2 | 17.4 | 220 | < 2.55 | < 2.55 | < 2.55 | < 2.55 | 30.3 | 26.4 | 155 | < 2.55 | 11/7/2012 | PFBA |
| 12A | WG41443 | 0.517 L | 187 | 12.1 | 12.6 | 5.34 | 37.1 | < 2.42 | < 2.42 | < 2.42 | < 2.42 | 13 | 13.9 | 24.2 | < 2.42 | 11/7/2012 | PFBA |
| 12B | WG41443 | 0.512 L | 187 | 12.5 | 12.5 | 5.09 | 37.8 | < 2.44 | < 2.44 | < 2.44 | < 2.44 | 13.6 | 14.4 | 25.9 | < 2.44 | 11/7/2012 | PFBA |
| 12C | WG41443 | 0.489 L | 183 | 9.78 | 11.8 | 5.87 | 34.9 | < 2.56 | < 2.56 | < 2.56 | < 2.56 | 13.4 | 14 | 23.1 | < 2.56 | 11/7/2012 | PFBA |

**Appendix A-3. QA Results for Fish Samples: lab blanks and matrix spikes by work group**

| WORK GROUP | CLIENT ID | Sample (g – wet) | UNITS | PFBA | PFPeA | PFHxA | PFHpA | PFOA | PFNA | PFDA | PFUnA | PFDoA | PFBS | PFHxS | PFOS | PFOSA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WG40905 | Lab Blank | 2.00 | ng/g | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | < 1.00 | < 0.600 |
| WG40905 | Spiked Matrix | | % Recov | 95.2 | 96.8 | 105 | 100 | 97.7 | 91.3 | 104 | 78.3 | 104 | 101 | 96.5 | 92.8 | 95.9 |
| WG40905 | 123255 (MS) | 2.01 | % Recov | 94.5 | 108 | 101 | 95.3 | 101 | 99.4 | 106 | 79.4 | 98.6 | 90.3 | 98.6 | 83.1 | 103 |
| WG40905 | 123255 (MSD) | 1.99 | % Recov | 97.4 | 131 | 97.6 | 107 | 95.4 | 96.1 | 103 | 84.1 | 97.5 | 70.3 | 95.6 | 85.2 | 110 |
| WG40904 | Lab Blank | 2.00 | ng/g | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | < 1.00 | < 0.600 |
| WG40904 | Spiked Matrix | | % Recov | 107 | 95 | 104 | 97 | 101 | 96.2 | 116 | 104 | 105 | 107 | 100 | 91.9 | 98.5 |
| WG40904 | 123172 (MS) | 2.00 | % Recov | 99.1 | 146 | 107 | 120 | 109 | 96.7 | 117 | 79.8 | 106 | 65.4 | 95 | 98.8 | 113 |
| WG40904 | 123172 (MSD) | 2.00 | % Recov | 99.4 | 162 | 112 | 129 | 109 | 105 | 118 | 88 | 108 | 68.8 | 101 | 88.8 | 115 |
| WG40903 | Lab Blank | 2.00 | ng/g | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | < 1.00 | < 0.600 |
| WG40903 | Spiked Matrix | | % Recov | 123 | 107 | 124 | 117 | 122 | 122 | 128 | 113 | 124 | 114 | 111 | 120 | 125 |
| WG40903 | 123121 (MS) | 2.00 | % Recov | 115 | 111 | 125 | 118 | 128 | 116 | 134 | 100 | 129 | 122 | 114 | 126 | 143 |
| WG40903 | 123121 (MSD) | 2.05 | % Recov | 118 | 113 | 127 | 115 | 122 | 117 | 132 | 105 | 127 | 126 | 118 | 116 | 131 |
| WG40901 | Lab Blank | 2.00 | ng/g | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | < 1.00 | < 0.600 |
| WG40901 | Spiked Matrix | | % Recov | 113 | 99.6 | 112 | 105 | 106 | 111 | 126 | 110 | 110 | 122 | 105 | 108 | 109 |
| WG40901 | 123077 (MS) | 2.00 | ng ww | 22 | 23.3 | 23 | 24.2 | 22 | 22 | 22.2 | 15.7 | 22.7 | 38.3 | 41.3 | 46.6 | 27.1 |
| WG40901 | 123077 (MS) | 2.00 | % Recov | 110 | 116 | 115 | 121 | 110 | 110 | 111 | 78.3 | 113 | 95.8 | 103 | 114 | 135 |
| WG40901 | 123077 (MSD) | 2.00 | ng ww | 22.2 | 23.6 | 22.9 | 22.9 | 23 | 21.1 | 26.1 | 21.1 | 22.3 | 37.7 | 43.2 | 42.3 | 25.9 |
| WG40901 | 123077 (MSD) | 2.00 | % Recov | 111 | 118 | 114 | 115 | 115 | 106 | 131 | 106 | 111 | 94.2 | 108 | 103 | 129 |
| WG40902 | Lab Blank | 2.00 | ng/g | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | < 1.00 | < 0.600 |
| WG40902 | Spiked Matrix | | % Recov | 101 | 94.3 | 106 | 98.4 | 102 | 99.3 | 114 | 105 | 101 | 118 | 95.9 | 94 | 102 |
| WG40902 | 123105 (MS) | 2.04 | ng/g ww | 19.6 | 17.1 | 20.7 | 16.6 | 20.4 | 20.3 | 24 | 21.4 | 21.9 | 43.5 | 39.1 | 90.2 | 22.2 |
| WG40902 | 123105 (MSD) | 2.02 | ng/g ww | 20.7 | 17.6 | 21.2 | 18.5 | 21.2 | 20.1 | 22.5 | 20.1 | 22.7 | 43.1 | 37.6 | 83.8 | 21.4 |
| WG40898 | Lab Blank | 2.00 | ng/g | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | < 1.00 | < 0.500 |
| WG40898 | Spiked Matrix | | % Recov | 102 | 96.1 | 108 | 102 | 106 | 105 | 114 | 112 | 113 | 106 | 99.1 | 101 | 111 |
| WG40898 | 123152 (MS) | 1.99 | ng/g ww | 22.7 | 21.2 | 24.1 | 21.4 | 23.1 | 22.9 | 28.9 | 24.1 | 26.2 | 45 | 42.2 | 120 | 23.4 |
| WG40898 | 123152 (MSD) | 2.00 | ng/g ww | 22.6 | 21 | 23.6 | 20.6 | 22.3 | 23.7 | 29.6 | 27.2 | 26.8 | 46.6 | 42.4 | 115 | 24 |
| WG40906 | Lab Blank | 2.00 | ng/g | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | < 1.00 | < 0.600 |
| WG40906 | Spiked Matrix | | % Recov | 97.3 | 96.5 | 104 | 96.4 | 101 | 104 | 105 | 92.5 | 104 | 101 | 100 | 98.2 | 104 |
| WG40906 | 123278 (MS) | 2.04 | % Recov | 93.9 | 119 | 104 | 105 | 103 | 96.2 | 116 | 97.9 | 106 | 78.7 | 97 | 108 | 108 |
| WG40906 | 123278 (MSD) | 1.98 | % Recov | 92 | 128 | 102 | 107 | 99.8 | 105 | 108 | 99.5 | 101 | 72.5 | 94.6 | 101 | 107 |

| WORK GROUP | CLIENT ID | Sample (g – wet) | UNITS | PFBA | PFPeA | PFHxA | PFHpA | PFOA | PFNA | PFDA | PFUnA | PFDoA | PFBS | PFHxS | PFOS | PFOSA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WG40910 | Lab Blank | 2.00 | ng/g | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | < 1.00 | < 0.600 |
| WG40910 | Spiked Matrix | | % Recov | 110 | 111 | 120 | 113 | 121 | 118 | 129 | 113 | 121 | 121 | 119 | 99.5 | 118 |
| WG40910 | 123190 (MS) | 2.07 | ng ww | 21 | 40.5 | 23.8 | 22.5 | 23.2 | 23.6 | 24.4 | 20.7 | 25.1 | 27.2 | 38.8 | 104 | 22.4 |
| WG40910 | 123190 (MSD) | 2.04 | ng ww | 19 | 39.4 | 24.7 | 25.5 | 22.5 | 21.4 | 28.3 | 22.5 | 26.2 | 32.9 | 48 | 108 | 23.3 |
| WG40910 | 123190 (MSD) | 2.04 | % Recov | 96.9 | 201 | 126 | 130 | 115 | 109 | 137 | 105 | 123 | 84 | 122 | 154 | 115 |
| WG40910 | 123190 (MS) | 2.07 | % Recov | 109 | 209 | 123 | 116 | 120 | 122 | 118 | 97.7 | 119 | 70.3 | 100 | 148 | 112 |
| WG40909 | Lab Blank | 2.00 | ng/g | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | < 1.00 | < 0.600 |
| WG40909 | Spiked Matrix | | % Recov | 113 | 123 | 126 | 108 | 129 | 119 | 123 | 108 | 130 | 133 | 125 | 119 | 116 |
| WG40909 | 123291 (MS) | 2.09 | ng ww | 23.3 | 31.6 | 23.1 | 23.1 | 24.4 | 22.2 | 26.5 | 20.7 | 26.1 | 33.8 | 44.4 | 62.1 | 23.3 |
| WG40909 | 123291 (MSD) | 2.05 | ng ww | 21.8 | 33.8 | 26.4 | 26.3 | 24.7 | 22.9 | 26.6 | 21.4 | 24.8 | 42.5 | 53.2 | 69.1 | 26 |
| WG40909 | 123291 (MSD) | 2.05 | % Recov | 112 | 173 | 135 | 135 | 127 | 117 | 130 | 105 | 120 | 109 | 136 | 131 | 133 |
| WG40909 | 123291 (MS) | 2.09 | % Recov | 122 | 165 | 121 | 121 | 128 | 116 | 132 | 103 | 128 | 88.4 | 116 | 115 | 122 |
| WG40908 | Lab Blank | 2.00 | ng/g | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | < 1.00 | < 0.600 |
| WG40908 | Spiked Matrix | | % Recov | 115 | 129 | 127 | 119 | 127 | 120 | 137 | 116 | 126 | 120 | 112 | 111 | 112 |
| WG40908 | 123229 (MS) | 1.99 | ng ww | 22.9 | 45.7 | 25.6 | 23.3 | 26.8 | 24.7 | 36.1 | 24.9 | 26.9 | 38.7 | 49.7 | 134 | 25 |
| WG40908 | 123229 (MSD) | 2.03 | ng ww | 22.4 | 46.5 | 24.2 | 23.2 | 23.5 | 23.1 | 36 | 22.7 | 27.1 | 37.1 | 52.3 | 141 | 25 |
| WG40908 | 123229 (MSD) | 2.03 | % Recov | 114 | 236 | 123 | 118 | 119 | 114 | 139 | 97.3 | 124 | 94.1 | 133 | 148 | 127 |
| WG40908 | 123229 (MS) | 1.99 | % Recov | 114 | 227 | 128 | 116 | 133 | 120 | 137 | 107 | 121 | 96.3 | 124 | 128 | 124 |
| WG40907 | Lab Blank | 2.00 | ng/g | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | < 1.00 | < 0.600 |
| WG40907 | Spiked Matrix | | % Recov | 95.3 | 103 | 98.4 | 82 | 97.1 | 91.1 | 110 | 98.7 | 98.2 | 99.8 | 96 | 110 | 103 |
| WG40907 | 123205 (MS) | 2.00 | ng/g ww | 41.2 | 26.8 | 21.3 | 20.8 | 30.3 | 19.3 | 30.9 | 19.1 | 26.5 | 22 | 49.4 | 5730 | 43.4 |
| WG40907 | 123205 (MSD) | 1.98 | ng/g ww | 46.8 | 24.5 | 21.7 | 22.5 | 28.9 | 18.1 | 31.5 | 22.9 | 25.3 | 38.6 | 64 | 5460 | 43.6 |
| WG40907 | 123205 (MSD) | 1.98 | % Recov | 109 | 118 | 107 | 111 | 98.9 | 87 | 99.1 | 96.4 | 102 | 95.6 | 126 | | 119 |
| WG40907 | 123205 (MS) | 2.00 | % Recov | 82.3 | 130 | 107 | 104 | 107 | 94.1 | 96.8 | 78.5 | 109 | 55.1 | 90.4 | | 120 |
| WG40911 | Lab Blank | 2.00 | ng/g | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | < 1.00 | < 0.600 |
| WG40911 | Spiked Matrix | | % Recov | 96.2 | 104 | 104 | 100 | 99.1 | 99.2 | 98.8 | 95.5 | 109 | 85.2 | 84.1 | 94.9 | 97 |
| WG40911 | 123142 (MS) | 2.04 | ng ww | 18.9 | 27.3 | 19.6 | 19.6 | 20 | 18.5 | 22.6 | 17.4 | 21.6 | 25.3 | 34.4 | 60.4 | 23.7 |
| WG40911 | 123142 (MSD) | 1.99 | ng ww | 17.3 | 28.2 | 21.2 | 20.8 | 21 | 19.6 | 21.6 | 16.5 | 22 | 25.9 | 36.3 | 65.3 | 22.2 |
| WG40911 | 123142 (MSD) | 1.99 | % Recov | 86.2 | 140 | 106 | 104 | 104 | 97.3 | 105 | 82 | 109 | 64.3 | 90.3 | 92 | 111 |
| WG40911 | 123142 (MS) | 2.04 | % Recov | 96.4 | 139 | 100 | 100 | 102 | 94.3 | 113 | 89 | 110 | 64.5 | 87.6 | 81.8 | 121 |
| WG41230 | Lab Blank | 2.00 | ng/g | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | < 1.00 | < 0.600 |

| WORK GROUP | CLIENT ID | Sample (g – wet) | UNITS | PFBA | PFPeA | PFHxA | PFHpA | PFOA | PFNA | PFDA | PFUnA | PFDoA | PFBS | PFHxS | PFOS | PFOSA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WG41230 | Spiked Matrix | | % Recov | 107 | 111 | 109 | 107 | 99.5 | 102 | 114 | 108 | 112 | 106 | 103 | 105 | 95.9 |
| WG41230 | 123300 (MS) | 1.99 | ng/g ww | 20.6 | 29.1 | 20.6 | 22.3 | 22.9 | 22 | 23.3 | 16.9 | 22.9 | 28.7 | 39.1 | 84.9 | 25.5 |
| WG41230 | 123300 (MS) | 1.99 | % Recov | 103 | 145 | 103 | 111 | 114 | 109 | 111 | 81.4 | 114 | 71.4 | 97.2 | 106 | 127 |
| WG41230 | 123300 (MSD) | 2.06 | ng/g ww | 18.8 | 29.1 | 19.8 | 22 | 21 | 20.1 | 23.6 | 19 | 22.4 | 21.8 | 33.3 | 78.6 | 21.5 |
| WG41230 | 123300 (MSD) | 2.06 | % Recov | 97 | 150 | 102 | 113 | 108 | 103 | 116 | 95.2 | 115 | 56.1 | 85.9 | 93.6 | 110 |
| WG41077 | Lab Blank | 2.00 | ng/g | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | < 1.00 | < 0.600 |
| WG41077 | Spiked Matrix | | % Recov | 95.4 | 115 | 106 | 98.3 | 111 | 106 | 124 | 89.5 | 113 | 124 | 110 | 95.1 | 121 |
| WG41077 | 123306 (MS) | 2.02 | ng ww | 20.3 | 32.6 | 20.3 | 22 | 23.6 | 21.8 | 24.7 | 17.7 | 24.6 | 31.3 | 39.7 | 84.8 | 27.1 |
| WG41077 | 123306 (MSD) | 2.01 | ng ww | 21.3 | 34.4 | 21.4 | 22.7 | 22.6 | 21.4 | 25.7 | 17.9 | 23.5 | 33.9 | 47.5 | 80.6 | 28.6 |
| WG41155 | Lab Blank | 2.00 | ng/g | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 5.00 | < 5.00 | < 5.00 | < 2.50 |
| WG41155 | Spiked Matrix | | % Recov | 94.2 | 92.2 | 97 | 93.4 | 104 | 94.6 | 80.8 | 102 | 103 | 98.3 | 91.5 | 89.9 | 98.1 |
| WG41079 | Lab Blank | 2.00 | ng/g | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | < 1.00 | < 0.600 |
| WG41079 | Spiked Matrix | | % Recov | 88.3 | 81.9 | 96.2 | 85.5 | 93.7 | 87 | 103 | 103 | 103 | 91.2 | 90.4 | 89.5 | 91.1 |
| WG41079 | 123334 (MS) | 2.04 | % Recov | 93.2 | 93 | 96.6 | 66.9 | 93 | 92.8 | 103 | 107 | 104 | 94.5 | 95.8 | 118 | 88.8 |
| WG41079 | 123334 (MSD) | 2.03 | % Recov | 97.1 | 84.3 | 94.5 | 72.7 | 87.9 | 94.3 | 102 | 110 | 103 | 99.2 | 93.9 | 91.6 | 81.7 |
| WG41790 | Lab Blank | 2.00 | ng/g | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | < 1.00 | < 0.600 |
| WG41790 | Spiked Matrix | | % Recov | 112 | 94 | 112 | 106 | 107 | 107 | 121 | 116 | 115 | 111 | 112 | 118 | 109 |
| WG41790 | 123368 (MS) | 2.00 | % Recov | 112 | 99.4 | 118 | 103 | 109 | 110 | 135 | 109 | 115 | 111 | 111 | 98.3 | 113 |
| WG41790 | 123368 (MSD) | 2.09 | % Recov | 109 | 87.8 | 106 | 90.5 | 101 | 95 | 116 | 110 | 104 | 99.2 | 99.3 | 86.1 | 94.8 |

**Appendix A-4. QA Results for Water Samples: lab blanks and matrix spikes by work group**

| WORK GROUP | CLIENT ID | Sample Size (L) | UNITS | PFBA | PFPeA | PFHxA | PFHpA | PFOA | PFNA | PFDA | PFUnA | PFDoA | PFBS | PFHxS | PFOS | PFOSA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WG41443 | Lab Blank | 0.500 | ng/L | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 5.00 | < 5.00 | < 5.00 | < 2.50 |
| WG41443 | Spiked Matrix | | % Recov | 123 | 105 | 120 | 114 | 113 | 113 | 116 | 122 | 123 | 115 | 117 | 106 | 119 |
| WG41443 | 5A (MS) | 0.504 | % Recov | 113 | 79.9 | 105 | 130 | 105 | 105 | 100 | 107 | 104 | 92.9 | 109 | 108 | 119 |
| WG41443 | 5A (MSD) | 0.539 | % Recov | 130 | 93.2 | 124 | 154 | 116 | 116 | 113 | 120 | 112 | 97.6 | 120 | 120 | 130 |
| WG41442 | Lab Blank | 0.500 | ng/L | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 2.50 | < 5.00 | < 5.00 | < 5.00 | < 2.50 |
| WG41442 | Spiked Matrix | | % Recov | 97.6 | 90.8 | 108 | 97.6 | 102 | 102 | 104 | 109 | 106 | 91.3 | 84.3 | 107 | 113 |
| WG41442 | 1A (MS) | 0.509 | ng/L | 492 | 377 | 503 | 623 | 483 | 468 | 470 | 473 | 481 | 788 | 905 | 935 | 496 |
| WG41442 | 1A (MSD) | 0.500 | ng/L | 527 | 417 | 541 | 690 | 497 | 502 | 517 | 512 | 525 | 844 | 983 | 1010 | 557 |

**Appendix A-5. Fish sample identification**

| MPCA ID | Section | Run | Sample Date | Species | Sex | Age | Length (cm) | Weight (g) | AXYS ID | Sample Received | Work Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 3076 | 1 | 1 | 7/30/2012 | Common Carp | m | 8 | 65 | 3500 | L18329-1 | 8-Aug-12 | WG40901 |
| 12 3077 | 1 | 1 | 7/30/2012 | Common Carp | m | 8 | 62 | 3950 | L18329-2 (A) | 8-Aug-12 | WG40901 |
| 12 3078 | 1 | 1 | 7/30/2012 | Common Carp | m | 8 | 62 | 1275 | L18329-3 | 8-Aug-12 | WG40901 |
| 12 3079 | 1 | 1 | 7/30/2012 | Common Carp | ind | 5 | 45 | 1300 | L18329-4 | 8-Aug-12 | WG40901 |
| 12 3080 | 1 | 1 | 7/30/2012 | Common Carp | f | 6 | 52 | 2500 | L18329-5 | 8-Aug-12 | WG40901 |
| 12 3081 | 1 | 1 | 7/30/2012 | Common Carp | f | 7 | 57.5 | 2750 | L18329-6 | 8-Aug-12 | WG40901 |
| 12 3082 | 1 | 1 | 7/30/2012 | Common Carp | f | 8 | 60.5 | 2600 | L18329-7 | 8-Aug-12 | WG40901 |
| 12 3083 | 1 | 1 | 7/30/2012 | Smallmouth Bass | m | 7 | 37 | 956 | L18330-1 | 7-Aug-12 | WG40901 |
| 12 3084 | 1 | 1 | 7/30/2012 | Smallmouth Bass | m | 6 | 34 | 832 | L18330-2 | 7-Aug-12 | WG40901 |
| 12 3085 | 1 | 1 | 7/30/2012 | Smallmouth Bass | m | 6 | 32 | 451 | L18330-3 | 7-Aug-12 | WG40901 |
| 12 3086 | 1 | 1 | 7/30/2012 | Smallmouth Bass | ind | 5 | 33.5 | 572 | L18330-4 | 7-Aug-12 | WG40901 |
| 12 3087 | 1 | 1 | 7/30/2012 | Smallmouth Bass | f | 6 | 34.5 | 716 | L18330-5 | 7-Aug-12 | WG40901 |
| 12 3088 | 1 | 1 | 7/30/2012 | Smallmouth Bass | m | 7 | 38 | 950 | L18330-6 | 7-Aug-12 | WG40901 |
| 12 3089 | 1 | 1 | 7/30/2012 | Smallmouth Bass | f | 4 | 29 | 377 | L18330-7 | 7-Aug-12 | WG40901 |
| 12 3090 | 1 | 1 | 7/30/2012 | Smallmouth Bass | m | 7 | 34 | 684 | L18330-8 | 7-Aug-12 | WG40901 |
| 12 3091 | 1 | 1 | 7/30/2012 | Smallmouth Bass | f | 4 | 30.5 | 432 | L18330-9 | 7-Aug-12 | WG40901 |
| 12 3092 | 1 | 1 | 7/30/2012 | Smallmouth Bass | f | 3 | 29 | 402 | L18330-10 | 7-Aug-12 | WG40901 |
| 12 3093 | 1 | 1 | 7/30/2012 | Smallmouth Bass | j | 3 | 23.3 | 205 | L18330-11 | 7-Aug-12 | WG40901 |
| 12 3094 | 1 | 1 | 7/30/2012 | Freshwater Drum | f | 5 | 34 | 483 | L18330-12 | 7-Aug-12 | WG40901 |
| 12 3095 | 1 | 1 | 7/30/2012 | Freshwater Drum | m | 6 | 37 | 719 | L18330-13 | 7-Aug-12 | WG40902 |
| 12 3096 | 1 | 1 | 7/30/2012 | Freshwater Drum | m | 8 | 42 | 862 | L18330-14 | 7-Aug-12 | WG40902 |
| 12 3097 | 1 | 1 | 7/30/2012 | Freshwater Drum | f | 5 | 34 | 413 | L18330-15 | 7-Aug-12 | WG40902 |
| 12 3098 | 1 | 1 | 7/30/2012 | Freshwater Drum | m | 4 | 29.5 | 308 | L18330-16 | 7-Aug-12 | WG40902 |
| 12 3099 | 1 | 1 | 7/30/2012 | Freshwater Drum | m | 8 | 39.5 | 671 | L18330-17 | 7-Aug-12 | WG40902 |
| 12 3100 | 1 | 1 | 7/30/2012 | Freshwater Drum | m | 3 | 31.5 | 348 | L18330-18 | 7-Aug-12 | WG40902 |
| 12 3101 | 1 | 1 | 7/30/2012 | Freshwater Drum | m | 3 | 29 | 284 | L18330-19 | 7-Aug-12 | WG40902 |
| 12 3102 | 1 | 1 | 7/30/2012 | Freshwater Drum | m | 7 | 38.5 | 617 | L18330-20 | 7-Aug-12 | WG40902 |

| MPCA ID | Section | Run | Sample Date | Species | Sex | Age | Length (cm) | Weight (g) | AXYS ID | Sample Received | Work Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 3103 | 1 | 1 | 7/30/2012 | Freshwater Drum | ind | 4 | 33 | 372 | L18330-21 | 7-Aug-12 | WG40902 |
| 12 3104 | 1 | 1 | 7/30/2012 | Freshwater Drum | f | 4 | 31 | 258 | L18330-22 | 7-Aug-12 | WG40902 |
| 12 3105 | 1 | 1 | 7/30/2012 | Freshwater Drum | f | 5 | 34 | 422 | L18330-23 (A) | 7-Aug-12 | WG40902 |
| 12 3106 | 1 | 1 | 7/30/2012 | Bluegill Sunfish | m | 5 | 15.5 | 98 | L18330-24 | 7-Aug-12 | WG40902 |
| 12 3107 | 1 | 1 | 7/30/2012 | Bluegill Sunfish | ind | 5 | 15.5 | 115 | L18330-25 | 7-Aug-12 | WG40902 |
| 12 3108 | 1 | 1 | 7/30/2012 | Bluegill Sunfish | j | 2 | 10 | 20.62 | L18330-26 | 7-Aug-12 | WG40902 |
| 12 3109 | 1 | 1 | 7/30/2012 | Bluegill Sunfish | f | 5 | 15 | 87 | L18330-27 | 7-Aug-12 | WG40902 |
| 12 3110 | 1 | 1 | 7/30/2012 | Bluegill Sunfish | ind | 5 | 15 | 74 | L18330-28 | 7-Aug-12 | WG40902 |
| 12 3111 | 1 | 1 | 7/30/2012 | Bluegill Sunfish | j | 3 | 13.5 | 56 | L18330-29 | 7-Aug-12 | WG40902 |
| 12 3112 | 1 | 1 | 7/30/2012 | Bluegill Sunfish | j | 3 | 12.5 | 45 | L18330-30 | 7-Aug-12 | WG40902 |
| 12 3113 | 1 | 1 | 7/30/2012 | Bluegill Sunfish | f | 7 | 18.5 | 69 | L18330-31 | 7-Aug-12 | WG40902 |
| 12 3114 | 1 | 1 | 7/30/2012 | Bluegill Sunfish | m | 4 | 14.5 | 175 | L18330-32 | 7-Aug-12 | WG40903 |
| 12 3115 | 1 | 1 | 7/30/2012 | Bluegill Sunfish | m | 4 | 14 | 88 | L18330-33 | 7-Aug-12 | WG40903 |
| 12 3116 | 1 | 1 | 7/30/2012 | Bluegill Sunfish | m | 4 | 14 | 64 | L18330-34 | 7-Aug-12 | WG40903 |
| 12 3117 | 1 | 1 | 7/30/2012 | Bluegill Sunfish | 1nd | 4 | 14 | 59.14 | L18330-35 | 7-Aug-12 | WG40903 |
| 12 3118 | 1 | 1 | 7/30/2012 | Bluegill Sunfish | j | 2 | 10.5 | 27.77 | L18330-36 | 7-Aug-12 | WG40903 |
| 12 3119 | 1 | 1 | 7/30/2012 | Bluegill Sunfish | f | 2 | 12 | 56.34 | L18330-37 | 7-Aug-12 | WG40903 |
| 12 3120 | 1 | 1 | 7/30/2012 | Bluegill Sunfish | m | 5 | 15.5 | 55.66 | L18330-38 | 7-Aug-12 | WG40903 |
| 12 3121 | 1 | 2 | 7/30/2012 | Common Carp | m | 7 | 53.5 | 2643 | L18330-39 (A) | 7-Aug-12 | WG40903 |
| 12 3122 | 1 | 2 | 7/30/2012 | Common Carp | m | 7 | 55 | 3072 | L18330-40 | 7-Aug-12 | WG40903 |
| 12 3123 | 1 | 2 | 7/30/2012 | Freshwater Drum | m | 4 | 35 | 540 | L18330-41 | 7-Aug-12 | WG40903 |
| 12 3124 | 1 | 2 | 7/30/2012 | Freshwater Drum | m | 8 | 39.5 | 559 | L18328-1 | 7-Aug-12 | WG40898 |
| 12 3125 | 1 | 2 | 7/30/2012 | Freshwater Drum | f | 5 | 33 | 433 | L18328-2 | 7-Aug-12 | WG40898 |
| 12 3126 | 1 | 3 | 7/30/2012 | Common Carp | f | 8 | 59 | 3700 | L18328-3 | 7-Aug-12 | WG40898 |
| 12 3127 | 1 | 3 | 7/30/2012 | Common Carp | f | 8 | 58.6 | 2900 | L18328-4 | 7-Aug-12 | WG40898 |
| 12 3128 | 1 | 3 | 7/30/2012 | Common Carp | f | 8 | 57 | 2640 | L18328-5 | 7-Aug-12 | WG40898 |
| 12 3129 | 1 | 3 | 7/30/2012 | Common Carp | m | 8 | 62 | 3500 | L18328-6 | 7-Aug-12 | WG40898 |
| 12 3130 | 1 | 3 | 7/30/2012 | Smallmouth Bass | m | 3 | 24.5 | 205 | L18328-7 | 7-Aug-12 | WG40898 |

| MPCA ID | Section | Run | Sample Date | Species | Sex | Age | Length (cm) | Weight (g) | AXYS ID | Sample Received | Work Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 3131 | 1 | 3 | 7/30/2012 | Smallmouth Bass | m | 6 | 34 | 778 | L18328-8 | 7-Aug-12 | WG40898 |
| 12 3132 | 1 | 3 | 7/30/2012 | Smallmouth Bass | m | 2 | 22 | 167 | L18328-9 | 7-Aug-12 | WG40898 |
| 12 3133 | 1 | 3 | 7/30/2012 | White Bass | f | 1 | 20 | 131 | L18328-10 | 7-Aug-12 | WG40898 |
| 12 3134 | 1 | 4 | 7/30/2012 | Common Carp | m | 7 | 57.5 | 2900 | L18336-1 | 8-Aug-12 | WG40911 |
| 12 3135 | 1 | 4 | 7/30/2012 | Common Carp | m | 7 | 53 | 2500 | L18336-2 | 8-Aug-12 | WG40911 |
| 12 3136 | 1 | 4 | 7/30/2012 | White Bass | m | 3 | 31 | 493 | L18336-3 | 8-Aug-12 | WG40911 |
| 12 3137 | 1 | 4 | 7/30/2012 | White Bass | f | 2 | 23 | 225 | L18336-4 | 8-Aug-12 | WG40911 |
| 12 3138 | 1 | 4 | 7/30/2012 | Smallmouth Bass | f | 8 | 36 | 721 | L18336-5 | 8-Aug-12 | WG40911 |
| 12 3139 | 1 | 5 | 7/30/2012 | White Bass | f | 5 | 36 | 815 | L18336-6 | 8-Aug-12 | WG40911 |
| 12 3140 | 2 | 1 | 7/30/2012 | Common Carp | f | 7 | 54 | 2700 | L18336-7 | 8-Aug-12 | WG40911 |
| 12 3141 | 2 | 1 | 7/30/2012 | Common Carp | m | 7 | 53 | 2500 | L18336-8 | 8-Aug-12 | WG40911 |
| 12 3142 | 2 | 1 | 7/30/2012 | Common Carp | m | 7 | 55 | 3100 | L18336-9 (A) | 8-Aug-12 | WG40911 |
| 12 3143 | 2 | 1 | 7/30/2012 | Common Carp | j | 3 | 32.5 | 624 | L18336-10 | 8-Aug-12 | WG40911 |
| 12 3144 | 2 | 1 | 7/30/2012 | Common Carp | j | 3 | 33 | 684 | L18336-11 | 8-Aug-12 | WG40911 |
| 12 3145 | 2 | 1 | 7/30/2012 | Common Carp | f | 5 | 36 | 2100 | L18336-12 | 8-Aug-12 | WG40911 |
| 12 3146 | 2 | 1 | 7/30/2012 | White Bass | f | 6 | 50 | 820 | L18336-13 | 8-Aug-12 | WG40911 |
| 12 3147 | 2 | 1 | 7/30/2012 | White Bass | m | 4 | 35 | 792 | L18328-11 | 7-Aug-12 | WG40898 |
| 12 3148 | 2 | 1 | 7/30/2012 | White Bass | f | 4 | 33.5 | 686 | L18328-12 | 7-Aug-12 | WG40898 |
| 12 3149 | 2 | 1 | 7/30/2012 | White Bass | f | 5 | 36 | 809 | L18328-13 | 7-Aug-12 | WG40898 |
| 12 3150 | 2 | 1 | 7/30/2012 | White Bass | m | 2 | 29 | 417 | L18328-14 | 7-Aug-12 | WG40898 |
| 12 3151 | 2 | 1 | 7/30/2012 | White Bass | f | 4 | 35 | 727 | L18328-15 | 7-Aug-12 | WG40898 |
| 12 3152 | 2 | 1 | 7/30/2012 | White Bass | m | 3 | 31 | 494 | L18328-16 (A) | 7-Aug-12 | WG40898 |
| 12 3153 | 2 | 1 | 7/30/2012 | White Bass | ind | 3 | 29.5 | 416 | L18328-17 | 7-Aug-12 | WG40898 |
| 12 3154 | 2 | 1 | 7/30/2012 | White Bass | f | 2 | 27.5 | 346 | L18328-18 | 7-Aug-12 | WG41155 |
| 12 3155 | 2 | 1 | 7/30/2012 | White Bass | m | 4 | 35 | 714 | L18328-19 | 7-Aug-12 | WG40898 |
| 12 3156 | 2 | 1 | 7/30/2012 | White Bass | f | 3 | 29.5 | 437 | L18328-20 | 7-Aug-12 | WG40898 |
| 12 3157 | 2 | 1 | 7/30/2012 | White Bass | j | 1 | 20 | 141.82 | L18331-1 | 8-Aug-12 | WG40903 |
| 12 3158 | 2 | 1 | 7/30/2012 | White Bass | j | 1 | 19 | 113.28 | L18331-2 | 8-Aug-12 | WG40903 |

| MPCA ID | Section | Run | Sample Date | Species | Sex | Age | Length (cm) | Weight (g) | AXYS ID | Sample Received | Work Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 3159 | 2 | 1 | 7/30/2012 | White Bass | j | 1 | 21 | 143 | L18331-3 | 8-Aug-12 | WG40903 |
| 12 3160 | 2 | 1 | 7/30/2012 | White Bass | j | 1 | 19 | 131 | L18331-4 | 8-Aug-12 | WG40903 |
| 12 3161 | 2 | 1 | 7/30/2012 | Freshwater Drum | m | 4 | 30 | 303 | L18331-5 | 8-Aug-12 | WG40903 |
| 12 3162 | 2 | 1 | 7/30/2012 | Freshwater Drum | f | 7 | 38 | 635 | L18331-6 | 8-Aug-12 | WG40903 |
| 12 3163 | 2 | 1 | 7/30/2012 | Freshwater Drum | m | 9 | 43 | 1056 | L18331-7 | 8-Aug-12 | WG40903 |
| 12 3164 | 2 | 1 | 7/30/2012 | Freshwater Drum | m | 6 | 36 | 523 | L18331-8 | 8-Aug-12 | WG40903 |
| 12 3165 | 2 | 1 | 7/30/2012 | Freshwater Drum | m | 5 | 33 | 435 | L18331-9 | 8-Aug-12 | WG40903 |
| 12 3166 | 2 | 1 | 7/30/2012 | Bluegill Sunfish | m | 5 | 15 | 71.56 | L18331-10 | 8-Aug-12 | WG40904 |
| 12 3167 | 4 | 1 | 7/31/2012 | Common Carp | m | 6 | 49.5 | 1876 | L18331-11 | 8-Aug-12 | WG40904 |
| 12 3168 | 4 | 1 | 7/31/2012 | Common Carp | f | 7 | 56 | 2350 | L18331-12 | 8-Aug-12 | WG40904 |
| 12 3169 | 4 | 1 | 7/31/2012 | Common Carp | m | 3 | 34 | 682 | L18331-13 | 8-Aug-12 | WG40904 |
| 12 3170 | 4 | 1 | 7/31/2012 | Common Carp | m | 5 | 43 | 1424 | L18331-14 | 8-Aug-12 | WG40904 |
| 12 3171 | 4 | 1 | 7/31/2012 | Common Carp | m | 4 | 40 | 1004 | L18331-15 | 8-Aug-12 | WG40904 |
| 12 3172 | 4 | 1 | 7/31/2012 | Common Carp | m | 6 | 52 | 2260 | L18331-16 (A) | 8-Aug-12 | WG40904 |
| 12 3173 | 4 | 1 | 7/31/2012 | Common Carp | m | 3 | 34 | 710 | L18331-17 | 8-Aug-12 | WG40904 |
| 12 3174 | 4 | 1 | 7/31/2012 | Common Carp | f | 3 | 30 | 497 | L18331-18 | 8-Aug-12 | WG40904 |
| 12 3175 | 4 | 1 | 7/31/2012 | Common Carp | m | 6 | 50 | 2072 | L18331-19 | 8-Aug-12 | WG40904 |
| 12 3176 | 4 | 1 | 7/31/2012 | Freshwater Drum | m | 6 | 36 | 540 | L18331-20 | 8-Aug-12 | WG40904 |
| 12 3177 | 4 | 1 | 7/31/2012 | Freshwater Drum | m | 12 | 51.5 | 1590 | L18331-21 | 8-Aug-12 | WG40904 |
| 12 3178 | 4 | 1 | 7/31/2012 | Freshwater Drum | m | 5 | 33.5 | 425 | L18331-22 | 8-Aug-12 | WG40904 |
| 12 3179 | 4 | 1 | 7/31/2012 | Freshwater Drum | f | 11 | 49 | 1430 | L18335-1 | 8-Aug-12 | WG41230 |
| 12 3180 | 4 | 1 | 7/31/2012 | Freshwater Drum | m | 8 | 40 | 831 | L18335-2 | 8-Aug-12 | WG41230 |
| 12 3181 | 4 | 1 | 7/31/2012 | Freshwater Drum | m | 5 | 34 | 439 | L18335-3 | 8-Aug-12 | WG41230 |
| 12 3182 | 4 | 1 | 7/31/2012 | Freshwater Drum | m | 4 | 32 | 463 | L18335-4 | 8-Aug-12 | WG41230 |
| 12 3183 | 4 | 1 | 7/31/2012 | Freshwater Drum | f | 8 | 40 | 794 | L18335-5 | 8-Aug-12 | WG41230 |
| 12 3184 | 4 | 1 | 7/31/2012 | Freshwater Drum | f | 9 | 43 | 908 | L18335-6 | 8-Aug-12 | WG41230 |
| 12 3185 | 4 | 1 | 7/31/2012 | White Bass | f | 7 | 39 | 956 | L18335-7 | 8-Aug-12 | WG41230 |
| 12 3186 | 4 | 1 | 7/31/2012 | White Bass | f | 4 | 33 | 604 | L18335-8 | 8-Aug-12 | WG41230 |

| MPCA ID | Section | Run | Sample Date | Species | Sex | Age | Length (cm) | Weight (g) | AXYS ID | Sample Received | Work Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 3187 | 4 | 1 | 7/31/2012 | White Bass | j | 1 | 20 | 127 | L18335-9 | 8-Aug-12 | WG40910 |
| 12 3188 | 4 | 1 | 7/31/2012 | White Bass | m | 4 | 35 | 731 | L18335-10 | 8-Aug-12 | WG40910 |
| 12 3189 | 4 | 1 | 7/31/2012 | White Bass | j | 1 | 19.5 | 112 | L18335-11 | 8-Aug-12 | WG40910 |
| 12 3190 | 4 | 1 | 7/31/2012 | Smallmouth Bass | ind | 5 | 31 | 522 | L18335-12 (A) | 8-Aug-12 | WG40910 |
| 12 3191 | 4 | 1 | 7/31/2012 | Smallmouth Bass | ind | 4 | 29 | 417 | L18335-13 | 8-Aug-12 | WG40910 |
| 12 3192 | 4 | 1 | 7/31/2012 | Smallmouth Bass | m | 4 | 28 | 376 | L18335-14 | 8-Aug-12 | WG40910 |
| 12 3193 | 4 | 1 | 7/31/2012 | Smallmouth Bass | j | 2 | 17 | 330 | L18335-15 | 8-Aug-12 | WG40910 |
| 12 3194 | 4 | 1 | 7/31/2012 | Smallmouth Bass | j | 2 | 16 | 283 | L18335-16 | 8-Aug-12 | WG40910 |
| 12 3195 | 4 | 1 | 7/31/2012 | Smallmouth Bass | j | 1 | 12.5 | 171 | L18335-17 | 8-Aug-12 | WG40910 |
| 12 3196 | 4 | 1 | 7/31/2012 | Smallmouth Bass | f | 5 | 32 | 490 | L18335-18 | 8-Aug-12 | WG40910 |
| 12 3197 | 4 | 1 | 7/31/2012 | Smallmouth Bass | j | 2 | 22.5 | 485 | L18335-19 | 8-Aug-12 | WG40910 |
| 12 3198 | 4 | 1 | 7/31/2012 | Bluegill Sunfish | j | 5 | 15 | 91.9 | L18335-20 | 8-Aug-12 | WG40910 |
| 12 3199 | 4 | 1 | 7/31/2012 | Bluegill Sunfish | j | 4 | 14 | 85.1 | L18335-21 | 8-Aug-12 | WG40910 |
| 12 3200 | 4 | 1 | 7/31/2012 | Bluegill Sunfish | f | 2 | 12 | 45.88 | L18335-22 | 8-Aug-12 | WG40910 |
| 12 3201 | 4 | 1 | 7/31/2012 | Bluegill Sunfish | f | 2 | 12 | 46.92 | L18335-23 | 8-Aug-12 | WG40910 |
| 12 3202 | 4 | 1 | 7/31/2012 | Bluegill Sunfish | f | 5 | 15.5 | 101 | L18335-24 | 8-Aug-12 | WG40910 |
| 12 3203 | 4 | 1 | 7/31/2012 | Bluegill Sunfish | f | 4 | 14 | 86.09 | L18335-25 | 8-Aug-12 | WG40910 |
| 12 3204 | 4 | 1 | 7/31/2012 | Bluegill Sunfish | j | 2 | 11 | 29.15 | L18335-26 | 8-Aug-12 | WG40910 |
| 12 3205 | 4 | 2 | 7/31/2012 | Common Carp | m | 7 | 53.5 | 2800 | L18333-1 (A) | 8-Aug-12 | WG40907 |
| 12 3206 | 4 | 2 | 7/31/2012 | Common Carp | m | 7 | 53 | 2100 | L18333-2 | 8-Aug-12 | WG40907 |
| 12 3207 | 4 | 2 | 7/31/2012 | Common Carp | m | 7 | 56 | 2300 | L18333-3 | 8-Aug-12 | WG40907 |
| 12 3208 | 4 | 2 | 7/31/2012 | Common Carp | m | 3 | 35 | 735 | L18333-4 | 8-Aug-12 | WG40907 |
| 12 3209 | 4 | 2 | 7/31/2012 | Freshwater Drum | m | 8 | 42 | 932 | L18333-5 | 8-Aug-12 | WG40907 |
| 12 3210 | 4 | 2 | 7/31/2012 | Freshwater Drum | f | 7 | 38 | 708 | L18333-6 | 8-Aug-12 | WG40907 |
| 12 3211 | 4 | 2 | 7/31/2012 | Freshwater Drum | m | 7 | 38 | 718 | L18333-7 | 8-Aug-12 | WG40907 |
| 12 3212 | 4 | 2 | 7/31/2012 | Freshwater Drum | m | 4 | 32 | 407 | L18333-8 | 8-Aug-12 | WG40907 |
| 12 3213 | 4 | 2 | 7/31/2012 | Freshwater Drum | m | 5 | 33 | 476 | L18333-9 | 8-Aug-12 | WG40907 |
| 12 3214 | 4 | 2 | 7/31/2012 | Smallmouth Bass | m | 3 | 26 | 288 | L18333-10 | 8-Aug-12 | WG40907 |

| MPCA ID | Section | Run | Sample Date | Species | Sex | Age | Length (cm) | Weight (g) | AXYS ID | Sample Received | Work Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 3215 | 4 | 3 | 7/31/2012 | Common Carp | j | 2 | 26 | 339 | L18333-11 | 8-Aug-12 | WG40908 |
| 12 3216 | 4 | 3 | 7/31/2012 | Common Carp | m | 2 | 26 | 301 | L18333-12 | 8-Aug-12 | WG40908 |
| 12 3217 | 4 | 3 | 7/31/2012 | Freshwater Drum | m | 8 | 40 | 888 | L18333-13 | 8-Aug-12 | WG40908 |
| 12 3218 | 4 | 3 | 7/31/2012 | Smallmouth Bass | f | 3 | 26 | 236 | L18333-14 | 8-Aug-12 | WG40908 |
| 12 3219 | 4 | 3 | 7/31/2012 | Smallmouth Bass | m | 5 | 33 | 628 | L18333-15 | 8-Aug-12 | WG40908 |
| 12 3220 | 4 | 3 | 7/31/2012 | Smallmouth Bass | j | 2 | 17 | 62.4 | L18333-16 | 8-Aug-12 | WG40908 |
| 12 3221 | 4 | 3 | 7/31/2012 | Smallmouth Bass | j | 2 | 16 | 65.04 | L18333-17 | 8-Aug-12 | WG40908 |
| 12 3222 | 4 | 3 | 7/31/2012 | Smallmouth Bass | j | 3 | 23 | 198 | L18333-18 | 8-Aug-12 | WG40908 |
| 12 3223 | 4 | 3 | 7/31/2012 | Smallmouth Bass | m | 2 | 21 | 168 | L18333-19 | 8-Aug-12 | WG40908 |
| 12 3224 | 4 | 3 | 7/31/2012 | White Bass | m | 2 | 27 | 338 | L18333-20 | 8-Aug-12 | WG40908 |
| 12 3225 | 4 | 3 | 7/31/2012 | White Bass | j | 1 | 19.6 | 123.88 | L18333-21 | 8-Aug-12 | WG40908 |
| 12 3226 | 4 | 4 | 7/31/2012 | White Bass | j | 1 | 19.5 | 112.24 | L18333-22 | 8-Aug-12 | WG40908 |
| 12 3227 | 4 | 4 | 7/31/2012 | White Bass | j | 1 | 18 | 99.32 | L18333-23 | 8-Aug-12 | WG40908 |
| 12 3228 | 4 | 4 | 7/31/2012 | White Bass | m | 1 | 19 | 117.95 | L18333-24 | 8-Aug-12 | WG40908 |
| 12 3229 | 4 | 4 | 7/31/2012 | White Bass | m | 5 | 35.5 | 705 | L18333-25 (A) | 8-Aug-12 | WG40908 |
| 12 3230 | 4 | 4 | 7/31/2012 | Bluegill Sunfish | j | 1 | 9 | 15.64 | L18333-26 | 8-Aug-12 | WG40908 |
| 12 3231 | 4 | 4 | 7/31/2012 | Bluegill Sunfish | j | 1 | 9 | 16.21 | L18333-27 | 8-Aug-12 | WG40908 |
| 12 3232 | 4 | 4 | 7/31/2012 | Bluegill Sunfish | m | 5 | 15 | 94.27 | L18333-28 | 8-Aug-12 | WG40908 |
| 12 3233 | 4 | 4 | 7/31/2012 | Bluegill Sunfish | m | 5 | 15 | 99.2 | L18333-29 | 8-Aug-12 | WG40908 |
| 12 3237 | 4 | 4 | 7/31/2012 | Bluegill Sunfish | j | 1 | 8 | 11.61 | L18333-33 | 8-Aug-12 | WG40909 |
| 12 3238 | 3 | 1 | 8/1/2012 | White Bass | m | 6 | 37 | 815 | L18332-1 | 7-Aug-12 | WG40904 |
| 12 3239 | 3 | 1 | 8/1/2012 | White Bass | m | 2 | 28 | 367 | L18332-2 | 7-Aug-12 | WG40904 |
| 12 3240 | 3 | 1 | 8/1/2012 | Bluegill Sunfish | f | 6 | 17.5 | 137 | L18332-3 | 7-Aug-12 | WG40904 |
| 12 3241 | 3 | 1 | 8/1/2012 | Bluegill Sunfish | f | 6 | 17.5 | 115 | L18332-4 | 7-Aug-12 | WG40904 |
| 12 3242 | 3 | 1 | 8/1/2012 | Bluegill Sunfish | m | 6 | 17.5 | 144 | L18332-5 | 7-Aug-12 | WG40904 |
| 12 3243 | 3 | 1 | 8/1/2012 | Bluegill Sunfish | f | 6 | 17.5 | 113 | L18332-6 | 7-Aug-12 | WG40904 |
| 12 3244 | 3 | 1 | 8/1/2012 | Bluegill Sunfish | f | 7 | 18.5 | 274 | L18332-7 | 7-Aug-12 | WG40905 |
| 12 3245 | 3 | 1 | 8/1/2012 | Bluegill Sunfish | m | 7 | 18.5 | 160.18 | L18332-8 | 7-Aug-12 | WG40905 |

| MPCA ID | Section | Run | Sample Date | Species | Sex | Age | Length (cm) | Weight (g) | AXYS ID | Sample Received | Work Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 3246 | 3 | 1 | 8/1/2012 | Bluegill Sunfish | m | 6 | 17 | 123.56 | L18332-9 | 7-Aug-12 | WG40905 |
| 12 3247 | 3 | 1 | 8/1/2012 | Bluegill Sunfish | m | 5 | 15 | 93 | L18332-10 | 7-Aug-12 | WG40905 |
| 12 3248 | 3 | 1 | 8/1/2012 | Bluegill Sunfish | m | 6 | 16.5 | 119 | L18332-11 | 7-Aug-12 | WG40905 |
| 12 3249 | 3 | 1 | 8/1/2012 | Bluegill Sunfish | m | 6 | 17 | 116 | L18332-12 | 7-Aug-12 | WG40905 |
| 12 3250 | 3 | 1 | 8/1/2012 | Bluegill Sunfish | m | 6 | 17.5 | 110 | L18332-13 | 7-Aug-12 | WG40905 |
| 12 3251 | 3 | 1 | 8/1/2012 | Bluegill Sunfish | f | 4 | 14.5 | 66.36 | L18332-14 | 7-Aug-12 | WG40905 |
| 12 3252 | 3 | 1 | 8/1/2012 | Bluegill Sunfish | ind | 8 | 19.5 | 173 | L18332-15 | 7-Aug-12 | WG40905 |
| 12 3253 | 3 | 1 | 8/1/2012 | Bluegill Sunfish | m | 5 | 16.5 | 129 | L18332-16 | 7-Aug-12 | WG40905 |
| 12 3254 | 3 | 1 | 8/1/2012 | Bluegill Sunfish | f | 6 | 17 | 121 | L18332-17 | 7-Aug-12 | WG40905 |
| 12 3255 | 2 | 2 | 8/1/2012 | Common Carp | m | 6 | 51 | 2300 | L18332-18 (A) | 7-Aug-12 | WG40905 |
| 12 3256 | 2 | 2 | 8/2/2012 | Common Carp | m | 7 | 52 | 2500 | L18332-19 | 7-Aug-12 | WG40905 |
| 12 3257 | 2 | 2 | 8/2/2012 | Common Carp | m | 3 | 33 | 528 | L18332-20 | 7-Aug-12 | WG40905 |
| 12 3258 | 2 | 2 | 8/2/2012 | Common Carp | j | 3 | 31 | 508 | L18332-21 | 7-Aug-12 | WG40905 |
| 12 3259 | 2 | 2 | 8/2/2012 | Common Carp | j | 2 | 30 | 414 | L18332-22 | 7-Aug-12 | WG40905 |
| 12 3260 | 2 | 2 | 8/2/2012 | Common Carp | m | 3 | 35 | 646 | L18332-23 | 7-Aug-12 | WG40905 |
| 12 3261 | 2 | 2 | 8/2/2012 | Bluegill Sunfish | j | 5 | 15 | 68 | L18332-24 | 7-Aug-12 | WG40905 |
| 12 3262 | 2 | 2 | 8/2/2012 | Bluegill Sunfish | j | 2 | 10 | 35 | L18332-25 | 7-Aug-12 | WG40905 |
| 12 3263 | 2 | 2 | 8/2/2012 | Bluegill Sunfish | j | 2 | 10 | 19 | L18332-26 | 7-Aug-12 | WG40906 |
| 12 3264 | 2 | 2 | 8/2/2012 | Bluegill Sunfish | j | 1 | 8.5 | 12 | L18332-27 | 7-Aug-12 | WG40906 |
| 12 3265 | 2 | 2 | 8/2/2012 | Bluegill Sunfish | j | 2 | 11 | 30 | L18332-28 | 7-Aug-12 | WG40906 |
| 12 3266 | 2 | 2 | 8/2/2012 | Bluegill Sunfish | j | 1 | 9.5 | 19 | L18332-29 | 7-Aug-12 | WG40906 |
| 12 3267 | 2 | 2 | 8/2/2012 | Freshwater Drum | m | 9 | 43 | 880 | L18332-30 | 7-Aug-12 | WG40906 |
| 12 3268 | 2 | 2 | 8/2/2012 | Freshwater Drum | m | 5 | 33 | 506 | L18332-31 | 7-Aug-12 | WG40906 |
| 12 3269 | 2 | 2 | 8/2/2012 | Freshwater Drum | m | 6 | 36 | 596 | L18332-32 | 7-Aug-12 | WG40906 |
| 12 3270 | 2 | 2 | 8/2/2012 | Freshwater Drum | m | 6 | 37 | 603 | L18332-33 | 7-Aug-12 | WG40906 |
| 12 3271 | 2 | 2 | 8/2/2012 | Freshwater Drum | m | 5 | 35 | 498 | L18332-34 | 7-Aug-12 | WG40906 |
| 12 3272 | 2 | 2 | 8/2/2012 | Freshwater Drum | m | 4 | 32.5 | 422 | L18332-35 | 7-Aug-12 | WG40906 |
| 12 3273 | 2 | 2 | 8/2/2012 | Smallmouth Bass | j | 2 | 15 | 43 | L18332-36 | 7-Aug-12 | WG40906 |

| MPCA ID | Section | Run | Sample Date | Species | Sex | Age | Length (cm) | Weight (g) | AXYS ID | Sample Received | Work Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 3274 | 2 | 2 | 8/2/2012 | Smallmouth Bass | j | 2 | 16 | 61 | L18332-37 | 7-Aug-12 | WG40906 |
| 12 3275 | 2 | 2 | 8/2/2012 | Smallmouth Bass | j | 2 | 16.5 | 64 | L18332-38 | 7-Aug-12 | WG40906 |
| 12 3276 | 2 | 2 | 8/2/2012 | Smallmouth Bass | m | 2 | 19.5 | 117 | L18332-39 | 7-Aug-12 | WG40906 |
| 12 3277 | 2 | 2 | 8/2/2012 | Smallmouth Bass | m | 2 | 21 | 127 | L18332-40 | 7-Aug-12 | WG40906 |
| 12 3278 | 2 | 3 | 8/2/2012 | Common Carp | m | 3 | 37 | 815 | L18332-41 (A) | 7-Aug-12 | WG40906 |
| 12 3279 | 2 | 3 | 8/2/2012 | Common Carp | m | 3 | 34 | 725 | L18332-42 | 7-Aug-12 | WG40906 |
| 12 3280 | 2 | 3 | 8/2/2012 | Common Carp | m | 3 | 35 | 729 | L18332-43 | 7-Aug-12 | WG40906 |
| 12 3281 | 2 | 3 | 8/2/2012 | Freshwater Drum | m | 5 | 33 | 452 | L18332-44 | 7-Aug-12 | WG40906 |
| 12 3282 | 2 | 3 | 8/2/2012 | Smallmouth Bass | m | 2 | 22 | 157 | L18332-45 | 7-Aug-12 | WG40907 |
| 12 3283 | 2 | 3 | 8/2/2012 | Bluegill Sunfish | j | 2 | 11 | 30.22 | L18332-46 | 7-Aug-12 | WG40907 |
| 12 3284 | 2 | 3 | 8/2/2012 | Bluegill Sunfish | f | 4 | 14.5 | 56 | L18332-47 | 7-Aug-12 | WG40907 |
| 12 3285 | 2 | 3 | 8/2/2012 | Bluegill Sunfish | m | 3 | 14 | 64 | L18332-48 | 7-Aug-12 | WG40907 |
| 12 3286 | 2 | 3 | 8/2/2012 | Bluegill Sunfish | f | 5 | 16 | 105 | L18332-49 | 7-Aug-12 | WG40907 |
| 12 3287 | 2 | 3 | 8/2/2012 | Bluegill Sunfish | f | 2 | 11 | 31 | L18332-50 | 7-Aug-12 | WG40907 |
| 12 3288 | 2 | 3 | 8/2/2012 | Bluegill Sunfish | m | 4 | 15 | 74 | L18332-51 | 7-Aug-12 | WG40907 |
| 12 3289 | 2 | 3 | 8/2/2012 | Bluegill Sunfish | m | 2 | 11 | 30.75 | L18332-52 | 7-Aug-12 | WG40907 |
| 12 3290 | 2 | 3 | 8/2/2012 | Bluegill Sunfish | m | 6 | 17 | 124 | L18332-53 | 7-Aug-12 | WG40907 |
| 12 3291 | 2 | 4 | 8/2/2012 | Freshwater Drum | m | 9 | 44 | 1106 | L18334-1 (A) | 7-Aug-12 | WG40909 |
| 12 3292 | 2 | 4 | 8/2/2012 | Freshwater Drum | m | 6 | 37 | 765 | L18334-2 | 7-Aug-12 | WG40909 |
| 12 3293 | 2 | 4 | 8/2/2012 | Freshwater Drum | m | 10 | 46 | 1353 | L18334-3 | 7-Aug-12 | WG40909 |
| 12 3294 | 2 | 4 | 8/2/2012 | Smallmouth Bass | m | 6 | 33.5 | 596 | L18334-4 | 7-Aug-12 | WG40909 |
| 12 3295 | 2 | 4 | 8/2/2012 | Smallmouth Bass | f | 1 | 15 | 44.8 | L18334-5 | 7-Aug-12 | WG40909 |
| 12 3296 | 2 | 4 | 8/2/2012 | Smallmouth Bass | m | 3 | 24 | 204 | L18334-6 | 7-Aug-12 | WG40909 |
| 12 3297 | 2 | 4 | 8/2/2012 | Smallmouth Bass | j | 2 | 21 | 114 | L18334-7 | 7-Aug-12 | WG40909 |
| 12 3298 | 2 | 4 | 8/2/2012 | Smallmouth Bass | j | 2 | 16 | 62 | L18334-8 | 7-Aug-12 | WG40909 |
| 12 3299 | 3 | 2 | 8/2/2012 | Common Carp | m | 7 | 56.5 | 3200 | L18334-9 | 7-Aug-12 | WG41230 |
| 12 3300 | 3 | 2 | 8/2/2012 | Common Carp | m | 7 | 55 | 3800 | L18334-10 (A) | 7-Aug-12 | WG41230 |
| 12 3301 | 3 | 2 | 8/2/2012 | Common Carp | m | 4 | 39.5 | 1184 | L18334-11 | 7-Aug-12 | WG41230 |

| MPCA ID | Section | Run | Sample Date | Species | Sex | Age | Length (cm) | Weight (g) | AXYS ID | Sample Received | Work Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 3302 | 3 | 2 | 8/2/2012 | Common Carp | m | 5 | 47 | 1722 | L18334-12 | 7-Aug-12 | WG41230 |
| 12 3303 | 3 | 2 | 8/2/2012 | Common Carp | f | 4 | 43 | 1248 | L18334-13 | 7-Aug-12 | WG40910 |
| 12 3304 | 3 | 2 | 8/2/2012 | Common Carp | m | 3 | 37.5 | 934 | L18334-14 | 7-Aug-12 | WG40909 |
| 12 3305 | 3 | 2 | 8/2/2012 | Common Carp | m | 6 | 51.5 | 2500 | L18334-15 | 7-Aug-12 | WG41230 |
| 12 3306 | 3 | 2 | 8/2/2012 | Common Carp | m | 7 | 52.5 | 2300 | L18425-1 (A) | 22-Aug-12 | WG41077 |
| 12 3307 | 3 | 2 | 8/2/2012 | Common Carp | m | 3 | 36.5 | 839 | L18425-2 | 22-Aug-12 | WG41077 |
| 12 3308 | 3 | 2 | 8/2/2012 | Common Carp | m | 4 | 43 | 1617 | L18425-3 | 22-Aug-12 | WG41077 |
| 12 3309 | 3 | 2 | 8/2/2012 | Common Carp | j | 4 | 41 | 1256 | L18425-4 | 22-Aug-12 | WG41077 |
| 12 3310 | 3 | 2 | 8/2/2012 | Common Carp | f | 3 | 34.5 | 604 | L18425-5 | 22-Aug-12 | WG41077 |
| 12 3311 | 3 | 2 | 8/2/2012 | Common Carp | f | 7 | 56 | 3000 | L18425-6 | 22-Aug-12 | WG41077 |
| 12 3312 | 3 | 2 | 8/2/2012 | Common Carp | f | 7 | 56 | 3300 | L18425-7 | 22-Aug-12 | WG41077 |
| 12 3313 | 3 | 2 | 8/2/2012 | Common Carp | f | 7 | 55.5 | 3200 | L18425-8 | 22-Aug-12 | WG41077 |
| 12 3314 | 3 | 2 | 8/2/2012 | Freshwater Drum | f | 6 | 37.0 | 736 | L18427-1 | 22-Aug-12 | WG41078 |
| 12 3315 | 3 | 2 | 8/2/2012 | Freshwater Drum | m | 6 | 36.0 | 1264 | L18427-2 | 22-Aug-12 | WG41078 |
| 12 3316 | 3 | 2 | 8/2/2012 | White Bass | m | 5 | 36.5 | 849 | L18427-3 | 22-Aug-12 | WG41078 |
| 12 3317 | 3 | 2 | 8/2/2012 | White Bass | f | 5 | 36.0 | 721 | L18427-4 (A) | 22-Aug-12 | WG41078 |
| 12 3318 | 3 | 2 | 8/2/2012 | White Bass | f | 3 | 31.0 | 566 | L18427-5 | 22-Aug-12 | WG41079 |
| 12 3319 | 3 | 2 | 8/2/2012 | White Bass | m | 3 | 31.5 | 500 | L18427-6 | 22-Aug-12 | WG41079 |
| 12 3320 | 3 | 2 | 8/2/2012 | White Bass | f | 3 | 31.5 | 592 | L18427-7 | 22-Aug-12 | WG41079 |
| 12 3321 | 3 | 2 | 8/2/2012 | White Bass | f | 3 | 31.0 | 541 | L18427-8 | 22-Aug-12 | WG41079 |
| 12 3322 | 3 | 2 | 8/2/2012 | White Bass | m | 2 | 28.0 | 379 | L18427-9 | 22-Aug-12 | WG41079 |
| 12 3323 | 3 | 2 | 8/2/2012 | Smallmouth Bass | j | 2 | 16.5 | 65 | L18427-10 | 22-Aug-12 | WG41079 |
| 12 3324 | 3 | 2 | 8/2/2012 | Smallmouth Bass | j | 2 | 16.0 | 69 | L18427-11 | 22-Aug-12 | WG41079 |
| 12 3325 | 3 | 2 | 8/2/2012 | Smallmouth Bass | j | 2 | 22.0 | 168 | L18427-12 | 22-Aug-12 | WG41079 |
| 12 3326 | 3 | 2 | 8/2/2012 | Smallmouth Bass | f | 6 | 35.5 | 698 | L18427-13 | 22-Aug-12 | WG41079 |
| 12 3327 | 3 | 3 | 8/2/2012 | Freshwater Drum | f | 8 | 40.5 | 938 | L18427-14 | 22-Aug-12 | WG41079 |
| 12 3328 | 3 | 3 | 8/2/2012 | Freshwater Drum | f | 5 | 33.0 | 494 | L18427-15 | 22-Aug-12 | WG41079 |
| 12 3329 | 3 | 3 | 8/2/2012 | White Bass | j | 3 | 33.0 | 636 | L18427-16 | 22-Aug-12 | WG41079 |

| MPCA ID | Section | Run | Sample Date | Species | Sex | Age | Length (cm) | Weight (g) | AXYS ID | Sample Received | Work Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 3330 | 3 | 3 | 8/2/2012 | White Bass | f | 5 | 36.0 | 870 | L18427-17 | 22-Aug-12 | WG41079 |
| 12 3331 | 3 | 3 | 8/2/2012 | White Bass | f | 6 | 37.5 | 985 | L18427-18 | 22-Aug-12 | WG41079 |
| 12 3332 | 3 | 3 | 8/2/2012 | White Bass | ind | 4 | 33.0 | 605 | L18427-19 | 22-Aug-12 | WG41079 |
| 12 3333 | 3 | 3 | 8/2/2012 | White Bass | m | 4 | 34.0 | 728 | L18427-20 | 22-Aug-12 | WG41079 |
| 12 3334 | 3 | 3 | 8/2/2012 | White Bass | f | 4 | 35.0 | 780 | L18427-21 (A) | 22-Aug-12 | WG41079 |
| 12 3335 | 3 | 3 | 8/2/2012 | Smallmouth Bass | j | 1 | 15.5 | 52 | L18427-22 | 22-Aug-12 | WG41079 |
| 12 3336 | 3 | 3 | 8/2/2012 | Smallmouth Bass | j | 1 | 14.0 | 48 | L18427-23 | 22-Aug-12 | WG41079 |
| 12 3337 | 3 | 3 | 8/2/2012 | Smallmouth Bass | j | 2 | 24.5 | 267 | L18427-24 | 22-Aug-12 | WG41079 |
| 12 3338 | 1 | 6 | 8/3/2012 | White Bass | m | 3 | 32.5 | 621 | L18426-1 | 22-Aug-12 | WG41077 |
| 12 3339 | 1 | 7 | 8/3/2012 | White Bass | j | 4 | 34.0 | 582 | L18426-2 | 22-Aug-12 | WG41077 |
| 12 3340 | 1 | 7 | 8/3/2012 | White Bass | f | 3 | 32.5 | 621 | L18426-3 | 22-Aug-12 | WG41077 |
| 12 3341 | 1 | 7 | 8/3/2012 | White Bass | f | 4 | 34.0 | 619 | L18426-4 | 22-Aug-12 | WG41077 |
| 12 3342 | 1 | 7 | 8/3/2012 | White Bass | j | 1 | 18.5 | 101 | L18426-5 | 22-Aug-12 | WG41077 |
| 12 3343 | 2 | 5 | 8/3/2012 | Smallmouth Bass | m | 7 | 39.5 | 1121 | L18426-6 | 22-Aug-12 | WG41077 |
| 12 3344 | 2 | 5 | 8/3/2012 | Smallmouth Bass | m | 4 | 30.0 | 514 | L18426-7 | 22-Aug-12 | WG41077 |
| 12 3345 | 2 | 5 | 8/3/2012 | Smallmouth Bass | j | 1 | 20.5 | 129 | L18426-8 | 22-Aug-12 | WG41077 |
| 12 3346 | 2 | 5 | 8/3/2012 | Smallmouth Bass | j | 0 | 13.5 | 41 | L18426-9 | 22-Aug-12 | WG41077 |
| 12 3347 | 3 | 5 | 8/7/2012 | Freshwater Drum | f | 3 | 28.0 | 309 | L18426-10 | 22-Aug-12 | WG41077 |
| 12 3348 | 3 | 5 | 8/7/2012 | Freshwater Drum | m | 4 | 31.5 | 407 | L18426-11 | 22-Aug-12 | WG41077 |
| 12 3349 | 3 | 5 | 8/7/2012 | Freshwater Drum | m | 5 | 33.5 | 523 | L18426-12 | 22-Aug-12 | WG41077 |
| 12 3350 | 3 | 5 | 8/7/2012 | Freshwater Drum | m | 5 | 33.5 | 397 | L18426-13 | 22-Aug-12 | WG41078 |
| 12 3351 | 3 | 5 | 8/7/2012 | Freshwater Drum | f | 5 | 34.0 | 497 | L18426-14 | 22-Aug-12 | WG41078 |
| 12 3352 | 3 | 5 | 8/7/2012 | Freshwater Drum | j | 3 | 26.5 | 260 | L18426-15 | 22-Aug-12 | WG41078 |
| 12 3353 | 3 | 6 | 8/7/2012 | Freshwater Drum | m | 5 | 34.5 | 530 | L18426-16 | 22-Aug-12 | WG41078 |
| 12 3354 | 3 | 6 | 8/7/2012 | Freshwater Drum | f | 11 | 48.0 | 1280 | L18426-17 | 22-Aug-12 | WG41078 |
| 12 3355 | 3 | 6 | 8/7/2012 | Freshwater Drum | f | 7 | 37.5 | 654 | L18426-18 | 22-Aug-12 | WG41078 |
| 12 3356 | 3 | 5 | 8/7/2012 | Freshwater Drum | ind | 5 | 34.0 | 432 | L18426-19 | 22-Aug-12 | WG41078 |
| 12 3357 | 3 | 5 | 8/7/2012 | Freshwater Drum | f | 7 | 38.5 | 828 | L18426-20 | 22-Aug-12 | WG41078 |

| MPCA ID | Section | Run | Sample Date | Species | Sex | Age | Length (cm) | Weight (g) | AXYS ID | Sample Received | Work Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 3358 | 3 | 4 | 8/6/2012 | Smallmouth Bass | ind | 6 | 34.5 | 755 | L18426-21 | 22-Aug-12 | WG41078 |
| 12 3359 | 3 | 4 | 8/6/2012 | Smallmouth Bass | j | 2 | 22.5 | 172 | L18426-22 | 22-Aug-12 | WG41078 |
| 12 3360 | 3 | 4 | 8/6/2012 | Smallmouth Bass | j | 2 | 23.5 | 215 | L18426-23 | 22-Aug-12 | WG41078 |
| 12 3361 | 3 | 4 | 8/6/2012 | Smallmouth Bass | f | 3 | 25.0 | 195 | L18426-24 | 22-Aug-12 | WG41078 |
| 12 3362 | 3 | 4 | 8/6/2012 | Smallmouth Bass | j | 3 | 26.0 | 309 | L18426-25 | 22-Aug-12 | WG41078 |
| 12 3363 | 3 | 4 | 8/6/2012 | Smallmouth Bass | j | 2 | 22.5 | 161 | L18426-26 | 22-Aug-12 | WG41078 |
| 12 3364 | 3 | 4 | 8/6/2012 | Smallmouth Bass | j | 3 | 25.5 | 266 | L18426-27 | 22-Aug-12 | WG41078 |
| 12 3365 | 3 | 4 | 8/6/2012 | Smallmouth Bass | j | 2 | 21.5 | 168 | L18426-28 | 22-Aug-12 | WG41078 |
| 12 3366 | 1 | 8 | 8/23/2012 | White Bass | M | 2 | 27.5 | 357 | L18746-1 | 25-Oct-12 | WG41790 |
| 12 3367 | 1 | 9 | 8/23/2012 | White Bass | M | 3 | 29.5 | 453 | L18746-2 | 25-Oct-12 | WG41790 |
| 12 3368 | 1 | 9 | 8/23/2012 | White Bass | F | 3 | 29.0 | 457 | L18746-3 (A) | 25-Oct-12 | WG41790 |
| 12 3369 | 1 | 10 | 9/14/2012 | White Bass | M | 1 | 22.5 | 205 | L18746-4 | 25-Oct-12 | WG41790 |
| 12 3370 | 4 | 5 | 9/14/2012 | Bluegill Sunfish | F | 5 | 16.5 | 126 | L18746-5 | 25-Oct-12 | WG41790 |
| 12 3371 | 4 | 5 | 9/14/2012 | Bluegill Sunfish | M | 4 | 15.0 | 101 | L18746-6 | 25-Oct-12 | WG41790 |
| 12 3372 | 4 | 5 | 9/14/2012 | Bluegill Sunfish | M | 4 | 14.5 | 79 | L18746-7 | 25-Oct-12 | WG41790 |
| 12 3373 | 4 | 6 | 9/14/2012 | White Bass | F | 2 | 23.5 | 198 | L18746-8 | 25-Oct-12 | WG41790 |
| 12 3374 | 4 | 6 | 9/14/2012 | White Bass | M | 2 | 27.5 | 403 | L18746-9 | 25-Oct-12 | WG41790 |

## Appendix A-6. Georeferences for fish-collection runs

| SECTION | RUN | SHOCKER START/STOP POINT | WAY POINT | DATE | LAT | LONG | BLUEGILL | COMMON CARP | FRESHWATER DRUM | SMALLMOUTH BASS | WHITE BASS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | START | A11 | 7/30/2012 | 44.91298500 | -93.20236500 | 15 | 7 | 12 | 11 | |
| 1 | 1 | STOP | A12 | | 44.90704600 | -93.19834200 | | | | | |
| 1 | 2 | START | A13 | 7/30/2012 | 44.91334400 | -93.19959200 | | 2 | 3 | | |
| 1 | 2 | STOP | A14 | | 44.91065300 | -93.20110100 | | | | | |
| 1 | 3 | START | A15 | 7/30/2012 | 44.91300200 | -93.19911400 | | 4 | | 3 | 1 |
| 1 | 3 | STOP | A16 | | 44.90414000 | -93.19102000 | | | | | |
| 1 | 4 | START | A17 | 7/30/2012 | 44.90265100 | -93.19044600 | | 2 | | 1 | 2 |
| 1 | 4 | STOP | A18 | | 44.89440400 | -93.16683400 | | | | | |
| 1 | 5 | START | A19 | 7/30/2012 | 44.89791100 | -93.15615200 | | | | | 1 |
| 1 | 5 | STOP | A20 | | 44.89823200 | -93.15167100 | | | | | |
| 1 | 6 | START | A21 | 8/3/2012 | 44.89339600 | -93.17746200 | | | | | 1 |
| 1 | 6 | STOP | A22 | | 44.88920600 | -93.17806300 | | | | | |
| 1 | 7 | START | A23 | 8/3/2012 | 44.91494900 | -93.19989300 | | | | | 4 |
| 1 | 7 | STOP | A24 | | 44.89812900 | -93.15141900 | | | | | |
| 1 | 8 | START/STOP | A25 | 8/23/2012 | 44.90580000 | -93.19552100 | | | | | 1 |
| 1 | 9 | START | A26 | 8/23/2012 | 44.89131000 | -93.17790600 | | | | | 2 |
| 1 | 9 | STOP | A27 | | 44.89001500 | -93.17793300 | | | | | |
| 1 | 10 | START | A28 | 9/14/2012 | 44.91268800 | -93.20227600 | | | | | 1 |
| 1 | 10 | STOP | A29 | | 44.90779800 | -93.19938700 | | | | | |
| 2 | 1 | START | B11 | 7/30/2012 | 44.89816700 | -93.14680100 | 1 | 6 | 5 | | 15 |
| 2 | 1 | STOP | B12 | | 44.90448800 | -93.13751200 | | | | | |
| 2 | 2 | START | B13 | 8/2/2012 | 44.91427600 | -93.13118100 | 6 | 6 | 6 | 5 | |
| 2 | 2 | STOP | B14 | | 44.92089800 | -93.12492400 | | | | | |

| SEC-TION | RUN | SHOCKER START/STOP POINT | WAY POINT | DATE | LAT | LONG | BLUEGILL | COMMON CARP | FRESHWATER DRUM | SMALLMOUTH BASS | WHITE BASS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 3 | START | B15 | 8/2/2012 | 44.92934000 | -93.11015700 | 8 | 3 | 1 | 1 | |
| 2 | 3 | STOP | B16 | | 44.92989700 | -93.11013000 | | | | | |
| 2 | 4 | START | B17 | 8/2/2012 | 44.90931400 | -93.04486800 | | | 3 | 5 | |
| 2 | 4 | STOP | B18 | | 44.89890800 | -93.03396000 | | | | | |
| 2 | 5 | START | B19 | 8/3/2012 | 44.90548900 | -93.13855700 | | | | 4 | |
| 2 | 5 | STOP | B20 | | 44.91835700 | -93.13107800 | | | | | |
| 3 | 1 | START | C11 | 8/1/2012 | 44.83996700 | -93.00670700 | 15 | | | | 2 |
| 3 | 1 | STOP | C12 | | 44.83113900 | -93.00342900 | | | | | |
| 3 | 2 | START | C13 | 8/2/2012 | 44.89320800 | -93.02393300 | | 15 | 2 | 4 | 7 |
| 3 | 2 | STOP | C14 | | 44.89088900 | -93.02063400 | | | | | |
| 3 | 3 | START | C15 | 8/2/2012 | 44.87685700 | -93.01267000 | | | 2 | 3 | 6 |
| 3 | 3 | STOP | C16 | | 44.87221900 | -93.01331900 | | | | | |
| 3 | 4 | START | C17 | 8/6/2012 | 44.84301000 | -93.00897500 | | | | 8 | |
| 3 | 4 | STOP | C18 | | 44.83152500 | -93.00890000 | | | | | |
| 3 | 5 | START | C19 | 8/6/2012 | 44.86691200 | -93.01354400 | | | 6 | | |
| 3 | 5 | STOP | C20 | | 44.83817400 | -93.01379000 | | | | | |
| 3 | 6 | START | C21 | 8/7/2012 | 44.88340400 | -93.01758800 | | | 3 | | |
| 3 | 6 | STOP | C22 | | 44.87792600 | -93.01650200 | | | | | |
| 3 | 7 | START | C23 | 8/7/2012 | 44.89320800 | -93.02355800 | | | 2 | | |
| 3 | 7 | STOP | C24 | | 44.89265500 | -93.02391300 | | | | | |
| 4 | 1 | START | D11 | 7/31/2012 | 44.78347500 | -92.93407500 | 7 | 9 | 9 | 8 | 5 |
| 4 | 1 | STOP | D12 | | 44.78496000 | -92.91887800 | | | | | |
| 4 | 2 | START | D13 | 7/31/2012 | 44.78348100 | -92.89555300 | | 4 | 5 | 1 | |
| 4 | 2 | STOP | D14 | | 44.78201300 | -92.88821700 | | | | | |

| SEC-TION | RUN | SHOCKER START/STOP POINT | WAY POINT | DATE | LAT | LONG | BLUEGILL | COMMON CARP | FRESHWATER DRUM | SMALLMOUTH BASS | WHITE BASS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 3 | START | D15 | 7/31/2012 | 44.77302400 | -92.91954700 | | 2 | 1 | 6 | 2 |
| 4 | 3 | STOP | D16 | | 44.77055200 | -92.89832600 | | | | | |
| 4 | 4 | START | D17 | 7/31/2012 | 44.76532300 | -92.89108600 | 8 | | | | 4 |
| 4 | 4 | STOP | D18 | | 44.76219200 | -92.87201600 | | | | | |
| 4 | 5 | START | D19 | 9/14/2012 | 44.78423600 | -92.93068700 | 3 | | | | |
| 4 | 5 | STOP | D20 | | 44.78530800 | -92.92324300 | | | | | |
| 4 | 6 | START | D21 | 9/14/2012 | 44.78191000 | -92.92643200 | | | | | 2 |
| 4 | 6 | STOP | D22 | | 44.78166100 | -92.92239600 | | | | | |

**Appendix A-7. Georeferences for water sample stations**

| Water Stations | Section | Description | Lat(DD) | Long (DD) |
|---|---|---|---|---|
| 1 | 1 | main channel at river mile 847 | 44.9103 | 93.2009 |
| 2 | 1 | old Minnesota River channel, near river mile 845.4 | 44.8936 | 93.1765 |
| 3 | 1 | main channel upstream of confluence with Minnesota River at river mile 844 | 44.8974 | 93.1568 |
| 4 | 2 | main channel near boat launch at river mile 842 | 44.9186 | 93.1300 |
| 5 | 2 | main channel adjacent to Holman Field at river mile 837 | 44.9317 | 93.0497 |
| 6 | 2 | bay south of Pigs Eye Lake near river mile 834 | 44.8964 | 93.0266 |
| 7 | 3 | main channel near boat launch and downstream from St. Paul Park Refinery at river mile 829.5 | 44.8395 | 93.0116 |
| 8 | 3 | main channel upstream of Island 112 at river mile 827.5 | 44.8229 | 93.0092 |
| 9 | 3 | Spring Lake, near river mile 821 | 44.7653 | 92.9540 |
| 10 | 4 | main channel, downstream of Grey Cloud Slough at river mile 819 | 44.7810 | 92.9324 |
| 11 | 4 | near shoreline, downstream of 3M Cottage Grove discharge, near river mile 817.5 | 44.7823 | 92.8923 |
| 12 | 4 | main channel, upstream of Lock & Dam No. 2 at river mile 816 | 44.7663 | 92.8731 |

# Appendix B: Benthic Macroinvertebrate and Sediment Data

## Appendix B-1. PFCs in Sediment samples from Pool 2

| CLIENT ID | WORK GROUP | Sample (g-dry) | PFBA | PFPeA | PFHxA | PFHpA | PFOA | PFNA | PFDA | PFUnA | PFDoA | PFBS | PFHxS | PFOS | PFOSA | Mois ture (%) | QA Review Date | Qualified Analytes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P2_837_SED | 40114 | 5.00 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.200 | < 0.200 | < 0.200 | < 0.100 | 25.4 | 7/24/2012 | NONE |
| MC_3_SED | 40114 | 5.05 | < 0.0991 | < 0.0991 | < 0.0991 | < 0.0991 | < 0.0991 | < 0.0991 | < 0.0991 | < 0.0991 | < 0.0991 | < 0.198 | < 0.198 | 0.581 | < 0.0991 | 26.8 | 7/24/2012 | NONE |
| P2_833_R_SED | 40114 | 4.97 | < 0.101 | < 0.101 | < 0.101 | < 0.101 | < 0.101 | 0.113 | 0.126 | < 0.101 | < 0.101 | < 0.201 | < 0.201 | 0.681 | < 0.101 | 57.2 | 7/24/2012 | NONE |
| P2_835_L_SED | 40114 | 5.10 | < 0.0980 | < 0.0980 | < 0.0980 | < 0.0980 | < 0.0980 | < 0.0980 | < 0.0980 | < 0.0980 | < 0.0980 | < 0.196 | < 0.196 | 1.58 | < 0.0980 | 40.9 | 7/24/2012 | NONE |
| P2_835_R_SED | 40114 | 5.13 | < 0.0975 | < 0.0975 | < 0.0975 | < 0.0975 | < 0.0975 | < 0.0975 | < 0.0975 | < 0.0975 | < 0.0975 | < 0.195 | < 0.195 | < 0.195 | < 0.0975 | 33.2 | 7/24/2012 | NONE |
| P2_836_L_SED | 40114 | 5.01 | < 0.0998 | < 0.0998 | < 0.0998 | < 0.0998 | < 0.0998 | < 0.0998 | < 0.0998 | < 0.0998 | < 0.0998 | < 0.200 | < 0.200 | 0.292 | < 0.0998 | 53.0 | 7/24/2012 | NONE |
| P2_836_R_SED | 40114 | 5.16 | < 0.0970 | < 0.0970 | < 0.0970 | < 0.0970 | < 0.0970 | < 0.0970 | < 0.0970 | < 0.0970 | < 0.0970 | < 0.194 | < 0.194 | 0.49 | < 0.0970 | 55.1 | 7/24/2012 | NONE |
| P2_525_SED | 40114 | 5.02 | < 0.0995 | < 0.0995 | < 0.0995 | < 0.0995 | < 0.0995 | < 0.0995 | 0.101 | < 0.0995 | < 0.0995 | < 0.199 | < 0.199 | 0.525 | < 0.0995 | 61.9 | 7/24/2012 | NONE |
| P2_829.5_SED | 40114 | 4.96 | < 0.101 | < 0.101 | < 0.101 | < 0.101 | < 0.101 | < 0.101 | < 0.101 | < 0.101 | < 0.101 | < 0.202 | < 0.202 | < 0.202 | < 0.101 | 33.5 | 7/24/2012 | NONE |
| P2_831_SED | 40114 | 5.23 | < 0.0956 | < 0.0956 | < 0.0956 | < 0.0956 | < 0.0956 | < 0.0956 | < 0.0956 | < 0.0956 | < 0.0956 | < 0.191 | < 0.191 | 0.195 | < 0.0956 | 45.1 | 7/24/2012 | NONE |
| P2_832.5_R_SED | 40114 | 5.02 | < 0.0996 | < 0.0996 | < 0.0996 | < 0.0996 | < 0.0996 | < 0.0996 | < 0.0996 | < 0.0996 | < 0.0996 | < 0.199 | < 0.199 | 0.594 | < 0.0996 | 38.3 | 7/24/2012 | NONE |
| P2_838_SED | 40114 | 5.32 | < 0.0941 | < 0.0941 | < 0.0941 | < 0.0941 | < 0.0941 | < 0.0941 | < 0.0941 | < 0.0941 | < 0.0941 | < 0.188 | < 0.188 | < 0.188 | < 0.0941 | 36.7 | 7/24/2012 | NONE |
| P2_832_SED | 40114 | 5.16 | < 0.0969 | < 0.0969 | < 0.0969 | < 0.0969 | < 0.0969 | < 0.0969 | < 0.0969 | < 0.0969 | < 0.0969 | < 0.194 | < 0.194 | 0.299 | < 0.0969 | 28.6 | 7/24/2012 | NONE |
| P2_841_SED | 40114 | 5.26 | < 0.0950 | < 0.0950 | < 0.0950 | < 0.0950 | < 0.0950 | < 0.0950 | < 0.0950 | < 0.0950 | < 0.0950 | < 0.190 | < 0.190 | 0.252 | < 0.0950 | 45.6 | 7/24/2012 | NONE |
| P2_842_SED | 40114 | 5.03 | < 0.0995 | < 0.0995 | < 0.0995 | < 0.0995 | < 0.0995 | < 0.0995 | < 0.0995 | < 0.0995 | < 0.0995 | < 0.199 | < 0.199 | 0.222 | < 0.0995 | 42.9 | 7/24/2012 | NONE |
| P2_844_SED | 40114 | 5.21 | < 0.0959 | < 0.0959 | < 0.0959 | < 0.0959 | < 0.0959 | < 0.0959 | < 0.0959 | < 0.0959 | < 0.0959 | < 0.192 | < 0.192 | < 0.192 | < 0.0959 | 32.8 | 7/24/2012 | NONE |
| P2_846_SED | 40114 | 5.27 | < 0.0948 | < 0.0948 | < 0.0948 | < 0.0948 | < 0.0948 | < 0.0948 | < 0.0948 | < 0.0948 | < 0.0948 | < 0.190 | < 0.190 | < 0.190 | < 0.0948 | 20.8 | 7/24/2012 | NONE |
| P2_847_SED | 40114 | 5.05 | < 0.0990 | < 0.0990 | < 0.0990 | < 0.0990 | < 0.0990 | < 0.0990 | < 0.0990 | < 0.0990 | < 0.0990 | < 0.198 | < 0.198 | < 0.198 | < 0.0990 | 22.2 | 7/24/2012 | NONE |
| MC_1_SED | 40114 | 4.98 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | 0.198 | 0.124 | < 0.201 | < 0.201 | 0.905 | 0.28 | 44.6 | 7/24/2012 | NONE |
| MC_2_SED | 40114 | 5.25 | < 0.0952 | < 0.0952 | < 0.0952 | < 0.0952 | < 0.0952 | < 0.0952 | < 0.0952 | < 0.0952 | < 0.0952 | < 0.190 | < 0.190 | 0.672 | 0.344 | 32.2 | 7/24/2012 | NONE |
| A SED | 41757 | 5.16 | < 0.0969 | < 0.0969 | < 0.0969 | < 0.0969 | < 0.0969 | < 0.0969 | < 0.0969 | < 0.0969 | < 0.0969 | < 0.194 | < 0.194 | 0.299 | < 0.0969 | 36.0 | 11/19/2012 | NONE |
| S SED | 41757 | 5.15 | 0.148 | < 0.0971 | < 0.0971 | < 0.0971 | 0.142 | < 0.0971 | 0.108 | < 0.0971 | < 0.0971 | < 0.194 | < 0.194 | 0.943 | < 0.0971 | 56.9 | 11/19/2012 | NONE |
| T SED | 41757 | 5.03 | 0.176 | < 0.0994 | < 0.0994 | < 0.0994 | 0.147 | < 0.0994 | 0.101 | < 0.0994 | < 0.0994 | < 0.199 | < 0.199 | 1.10 | < 0.0994 | 54.4 | 11/19/2012 | NONE |
| F SED | 41757 | 5.09 | < 0.0983 | < 0.0983 | < 0.0983 | < 0.0983 | < 0.0983 | < 0.0983 | < 0.0983 | < 0.0983 | < 0.0983 | < 0.197 | < 0.197 | 0.282 | < 0.0983 | 28.6 | 11/19/2012 | NONE |
| B SED | 41757 | 5.14 | < 0.0973 | < 0.0973 | < 0.0973 | < 0.0973 | < 0.0973 | < 0.0973 | < 0.0973 | < 0.0973 | < 0.0973 | < 0.195 | < 0.195 | 0.566 | < 0.0973 | 47.4 | 11/19/2012 | NONE |
| C SED | 41757 | 4.98 | 0.124 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.201 | < 0.201 | 0.723 | < 0.100 | 50.8 | 11/19/2012 | NONE |
| D SED | 41757 | 4.99 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.200 | < 0.200 | 0.473 | < 0.100 | 42.7 | 11/19/2012 | NONE |
| E SED | 41757 | 5.00 | 0.118 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | 0.105 | < 0.100 | < 0.100 | < 0.200 | < 0.200 | 0.586 | < 0.100 | 52.6 | 11/19/2012 | NONE |
| O SED | 41757 | 5.01 | < 0.0999 | < 0.0999 | < 0.0999 | < 0.0999 | < 0.0999 | < 0.0999 | < 0.0999 | < 0.0999 | < 0.0999 | < 0.200 | < 0.200 | 0.537 | < 0.0999 | 30.4 | 11/19/2012 | NONE |
| P SED | 41757 | 5.15 | < 0.0971 | < 0.0971 | < 0.0971 | < 0.0971 | < 0.0971 | < 0.0971 | < 0.0971 | < 0.0971 | < 0.0971 | < 0.194 | < 0.194 | 0.435 | < 0.0971 | 26.3 | 11/19/2012 | NONE |
| Q SED | 41757 | 5.72 | 0.095 | < 0.0874 | < 0.0874 | < 0.0874 | < 0.0874 | < 0.0874 | < 0.0874 | < 0.0874 | < 0.0874 | < 0.175 | < 0.175 | 0.647 | < 0.0874 | 33.8 | 11/19/2012 | NONE |
| R SED | 41757 | 5.06 | 0.119 | < 0.0987 | < 0.0987 | < 0.0987 | 0.180 | < 0.0987 | 0.131 | < 0.0987 | < 0.0987 | < 0.197 | < 0.197 | 2.10 | < 0.0987 | 44.9 | 11/19/2012 | NONE |

| CLIENT ID | WORK GROUP | Sample (g-dry) | PFBA | PFPeA | PFHxA | PFHpA | PFOA | PFNA | PFDA | PFUnA | PFDoA | PFBS | PFHxS | PFOS | PFOSA | Moisture (%) | QA Review Date | Qualified Analytes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| G SED | 41758 | 5.34 | < 0.0937 | < 0.0937 | < 0.0937 | < 0.0937 | < 0.0937 | < 0.0937 | < 0.0937 | < 0.0937 | < 0.0937 | < 0.187 | < 0.187 | 0.601 | < 0.0937 | 40.6 | 12/3/2012 | NONE |
| G SED FD | 41758 | 5.09 | < 0.0983 | < 0.0983 | < 0.0983 | < 0.0983 | < 0.0983 | < 0.0983 | < 0.0983 | < 0.0983 | < 0.0983 | < 0.197 | < 0.197 | 0.86 | < 0.0983 | 45.9 | 12/3/2012 | NONE |
| H SED | 41758 | 5.10 | < 0.0981 | < 0.0981 | < 0.0981 | < 0.0981 | < 0.0981 | < 0.0981 | < 0.0981 | < 0.0981 | < 0.0981 | < 0.196 | < 0.196 | 0.504 | < 0.0981 | 42.8 | 12/3/2012 | NONE |
| I SED | 41758 | 5.14 | 0.102 | < 0.0972 | < 0.0972 | < 0.0972 | < 0.0972 | < 0.0972 | < 0.0972 | < 0.0972 | < 0.0972 | < 0.194 | < 0.194 | 0.825 | < 0.0972 | 36.3 | 12/3/2012 | NONE |
| J SED | 41758 | 5.33 | 2.720 | 0.506 | 0.263 | < 0.0938 | 0.097 | < 0.0938 | < 0.0938 | < 0.0938 | < 0.0938 | < 0.188 | < 0.188 | 0.335 | < 0.0938 | 29.6 | 12/3/2012 | PFHxA, PFOA |
| K SED | 41758 | 5.01 | 0.702 | < 0.0997 | < 0.0997 | < 0.0997 | 0.719 | < 0.0997 | 0.178 | < 0.0997 | < 0.0997 | < 0.199 | < 0.199 | 8.58 | 0.319 | 45.8 | 12/3/2012 | PFDA, PFOA |
| K SED FD | 41758 | 4.64 | 0.672 | < 0.108 | < 0.108 | < 0.108 | 0.594 | < 0.108 | 0.134 | < 0.108 | < 0.108 | < 0.216 | < 0.216 | 6.38 | 0.323 | 43.5 | 12/3/2012 | PFDA, PFOA |
| L SED | 41758 | 5.09 | < 0.0981 | < 0.0981 | < 0.0981 | < 0.0981 | < 0.0981 | < 0.0981 | < 0.0981 | < 0.0981 | < 0.0981 | < 0.196 | < 0.196 | < 0.196 | < 0.0981 | 25.2 | 12/3/2012 | NONE |
| M SED | 41758 | 4.98 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.201 | < 0.201 | 0.203 | < 0.100 | 25.9 | 12/3/2012 | NONE |
| M SED FD | 41758 | 5.14 | < 0.0973 | < 0.0973 | < 0.0973 | < 0.0973 | < 0.0973 | < 0.0973 | < 0.0973 | < 0.0973 | < 0.0973 | < 0.195 | < 0.195 | 0.366 | < 0.0973 | 28.6 | 12/3/2012 | NONE |
| N SED | 41758 | 5.18 | 0.252 | < 0.0965 | < 0.0965 | < 0.0965 | 0.099 | < 0.0965 | < 0.0965 | < 0.0965 | < 0.0965 | < 0.193 | < 0.193 | 1.02 | < 0.0965 | 30.6 | 12/3/2012 | PFOA |
| 517 SED1 | 38714 | 5.3 | 1.950 | 0.229 | 0.287 | 0.152 | 3.920 | 0.136 | 0.553 | 0.134 | 0.329 | 0.455 | 0.646 | 80.20 | 2.51 | 59.3 | 2/8/2012 | PFDoA |
| 517 SED2 | 38714 | 5.38 | 1.170 | 0.154 | 0.185 | 0.112 | 3.01 | 0.096 | 0.365 | < 0.0930 | 0.247 | 0.298 | 0.428 | 33.30 | 1.39 | 51.1 | 2/8/2012 | PFDoA |
| 517 SED3 | 38714 | 5.19 | 1.360 | 0.253 | 0.301 | 0.149 | 5.460 | 0.124 | 0.380 | < 0.0964 | 0.224 | 0.329 | 0.632 | 41.10 | 1.67 | 52.9 | 2/8/2012 | PFDoA |
| 518 SED | 38714 | 5.22 | < 0.0959 | < 0.0959 | < 0.0959 | < 0.0959 | < 0.0959 | < 0.0959 | < 0.0959 | < 0.0959 | < 0.0959 | < 0.192 | < 0.192 | 0.655 | < 0.0959 | 42 | 2/8/2012 | NONE |
| 519 SED | 38714 | 5.3 | < 0.0943 | < 0.0943 | < 0.0943 | < 0.0943 | < 0.0943 | < 0.0943 | < 0.0943 | < 0.0943 | < 0.0943 | < 0.189 | < 0.189 | < 0.189 | < 0.0943 | 23.7 | 2/8/2012 | NONE |
| 520 SED | 38714 | 5.52 | < 0.0906 | < 0.0906 | < 0.0906 | < 0.0906 | < 0.0906 | < 0.0906 | < 0.0906 | < 0.0906 | < 0.0906 | < 0.181 | < 0.181 | 0.309 | < 0.0906 | 31.1 | 2/8/2012 | NONE |
| 521 SED | 38714 | 5.4 | < 0.0926 | < 0.0926 | < 0.0926 | < 0.0926 | < 0.0926 | < 0.0926 | < 0.0926 | < 0.0926 | < 0.0926 | < 0.185 | < 0.185 | 0.280 | < 0.0926 | 32.3 | 2/8/2012 | NONE |
| 522 SED | 38714 | 5.44 | < 0.0920 | < 0.0920 | < 0.0920 | < 0.0920 | < 0.0920 | < 0.0920 | < 0.0920 | < 0.0920 | < 0.0920 | < 0.184 | < 0.184 | 0.288 | < 0.0920 | 32.1 | 2/8/2012 | NONE |
| 523 SED | 38714 | 5.06 | < 0.0988 | < 0.0988 | < 0.0988 | < 0.0988 | < 0.0988 | < 0.0988 | < 0.0988 | < 0.0988 | < 0.0988 | < 0.198 | < 0.198 | 0.290 | < 0.0988 | 36.7 | 2/8/2012 | NONE |
| 524 SED | 38714 | 5.56 | < 0.0900 | < 0.0900 | < 0.0900 | < 0.0900 | < 0.0900 | < 0.0900 | < 0.0900 | < 0.0900 | < 0.0900 | < 0.180 | < 0.180 | 0.257 | < 0.0900 | 25.9 | 2/8/2012 | NONE |
| 525 SED | 38714 | 5.48 | 0.103 | < 0.0912 | < 0.0912 | < 0.0912 | < 0.0912 | < 0.0912 | < 0.0912 | < 0.0912 | < 0.0912 | < 0.182 | < 0.182 | 0.326 | < 0.0912 | 39.2 | 2/8/2012 | NONE |
| 526 SED | 38714 | 5.63 | 0.127 | < 0.0888 | < 0.0888 | < 0.0888 | 0.092 | < 0.0888 | < 0.0888 | < 0.0888 | < 0.0888 | < 0.178 | < 0.178 | 0.713 | < 0.0888 | 33.8 | 2/8/2012 | NONE |
| 530 SED | 38714 | 5.38 | < 0.0930 | < 0.0930 | < 0.0930 | < 0.0930 | < 0.0930 | < 0.0930 | < 0.0930 | < 0.0930 | < 0.0930 | < 0.186 | < 0.186 | 0.882 | < 0.0930 | 36.3 | 2/8/2012 | NONE |
| 532 SED | 38714 | 5.45 | < 0.0918 | < 0.0918 | < 0.0918 | < 0.0918 | < 0.0918 | < 0.0918 | 0.190 | < 0.0918 | < 0.0918 | < 0.184 | < 0.184 | 2.070 | < 0.0918 | 45.6 | 2/8/2012 | NONE |
| 533 SED | 38714 | 5.33 | < 0.0938 | < 0.0938 | < 0.0938 | < 0.0938 | < 0.0938 | < 0.0938 | < 0.0938 | < 0.0938 | < 0.0938 | < 0.188 | < 0.188 | 0.303 | < 0.0938 | 40.7 | 2/8/2012 | NONE |

## Appendix B-2. PFCs for Benthic Macroinvertebrate samples from Pool 2

| CLIENT ID | WORK GROUP | Sample (g-wet) | PFBA | PFPeA | PFHxA | PFHpA | PFOA | PFNA | PFDA | PFUnA | PFDoA | PFBS | PFHxS | PFOS | PFOSA | QA Review Date | Qualified Analytes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J INV | 41820 | 0.26 | 2.54 | < 1.92 | < 1.92 | < 1.92 | < 1.92 | < 1.92 | < 1.92 | < 1.92 | < 1.92 | < 3.85 | < 3.85 | 31.6 | < 2.69 | 12/27/2012 | NONE |
| M INV | 41820 | 0.13 | < 3.85 | < 3.85 | < 3.85 | < 3.85 | < 3.85 | < 3.85 | < 3.85 | < 3.85 | < 3.85 | < 7.69 | < 7.69 | 35.4 | < 5.38 | 12/27/2012 | NONE |
| A INV | 41756 | 2.02 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | 0.65 | 1.53 | 0.522 | 1.26 | < 0.495 | < 0.990 | < 0.990 | 9.28 | < 0.594 | 12/27/2012 | PFNA, PFDA, PFUnA, PFDoA, PFOSA |
| B INV | 41756 | 1.00 | < 1.00 | < 1.00 | < 1.00 | < 1.00 | < 1.00 | < 1.00 | < 1.00 | < 1.00 | < 1.00 | < 2.00 | < 2.00 | 8.02 | < 1.20 | 12/27/2012 | NONE |
| C INV | 41756 | 2.01 | < 0.498 | < 0.498 | < 0.498 | < 0.536 | 0.976 | 2.05 | 0.726 | 1.61 | < 0.498 | < 0.995 | < 0.995 | 15.8 | < 0.597 | 12/27/2012 | PFDOA, PFOS, PFOSA, PFUnA |
| D INV | 41756 | 2.01 | < 0.498 | < 1.22 | < 0.797 | < 0.498 | < 0.498 | 1.07 | < 0.498 | < 0.498 | < 0.498 | < 0.995 | < 0.995 | 8.6 | < 0.597 | 12/27/2012 | PFBA, PFDA, PFUnA, PFDoA, PFBS, PFHxS, PFOS, PFOSA |
| E INV | 41756 | 1.41 | < 0.709 | < 0.709 | < 0.709 | < 0.709 | 0.944 | 1.37 | < 0.709 | 0.96 | < 0.709 | < 1.42 | < 1.42 | 11.9 | < 0.851 | 12/27/2012 | PFBA, PFDoA, PFOS, PFOSA, PFUnA |
| F INV | 41756 | 0.96 | < 1.04 | < 1.04 | < 1.04 | < 1.04 | < 1.04 | < 1.04 | < 1.04 | 1.1 | < 1.04 | < 2.08 | < 2.08 | 12.8 | < 1.25 | 12/27/2012 | PFDoA, PFUnA |
| G INV | 41756 | 1.30 | < 0.769 | < 0.769 | < 0.769 | < 0.769 | 1.03 | 2.45 | 1.07 | 1.61 | < 0.769 | < 1.54 | < 1.54 | 23.1 | < 0.923 | 12/27/2012 | PFNA, PFDoA, PFUnA |
| I INV | 41756 | 0.60 | < 1.67 | < 1.67 | < 1.67 | < 1.67 | < 1.67 | < 1.67 | < 1.67 | < 1.67 | < 1.67 | < 3.33 | < 3.33 | 18.8 | < 2.00 | 12/27/2012 | NONE |
| K INV | 41756 | 0.96 | 1.84 | < 1.04 | < 1.04 | < 1.04 | 6.1 | < 1.04 | 1.33 | < 1.04 | < 1.04 | < 2.08 | 3.47 | 194 | 4.18 | 12/27/2012 | PFBA, PFDoA, PFOS, PFOSA |
| N INV | 41756 | 1.85 | < 0.541 | < 0.541 | < 0.541 | < 0.541 | 1.21 | 0.976 | < 0.541 | < 0.541 | < 0.541 | < 1.08 | < 1.08 | 37.2 | < 0.649 | 12/27/2012 | PFNA |
| O INV | 41756 | 0.47 | < 2.13 | < 2.13 | < 2.13 | < 2.13 | < 2.13 | < 2.13 | < 2.13 | < 2.13 | < 2.13 | < 4.26 | < 4.26 | 23.7 | < 2.55 | 12/27/2012 | PFDoA |
| Q INV | 41756 | 2.03 | < 0.493 | 2.76 | < 0.493 | < 0.493 | 0.87 | 1.48 | 0.604 | 0.724 | < 0.493 | < 0.985 | < 0.985 | 14.2 | < 0.591 | 12/27/2012 | PFPeA, PFDoA, PFBS, PFHxS, PFOS, PFOSA, PFUnA |
| R INV | 41756 | 1.31 | < 0.763 | 1.03 | < 0.763 | < 0.763 | 1.75 | 1.93 | < 0.763 | 1.02 | < 0.763 | < 1.53 | < 1.53 | 32.2 | < 0.916 | 12/27/2012 | PFPea, PFBA, PFDoA, PFBS, PFHxS, PFOS, PFOSA, PFUnA |

| CLIENT ID | WORK GROUP | Sample (g-wet) | PFBA | PFPeA | PFHxA | PFHpA | PFOA | PFNA | PFDA | PFUnA | PFDoA | PFBS | PFHxS | PFOS | PFOSA | QA Review Date | Qualified Analytes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S INV | 41756 | 1.54 | < 0.649 | < 0.780 | < 0.729 | < 0.649 | 1.81 | 2.23 | < 0.649 | < 0.649 | < 0.649 | < 1.30 | < 1.30 | 17.5 | < 0.779 | 12/27/2012 | PFBA, PFPeA, PFHzA, PFHpA, PFNA, PFDA, PFUnA, PFDoA, PFBS, PFHxS, PFOS, PFOSA |
| T INV | 41756 | 1.73 | < 0.578 | < 1.01 | < 0.578 | 0.872 | 1.11 | 1.33 | < 0.578 | < 0.578 | < 0.578 | < 1.16 | < 1.16 | 12.5 | < 0.694 | 12/27/2012 | PFBA, PFPeA, PFHxA, PFHpA, PFNA, PFDA, PFUnA, PFDoA, PFBS, PFHxS, PFOS, PFOSA |
| P2_838_INV | 40110 | 0.46 | < 1.09 | < 1.09 | < 1.09 | < 1.09 | < 1.09 | < 1.09 | < 1.09 | < 1.09 | < 1.09 | < 2.17 | < 5.43 | 8.09 | < 1.52 | 7/30/2012 | PFDoA, PFOSA |
| P2_836_R_INV | 40110 | 0.38 | 2.8 | < 1.32 | < 1.32 | < 1.32 | 4.3 | 1.53 | < 1.32 | < 1.32 | < 1.32 | < 2.63 | < 6.58 | 23.8 | < 1.84 | 7/30/2012 | PFOS, PFNA, PFDoA |
| P2_525_INV | 40110 | 0.36 | < 1.39 | < 1.39 | < 1.39 | < 1.39 | < 1.39 | < 1.39 | < 1.39 | < 1.39 | < 1.39 | < 2.78 | < 6.94 | 9.89 | < 1.94 | 7/30/2012 | PFDoA, PFOSA |
| P2_831_INV | 40110 | 0.68 | < 0.735 | < 0.735 | < 0.735 | < 0.735 | < 0.735 | < 0.735 | < 0.735 | < 0.735 | < 0.735 | < 1.47 | < 3.68 | < 1.47 | < 1.03 | 7/30/2012 | PFDoA, PFOSA |
| P2_832.5_R_INV | 40110 | 0.46 | < 1.09 | < 1.09 | < 1.09 | < 1.09 | < 1.09 | < 1.09 | < 1.09 | < 1.09 | < 1.09 | < 2.17 | < 5.43 | 8.11 | < 1.52 | 7/30/2012 | PFDoA, PFOSA |
| P2_832_INV | 40110 | 0.53 | < 0.943 | < 0.943 | < 0.943 | < 0.943 | < 0.943 | < 0.943 | < 0.943 | < 0.943 | < 0.943 | < 1.89 | < 4.72 | 6.15 | < 1.32 | 7/30/2012 | PFDoA, PFOSA |
| P2_841_INV | 40110 | 0.30 | | < 1.67 | < 1.67 | < 1.67 | < 1.67 | < 1.67 | < 1.67 | < 1.67 | < 1.67 | < 3.33 | < 8.33 | < 3.33 | < 2.33 | 7/30/2012 | PFDoA, PFOSA |
| P2_842_INV | 40110 | 0.68 | < 0.735 | < 0.735 | < 0.735 | < 0.735 | < 0.735 | < 0.735 | < 0.735 | < 0.735 | < 0.735 | < 1.47 | < 3.68 | 3.69 | < 1.03 | 7/30/2012 | PFDoA, PFOSA |
| P2_844_INV | 40110 | 0.33 | < 1.52 | < 1.52 | < 1.52 | < 1.52 | < 1.52 | < 1.52 | < 1.52 | < 1.52 | < 1.52 | < 3.03 | < 7.58 | < 3.03 | < 2.12 | 7/30/2012 | PFDoA, PFOSA |
| MC_1_INV | 40110 | 0.69 | < 0.725 | < 0.725 | < 0.725 | < 0.725 | < 0.725 | < 0.725 | < 0.725 | < 0.725 | < 0.725 | < 1.45 | < 3.62 | 1.65 | 1.76 | 7/30/2012 | PFDoA |
| P2_833_R_INV | 40110 | 0.38 | < 1.32 | < 1.32 | < 1.32 | < 1.32 | < 1.32 | < 1.32 | < 1.32 | < 1.32 | < 1.32 | < 2.63 | < 6.58 | 6.83 | < 1.84 | 7/30/2012 | PFDoA, PFOSA |
| P2_835_L_INV | 40110 | 0.24 | < 2.08 | < 2.08 | < 2.08 | < 2.08 | < 2.08 | < 2.08 | < 2.08 | < 2.08 | < 2.08 | < 4.17 | < 10.4 | < 4.17 | < 2.92 | 7/30/2012 | PFDoA, PFOSA |
| P2_835_R_INV | 40110 | 0.75 | < 0.667 | < 0.667 | < 0.667 | < 0.667 | < 0.667 | < 1.33 | < 0.667 | < 0.667 | < 0.667 | < 1.33 | < 3.33 | 18.5 | 1.42 | 7/30/2012 | PFDoA |
| P2_836_L_INV | 40110 | 0.71 | < 0.704 | < 0.704 | < 0.704 | < 0.704 | 0.743 | < 0.704 | < 0.704 | < 0.704 | < 0.704 | < 1.41 | < 3.52 | 7.3 | < 0.986 | 7/30/2012 | PFOS, PFDoA, PFOSA |
| 517 INV | 38738 | 1.98 | 6.10 | D 0.847 | < 0.758 | < 0.758 | 13.6 | 0.366 | 1.83 | 1.45 | D 0.956 | < 0.505 | 6.28 | D 684 | D 18.3 | 2/24/2012 | PFNA |
| 526 INV | 38738 | 2.04 | < 0.245 | < 0.245 | < 0.245 | < 0.245 | < 0.245 | < 0.245 | < 0.245 | < 0.245 | < 0.245 | < 0.490 | < 0.490 | D 6.84 | < 0.343 | 2/24/2012 | NONE |
| 527 INV | 38738 | 0.68 | < 0.735 | < 0.735 | < 0.735 | < 0.735 | < 0.735 | < 0.735 | < 0.735 | < 0.735 | < 0.735 | < 1.47 | < 1.47 | D 24.9 | < 1.03 | 2/24/2012 | NONE |
| 530 INV | 38738 | 2.07 | < 0.242 | < 0.242 | < 0.242 | < 0.242 | < 0.242 | < 0.242 | < 0.242 | < 0.242 | < 0.242 | < 0.483 | < 0.483 | D 3.95 | 0.622 | 2/24/2012 | NONE |
| 532 INV | 38738 | 1.99 | < 0.251 | < 0.251 | 0.327 | < 0.251 | < 0.251 | < 0.251 | 0.435 | 0.503 | < 0.251 | < 0.503 | < 0.503 | D 11.1 | < 0.352 | 2/24/2012 | NONE |
| 533 INV | 38738 | 2.04 | < 0.245 | < 0.245 | 0.287 | < 0.245 | < 0.245 | < 0.245 | < 0.245 | < 0.245 | < 0.735 | < 0.490 | < 0.490 | D 4.56 | < 0.343 | 2/24/2012 | NONE |
| 518 INV | 38738 | 2.04 | < 0.245 | < 0.245 | < 0.245 | < 0.245 | < 0.245 | 1.07 | 0.775 | 0.533 | < 0.735 | < 0.490 | < 0.490 | D 20.0 | < 1.03 | 2/24/2012 | PFNA |
| 519 INV | 38738 | 2.00 | < 0.250 | < 0.250 | < 0.250 | < 0.250 | < 0.250 | < 0.250 | < 0.250 | < 0.250 | < 0.250 | < 1.50 | < 1.50 | D 3.85 | < 0.350 | 2/24/2012 | NONE |
| 520 INV | 38738 | 2.05 | < 0.244 | < 0.244 | < 0.244 | < 0.244 | < 0.244 | 0.646 | 0.279 | < 0.244 | < 0.244 | < 0.488 | < 0.488 | D 8.44 | < 0.341 | 2/24/2012 | PFNA |
| 521 INV | 38738 | 2.03 | < 0.332 | 0.258 | 0.562 | < 0.246 | 0.36 | 1.29 | 0.698 | 0.386 | < 0.739 | < 0.493 | < 0.493 | D 10.4 | < 0.345 | 2/24/2012 | NONE |
| 522 INV | 38738 | 1.01 | < 0.495 | < 0.495 | 0.678 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.495 | < 0.990 | < 0.990 | D 11.1 | < 0.693 | 2/24/2012 | NONE |
| 523 INV | 38738 | 1.98 | < 0.253 | 1.53 | < 0.253 | 0.272 | 0.529 | 1.41 | 0.713 | 0.697 | < 0.758 | < 0.505 | < 0.505 | D 13.7 | < 1.06 | 2/24/2012 | PFNA, PFPeA, PFHpA |

| CLIENT ID | WORK GROUP | Sample (g-wet) | PFBA | PFPeA | PFHxA | PFHpA | PFOA | PFNA | PFDA | PFUnA | PFDoA | PFBS | PFHxS | PFOS | PFOSA | QA Review Date | Qualified Analytes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 524 INV | 38738 | 2.01 | < 0.249 | < 0.249 | < 0.249 | < 0.249 | < 0.249 | < 0.249 | < 0.249 | < 0.249 | < 0.249 | < 0.498 | < 0.498 | < 1.49 | < 0.348 | 2/24/2012 | NONE |
| 525 INV | 38738 | 1.99 | < 0.251 | D 1.18 | < 0.754 | < 0.754 | 0.435 | 1.22 | 0.585 | 0.752 | < 0.754 | < 0.503 | < 0.503 | D 14.3 | < 0.352 | 2/24/2012 | PFNA, PFPeA |

**Appendix B-3. Combined sediment and invertebrate PFOS concentrations, sediment organic carbon, and georeferences**

| Site | LAT (DD) | LONG (DD) | Date Collected | Sediment Sample ID | Sediment PFOS (ng/g-dw) | Sediment Moisture (%) | Sediment PFOS (ng/g-ww) | Fraction Organic Carbon ($f_{oc}$) | Sediment PFOS (ng/g OC) | Invertebrate Sample ID | Invertebrate PFOS (ng/g-ww) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 44.76008 | -92.97092 | 10/10/12 15:00 | A SED | 0.299 | 36.0 | 0.191 | 0.97% | 30.7 | A INV | 9.28 |
| B | 44.75987 | -92.95783 | 10/10/12 14:40 | B SED | 0.566 | 47.4 | 0.298 | 2.34% | 24.2 | B INV | 8.02 |
| C | 44.76015 | -92.94590 | 10/10/12 14:45 | C SED | 0.723 | 50.8 | 0.356 | 1.91% | 38.0 | C INV | 15.8 |
| D | 44.75560 | -92.96452 | 10/10/12 15:25 | D SED | 0.473 | 42.7 | 0.271 | 1.63% | 29.0 | D INV | 8.6 |
| E | 44.75565 | -92.95207 | 10/10/12 15:45 | E SED | 0.586 | 52.6 | 0.278 | 1.80% | 32.6 | E INV | 11.9 |
| F | 44.77228 | -92.94797 | 10/16/12 10:40 | F SED | 0.282 | 28.6 | 0.201 | 0.48% | 59.2 | F INV | 12.8 |
| G | 44.77130 | -92.93517 | 10/16/12 11:20 | G SED | 0.601 | 40.6 | 0.357 | 0.95% | 63.0 | G INV | 23.1 |
| G-FD | 44.77130 | -92.93517 | 10/16/12 11:25 | G SED FD | 0.86 | 45.9 | 0.465 | 1.13% | 76.1 | | |
| H | 44.77388 | -92.92642 | 10/16/12 11:42 | H SED | 0.504 | 42.8 | 0.288 | 1.06% | 47.8 | | |
| I | 44.78248 | -92.91725 | 10/16/12 11:36 | I SED | 0.825 | 36.3 | 0.526 | 0.61% | 135.6 | I INV | 18.8 |
| J | 44.78188 | -92.90643 | 10/16/12 13:10 | J SED | 0.335 | 29.6 | 0.236 | 0.62% | 54.2 | J INV | 31.6 |
| K | 44.78153 | -92.89293 | 10/16/12 15:06 | K SED | 8.58 | 45.8 | 4.650 | 0.98% | 874.2 | K INV | 194 |
| K-FD | 44.78153 | -92.89293 | 10/16/12 15:10 | K SED FD | 6.38 | 43.5 | 3.605 | 0.70% | 916.7 | | |
| L | 44.77753 | -92.91138 | 10/16/12 13:25 | L SED | < 0.196 | 25.2 | | 0.51% | | | |
| M | 44.77775 | -92.90055 | 10/16/12 13:55 | M SED | 0.203 | 25.9 | 0.150 | 0.36% | 56.2 | M INV | 35.4 |
| M-FD | 44.77775 | -92.90055 | 10/16/12 13:58 | M SED FD | 0.366 | 28.6 | 0.261 | 0.66% | 55.8 | | |
| N | 44.77783 | -92.88902 | 10/16/12 14:16 | N SED | 1.02 | 30.6 | 0.708 | 0.63% | 161.8 | N INV | 37.2 |
| O | 44.76930 | -92.89307 | 10/10/12 13:11 | O SED | 0.537 | 30.4 | 0.374 | 0.73% | 73.9 | O INV | 23.7 |
| P | 44.77142 | -92.88312 | 10/10/12 13:47 | P SED | 0.435 | 26.3 | 0.321 | 0.55% | 78.7 | | |
| Q | 44.76315 | -92.88422 | 10/10/12 12:45 | Q SED | 0.647 | 33.8 | 0.428 | 0.83% | 77.7 | Q INV | 14.2 |
| R | 44.76607 | -92.87648 | 10/10/12 12:05 | R SED | 2.1 | 44.9 | 1.157 | 0.99% | 212.2 | R INV | 32.2 |
| S | 44.75747 | -92.87737 | 10/10/12 11:00 | S SED | 0.943 | 56.9 | 0.406 | 1.38% | 68.3 | S INV | 17.5 |
| T | 44.75977 | -92.87493 | 10/10/12 11:40 | T SED | 1.1 | 54.4 | 0.502 | 1.19% | 92.4 | T INV | 12.5 |
| P2_525 | 44.82145 | -93.00985 | 05/23/12 13:55 | P2_525_SED | 0.525 | 61.9 | 0.200 | 2.03% | 25.9 | P2_525_INV | 9.89 |
| P2_829.5 | 44.84305 | -93.01288 | 05/23/12 14:30 | P2_829.5_SED | < 0.202 | 33.5 | | 0.80% | | | |
| P2_831 | 44.86515 | -93.01217 | 05/23/12 13:05 | P2_831_SED | 0.195 | 45.1 | 0.107 | 0.95% | 20.5 | P2_831_INV | < 1.47 |
| P2_832.5 | 44.88443 | -93.01708 | 05/23/12 11:20 | P2_832.5_R_SED | 0.594 | 38.3 | 0.366 | 0.99% | 59.9 | P2_832.5_R_INV | 8.11 |
| P2_832 | 44.87737 | -93.01652 | 05/23/12 10:45 | P2_832_SED | 0.299 | 28.6 | 0.213 | 1.36% | 22.0 | P2_832_INV | 6.15 |

| Site | LAT (DD) | LONG (DD) | Date Collected | Sediment Sample ID | Sediment PFOS (ng/g-dw) | Sediment Moisture (%) | Sediment PFOS (ng/g-ww) | Fraction Organic Carbon ($f_{oc}$) | Sediment PFOS (ng/g OC) | Invertebrate Sample ID | Invertebrate PFOS (ng/g-ww) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MC_1 | 44.91560 | -93.04452 | 05/22/12 14:00 | MC_1_SED | 0.905 | 44.6 | 0.501 | 2.17% | 41.8 | MC_1_INV | 1.65 |
| MC_2 | 44.91560 | -93.04452 | 05/22/12 14:05 | MC_2_SED | 0.672 | 32.2 | 0.456 | 1.67% | 40.2 | | |
| MC_3 | 44.91560 | -93.04452 | 05/22/12 14:15 | MC_3_SED | 0.581 | 26.8 | 0.425 | 0.59% | 98.6 | | |
| P2_833_R | 44.88912 | -93.01937 | 05/22/12 15:05 | P2_833_R_SED | 0.681 | 57.2 | 0.291 | 1.92% | 35.5 | P2_833_R_INV | 6.83 |
| P2_835_L | 44.90982 | -93.04267 | 05/22/12 12:55 | P2_835_L_SED | 1.58 | 40.9 | 0.934 | 1.32% | 119.7 | P2_835_L_INV | < 4.17 |
| P2_835_R | 44.91002 | -93.04515 | 05/22/12 11:55 | P2_835_R_SED | < 0.195 | 33.2 | | 0.58% | | P2_835_R_INV | 18.5 |
| P2_836_L | 44.92053 | -93.05037 | 05/22/12 11:13 | P2_836_L_SED | 0.292 | 53 | 0.137 | 12.75% | 2.3 | P2_836_L_INV | 7.3 |
| P2_836_R | 44.92035 | -93.05315 | 05/22/12 10:30 | P2_836_R_SED | 0.49 | 55.1 | 0.220 | 1.61% | 30.4 | P2_836_R_INV | 23.8 |
| P2_837_R | 44.92900 | -93.05142 | 05/16/12 16:40 | P2_837_R_SED | < 0.200 | 25.4 | | 0.14% | | | |
| P2_838 | 44.93913 | -93.05597 | 05/16/12 16:00 | P2_838_SED | < 0.188 | 36.7 | | 1.33% | | P2_838_INV | 8.09 |
| P2_841 | 44.92575 | -93.11460 | 05/16/12 15:05 | P2_841_SED | 0.252 | 45.6 | 0.137 | 2.52% | 10.0 | P2_841_INV | < 3.33 |
| P2_842 | 44.91890 | -93.12847 | 05/16/12 14:20 | P2_842_SED | 0.222 | 42.9 | 0.127 | 1.54% | 14.4 | P2_842_INV | 3.69 |
| P2_844 | 44.89698 | -93.15080 | 05/16/12 13:10 | P2_844_SED | < 0.192 | 32.8 | | 0.79% | | P2_844_INV | < 3.03 |
| P2_846 | 44.89567 | -93.18923 | 05/16/12 11:48 | P2_846_SED | < 0.190 | 20.8 | | 0.05% | | | |
| P2_847 | 44.91193 | -93.20093 | 05/16/12 11:19 | P2_847_SED | < 0.198 | 22.2 | | 0.06% | | | |
| 517 SED1 | 44.78210 | -92.88855 | 11/23/11 15:00 | 517 SED1 | 80.20 | 59.3 | 32.641 | 2.84% | 2823.9 | 517 INV | 684 |
| 517 SED2 | 44.78210 | -92.88855 | 11/23/11 15:10 | 517 SED2 | 33.30 | 51.1 | 16.284 | 1.75% | 1902.9 | | |
| 517 SED3 | 44.78210 | -92.88855 | 11/23/11 15:18 | 517 SED3 | 41.10 | 52.9 | 19.358 | 1.62% | 2537.0 | | |
| 518 SED | 44.77012 | -92.94168 | 11/23/11 13:00 | 518 SED | 0.66 | 42.0 | 0.380 | 1.17% | 56.0 | 518 INV | 20 |
| 519 SED | 44.76645 | -92.95885 | 11/23/11 13:30 | 519 SED | 0.09 | 23.7 | 0.072 | 0.16% | 57.6 | 519 INV | 3.85 |
| 520 SED | 44.77222 | -92.96918 | 11/23/11 12:30 | 520 SED | 0.31 | 31.1 | 0.213 | 0.63% | 48.8 | 520 INV | 8.44 |
| 521 SED | 44.77407 | -93.01647 | 11/30/11 15:45 | 521 SED | 0.28 | 32.3 | 0.190 | 1.02% | 27.5 | 521 INV | 10.4 |
| 522 SED | 44.78468 | -93.01883 | 11/18/11 15:30 | 522 SED | 0.29 | 32.1 | 0.196 | 0.64% | 44.7 | 522 INV | 11.1 |
| 523 SED | 44.79105 | -93.02527 | 11/18/11 14:00 | 523 SED | 0.29 | 36.7 | 0.184 | 1.16% | 25.0 | 523 INV | 13.7 |
| 524 SED | 44.81015 | -93.00707 | 11/30/11 14:30 | 524 SED | 0.26 | 25.9 | 0.190 | 0.25% | 104.0 | 524 INV | < 1.49 |
| 525 SED | 44.82175 | -93.00955 | 11/30/11 13:10 | 525 SED | 0.33 | 39.2 | 0.198 | 1.17% | 27.9 | 525 INV | 14.3 |
| 526 SED | 44.83353 | -93.01233 | 11/30/11 12:00 | 526 SED | 0.71 | 33.8 | 0.472 | 0.95% | 74.7 | 526 INV | 6.84 |
| 530 SED | 44.89130 | -93.01835 | 11/28/11 12:30 | 530 SED | 0.88 | 36.3 | 0.562 | 0.89% | 98.7 | 530 INV | 3.95 |
| 532 SED | 44.90618 | -93.04245 | 11/28/11 14:00 | 532 SED | 2.07 | 45.6 | 1.126 | 1.52% | 136.2 | 532 INV | 11.1 |

| Site | LAT (DD) | LONG (DD) | Date Collected | Sediment Sample ID | Sediment PFOS (ng/g-dw) | Sediment Moisture (%) | Sediment PFOS (ng/g-ww) | Fraction Organic Carbon ($f_{oc}$) | Sediment PFOS (ng/g OC) | Invertebrate Sample ID | Invertebrate PFOS (ng/g-ww) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 533 SED | 44.92512 | -93.05007 | 11/28/11 15:30 | 533 SED | 0.30 | 40.7 | 0.180 | 1.33% | 22.8 | 533 INV | 4.56 |

## Appendix B-4. QA results for sediment and invertebrate work groups

| WORK GROUP | CLIENT ID | AXYS ID | Sample (g) | UNITS | PFBA | PFPeA | PFHxA | PFHpA | PFOA | PFNA | PFDA | PFUnA | PFDoA | PFBS | PFHxS | PFOS | PFOSA | Mois ture (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 40114 | Lab Blank | WG40114-101 | 5.00 | ng/g | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.200 | < 0.200 | < 0.200 | < 0.100 | |
| 40114 | Spiked Matrix | WG40114-102 | | % Recov | 90 | 87.5 | 94.7 | 87.5 | 93.8 | 92.7 | 104 | 60.1 | 90.8 | 94 | 88.5 | 85.5 | 64.1 | |
| 40114 | P2_846_SED (MS) | WG40114-103 | 5.33 | ng/g (dry wt) | 42.3 | 46 | 43.4 | 45.6 | 41.9 | 40.3 | 44.2 | 33.6 | 38.2 | 86.2 | 87 | 82.5 | 43.1 | 20.7 |
| 40114 | P2_846_SED (MSD) | WG40114-104 | 5.25 | ng/g (dry wt) | 41.5 | 47.6 | 45.8 | 46.4 | 46.2 | 44.3 | 46.1 | 28.4 | 40 | 88.2 | 91.3 | 82 | 37.1 | 21.8 |
| 41757 | Lab Blank | WG41757-101 | 5.00 | ng/g | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.200 | < 0.200 | < 0.200 | < 0.100 | |
| 41757 | Spiked Matrix | WG41757-102 | | % Recov | 125 | 113 | 128 | 109 | 117 | 119 | 127 | 103 | 128 | 121 | 121 | 113 | 103 | |
| 41757 | F SED (MS) | WG41757-103 | 5.18 | ng/g | 55.5 | 58 | 60.2 | 60.8 | 58.3 | 55.5 | 57 | 51.5 | 52 | 112 | 117 | 125 | 60.6 | 28.7 |
| 41757 | F SED (MSD) | WG41757-104 | 5.25 | ng/g | 57.9 | 55.9 | 60 | 56.8 | 57.5 | 56.4 | 57.9 | 47 | 50.6 | 112 | 120 | 113 | 55.2 | 28.4 |
| 41758 | Lab Blank | WG41758-101 | 5.00 | ng/g | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.200 | < 0.200 | < 0.200 | < 0.100 | |
| 41758 | Spiked Matrix | WG41758-102 | | % Recov | 130 | 117 | 141 | 114 | 131 | 139 | 155 | 105 | 130 | 129 | 129 | 125 | 105 | |
| 41758 | M SED (MS) | WG41758-103 | 5.21 | % Recov | 123 | 127 | 124 | 129 | 122 | 123 | 126 | 106 | 113 | 116 | 119 | 128 | 132 | 25 |
| 41758 | M SED (MSD) | WG41758-104 | 5.15 | % Recov | 129 | 131 | 125 | 131 | 120 | 129 | 121 | 115 | 108 | 105 | 111 | 127 | 131 | 25.3 |
| 38714 | Lab Blank | WG38714-101 | 5.00 | ng/g | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.100 | < 0.200 | < 0.200 | < 0.200 | < 0.100 | |
| 38714 | Spiked Matrix | WG38714-102 | | % Recov | 87.3 | 84.7 | 89 | 94.2 | 83.8 | 70 | 106 | 75.8 | 94.7 | 90.6 | 87.9 | 91.7 | 64.5 | |
| 38714 | 530 SED (MS) | WG38714-103 | 5.36 | % Recov | 94.2 | 94.6 | 88.2 | 97.8 | 98.8 | 89.7 | 94.3 | 57.3 | 84.8 | 96.8 | 92.3 | 101 | 62.2 | 37 |
| 38714 | 530 SED (MSD) | WG38714-104 | 5.38 | % Recov | 95.3 | 102 | 94.1 | 106 | 101 | 93.9 | 93.3 | 53.7 | 85.9 | 87.8 | 85.5 | 96.4 | 57.2 | 36.4 |
| 41820 | Lab Blank | WG41820-101 | 0.500 | ng/g | < 1.00 | < 1.00 | < 1.00 | < 1.00 | < 1.00 | < 1.00 | < 1.00 | < 1.00 | < 1.00 | < 2.00 | < 2.00 | < 2.00 | < 1.40 | |
| 41820 | Spiked Matrix | WG41820-102 | | % Recov | 106 | 107 | 115 | 107 | 105 | 105 | 120 | 109 | 120 | 118 | 113 | 106 | 104 | |
| 41756 | Lab Blank | WG41756- | 2.00 | ng/g | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 0.500 | < 1.00 | < 1.00 | < 1.00 | < 0.600 | |

| WORK GROUP | CLIENT ID | AXYS ID | Sample (g) | UNITS | PFBA | PFPeA | PFHxA | PFHpA | PFOA | PFNA | PFDA | PFUnA | PFDoA | PFBS | PFHxS | PFOS | PFOSA | Moisture (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 101 | | | | | | | | | | | | | | | | |
| 41756 | Spiked Matrix | WG41756-102 | | % Recov | 106 | 93.7 | 105 | 96 | 109 | 106 | 125 | 98.2 | 113 | 112 | 116 | 108 | 104 | |
| 41756 | E INV (MS) | WG41756-103 | 1.34 | % Recov | 113 | 466 | 116 | 228 | 106 | 109 | 130 | 435 | 115 | 50.6 | 108 | 94.5 | 116 | |
| 41756 | E INV (MSD) | WG41756-104 | 1.33 | % Recov | 113 | 489 | 111 | 228 | 108 | 106 | 124 | 429 | 115 | 50.6 | 121 | 95.8 | 118 | |
| 38738 | Lab Blank | WG38738-101 | 2.00 | ng/g | < 0.250 | < 0.250 | < 0.250 | < 0.250 | < 0.250 | < 0.250 | < 0.250 | < 0.250 | < 0.250 | < 0.500 | < 0.500 | < 0.500 | < 0.350 | |
| 38738 | Spiked Matrix | WG38738-102 | | % Recov | 94.7 | 99.8 | 108 | 103 | 105 | 94.6 | 123 | 110 | 107 | 107 | 105 | 105 | 97.9 | |
| 38738 | 524 INV (MS) | WG38738-103 | 2.00 | ng/g (wet wt) | 10.7 | 8.07 | 11.3 | 12.1 | 11.2 | 9.75 | 11.9 | 12.9 | 11.1 | 21.7 | 21.3 | D 20.1 | 9.54 | |
| 38738 | 524 INV (MS) | WG38738-103 | 2.00 | % Recov | 107 | 80.7 | 113 | 121 | 112 | 97.5 | 119 | 129 | 111 | 108 | 107 | 101 | 95.4 | |
| 38738 | 524 INV (MSD) | WG38738-104 | 2.04 | ng/g (wet wt) | 10.2 | 8.21 | 10.5 | 11.5 | 11 | 9.89 | 11.4 | 12.7 | 10.9 | 19.4 | 20.8 | D 22.8 | 9.84 | |
| 38738 | 524 INV (MSD) | WG38738-104 | 2.04 | % Recov | 104 | 83.8 | 107 | 117 | 112 | 101 | 116 | 129 | 111 | 99.1 | 106 | 116 | 100 | |
| 40110 | Lab Blank | WG40110-101 | 0.500 | ng/g | < 1.00 | < 1.00 | < 1.00 | < 1.00 | < 1.00 | < 1.00 | < 1.00 | < 1.00 | < 1.00 | < 2.00 | < 5.00 | < 2.00 | < 1.40 | |
| 40110 | Spiked Matrix | WG40110-102 | | % Recov | 101 | 79.5 | 103 | 97.7 | 109 | 105 | 104 | 104 | 100 | 112 | 106 | 95.1 | 102 | |
| 40110 | P2_525_INV (MS) | WG40110-103 | 0.370 | ng/g (wet wt) | 53 | D 94.8 | D 48.1 | D 54.2 | 55.7 | 53.6 | 54.3 | 75 | 54.7 | D 50.1 | 105 | 111 | 49.7 | |
| 40110 | P2_525_INV (MSD) | WG40110-104 | 0.390 | ng/g (wet wt) | 53.3 | D 98.0 | D 52.5 | D 57.6 | 53.3 | 57.9 | 56.8 | 88.4 | 53.7 | D 50.8 | 116 | 114 | 49.5 | |