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FY15 ENVIRONMENTAL CONTAMINANTS PROGRAM
OFF-REFUGE INVESTIGATIONS SUB-ACTIVITY

Reproductive effects of contaminants on artificially matured and fertilized American eels, *Anguilla rostrata*

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EXECUTIVE SUMMARY

This investigation furthers the current understanding of contaminant impacts to American eel by investigating the impacts of contaminants on the fertility of adult female and male eels and the survival of embryos and larvae within a laboratory setting. The objectives of the investigation where to 1) determine the extent of maternal transfer of contaminant load to the eggs from female eels, 2) determine the effects of contaminant load on fertility of females, 3) determine male reproductive parameters, and 4) determine effects of contaminant treatment on reproductive maturation and fertility of males.

This investigation has allowed for the first ever examination of the effects of contaminant loads on reproduction in sexually mature male and female American eel. Contaminant concentrations, reported in this study, in American eel tissues from the Paskamansett River and St. Lawrence River are within the range of concentrations associated with impacts that have been documented in other fish species. However, contaminant concentrations in American eels from this 2009-2011 study were lower than concentrations recently reported in the literature in American eels collected from the Lake Ontario and St. Lawrence River in 2008. Twenty-four organic and inorganic contaminants were significantly greater in the St. Lawrence River eel muscle tissue than in the Paskamansett River eel muscle tissue. In addition, maternal transfer of contaminants did occur and sixteen contaminants were determined to be proportionally transferred to the eggs. Contaminants in female American eel muscle tissue did affect time to ovulation in female American eels but did not affect the percentage of fertile embryos. Only 1 contaminant, PCB 199, in muscle tissue, was found to affect the percentage of developed embryos. Baseline reproductive parameters for male eels, including sperm density/count and sperm motility were established and will provide a basis for future comparisons of eels from other studies and from contaminated regions. In general, contaminant concentrations reported in male tissues were similar to or lower than contaminant concentrations reported in the female eel muscle and egg tissues from the Paskamansett River. Finally, male exposure to PCBs negatively affected the percentage of fertile eggs but did not negatively affect sperm density, the percentage of developed and dead embryos, or the percentage of hatched and 6 days post hatch embryos. These results indicate that if fertilization occurred, even with sperm from highly contaminated males, all subsequent developmental stages occurred normally. Therefore, fertilization, but not later development, was compromised due to the male's exposure to PCBs.

Until now, American eel reproduction has only been assumed, but never documented, to occur in the Sargasso Sea. Advances in the current knowledge of American eels, related to contaminants, could lead to more focused research that would investigate the impacts of new and emergent contaminants and complex mixtures of contaminants on the American eel lifecycle. Further investigations would help address the uncertainty that exists related to the impacts of contaminants at a population level in the American eel. The information obtained from this and future investigations could potentially result in a re-evaluation of the Endangered Species Act status review for the species.

Contents

EXECUTIVE SUMMARY 1

I. INTRODUCTION 3

IA. BACKGROUND 3

IB. EFFECTS OF ENVIRONMENTAL CONTAMINANTS ON EELS 3

IC. PROJECT OBJECTIVES 7

II. METHODS 7

IIA. DATA COLLECTION 7

IIB. CHEMICAL ANALYSIS OF EEL MUSCLE, EGG, AND GONAD TISSUE 10

IIC. DATA TREATMENT 11

IID. TOXIC EQUIVALENCY ANALYSIS 11

IIE. STATISTICAL ANALYSIS 12

III. RESULTS 13

Objective 1 – Determine the extent of maternal transfer of contaminant load to the eggs from female eels. 13

Objective 2 – Determine the effects of contaminant load on fertility of females. 21

Objective 3 – Determine male reproductive parameters. 24

Objective 4 – Determine effects of contaminant treatment on reproductive maturation and fertility of males. 26

IV. DISCUSSION 28

V. CONCLUSIONS 32

VI. LITERATURE CITED 34

APPENDIX A. American Eel Tissue Organic and Inorganic Results 38

APPENDIX B. Roe 2006. Working Draft of American Eel Contaminants Review 4-5-06. US Fish and Wildlife Service, New York Field Office, Cortland New York. 200

I. INTRODUCTION

IA. BACKGROUND

The American eel, *Anguilla rostrata*, is a species distributed over a multitude of aquatic habitats spanning more than 50 degrees of latitude. The species has been described as an ecological and behavioral generalist, inhabiting the broadest diversity of habitats of any fish species in the world (Helfman *et al*. 1987). The life cycle begins with spawning in the southern Sargasso Sea, primarily in an area of the western North Atlantic between 23 and 28°N and 60 and 75°W, north of the West Indies, and south of Bermuda (Kleckner and McCleave 1988). For several months, the leptocephali (larvae) drift westward and then northward via the Florida Current and Gulf Stream (Kleckner and McCleave 1985). There, larvae begin to metamorphose into the glass eel stage and begin to swim toward fresh water (Tesch 1977). Once reaching estuaries and fresh waters, the eels may spend from 2-40 years in the yellow phase (Harrell and Loyacano 1982, Jessop 1987, Oliveira 1999, and Oliveira and McCleave 2000), the primary feeding and growth phase. Upon approaching maturity, the eels undergo another metamorphosis, to the silver phase, and then migrate to the Sargasso Sea to spawn once, and it is presumed, then die (Kleckner and McCleave 1988).

In May 2004, the Atlantic States Marine Fisheries Commission (ASMFC) requested that the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration/Fisheries (NOAA/F) conduct a status review of the American eel over concern of extreme declines in the Saint Lawrence River and Lake Ontario (SLR/LO) species' range. Concern was noted regarding the dramatic decrease in recruitment of American eel on the St. Lawrence River Moses-Saunders Dam in Canada (USFWS 2007). In 1996, upon evaluation of the declining indices of abundance data, approximately a 99% decline since the 1970s in the upper SLR/LO, Canada designated the American eel as a Species of Special Concern under their version of the Endangered Species Act, known as Species At Risk Act (SARA). The extreme decline in eels migrating up to the upper SLR/LO, as tallied at the Moses-Saunders eel ladder, resulted in concern over the potential impact of the decline to the overall American eel population. American eels in the upper SLR/LO are almost exclusively female and it has been suggested that the reproductive contribution to the overall American eel population from the upper SLR/LO may be disproportionately large (USFWS 2007). Upon review, the USFWS agreed to conduct a rangewide status review of the American eel.

IB. EFFECTS OF ENVIRONMENTAL CONTAMINANTS ON EELS

In November 2004, the USFWS and NOAA/F received a petition requesting the listing of the American eel as an endangered species under the Endangered Species Act (16 U.S.C. 1531 et seq). During the contaminant literature review for the 12-Month Finding related to the Petition to list the American eel as threatened or endangered (USFWS 2007), it became evident that full characterization of the population threats by bioaccumulative contaminants was hindered by incomplete information. A summary of the current American eel literature (Roe 2006 in Appendix B) was compiled and the geographic locations with reported contaminant concentrations in the literature included Canada, Lake Ontario/St. Lawrence River, Connecticut,

Maine, New Jersey, New York, Pennsylvania, Georgia, and Mexico. During the review of contaminant data in the American eel literature, the following impacts were reviewed: 1) Existing contaminants on the American eel life cycle; 2) new and emergent contaminants; 3) persistent contaminants, such as genotoxic polycyclic aromatic hydrocarbons (PAHs); 4) non-persistent contaminants, such as pharmaceutical chemicals and pesticides; 5) complex mixtures of contaminants; 6) vitamin deficiency related to diet; and combined threats, such as disease, parasites, and contaminants on eel health. It was determined that current American eel contaminant concentration data (polychlorinated biphenyls (PCBs), PAHs, polychlorinated diphenyl dioxins/polychlorinated diphenyl furans (PCDDs/PCDFs), pesticides such as mirex and dichlorodiphenyltrichloroethane (DDT), and metals such as mercury) were limited to the yellow and silver eel stages from only a portion of its range, from eastern United States and Canadian waters.

Cumulative Impacts of Complex Mixtures of Contaminants

Fish and wildlife are not exposed to single contaminants in the aquatic environment; they are exposed to complex mixtures of environmental contaminants. Contaminants within the complex mixtures may interact and have additive (Dioxin-like contaminants; Safe 1990 and Van den Berg *et al*. 1998) or synergistic (PAHs; Wassenberg and DiGiulio 2004) effects. However, the cumulative impacts of complex mixtures of contaminants on the eel species are unknown.

The contaminant concentrations reported in American eel tissues are within the range of concentrations associated with impacts that have been documented in other fish species (Roe 2006). These environmental contaminants have been shown to have biochemical, immunological, genotoxic, growth, survival, and reproductive impacts on various fish species; therefore, have the potential to also impact the American eel. However, the available data on maximum PCB and pesticide concentrations in American eels from the upper SLR/LO are not consistent with the timing of the 1980s decline of American eels in the SLR/LO (Roe 2006, USFWS 2007). American eels survive with these contaminant loads at concentrations that would be toxic and lethal to other fish species. There is a potential that there may be contaminant impacts during critical periods of their life cycle such as metamorphosis, hatching, and larval development, all of which occur at sea and, therefore, until now, have been impossible to research under natural conditions.

Impacts of Complex Mixtures of Contaminants and Other Stressors Including Diseases, Parasites, Bacterial, and Viral Infections

As stated previously, contaminants can impact the immune system and therefore increase the organism's susceptibility to other stressors such as diseases, parasites, and bacterial and viral infections (Arkoosh *et al*. 1996 and 1998, Grassman *et al*. 1996, Couillard *et al*. 1997, Johnson *et al*. 1998, Van Lovern *et al*. 2000, and Zelikoff *et al*. 2000). Research on English sole (Pleuronectes vetulus) from Puget Sound indicated proliferation of splenic leukocytes was linked to PAH exposure within Puget Sound (Arkoosh et al. 1996). Smallmouth bass (*Micropterus dolomieui*) collected from a PCB contaminated site demonstrated significantly reduced phagocyte function and antioxidant activity compared to reference site fish (Zelikoff *et al*. 2000). Contaminants were linked to mass virus mortalities that occurred in seals from Northwestern Europe (Van Lovern *et al*. 2000).

Bacterial pathogens have been isolated in American eels and increased prevalence may potentially be related to stress and subsequent decreased immune resistance. Pathogens isolated from American eels cultured in South Carolina included *Aeromonas hydrophila*, *A. salmonicida*, and Vibrio and Pseudomonas spp (Davis and Hayasaka 1983). *A. hydrophila* was found to be responsible for lesions and mortality (Hayasaka and Sullivan 1981 and Davis and Hayasaka 1983). An increase in pathogen occurrence was confirmed during months when eels were culled, which has been noted to be an added stress to the eels (Davis and Hayasaka 1983). The cumulative stress of the complex mixtures of environmental contaminants and other stressors may potentially lead to increased disease and mortality.

American Eel Reproductive and Environmental Contaminant Research Needs

The catadromous life cycle of the American eel has presented challenges to understanding the reproduction of the species. The remoteness of the spawning region in the Sargasso Sea has severely limited the ability of researchers to explore the effects of the freshwater life history phase on reproduction. For example, it is not possible to determine the effect of contamination that accumulates during the yellow (growth phase) of the sub-adults on future reproductive success. Gamete maturity is not believed to occur until the eel reaches the spawning areas, and no individual has ever been collected in the reputed spawning areas; thus, key information regarding fertilization and early development is missing. Fecundity and other similar data collected from un-ripened gametes can be obtained but may not be representative of the actual problems that may influence recruitment (Hodson *et al.* 1994, Barbin and McCleave 1997). Definitive data are lacking on the impact of contaminants to eggs, embryos, and larvae. Two important developmental factors that may be influenced by contaminants and, therefore, directly affect recruitment are 1) fertilization success and 2) teratogenic effects on early development. During the 12-Month Finding review process, it was determined that additional time, research, and resources were necessary to evaluate the threat of contaminants at a population level (USFWS 2007). The ability to explore the role of contamination and other potential freshwater problems is dependent upon artificial fertilization in the laboratory.

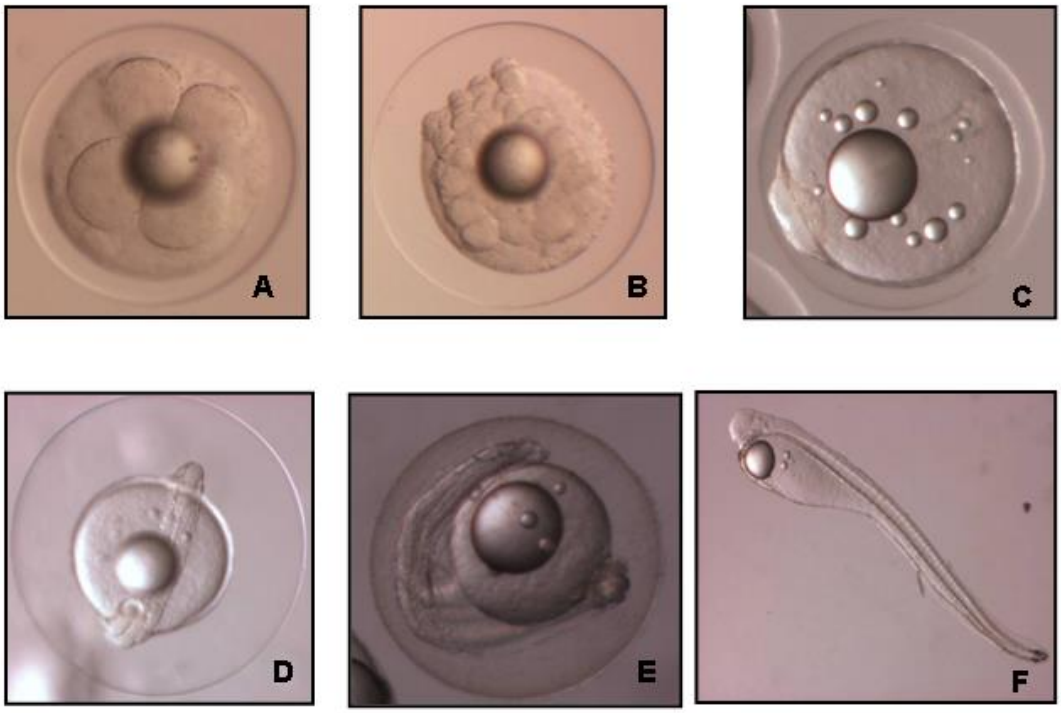
Numerous future research needs regarding the impacts of contaminants to the American eel were outlined by the Contaminant Panel Members at the American Eel Great Lakes/Canada scientific workshop held in Buffalo, New York, in February 2006. The goal of the scientific workshop was to ensure that the most credible and current scientific and commercial data were utilized during the status review (USFWS 2007). Among the research needs outlined, the Contaminant Panelists suggested more research was needed on the development of techniques for maturing North American eels in laboratories for studies of embryo-larval toxicity, analogous to experiments on salmonids. Various laboratory studies with salmon, trout, and whitefish have shown egg, fry, and larval toxicity and lethality due to contaminants such as PCBs, PCDD, and mercury ranging in concentration from <1 – 125 part per million (ppm) in fry and larval body burdens (Mauck *et al*. 1978, Roe 2006). In summary, the 12-Month Finding (USFWS 2007) stated, in relation to contaminants, "We support… the ongoing research being conducted by the scientific community."

Within the last 10 years, laboratory groups in Japan (Ohta *et al.* 1997, Tanaka *et al*. 2001), Europe (Palstra *et al.* 2005 & 2006), and New Zealand (Lokman and Young 2000) have had varying success with artificial fertilization and embryogenesis/development of *Anguilla*. Palstra

et al. (2006) attempted, with mixed results, to use *in vitro* fertilization to explore questions pertaining to adult contamination concentrations. Recently, the University of Massachusetts (UMass) team (Oliveira and Hable 2010) developed an artificial *in vivo* maturation protocol with subsequent *in vitro* fertilization for the American eel that has been demonstrated to produce ovulated eggs in 100% of the trials (sample size (n)=20) and to reliably produce hatching larvae (Figure 1).

The development of these maturation and fertilization procedures provides an unprecedented opportunity to explore the role of contaminants on the reproductive potential and recruitment of the American eel. In addition, the protocol for *in vivo* maturation of male eels has also been successfully achieved in the laboratory and methods for examining sperm parameters (spermatocrit, count, and motility) have been established (Oliveira and Hable 2010). The development of these methods provides an opportunity to examine the often overlooked male component in reproduction.

Figure 1. Time-series of developing American eel embryos resulting from artificial fertilization. A) 1 hr post-fertilization (PF); B) 8 hrs PF; C) Somite formation 20 hrs PF; D) Somite development 28 hrs PF; E) Pre hatching 40 hrs PF; F) hatched larvae 96 hrs PF, (42 hrs post hatching).



IC. Project Objectives

The investigation furthers the current understanding of contaminant impacts to American eel by investigating the impacts of contaminants on the fertility of adult female and male eels and the survival of embryos and larvae within a laboratory setting.

The specific original objectives of this project were to:

Objective #1 – Determine the extent of maternal transfer of contaminant load to the eggs from female eels.

Objective #2 – Determine the effects of contaminant load on fertility of females.

Objective #3 – Determine male reproductive parameters.

Objective #4 – Determine effects of contaminant treatment on reproductive maturation and fertility of males.

With respect to Objectives 1 and 2, the sampling location and the number of female eels matured and subsequently fertilized varied slightly from the 2008 proposal. The original proposal stated that migrating females bearing different contaminant loads, from known contaminated (Hudson River, NY, n=6) and lesser polluted (Sebasticook River, ME, n=6) sites, would be compared for time to full maturation, via *in vivo* hormonal induction, and subsequent ovulation, egg quality, and the quality and quantity of developing embryos. However, silver stage (reproductively mature) female eels could not be collected at the Hudson River and Sebasticook River locations. Instead, silver stage female eels were collected from the St. Lawrence River, Ontario, and the Paskamansett River, MA, with the St. Lawrence River representing the "known contaminated site" and the Paskamansett River representing the "lesser polluted site." In addition, after completion of three years of laboratory maturation studies, five muscle and egg tissue pairs from the Paskamansett River and eleven muscle and egg tissue pairs from the St. Lawrenece River were collected and underwent contaminant analyses.

II. METHODS

IIA. Data Collection

Female Maturation

To study varying degrees of contaminant loads across river systems, a total of 31 downstream migrating female eels were collected from two different locations in 2009, 2010, and 2011. Migrating silver phase female eels collected in the Paskamansett River and the St. Lawrence River were matured using methods previously described (Oliveira and Hable 2010). Maturation methods used during the study (Carey 2012) are briefly described below.

Upon collection, the females were transported to the University of Massachusetts Dartmouth's School for Marine Science and Technology's (SMAST) marine laboratory in New Bedford, MA

and held in flow-through seawater tanks at a temperature of 20°C. Each female was freeze-branded with a unique number or symbol using liquid nitrogen cooled brands. Following a two week acclimation period, females were anesthetized, weighed, and given 0.5 milliliter (mL) injections of salmon pituitary extract (SPE; 20 miligram (mg)/mL) once per week in order to induce maturation. The female's weight was used to calculate a weekly body mass index percentage (BMI = actual body mass/initial body mass x 100). When the BMI reached greater than 110%, eggs were biopsied from the ovary using a syringe fitted with a 16 gauge needle and examined under a light microscope. Oocytes were considered mature and ready for ovulation when their diameters were 800 micrometer (μm) or greater, the lipid droplets were condensed, and the germinal vesicle (GV) was either in the process of migrating towards the cortex or was located at the cortex. Upon oocyte maturation, injections of 17α, 20β-dihydroxy-4-pregnen-3-one (DHP: 2 microgram (μg)/gram (g) body mass) were administered to the female at 3-4 locations along each lateral ventral side to ensure the entire ovaries were fully exposed in order to induce ovulation (Oliveira and Hable 2010).

Egg and Muscle Collection

After anesthetizing the females, eggs were stripped by hand into plastic containers. At least 10 g of eggs were collected and placed into chemically cleaned glass jars. The day of or the day after ovulation, the females were euthanized and at least 10 g of skinless muscle was removed and placed into clean glass jars. The egg and muscle samples were stored in a -80°C freezer until they were shipped for contaminant analysis. Sagittal otoliths were removed from all ovulated females and aged according to Oliveira (1996).

Male Maturation and PCB Dosing

In October 2009, 2010, and 2011, male silver phase American eels were collected during their downstream migration from the Paskamansett River in Dartmouth, MA using fyke nets. The males were initially maintained in freshwater tanks and acclimated to 20ºC and a 12/12 light/dark (LD) cycle. Prior to beginning the maturation process, 30 males of similar size (50 - 70 g) were arbitrarily transferred to a seawater flow-through system at 20ºC and a natural LD cycle. Eels were held in these conditions for at least one week before the start of the experimental procedures. Prior to maturation, each fish was anesthetized using Eugenol (clove oil) and freeze-branded with a unique number or symbol indicating the treatment group using liquid nitrogen cooled brands. As maturing eels do not feed, all treatments were delivered by intraperitoneal injection. Experiments began with a two week priming period in which 6 males per treatment groups received weekly 0.1 ml injections of methanol (MeOH, solvent control), 1.0 or 10 µg PCBs (a mixture of Aroclors 1221, 1242 and 1254 (Sigma USA)) per fish. Higher concentrations were not possible due to the limited solubility of PCBs in the dosing solvent. Beginning in the third week, injections continued with the addition of human chorionic gonadotropin hormone (HCG; 50 International Unit (IU)/fish) to induce maturation. After approximately 5 weeks of dual injections, males were considered fully mature if when gently squeezed, sperm was released from their urogenital opening. Sperm used for fertilization was collected from eels between weeks 5-8. The male maturation process was repeated as needed to match the timing of female maturation.

Artificial Fertilization

Migrating silver phase female eels collected in the Paskamansett River and the St. Lawrence River were matured using methods previously described above and in Oliveira and Hable (2010) and Carey (2012). After being anesthetized, eggs were stripped from the female by hand into plastic containers. Females were only used once and were immediately euthanized after egg collection. On the day of ovulation, sperm was collected from two to three males from each treatment group (a maximum of 12 males) and the percent motile sperm was estimated using light microscopy. Due to high variability in motility in the sperm, across all treatment groups, sperm was only used for fertilizations when motility was assessed to be greater than 50% (Oliveira and Hable 2010). Sperm was diluted 1 to 1000 in a 0.90% saline solution and sperm cell counts (cells/ml) were determined using a hemocytometer and a light microscope at 200x magnification within 24 hrs of collection.

For in vitro fertilizations, 5 µL of sperm were activated with 10 ml of sterile filtered (0.2 µm) seawater that was treated with antibiotics (10,000 IU/ml penicillin and 10 mg/ml streptomycin) and bovine serum albumin (BSA, 1 mg/ml; Kagawa et al. 1995; Okamoto et al. 2009), and immediately mixed with 2-3 g of eggs. Two replicate fertilizations were performed for each male from which sperm was collected. After approximately one minute, fertilized eggs were transferred to 100 ml of filtered-sterilized seawater treated with the antibiotics and BSA, and cultured at 20°C as previously described (Oliveira and Hable 2010 and Carey 2012). Two to 4 hours post fertilization (PF), floating or neutrally buoyant fertilized eggs were gently transferred into Petri dishes filled with sterile filtered seawater treated with antibiotics and BSA.

Fertilization success and embryogenesis were assessed 2-4 hours PF, 24 hours PF, and 48 hours PF. To determine fertilization success, at 2-4 hours PF the number of embryos with one or more cell divisions was counted out of a sample of 50 or 100 total embryos. Since there are no immediate signs of fertilization in the embryos, the occurrence of cell division was used as a proxy for fertilization success. At 24 hours PF, the number of embryos that had formed somites[a] was counted from a sample of 50 or 100 embryos. A maximum of fifty embryos bearing somites from each treatment was then transferred to new Petri dishes containing sterile filtered seawater treated with antibiotics and BSA. The remaining embryos were discarded after determining that none continued to develop. To determine hatching success at 48 hours PF, the percentage of transferred embryos that had hatched was calculated. Larvae were held in Petri dishes for 6 days in which they received an approximate 50% water change on a daily basis. Feeding techniques have not been developed for American eel larvae and their yolk sack tends to noticeably shrink at 8 days post hatch (PH); in order to rule out mortality by starvation, the remaining larvae were terminated and percent survival was calculated.

Muscle and Gonad Collection

Muscle and gonad tissue samples were collected from a subset of male silver eels collected from the Paskamansett River in 2009 for baseline organochlorine contaminant analyses. Non-matured

[a] Somites are blocks of mesoderm that are located on either side of the neural tube in the developing vertebrate embryo. Somites are precursor populations of cells that give rise to important structures associated with the vertebrate body plan and will eventually differentiate into dermis, skeletal muscle, cartilage, tendons, and vertebrae. Somites also determine the migratory paths of neural crest cells and of the axons of spinal nerves.

male silver eels (n=3) were necropsied and 6-11 g of muscle tissue was collected, wrapped in foil, and stored at −80°C. Upon completion of the 2009 fertilization experiments, 4-5 g gonad tissue, from negative control matured silver male eels (n=2), was collected, wrapped in foil, and stored at −80°C.

IIB. Chemical Analysis of Eel Muscle, Egg, and Gonad Tissue

A summary of chemical analyses performed on various samples is presented in Table 1. Sixteen female eel muscle and egg tissue pairs (five muscle and egg tissue pairs from the Paskamansett River and eleven muscle and egg tissue pairs from the St. Lawrence River) were submitted for analysis of metals, PCBs, polybrominated diphenyl ethers (PBDEs), PCDDs, PCDFs, organochlorine (OC) pesticides, including total dichlorodiphenyltrichloroethane (Total DDT), chlordane, dieldrin, endrin, benzene hexachloride (BHC), mirex, and toxaphene. This suite of chemicals was selected due to previous detection in American eel tissues at concentrations noted to be within the range of concentrations associated with biochemical, immunological, genotoxic, growth, survival, and reproductive impacts that have been documented in other various fish species (Roe 2006).

Male eel muscle and gonad tissues were also submitted for contaminant analyses. Male eel gonad tissue samples (3 control males and 3 high PCB dose males) were submitted for PCB and OC pesticides analysis. Due to low sample size, control male gonad tissues from eel 2 and eel 3 were combined for contaminant analyses. An additional three non-mature male muscle tissue samples were submitted for PCBs and OC pesticides. Two of the three non-mature male muscle tissue samples were also submitted for metals, PBDEs, PCDDs, and PCDFs.

Table 1. American Eel Analytical Sample Summary

Analysis	Matrix	# Samples
Metals, PCBs, PBDEs, PCDDs, PCDFs, and OC pesticides	Female muscle and Eggs	16
PCBs and OC pesticides	Control male gonads	3*
PCBs and OC pesticides	High dose male gonads	3
PCBs and OC pesticides	Non-matured male muscle	3
Metals, PBDEs, PCDDs, and PCDFs	Non-matured male muscle	2

* Due to low sample size, control male gonad tissues from eel 2 and eel 3 were combined for contaminant analyses

Five female muscle and egg tissue pairs and all male muscle and gonad tissue samples were shipped overnight to the USFWS Analytical Control Facility contract lab Geochemical and

Environmental Research Group (GERG) in College Station, Texas on March 1, 2011 for organic contaminant analyses. Trace Element Research Laboratory, (TERL) also located in College Station, Texas conducted the metals analyses. Percent lipid and percent moisture were measured at the time of analysis. The remaining 11 female muscle and egg tissue pairs were shipped overnight to GERG on May 1, 2012 for organic contaminant analyses and TERL again conducted the metals analyses.

All GERG and TERL analyses followed methods approved by the Analytical Control Facility and can be found at: http://www.fws.gov/chemistry/downloads/analytical_methods.pdf

IIC. Data Treatment

All contaminant data were combined and prepared for statistical analyses. Contaminant concentrations that fall below detection limits are known to lie between zero and the limits of the detection equipment used by the laboratories. The most commonly used method in environmental chemistry to deal with values below detection limits is to substitute a fraction of the detection limit for each nondetect value, also known as censored data. Helsel (2006) contends that this substitution of values produces poor estimates of statistics, and commonly obscures patterns and trends in the data.

Two data treatment approaches were used to account for data with reported results below the analytical detection limit (DL), also known as nondetect (ND) data: 1) ½ the DL and 2) NADA package (Nondetects And Data Analysis for environmental data) in the statistical program, R. Due to the small size of the data set (with the largest sample size: 16 muscle and egg pairs), use of the NADA package in R was not appropriate as there was not enough detectable data to fit a distribution to the data that matches both the values for detected observations and the proportion of observations falling below each detection limit. Therefore, the statistical results were calculated using ½ DL approach for ND data at a p value of 0.05. For statistical comparisons, the authors did not consider results with all or a majority of ND values reliable, therefore, results with 9 or more of the 16 samples with NDs were not considered significant. Contaminant data are reported on a wet weight (ww) basis, unless otherwise specified.

IID. Toxic Equivalency Analysis

The tissue and egg contaminant analysis for the presence of dioxins, furans, and dioxin-like PCBs used toxic equivalency factors (TEFs) to calculate toxic equivalents (TEQs). The contaminants noted above are believed to cause similar effects in organisms through a cellular mechanism, the aryl hydrocarbon (Ah) receptor. Since they have similar modes of action in organisms, their individual toxicities can be compared. The most toxic compound of the dioxin like contaminants is 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) which has been assigned a TEF of 1. The other dioxins, furans, and dioxin like PCBs, are assigned a unique TEF which is related to their potency in comparison to TCDD. The TEFs and the concentration data for each contaminant are then used to calculate the total TEQ. Each contaminant concentration is multiplied by its corresponding TEF and then summed together to result in the total TEQ of the

sample being analyzed. Calculating TEQs allows for the determination of the overall toxicity of a mixture, as related to the similar mode of action, the Ah receptor mediated effects.

IIE. Statistical Analysis

Objective 1 – Determine the extent of maternal transfer of contaminant load to the eggs from female eels.

Two-sample t-tests were conducted on the muscle and egg data to determine if there was a statistical difference between the Paskamansett River and St. Lawrence River female eel tissues. The results were calculated using ½ DL approach for ND data at a p value of 0.05. Results were not considered significant if 9 or more of the 16 samples were ND. In addition, organic data are reported on a ww and lipid weight basis.

Muscle and Egg Organics Relationship
Three analyses were conducted to determine whether there was a relationship between organic contaminant egg concentration and organic contaminant muscle concentration with ½ DL used for ND data and a p value of 0.05. The first analysis determined if organic contaminant egg concentration was a linear function of organic contaminant muscle concentration. The second analysis determined if there was a difference between Paskamansett River and St. Lawrence River female eggs and muscle tissue organic contaminant concentrations. This analysis assumed that the slope that describes the relationship between eggs and muscle is the same, but the intercept is different. The third analysis determined if the relationship between egg and muscle organic contaminants was different between locations for both slope and intercept. This analysis did not assume parallel lines.

Objective 2 – Determine the effects of contaminant load on fertility of females.

For all organic and metal contaminants analyzed, a logistic regression approach was used to determine whether contaminants affected time to ovulation, egg quality (percent fertile), and quality and quantity of developing embryos (percent developed). Muscle and egg analyses were conducted separately and location was not considered. The results were calculated using ½ DL approach for ND data and a p value of 0.05. Results were not considered significant if 9 or more of the 16 samples were ND.

Objective 3 – Determine male reproductive parameters.

Baseline sperm density/count, spermatocrit, motility, and duration of motility were determined for males collected from the Paskamansett River and matured with weekly injections of HGC (50 international units per fish). Spermatocrit and duration of motility were not considered reliable and dropped in the final year of experiments. An analysis of variance (ANOVA), with a square root transformation of the data (to equalize the variance), was conducted to determine if there was an effect of treatment on sperm density. A chi-square analaysis was conducted to determine if motility was independent of treatment. The results were calculated using a p value of 0.05.

Objective 4 – Determine effects of contaminant treatment on reproductive maturation and fertility of males.

A linear regression mixed model was used to determine if there was a difference in sperm density based on male treatment. Since each male was identified in this data set, a mixed model was used that allowed observations from the same male to be correlated with each other. This can also be accomplished with a two-factor ANOVA, but care must be taken since the data were unbalanced, that is there were not the same numbers of observations for each male. Accounting for the unbalanced design was easier with the mixed model approach. The results were calculated using ½ DL approach for ND data and a p value of 0.05.

To determine the effect of male treatment on the percent of fertile eggs, a logistic regression was used. The percentage of fertile eggs was reported and the number of eggs used to calculate the percentage of fertile eggs was used to weight the observations. Since multiple observations from each female were used, a mixed model was used to model the correlation between the observations of the same female. Additionally, different males were used to fertilize each female, with some females being fertilized by more than one male. The mixed model approach also allowed for the observations from the same male to be correlated. A similar mixed model analysis was conducted to determine the effect of male treatment on percentage of embryos that developed somites after 24 hours, percentage of hatched eggs, and percentage of hatched eggs that survived to day 6. The results are calculated using ½ DL approach for ND data and a p value of 0.05.

III. RESULTS

Appendix A contains the raw data for the American eel tissue organic and inorganic results.

Objective 1 – Determine the extent of maternal transfer of contaminant load to the eggs from female eels.

For the Total TEQ calculation, the following PCBs were the only contaminants with concentrations consistently above the DL: PCBs 105, 119, 123, 156, 167, and 189. A Total BDE was not calculated as only two congeners, 47 and 100, had enough results above the DL for analysis. The mean and median muscle tissue Total PCB, Total TEQ, and Total DDT concentrations, in parts per billion (ppb) ww, along with the range are presented in Table 2.

Table 2. Paskamansett River, MA and St. Lawrence River, Canada, American Eel Female Muscle Tissue Total PCB, TEQ, and DDT concentrations in ppb ww, Mean (Median) Range.

Organic Contaminant	Paskamansett River, MA	St. Lawrence River, Canada
Total PCBs	247 (174) 119-532	386 (292) 82-1460
Total TEQ	4.8 (2.7) 0.28-11	13 (11) 0.28-44
Total DDT	35 (21) 2-92	46 (32) 9.4-170

Muscle Organics Two-Sample T-Tests (to determine if there was a statistical difference between the Paskamansett River and St. Lawrence River female eel muscle tissues):

Total PCBs were not significant for location (p=0.33, p=0.38 with lipid). Total TEQ was not significant for location (p=0.52, p=0.70 with lipid). Total DDT was not significant for location (p=0.61, p=0.86 with lipid).

Organic contaminants that were significant between Paskamansett River and St. Lawrence River female eel muscle tissues include the following: PCBs 26, 28, 48, 83, 97, 105, 107, 170/190, 171/202, 174, 177, 178, 191, 193, 195/208, and 205, BDEs 47, 100, and 154, o,p-DDD, heptachlor epoxide, and HCB. The mean and median muscle tissue concentrations, in ppb ww, along with the range are presented in Tables 3 and 4. As an interesting comparison, lipid normalized organic contaminants that were significant between Paskamansett River and St. Lawrence River female eel muscle tissues varied slightly from ww concentrations and included the following: PCBs 1, 26, 28, 31, 48, 83, 105, 170/190, 171/202, 174, 177, 191, 193, 195/208, 197, and 205, BDE 47 and 100, pentachloro-anisole, o,p-DDD, and HCB.

Table 3. Organic Contaminant Concentrations in American Eel Female Muscle Tissue with Statistically Significant Differences Between the Paskamansett River, MA, and the St. Lawrence River, Canada, ppb ww, Mean (Median) Range.

Organic Contaminant	Paskamansett River, MA	St. Lawrence River, Canada		Organic Contaminant	Paskamansett River, MA	St. Lawrence River, Canada
PCB 26	0.66 (0.048) ND-3.1	2.5 (2.6) ND-5.5		PCB 177	0.26 (0.048) ND-1.1	2.7 (2.8) ND-8.1
PCB 28	1.2 (0.048) ND-4.1	8.1 (8.3) 0.89-25		PCB 178	0.45 (0.053) ND-1.3	1.8 (1.6) ND-5.6
PCB 48	0.41 (0.048) ND-1.9	6.3 (5.9) ND-14		PCB 191	0.042 (0.047) ND-0.05	0.20 (0.19) ND-0.70
PCB 83	0.14 (0.047) ND-0.54	0.84 (0.86) ND-1.9		PCB 193	0.17 (0.048) ND-0.67	1.0 (1.1) ND-3.9
PCB 97	0.20 (0.048) ND-0.83	0.81 (1.0) ND-1.8		PCB 195/208	0.27 (0.048) ND-1.2	1.7 (1.6) ND-5.7
PCB 105	0.99 (1.2) ND-2.3	6.0 (4.4) ND-19		PCB 205	ND	0.45 (0.42) ND-1.7
PCB 107	0.042 (0.047) ND-0.05	2.8 (1.6) ND-12		BDE 47	4.3 (4.3) 3.4-5.8	30 (26) 2.6-71
PCB 170/190	0.84 (0.048) ND-4.0	5.7 (5.3) ND-19		BDE 100	1.3 (1.0) ND-2.2	7.1 (7.2) ND-17
PCB 171/202	0.22 (0.047) ND-0.92	2.9 (1.5) ND-8.1		BDE 154	1.1 (1.3) ND-1.3	2.3 (2.1) ND-4.3
PCB 174	0.26 (0.048) ND-1.1	1.6 (1.4) ND-4.8				

Table 4. Paskamansett River, MA and St. Lawrence River, Canada, American Eel Female Muscle Tissue Organochlorine Pesticide Concentrations in ppb ww, Mean (Median) Range[1].

Organochlorine Pesticide	Paskamansett River, MA	St. Lawrence River, Canada	Organochlorine Pesticide	Paskamansett River, MA	St. Lawrence River, Canada
Aldrin	0.27 (0.24) ND-0.39	0.28 (0.23) ND-0.55	**Heptachlor epoxide**	**0.21 (0.24) ND-0.26**	**1.0 (1.1) ND-3.3**
Alpha BHC	0.34 (0.24) ND-0.87	0.14 (0.13) ND-0.38	Mirex	0.21 (0.24) ND-0.26	2.6 (1.0) ND-14
Alpha Chlordane	1.8 (0.26) ND-4.3	1.3 (1.2) ND-2.6	**o,p'-DDD**	**0.21 (0.24) ND-0.26**	**0.74 (0.71) ND-1.5**
Beta BHC	19 (0.26) ND-85	0.44 (0.11) ND-3.8	o,p'-DDE	0.21 (0.24) ND-0.26	0.094 (0.070) ND-0.23
Cis-nonachlor	0.66 (0.24) ND-2.3	1.6 (1.4) ND-5.0	o,p'-DDT	5.9 (2.2) ND-22	1.5 (1.3) ND-4.1
Delta BHC	0.21 (0.24) ND-0.26	0.13 (0.063) ND-0.43	Oxychlordane	1.8 (0.24) ND-5.9	0.99 (0.35) ND-3.9
Dieldrin	0.76 (0.26) ND-1.9	2.2 (0.23) ND-9.0	p,p'-DDD	2.9 (0.26) ND-7.1	5.4 (4.3) ND-14
Endosulfan II	0.21 (0.24) ND-0.26	0.12 (0.12) ND-0.25	p,p'-DDE	25 (15) 10-69	36 (22) 6.9-147
Endrin	0.21 (0.24) ND-0.26	0.19 (0.19) ND-0.38	p,p'-DDT	0.85 (0.26) ND-2.1	2.9 (1.2) ND-18
Gamma BHC	17 (0.24) ND-83	0.30 (0.13) ND-1.4	Pentachloro-anisole	20 (23) 7.4-34	7.01 (6.7) 4.9-10
Gamma Chlordane	0.87 (0.64) ND-2.5	0.27 (0.13) ND-0.82	Toxaphene	ND	ND
HCB	**0.58 (0.74) ND-0.89**	**1.3 (1.3) ND-2.4**	Trans-nonachlor	5.6 (3.6) 2.8-9.9	3.4 (2.6) ND-10
Heptachlor	0.21 (0.24) ND-0.26	0.10 (0.12) ND-0.23			

[1] Muscle metal concentrations with significant statistical differences between the Paskamansett River and St. Lawrence River female eels are bolded.

Egg Organics Two-Sample T-Tests (to determine if there was a statistical difference between the Paskamansett River and St. Lawrence River female eel egg tissues):

Total PCBs were not significant for location (p=0.53, p=0.67 with lipid). Total TEQ was not significant for location (p=0.78, p=0.73 with lipid). Total DDT was not significant for location (p=0.96, p=0.47 with lipid).

For the Total TEQ calculation, the following PCBs were the only contaminants with concentrations consistently above the DL: PCBs 105, 119, 123, 156, 167, and 189. A Total BDE was not calculated as only two congeners, 47 and 100, had enough results above the DL for analysis. The mean and median egg tissue Total PCB, Total TEQ, and Total DDT concentrations, in ppb ww, along with the range are presented in Table 5.

Table 5. Paskamansett River, MA and St. Lawrence River, Canada, American Eel Female Egg Tissue Total PCB, TEQ, and DDT concentrations in ppb ww, Mean (Median) Range.

Organic Contaminant	Paskamansett River, MA	St. Lawrence River, Canada
Total PCBs	130 (150) 76-156	168 (112) 52-731
Total TEQ	6.0 (5.8) 2.4-11	6.8 (3.8) 0.32-33
Total DDT	20 (22) 9-30	19 (7.1) 1.4-91

Organic contaminants that were significant between Paskamansett River and St. Lawrence River female eel eggs include the following: PCB 33/20 and 67. The mean and median egg tissue concentrations, in ppb ww, along with the ranges are presented in Tables 6 and 7. No lipid normalized organic contaminants were significant between Paskamansett River and St. Lawrence River female eel eggs.

Table 6. Organic Contaminants in American Eel Female Egg Tissue with Statistically Significant Differences Between the Paskamansett River, MA, and the St. Lawrence River, Canada, ppb ww, Mean (Median) Range.

Organic Contaminant	Paskamansett River, MA	St. Lawrence River, Canada		Organic Contaminant	Paskamansett River, MA	St. Lawrence River, Canada
PCB 33/20	0.087 (0.050) ND-0.25	0.43 (0.31) ND-1.8		PCB 67	0.084 (0.050) ND-0.21	0.27 (0.14) ND-0.79

Table 7. Paskamansett River, MA and St. Lawrence River, Canada, American Eel Female Egg Tissue Organochlorine Pesticide Concentrations in ppb ww, Mean (Median) Range.

Organochlorine Pesticide	Paskamansett River, MA	St. Lawrence River, Canada	Organochlorine Pesticide	Paskamansett River, MA	St. Lawrence River, Canada
Aldrin	0.28 (0.25) ND-0.51	0.49 (0.46) ND-0.95	Heptachlor epoxide	0.28 (0.25) ND-0.57	0.53 (0.23) ND-3.3
Alpha BHC	0.37 (0.25) ND-0.99	0.77 (0.24) ND-5.1	Mirex	0.28 (0.25) ND-0.50	0.46 (0.25) ND-2.2
Alpha Chlordane	1.4 (0.25) ND-3.5	0.69 (0.23) ND-2.0	o,p'-DDD	0.36 (0.25) ND-0.89	0.41 (0.24) ND-1.5
Beta BHC	37 (0.25) ND-181	0.87 (0.23) ND-7.5	o,p'-DDE	0.22 (0.25) ND-0.25	2.5 (0.23) ND-26
Cis-nonachlor	0.55 (0.25) ND-1.1	0.86 (0.26) ND-5.3	o,p'-DDT	0.27 (0.25) ND-0.44	0.48 (0.39) ND-1.8
Delta BHC	0.22 (0.25) ND-0.25	0.24 (0.23) ND-0.53	Oxychlordane	0.92 (0.25) ND-2.4	0.57 (0.23) ND-3.2
Dieldrin	0.51 (0.25) ND-1.6	2.9 (1.8) ND-18	p,p'-DDD	4.3 (3.1) ND-8.4	2.5 (0.67) ND-17
Endosulfan II	0.22 (0.25) ND-0.25	3.1 (0.23) ND-32	p,p'-DDE	14 (13) 3.2-26	12 (4.9) ND-64
Endrin	0.22 (0.25) ND-0.25	0.28 (0.24) ND-0.50	p,p'-DDT	0.85 (0.25) ND-3.4	1.1 (0.23) ND-5.3
Gamma BHC	0.22 (0.25) ND-0.25	1.1 (0.25) ND-4.9	Pentachloro-anisole	9.1 (9.4) 5.3-14	6.9 (2.4) 1.6-49
Gamma Chlordane	0.36 (0.25) ND-0.90	0.29 (0.24) ND-0.51	Toxaphene	ND	ND
HCB	0.28 (0.25) ND-0.47	0.85 (0.54) ND-5.0	Trans-nonachlor	3.2 (3.8) 1.5-4.3	1.5 (0.84) ND-8.9
Heptachlor	0.22 (0.25) ND-0.25	0.28 (0.23) ND-0.93			

Muscle and Egg Organics Relationship

Three analyses were conducted to determine whether there was a relationship between organic contaminant egg concentration and organic contaminant muscle concentration. The first analysis determined if organic contaminant egg concentration is a linear function of organic muscle concentration. The second analysis determined if there was a difference between Paskamansett River and St. Lawrence River female eggs and muscle tissue organic contaminant concentrations. This analysis assumed that the slope that describes the relationship between eggs and muscle is the same, but the intercept is different. The third analysis determined if the relationship between egg and muscle organic contaminants is different between locations for both slope and intercept (this analysis did not assume parallel lines).

Total PCBs were not significant for any of the above relationship analyses ($p=0.64$, $p=0.74$, and $p=0.94$ respectively). Total TEQ was not significant for any of the relationship analyses

(p=0.43, p=0.74, and p=0.61 respectively). Total DDT was not significant for any of the relationship analyses (p=0.79, p=0.95, and p=0.94 respectively).

Organic contaminants that were significant for a linear function of egg concentrations and organic muscle concentration include the following: PCB16/32, 31, 128, and 175, BDE 99, and HCB. Organic contaminants that were significant for a difference between Paskamansett River and St. Lawrence River female eggs and muscle tissue organic contaminant concentrations include the following: PCBs 175 and 207. Organic contaminants that had a significantly different relationship between egg and muscle organic contaminants between locations for both slope and intercept included only PCB 25. The significant organic contaminants and p-values are presented in Table 8.

Table 8. Statistically Significant Relationships Between Female American Eel Organic Contaminant Egg Concentrations and Organic Contaminant Muscle Concentrations

Egg Concentration is a Linear Function of Muscle Concentration		The Relationship Between Egg Concentration and Muscle Concentration is Different Between Locations (same slope different intercept)		The Relationship Between Egg Concentration and Muscle Concentration is Different Between Locations (different slope and intercept)	
Contaminant	P-value	Contaminant	P-value	Contaminant	P-value
PCB 16/32	0.022	PCB 175	0.023	PCB 25	0.048
PCB 31	0.026	PCB 207	0.025		
PCB 128	0.0070				
PCB 175	0.033				
BDE 99	0.0050				
HCB	0.043				

Muscle Metals and Egg Metals Two-Sample T-Tests (to determine if there was a statistical difference between the Paskamansett River and St. Lawrence River female eel muscle and egg tissues):

The mean and median muscle and egg tissue metal concentrations, in parts per million (ppm) ww, along with the ranges are presented in Tables 9 and 10. Only two metal concentrations in female eel muscle were significant for location: As (p=0.010) and Zn (p=0.011). The significant mean and median muscle metal concentrations, in ppm ww, along with standard deviations are presented in bold in Table 9.

Only two metal concentrations in female eel eggs were significant for location: Mn (p=0.017) and Zn (p=0.0040). The significant mean and median egg metal concentrations, in ppm ww, along with standard deviations are presented in bold in Table 10.

Table 9. Paskamansett River, MA and St. Lawrence River, Canada, American Eel Female Muscle Tissue Metal Concentrations in ppm ww, Mean (Median) Range[1].

Inorganic Contaminant	Paskamansett River, MA	St. Lawrence River, Canada	Inorganic Contaminant	Paskamansett River, MA	St. Lawrence River, Canada
Ag	0.0035 (0.0029) ND-0.0066	0.0041 (0.0017) ND-0.017	Hg	0.76 (0.49) 0.22-1.5	0.76 (0.58) 0.39-2.3
Al	4.5 (3.0) 1.7-10	2.8 (2.3) 1.9-7.3	Li	0.076 (0.098) ND-0.12	0.042 (0.021) ND-0.17
As	**0.023 (0.023)** **ND-0.045**	**0.088 (0.065)** **ND-0.20**	Mg	182 (168) 151-225	190 (173) 120-363
B	0.18 (0.12) ND-0.31	0.36 (0.30) ND-1.2	Mn	0.78 (0.53) 0.55-1.7	0.51 (0.40) 0.22-1.4
Ba	0.10 (0.12) 0.070-0.13	0.071 (0.050) 0.025-0.21	Mo	ND-0.040	ND
Be	ND	ND	Ni	0.094 (0.087) 0.067-0.14	0.15 (0.074) 0.038-0.63
Cd	0.036 (0.032) 0.0057-0.090	ND-0.0086	Pb	0.18 (0.062) 0.037-0.70	0.015 (0.0083) ND-0.048
Co	0.011 (0.011) 0.0082-0.014	0.0087 (0.0073) ND-0.017	Sb	0.0018-0.0028	ND-0.0041
Cr	0.56 (0.24) 0.18-1.8	0.24 (0.17) 0.072-0.84	Se	0.43 (0.24) 0.16-1.3	0.32 (0.32) 0.15-0.49
Cu	0.50 (0.44) 0.30-0.82	0.41 (0.37) 0.29-0.79	Sr	1.4 (0.95) 0.80-2.4	1.0 (0.76) 0.39-3.4
Fe	11 (7.8) 4.3-25	8.6 (7.8) 4.4-13	**Zn**	**14 (14)** **13-16**	**19 (17)** **14-27**

[1] Muscle metal concentrations with significant statistical differences between the Paskamansett River and St. Lawrence River female eels are bolded.

Table 10. Paskamansett River, MA and St. Lawrence River, Canada, American Eel Female Egg Tissue Metal Concentrations in ppm ww, Mean (Median) Range[1].

Inorganic Contaminant	Paskamansett River, MA	St. Lawrence River, Canada	Inorganic Contaminant	Paskamansett River, MA	St. Lawrence River, Canada
Ag	0.015 (0.016) 0.012-0.020	0.0092 (0.0043) 0.0016-0.044	Hg	0.046 (0.021) 0.0069-0.11	0.046 (0.028) 0.015-0.23
Al	0.49 (0.39) 0.34-0.80	0.50 (0.54) 0.38-0.61	Li	0.040 (0.054) ND-0.064	0.022 (0.013) ND-0.079
As	0.0084 (0.011) ND-0.013	0.0071 (0.0038) ND-0.016	Mg	65 (51) 48-119	66 (53) 35-148
B	0.11 (0.062) ND-0.29	0.15 (0.075) ND-0.43	**Mn**	**0.40 (0.40)** **0.25-0.51**	**0.24 (0.20)** **0.14-0.46**
Ba	0.75 (0.022) 0.010-3.7	0.0092 (0.0036) 0.0030-0.035	Mo	ND	ND
Be	ND	ND	Ni	0.012 (0.0085) 0.0062-0.029	0.010 (0.010) 0.0033-0.021
Cd	0.0084 (0.032) 0.0031-0.014	ND	Pb	0.0079 (0.0043) ND-0.018	0.0042 (0.0033) ND-0.014
Co	0.012 (0.012) 0.0055-0.019	0.0061 (0.0052) 0.0033-0.016	Sb	ND	ND
Cr	0.020 (0.013) ND-0.042	0.020 (0.013) ND-0.063	Se	0.40 (0.24) 0.18-1.1	0.30 (0.33) 0.090-0.44
Cu	0.36 (0.34) 0.28-0.46	0.32 (0.33) 0.21-0.40	Sr	0.19 (0.18) ND-0.35	0.22 (0.15) 0.061-0.85
Fe	19 (2.0) 1.4-89	2.1 (2.0) 1.3-3.4	**Zn**	**16 (16)** **15-17**	**20 (19)** **14-26**

[1] Egg metal concentrations with significant statistical differences between the Paskamansett River and St. Lawrence River female eels are bolded.

Muscle and Egg Metals Relationship

Three analyses were conducted to determine whether there was a relationship between metal contaminant egg concentrations and metal contaminant muscle concentrations. Metal contaminants that were significant for a linear function of egg concentrations and muscle concentrations include the following: Ag, B, Cd, Hg, Li, Mg, Pb, Se, Sr, and Zn. Metal contaminants that were significant for a difference between Paskamansett River and St. Lawrence River female eggs and muscle tissue concentrations include the following: Ag, Cd, Co, and Mn. Metal contaminants that had a significantly different relationship between egg and muscle concentrations between locations for both slope and intercept include the following: Ag, Li, and Mn. The significant inorganic contaminants and p-values are presented in Table 11.

Table 11. Relationships Between Female American Eel Inorganic Contaminant Egg Concentrations and Inorganic Contaminant Muscle Concentrations					
Egg Concentration is a Linear Function of Muscle Concentration		The Relationship Between Egg Concentration and Muscle Concentration is Different Between Locations (same slope different intercept)		The Relationship Between Egg Concentration and Muscle Concentration is Different Between Locations (different slope and intercept)	
Contaminant	P-value	Contaminant	P-value	Contaminant	P-value
Ag	0.00048	Ag	0.039	Ag	0.0080
B	0.0019	Cd	0.043	Li	0.037
Cd	1.1E-06	Co	0.042	Mn	0.000032
Hg	7.7E-11	Mn	0.038		
Li	1.6E-12				
Mg	0.00090				
Pb	0.0018				
Se	3.6E-10				
Sr	0.0046				
Zn	0.015				

Objective 2 – Determine the effects of contaminant load on fertility of females.

For all organic and metal contaminants analyzed, a logistic regression approach was used to determine whether contaminants affected time to ovulation, egg quality (percent fertile), and quality and quantity of developing embryos (percent developed). Muscle and egg analyses were conducted separately and location was not considered. The results are calculated using ½ DL approach for ND data and a p value of 0.05. Results were not considered significant if 9 or more of the 16 samples were ND.

Time to Ovulation Organics
Total PCBs did not affect time to ovulation (p=0.12 for muscle, p=0.35 for egg). Total TEQ did not affect time to ovulation (p=0.076 for muscle, p=0.50 for egg). Total DDT did not affect time to ovulation (p=0.22 for muscle, p=0.61 for egg).

Organic contaminants in muscle that did significantly affect time to ovulation (with detectable concentrations of at least 8 of 16 samples) include: PCBs 1, 16/32, 26, 48, 83, 97, 105, 107, 153/132, 167, 170/190, 171/202, 172, 174, 177, 178, 180, 183, 187, 191, 193, 195/208, 196, 197, 205, and 209, BDE 100, gamma chlordane, mirex, HCB, cis-nonachlor, o,p-DDD, p,p-DDD, and pentachloro-anisole (Table 12). Organic contaminants in eggs that did significantly affect time to ovulation (with detectable concentrations of at least 8 of 16 samples) include: PCBs 16/32, 22/51, 25, 60/56, 129, 130, 175, and 207 (Table 12).

Table 12. Organic Contaminant Concentrations in American Eel Female Muscle and Egg Tissues that Significantly Affected Time to Ovulation, ppb ww, Mean (Median) ± Standard Deviation.

Muscle Concentrations, ppb ww						Egg Concentrations, ppb ww	
Organic Contaminant	Mean (Median) ± Standard Deviation		Organic Contaminant	Mean (Median) ± Standard Deviation		Organic Contaminant	Mean (Median) ± Standard Deviation
PCB 1	2.4 (0.060) ± 5.5		PCB 183	2.4 (1.6) ± 2.7		PCB 16/32	0.47 (0.46) ± 0.42
PCB 16/32	0.49 (0.40) ± 0.47		PCB 187	18 (8.1) ± 37		PCB 22/51	1.4 (1.5) ± 1.1
PCB 26	0.66 (0.050) ± 1.4		PCB 191	0.15 (0.060) ± 0.17		PCB 25	2.5 (1.0) ± 3.7
PCB 48	4.4 (3.9) ± 4.5		PCB 193	0.76 (0.18) ± 1.1		PCB 60/56	1.1 (0.20) ± 3.2
PCB 83	0.62 (0.30) ± 0.70		PCB 195/208	1.2 (0.60) ± 1.6		PCB 129	0.26 (0.080) ± 0.45
PCB 97	0.62 (0.44) ± 0.64		PCB 196	3.1 (1.8) ± 3.8		PCB 130	0.77 (0.12) ± 1.5
PCB 105	4.5 (2.3) ± 5.3		PCB 197	2.2 (0.050) ± 4.4		PCB 175	2.9 (3.8) ± 2.1
PCB 107	1.9 (0.29) ± 3.3		PCB 205	0.32 (0.090) ± 0.44		PCB 207	1.0 (1.3) ± 0.74
PCB 153/132	33 (14) ± 64		PCB 209	1.1 (0.49) ± 1.3			
PCB 167	0.71 (0.23) ± 1.0		BDE 100	5.2 (1.8) ± 5.4			
PCB 170/190	4.2 (2.2) ± 5.4		Gamma chlordane	0.46 (0.23) ± 0.61			
PCB 171/202	2.1 (0.71) ± 2.7		Mirex	1.8 (0.28) ± 3.5			
PCB 172	1.4 (1.2) ± 1.4		HCB	1.1 (1.1) ± 0.67			
PCB 174	1.2 (0.69) ± 1.4		Cis-nonachlor	1.3 (1.0) ± 1.3			
PCB 177	2.0 (1.1) ± 2.5		o,p-DDD	0.53 (0.24) ± 0.50			
PCB 178	1.4 (0.89) ± 1.6		p,p-DDD	4.6 (4.2) ± 4.3			
PCB 180	27 (13) ± 44		pentachloro-anisole	11 (7.6) ± 8.7			

Time to Ovulation Metals

Metal contaminants in muscle (with detectable concentrations of at least 8 of 16 samples) that did significantly affect time to ovulation include: Al, As, Li, Mn, and Pb. Metal contaminants in eggs (with detectable concentrations of at least 8 of 16 samples) that did significantly affect time

to ovulation include: Li, Mn, and Zn. The significant inorganic contaminant results are presented in Table 13.

Table 13. Metal Concentrations in American Eel Female Muscle and Egg Tissues that Significantly Affected Time to Ovulation, ppm ww, Mean (Median) ± Standard Deviation.

Muscle Concentrations, ppm ww			Egg Concentrations, ppm ww	
Metal	Mean (Median) ± Standard Deviation		Metal	Mean (Median) ± Standard Deviation
Al	3.4 (2.4) ± 2.3		Li	0.028 (0.014) ± 0.026
As	0.068 (0.037) ± 0.063		Mn	0.29 (0.26) ± 0.12
Li	0.053 (0.021) ± 0.54		Zn	19 (19) ± 3.4
Mn	0.67 (0.51) ± 0.47			
Pb	0.068 (0.017) ± 0.17			

Percent Fertile Organics
Total PCBs did not affect the percentage of fertile eggs (p=0.12 for muscle, p=0.31 for egg). Total TEQ did not affect the percentage of fertile eggs (p=0.28 for muscle, p=0.54 for egg). Total DDT did not affect the percentage of fertile eggs (p=0.21 for muscle, p=0.61 for egg). No other organic contaminant in muscle or egg, with at least 8 of 16 samples having detectable concentrations, significantly affected the percentage of fertile eggs.

Percent Fertile Metals
No metal contaminants in muscle or eggs significantly affected the percentage of fertile eggs, with detectable concentrations in at least 8 of 16 samples.

Percent Developed Organics
Total PCBs did not affect the percentage of developed embryos (p=0.28 for muscle, p=0.104 for egg). Total TEQ did not affect the percentage of developed embryos (p=0.38 for muscle, p=0.34 for egg). Total DDT did not affect the percentage of developed embryos (p=0.33 for muscle, p=0.59 for egg). For the remaining organic contaminants analyzed (with detectable concentrations of at least 8 of 16 samples), only two PCBs were found to be significant for the percentage of developed embryos: PCB 199 for muscle (with a Mean (Median) ± Standard Deviation of 5.4 ppb (3.8 ppb) ± 6.7 ppb) and PCB 52 for egg (with a Mean (Median) ± Standard Deviation of 7.1 ppb (5.3 ppb) ± 10 ppb).

Percent Developed Metals
No metal contaminants in muscle (with detectable concentrations of at least 8 of 16 samples) significantly affected the percentage of developed embryos. Two metals, in eggs (with detectable concentrations of at least 8 of 16 samples) significantly affected the percentage of developed embryos: Ba (with a Mean (Median) + Standard Deviation of 0.24 ppm (0.0074 ppm) ± 0.92 ppm) and Fe egg (with a Mean (Median) + Standard Deviation of 7.5 ppm (2.0 ppm) ± 22 ppm).

Objective 3 – Determine male reproductive parameters.

Baseline sperm density/count, spermatocrit, motility, and duration of motility were determined for males collected from the Paskamansett River and matured with weekly injections of HCG (50 international units per fish). Spermatocrit and duration of motility were not considered reliable and dropped in the final year of experiments. Sperm counts and motility estimates were made for a total of 56 males, 14 of which were control fish (received no contaminant treatment, Objective 4). An ANOVA, with a square root transformation of the data (to equalize the variance), was conducted to determine if there was an effect of treatment on sperm density/count. A chi-square analysis was conducted to determine if motility was independent of treatment. The results were calculated using a p value of 0.05.

Sperm density/count

Sperm density/count within all eel treatment groups (Objective 4) varied greatly and there was no evidence of significant differences between treatment groups (p=0.20, Table 14). The pooled mean sperm density/count was 1.33×10^{10} cells/ml ± 1.01×10^{10}SD.

Table 14. American Eel Sperm Cell Count of All Sperm Used in Artificial Maturation Experiments, cells/ml

Objective 4 American Eel Male Treatment Groups				
	Control	Methanol Control	1.0 µg PCBs/fish	10 µg PCBs/fish
	2.98E+08	2.26E+08	4.20E+08	3.48E+08
	1.56E+10	4.68E+08	1.36E+10	3.98E+08
	1.20E+10	1.40E+10	1.80E+10	6.65E+08
	1.18E+10	1.92E+10	1.88E+10	1.08E+10
	1.85E+10	1.40E+10	5.29E+09	1.45E+10
	6.08E+09	1.88E+10	8.98E+09	2.40E+10
	5.59E+09	7.79E+09	7.68E+09	1.34E+10
	6.85E+09	7.10E+09	7.82E+09	1.24E+10
	5.70E+09	1.18E+10	8.36E+09	1.00E+10
	7.66E+09	9.72E+09	1.20E+10	1.49E+10
	1.60E+10	7.48E+09	2.60E+10	9.48E+09
	3.73E+10	1.18E+10	6.08E+10	1.55E+10
	2.83E+10	2.30E+10	1.53E+10	2.70E+10
	2.00E+10	2.23E+10		1.75E+10
				1.25E+10
Mean	**1.37E+10**	**1.20E+10**	**1.56E+10**	**1.22E+10**
Standard Deviation	**9.98E+09**	**7.19E+09**	**1.51E+10**	**7.74E+09**

Sperm motility
High variability in motility was observed in the sperm across all treatment groups and there was no evidence that motility was dependent on the treatment group (p=0.13). Sperm was only used for fertilizations when motility was assessed to be greater than 50% (Oliveira and Hable 2010).

Muscle and Gonad Organics and Inorganics
Male American eel muscle and gonad tissue organic and inorganic contaminant concentrations are presented in Tables 15 and 16 (and in Appendix A). In general, contaminant concentrations reported in male tissues were similar to or lower than contaminant concentrations reported in the female eel muscle and egg tissues from the Paskamansett River. One notable exception to this general contaminant trend is pentachloro-anisole, where concentrations of pentachloro-anisole in male tissues greatly exceeded female tissue concentrations from both the Paskamansett and St. Lawrence Rivers.

Table 15. Paskamansett River, MA American Eel Male Muscle and Gonad Tissue Organic Contaminant Concentrations in ppb ww.

Organic Contaminant	Non-Mature Muscle n=3	Control Gonads n=2	High Dose PCB Gonads n=3	Organic Contaminant	Non-Mature Muscle n=3	Control Gonads n=2	High Dose PCB Gonads n=3
Aldrin	ND	ND	ND	Heptachlor epoxide	ND-2.5	ND	ND
Alpha BHC	ND-0.46	ND	ND	Mirex	ND-125	ND	ND
Alpha Chlordane	ND-8.0	ND	ND	o,p'-DDD	ND	ND	ND
Beta BHC	0.88, 12, 104	ND	ND, 9.3, 249	o,p'-DDE	ND	ND	ND
Cis-nonachlor	ND-5.6	ND	ND	o,p'-DDT	1.0, 3.7, 24	8.6, 38	ND-26
Delta BHC	ND-1.2	ND, 22	ND, 5, 71	Oxychlordane	ND-3.4	ND	ND
Dieldrin	2.4, 2.6, 5.0	ND	ND, 5, 32	p,p'-DDD	ND, 4.7, 21	ND	ND- 49
Endosulfan II	ND	ND	ND	p,p'-DDE	ND-77	34, 43	ND
Endrin	ND	ND	ND	p,p'-DDT	9.5, 16, 37	ND	ND
Gamma BHC	ND	ND	ND-292	Pentachloro-anisole	678, 762, 810	281, 457	49, 393, 2690
Gamma Chlordane	2.4, 3.5, 3.6	ND	ND	Toxaphene	ND	ND	ND
HCB	3.6, 4.8, 5.3	ND	ND-25	Trans-nonachlor	5.2, 6.3, 13	ND, 3.8	ND, 5.6, 27
Heptachlor	ND	ND	ND-39				
				Total PCBs	234, 371, 448	435, 1190	448, 991, 4160

Table 16. Paskamansett River, MA American Eel Non-Mature Male Muscle Tissue Metal Concentrations in ppm ww.

Inorganic Contaminant	Non-Mature Silver 4	Non-Mature Silver 5	Inorganic Contaminant	Non-Mature Silver 4	Non-Mature Silver 5
Ag	0.0047	0.0075	Hg	0.19	0.13
Al	1.5	1.4	Li	ND	ND
As	ND	0.078	Mg	213	234
B	ND	ND	Mn	0.67	1.7
Ba	0.10	0.11	Mo	ND	ND
Be	ND	ND	Ni	0.057	0.052
Cd	0.042	0.13	Pb	0.10	1.6
Co	0.012	0.0097	Sb	ND	ND
Cr	0.21	0.13	Se	0.52	0.77
Cu	0.32	0.38	Sr	0.77	0.70
Fe	6.1	9.7	Zn	18	21

Objective 4 – Determine effects of contaminant treatment on reproductive maturation and fertility of males.

A linear regression mixed model was used to determine if there was a difference in sperm density based on male treatment. Since each male was identified in this data set, a mixed model was used that allows observations from the same male to be correlated with each other. This can also be accomplished with a two-factor ANOVA, but care must be taken since the data are unbalanced, *i.e.* there are not the same numbers of observations for each male. Accounting for the unbalanced design is easier with the mixed model approach. The results were calculated using ½ DL approach for ND data and a p value of 0.05. There was no difference among the four treatments in terms of sperm density ($F=0.369$, $p=0.78$).

To determine the effect of male treatment on the percent of fertile eggs, a logistic regression mixed model was used. The percentage of fertile eggs was reported and the number of eggs used to calculate the percentage of fertile eggs was used to weight the observations. Since multiple observations from each female were used, a mixed model was used to model the correlation between the observations of the same female. Additionally, different males were used to fertilize each female, with some females being fertilized by more than one male. The mixed model approach also allowed for the observations from the same male to be correlated. The results are calculated using ½ DL approach for ND data and a p value of 0.05.

For percentage of fertile eggs, there was an effect of male treatment ($\chi^2=10.802$, $p=0.013$), at a p value of 0.05, with the High treatment statistically different from the Control and MeOH treatments. The average percentage of fertile eggs in each treatment is given below (Table 17) with those treatments not statistically different from each other grouped together by a letter.

Table 17. Effect of Male Treatment on Percentage of Fertile Eggs		
Objective 4 Treatment Groups	Percent Fertile	Grouping[1]
High	25.6%	A
Low	35.6%	A,B
Control	44.6%	B
MeOH	45.0%	B
[1]Treatments not statistically different from each other grouped together by letter		

A similar analysis was conducted to determine the effect of male treatment on percentage of embryos that developed somites after 24 hours (Table 18). The eggs from "EelS4m" did not survive 24 hours; therefore, all observations from this female were removed from the analysis. Using the mixed model approach, there were no significant differences between male treatments for the percentage of embryos that developed somites (χ^2=6.908, p=0.075), at a p value of 0.05. The estimated means are given below (Note: they will appear low, however, keep in mind that the means are weighted by the number of eggs examined, as noted above in the section on the determination of the effect of male treatment on the percent of fertile eggs).

Table 18. Effect of Male Treatment on Percentage of Somites		
Treatment	Percent Fertile	Grouping[1]
High	4.8%	A
Control	11.7%	A
Low	11.8%	A
MeOH	13.3%	A
[1]Treatments not statistically different from each other grouped together by letter		

An analysis to determine the effect of male treatment on the percent of dead eggs gives the same exact results as above in Table 18, with no significant differences between male treatments. The only difference is the percentages are one minus what is given in the above table.

An analysis to determine the effect of male treatment on the percentage of hatched eggs was conducted with the same mixed model. Again, observations from "EelS4m" were removed. A number of other observations were missing and those were not used in the analysis. There was

no statistical difference in the percentage of hatched eggs based on male treatment (χ^2=2.132, p=0.55) at a p value of 0.05 (Table 19).

Table 19. Effect of Male Treatment on Percentage of Hatched Eggs

Treatment	Percent Fertile	Grouping[1]
Control	82.1%	A
High	82.6%	A
Low	84.7%	A
MeOH	85.9%	A

[1]Treatments not statistically different from each other grouped together by letter

An analysis to determine the effect of male treatment on the percentage of hatched eggs that survived to day 6 was also conducted with the same mixed model. There is no statistical differences in the percentage of hatched eggs based on male treatment (χ^2=0.426, p=0.94), at a p value of 0.05 (Table 20).

Table 20. Effect of Male Treatment on Percentage of Hatched Eggs Surviving to Day 6

Treatment	Percent Fertile	Grouping[1]
Control	10.2%	A
MeOH	10.5%	A
Low	10.6%	A
High	12.0%	A

[1]Treatments not statistically different from each other grouped together by letter

IV. DISCUSSION

Before this investigation, there was no information on the extent of contaminant impacts during critical periods of the American eel life cycle including fertility, hatching, and larval development. As noted previously, contaminant concentrations reported in American eel tissues are within the range of concentrations associated with impacts that have been documented in other fish species (Roe 2006, Tables 1 and 2 in Appendix B of this report). These environmental

contaminants have been shown to have negative biochemical, immunological, genotoxic, growth, survival, and reproductive effects on various fish species; and therefore, have the potential to also negatively affect the American eel. For a review of contaminant concentrations in other fish species that have been shown to have negative effects, please see Roe 2006 in Appendix B, Contaminant Impacts, General Impacts of Contaminants on Fish and Table 2.

Objective 1 results indicated that 24 organic and inorganic contaminants were significantly greater in the St. Lawrence River eel muscle tissue than in the Paskamansett River eel muscle tissue (Tables 3 and 4, Organics: PCBs 26, 28, 48, 83, 97, 105, 107, 170/190, 171/202, 174, 177, 178, 191, 193, 195/208, and 205, BDEs 47, 100, and 154, o,p-DDD, heptachlor epoxide, and HCB; Table 9, Inorganics: As and Zn) and 4 organic and inorganic contaminants were significantly greater in the St. Lawrence River eel egg tissue than in the Paskamansett River eel egg tissue (Tables 6 and 7, Organics: PCB 33/20 and 67; Table 10, Inorganics: Mn and Zn). In addition, maternal transfer of contaminants did occur and 16 contaminants were determined to be proportionally transferred to the eggs (Tables 8 and 11, Organics: PCB16/32, 31, 128, and 175, BDE 99, and HCB; Inorganics: Ag, B, Cd, Hg, Li, Mg, Pb, Se, Sr, and Zn).

Objective 2 results indicated negative effects from contaminants to female American eel fertility. Thirty-nine organic and inorganic contaminants in female American eel muscle tissue did affect time to ovulation in female American eels (Tables 12 and 13, Organics: PCBs 1, 16/32, 26, 48, 83, 97, 105, 107, 153/132, 167, 170/190, 171/202, 172, 174, 177, 178, 180, 183, 187, 191, 193, 195/208, 196, 197, 205, and 209, BDE 100, gamma chlordane, mirex, HCB, cis-nonachlor, o,p-DDD, p,p-DDD, and pentachloro-anisole; Inorganics: Al, As, Li, Mn, and Pb). Contaminants were not found to affect the percentage of fertile embryos. However, PCB 199 muscle tissue concentrations did affect the percentage of developed embryos.

Objective 3 examined the male contribution to reproduction and established baseline reproductive parameters for male eels: sperm density/count and sperm motility. The male eels were collected from the Paskamansett River, a narrow homogeneous river (21 km in length) with a single impoundment at the head water. The Paskamansett River was selected to represent a non/low contaminated river due to a lack of a consumption advisory for the river, related to contaminants, and the fact that baseline contaminant loads in eels from this river were anticipated to unlikely vary greatly due to the reduced variation in habitat. Wild eels were used as farmed eels are currently not available for this species. These results will provide a basis for future comparisons of eels from contaminated regions.

As noted previously, contaminant concentrations reported in male tissues were similar to or lower than contaminant concentrations reported in the female eel muscle and egg tissues from the Paskamansett River with one notable exception. Concentrations of pentachloro-anisole in male tissues greatly exceeded female tissue concentrations from both the Paskamansett and St. Lawrence Rivers. Pentachloro-anisole is a chlorinated aromatic compound which is ubiquitous, at low concentrations, in the environment. Formation of pentachloro-anisole in the environment may result from the degradation of ubiquitous chlorinated aromatic compounds such as pentachlorophenol and pentachloronitrobenzene, known rodent toxicants. The Material Safety Data Sheet for pentachloro-anisole classifies it as very toxic to aquatic life (Sigma-Aldrich

2014). Criteria or thresholds, for the protection of wildlife from pentachloro-anisole, are currently not available.

Objective 4 results indicated that male exposure to PCBs negatively affected the percentage of fertile eggs but did not negatively affect sperm density, the percentage of developed and dead embryos, or the percentage of hatched and 6 days post hatch embryos. Exposing American eel males to 10 ug/g PCBs/fish during gametogenesis significantly reduced the number of fertile eggs, when compared to the two controls (negative and solvent, MeOH). These results indicate that if fertilization occurred, even with sperm from highly contaminated males, all subsequent developmental stages occurred normally. Therefore, fertilization, but not later development, was compromised due to the male's exposure to PCBs.

This investigation has allowed for the first ever examination of the effects of contaminant loads on reproduction in sexually mature male and female American eel. Until now, American eel reproduction has only been assumed, but never documented, to occur in the Sargasso Sea. Advances in the current knowledge of American eels, related to contaminants, could lead to more focused research that would investigate the impacts of new and emergent contaminants and complex mixtures of contaminants on the American eel lifecycle. Further investigations would help address the uncertainty that exists related to the impacts of contaminants at a population level in the American eel. The information obtained from this and future investigations could potentially result in a re-evaluation of the Endangered Species Act status review for the species.

Contaminants in Eels

Total PCB tissue concentrations were the most frequently reported contaminant in the American eel literature that was compiled for the 2007 species review (Roe 2006 see Table 1 in Appendix B of this report). American eel tissue Total PCB concentrations, in the literature (Roe 2006, Appendix B) ranged from 1 to 95,520 ppb ww (with a range of 1- 6,688 ppb ww in the Lake Ontario/St. Lawrence River region, LO/SLR) while muscle tissue concentrations of Total PCBs from this study (Table 2) ranged from 119-532 ppb ww for the Paskamansett River and 82-1,460 ppb ww for the St. Lawrence River.

Total TEQ, Total DDT, and pesticides including mirex, chlordane, dieldrin, and endrin were the next most frequently reported contaminants in tissues of the American eel (Roe 2006 see Table 1 in Appendix B of this report, Byer *et al*. 2013 and 2015). Mean concentrations of pesticides in American eels reported in this study were lower than concentrations reported in American eels collected in 2008 in Eastern LO (Byer *et al*. 2015), Table 21. In addition, the ranges of pesticide concentrations reported in this study were lower than ranges of concentrations reported in the literature between 1984 and 1990 (Roe 2006, Table 1 in Appendix B of this report), Table 21. Concentrations of the above mentioned "legacy" contaminants have decreased in the environment and American eel tissues over time. However, there is no information on complex mixtures of contaminants and new and emerging contaminants currently reported within the literature (see the next section, Cumulative Impacts of Complex Mixtures of Contaminants).

Table 21. American Eel Concentrations in ppb ww, Mean (Median) Range, unless otherwise noted.					
Contaminant	Paskamansett River, MA 2009-2011	St. Lawrence River, Canada 2009-2011	LO/SLR Range (Roe 2006)	LO/SLR, 2007-2008 Range (Byer *et al.* 2013)	Eastern LO, 2008 Means (Byer *et al.* 2015)
Total TEQ	4.8 (2.7) 0.28-11	13 (11) 0.28-44	Total PCDD / F 6.4-131 / 20-75	$Fish_{1998}$ Total TEQ 1.60-3.87	No-PCB-TEQ/ Mo-PCB-TEQ/Total TEQ 0.2 / 0.5 / 3.5
Total DDT	35 (21) 2-92	46 (32) 9.4-170	20-734		102 35-209
Mirex	0.21 (0.24) ND-0.26	2.6 (1.00) ND-14	1-301		18 5.2-39
Chlordane	1.8 (0.26) ND-4.3	1.3 (1.2) ND-2.6	3-105		Total Chlordane 27 9.5-66
Dieldrin	0.76 (0.26) ND-1.9	2.2 (0.23) ND-9.00	3-105		11 6.0-21
Endrin	0.21 (0.24) ND-0.26	0.19 (0.19) ND-0.38	1-15		

Cumulative Impacts of Complex Mixtures of Contaminants

As noted above, fish and wildlife are exposed to complex mixtures of environmental contaminants. However, the cumulative impacts of complex mixtures of contaminants on the eel species are unknown. The contaminant classes included for analysis in this investigation of American eel muscle and egg tissue included OC pesticides, PCBs, PCDDs/PCDFs, PBDEs, and metals. From the current investigation, it is noted that across all statistical analyses conducted, the concentrations of Total PCBs, Total TEQs, and Total DDT, in American eels collected in 2009, 2010, and 2011, were not found to have significant results. However, two dioxin like PCBs from the current investigation, PCB 105 and 167, in addition to other non dioxin like organic and inorganic contaminants did affect time to ovulation. Therefore, it appears that the additive effects of the concentrations of dioxin like contaminants (Total TEQs), in American eels collected in 2009, 2010, and 2011, were not of concern while individual PCB congener concentrations were of concern, as investigated in this study, for the Paskamansett River and St. Lawrence River female American eels.

In order to determine the range of possible effects of dioxin like contaminants on American eels, analyses would need to be conducted on eels exposed in the lab or from known dioxin like contaminant hot spots to determine if greater TEQ concentrations result in significant changes in female and male fertility and reproductive success. Due to the small sample size of male American eel tissues sent for contaminant analyses, no conclusions can be made. In order to make a determination of the effect of dioxin like contaminants on male Paskamansett River American eels, additional tissue analyses would be required after additional American eel maturation and reproduction investigations.

It is possible that the dioxin like PCB congeners 105 and 167 (mono-ortho-substituted planar PCBs) are working through a cellular mechanism other than the Ah receptor, as is the case for non dioxin like (ortho-substituted nonplanar PCB congeners) contaminants. The TEF/TEQ approach does not evaluate ortho-substituted nonplanar PCB congeners and potential adverse effects not associated with the Ah receptor, such as neurotoxicity, carcinogenicity, and endocrine disruption (Seegal 1996 and Giesy and Kannan 1998). Therefore, the use of only TEQs for assessing the entire scope of potential toxicity of PCBs does not address all of the potential adverse effects by PCBs (Giesy and Kannan 1998).

The non significant Total TEQ results from this investigation, from American eels collected in 2009-2011, are in agreement with a recent investigation on the effects of American eel extracts from eels collected in 1988, 1998, and 2008 (Rigaud *et al*. 2016). The recent embryotoxicty investigation utilized American eel contaminant extracts and indicated that the 1988 and 1998 extracts were more toxic to *Fundulus heterocltius* than the 2008 extract, causing sublethal embryotoxic responses but not mortality or significant changes in hatching success (Rigaud *et al*. 2016). The 1988 and 1989 extract sublethal embryotoxic responses were comparable to previously noted sublethal responses in single dioxin like contaminant embryo exposure studies (Rigaud *et al*. 2013): stunted growth, craniofacial deformities, ethoxyresorufin-O-deethylase (EROD) induction, and reduced predatory capacities. Only one subleathal embryotoxic response was significant for the 2008 American eel extract, EROD induction. The temporal results from the Rigaud *et al.* (2016) investigation are consistent with the literature, in that concentrations of contaminants have generally declined from the 1970s and 1980s to the present (Roe 2006).

The list of contaminant classes that was not included in the American eel tissue analyses is quite long and includes, but is not limited to, the following: PAHs, contaminants of emerging concern, pesticide classes including organophosphorus, carbamate, triazine, and neonicotinoid pesticides, solvents and industrial/manufacturing chemicals such as benzene, trichloroethylene, and alkylphenols. In addition, the effects of short-term exposure of non-persistent contaminants during critical American eel life stages may also be of concern and are briefly reviewed in Roe (2006). In order to determine the range of possible effects of these other classes of contaminants on American eels, further laboratory analyses would need to be conducted.

V. CONCLUSIONS

This investigation has allowed for the first ever examination of the effects of contaminant loads on reproduction in sexually mature male and female American eel. Contaminant concentrations reported in American eel tissues from the Paskamansett River and St. Lawrence River are within the range of concentrations associated with impacts that have been documented in other fish species. However, contaminant concentrations in American eels from this study were lower than concentrations recently reported in the literature in American eels collected from the Lake Ontario and St. Lawrence River in 2008. Twenty-four organic and inorganic contaminants were significantly greater in the St. Lawrence River eel muscle tissue than in the Paskamansett River eel muscle tissue. In addition, maternal transfer of contaminants did occur and sixteen contaminants were determined to be proportionally transferred to the eggs. Contaminants in female American eel muscle tissue did affect time to ovulation in female American eels but did

not affect the percentage of fertile embryos. PCB 199 muscle tissue concentrations did affect the percentage of developed embryos. Baseline reproductive parameters for male eels, including sperm density/count and sperm motility were established and will provide a basis for future comparisons of eels from other studies and from contaminated regions. In general, contaminant concentrations reported in male tissues were similar to or lower than contaminant concentrations reported in the female eel muscle and egg tissues from the Paskamansett River. One notable exception to this general contaminant trend is pentachloro-anisole, where concentrations of pentachloro-anisole in male tissues greatly exceeded female tissue concentrations from both the Paskamansett and St. Lawrence Rivers. Finally, male exposure to PCBs negatively affected the percentage of fertile eggs but did not negatively affect sperm density, the percentage of developed and dead embryos, or the percentage of hatched and 6 days post hatch embryos. These results indicate that if fertilization occurred, even with sperm from highly contaminated males, all subsequent developmental stages occurred normally. Therefore, fertilization, but not later development, was compromised due to the male's exposure to PCBs. Until now, American eel reproduction has only been assumed, but never documented, to occur in the Sargasso Sea. Advances in the current knowledge of American eels, related to contaminants, could lead to more focused research that would investigate the impacts of new and emergent contaminants and complex mixtures of contaminants on the American eel lifecycle. Further investigations would help address the uncertainty that exists related to the impacts of contaminants at a population level in the American eel. The information obtained from this and future investigations could potentially result in a re-evaluation of the Endangered Species Act status review for the species.

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APPENDIX A. American Eel Tissue Organic and Inorganic Results

American eel organic data

	Sample ID	Sample Type	Location	Sample Weight grams	% Lipid Percent Result percent	Lipid	% Moisture Percent Result percent	Aldrin DL Rel Symbol	Aldrin Wet Weight Result ppm	Aldrin Wet Weight Detection Limit ppm
1	Eel16e	Eggs	MA	10	2.27	0.0227	87.8	<	0.000336	0.000336
	Eel16m	Female muscle	MA	10	3.15	0.0315	78.9	<	0.000472	0.000472
2	Eel1Se	Eggs	MA	10	2.61	0.0261	86.5	<	0.0005	0.0005
	Eel1Sm	Female muscle	MA	10	5.86	0.0586	73.3	<	0.000526	0.000526
3	EelS1e	Eggs	MA	25	2.43	0.0243	86.4	<	0.00049	0.00049
	EelS1m	Female muscle	MA	11.6	7.09	0.0709	74.6		0.000389	0.000177
4	EelS4e	Eggs	MA	27	2.13	0.0213	88.4		0.00051	0.000382
	EelS4m	Female muscle	MA	10	1.56	0.0156	81.2	<	0.000472	0.000472
5	EelSSe	Eggs	MA	10	2.46	0.0246	86.2	<	0.000495	0.000495
	EelSSm	Female muscle	MA	10	3.68	0.0368	75.3	<	0.000476	0.000476
6	Eel11e	Eggs	SLR	57	3.07	0.0307	86.7		0.000506	0.0005
	Eel11m	Female muscle	SLR	32	17.6	0.176	64.5		0.00006	0.0000542
7	Eel12e	Eggs	SLR	41.8	3.17	0.0317	84		0.000698	0.000485
	Eel12m	Female muscle	SLR	41.4	17.2	0.172	62.6		0.000488	0.0000488
8	Eel14e	Eggs	SLR	55	2.7	0.027	86.4		0.000437	0.00034
	Eel14m	Female muscle	SLR	35.4	9.05	0.0905	66.8	<	0.0000532	0.0000532
9	Eel33e	Eggs	SLR	41	2.15	0.0215	87.7		0.000457	0.000379
	Eel33m	Female muscle	SLR	34	5.06	0.0506	77.7		0.000255	0.0000577
10	Eel3e	Eggs	SLR	10	2.79	0.0279	86.5	<	0.000455	0.000455
	Eel3m	Female muscle	SLR	10	9.23	0.0923	69.7	<	0.000459	0.000459
11	Eel4e	Eggs	SLR	37	2.54	0.0254	85.6		0.000483	0.00045
	Eel4m	Female muscle	SLR	24.6	11.2	0.112	73		0.000287	0.0000994
12	Eel5e	Eggs	SLR	36	2.33	0.0233	84		0.000948	0.000307
	Eel5m	Female muscle	SLR	62	7.32	0.0732	70.2		0.000554	0.0000773
13	Eel6e	Eggs	SLR	10	4.24	0.0424	81.8	<	0.000515	0.000515
	Eel6m	Female muscle	SLR	10	11.6	0.116	61.2	<	0.000459	0.000459
14	Eel811e	Eggs	SLR	77	2.21	0.0221	87		0.000859	0.000312
	Eel811m	Female muscle	SLR	31.1	10.8	0.108	69.1		0.000203	0.0000729
15	Eel812e	Eggs	SLR	25.7	1.98	0.0198	88.5	<	0.000446	0.000446
	Eel812m	Female muscle	SLR	10.9	8.96	0.0896	72.4	<	0.000259	0.000259
16	Eel9e	Eggs	SLR	31.4	2.23	0.0223	87.4	<	0.000485	0.000485
	Eel9m	Female muscle	SLR	25	12.8	0.128	68.5	<	0.0000882	0.0000882
	EelC1	Male gonads	MA	4.2	6.83	0.0683	77.2	<	0.00312	0.00312
	EelC2nC3	Male gonads	MA	5.8	5.24	0.0524	76.5	<	0.00139	0.00139

EelH1	Male gonads	MA	2.3	2.97	0.0297	75.6	<	0.00294	0.00294
EelH2	Male gonads	MA	6.3	6.97	0.0697	77.1	<	0.00104	0.00104
EelH3	Male gonads	MA	3.5	0.48	0.0048	80.1	<	0.0025	0.0025
NMS1	Male muscle	MA	6.39	9.09	0.0909	63.7	<	0.000556	0.000556
NMS4	Male muscle	MA	9.5	6.27	0.0627	68.9	<	0.000431	0.000431
NMS5	Male muscle	MA	11.51	11.6	0.116	66.1	<	0.000455	0.000455

The "<" indicates that the actual result is less than the reported detection limit.

Aldrin	alpha BHC	alpha BHC	alpha BHC	alpha BHC	alpha chlordane	alpha chlordane	alpha chlordane
Result Modifier Comments	DL Rel Symbol	Wet Weight Result	Wet Weight Detection Limit	Result Modifier Comments	DL Rel Symbol	Wet Weight Result	Wet Weight Detection Limit
		ppm	ppm			ppm	ppm
	<	0.000336	0.000336		<	0.000336	0.000336
	<	0.000472	0.000472		<	0.000472	0.000472
	<	0.0005	0.0005		<	0.0005	0.0005
	<	0.000526	0.000526		<	0.000526	0.000526
	<	0.00049	0.00049			0.00262	0.00049
	<	0.000177	0.000177			0.00432	0.000177
	<	0.000382	0.000382			0.0035	0.000382
	<	0.000472	0.000472			0.00379	0.000472
		0.000987	0.000495		<	0.000495	0.000495
		0.000868	0.000476		<	0.000476	0.000476
	<	0.0005	0.0005			0.00136	0.0005
	<	0.0000542	0.0000542			0.00232	0.0000542
COM M - CONFIRMED BY GC/MS		0.000785	0.000485	COM M - CONFIRMED BY GC/MS		0.002	0.000485
	<	0.0000488	0.0000488			0.00164	0.0000488
		0.000474	0.00034		<	0.00034	0.00034
		0.000376	0.0000532			0.00255	0.0000532
	<	0.000379	0.000379			0.000494	0.000379
		0.000146	0.0000577			0.000551	0.0000577
	<	0.000455	0.000455		<	0.000455	0.000455
	<	0.000459	0.000459		<	0.000459	0.000459
	<	0.00045	0.00045		<	0.00045	0.00045
	<	0.0000994	0.0000994			0.00176	0.0000994
		0.000572	0.000307		<	0.000307	0.000307
		0.000162	0.0000773			0.000862	0.0000773
		0.0051	0.000515			0.00199	0.000515
	<	0.000459	0.000459			0.00117	0.000459
	<	0.000312	0.000312		<	0.000312	0.000312
		0.000084	0.0000729			0.00106	0.0000729
	<	0.000446	0.000446		<	0.000446	0.000446
	<	0.000259	0.000259		<	0.000259	0.000259
	<	0.000485	0.000485			0.000565	0.000485
	<	0.0000882	0.0000882			0.002	0.0000882
	<	0.00312	0.00312		<	0.00312	0.00312
	<	0.00139	0.00139		<	0.00139	0.00139

<	0.00294	0.00294	<	0.00294	0.00294
<	0.00104	0.00104	<	0.00104	0.00104
<	0.0025	0.0025	<	0.0025	0.0025
<	0.000556	0.000556	<	0.000556	0.000556
<	0.000431	0.000431	<	0.000431	0.000431
	0.000457	0.000455		0.00803	0.000455

alpha chlordane	beta BHC	beta BHC	beta BHC	beta BHC	cis-nonachlor	cis-nonachlor	cis-nonachlor	cis-nonachlor
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments
		0.181	0.000336		<	0.000336	0.000336	
		0.0849	0.000472		<	0.000472	0.000472	
	<	0.0005	0.0005		<	0.0005	0.0005	
	<	0.000526	0.000526		<	0.000526	0.000526	
	<	0.00049	0.00049			0.000968	0.00049	
	<	0.000177	0.000177			0.00233	0.000177	
	<	0.000382	0.000382			0.00114	0.000382	
	<	0.000472	0.000472		<	0.000472	0.000472	
		0.00368	0.000495		<	0.000495	0.000495	
		0.00815	0.000476		<	0.000476	0.000476	
	<	0.0005	0.0005			0.00116	0.0005	
COM M - CONFIRMED BY GC/MS	<	0.0000542	0.0000542			0.00499	0.0000542	COM M - CONFIRMED BY GC/MS
COM M - CONFIRMED BY GC/MS	<	0.000485	0.000485	COM M - CONFIRMED BY GC/MS		0.00526	0.000485	
		0.000202	0.0000488			0.00181	0.0000488	
	<	0.00034	0.00034			0.000434	0.00034	
		0.000079	0.0000532			0.00179	0.0000532	
	<	0.000379	0.000379		<	0.000379	0.000379	
		0.000114	0.0000577			0.00102	0.0000577	
		0.00748	0.000455		<	0.000455	0.000455	
		0.00384	0.000459		<	0.000459	0.000459	
	<	0.00045	0.00045			0.000794	0.00045	
	<	0.0000994	0.0000994			0.00212	0.0000994	
	<	0.000307	0.000307		<	0.000307	0.000307	
		0.000128	0.0000773			0.00104	0.0000773	
	<	0.000515	0.000515		<	0.000515	0.000515	
	<	0.000459	0.000459		<	0.000459	0.000459	
	<	0.000312	0.000312			0.000534	0.000312	
	<	0.0000729	0.0000729			0.00141	0.0000729	
	<	0.000446	0.000446		<	0.000446	0.000446	
	<	0.000259	0.000259		<	0.000259	0.000259	
COM M - CONFIRMED BY GC/MS	<	0.000485	0.000485		<	0.000485	0.000485	COM M - CONFIRMED BY GC/MS
COM M - CONFIRMED BY GC/MS	<	0.0000882	0.0000882			0.00258	0.0000882	COM M - CONFIRMED BY GC/MS
	<	0.00312	0.00312		<	0.00312	0.00312	
	<	0.00139	0.00139		<	0.00139	0.00139	

<	0.00294	0.00294		0.0105	0.00294
	0.00927	0.00104	<	0.00104	0.00104
	0.249	0.0025	<	0.0025	0.0025
	0.000876	0.000556	<	0.000556	0.000556
	0.104	0.000431	<	0.000431	0.000431
	0.0123	0.000455		0.0056	0.000455

delta BHC	delta BHC	delta BHC	delta BHC	dieldrin	dieldrin	dieldrin	dieldrin	endosulfan II
DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol
<	0.000336	0.000336		<	0.000336	0.000336		<
<	0.000472	0.000472		<	0.000472	0.000472		<
<	0.0005	0.0005		<	0.0005	0.0005		<
<	0.000526	0.000526		<	0.000526	0.000526		<
<	0.00049	0.00049		<	0.00049	0.00049		<
<	0.000177	0.000177			0.00189	0.000177		<
<	0.000382	0.000382			0.00164	0.000382		<
<	0.000472	0.000472		<	0.000472	0.000472		<
<	0.000495	0.000495		<	0.000495	0.000495		<
<	0.000476	0.000476			0.00116	0.000476		<
<	0.0005	0.0005			0.00314	0.0005		<
	0.000063	0.0000542		<	0.0000542	0.0000542		<
	0.000533	0.000485			0.0182	0.000485	COM M - CONFIRMED BY GC/MS	<
	0.000433	0.0000488		<	0.0000488	0.0000488		
<	0.00034	0.00034			0.00198	0.00034		
<	0.0000532	0.0000532		<	0.0000532	0.0000532		<
<	0.000379	0.000379			0.00141	0.000379		<
	0.000121	0.0000577			0.00281	0.0000577		
<	0.000455	0.000455		<	0.000455	0.000455		<
<	0.000459	0.000459		<	0.000459	0.000459		<
<	0.00045	0.00045			0.00185	0.00045		<
<	0.0000994	0.0000994			0.00796	0.0000994		<
<	0.000307	0.000307		<	0.000307	0.000307		<
<	0.0000773	0.0000773			0.00329	0.0000773		
<	0.000515	0.000515		<	0.000515	0.000515		
<	0.000459	0.000459		<	0.000459	0.000459		<
<	0.000312	0.000312			0.00178	0.000312		<
<	0.0000729	0.0000729		<	0.0000729	0.0000729		<
<	0.000446	0.000446		<	0.000446	0.000446		<
<	0.000259	0.000259			0.000886	0.000259		<
<	0.000485	0.000485			0.00218	0.000485	COM M - CONFIRMED BY GC/MS	<
<	0.0000882	0.0000882			0.00895	0.0000882	COM M - CONFIRMED BY GC/MS	<
	0.0221	0.00312		<	0.00312	0.00312		<
<	0.00139	0.00139		<	0.00139	0.00139		<

	0.0707	0.00294	COM M - CONFIRMED BY GC/MS		0.0324	0.00294	COM M - CONFIRMED BY GC/MS	<
	0.0053	0.00104			0.00496	0.00104	<
<	0.0025	0.0025		<	0.0025	0.0025	<
<	0.000556	0.000556			0.00243	0.000556	<
<	0.000431	0.000431			0.00501	0.000431	<
	0.00122	0.000455			0.00263	0.000455	<

endosulfan II	endosulfan II	endosulfan II	endrin	endrin	endrin	endrin	gamma BHC	gamma BHC	gamma BHC
Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
0.000336	0.000336		<	0.000336	0.000336		<	0.000336	0.000336
0.000472	0.000472		<	0.000472	0.000472			0.0832	0.000472
0.0005	0.0005		<	0.0005	0.0005		<	0.0005	0.0005
0.000526	0.000526		<	0.000526	0.000526		<	0.000526	0.000526
0.00049	0.00049		<	0.00049	0.00049		<	0.00049	0.00049
0.000177	0.000177		<	0.000177	0.000177		<	0.000177	0.000177
0.000382	0.000382		<	0.000382	0.000382		<	0.000382	0.000382
0.000472	0.000472		<	0.000472	0.000472		<	0.000472	0.000472
0.000495	0.000495		<	0.000495	0.000495		<	0.000495	0.000495
0.000476	0.000476		<	0.000476	0.000476		<	0.000476	0.000476
0.0005	0.0005		<	0.0005	0.0005		<	0.0005	0.0005
0.0000542	0.0000542			0.000356	0.0000542		<	0.0000542	0.0000542
0.000485	0.000485			0.000495	0.000485			0.00146	0.000485
0.000248	0.0000488			0.000374	0.0000488			0.000355	0.0000488
0.000535	0.00034		<	0.00034	0.00034			0.00207	0.00034
0.0000532	0.0000532		<	0.0000532	0.0000532		<	0.0000532	0.0000532
0.000379	0.000379			0.000385	0.000379		<	0.000379	0.000379
0.000123	0.0000577			0.000379	0.0000577			0.00144	0.0000577
0.000455	0.000455		<	0.000455	0.000455		<	0.000455	0.000455
0.000459	0.000459		<	0.000459	0.000459		<	0.000459	0.000459
0.00045	0.00045		<	0.00045	0.00045			0.00492	0.00045
0.0000994	0.0000994		<	0.0000994	0.0000994		<	0.0000994	0.0000994
0.000307	0.000307			0.00047	0.000307		<	0.000307	0.000307
0.000172	0.0000773			0.00019	0.0000773			0.000675	0.0000773
0.0317	0.000515		<	0.000515	0.000515		<	0.000515	0.000515
0.000459	0.000459		<	0.000459	0.000459		<	0.000459	0.000459
0.000312	0.000312		<	0.000312	0.000312		<	0.000312	0.000312
0.0000729	0.0000729		<	0.0000729	0.0000729		<	0.0000729	0.0000729
0.000446	0.000446		<	0.000446	0.000446			0.00206	0.000446
0.000259	0.000259		<	0.000259	0.000259		<	0.000259	0.000259
0.000485	0.000485		<	0.000485	0.000485		<	0.000485	0.000485
0.0000882	0.0000882		<	0.0000882	0.0000882		<	0.0000882	0.0000882
0.00312	0.00312		<	0.00312	0.00312		<	0.00312	0.00312
0.00139	0.00139		<	0.00139	0.00139		<	0.00139	0.00139

0.00294	0.00294	<	0.00294	0.00294	<	0.00294	0.00294
0.00104	0.00104	<	0.00104	0.00104	<	0.00104	0.00104
0.0025	0.0025	<	0.0025	0.0025		0.292	0.0025
0.000556	0.000556	<	0.000556	0.000556	<	0.000556	0.000556
0.000431	0.000431	<	0.000431	0.000431	<	0.000431	0.000431
0.000455	0.000455	<	0.000455	0.000455	<	0.000455	0.000455

gamma BHC	gamma chlordane	gamma chlordane	gamma chlordane	gamma chlordane	HCB	HCB	HCB	HCB
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments
	<	0.000336	0.000336		<	0.000336	0.000336	
	<	0.000472	0.000472		<	0.000472	0.000472	
	<	0.0005	0.0005		<	0.0005	0.0005	
		0.00248	0.000526		<	0.000526	0.000526	
	<	0.00049	0.00049		<	0.00049	0.00049	
		0.000635	0.000177			0.00074	0.000177	
		0.000899	0.000382			0.000466	0.000382	
	<	0.000472	0.000472			0.00089	0.000472	
	<	0.000495	0.000495		<	0.000495	0.000495	
		0.000762	0.000476			0.000783	0.000476	
	<	0.0005	0.0005			0.00072	0.0005	
		0.000108	0.0000542			0.00244	0.0000542	COM M - CONFIRMED BY GC/MS
COM M - CONFIRMED BY GC/MS	<	0.000485	0.000485	COM M - CONFIRMED BY GC/MS		0.00496	0.000485	COM M - CONFIRMED BY GC/MS
		0.000638	0.0000488			0.00208	0.0000488	
		0.000514	0.00034			0.000485	0.00034	
		0.000688	0.0000532			0.00132	0.0000532	
	<	0.000379	0.000379		<	0.000379	0.000379	
		0.000169	0.0000577			0.00129	0.0000577	
	<	0.000455	0.000455		<	0.000455	0.000455	
		0.000823	0.000459		<	0.000459	0.000459	
	<	0.00045	0.00045			0.00054	0.00045	
	<	0.0000994	0.0000994			0.00156	0.0000994	
		0.000349	0.000307			0.000565	0.000307	
	<	0.0000773	0.0000773			0.00132	0.0000773	
	<	0.000515	0.000515		<	0.000515	0.000515	
	<	0.000459	0.000459		<	0.000459	0.000459	
		0.000476	0.000312			0.000608	0.000312	
	<	0.0000729	0.0000729			0.00163	0.0000729	
	<	0.000446	0.000446		<	0.000446	0.000446	
	<	0.000259	0.000259			0.000813	0.000259	
	<	0.000485	0.000485	COM M - CONFIRMED BY GC/MS		0.000549	0.000485	COM M - CONFIRMED BY GC/MS
	<	0.0000882	0.0000882			0.00143	0.0000882	COM M - CONFIRMED BY GC/MS
	<	0.00312	0.00312		<	0.00312	0.00312	
	<	0.00139	0.00139		<	0.00139	0.00139	

<	0.00294	0.00294		0.0253	0.00294	COM M - CONFIRMED BY GC/MS
<	0.00104	0.00104	<	0.00104	0.00104	
<	0.0025	0.0025	<	0.0025	0.0025	
	0.00242	0.000556		0.00478	0.000556	
	0.00352	0.000431		0.0053	0.000431	
	0.00362	0.000455		0.00357	0.000455	

Heptachlor	Heptachlor	Heptachlor	Heptachlor	heptachlor epoxide	heptachlor epoxide	heptachlor epoxide	heptachlor epoxide	mirex	mirex
DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm
<	0.000336	0.000336		<	0.000336	0.000336		<	0.000336
<	0.000472	0.000472		<	0.000472	0.000472		<	0.000472
<	0.0005	0.0005		<	0.0005	0.0005		<	0.0005
<	0.000526	0.000526		<	0.000526	0.000526		<	0.000526
<	0.00049	0.00049			0.000567	0.00049		<	0.00049
<	0.000177	0.000177		<	0.000177	0.000177		<	0.000177
<	0.000382	0.000382		<	0.000382	0.000382			0.000496
<	0.000472	0.000472		<	0.000472	0.000472		<	0.000472
<	0.000495	0.000495		<	0.000495	0.000495		<	0.000495
<	0.000476	0.000476		<	0.000476	0.000476		<	0.000476
<	0.0005	0.0005		<	0.0005	0.0005		<	0.0005
	0.000115	0.0000542			0.000896	0.0000542			0.0137
	0.000929	0.000485	COM M - CONFIRMED BY GC/MS		0.00333	0.000485			0.00216
<	0.0000488	0.0000488			0.00173	0.0000488			0.00272
<	0.00034	0.00034		<	0.00034	0.00034		<	0.00034
<	0.0000532	0.0000532			0.00113	0.0000532			0.000754
<	0.000379	0.000379		<	0.000379	0.000379			0.000476
	0.000118	0.0000577			0.000218	0.0000577			0.00134
<	0.000455	0.000455		<	0.000455	0.000455		<	0.000455
<	0.000459	0.000459			0.00328	0.000459		<	0.000459
<	0.00045	0.00045		<	0.00045	0.00045		<	0.00045
<	0.0000994	0.0000994			0.00121	0.0000994			0.00552
<	0.000307	0.000307			0.000533	0.000307		<	0.000307
	0.000121	0.0000773		<	0.0000773	0.0000773			0.000287
<	0.000515	0.000515		<	0.000515	0.000515		<	0.000515
<	0.000459	0.000459		<	0.000459	0.000459		<	0.000459
<	0.000312	0.000312		<	0.000312	0.000312			0.000446
<	0.0000729	0.0000729			0.00122	0.0000729			0.001
<	0.000446	0.000446		<	0.000446	0.000446			0.000448
<	0.000259	0.000259		<	0.000259	0.000259		<	0.000259
<	0.000485	0.000485		<	0.000485	0.000485		<	0.000485
<	0.0000882	0.0000882			0.00122	0.0000882	COM M - CONFIRMED BY GC/MS		0.00238
<	0.00312	0.00312		<	0.00312	0.00312		<	0.00312
<	0.00139	0.00139		<	0.00139	0.00139		<	0.00139

	0.0394	0.00294	<	0.00294	0.00294	<	0.00294
<	0.00104	0.00104	<	0.00104	0.00104	<	0.00104
<	0.0025	0.0025	<	0.0025	0.0025	<	0.0025
<	0.000556	0.000556	<	0.000556	0.000556	<	0.000556
<	0.000431	0.000431	<	0.000431	0.000431		0.125
<	0.000455	0.000455		0.0025	0.000455	<	0.000455

mirex	mirex	o,p'-DDD	o,p'-DDD	o,p'-DDD	o,p'-DDD	o,p'-DDE	o,p'-DDE	o,p'-DDE
Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
0.000336		<	0.000336	0.000336		<	0.000336	0.000336
0.000472		<	0.000472	0.000472		<	0.000472	0.000472
0.0005		<	0.0005	0.0005		<	0.0005	0.0005
0.000526		<	0.000526	0.000526		<	0.000526	0.000526
0.00049		<	0.00049	0.00049		<	0.00049	0.00049
0.000177		<	0.000177	0.000177		<	0.000177	0.000177
0.000382			0.000894	0.000382		<	0.000382	0.000382
0.000472		<	0.000472	0.000472		<	0.000472	0.000472
0.000495		<	0.000495	0.000495		<	0.000495	0.000495
0.000476		<	0.000476	0.000476		<	0.000476	0.000476
0.0005		<	0.0005	0.0005		<	0.0005	0.0005
0.0000542	COM M - CONFIRMED BY GC/MS		0.0015	0.0000542	COM M - CONFIRMED BY GC/MS		0.00007	0.0000542
0.000485	COM M - CONFIRMED BY GC/MS		0.0015	0.000485	COM M - CONFIRMED BY GC/MS	<	0.000485	0.000485
0.0000488			0.00147	0.0000488			0.00007	0.0000488
0.00034			0.000679	0.00034		<	0.00034	0.00034
0.0000532			0.00109	0.0000532		<	0.0000532	0.0000532
0.000379		<	0.000379	0.000379		<	0.000379	0.000379
0.0000577			0.000123	0.0000577			0.00011	0.0000577
0.000455		<	0.000455	0.000455		<	0.000455	0.000455
0.000459		<	0.000459	0.000459		<	0.000459	0.000459
0.00045		<	0.00045	0.00045		<	0.00045	0.00045
0.0000994			0.00108	0.0000994		<	0.0000994	0.0000994
0.000307			0.000596	0.000307		<	0.000307	0.000307
0.0000773			0.000143	0.0000773		<	0.0000773	0.0000773
0.000515		<	0.000515	0.000515			0.0255	0.000515
0.000459		<	0.000459	0.000459		<	0.000459	0.000459
0.000312		<	0.000312	0.000312		<	0.000312	0.000312
0.0000729			0.000705	0.0000729		<	0.0000729	0.0000729
0.000446		<	0.000446	0.000446		<	0.000446	0.000446
0.000259		<	0.000259	0.000259		<	0.000259	0.000259
0.000485	COM M - CONFIRMED BY GC/MS	<	0.000485	0.000485		<	0.000485	0.000485
0.0000882	COM M - CONFIRMED BY GC/MS		0.0014	0.0000882	COM M - CONFIRMED BY GC/MS	<	0.0000882	0.0000882
0.00312		<	0.00312	0.00312		<	0.00312	0.00312
0.00139		<	0.00139	0.00139		<	0.00139	0.00139

0.00294	<	0.00294	0.00294	<	0.00294	0.00294
0.00104	<	0.00104	0.00104	<	0.00104	0.00104
0.0025	<	0.0025	0.0025	<	0.0025	0.0025
0.000556	<	0.000556	0.000556	<	0.000556	0.000556
0.000431	<	0.000431	0.000431	<	0.000431	0.000431
0.000455	<	0.000455	0.000455	<	0.000455	0.000455

o,p'-DDE	o,p'-DDT	o,p'-DDT	o,p'-DDT	o,p'-DDT	oxychlordane	oxychlordane	oxychlordane	oxychlordane
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments
	<	0.000336	0.000336		<	0.000336	0.000336	
		0.00215	0.000472		<	0.000472	0.000472	
	<	0.0005	0.0005		<	0.0005	0.0005	
		0.00516	0.000526			0.00594	0.000526	
	<	0.00049	0.00049			0.00152	0.00049	
	<	0.000177	0.000177			0.00241	0.000177	
		0.000435	0.000382			0.00239	0.000382	
	<	0.000472	0.000472		<	0.000472	0.000472	
	<	0.000495	0.000495		<	0.000495	0.000495	
		0.022	0.000476		<	0.000476	0.000476	
		0.000525	0.0005		<	0.0005	0.0005	
COM M - CONFIRMED BY GC/MS		0.00405	0.0000542			0.00388	0.0000542	COM M - CONFIRMED BY GC/MS
COM M - CONFIRMED BY GC/MS		0.00179	0.000485	COM M - CONFIRMED BY GC/MS		0.00319	0.000485	COM M - CONFIRMED BY GC/MS
		0.00099	0.0000488			0.000351	0.0000488	
		0.000389	0.00034		<	0.00034	0.00034	
		0.00187	0.0000532			0.00117	0.0000532	
	<	0.000379	0.000379		<	0.000379	0.000379	
		0.00127	0.0000577			0.000226	0.0000577	
	<	0.000455	0.000455		<	0.000455	0.000455	
	<	0.000459	0.000459		<	0.000459	0.000459	
	<	0.00045	0.00045			0.000469	0.00045	
		0.00176	0.0000994			0.00162	0.0000994	
		0.000495	0.000307		<	0.000307	0.000307	
		0.000537	0.0000773			0.000141	0.0000773	
	<	0.000515	0.000515		<	0.000515	0.000515	
		0.00154	0.000459	COM M - CONFIRMED BY GC/MS	<	0.000459	0.000459	
		0.000481	0.000312		<	0.000312	0.000312	
		0.000927	0.0000729			0.000871	0.0000729	
	<	0.000446	0.000446		<	0.000446	0.000446	
	<	0.000259	0.000259		<	0.000259	0.000259	
		0.000507	0.000485	COM M - CONFIRMED BY GC/MS		0.000961	0.000485	COM M - CONFIRMED BY GC/MS
		0.00282	0.0000882	COM M - CONFIRMED BY GC/MS		0.00202	0.0000882	COM M - CONFIRMED BY GC/MS
		0.00861	0.00312		<	0.00312	0.00312	
		0.038	0.00139		<	0.00139	0.00139	

<	0.00294	0.00294	<	0.00294	0.00294
	0.0264	0.00104	<	0.00104	0.00104
<	0.0025	0.0025	<	0.0025	0.0025
	0.0239	0.000556	<	0.000556	0.000556
	0.00101	0.000431		0.00335	0.000431
	0.00368	0.000455	<	0.000455	0.000455

p,p'-DDD	p,p'-DDD	p,p'-DDD	p,p'-DDD	p,p'-DDE	p,p'-DDE	p,p'-DDE	p,p'-DDE	p,p'-DDT	p,p'-DDT	p,p'-DDT
DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
<	0.000336	0.000336			0.0209	0.000336		<	0.000336	0.000336
<	0.000472	0.000472			0.0175	0.000472		<	0.000472	0.000472
	0.00838	0.0005			0.0032	0.0005		<	0.0005	0.0005
<	0.000526	0.000526			0.0152	0.000526		<	0.000526	0.000526
	0.00271	0.00049			0.00524	0.00049		<	0.00049	0.00049
	0.00714	0.000177			0.0147	0.000177			0.0015	0.000177
	0.0072	0.000382			0.0131	0.000382			0.00336	0.000382
	0.00643	0.000472			0.0104	0.000472			0.00209	0.000472
	0.0031	0.000495			0.026	0.000495		<	0.000495	0.000495
<	0.000476	0.000476			0.0693	0.000476		<	0.000476	0.000476
	0.00273	0.0005			0.00922	0.0005			0.00175	0.0005
	0.013	0.0000542	COM M - CONFIRMED BY GC/MS		0.147	0.0000542	COM M - CONFIRMED BY GC/MS		0.00415	0.0000542
	0.0174	0.000485	COM M - CONFIRMED BY GC/MS		0.0644	0.000485			0.00531	0.000485
	0.00419	0.0000488			0.0148	0.0000488			0.000679	0.0000488
<	0.00034	0.00034			0.0031	0.00034		<	0.00034	0.00034
	0.00753	0.0000532			0.0257	0.0000532			0.00238	0.0000532
<	0.000379	0.000379			0.0027	0.000379		<	0.000379	0.000379
	0.00193	0.0000577			0.00688	0.0000577			0.000814	0.0000577
<	0.000455	0.000455		<	0.000455	0.000455		<	0.000455	0.000455
<	0.000459	0.000459			0.00828	0.000459		<	0.000459	0.000459
	0.00173	0.00045			0.00499	0.00045			0.00054	0.00045
	0.00653	0.0000994			0.0325	0.0000994			0.00116	0.0000994
	0.000672	0.000307			0.0029	0.000307		<	0.000307	0.000307
	0.00427	0.0000773			0.0138	0.0000773			0.00136	0.0000773
<	0.000515	0.000515			0.0283	0.000515		<	0.000515	0.000515
	0.0032	0.000459	COM M - CONFIRMED BY GC/MS		0.0504	0.000459	COM M - CONFIRMED BY GC/MS	<	0.000459	0.000459
	0.00127	0.000312			0.00485	0.000312		<	0.000312	0.000312
	0.00515	0.0000729			0.0222	0.0000729			0.00328	0.0000729
<	0.000446	0.000446			0.00338	0.000446		<	0.000446	0.000446
<	0.000259	0.000259			0.00969	0.000259		<	0.000259	0.000259
	0.0029	0.000485	COM M - CONFIRMED BY GC/MS		0.0109	0.000485	COM M - CONFIRMED BY GC/MS		0.00266	0.000485
	0.0136	0.0000882	COM M - CONFIRMED BY GC/MS		0.0603	0.0000882	COM M - CONFIRMED BY GC/MS		0.0176	0.0000882
<	0.00312	0.00312			0.0433	0.00312		<	0.00312	0.00312
<	0.00139	0.00139			0.034	0.00139		<	0.00139	0.00139

	0.0492	0.00294	COM M - CONFIRMED BY GC/MS	<	0.00294	0.00294		<	0.00294	0.00294
<	0.00104	0.00104		<	0.00104	0.00104		<	0.00104	0.00104
<	0.0025	0.0025		<	0.0025	0.0025		<	0.0025	0.0025
<	0.000556	0.000556			0.0774	0.000556			0.0371	0.000556
	0.00469	0.000431		<	0.000431	0.000431			0.00948	0.000431
	0.0208	0.000455		<	0.000455	0.000455			0.0159	0.000455

p,p'-DDT	PCB-TOTAL	PCB-TOTAL	PCB-TOTAL	PCB-TOTAL	pentachloro-anisole	pentachloro-anisole	pentachloro-anisole	pentachloro-anisole	toxaphene
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol
		0.0756	0.00671			0.0114	0.000336		<
		0.173	0.00943			0.0262	0.000472		<
		0.152	0.01			0.0139	0.0005		<
		0.235	0.0105			0.0344	0.000526		<
		0.114	0.0098			0.00527	0.00049		<
		0.174	0.00355			0.0117	0.000177		<
		0.15	0.00763			0.00559	0.000382		<
		0.119	0.00943			0.00744	0.000472		<
		0.156	0.0099			0.00941	0.000495		<
		0.532	0.00952			0.0226	0.000476		<
		0.167	0.01			0.00232	0.0005		<
COM M - CONFIRMED BY GC/MS		1.46	0.00108			0.00582	0.0000542		<
COM M - CONFIRMED BY GC/MS		0.731	0.00971			0.0486	0.000485	COM M - CONFIRMED BY GC/MS	<
		0.294	0.000977			0.00522	0.0000488		<
		0.0973	0.0068			0.00185	0.00034		<
		0.292	0.00106			0.00614	0.0000532		<
		0.0856	0.00758			0.00242	0.000379		<
		0.134	0.00115			0.00574	0.0000577		<
		0.152	0.00909			0.00432	0.000455		<
		0.546	0.00917			0.0102	0.000459		<
		0.164	0.00901			0.00281	0.00045		<
		0.433	0.00199			0.00922	0.0000994		<
		0.0671	0.00613			0.0023	0.000307		<
		0.148	0.00155			0.0085	0.0000773		<
		0.0523	0.0103			0.00548	0.000515		<
		0.1	0.00917			0.00672	0.000459		<
		0.112	0.00625			0.00238	0.000312		<
		0.289	0.00146			0.00771	0.0000729		<
		0.068	0.00893			0.00156	0.000446		<
		0.0822	0.00518			0.00493	0.000259		<
COM M - CONFIRMED BY GC/MS		0.153	0.00971			0.00224	0.000485		<
COM M - CONFIRMED BY GC/MS		0.473	0.00176			0.00692	0.0000882		<
		1.19	0.0625			0.457	0.00312		<
		0.435	0.0278			0.281	0.00139		<

4.16	0.0588	2.69	0.00294	<
0.991	0.0208	0.393	0.00104	<
0.448	0.05	0.0486	0.0025	<
0.371	0.0111	0.81	0.000556	<
0.234	0.00862	0.678	0.000431	<
0.322	0.00909	0.762	0.000455	<

toxaphene	toxaphene	toxaphene	trans-nonachlor	trans-nonachlor	trans-nonachlor	trans-nonachlor	BDE# 1	BDE# 1	BDE# 1
Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
0.00671	0.00671			0.00226	0.000336		<	0.00111	0.00111
0.00943	0.00943			0.00275	0.000472		<	0.00125	0.00125
0.01	0.01			0.00416	0.0005		<	0.00119	0.00119
0.0105	0.0105			0.00985	0.000526		<	0.00133	0.00133
0.0098	0.0098			0.00381	0.00049		<	0.00123	0.00123
0.00355	0.00355			0.00855	0.000177		<	0.000443	0.000443
0.00763	0.00763			0.00432	0.000382		<	0.000954	0.000954
0.00943	0.00943			0.00345	0.000472		<	0.00118	0.00118
0.0099	0.0099			0.00152	0.000495		<	0.00114	0.00114
0.00952	0.00952			0.00359	0.000476		<	0.00132	0.00132
0.01	0.01		<	0.0005	0.0005		<	0.00125	0.00125
0.00108	0.00108			0.00998	0.0000542	COM M - CONFIRMED BY GC/MS	<	0.000136	0.000136
0.00971	0.00971			0.00893	0.000485		<	0.00121	0.00121
0.000977	0.000977			0.00262	0.0000488		<	0.000122	0.000122
0.0068	0.0068			0.000823	0.00034		<	0.00085	0.00085
0.00106	0.00106			0.00479	0.0000532		<	0.000133	0.000133
0.00758	0.00758			0.000623	0.000379		<	0.000947	0.000947
0.00115	0.00115			0.00142	0.0000577		<	0.000144	0.000144
0.00909	0.00909		<	0.000455	0.000455		<	0.0012	0.0012
0.00917	0.00917		<	0.000459	0.000459		<	0.00129	0.00129
0.00901	0.00901			0.00115	0.00045		<	0.00113	0.00113
0.00199	0.00199			0.0036	0.0000994		<	0.000249	0.000249
0.00613	0.00613			0.000836	0.000307		<	0.000767	0.000767
0.00155	0.00155			0.0019	0.0000773		<	0.000193	0.000193
0.0103	0.0103		<	0.000515	0.000515		<	0.00113	0.00113
0.00917	0.00917			0.00325	0.000459	COM M - CONFIRMED BY GC/MS	<	0.0013	0.0013
0.00625	0.00625			0.000909	0.000312		<	0.000781	0.000781
0.00146	0.00146			0.00245	0.0000729		<	0.000182	0.000182
0.00893	0.00893			0.000863	0.000446		<	0.00112	0.00112
0.00518	0.00518			0.00174	0.000259		<	0.000648	0.000648
0.00971	0.00971			0.00164	0.000485	COM M - CONFIRMED BY GC/MS	<	0.00121	0.00121
0.00176	0.00176			0.00495	0.0000882	COM M - CONFIRMED BY GC/MS	<	0.00022	0.00022
0.0625	0.0625			0.00376	0.00312				
0.0278	0.0278		<	0.00139	0.00139				

0.0588	0.0588		0.0274	0.00294			
0.0208	0.0208		0.00564	0.00104			
0.05	0.05	<	0.0025	0.0025			
0.0111	0.0111		0.00521	0.000556			
0.00862	0.00862		0.00634	0.000431	<	0.0012	0.0012
0.00909	0.00909		0.0131	0.000455	<	0.00116	0.00116

BDE# 1	BDE# 10	BDE# 10	BDE# 10	BDE# 10	BDE# 100	BDE# 100	BDE# 100	BDE# 100	BDE# 116	BDE# 116
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm
	<	0.00111	0.00111		<	0.00166	0.00166		<	0.00166
	<	0.00125	0.00125			0.00224	0.00188		<	0.00188
	<	0.00119	0.00119		<	0.00179	0.00179		<	0.00179
	<	0.00133	0.00133		<	0.00199	0.00199		<	0.00199
	<	0.00123	0.00123		<	0.00184	0.00184		<	0.00184
	<	0.000443	0.000443			0.0012	0.000665		<	0.000665
	<	0.000954	0.000954		<	0.00143	0.00143		<	0.00143
	<	0.00118	0.00118		<	0.00177	0.00177		<	0.00177
	<	0.00114	0.00114		<	0.0017	0.0017		<	0.0017
	<	0.00132	0.00132		<	0.00197	0.00197		<	0.00197
	<	0.00125	0.00125			0.00241	0.00188		<	0.00188
	<	0.000136	0.000136			0.0111	0.000203		<	0.000203
	<	0.00121	0.00121			0.0165	0.00182		<	0.00182
	<	0.000122	0.000122			0.00716	0.000183		<	0.000183
	<	0.00085	0.00085		<	0.00128	0.00128		<	0.00128
	<	0.000133	0.000133			0.0132	0.0002		<	0.0002
	<	0.000947	0.000947		<	0.00142	0.00142		<	0.00142
	<	0.000144	0.000144			0.00128	0.000217		<	0.000217
	<	0.0012	0.0012		<	0.0018	0.0018		<	0.0018
	<	0.00129	0.00129		<	0.00193	0.00193		<	0.00193
	<	0.00113	0.00113		<	0.00169	0.00169		<	0.00169
	<	0.000249	0.000249			0.00737	0.000373		<	0.000373
	<	0.000767	0.000767		<	0.00115	0.00115		<	0.00115
	<	0.000193	0.000193			0.005	0.00029		<	0.00029
	<	0.00113	0.00113		<	0.00169	0.00169		<	0.00169
	<	0.0013	0.0013		<	0.00195	0.00195		<	0.00195
	<	0.000781	0.000781			0.00224	0.00117		<	0.00117
	<	0.000182	0.000182			0.0169	0.000273		<	0.000273
	<	0.00112	0.00112		<	0.00167	0.00167		<	0.00167
	<	0.000648	0.000648			0.00142	0.000972		<	0.000972
	<	0.00121	0.00121			0.00202	0.00182		<	0.00182
	<	0.00022	0.00022			0.0122	0.000331		<	0.000331

<	0.0012	0.0012	<	0.0018	0.0018	<	0.0018
<	0.00116	0.00116	<	0.00174	0.00174	<	0.00174

BDE# 116	BDE# 116	BDE# 118	BDE# 118	BDE# 118	BDE# 118	BDE# 119	BDE# 119	BDE# 119	BDE# 119	BDE# 12	BDE# 12
Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm
0.00166		<	0.00166	0.00166		<	0.00166	0.00166		<	0.00111
0.00188		<	0.00188	0.00188		<	0.00188	0.00188		<	0.00125
0.00179		<	0.00179	0.00179		<	0.00179	0.00179		<	0.00119
0.00199		<	0.00199	0.00199		<	0.00199	0.00199		<	0.00133
0.00184		<	0.00184	0.00184		<	0.00184	0.00184		<	0.00123
0.000665		<	0.000665	0.000665		<	0.000665	0.000665		<	0.000443
0.00143		<	0.00143	0.00143		<	0.00143	0.00143		<	0.000954
0.00177		<	0.00177	0.00177		<	0.00177	0.00177		<	0.00118
0.0017		<	0.0017	0.0017		<	0.0017	0.0017		<	0.00114
0.00197		<	0.00197	0.00197		<	0.00197	0.00197		<	0.00132
0.00188		<	0.00188	0.00188		<	0.00188	0.00188		<	0.00125
0.000203			0.00021	0.000203		<	0.000203	0.000203		<	0.000136
0.00182		<	0.00182	0.00182		<	0.00182	0.00182		<	0.00121
0.000183		<	0.000183	0.000183		<	0.000183	0.000183		<	0.000122
0.00128		<	0.00128	0.00128		<	0.00128	0.00128		<	0.00085
0.0002		<	0.0002	0.0002		<	0.0002	0.0002		<	0.000133
0.00142		<	0.00142	0.00142		<	0.00142	0.00142		<	0.000947
0.000217		<	0.000217	0.000217		<	0.000217	0.000217		<	0.000144
0.0018		<	0.0018	0.0018		<	0.0018	0.0018		<	0.0012
0.00193		<	0.00193	0.00193		<	0.00193	0.00193		<	0.00129
0.00169		<	0.00169	0.00169		<	0.00169	0.00169		<	0.00113
0.000373		<	0.000373	0.000373		<	0.000373	0.000373		<	0.000249
0.00115		<	0.00115	0.00115		<	0.00115	0.00115		<	0.000767
0.00029		<	0.00029	0.00029		<	0.00029	0.00029		<	0.000193
0.00169		<	0.00169	0.00169		<	0.00169	0.00169		<	0.00113
0.00195		<	0.00195	0.00195		<	0.00195	0.00195		<	0.0013
0.00117		<	0.00117	0.00117		<	0.00117	0.00117		<	0.000781
0.000273		<	0.000273	0.000273		<	0.000273	0.000273		<	0.000182
0.00167		<	0.00167	0.00167		<	0.00167	0.00167		<	0.00112
0.000972		<	0.000972	0.000972		<	0.000972	0.000972		<	0.000648
0.00182		<	0.00182	0.00182		<	0.00182	0.00182		<	0.00121
0.000331		<	0.000331	0.000331		<	0.000331	0.000331		<	0.00022

0.0018	<	0.0018	0.0018	<	0.0018	0.0018	<	0.0012
0.00174	<	0.00174	0.00174	<	0.00174	0.00174	<	0.00116

BDE# 12	BDE# 12	BDE# 126	BDE# 126	BDE# 126	BDE# 126	BDE# 13	BDE# 13	BDE# 13	BDE# 13	BDE# 138	BDE# 138
Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm
0.00111		<	0.00166	0.00166		<	0.00111	0.00111		<	0.00221
0.00125		<	0.00188	0.00188		<	0.00125	0.00125		<	0.0025
0.00119		<	0.00179	0.00179		<	0.00119	0.00119		<	0.00238
0.00133		<	0.00199	0.00199		<	0.00133	0.00133		<	0.00266
0.00123		<	0.00184	0.00184		<	0.00123	0.00123		<	0.00245
0.000443		<	0.000665	0.000665		<	0.000443	0.000443		<	0.000887
0.000954		<	0.00143	0.00143		<	0.000954	0.000954		<	0.00191
0.00118		<	0.00177	0.00177		<	0.00118	0.00118		<	0.00236
0.00114		<	0.0017	0.0017		<	0.00114	0.00114		<	0.00227
0.00132		<	0.00197	0.00197		<	0.00132	0.00132		<	0.00263
0.00125		<	0.00188	0.00188		<	0.00125	0.00125		<	0.0025
0.000136		<	0.000203	0.000203		<	0.000136	0.000136		<	0.000271
0.00121		<	0.00182	0.00182		<	0.00121	0.00121		<	0.00243
0.000122		<	0.000183	0.000183		<	0.000122	0.000122		<	0.000244
0.00085		<	0.00128	0.00128		<	0.00085	0.00085		<	0.0017
0.000133		<	0.0002	0.0002		<	0.000133	0.000133		<	0.000266
0.000947		<	0.00142	0.00142		<	0.000947	0.000947		<	0.00189
0.000144		<	0.000217	0.000217		<	0.000144	0.000144		<	0.000289
0.0012		<	0.0018	0.0018		<	0.0012	0.0012		<	0.0024
0.00129		<	0.00193	0.00193		<	0.00129	0.00129		<	0.00258
0.00113		<	0.00169	0.00169		<	0.00113	0.00113		<	0.00225
0.000249		<	0.000373	0.000373		<	0.000249	0.000249		<	0.000497
0.000767		<	0.00115	0.00115		<	0.000767	0.000767		<	0.00153
0.000193		<	0.00029	0.00029		<	0.000193	0.000193		<	0.000386
0.00113		<	0.00169	0.00169		<	0.00113	0.00113		<	0.00225
0.0013		<	0.00195	0.00195		<	0.0013	0.0013		<	0.0026
0.000781		<	0.00117	0.00117		<	0.000781	0.000781		<	0.00156
0.000182		<	0.000273	0.000273		<	0.000182	0.000182		<	0.000364
0.00112		<	0.00167	0.00167		<	0.00112	0.00112		<	0.00223
0.000648		<	0.000972	0.000972		<	0.000648	0.000648		<	0.0013
0.00121		<	0.00182	0.00182		<	0.00121	0.00121		<	0.00243
0.00022		<	0.000331	0.000331		<	0.00022	0.00022		<	0.000441

0.0012	<	0.0018	0.0018	<	0.0012	0.0012	<	0.0024
0.00116	<	0.00174	0.00174	<	0.00116	0.00116	<	0.00231

BDE# 138	BDE# 138	BDE# 15	BDE# 15	BDE# 15	BDE# 15	BDE# 153	BDE# 153	BDE# 153	BDE# 153	BDE# 154	BDE# 154
Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm
0.00221		<	0.00111	0.00111		<	0.00221	0.00221		<	0.00221
0.0025		<	0.00125	0.00125		<	0.0025	0.0025		<	0.0025
0.00238		<	0.00119	0.00119		<	0.00238	0.00238		<	0.00238
0.00266		<	0.00133	0.00133		<	0.00266	0.00266		<	0.00266
0.00245		<	0.00123	0.00123		<	0.00245	0.00245		<	0.00245
0.000887		<	0.000443	0.000443		<	0.000887	0.000887		<	0.000887
0.00191		<	0.000954	0.000954		<	0.00191	0.00191		<	0.00191
0.00236		<	0.00118	0.00118		<	0.00236	0.00236		<	0.00236
0.00227		<	0.00114	0.00114		<	0.00227	0.00227		<	0.00227
0.00263		<	0.00132	0.00132		<	0.00263	0.00263		<	0.00263
0.0025		<	0.00125	0.00125		<	0.0025	0.0025		<	0.0025
0.000271		<	0.000136	0.000136			0.00182	0.000271			0.0043
0.00243		<	0.00121	0.00121		<	0.00243	0.00243			0.00319
0.000244		<	0.000122	0.000122			0.00112	0.000244			0.00229
0.0017		<	0.00085	0.00085		<	0.0017	0.0017		<	0.0017
0.000266		<	0.000133	0.000133			0.00232	0.000266			0.00337
0.00189		<	0.000947	0.000947		<	0.00189	0.00189		<	0.00189
0.000289		<	0.000144	0.000144		<	0.000289	0.000289			0.00043
0.0024		<	0.0012	0.0012		<	0.0024	0.0024		<	0.0024
0.00258		<	0.00129	0.00129		<	0.00258	0.00258		<	0.00258
0.00225		<	0.00113	0.00113		<	0.00225	0.00225		<	0.00225
0.000497		<	0.000249	0.000249			0.00106	0.000497			0.00211
0.00153		<	0.000767	0.000767		<	0.00153	0.00153		<	0.00153
0.000386		<	0.000193	0.000193			0.00063	0.000386			0.00094
0.00225		<	0.00113	0.00113		<	0.00225	0.00225		<	0.00225
0.0026		<	0.0013	0.0013		<	0.0026	0.0026		<	0.0026
0.00156		<	0.000781	0.000781		<	0.00156	0.00156		<	0.00156
0.000364		<	0.000182	0.000182			0.00331	0.000364			0.00428
0.00223		<	0.00112	0.00112		<	0.00223	0.00223		<	0.00223
0.0013		<	0.000648	0.000648		<	0.0013	0.0013		<	0.0013
0.00243		<	0.00121	0.00121		<	0.00243	0.00243		<	0.00243
0.000441		<	0.00022	0.00022			0.00276	0.000441			0.00426

0.0024	<	0.0012	0.0012	<	0.0024	0.0024	<	0.0024
0.00231	<	0.00116	0.00116	<	0.00231	0.00231	<	0.00231

BDE# 154	BDE# 154	BDE# 155	BDE# 155	BDE# 155	BDE# 155	BDE# 166	BDE# 166	BDE# 166	BDE# 166	BDE# 17	BDE# 17	BDE# 17
Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
0.00221		<	0.00221	0.00221		<	0.00221	0.00221		<	0.00111	0.00111
0.0025		<	0.0025	0.0025		<	0.0025	0.0025		<	0.00125	0.00125
0.00238		<	0.00238	0.00238		<	0.00238	0.00238		<	0.00119	0.00119
0.00266		<	0.00266	0.00266		<	0.00266	0.00266		<	0.00133	0.00133
0.00245		<	0.00245	0.00245		<	0.00245	0.00245		<	0.00123	0.00123
0.000887		<	0.000887	0.000887		<	0.000887	0.000887		<	0.000443	0.000443
0.00191		<	0.00191	0.00191		<	0.00191	0.00191		<	0.000954	0.000954
0.00236		<	0.00236	0.00236		<	0.00236	0.00236		<	0.00118	0.00118
0.00227		<	0.00227	0.00227		<	0.00227	0.00227		<	0.00114	0.00114
0.00263		<	0.00263	0.00263		<	0.00263	0.00263		<	0.00132	0.00132
0.0025		<	0.0025	0.0025		<	0.0025	0.0025		<	0.00125	0.00125
0.000271			0.00051	0.000271		<	0.000271	0.000271		<	0.000136	0.000136
0.00243		<	0.00243	0.00243		<	0.00243	0.00243		<	0.00121	0.00121
0.000244			0.00049	0.000244		<	0.000244	0.000244		<	0.000122	0.000122
0.0017		<	0.0017	0.0017		<	0.0017	0.0017		<	0.00085	0.00085
0.000266			0.00067	0.000266		<	0.000266	0.000266		<	0.000133	0.000133
0.00189		<	0.00189	0.00189		<	0.00189	0.00189		<	0.000947	0.000947
0.000289		<	0.000289	0.000289		<	0.000289	0.000289		<	0.000144	0.000144
0.0024		<	0.0024	0.0024		<	0.0024	0.0024		<	0.0012	0.0012
0.00258		<	0.00258	0.00258		<	0.00258	0.00258		<	0.00129	0.00129
0.00225		<	0.00225	0.00225		<	0.00225	0.00225		<	0.00113	0.00113
0.000497		<	0.000497	0.000497		<	0.000497	0.000497		<	0.000249	0.000249
0.00153		<	0.00153	0.00153		<	0.00153	0.00153		<	0.000767	0.000767
0.000386		<	0.000386	0.000386		<	0.000386	0.000386		<	0.000193	0.000193
0.00225		<	0.00225	0.00225		<	0.00225	0.00225		<	0.00113	0.00113
0.0026		<	0.0026	0.0026		<	0.0026	0.0026		<	0.0013	0.0013
0.00156		<	0.00156	0.00156		<	0.00156	0.00156		<	0.000781	0.000781
0.000364			0.00068	0.000364		<	0.000364	0.000364		<	0.000182	0.000182
0.00223		<	0.00223	0.00223		<	0.00223	0.00223		<	0.00112	0.00112
0.0013		<	0.0013	0.0013		<	0.0013	0.0013		<	0.000648	0.000648
0.00243		<	0.00243	0.00243		<	0.00243	0.00243		<	0.00121	0.00121
0.000441		<	0.000441	0.000441		<	0.000441	0.000441		<	0.00022	0.00022

0.0024	<	0.0024	0.0024	<	0.0024	0.0024	<	0.0012	0.0012
0.00231	<	0.00231	0.00231	<	0.00231	0.00231	<	0.00116	0.00116

BDE# 17	BDE# 181	BDE# 181	BDE# 181	BDE# 181	BDE# 183	BDE# 183	BDE# 183	BDE# 183	BDE# 190	BDE# 190	BDE# 190	BDE# 190
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments
	<	0.00277	0.00277		<	0.00277	0.00277		<	0.00277	0.00277	
	<	0.00312	0.00312		<	0.00312	0.00312		<	0.00312	0.00312	
	<	0.00298	0.00298		<	0.00298	0.00298		<	0.00298	0.00298	
	<	0.00332	0.00332		<	0.00332	0.00332		<	0.00332	0.00332	
	<	0.00306	0.00306		<	0.00306	0.00306		<	0.00306	0.00306	
	<	0.00111	0.00111		<	0.00111	0.00111		<	0.00111	0.00111	
	<	0.00239	0.00239		<	0.00239	0.00239		<	0.00239	0.00239	
	<	0.00295	0.00295		<	0.00295	0.00295		<	0.00295	0.00295	
	<	0.00284	0.00284		<	0.00284	0.00284		<	0.00284	0.00284	
	<	0.00329	0.00329		<	0.00329	0.00329		<	0.00329	0.00329	
	<	0.00312	0.00312		<	0.00312	0.00312		<	0.00312	0.00312	
	<	0.000339	0.000339		<	0.000339	0.000339		<	0.000339	0.000339	
	<	0.00303	0.00303		<	0.00303	0.00303		<	0.00303	0.00303	
	<	0.000305	0.000305		<	0.000305	0.000305		<	0.000305	0.000305	
	<	0.00213	0.00213		<	0.00213	0.00213		<	0.00213	0.00213	
	<	0.000333	0.000333		<	0.000333	0.000333		<	0.000333	0.000333	
	<	0.00237	0.00237		<	0.00237	0.00237		<	0.00237	0.00237	
	<	0.000361	0.000361		<	0.000361	0.000361		<	0.000361	0.000361	
	<	0.003	0.003		<	0.003	0.003		<	0.003	0.003	
	<	0.00322	0.00322		<	0.00322	0.00322		<	0.00322	0.00322	
	<	0.00282	0.00282		<	0.00282	0.00282		<	0.00282	0.00282	
	<	0.000621	0.000621		<	0.000621	0.000621		<	0.000621	0.000621	
	<	0.00192	0.00192		<	0.00192	0.00192		<	0.00192	0.00192	
	<	0.000483	0.000483		<	0.000483	0.000483		<	0.000483	0.000483	
	<	0.00282	0.00282		<	0.00282	0.00282		<	0.00282	0.00282	
	<	0.00326	0.00326		<	0.00326	0.00326		<	0.00326	0.00326	
	<	0.00195	0.00195		<	0.00195	0.00195		<	0.00195	0.00195	
	<	0.000456	0.000456		<	0.000456	0.000456		<	0.000456	0.000456	
	<	0.00279	0.00279		<	0.00279	0.00279		<	0.00279	0.00279	
	<	0.00162	0.00162		<	0.00162	0.00162		<	0.00162	0.00162	
	<	0.00303	0.00303		<	0.00303	0.00303		<	0.00303	0.00303	
	<	0.000551	0.000551		<	0.000551	0.000551		<	0.000551	0.000551	

<	0.003	0.003	<	0.003	0.003	<	0.003	0.003
<	0.00289	0.00289	<	0.00289	0.00289	<	0.00289	0.00289

BDE# 2	BDE# 2	BDE# 2	BDE# 2	BDE# 209	BDE# 209	BDE# 209	BDE# 209	BDE# 25	BDE# 25	BDE# 25	BDE# 25	BDE# 28
DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol
<	0.00111	0.00111		<	0.177	0.177		<	0.00111	0.00111		<
<	0.00125	0.00125		<	0.2	0.2		<	0.00125	0.00125		<
<	0.00119	0.00119		<	0.19	0.19		<	0.00119	0.00119		<
<	0.00133	0.00133		<	0.213	0.213		<	0.00133	0.00133		<
<	0.00123	0.00123		<	0.196	0.196		<	0.00123	0.00123		<
<	0.000443	0.000443		<	0.0709	0.0709		<	0.000443	0.000443		<
<	0.000954	0.000954		<	0.153	0.153		<	0.000954	0.000954		<
<	0.00118	0.00118		<	0.189	0.189		<	0.00118	0.00118		<
<	0.00114	0.00114		<	0.182	0.182		<	0.00114	0.00114		<
<	0.00132	0.00132		<	0.211	0.211		<	0.00132	0.00132		<
<	0.00125	0.00125		<	0.2	0.2		<	0.00125	0.00125		<
<	0.000136	0.000136		<	0.0217	0.0217		<	0.000136	0.000136		
<	0.00121	0.00121		<	0.194	0.194		<	0.00121	0.00121		
<	0.000122	0.000122		<	0.0195	0.0195		<	0.000122	0.000122		
<	0.00085	0.00085		<	0.136	0.136		<	0.00085	0.00085		<
<	0.000133	0.000133		<	0.0213	0.0213		<	0.000133	0.000133		
<	0.000947	0.000947		<	0.152	0.152		<	0.000947	0.000947		<
<	0.000144	0.000144		<	0.0231	0.0231		<	0.000144	0.000144		<
<	0.0012	0.0012		<	0.192	0.192		<	0.0012	0.0012		<
<	0.00129	0.00129		<	0.206	0.206		<	0.00129	0.00129		<
<	0.00113	0.00113		<	0.18	0.18		<	0.00113	0.00113		<
<	0.000249	0.000249		<	0.0398	0.0398		<	0.000249	0.000249		
<	0.000767	0.000767		<	0.123	0.123		<	0.000767	0.000767		<
<	0.000193	0.000193		<	0.0309	0.0309		<	0.000193	0.000193		
<	0.00113	0.00113		<	0.18	0.18		<	0.00113	0.00113		<
<	0.0013	0.0013		<	0.208	0.208		<	0.0013	0.0013		<
<	0.000781	0.000781		<	0.125	0.125		<	0.000781	0.000781		<
<	0.000182	0.000182		<	0.0292	0.0292		<	0.000182	0.000182		
<	0.00112	0.00112		<	0.179	0.179		<	0.00112	0.00112		<
<	0.000648	0.000648		<	0.104	0.104		<	0.000648	0.000648		<
<	0.00121	0.00121		<	0.194	0.194		<	0.00121	0.00121		<
<	0.00022	0.00022		<	0.0353	0.0353		<	0.00022	0.00022		

<	0.0012	0.0012	<	0.192	0.192	<	0.0012	0.0012	<
<	0.00116	0.00116	<	0.185	0.185	<	0.00116	0.00116	<

BDE# 28	BDE# 28	BDE# 28	BDE# 3	BDE# 3	BDE# 3	BDE# 3	BDE# 30	BDE# 30	BDE# 30	BDE# 30	BDE# 32	BDE# 32
Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm
0.00111	0.00111		<	0.00111	0.00111		<	0.00111	0.00111		<	0.00111
0.00125	0.00125		<	0.00125	0.00125		<	0.00125	0.00125		<	0.00125
0.00119	0.00119		<	0.00119	0.00119		<	0.00119	0.00119		<	0.00119
0.00133	0.00133		<	0.00133	0.00133		<	0.00133	0.00133		<	0.00133
0.00123	0.00123		<	0.00123	0.00123		<	0.00123	0.00123		<	0.00123
0.000443	0.000443		<	0.000443	0.000443		<	0.000443	0.000443		<	0.000443
0.000954	0.000954		<	0.000954	0.000954		<	0.000954	0.000954		<	0.000954
0.00118	0.00118		<	0.00118	0.00118		<	0.00118	0.00118		<	0.00118
0.00114	0.00114		<	0.00114	0.00114		<	0.00114	0.00114		<	0.00114
0.00132	0.00132		<	0.00132	0.00132		<	0.00132	0.00132		<	0.00132
0.00125	0.00125		<	0.00125	0.00125		<	0.00125	0.00125		<	0.00125
0.00021	0.000136		<	0.000136	0.000136		<	0.000136	0.000136		<	0.000136
0.00165	0.00121		<	0.00121	0.00121		<	0.00121	0.00121		<	0.00121
0.00021	0.000122		<	0.000122	0.000122		<	0.000122	0.000122		<	0.000122
0.00085	0.00085		<	0.00085	0.00085		<	0.00085	0.00085		<	0.00085
0.00058	0.000133		<	0.000133	0.000133		<	0.000133	0.000133		<	0.000133
0.000947	0.000947		<	0.000947	0.000947		<	0.000947	0.000947		<	0.000947
0.000144	0.000144		<	0.000144	0.000144		<	0.000144	0.000144		<	0.000144
0.0012	0.0012		<	0.0012	0.0012		<	0.0012	0.0012		<	0.0012
0.00129	0.00129		<	0.00129	0.00129		<	0.00129	0.00129		<	0.00129
0.00113	0.00113		<	0.00113	0.00113		<	0.00113	0.00113		<	0.00113
0.00025	0.000249		<	0.000249	0.000249		<	0.000249	0.000249		<	0.000249
0.000767	0.000767		<	0.000767	0.000767		<	0.000767	0.000767		<	0.000767
0.00042	0.000193		<	0.000193	0.000193		<	0.000193	0.000193		<	0.000193
0.00113	0.00113		<	0.00113	0.00113		<	0.00113	0.00113		<	0.00113
0.0013	0.0013		<	0.0013	0.0013		<	0.0013	0.0013		<	0.0013
0.000781	0.000781		<	0.000781	0.000781		<	0.000781	0.000781		<	0.000781
0.00046	0.000182		<	0.000182	0.000182		<	0.000182	0.000182		<	0.000182
0.00112	0.00112		<	0.00112	0.00112		<	0.00112	0.00112		<	0.00112
0.000648	0.000648		<	0.000648	0.000648		<	0.000648	0.000648		<	0.000648
0.00121	0.00121		<	0.00121	0.00121		<	0.00121	0.00121		<	0.00121
0.0004	0.00022		<	0.00022	0.00022		<	0.00022	0.00022		<	0.00022

0.0012	0.0012	<	0.0012	0.0012	<	0.0012	0.0012	<	0.0012
0.00116	0.00116	<	0.00116	0.00116	<	0.00116	0.00116	<	0.00116

BDE# 32	BDE# 32	BDE# 33	BDE# 33	BDE# 33	BDE# 33	BDE# 35	BDE# 35	BDE# 35	BDE# 35	BDE# 37	BDE# 37
Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm
0.00111		<	0.00111	0.00111		<	0.00111	0.00111		<	0.00111
0.00125		<	0.00125	0.00125		<	0.00125	0.00125		<	0.00125
0.00119		<	0.00119	0.00119		<	0.00119	0.00119		<	0.00119
0.00133		<	0.00133	0.00133		<	0.00133	0.00133		<	0.00133
0.00123		<	0.00123	0.00123		<	0.00123	0.00123		<	0.00123
0.000443		<	0.000443	0.000443		<	0.000443	0.000443		<	0.000443
0.000954		<	0.000954	0.000954		<	0.000954	0.000954		<	0.000954
0.00118		<	0.00118	0.00118		<	0.00118	0.00118		<	0.00118
0.00114		<	0.00114	0.00114		<	0.00114	0.00114		<	0.00114
0.00132		<	0.00132	0.00132		<	0.00132	0.00132		<	0.00132
0.00125		<	0.00125	0.00125		<	0.00125	0.00125		<	0.00125
0.000136		<	0.000136	0.000136		<	0.000136	0.000136		<	0.000136
0.00121		<	0.00121	0.00121		<	0.00121	0.00121		<	0.00121
0.000122		<	0.000122	0.000122		<	0.000122	0.000122		<	0.000122
0.00085		<	0.00085	0.00085		<	0.00085	0.00085		<	0.00085
0.000133		<	0.000133	0.000133		<	0.000133	0.000133		<	0.000133
0.000947		<	0.000947	0.000947		<	0.000947	0.000947		<	0.000947
0.000144		<	0.000144	0.000144		<	0.000144	0.000144		<	0.000144
0.0012		<	0.0012	0.0012		<	0.0012	0.0012		<	0.0012
0.00129		<	0.00129	0.00129		<	0.00129	0.00129		<	0.00129
0.00113		<	0.00113	0.00113		<	0.00113	0.00113		<	0.00113
0.000249		<	0.000249	0.000249		<	0.000249	0.000249		<	0.000249
0.000767		<	0.000767	0.000767		<	0.000767	0.000767		<	0.000767
0.000193		<	0.000193	0.000193		<	0.000193	0.000193		<	0.000193
0.00113		<	0.00113	0.00113		<	0.00113	0.00113		<	0.00113
0.0013		<	0.0013	0.0013		<	0.0013	0.0013		<	0.0013
0.000781		<	0.000781	0.000781		<	0.000781	0.000781		<	0.000781
0.000182		<	0.000182	0.000182		<	0.000182	0.000182		<	0.000182
0.00112		<	0.00112	0.00112		<	0.00112	0.00112		<	0.00112
0.000648		<	0.000648	0.000648		<	0.000648	0.000648		<	0.000648
0.00121		<	0.00121	0.00121		<	0.00121	0.00121		<	0.00121
0.00022		<	0.00022	0.00022		<	0.00022	0.00022		<	0.00022

0.0012	<	0.0012	0.0012	<	0.0012	0.0012	<	0.0012
0.00116	<	0.00116	0.00116	<	0.00116	0.00116	<	0.00116

BDE# 37	BDE# 37	BDE# 47	BDE# 47	BDE# 47	BDE# 47	BDE# 49	BDE# 49	BDE# 49	BDE# 49	BDE# 66	BDE# 66
Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm
0.00111			0.00347	0.00111		<	0.00111	0.00111		<	0.00111
0.00125			0.00426	0.00125		<	0.00125	0.00125		<	0.00125
0.00119			0.00504	0.00119		<	0.00119	0.00119		<	0.00119
0.00133			0.00581	0.00133		<	0.00133	0.00133		<	0.00133
0.00123			0.00428	0.00123		<	0.00123	0.00123		<	0.00123
0.000443			0.00341	0.000443		<	0.000443	0.000443		<	0.000443
0.000954			0.00486	0.000954		<	0.000954	0.000954		<	0.000954
0.00118			0.00478	0.00118		<	0.00118	0.00118		<	0.00118
0.00114			0.00224	0.00114		<	0.00114	0.00114		<	0.00114
0.00132			0.00343	0.00132		<	0.00132	0.00132		<	0.00132
0.00125			0.00945	0.00125		<	0.00125	0.00125		<	0.00125
0.000136			0.0367	0.000136			0.00467	0.000136			0.00047
0.00121			0.116	0.00121			0.00887	0.00121			0.00137
0.000122			0.0246	0.000122			0.00365	0.000122			0.00041
0.00085			0.00507	0.00085		<	0.00085	0.00085		<	0.00085
0.000133			0.0595	0.000133			0.00557	0.000133			0.00081
0.000947			0.00304	0.000947		<	0.000947	0.000947		<	0.000947
0.000144			0.00592	0.000144			0.00083	0.000144		<	0.000144
0.0012			0.00212	0.0012		<	0.0012	0.0012		<	0.0012
0.00129			0.00261	0.00129		<	0.00129	0.00129		<	0.00129
0.00113			0.00669	0.00113		<	0.00113	0.00113		<	0.00113
0.000249			0.0256	0.000249			0.0028	0.000249			0.00048
0.000767			0.00626	0.000767		<	0.000767	0.000767		<	0.000767
0.000193			0.0306	0.000193		<	0.000193	0.000193			0.00036
0.00113			0.00209	0.00113		<	0.00113	0.00113		<	0.00113
0.0013			0.00476	0.0013		<	0.0013	0.0013		<	0.0013
0.000781			0.014	0.000781			0.0013	0.000781		<	0.000781
0.000182			0.0636	0.000182			0.00658	0.000182			0.0011
0.00112			0.00545	0.00112		<	0.00112	0.00112		<	0.00112
0.000648			0.00824	0.000648		<	0.000648	0.000648		<	0.000648
0.00121			0.0145	0.00121		<	0.00121	0.00121		<	0.00121
0.00022			0.0714	0.00022			0.00612	0.00022			0.00068

0.0012	0.00367	0.0012	<	0.0012	0.0012	<	0.0012
0.00116	0.00633	0.00116	<	0.00116	0.00116	<	0.00116

BDE# 66	BDE# 66	BDE# 7	BDE# 7	BDE# 7	BDE# 7	BDE# 71	BDE# 71	BDE# 71	BDE# 71	BDE# 75	BDE# 75	BDE# 75
Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
0.00111		<	0.00111	0.00111		<	0.00111	0.00111		<	0.00111	0.00111
0.00125		<	0.00125	0.00125		<	0.00125	0.00125		<	0.00125	0.00125
0.00119		<	0.00119	0.00119		<	0.00119	0.00119		<	0.00119	0.00119
0.00133		<	0.00133	0.00133		<	0.00133	0.00133		<	0.00133	0.00133
0.00123		<	0.00123	0.00123		<	0.00123	0.00123		<	0.00123	0.00123
0.000443		<	0.000443	0.000443		<	0.000443	0.000443		<	0.000443	0.000443
0.000954		<	0.000954	0.000954		<	0.000954	0.000954		<	0.000954	0.000954
0.00118		<	0.00118	0.00118		<	0.00118	0.00118		<	0.00118	0.00118
0.00114		<	0.00114	0.00114		<	0.00114	0.00114		<	0.00114	0.00114
0.00132		<	0.00132	0.00132		<	0.00132	0.00132		<	0.00132	0.00132
0.00125		<	0.00125	0.00125		<	0.00125	0.00125		<	0.00125	0.00125
0.000136		<	0.000136	0.000136		<	0.000136	0.000136		<	0.000136	0.000136
0.00121		<	0.00121	0.00121		<	0.00121	0.00121		<	0.00121	0.00121
0.000122		<	0.000122	0.000122		<	0.000122	0.000122		<	0.000122	0.000122
0.00085		<	0.00085	0.00085		<	0.00085	0.00085		<	0.00085	0.00085
0.000133		<	0.000133	0.000133		<	0.000133	0.000133		<	0.000133	0.000133
0.000947		<	0.000947	0.000947		<	0.000947	0.000947		<	0.000947	0.000947
0.000144		<	0.000144	0.000144		<	0.000144	0.000144		<	0.000144	0.000144
0.0012		<	0.0012	0.0012		<	0.0012	0.0012		<	0.0012	0.0012
0.00129		<	0.00129	0.00129		<	0.00129	0.00129		<	0.00129	0.00129
0.00113		<	0.00113	0.00113		<	0.00113	0.00113		<	0.00113	0.00113
0.000249		<	0.000249	0.000249		<	0.000249	0.000249		<	0.000249	0.000249
0.000767		<	0.000767	0.000767		<	0.000767	0.000767		<	0.000767	0.000767
0.000193		<	0.000193	0.000193		<	0.000193	0.000193		<	0.000193	0.000193
0.00113		<	0.00113	0.00113		<	0.00113	0.00113		<	0.00113	0.00113
0.0013		<	0.0013	0.0013		<	0.0013	0.0013		<	0.0013	0.0013
0.000781		<	0.000781	0.000781		<	0.000781	0.000781		<	0.000781	0.000781
0.000182		<	0.000182	0.000182		<	0.000182	0.000182		<	0.000182	0.000182
0.00112		<	0.00112	0.00112		<	0.00112	0.00112		<	0.00112	0.00112
0.000648		<	0.000648	0.000648		<	0.000648	0.000648		<	0.000648	0.000648
0.00121		<	0.00121	0.00121		<	0.00121	0.00121		<	0.00121	0.00121
0.00022		<	0.00022	0.00022		<	0.00022	0.00022			0.00473	0.00022

0.0012	<	0.0012	0.0012	<	0.0012	0.0012	<	0.0012	0.0012
0.00116	<	0.00116	0.00116	<	0.00116	0.00116	<	0.00116	0.00116

BDE# 75	BDE# 77	BDE# 77	BDE# 77	BDE# 77	BDE# 8/11	BDE# 8/11	BDE# 8/11	BDE# 8/11	BDE# 85	BDE# 85	BDE# 85
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
	<	0.00111	0.00111		<	0.00111	0.00111		<	0.00166	0.00166
	<	0.00125	0.00125		<	0.00125	0.00125		<	0.00188	0.00188
	<	0.00119	0.00119		<	0.00119	0.00119		<	0.00179	0.00179
	<	0.00133	0.00133		<	0.00133	0.00133		<	0.00199	0.00199
	<	0.00123	0.00123		<	0.00123	0.00123		<	0.00184	0.00184
	<	0.000443	0.000443		<	0.000443	0.000443		<	0.000665	0.000665
	<	0.000954	0.000954		<	0.000954	0.000954		<	0.00143	0.00143
	<	0.00118	0.00118		<	0.00118	0.00118		<	0.00177	0.00177
	<	0.00114	0.00114		<	0.00114	0.00114		<	0.0017	0.0017
	<	0.00132	0.00132		<	0.00132	0.00132		<	0.00197	0.00197
	<	0.00125	0.00125		<	0.00125	0.00125		<	0.00188	0.00188
	<	0.000136	0.000136		<	0.000136	0.000136		<	0.000203	0.000203
	<	0.00121	0.00121		<	0.00121	0.00121		<	0.00182	0.00182
	<	0.000122	0.000122		<	0.000122	0.000122		<	0.000183	0.000183
	<	0.00085	0.00085		<	0.00085	0.00085		<	0.00128	0.00128
	<	0.000133	0.000133		<	0.000133	0.000133			0.00024	0.0002
	<	0.000947	0.000947		<	0.000947	0.000947		<	0.00142	0.00142
	<	0.000144	0.000144		<	0.000144	0.000144		<	0.000217	0.000217
	<	0.0012	0.0012		<	0.0012	0.0012		<	0.0018	0.0018
	<	0.00129	0.00129		<	0.00129	0.00129		<	0.00193	0.00193
	<	0.00113	0.00113		<	0.00113	0.00113		<	0.00169	0.00169
	<	0.000249	0.000249		<	0.000249	0.000249		<	0.000373	0.000373
	<	0.000767	0.000767		<	0.000767	0.000767		<	0.00115	0.00115
	<	0.000193	0.000193		<	0.000193	0.000193		<	0.00029	0.00029
	<	0.00113	0.00113		<	0.00113	0.00113		<	0.00169	0.00169
	<	0.0013	0.0013		<	0.0013	0.0013		<	0.00195	0.00195
	<	0.000781	0.000781		<	0.000781	0.000781		<	0.00117	0.00117
	<	0.000182	0.000182		<	0.000182	0.000182		<	0.000273	0.000273
	<	0.00112	0.00112		<	0.00112	0.00112		<	0.00167	0.00167
	<	0.000648	0.000648		<	0.000648	0.000648		<	0.000972	0.000972
	<	0.00121	0.00121		<	0.00121	0.00121		<	0.00182	0.00182
	<	0.00022	0.00022		<	0.00022	0.00022		<	0.000331	0.000331

<	0.0012	0.0012	<	0.0012	0.0012	<	0.0018	0.0018
<	0.00116	0.00116	<	0.00116	0.00116	<	0.00174	0.00174

BDE# 85	BDE# 99	BDE# 99	BDE# 99	BDE# 99	BDE-TOTAL	BDE-TOTAL	BDE-TOTAL	BDE-TOTAL	chlorpyrifos	chlorpyrifos	chlorpyrifos
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
	<	0.00166	0.00166		<	0.0221	0.0221		<	0.000336	0.000336
	<	0.00188	0.00188		<	0.025	0.025		<	0.000472	0.000472
	<	0.00179	0.00179		<	0.0238	0.0238		<	0.0005	0.0005
	<	0.00199	0.00199		<	0.0266	0.0266		<	0.000526	0.000526
		0.00391	0.00184		<	0.0245	0.0245		<	0.00049	0.00049
		0.00285	0.000665		<	0.00887	0.00887		<	0.000177	0.000177
		0.00306	0.00143		<	0.0191	0.0191		<	0.000382	0.000382
		0.00468	0.00177		<	0.0236	0.0236		<	0.000472	0.000472
	<	0.0017	0.0017		<	0.0227	0.0227		<	0.000495	0.000495
	<	0.00197	0.00197		<	0.0263	0.0263		<	0.000476	0.000476
		0.00285	0.00188		<	0.025	0.025		<	0.0005	0.0005
		0.00136	0.000203			0.0615	0.00271			0.000288	0.0000542
		0.00544	0.00182			0.156	0.0243			0.000493	0.000485
		0.00256	0.000183			0.0424	0.00244			0.000488	0.0000488
		0.00469	0.00128		<	0.017	0.017		<	0.00034	0.00034
		0.00269	0.0002			0.0891	0.00266			0.000088	0.0000532
		0.0019	0.00142		<	0.0189	0.0189		<	0.000379	0.000379
		0.00059	0.000217			0.0096	0.00289			0.000411	0.0000577
	<	0.0018	0.0018		<	0.024	0.024		<	0.000455	0.000455
	<	0.00193	0.00193		<	0.0258	0.0258		<	0.000459	0.000459
		0.00273	0.00169		<	0.0225	0.0225			0.00165	0.00045
		0.00131	0.000373			0.041	0.00497			0.000101	0.0000994
		0.00149	0.00115		<	0.0153	0.0153			0.000309	0.000307
		0.00136	0.00029			0.0396	0.00386			0.000243	0.0000773
	<	0.00169	0.00169		<	0.0225	0.0225		<	0.000515	0.000515
	<	0.00195	0.00195		<	0.026	0.026		<	0.000459	0.000459
		0.00368	0.00117			0.0223	0.0156			0.000374	0.000312
		0.00489	0.000273			0.102	0.00364		<	0.0000729	0.0000729
		0.00305	0.00167		<	0.0223	0.0223		<	0.000446	0.000446
		0.00224	0.000972			0.0137	0.013		<	0.000259	0.000259
		0.00332	0.00182		<	0.0243	0.0243		<	0.000485	0.000485
		0.00256	0.000331			0.106	0.00441		<	0.0000882	0.0000882
									<	0.00312	0.00312
									<	0.00139	0.00139

						<	0.00294	0.00294
						<	0.00104	0.00104
						<	0.0025	0.0025
						<	0.000556	0.000556
<	0.0018	0.0018	<	0.024	0.024	<	0.000431	0.000431
<	0.00174	0.00174	<	0.0231	0.0231	<	0.000455	0.000455

chlorpyrifos	1,2,3,4-Tetrachlorobenzene	1,2,3,4-Tetrachlorobenzene	1,2,3,4-Tetrachlorobenzene	1,2,3,4-Tetrachlorobenzene	1,2,4,5-Tetrachlorobenzene	1,2,4,5-Tetrachlorobenzene	1,2,4,5-Tetrachlorobenzene
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
		0.00486	0.000336		<	0.000336	0.000336
		0.0145	0.000472			0.00195	0.000472
	<	0.0005	0.0005		<	0.0005	0.0005
		0.0044	0.000526		<	0.000526	0.000526
		0.000854	0.00049			0.00668	0.00049
	<	0.000177	0.000177			0.00181	0.000177
	<	0.000382	0.000382			0.00478	0.000382
		0.000596	0.000472			0.00786	0.000472
		0.00223	0.000495		<	0.000495	0.000495
		0.00416	0.000476		<	0.000476	0.000476
	<	0.0005	0.0005			0.00574	0.0005
CONFIRMED BY	<	0.0000542	0.0000542			0.000582	0.0000542
CONFIRMED BY	<	0.000485	0.000485			0.00383	0.000485
		0.000062	0.0000488		<	0.0000488	0.0000488
	<	0.00034	0.00034			0.00334	0.00034
		0.000223	0.0000532			0.000811	0.0000532
		0.000715	0.000379			0.00533	0.000379
		0.000126	0.0000577			0.000621	0.0000577
	<	0.000455	0.000455		<	0.000455	0.000455
		0.071	0.000459		<	0.000459	0.000459
		0.000508	0.00045			0.00528	0.00045
		0.000102	0.0000994			0.00213	0.0000994
	<	0.000307	0.000307			0.00376	0.000307
		0.000171	0.0000773			0.00104	0.0000773
		0.0453	0.000515			0.0104	0.000515
	<	0.000459	0.000459		<	0.000459	0.000459
		0.000509	0.000312			0.00427	0.000312
	<	0.0000729	0.0000729			0.000686	0.0000729
		0.000533	0.000446			0.00587	0.000446
	<	0.000259	0.000259			0.00237	0.000259
CONFIRMED BY	<	0.000485	0.000485			0.00548	0.000485
CONFIRMED BY	<	0.0000882	0.0000882			0.000717	0.0000882
	<	0.00312	0.00312			0.0358	0.00312
		0.0273	0.00139			0.124	0.00139

<	0.00294	0.00294		0.105	0.00294
	0.0372	0.00104		0.0186	0.00104
	0.0135	0.0025	<	0.0025	0.0025
<	0.000556	0.000556	<	0.000556	0.000556
<	0.000431	0.000431	<	0.000431	0.000431
<	0.000455	0.000455		0.00608	0.000455

1,2,4,5-Tetrachlorobenzene	Cl1-PCB	Cl1-PCB	Cl1-PCB	Cl1-PCB	Cl10-PCB	Cl10-PCB	Cl10-PCB	Cl10-PCB	Cl2-PCB	Cl2-PCB	Cl2-PCB
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
	<	0.00671	0.00671		<	0.00671	0.00671		<	0.00671	0.00671
		0.0104	0.00943		<	0.00943	0.00943		<	0.00943	0.00943
	<	0.01	0.01		<	0.01	0.01		<	0.01	0.01
		0.0203	0.0105		<	0.0105	0.0105			0.0135	0.0105
	<	0.0098	0.0098		<	0.0098	0.0098		<	0.0098	0.0098
	<	0.00355	0.00355		<	0.00355	0.00355		<	0.00355	0.00355
	<	0.00763	0.00763		<	0.00763	0.00763		<	0.00763	0.00763
	<	0.00943	0.00943		<	0.00943	0.00943		<	0.00943	0.00943
	<	0.0099	0.0099		<	0.0099	0.0099		<	0.0099	0.0099
	<	0.00952	0.00952		<	0.00952	0.00952			0.0215	0.00952
	<	0.01	0.01		<	0.01	0.01		<	0.01	0.01
	<	0.00108	0.00108			0.00404	0.00108		<	0.00108	0.00108
GC/MS	<	0.00971	0.00971		<	0.00971	0.00971		<	0.00971	0.00971
	<	0.000977	0.000977			0.00214	0.000977			0.00867	0.000977
	<	0.0068	0.0068		<	0.0068	0.0068		<	0.0068	0.0068
	<	0.00106	0.00106			0.00354	0.00106			0.00449	0.00106
	<	0.00758	0.00758		<	0.00758	0.00758		<	0.00758	0.00758
	<	0.00115	0.00115		<	0.00115	0.00115			0.00311	0.00115
		0.0148	0.00909		<	0.00909	0.00909		<	0.00909	0.00909
	<	0.00917	0.00917		<	0.00917	0.00917			0.0673	0.00917
	<	0.00901	0.00901		<	0.00901	0.00901		<	0.00901	0.00901
	<	0.00199	0.00199			0.00243	0.00199		<	0.00199	0.00199
	<	0.00613	0.00613		<	0.00613	0.00613		<	0.00613	0.00613
	<	0.00155	0.00155		<	0.00155	0.00155			0.00246	0.00155
	<	0.0103	0.0103		<	0.0103	0.0103		<	0.0103	0.0103
	<	0.00917	0.00917		<	0.00917	0.00917		<	0.00917	0.00917
	<	0.00625	0.00625		<	0.00625	0.00625		<	0.00625	0.00625
	<	0.00146	0.00146		<	0.00146	0.00146		<	0.00146	0.00146
	<	0.00893	0.00893		<	0.00893	0.00893		<	0.00893	0.00893
	<	0.00518	0.00518		<	0.00518	0.00518		<	0.00518	0.00518
	<	0.00971	0.00971		<	0.00971	0.00971		<	0.00971	0.00971
	<	0.00176	0.00176		<	0.00176	0.00176		<	0.00176	0.00176
		0.146	0.0625		<	0.0625	0.0625			0.0674	0.0625
		0.122	0.0278		<	0.0278	0.0278		<	0.0278	0.0278

	0.252	0.0588	<	0.0588	0.0588		0.461	0.0588
	0.0399	0.0208	<	0.0208	0.0208		0.0685	0.0208
<	0.05	0.05	<	0.05	0.05		0.0738	0.05
	0.0314	0.0111	<	0.0111	0.0111		0.054	0.0111
	0.0262	0.00862	<	0.00862	0.00862	<	0.00862	0.00862
	0.0306	0.00909	<	0.00909	0.00909		0.0129	0.00909

Cl2-PCB	Cl3-PCB	Cl3-PCB	Cl3-PCB	Cl3-PCB	Cl4-PCB	Cl4-PCB	Cl4-PCB	Cl4-PCB	Cl5-PCB	Cl5-PCB	Cl5-PCB
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
		0.0167	0.00671		<	0.00671	0.00671			0.0189	0.00671
		0.0157	0.00943			0.00978	0.00943			0.0302	0.00943
		0.0301	0.01		<	0.01	0.01			0.0316	0.01
		0.0637	0.0105			0.0236	0.0105			0.0587	0.0105
		0.0159	0.0098			0.0316	0.0098			0.0246	0.0098
		0.0174	0.00355			0.0199	0.00355			0.0348	0.00355
		0.0199	0.00763			0.0283	0.00763			0.0463	0.00763
	<	0.00943	0.00943		<	0.00943	0.00943			0.0317	0.00943
	<	0.0099	0.0099			0.0135	0.0099			0.059	0.0099
		0.0395	0.00952			0.0547	0.00952			0.174	0.00952
	<	0.01	0.01			0.0446	0.01			0.0398	0.01
		0.0256	0.00108			0.0409	0.00108			0.331	0.00108
		0.0717	0.00971			0.125	0.00971			0.196	0.00971
		0.0264	0.000977			0.0557	0.000977			0.0632	0.000977
		0.0132	0.0068			0.0217	0.0068			0.0229	0.0068
		0.0167	0.00106			0.0357	0.00106			0.0662	0.00106
		0.0104	0.00758			0.0198	0.00758			0.0179	0.00758
		0.0119	0.00115			0.0194	0.00115			0.0384	0.00115
		0.0239	0.00909		<	0.00909	0.00909			0.0482	0.00909
		0.17	0.00917			0.276	0.00917			0.0226	0.00917
		0.0118	0.00901			0.0352	0.00901			0.0387	0.00901
		0.0172	0.00199			0.0425	0.00199			0.101	0.00199
		0.00792	0.00613			0.0196	0.00613			0.0109	0.00613
		0.0132	0.00155			0.0207	0.00155			0.0371	0.00155
	<	0.0103	0.0103			0.0219	0.0103		<	0.0103	0.0103
		0.0371	0.00917			0.0452	0.00917			0.0101	0.00917
		0.0165	0.00625			0.0233	0.00625			0.0228	0.00625
		0.015	0.00146			0.0355	0.00146			0.0584	0.00146
		0.0111	0.00893			0.0198	0.00893			0.00924	0.00893
		0.00669	0.00518			0.0167	0.00518			0.0179	0.00518
		0.0178	0.00971			0.0336	0.00971			0.0368	0.00971
		0.016	0.00176			0.0501	0.00176			0.126	0.00176
	<	0.0625	0.0625			0.55	0.0625			0.273	0.0625
	<	0.0278	0.0278		<	0.0278	0.0278			0.187	0.0278

	0.488	0.0588		0.631	0.0588	1.37	0.0588
	0.0892	0.0208		0.214	0.0208	0.344	0.0208
<	0.05	0.05	<	0.05	0.05	0.101	0.05
	0.0138	0.0111		0.0472	0.0111	0.0821	0.0111
	0.0133	0.00862		0.0603	0.00862	0.0626	0.00862
	0.0427	0.00909		0.077	0.00909	0.0519	0.00909

Cl5-PCB	Cl6-PCB	Cl6-PCB	Cl6-PCB	Cl6-PCB	Cl7-PCB	Cl7-PCB	Cl7-PCB	Cl7-PCB	Cl8-PCB	Cl8-PCB	Cl8-PCB
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
		0.0258	0.00671			0.0114	0.00671		<	0.00671	0.00671
		0.0209	0.00943			0.00955	0.00943			0.0656	0.00943
		0.0516	0.01			0.0188	0.01			0.0114	0.01
		0.0187	0.0105			0.0171	0.0105			0.019	0.0105
		0.0166	0.0098			0.0189	0.0098		<	0.0098	0.0098
		0.0494	0.00355			0.0309	0.00355			0.0102	0.00355
		0.0322	0.00763			0.0181	0.00763		<	0.00763	0.00763
		0.03	0.00943			0.0155	0.00943		<	0.00943	0.00943
		0.0582	0.0099		<	0.0099	0.0099			0.0169	0.0099
		0.163	0.00952			0.0318	0.00952			0.0285	0.00952
		0.0336	0.01			0.0331	0.01		<	0.01	0.01
		0.599	0.00108			0.396	0.00108			0.0478	0.00108
		0.152	0.00971			0.143	0.00971			0.0199	0.00971
		0.065	0.000977			0.053	0.000977			0.0146	0.000977
		0.0158	0.0068			0.014	0.0068		<	0.0068	0.0068
		0.0769	0.00106			0.0699	0.00106			0.0149	0.00106
		0.0175	0.00758			0.0152	0.00758		<	0.00758	0.00758
		0.0347	0.00115			0.0193	0.00115			0.005	0.00115
		0.0453	0.00909			0.012	0.00909		<	0.00909	0.00909
	<	0.00917	0.00917		<	0.00917	0.00917		<	0.00917	0.00917
		0.039	0.00901			0.0288	0.00901		<	0.00901	0.00901
		0.13	0.00199			0.102	0.00199			0.031	0.00199
		0.00849	0.00613			0.0108	0.00613		<	0.00613	0.00613
		0.0336	0.00155			0.0305	0.00155			0.00581	0.00155
	<	0.0103	0.0103			0.0163	0.0103		<	0.0103	0.0103
	<	0.00917	0.00917		<	0.00917	0.00917		<	0.00917	0.00917
		0.0199	0.00625			0.0246	0.00625		<	0.00625	0.00625
		0.0759	0.00146			0.0839	0.00146			0.0155	0.00146
		0.0102	0.00893			0.0133	0.00893		<	0.00893	0.00893
		0.0221	0.00518			0.0105	0.00518		<	0.00518	0.00518
		0.0279	0.00971			0.0284	0.00971		<	0.00971	0.00971
		0.134	0.00176			0.119	0.00176			0.0229	0.00176
	<	0.0625	0.0625		<	0.0625	0.0625			0.0869	0.0625
		0.103	0.0278		<	0.0278	0.0278		<	0.0278	0.0278

0.726	0.0588	0.21	0.0588	<	0.0588	0.0588
0.195	0.0208	0.0249	0.0208	<	0.0208	0.0208
0.162	0.05	0.0625	0.05	<	0.05	0.05
0.0758	0.0111	0.0331	0.0111		0.0299	0.0111
0.0517	0.00862	0.014	0.00862	<	0.00862	0.00862
0.0654	0.00909	0.0412	0.00909	<	0.00909	0.00909

Cl8-PCB	Cl9-PCB	Cl9-PCB	Cl9-PCB	Cl9-PCB	PCB# 1	PCB# 1	PCB# 1	PCB# 1	PCB# 101/90	PCB# 101/90
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm
	<	0.00671	0.00671		<	0.0000671	0.0000671			0.000696
	<	0.00943	0.00943			0.0104	0.0000943			0.00705
	<	0.01	0.01		<	0.0001	0.0001			0.014
	<	0.0105	0.0105			0.0203	0.000105			0.0218
	<	0.0098	0.0098			0.00112	0.000098			0.00539
		0.00925	0.00355		<	0.0000355	0.0000355			0.00741
	<	0.00763	0.00763			0.0002	0.0000763			0.00729
		0.0301	0.00943			0.00206	0.0000943			0.00939
	<	0.0099	0.0099		<	0.000099	0.000099			0.00846
		0.0148	0.00952			0.00456	0.0000952			0.00358
	<	0.01	0.01			0.0009	0.0001			0.00767
		0.00987	0.00108			0.000074	0.0000108			0.0186
	<	0.00971	0.00971			0.00352	0.0000971			0.0232
		0.0045	0.000977			0.000289	0.00000977			0.00784
	<	0.0068	0.0068			0.00053	0.000068			0.00596
		0.00338	0.00106			0.000116	0.0000106			0.0101
	<	0.00758	0.00758			0.000094	0.0000758			0.00308
		0.00165	0.00115			0.000145	0.0000116			0.00427
	<	0.00909	0.00909			0.0148	0.0000909		<	0.0000909
	<	0.00917	0.00917		<	0.0000917	0.0000917			0.0138
	<	0.00901	0.00901			0.000697	0.0000901			0.00537
		0.00557	0.00199		<	0.0000199	0.0000199			0.0103
	<	0.00613	0.00613			0.00148	0.0000614			0.000829
		0.0046	0.00155		<	0.0000155	0.0000155			0.0055
	<	0.0103	0.0103		<	0.000103	0.000103		<	0.000103
	<	0.00917	0.00917		<	0.0000917	0.0000917			0.00746
	<	0.00625	0.00625			0.000232	0.0000625			0.00467
		0.00231	0.00146		<	0.0000146	0.0000146			0.00773
	<	0.00893	0.00893			0.000953	0.0000893			0.00183
		0.00827	0.00518		<	0.0000518	0.0000518			0.00299
	<	0.00971	0.00971			0.00341	0.0000971			0.0058
		0.00472	0.00176		<	0.0000176	0.0000176			0.0123
	<	0.0625	0.0625			0.146	0.000625			0.0507
	<	0.0278	0.0278			0.122	0.000278			0.0372

<	0.0588	0.0588	0.252	0.000588		0.275
<	0.0208	0.0208	0.0399	0.000208		0.0829
<	0.05	0.05	0.0492	0.0005	<	0.0005
<	0.0111	0.0111	0.0314	0.000111		0.00454
<	0.00862	0.00862	0.0262	0.0000862		0.0206
<	0.00909	0.00909	0.0306	0.0000909		0.00757

PCB# 101/90	PCB# 101/90	PCB# 105	PCB# 105	PCB# 105	PCB# 105	PCB# 107	PCB# 107	PCB# 107
Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
0.0000671			0.00567	0.0000671		<	0.0000671	0.0000671
0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943
0.0001		<	0.0001	0.0001		<	0.0001	0.0001
0.000105			0.00135	0.000105		<	0.000105	0.000105
0.000098			0.00117	0.000098			0.00103	0.000098
0.0000355			0.0023	0.0000355		<	0.0000355	0.0000355
0.0000763			0.00376	0.0000763			0.000856	0.0000763
0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943
0.000099			0.000884	0.000099		<	0.000099	0.000099
0.0000952			0.00121	0.0000952		<	0.0000952	0.0000952
0.0001			0.00246	0.0001			0.00131	0.0001
0.0000108	COM M - CONFIRMED BY GC/MS		0.0191	0.0000108	COM M - CONFIRMED BY GC/MS		0.0124	0.0000108
0.0000971	COM M - CONFIRMED BY GC/MS		0.0108	0.0000971	COM M - CONFIRMED BY GC/MS		0.00571	0.0000971
0.00000977			0.00606	0.00000977			0.00283	0.00000977
0.000068			0.00141	0.000068			0.000862	0.000068
0.0000106			0.00438	0.0000106			0.00355	0.0000106
0.0000758			0.000714	0.0000758		<	0.0000758	0.0000758
0.0000116			0.00339	0.0000116			0.00161	0.0000116
0.0000909		<	0.0000909	0.0000909		<	0.0000909	0.0000909
0.0000917		<	0.0000917	0.0000917		<	0.0000917	0.0000917
0.0000901			0.00482	0.0000901			0.00108	0.0000901
0.0000199			0.0113	0.0000199			0.00263	0.0000199
0.0000614			0.00124	0.0000614		<	0.0000614	0.0000614
0.0000155			0.00234	0.0000155			0.00124	0.0000155
0.000103		<	0.000103	0.000103		<	0.000103	0.000103
0.0000917	COM M - CONFIRMED BY GC/MS		0.000855	0.0000917	COM M - CONFIRMED BY GC/MS	<	0.0000917	0.0000917
0.0000625			0.00134	0.0000625			0.000377	0.0000625
0.0000146			0.00517	0.0000146			0.00053	0.0000146
0.0000893			0.000784	0.0000893			0.000426	0.0000893
0.0000518			0.00213	0.0000518		<	0.0000518	0.0000518
0.0000971	COM M - CONFIRMED BY GC/MS		0.00335	0.0000971	COM M - CONFIRMED BY GC/MS		0.000557	0.0000971
0.0000176	COM M - CONFIRMED BY GC/MS		0.0116	0.0000176	COM M - CONFIRMED BY GC/MS		0.00586	0.0000176
0.000625		<	0.000625	0.000625		<	0.000625	0.000625
0.000278		<	0.000278	0.000278		<	0.000278	0.000278

0.000588	COM M - CONFIRMED BY GC/MS		0.0756	0.000588	COM M - CONFIRMED BY GC/MS	<	0.000588	0.000588
0.000208			0.00675	0.000208		<	0.000208	0.000208
0.0005		<	0.0005	0.0005		<	0.0005	0.0005
0.000111			0.0012	0.000111		<	0.000111	0.000111
0.0000862			0.00159	0.0000862		<	0.0000862	0.0000862
0.0000909			0.00178	0.0000909		<	0.0000909	0.0000909

PCB# 107	PCB# 110	PCB# 110	PCB# 110	PCB# 110	PCB# 114	PCB# 114	PCB# 114	PCB# 114	PCB# 118
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol
		0.0126	0.0000671		<	0.0000671	0.0000671		<
	<	0.0000943	0.0000943		<	0.0000943	0.0000943		
		0.0079	0.0001		<	0.0001	0.0001		
		0.00591	0.000105		<	0.000105	0.000105		
		0.00308	0.000098		<	0.000098	0.000098		
		0.00645	0.0000355		<	0.0000355	0.0000355		
		0.00767	0.0000763		<	0.0000763	0.0000763		
		0.00602	0.0000943		<	0.0000943	0.0000943		
		0.0123	0.000099		<	0.000099	0.000099		
		0.0205	0.0000952		<	0.0000952	0.0000952		
		0.00748	0.0001		<	0.0001	0.0001		
COM M - CONFIRMED BY GC/MS		0.112	0.0000108	COM M - CONFIRMED BY GC/MS	<	0.0000108	0.0000108		
COM M - CONFIRMED BY GC/MS		0.0336	0.0000971	COM M - CONFIRMED BY GC/MS	<	0.0000971	0.0000971		
		0.0115	0.00000977		<	0.00000977	0.00000977		
		0.00398	0.000068		<	0.000068	0.000068		
	<	0.0000106	0.0000106		<	0.0000106	0.0000106		
		0.00283	0.0000758		<	0.0000758	0.0000758		
		0.00507	0.0000116		<	0.0000116	0.0000116		
	<	0.0000909	0.0000909		<	0.0000909	0.0000909		<
		0.00168	0.0000917		<	0.0000917	0.0000917		<
		0.00843	0.0000901		<	0.0000901	0.0000901		
		0.022	0.0000199		<	0.0000199	0.0000199		
		0.00216	0.0000614		<	0.0000614	0.0000614		
		0.00607	0.0000155		<	0.0000155	0.0000155		
	<	0.000103	0.000103		<	0.000103	0.000103		<
	<	0.0000917	0.0000917		<	0.0000917	0.0000917		<
		0.00395	0.0000625		<	0.0000625	0.0000625		
		0.0126	0.0000146		<	0.0000146	0.0000146		
		0.00167	0.0000893		<	0.0000893	0.0000893		
		0.00361	0.0000518		<	0.0000518	0.0000518		
COM M - CONFIRMED BY GC/MS		0.00665	0.0000971	COM M - CONFIRMED BY GC/MS	<	0.0000971	0.0000971		
		0.0238	0.0000176	COM M - CONFIRMED BY GC/MS	<	0.0000176	0.0000176		
		0.0201	0.000625		<	0.000625	0.000625		
	<	0.000278	0.000278		<	0.000278	0.000278		

	0.283	0.000588	COM M - CONFIRMED BY GC/MS	<	0.000588	0.000588	
	0.0447	0.000208		<	0.000208	0.000208	
<	0.0005	0.0005		<	0.0005	0.0005	<
	0.0203	0.000111		<	0.000111	0.000111	
	0.00352	0.0000862		<	0.0000862	0.0000862	
	0.00681	0.0000909		<	0.0000909	0.0000909	<

PCB# 118	PCB# 118	PCB# 118	PCB# 119	PCB# 119	PCB# 119	PCB# 119	PCB# 126	PCB# 126	PCB# 126
Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
0.0000671	0.0000671		<	0.0000671	0.0000671		<	0.0000671	0.0000671
0.00492	0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943
0.00516	0.0001		<	0.0001	0.0001		<	0.0001	0.0001
0.00592	0.000105		<	0.000105	0.000105		<	0.000105	0.000105
0.00407	0.000098			0.000913	0.000098		<	0.000098	0.000098
0.00814	0.0000355		<	0.0000355	0.0000355		<	0.0000355	0.0000355
0.00883	0.0000763		<	0.0000763	0.0000763		<	0.0000763	0.0000763
0.0088	0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943
0.0246	0.000099		<	0.000099	0.000099		<	0.000099	0.000099
0.0638	0.0000952			0.000822	0.0000952		<	0.0000952	0.0000952
0.00516	0.0001			0.000259	0.0001		<	0.0001	0.0001
0.152	0.0000108	COM M - CONFIRMED BY GC/MS		0.00025	0.0000108	COM M - CONFIRMED BY GC/MS	<	0.0000108	0.0000108
0.0285	0.0000971	COM M - CONFIRMED BY GC/MS		0.000115	0.0000971		<	0.0000971	0.0000971
0.0123	0.00000977			0.000532	0.00000977		<	0.00000977	0.00000977
0.00316	0.000068			0.000237	0.000068		<	0.000068	0.000068
0.0115	0.0000106		<	0.0000106	0.0000106		<	0.0000106	0.0000106
0.00355	0.0000758		<	0.0000758	0.0000758		<	0.0000758	0.0000758
0.00672	0.0000116			0.000212	0.0000116		<	0.0000116	0.0000116
0.0000909	0.0000909		<	0.0000909	0.0000909		<	0.0000909	0.0000909
0.0000917	0.0000917		<	0.0000917	0.0000917		<	0.0000917	0.0000917
0.00647	0.0000901			0.00022	0.0000901		<	0.0000901	0.0000901
0.0228	0.0000199		<	0.0000199	0.0000199		<	0.0000199	0.0000199
0.00102	0.0000614			0.000154	0.0000614		<	0.0000614	0.0000614
0.00608	0.0000155			0.000188	0.0000155		<	0.0000155	0.0000155
0.000103	0.000103		<	0.000103	0.000103		<	0.000103	0.000103
0.0000917	0.0000917		<	0.0000917	0.0000917		<	0.0000917	0.0000917
0.00372	0.0000625		<	0.0000625	0.0000625		<	0.0000625	0.0000625
0.0127	0.0000146		<	0.0000146	0.0000146		<	0.0000146	0.0000146
0.00124	0.0000893			0.000154	0.0000893		<	0.0000893	0.0000893
0.00473	0.0000518		<	0.0000518	0.0000518		<	0.0000518	0.0000518
0.00691	0.0000971	COM M - CONFIRMED BY GC/MS	<	0.0000971	0.0000971		<	0.0000971	0.0000971
0.0276	0.0000176	COM M - CONFIRMED BY GC/MS	<	0.0000176	0.0000176		<	0.0000176	0.0000176
0.0154	0.000625		<	0.000625	0.000625		<	0.000625	0.000625
0.0119	0.000278		<	0.000278	0.000278		<	0.000278	0.000278

0.149	0.000588	COM M - CONFIRMED BY GC/MS	<	0.000588	0.000588		<	0.000588	0.000588
0.035	0.000208		<	0.000208	0.000208		<	0.000208	0.000208
0.0005	0.0005		<	0.0005	0.0005		<	0.0005	0.0005
0.0133	0.000111		<	0.000111	0.000111		<	0.000111	0.000111
0.00771	0.0000862		<	0.0000862	0.0000862		<	0.0000862	0.0000862
0.0000909	0.0000909		<	0.0000909	0.0000909		<	0.0000909	0.0000909

PCB# 126	PCB# 128	PCB# 128	PCB# 128	PCB# 128	PCB# 129	PCB# 129	PCB# 129	PCB# 129
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments
	<	0.0000671	0.0000671		<	0.0000671	0.0000671	
		0.00294	0.0000943		<	0.0000943	0.0000943	
	<	0.0001	0.0001			0.0018	0.0001	
	<	0.000105	0.000105		<	0.000105	0.000105	
		0.00107	0.000098		<	0.000098	0.000098	
		0.00192	0.0000355		<	0.0000355	0.0000355	
		0.00197	0.0000763		<	0.0000763	0.0000763	
		0.00146	0.0000943		<	0.0000943	0.0000943	
		0.00654	0.000099		<	0.000099	0.000099	
		0.0149	0.0000952		<	0.0000952	0.0000952	
		0.00149	0.0001		<	0.0001	0.0001	
COM M - CONFIRMED BY GC/MS		0.0116	0.0000108	COM M - CONFIRMED BY GC/MS		0.000228	0.0000108	COM M - CONFIRMED BY GC/MS
		0.0059	0.0000971	COM M - CONFIRMED BY GC/MS		0.000186	0.0000971	
		0.00333	0.00000977			0.000174	0.00000977	
		0.000674	0.000068			0.000136	0.000068	
		0.00338	0.0000106		<	0.0000106	0.0000106	
		0.00124	0.0000758			0.000244	0.0000758	
		0.00192	0.0000116			0.000172	0.0000116	
	<	0.0000909	0.0000909			0.00077	0.0000909	
	<	0.0000917	0.0000917		<	0.0000917	0.0000917	
		0.00227	0.0000901			0.000149	0.0000901	
		0.00626	0.0000199		<	0.0000199	0.0000199	
		0.0004	0.0000614		<	0.0000614	0.0000614	
		0.0015	0.0000155			0.000139	0.0000155	
	<	0.000103	0.000103		<	0.000103	0.000103	
	<	0.0000917	0.0000917		<	0.0000917	0.0000917	
		0.000668	0.0000625			0.000108	0.0000625	
		0.00309	0.0000146		<	0.0000146	0.0000146	
		0.000484	0.0000893			0.00037	0.0000893	
		0.0011	0.0000518		<	0.0000518	0.0000518	
		0.00163	0.0000971	COM M - CONFIRMED BY GC/MS	<	0.0000971	0.0000971	
		0.00577	0.0000176	COM M - CONFIRMED BY GC/MS	<	0.0000176	0.0000176	
	<	0.000625	0.000625		<	0.000625	0.000625	
	<	0.000278	0.000278		<	0.000278	0.000278	

	0.0524	0.000588	COM M - CONFIRMED BY GC/MS		0.0222	0.000588	COM M - CONFIRMED BY GC/MS
	0.0121	0.000208		<	0.000208	0.000208	
<	0.0005	0.0005		<	0.0005	0.0005	
	0.00624	0.000111		<	0.000111	0.000111	
<	0.0000862	0.0000862			0.00028	0.0000862	
	0.0022	0.0000909		<	0.0000909	0.0000909	

PCB# 130	PCB# 130	PCB# 130	PCB# 130	PCB# 135	PCB# 135	PCB# 135	PCB# 135	PCB# 136	PCB# 136	PCB# 136
DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
<	0.0000671	0.0000671		<	0.0000671	0.0000671		<	0.0000671	0.0000671
<	0.0000943	0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943
	0.0053	0.0001		<	0.0001	0.0001		<	0.0001	0.0001
<	0.000105	0.000105		<	0.000105	0.000105		<	0.000105	0.000105
<	0.000098	0.000098		<	0.000098	0.000098		<	0.000098	0.000098
<	0.0000355	0.0000355		<	0.0000355	0.0000355		<	0.0000355	0.0000355
	0.000153	0.0000763			0.000571	0.0000763		<	0.0000763	0.0000763
<	0.0000943	0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943
	0.00123	0.000099		<	0.000099	0.000099		<	0.000099	0.000099
	0.00351	0.0000952		<	0.0000952	0.0000952		<	0.0000952	0.0000952
	0.000157	0.0001			0.000179	0.0001			0.000234	0.0001
	0.000168	0.0000108		<	0.0000108	0.0000108		<	0.0000108	0.0000108
<	0.0000971	0.0000971			0.00077	0.0000971			0.000387	0.0000971
	0.000248	0.00000977			0.000161	0.00000977			0.000099	0.00000977
	0.000507	0.000068			0.000427	0.000068			0.000286	0.000068
<	0.0000106	0.0000106		<	0.0000106	0.0000106			0.000835	0.0000106
<	0.0000758	0.0000758			0.000199	0.0000758		<	0.0000758	0.0000758
	0.00025	0.0000116			0.000123	0.0000116			0.0003	0.0000116
	0.00372	0.0000909		<	0.0000909	0.0000909			0.00418	0.0000909
<	0.0000917	0.0000917		<	0.0000917	0.0000917		<	0.0000917	0.0000917
	0.000634	0.0000901		<	0.0000901	0.0000901			0.0001	0.0000901
<	0.0000199	0.0000199		<	0.0000199	0.0000199		<	0.0000199	0.0000199
	0.000148	0.0000614		<	0.0000614	0.0000614			0.00013	0.0000614
	0.000251	0.0000155			0.0003	0.0000155			0.000236	0.0000155
<	0.000103	0.000103		<	0.000103	0.000103		<	0.000103	0.000103
<	0.0000917	0.0000917		<	0.0000917	0.0000917		<	0.0000917	0.0000917
	0.000094	0.0000625			0.000328	0.0000625		<	0.0000625	0.0000625
<	0.0000146	0.0000146		<	0.0000146	0.0000146		<	0.0000146	0.0000146
<	0.0000893	0.0000893			0.000109	0.0000893		<	0.0000893	0.0000893
<	0.0000518	0.0000518		<	0.0000518	0.0000518		<	0.0000518	0.0000518
<	0.0000971	0.0000971	COM M - CONFIRMED BY GC/MS	<	0.0000971	0.0000971		<	0.0000971	0.0000971
<	0.0000176	0.0000176		<	0.0000176	0.0000176		<	0.0000176	0.0000176
<	0.000625	0.000625		<	0.000625	0.000625		<	0.000625	0.000625
<	0.000278	0.000278		<	0.000278	0.000278		<	0.000278	0.000278

<	0.000588	0.000588	<	0.000588	0.000588	<	0.000588	0.000588
<	0.000208	0.000208		0.00541	0.000208	<	0.000208	0.000208
<	0.0005	0.0005	<	0.0005	0.0005	<	0.0005	0.0005
	0.0049	0.000111	<	0.000111	0.000111		0.00285	0.000111
<	0.0000862	0.0000862	<	0.0000862	0.0000862	<	0.0000862	0.0000862
<	0.0000909	0.0000909	<	0.0000909	0.0000909	<	0.0000909	0.0000909

PCB# 136	PCB# 138/160	PCB# 138/160	PCB# 138/160	PCB# 138/160	PCB# 141/179	PCB# 141/179	PCB# 141/179	PCB# 141/179	PCB# 146
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol
	<	0.0000671	0.0000671		<	0.0000671	0.0000671		<
		0.0117	0.0000943		<	0.0000943	0.0000943		
	<	0.0001	0.0001		<	0.0001	0.0001		<
		0.00602	0.000105			0.00239	0.000105		<
		0.00504	0.000098			0.000523	0.000098		<
		0.0167	0.0000355			0.00294	0.0000355		
		0.00938	0.0000763			0.00142	0.0000763		<
		0.0143	0.0000943		<	0.0000943	0.0000943		
		0.0297	0.000099		<	0.000099	0.000099		
		0.0858	0.0000952			0.0055	0.0000952		
		0.00958	0.0001			0.00166	0.0001		
		0.267	0.0000108	COM M - CONFIRMED BY GC/MS		0.0129	0.0000108	COM M - CONFIRMED BY GC/MS	<
		0.0435	0.0000971	COM M - CONFIRMED BY GC/MS		0.00978	0.0000971		
		0.021	0.00000977			0.00493	0.00000977		<
		0.00493	0.000068			0.00129	0.000068		<
		0.0239	0.0000106			0.00536	0.0000106		
		0.00448	0.0000758			0.000402	0.0000758		
		0.0104	0.0000116			0.00284	0.0000116		<
		0.00167	0.0000909		<	0.0000909	0.0000909		<
		0.00509	0.0000917		<	0.0000917	0.0000917		<
		0.0109	0.0000901			0.00312	0.0000901		
		0.0441	0.0000199			0.00676	0.0000199		
		0.00263	0.0000614			0.000218	0.0000614		
		0.00973	0.0000155			0.00194	0.0000155		
	<	0.000103	0.000103		<	0.000103	0.000103		<
	<	0.0000917	0.0000917		<	0.0000917	0.0000917		<
		0.0057	0.0000625			0.0015	0.0000625		
		0.0254	0.0000146			0.00508	0.0000146		
		0.00291	0.0000893			0.000298	0.0000893		
		0.0103	0.0000518		<	0.0000518	0.0000518		<
		0.00838	0.0000971	COM M - CONFIRMED BY GC/MS		0.00148	0.0000971	COM M - CONFIRMED BY GC/MS	<
		0.0465	0.0000176	COM M - CONFIRMED BY GC/MS		0.00701	0.0000176	COM M - CONFIRMED BY GC/MS	
		0.0149	0.000625		<	0.000625	0.000625		<
		0.027	0.000278		<	0.000278	0.000278		

	0.0522	0.000588	COM M - CONFIRMED BY GC/MS	<	0.000588	0.000588	<
	0.0483	0.000208			0.0259	0.000208	
<	0.0005	0.0005		<	0.0005	0.0005	<
	0.036	0.000111			0.00382	0.000111	
	0.00251	0.0000862		<	0.0000862	0.0000862	
	0.0189	0.0000909		<	0.0000909	0.0000909	

PCB# 146	PCB# 146	PCB# 146	PCB# 149/123	PCB# 149/123	PCB# 149/123	PCB# 149/123	PCB# 15	PCB# 15	PCB# 15
Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
0.0000671	0.0000671		<	0.0000671	0.0000671		<	0.0000671	0.0000671
0.00486	0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943
0.0001	0.0001			0.00205	0.0001		<	0.0001	0.0001
0.000105	0.000105		<	0.000105	0.000105			0.0102	0.000105
0.000098	0.000098			0.0021	0.000098			0.000135	0.000098
0.00302	0.0000355			0.00376	0.0000355		<	0.0000355	0.0000355
0.0000763	0.0000763			0.00281	0.0000763		<	0.0000763	0.0000763
0.00174	0.0000943			0.00249	0.0000943		<	0.0000943	0.0000943
0.00483	0.000099			0.00523	0.000099		<	0.000099	0.000099
0.0122	0.0000952			0.00925	0.0000952			0.0161	0.0000952
0.00244	0.0001			0.00409	0.0001		<	0.0001	0.0001
0.0000108	0.0000108			0.0134	0.0000108	COM M - CONFIRMED BY GC/MS	<	0.0000108	0.0000108
0.0112	0.0000971	COM M - CONFIRMED BY GC/MS		0.0145	0.0000971	COM M - CONFIRMED BY GC/MS		0.00492	0.0000971
0.00000977	0.00000977			0.00544	0.00000977			0.00677	0.00000977
0.000068	0.000068			0.0014	0.000068			0.00254	0.000068
0.00627	0.0000106			0.00672	0.0000106			0.00273	0.0000106
0.000873	0.0000758			0.00125	0.0000758		<	0.0000758	0.0000758
0.0000116	0.0000116			0.00226	0.0000116			0.00119	0.0000116
0.0000909	0.0000909		<	0.0000909	0.0000909		<	0.0000909	0.0000909
0.0000917	0.0000917		<	0.0000917	0.0000917			0.0508	0.0000917
0.00296	0.0000901			0.00318	0.0000901			0.00177	0.0000901
0.00942	0.0000199			0.00821	0.0000199		<	0.0000199	0.0000199
0.000433	0.0000614			0.000914	0.0000614			0.00328	0.0000614
0.00219	0.0000155			0.003	0.0000155			0.000575	0.0000155
0.000103	0.000103		<	0.000103	0.000103		<	0.000103	0.000103
0.0000917	0.0000917		<	0.0000917	0.0000917		<	0.0000917	0.0000917
0.00136	0.0000625			0.00184	0.0000625		<	0.0000625	0.0000625
0.00517	0.0000146			0.00625	0.0000146		<	0.0000146	0.0000146
0.000461	0.0000893		<	0.0000893	0.0000893		<	0.0000893	0.0000893
0.0000518	0.0000518		<	0.0000518	0.0000518		<	0.0000518	0.0000518
0.0000971	0.0000971			0.00231	0.0000971	COM M - CONFIRMED BY GC/MS	<	0.0000971	0.0000971
0.00975	0.0000176	COM M - CONFIRMED BY GC/MS		0.00783	0.0000176	COM M - CONFIRMED BY GC/MS	<	0.0000176	0.0000176
0.000625	0.000625			0.00582	0.000625		<	0.000625	0.000625
0.0485	0.000278			0.00453	0.000278		<	0.000278	0.000278

0.000588	0.000588		0.107	0.000588	COM M - CONFIRMED BY GC/MS		0.169	0.000588
0.00954	0.000208		0.025	0.000208			0.0419	0.000208
0.0005	0.0005	<	0.0005	0.0005			0.0738	0.0005
0.00288	0.000111		0.00609	0.000111			0.0299	0.000111
0.00178	0.0000862		0.00722	0.0000862		<	0.0000862	0.0000862
0.00295	0.0000909		0.00442	0.0000909			0.007	0.0000909

PCB# 15	PCB# 151	PCB# 151	PCB# 151	PCB# 151	PCB# 153/132	PCB# 153/132	PCB# 153/132	PCB# 153/132
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments
	<	0.0000671	0.0000671			0.0135	0.0000671	
	<	0.0000943	0.0000943			0.00138	0.0000943	
	<	0.0001	0.0001			0.00645	0.0001	
	<	0.000105	0.000105			0.0103	0.000105	
	<	0.000098	0.000098			0.00469	0.000098	
	<	0.0000355	0.0000355			0.018	0.0000355	
	<	0.0000763	0.0000763			0.00936	0.0000763	
	<	0.0000943	0.0000943			0.00997	0.0000943	
	<	0.000099	0.000099			0.0081	0.000099	
	<	0.0000952	0.0000952			0.0204	0.0000952	
		0.000376	0.0001			0.00924	0.0001	
		0.00304	0.0000108	COM M - CONFIRMED BY GC/MS		0.269	0.0000108	COM M - CONFIRMED BY GC/MS
		0.00285	0.0000971	COM M - CONFIRMED BY GC/MS		0.0465	0.0000971	COM M - CONFIRMED BY GC/MS
		0.0024	0.00000977			0.0227	0.00000977	
	<	0.000068	0.000068			0.00465	0.000068	
		0.00185	0.0000106			0.0255	0.0000106	
	<	0.0000758	0.0000758			0.00501	0.0000758	
		0.00163	0.0000116			0.0108	0.0000116	
	<	0.0000909	0.0000909		<	0.0000909	0.0000909	
	<	0.0000917	0.0000917		<	0.0000917	0.0000917	
		0.000118	0.0000901			0.0111	0.0000901	
		0.00268	0.0000199			0.0449	0.0000199	
	<	0.0000614	0.0000614			0.00283	0.0000614	
		0.000885	0.0000155			0.0107	0.0000155	
	<	0.000103	0.000103		<	0.000103	0.000103	
	<	0.0000917	0.0000917			0.00807	0.0000917	COM M - CONFIRMED BY GC/MS
	<	0.0000625	0.0000625			0.00635	0.0000625	
	<	0.0000146	0.0000146			0.0276	0.0000146	
	<	0.0000893	0.0000893			0.00308	0.0000893	
	<	0.0000518	0.0000518			0.0107	0.0000518	
		0.000844	0.0000971	COM M - CONFIRMED BY GC/MS		0.00959	0.0000971	COM M - CONFIRMED BY GC/MS
	<	0.0000176	0.0000176			0.0506	0.0000176	COM M - CONFIRMED BY GC/MS
	<	0.000625	0.000625			0.0303	0.000625	
	<	0.000278	0.000278			0.0228	0.000278	

COM M - CONFIRMED BY GC/MS		0.0162	0.000588	COM M - CONFIRMED BY GC/MS		0.213	0.000588	COM M - CONFIRMED BY GC/MS
		0.00805	0.000208			0.0604	0.000208	
	<	0.0005	0.0005		<	0.0005	0.0005	
	<	0.000111	0.000111			0.00417	0.000111	
	<	0.0000862	0.0000862			0.00903	0.0000862	
	<	0.0000909	0.0000909			0.0145	0.0000909	

PCB# 156	PCB# 156	PCB# 156	PCB# 156	PCB# 157/173/201	PCB# 157/173/201	PCB# 157/173/201	PCB# 157/173/201	PCB# 158
DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol
<	0.0000671	0.0000671		<	0.0000671	0.0000671		
<	0.0000943	0.0000943		<	0.0000943	0.0000943		<
<	0.0001	0.0001		<	0.0001	0.0001		<
<	0.000105	0.000105		<	0.000105	0.000105		<
<	0.000098	0.000098		<	0.000098	0.000098		
	0.000834	0.0000355		<	0.0000355	0.0000355		
	0.00326	0.0000763			0.000139	0.0000763		
<	0.0000943	0.0000943		<	0.0000943	0.0000943		<
<	0.000099	0.000099		<	0.000099	0.000099		
<	0.0000952	0.0000952		<	0.0000952	0.0000952		
	0.00125	0.0001		<	0.0001	0.0001		
	0.0071	0.0000108	COM M - CONFIRMED BY GC/MS		0.00295	0.0000108	COM M - CONFIRMED BY GC/MS	
	0.0055	0.0000971			0.00155	0.0000971		
<	0.00000977	0.00000977			0.000394	0.00000977		
	0.000338	0.000068			0.000086	0.000068		
<	0.0000106	0.0000106		<	0.0000106	0.0000106		
	0.00172	0.0000758			0.000288	0.0000758		<
	0.00149	0.0000116			0.000194	0.0000116		
<	0.0000909	0.0000909		<	0.0000909	0.0000909		<
<	0.0000917	0.0000917		<	0.0000917	0.0000917		<
<	0.0000901	0.0000901		<	0.0000901	0.0000901		
	0.00317	0.0000199			0.00142	0.0000199		
<	0.0000614	0.0000614		<	0.0000614	0.0000614		<
	0.00104	0.0000155			0.00017	0.0000155		
<	0.000103	0.000103		<	0.000103	0.000103		<
<	0.0000917	0.0000917		<	0.0000917	0.0000917		<
<	0.0000625	0.0000625			0.000142	0.0000625		
<	0.0000146	0.0000146			0.000801	0.0000146		
	0.000494	0.0000893		<	0.0000893	0.0000893		
<	0.0000518	0.0000518		<	0.0000518	0.0000518		<
	0.00145	0.0000971	COM M - CONFIRMED BY GC/MS	<	0.0000971	0.0000971		
<	0.0000176	0.0000176			0.00109	0.0000176	COM M - CONFIRMED BY GC/MS	
<	0.000625	0.000625		<	0.000625	0.000625		<
<	0.000278	0.000278		<	0.000278	0.000278		<

	0.0397	0.000588	COM M - CONFIRMED BY GC/MS	<	0.000588	0.000588	<
<	0.000208	0.000208		<	0.000208	0.000208	<
<	0.0005	0.0005		<	0.0005	0.0005	<
<	0.000111	0.000111		<	0.000111	0.000111	
<	0.0000862	0.0000862		<	0.0000862	0.0000862	<
<	0.0000909	0.0000909		<	0.0000909	0.0000909	<

PCB# 158	PCB# 158	PCB# 158	PCB# 16/32	PCB# 16/32	PCB# 16/32	PCB# 16/32	PCB# 166	PCB# 166	PCB# 166
Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
0.0123	0.0000671		<	0.0000671	0.0000671		<	0.0000671	0.0000671
0.0000943	0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943
0.0001	0.0001		<	0.0001	0.0001			0.036	0.0001
0.000105	0.000105		<	0.000105	0.000105		<	0.000105	0.000105
0.000209	0.000098			0.000586	0.000098			0.000124	0.000098
0.00142	0.0000355			0.00115	0.0000355		<	0.0000355	0.0000355
0.00108	0.0000763			0.001	0.0000763		<	0.0000763	0.0000763
0.0000943	0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943
0.00262	0.000099		<	0.000099	0.000099		<	0.000099	0.000099
0.00963	0.0000952		<	0.0000952	0.0000952		<	0.0000952	0.0000952
0.00116	0.0001			0.000817	0.0001		<	0.0001	0.0001
0.00678	0.0000108			0.00115	0.0000108	COM M - CONFIRMED BY GC/MS		0.0031	0.0000108
0.00605	0.0000971	COM M - CONFIRMED BY GC/MS		0.000915	0.0000971	COM M - CONFIRMED BY GC/MS		0.00102	0.0000971
0.00198	0.00000977			0.00113	0.00000977			0.00135	0.00000977
0.000692	0.000068			0.000782	0.000068		<	0.000068	0.000068
0.00237	0.0000106			0.000453	0.0000106			0.000598	0.0000106
0.0000758	0.0000758			0.000908	0.0000758		<	0.0000758	0.0000758
0.0014	0.0000116			0.000325	0.0000116			0.00013	0.0000116
0.0000909	0.0000909		<	0.0000909	0.0000909			0.035	0.0000909
0.0000917	0.0000917		<	0.0000917	0.0000917		<	0.0000917	0.0000917
0.00174	0.0000901			0.000443	0.0000901		<	0.0000901	0.0000901
0.00327	0.0000199			0.00102	0.0000199		<	0.0000199	0.0000199
0.0000614	0.0000614			0.000074	0.0000614		<	0.0000614	0.0000614
0.00102	0.0000155			0.000555	0.0000155			0.000207	0.0000155
0.000103	0.000103		<	0.000103	0.000103		<	0.000103	0.000103
0.0000917	0.0000917		<	0.0000917	0.0000917		<	0.0000917	0.0000917
0.000505	0.0000625			0.00122	0.0000625			0.000124	0.0000625
0.00246	0.0000146			0.000911	0.0000146		<	0.0000146	0.0000146
0.000309	0.0000893		<	0.0000893	0.0000893			0.000096	0.0000893
0.0000518	0.0000518		<	0.0000518	0.0000518		<	0.0000518	0.0000518
0.000873	0.0000971	COM M - CONFIRMED BY GC/MS		0.000481	0.0000971	COM M - CONFIRMED BY GC/MS	<	0.0000971	0.0000971
0.00388	0.0000176	COM M - CONFIRMED BY GC/MS		0.000851	0.0000176	COM M - CONFIRMED BY GC/MS		0.0008	0.0000176
0.000625	0.000625		<	0.000625	0.000625		<	0.000625	0.000625
0.000278	0.000278		<	0.000278	0.000278		<	0.000278	0.000278

0.000588	0.000588	<	0.000588	0.000588		0.205	0.000588
0.000208	0.000208	<	0.000208	0.000208	<	0.000208	0.000208
0.0005	0.0005	<	0.0005	0.0005		0.162	0.0005
0.00886	0.000111	<	0.000111	0.000111	<	0.000111	0.000111
0.0000862	0.0000862	<	0.0000862	0.0000862		0.0309	0.0000862
0.0000909	0.0000909	<	0.0000909	0.0000909		0.0224	0.0000909

PCB# 166	PCB# 167	PCB# 167	PCB# 167	PCB# 167	PCB# 169	PCB# 169	PCB# 169	PCB# 169
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments
	<	0.0000671	0.0000671		<	0.0000671	0.0000671	
	<	0.0000943	0.0000943		<	0.0000943	0.0000943	
	<	0.0001	0.0001		<	0.0001	0.0001	
	<	0.000105	0.000105		<	0.000105	0.000105	
		0.000558	0.000098		<	0.000098	0.000098	
		0.00085	0.0000355		<	0.0000355	0.0000355	
		0.000774	0.0000763		<	0.0000763	0.0000763	
	<	0.0000943	0.0000943		<	0.0000943	0.0000943	
	<	0.000099	0.000099		<	0.000099	0.000099	
	<	0.0000952	0.0000952		<	0.0000952	0.0000952	
		0.000262	0.0001		<	0.0001	0.0001	
		0.00383	0.0000108	COM M - CONFIRMED BY GC/MS	<	0.0000108	0.0000108	COM M - CONFIRMED BY GC/MS
COM M - CONFIRMED BY GC/MS		0.00193	0.0000971		<	0.0000971	0.0000971	
		0.00115	0.00000977		<	0.00000977	0.00000977	
		0.000292	0.000068		<	0.000068	0.000068	
	<	0.0000106	0.0000106		<	0.0000106	0.0000106	
		0.000511	0.0000758		<	0.0000758	0.0000758	
		0.000946	0.0000116		<	0.0000116	0.0000116	
	<	0.0000909	0.0000909		<	0.0000909	0.0000909	
	<	0.0000917	0.0000917		<	0.0000917	0.0000917	
		0.00132	0.0000901		<	0.0000901	0.0000901	
		0.00129	0.0000199		<	0.0000199	0.0000199	
		0.00008	0.0000614		<	0.0000614	0.0000614	
		0.00041	0.0000155		<	0.0000155	0.0000155	
	<	0.000103	0.000103		<	0.000103	0.000103	
	<	0.0000917	0.0000917		<	0.0000917	0.0000917	
		0.000295	0.0000625		<	0.0000625	0.0000625	
		0.000891	0.0000146		<	0.0000146	0.0000146	
	<	0.0000893	0.0000893		<	0.0000893	0.0000893	
	<	0.0000518	0.0000518		<	0.0000518	0.0000518	
COM M - CONFIRMED BY GC/MS	<	0.0000971	0.0000971	COM M - CONFIRMED BY GC/MS	<	0.0000971	0.0000971	COM M - CONFIRMED BY GC/MS
COM M - CONFIRMED BY GC/MS		0.00173	0.0000176	COM M - CONFIRMED BY GC/MS	<	0.0000176	0.0000176	COM M - CONFIRMED BY GC/MS
	<	0.000625	0.000625		<	0.000625	0.000625	
	<	0.000278	0.000278		<	0.000278	0.000278	

	0.0177	0.000588	COM M - CONFIRMED BY GC/MS	<	0.000588	0.000588	COM M - CONFIRMED BY GC/MS
<	0.000208	0.000208		<	0.000208	0.000208	
<	0.0005	0.0005		<	0.0005	0.0005	
<	0.000111	0.000111		<	0.000111	0.000111	
<	0.0000862	0.0000862		<	0.0000862	0.0000862	
<	0.0000909	0.0000909		<	0.0000909	0.0000909	

PCB# 170/190	PCB# 170/190	PCB# 170/190	PCB# 170/190	PCB# 171/202	PCB# 171/202	PCB# 171/202	PCB# 171/202	PCB# 172	PCB# 172	PCB# 172
DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
<	0.0000671	0.0000671		<	0.0000671	0.0000671		<	0.0000671	0.0000671
<	0.0000943	0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943
<	0.0001	0.0001		<	0.0001	0.0001			0.0155	0.0001
<	0.000105	0.000105		<	0.000105	0.000105		<	0.000105	0.000105
	0.00153	0.000098			0.000917	0.000098			0.00291	0.000098
	0.004	0.0000355		<	0.0000355	0.0000355			0.00134	0.0000355
	0.00136	0.0000763		<	0.0000763	0.0000763			0.00287	0.0000763
<	0.0000943	0.0000943		<	0.0000943	0.0000943			0.00228	0.0000943
<	0.000099	0.000099		<	0.000099	0.000099			0.00105	0.000099
<	0.0000952	0.0000952			0.000924	0.0000952		<	0.0000952	0.0000952
	0.00234	0.0001			0.00125	0.0001			0.00348	0.0001
	0.0186	0.0000108	COM M - CONFIRMED BY GC/MS		0.00618	0.0000108	COM M - CONFIRMED BY GC/MS		0.00501	0.0000108
	0.0101	0.0000971	COM M - CONFIRMED BY GC/MS		0.0064	0.0000971			0.00482	0.0000971
	0.00525	0.00000977			0.0038	0.00000977			0.00174	0.00000977
	0.000896	0.000068			0.000399	0.000068			0.00191	0.000068
	0.00631	0.0000106			0.00126	0.0000106			0.00183	0.0000106
	0.00065	0.0000758		<	0.0000758	0.0000758			0.0027	0.0000758
	0.00201	0.0000116			0.000487	0.0000116			0.000791	0.0000116
<	0.0000909	0.0000909		<	0.0000909	0.0000909			0.012	0.0000909
<	0.0000917	0.0000917		<	0.0000917	0.0000917		<	0.0000917	0.0000917
	0.00254	0.0000901			0.00195	0.0000901			0.003	0.0000901
	0.0108	0.0000199			0.00502	0.0000199			0.00297	0.0000199
	0.000486	0.0000614			0.000191	0.0000614			0.00172	0.0000614
	0.00241	0.0000155			0.0015	0.0000155			0.000727	0.0000155
<	0.000103	0.000103		<	0.000103	0.000103		<	0.000103	0.000103
<	0.0000917	0.0000917		<	0.0000917	0.0000917		<	0.0000917	0.0000917
	0.00138	0.0000625			0.00163	0.0000625			0.00228	0.0000625
	0.00644	0.0000146			0.00567	0.0000146			0.00158	0.0000146
	0.000329	0.0000893			0.000252	0.0000893			0.00296	0.0000893
<	0.0000518	0.0000518		<	0.0000518	0.0000518			0.0011	0.0000518
	0.00244	0.0000971	COM M - CONFIRMED BY GC/MS		0.000584	0.0000971	COM M - CONFIRMED BY GC/MS		0.00268	0.0000971
	0.0111	0.0000176	COM M - CONFIRMED BY GC/MS		0.00806	0.0000176	COM M - CONFIRMED BY GC/MS		0.0027	0.0000176
	0.00481	0.000625		<	0.000625	0.000625		<	0.000625	0.000625
	0.0173	0.000278		<	0.000278	0.000278		<	0.000278	0.000278

<	0.000588	0.000588		<	0.000588	0.000588		0.0696	0.000588
<	0.000208	0.000208		<	0.000208	0.000208	<	0.000208	0.000208
<	0.0005	0.0005		<	0.0005	0.0005		0.0625	0.0005
	0.00328	0.000111			0.00102	0.000111	<	0.000111	0.000111
<	0.0000862	0.0000862		<	0.0000862	0.0000862		0.0106	0.0000862
<	0.0000909	0.0000909			0.00162	0.0000909		0.00756	0.0000909

PCB# 172	PCB# 174	PCB# 174	PCB# 174	PCB# 174	PCB# 175	PCB# 175	PCB# 175
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
	<	0.0000671	0.0000671		<	0.0000671	0.0000671
	<	0.0000943	0.0000943		<	0.0000943	0.0000943
	<	0.0001	0.0001		<	0.0001	0.0001
	<	0.000105	0.000105		<	0.000105	0.000105
		0.000585	0.000098			0.00491	0.000098
COM POSSIBLE BLANK CONTAMINATION		0.00112	0.0000355			0.00153	0.0000355
		0.000758	0.0000763			0.0044	0.0000763
COM POSSIBLE BLANK CONTAMINATION	<	0.0000943	0.0000943			0.00412	0.0000943
	<	0.000099	0.000099		<	0.000099	0.000099
	<	0.0000952	0.0000952		<	0.0000952	0.0000952
		0.0012	0.0001			0.00492	0.0001
COM M - CONFIRMED BY GC/MS		0.00482	0.0000108	COM M - CONFIRMED BY GC/MS		0.000915	0.0000108
		0.00373	0.0000971			0.00506	0.0000971
COM POSSIBLE BLANK CONTAMINATION		0.00143	0.00000977			0.000367	0.00000977
		0.0002	0.000068			0.00347	0.000068
COM POSSIBLE BLANK CONTAMINATION		0.00226	0.0000106		<	0.0000106	0.0000106
		0.000365	0.0000758			0.00419	0.0000758
COM POSSIBLE BLANK CONTAMINATION		0.000716	0.0000116			0.000826	0.0000116
	<	0.0000909	0.0000909		<	0.0000909	0.0000909
	<	0.0000917	0.0000917		<	0.0000917	0.0000917
		0.000381	0.0000901			0.0048	0.0000901
		0.00304	0.0000199			0.00059	0.0000199
		0.000077	0.0000614			0.0029	0.0000614
COM POSSIBLE BLANK CONTAMINATION		0.000659	0.0000155			0.000388	0.0000155
	<	0.000103	0.000103		<	0.000103	0.000103
	<	0.0000917	0.0000917		<	0.0000917	0.0000917
		0.000759	0.0000625			0.00335	0.0000625
COM POSSIBLE BLANK CONTAMINATION		0.00223	0.0000146			0.00107	0.0000146
		0.000318	0.0000893			0.00458	0.0000893
COM POSSIBLE BLANK CONTAMINATION	<	0.0000518	0.0000518			0.0018	0.0000518
COM M - CONFIRMED BY GC/MS		0.000616	0.0000971	COM M - CONFIRMED BY GC/MS		0.00436	0.0000971
COM M - CONFIRMED BY GC/MS		0.00206	0.0000176	COM M - CONFIRMED BY GC/MS		0.000986	0.0000176
	<	0.000625	0.000625		<	0.000625	0.000625
	<	0.000278	0.000278		<	0.000278	0.000278

COM M - CONFIRMED BY GC/MS	<	0.000588	0.000588	<	0.000588	0.000588
		0.00443	0.000208	<	0.000208	0.000208
	<	0.0005	0.0005	<	0.0005	0.0005
		0.00151	0.000111	<	0.000111	0.000111
	<	0.0000862	0.0000862	<	0.0000862	0.0000862
		0.00114	0.0000909	<	0.0000909	0.0000909

PCB# 175	PCB# 176/137	PCB# 176/137	PCB# 176/137	PCB# 176/137	PCB# 177	PCB# 177	PCB# 177	PCB# 177	PCB# 178
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol
	<	0.0000671	0.0000671		<	0.0000671	0.0000671		<
	<	0.0000943	0.0000943		<	0.0000943	0.0000943		<
	<	0.0001	0.0001		<	0.0001	0.0001		<
	<	0.000105	0.000105		<	0.000105	0.000105		<
COM POSSIBLE BLANK CONTAMINATION	<	0.000098	0.000098			0.000419	0.000098		
COM POSSIBLE BLANK CONTAMINATION	<	0.0000355	0.0000355			0.00111	0.0000355		
COM POSSIBLE BLANK CONTAMINATION		0.000092	0.0000763			0.000697	0.0000763		
COM POSSIBLE BLANK CONTAMINATION	<	0.0000943	0.0000943		<	0.0000943	0.0000943		<
		0.00056	0.000099		<	0.000099	0.000099		
		0.00282	0.0000952		<	0.0000952	0.0000952		
COM POSSIBLE BLANK CONTAMINATION		0.000218	0.0001			0.00121	0.0001		
COM M - CONFIRMED BY GC/MS		0.0002	0.0000108			0.00813	0.0000108	COM M - CONFIRMED BY GC/MS	
COM M - CONFIRMED BY GC/MS	<	0.0000971	0.0000971			0.00613	0.0000971		
COM POSSIBLE BLANK CONTAMINATION	<	0.00000977	0.00000977			0.00303	0.00000977		
COM POSSIBLE BLANK CONTAMINATION		0.000168	0.000068			0.00058	0.000068		
	<	0.0000106	0.0000106			0.00281	0.0000106		
COM POSSIBLE BLANK CONTAMINATION	<	0.0000758	0.0000758			0.000391	0.0000758		
COM POSSIBLE BLANK CONTAMINATION	<	0.0000116	0.0000116			0.00112	0.0000116		
	<	0.0000909	0.0000909		<	0.0000909	0.0000909		<
	<	0.0000917	0.0000917		<	0.0000917	0.0000917		<
COM POSSIBLE BLANK CONTAMINATION		0.000211	0.0000901			0.00162	0.0000901		
COM POSSIBLE BLANK CONTAMINATION	<	0.0000199	0.0000199			0.00632	0.0000199		
COM POSSIBLE BLANK CONTAMINATION		0.000116	0.0000614			0.000104	0.0000614		
COM POSSIBLE BLANK CONTAMINATION		0.000099	0.0000155			0.00136	0.0000155		
	<	0.000103	0.000103		<	0.000103	0.000103		<
	<	0.0000917	0.0000917		<	0.0000917	0.0000917		<
COM POSSIBLE BLANK CONTAMINATION		0.000114	0.0000625			0.000543	0.0000625		
COM POSSIBLE BLANK CONTAMINATION	<	0.0000146	0.0000146			0.00306	0.0000146		
COM POSSIBLE BLANK CONTAMINATION	<	0.0000893	0.0000893			0.000333	0.0000893		
COM POSSIBLE BLANK CONTAMINATION	<	0.0000518	0.0000518		<	0.0000518	0.0000518		<
COM M - CONFIRMED BY GC/MS	<	0.0000971	0.0000971			0.00126	0.0000971	COM M - CONFIRMED BY GC/MS	
COM M - CONFIRMED BY GC/MS	<	0.0000176	0.0000176			0.00422	0.0000176	COM M - CONFIRMED BY GC/MS	
	<	0.000625	0.000625		<	0.000625	0.000625		
	<	0.000278	0.000278		<	0.000278	0.000278		<

<	0.000588	0.000588		0.0168	0.000588	COM M - CONFIRMED BY GC/MS	<
<	0.000208	0.000208		0.00558	0.000208		<
<	0.0005	0.0005	<	0.0005	0.0005		<
	0.00639	0.000111	<	0.000111	0.000111		
<	0.0000862	0.0000862	<	0.0000862	0.0000862		<
<	0.0000909	0.0000909		0.00199	0.0000909		<

PCB# 178	PCB# 178	PCB# 178	PCB# 18/17	PCB# 18/17	PCB# 18/17	PCB# 18/17	PCB# 180	PCB# 180	PCB# 180
Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
0.0000671	0.0000671		<	0.0000671	0.0000671		<	0.0000671	0.0000671
0.0000943	0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943
0.0001	0.0001		<	0.0001	0.0001		<	0.0001	0.0001
0.000105	0.000105			0.0433	0.000105		<	0.000105	0.000105
0.000441	0.000098			0.00153	0.000098			0.00409	0.000098
0.000799	0.0000355			0.00215	0.0000355			0.0106	0.0000355
0.000782	0.0000763			0.00396	0.0000763			0.00424	0.0000763
0.0000943	0.0000943		<	0.0000943	0.0000943			0.00527	0.0000943
0.00106	0.000099		<	0.000099	0.000099			0.0037	0.000099
0.00128	0.0000952			0.0256	0.0000952			0.0155	0.0000952
0.00112	0.0001			0.000879	0.0001			0.012	0.0001
0.00564	0.0000108	COM M - CONFIRMED BY GC/MS		0.00404	0.0000108	COM M - CONFIRMED BY GC/MS		0.179	0.0000108
0.00333	0.0000971	COM M - CONFIRMED BY GC/MS		0.0138	0.0000971	COM M - CONFIRMED BY GC/MS		0.0741	0.0000971
0.00207	0.00000977			0.00568	0.00000977			0.0182	0.00000977
0.000693	0.000068			0.00273	0.000068			0.00374	0.000068
0.00168	0.0000106			0.00315	0.0000106			0.0371	0.0000106
0.000525	0.0000758			0.00155	0.0000758			0.00326	0.0000758
0.000978	0.0000116			0.00269	0.0000116			0.00627	0.0000116
0.0000909	0.0000909		<	0.0000909	0.0000909		<	0.0000909	0.0000909
0.0000917	0.0000917			0.149	0.0000917		<	0.0000917	0.0000917
0.00128	0.0000901			0.00309	0.0000901			0.00631	0.0000901
0.00358	0.0000199			0.00194	0.0000199			0.0342	0.0000199
0.000417	0.0000614			0.00157	0.0000614			0.00384	0.0000614
0.000577	0.0000155			0.0015	0.0000155			0.0154	0.0000155
0.000103	0.000103		<	0.000103	0.000103		<	0.000103	0.000103
0.0000917	0.0000917		<	0.0000917	0.0000917		<	0.0000917	0.0000917
0.000603	0.0000625			0.00415	0.0000625			0.0102	0.0000625
0.00162	0.0000146			0.0017	0.0000146			0.0438	0.0000146
0.000354	0.0000893			0.00109	0.0000893			0.00323	0.0000893
0.0000518	0.0000518			0.00144	0.0000518			0.0055	0.0000518
0.00085	0.0000971	COM M - CONFIRMED BY GC/MS		0.00607	0.0000971	COM M - CONFIRMED BY GC/MS		0.0109	0.0000971
0.0033	0.0000176	COM M - CONFIRMED BY GC/MS		0.00195	0.0000176	COM M - CONFIRMED BY GC/MS		0.0581	0.0000176
0.00775	0.000625		<	0.000625	0.000625		<	0.000625	0.000625
0.000278	0.000278		<	0.000278	0.000278		<	0.000278	0.000278

0.000588	0.000588		0.233	0.000588	COM M - CONFIRMED BY GC/MS		0.0762	0.000588
0.000208	0.000208		0.044	0.000208		<	0.000208	0.000208
0.0005	0.0005	<	0.0005	0.0005		<	0.0005	0.0005
0.00165	0.000111	<	0.000111	0.000111			0.011	0.000111
0.0000862	0.0000862	<	0.0000862	0.0000862		<	0.0000862	0.0000862
0.0000909	0.0000909		0.00432	0.0000909			0.0105	0.0000909

PCB# 180	PCB# 183	PCB# 183	PCB# 183	PCB# 183	PCB# 185	PCB# 185	PCB# 185	PCB# 185	PCB# 187
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol
	<	0.0000671	0.0000671		<	0.0000671	0.0000671		
		0.00142	0.0000943		<	0.0000943	0.0000943		
	<	0.0001	0.0001		<	0.0001	0.0001		
	<	0.000105	0.000105		<	0.000105	0.000105		
		0.000599	0.000098			0.000248	0.000098		
		0.00168	0.0000355		<	0.0000355	0.0000355		
		0.000299	0.0000763			0.000106	0.0000763		
	<	0.0000943	0.0000943		<	0.0000943	0.0000943		
	<	0.000099	0.000099			0.000218	0.000099		
		0.00148	0.0000952			0.00258	0.0000952		
		0.00142	0.0001		<	0.0001	0.0001		
COM M - CONFIRMED BY GC/MS		0.00999	0.0000108	COM M - CONFIRMED BY GC/MS		0.000111	0.0000108		
		0.00636	0.0000971	COM M - CONFIRMED BY GC/MS	<	0.0000971	0.0000971		
		0.00281	0.00000977			0.000177	0.00000977		
		0.000641	0.000068		<	0.000068	0.000068		
		0.00331	0.0000106		<	0.0000106	0.0000106		
		0.000576	0.0000758			0.000266	0.0000758		
		0.00122	0.0000116			0.000029	0.0000116		
	<	0.0000909	0.0000909		<	0.0000909	0.0000909		<
	<	0.0000917	0.0000917		<	0.0000917	0.0000917		<
		0.00115	0.0000901			0.000236	0.0000901		
		0.00522	0.0000199		<	0.0000199	0.0000199		
		0.000312	0.0000614		<	0.0000614	0.0000614		
		0.00164	0.0000155			0.000117	0.0000155		
	<	0.000103	0.000103		<	0.000103	0.000103		
	<	0.0000917	0.0000917		<	0.0000917	0.0000917		<
		0.000704	0.0000625		<	0.0000625	0.0000625		
		0.00359	0.0000146		<	0.0000146	0.0000146		
		0.000281	0.0000893		<	0.0000893	0.0000893		
	<	0.0000518	0.0000518		<	0.0000518	0.0000518		
COM M - CONFIRMED BY GC/MS		0.00113	0.0000971	COM M - CONFIRMED BY GC/MS		0.000168	0.0000971		
COM M - CONFIRMED BY GC/MS		0.00507	0.0000176	COM M - CONFIRMED BY GC/MS	<	0.0000176	0.0000176		
	<	0.000625	0.000625		<	0.000625	0.000625		<
	<	0.000278	0.000278		<	0.000278	0.000278		

COM M - CONFIRMED BY GC/MS		0.0103	0.000588	COM M - CONFIRMED BY GC/MS	<	0.000588	0.000588		
		0.00362	0.000208		<	0.000208	0.000208		
	<	0.0005	0.0005		<	0.0005	0.0005		<
		0.000437	0.000111		<	0.000111	0.000111		
	<	0.0000862	0.0000862		<	0.0000862	0.0000862		
		0.00153	0.0000909		<	0.0000909	0.0000909		

PCB# 187	PCB# 187	PCB# 187	PCB# 189	PCB# 189	PCB# 189	PCB# 189	PCB# 191	PCB# 191	PCB# 191	PCB# 191
Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments
0.0114	0.0000671		<	0.0000671	0.0000671		<	0.0000671	0.0000671	
0.00813	0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943	
0.00329	0.0001		<	0.0001	0.0001		<	0.0001	0.0001	
0.0171	0.000105		<	0.000105	0.000105		<	0.000105	0.000105	
0.00184	0.000098		<	0.000098	0.000098		<	0.000098	0.000098	
0.00803	0.0000355		<	0.0000355	0.0000355		<	0.0000355	0.0000355	
0.00212	0.0000763		<	0.0000763	0.0000763			0.000106	0.0000763	
0.00387	0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943	
0.00171	0.000099		<	0.000099	0.000099		<	0.000099	0.000099	
0.00719	0.0000952		<	0.0000952	0.0000952		<	0.0000952	0.0000952	
0.00354	0.0001			0.000312	0.0001		<	0.0001	0.0001	
0.153	0.0000108	COM M - CONFIRMED BY GC/MS		0.000058	0.0000108			0.0007	0.0000108	
0.0212	0.0000971	COM M - CONFIRMED BY GC/MS	<	0.0000971	0.0000971		<	0.0000971	0.0000971	
0.0126	0.00000977			0.000118	0.00000977			0.000194	0.00000977	
0.00114	0.000068			0.000084	0.000068		<	0.000068	0.000068	
0.0117	0.0000106			0.000336	0.0000106			0.000222	0.0000106	
0.00183	0.0000758		<	0.0000758	0.0000758			0.000147	0.0000758	
0.0047	0.0000116		<	0.0000116	0.0000116			0.000066	0.0000116	
0.0000909	0.0000909		<	0.0000909	0.0000909		<	0.0000909	0.0000909	
0.0000917	0.0000917		<	0.0000917	0.0000917		<	0.0000917	0.0000917	
0.00497	0.0000901		<	0.0000901	0.0000901		<	0.0000901	0.0000901	
0.0273	0.0000199			0.000389	0.0000199			0.000239	0.0000199	
0.000664	0.0000614		<	0.0000614	0.0000614		<	0.0000614	0.0000614	
0.00515	0.0000155			0.000068	0.0000155			0.000141	0.0000155	
0.0163	0.000103		<	0.000103	0.000103		<	0.000103	0.000103	
0.0000917	0.0000917		<	0.0000917	0.0000917		<	0.0000917	0.0000917	
0.00254	0.0000625		<	0.0000625	0.0000625			0.00008	0.0000625	
0.0132	0.0000146			0.000207	0.0000146			0.00024	0.0000146	
0.00047	0.0000893			0.000096	0.0000893		<	0.0000893	0.0000893	
0.00212	0.0000518		<	0.0000518	0.0000518		<	0.0000518	0.0000518	
0.00327	0.0000971	COM M - CONFIRMED BY GC/MS	<	0.0000971	0.0000971		<	0.0000971	0.0000971	
0.0209	0.0000176	COM M - CONFIRMED BY GC/MS		0.000397	0.0000176	CONFIRMED BY		0.000279	0.0000176	
0.000625	0.000625		<	0.000625	0.000625		<	0.000625	0.000625	
0.00626	0.000278		<	0.000278	0.000278		<	0.000278	0.000278	

0.0373	0.000588	COM M - CONFIRMED BY GC/MS	<	0.000588	0.000588	<	0.000588	0.000588
0.0113	0.000208		<	0.000208	0.000208	<	0.000208	0.000208
0.0005	0.0005		<	0.0005	0.0005	<	0.0005	0.0005
0.00782	0.000111		<	0.000111	0.000111	<	0.000111	0.000111
0.00338	0.0000862		<	0.0000862	0.0000862	<	0.0000862	0.0000862
0.0168	0.0000909		<	0.0000909	0.0000909	<	0.0000909	0.0000909

PCB# 193	PCB# 193	PCB# 193	PCB# 193	PCB# 194	PCB# 194	PCB# 194	PCB# 194	PCB# 195/208	PCB# 195/208
DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm
<	0.0000671	0.0000671		<	0.0000671	0.0000671		<	0.0000671
<	0.0000943	0.0000943			0.00715	0.0000943		<	0.0000943
<	0.0001	0.0001		<	0.0001	0.0001		<	0.0001
<	0.000105	0.000105			0.0055	0.000105		<	0.000105
	0.000214	0.000098			0.000271	0.000098			0.000156
	0.000671	0.0000355			0.00256	0.0000355			0.00117
	0.000198	0.0000763		<	0.0000763	0.0000763			0.000412
<	0.0000943	0.0000943		<	0.0000943	0.0000943		<	0.0000943
<	0.000099	0.000099			0.00384	0.000099		<	0.000099
<	0.0000952	0.0000952			0.00611	0.0000952		<	0.0000952
<	0.0001	0.0001			0.00082	0.0001			0.000245
	0.00389	0.0000108			0.0111	0.0000108	COM M - CONFIRMED BY GC/MS		0.00566
	0.00201	0.0000971	COM M - CONFIRMED BY GC/MS		0.0046	0.0000971			0.000419
	0.00117	0.00000977			0.00305	0.00000977			0.00214
<	0.000068	0.000068			0.000123	0.000068			0.000264
	0.00113	0.0000106			0.00408	0.0000106			0.00174
	0.000271	0.0000758			0.000234	0.0000758			0.000641
	0.000138	0.0000116			0.00108	0.0000116			0.000558
<	0.0000909	0.0000909		<	0.0000909	0.0000909		<	0.0000909
<	0.0000917	0.0000917		<	0.0000917	0.0000917		<	0.0000917
	0.000311	0.0000901			0.000638	0.0000901			0.000669
	0.00179	0.0000199			0.00687	0.0000199			0.00378
<	0.0000614	0.0000614		<	0.0000614	0.0000614		<	0.0000614
	0.000211	0.0000155			0.000968	0.0000155			0.000649
<	0.000103	0.000103			0.00329	0.000103		<	0.000103
<	0.0000917	0.0000917		<	0.0000917	0.0000917		<	0.0000917
	0.000296	0.0000625			0.000353	0.0000625		<	0.0000625
	0.00121	0.0000146			0.00358	0.0000146			0.00162
<	0.0000893	0.0000893			0.000211	0.0000893			0.000165
<	0.0000518	0.0000518		<	0.0000518	0.0000518		<	0.0000518
<	0.0000971	0.0000971			0.000685	0.0000971			0.000353
	0.0017	0.0000176			0.00537	0.0000176	COM M - CONFIRMED BY GC/MS		0.0023
<	0.000625	0.000625		<	0.000625	0.000625		<	0.000625
<	0.000278	0.000278		<	0.000278	0.000278		<	0.000278

<	0.000588	0.000588	<	0.000588	0.000588	<	0.000588
<	0.000208	0.000208		0.0163	0.000208	<	0.000208
<	0.0005	0.0005	<	0.0005	0.0005	<	0.0005
<	0.000111	0.000111		0.00943	0.000111	<	0.000111
<	0.0000862	0.0000862	<	0.0000862	0.0000862	<	0.0000862
<	0.0000909	0.0000909	<	0.0000909	0.0000909	<	0.0000909

PCB# 195/208	PCB# 195/208	PCB# 196	PCB# 196	PCB# 196	PCB# 196	PCB# 197	PCB# 197	PCB# 197	PCB# 197
Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments
0.0000671		<	0.0000671	0.0000671		<	0.0000671	0.0000671	
0.0000943		<	0.0000943	0.0000943			0.00686	0.0000943	
0.0001			0.0114	0.0001		<	0.0001	0.0001	
0.000105		<	0.000105	0.000105			0.0135	0.000105	
0.000098			0.000399	0.000098		<	0.000098	0.000098	
0.0000355			0.00306	0.0000355		<	0.0000355	0.0000355	
0.0000763			0.000685	0.0000763		<	0.0000763	0.0000763	
0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943	
0.000099		<	0.000099	0.000099			0.0131	0.000099	
0.0000952			0.00191	0.0000952			0.0112	0.0000952	
0.0001			0.000786	0.0001		<	0.0001	0.0001	
0.0000108	COM M - CONFIRMED BY GC/MS		0.0135	0.0000108	COM M - CONFIRMED BY GC/MS	<	0.0000108	0.0000108	
0.0000971	COM M - CONFIRMED BY GC/MS		0.00507	0.0000971			0.000196	0.0000971	
0.00000977			0.00362	0.00000977			0.000053	0.00000977	
0.000068			0.000177	0.000068		<	0.000068	0.000068	
0.0000106			0.00404	0.0000106			0.000031	0.0000106	
0.0000758			0.000439	0.0000758		<	0.0000758	0.0000758	
0.0000116			0.00118	0.0000116			0.000025	0.0000116	
0.0000909		<	0.0000909	0.0000909		<	0.0000909	0.0000909	
0.0000917		<	0.0000917	0.0000917			0.00384	0.0000917	
0.0000901		<	0.0000901	0.0000901		<	0.0000901	0.0000901	
0.0000199			0.00844	0.0000199			0.000159	0.0000199	
0.0000614			0.000255	0.0000614		<	0.0000614	0.0000614	
0.0000155			0.00165	0.0000155			0.00005	0.0000155	
0.000103		<	0.000103	0.000103		<	0.000103	0.000103	
0.0000917		<	0.0000917	0.0000917		<	0.0000917	0.0000917	
0.0000625			0.000465	0.0000625		<	0.0000625	0.0000625	
0.0000146			0.00438	0.0000146		<	0.0000146	0.0000146	
0.0000893			0.000183	0.0000893		<	0.0000893	0.0000893	
0.0000518		<	0.0000518	0.0000518		<	0.0000518	0.0000518	
0.0000971			0.000185	0.0000971		<	0.0000971	0.0000971	
0.0000176	COM M - CONFIRMED BY GC/MS		0.00704	0.0000176	COM M - CONFIRMED BY GC/MS	<	0.0000176	0.0000176	
0.000625		<	0.000625	0.000625			0.0869	0.000625	
0.000278		<	0.000278	0.000278		<	0.000278	0.000278	

0.000588		0.0248	0.000588	<	0.000588	0.000588
0.000208	<	0.000208	0.000208	<	0.000208	0.000208
0.0005	<	0.0005	0.0005	<	0.0005	0.0005
0.000111		0.00506	0.000111		0.0154	0.000111
0.0000862	<	0.0000862	0.0000862	<	0.0000862	0.0000862
0.0000909	<	0.0000909	0.0000909	<	0.0000909	0.0000909

PCB# 199	PCB# 199	PCB# 199	PCB# 199	PCB# 200	PCB# 200	PCB# 200	PCB# 200	PCB# 205	PCB# 205	PCB# 205
DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
<	0.0000671	0.0000671		<	0.0000671	0.0000671		<	0.0000671	0.0000671
	0.0516	0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943
<	0.0001	0.0001		<	0.0001	0.0001		<	0.0001	0.0001
<	0.000105	0.000105		<	0.000105	0.000105		<	0.000105	0.000105
	0.000805	0.000098		<	0.000098	0.000098		<	0.000098	0.000098
	0.00342	0.0000355		<	0.0000355	0.0000355		<	0.0000355	0.0000355
<	0.0000763	0.0000763		<	0.0000763	0.0000763		<	0.0000763	0.0000763
	0.000796	0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943
<	0.000099	0.000099		<	0.000099	0.000099		<	0.000099	0.000099
	0.00932	0.0000952		<	0.0000952	0.0000952		<	0.0000952	0.0000952
	0.00158	0.0001		<	0.0001	0.0001		<	0.0001	0.0001
	0.0128	0.0000108	COM M - CONFIRMED BY GC/MS		0.000154	0.0000108			0.00166	0.0000108
	0.0069	0.0000971		<	0.0000971	0.0000971			0.00117	0.0000971
	0.00444	0.00000977			0.000077	0.00000977			0.000797	0.00000977
	0.00074	0.000068		<	0.000068	0.000068			0.000086	0.000068
	0.00418	0.0000106			0.00021	0.0000106			0.000582	0.0000106
	0.000732	0.0000758		<	0.0000758	0.0000758			0.000148	0.0000758
	0.0018	0.0000116			0.00004	0.0000116			0.000124	0.0000116
<	0.0000909	0.0000909		<	0.0000909	0.0000909		<	0.0000909	0.0000909
<	0.0000917	0.0000917		<	0.0000917	0.0000917		<	0.0000917	0.0000917
	0.00189	0.0000901		<	0.0000901	0.0000901		<	0.0000901	0.0000901
	0.00975	0.0000199		<	0.0000199	0.0000199			0.000599	0.0000199
	0.000396	0.0000614		<	0.0000614	0.0000614		<	0.0000614	0.0000614
	0.00216	0.0000155			0.000042	0.0000155			0.000118	0.0000155
<	0.000103	0.000103		<	0.000103	0.000103		<	0.000103	0.000103
<	0.0000917	0.0000917		<	0.0000917	0.0000917		<	0.0000917	0.0000917
	0.000773	0.0000625		<	0.0000625	0.0000625		<	0.0000625	0.0000625
	0.00468	0.0000146		<	0.0000146	0.0000146			0.000415	0.0000146
<	0.0000893	0.0000893		<	0.0000893	0.0000893			0.000318	0.0000893
<	0.0000518	0.0000518		<	0.0000518	0.0000518		<	0.0000518	0.0000518
	0.00118	0.0000971			0.000131	0.0000971			0.000129	0.0000971
	0.00661	0.0000176		<	0.0000176	0.0000176			0.000504	0.0000176
<	0.000625	0.000625		<	0.000625	0.000625		<	0.000625	0.000625
<	0.000278	0.000278		<	0.000278	0.000278		<	0.000278	0.000278

<	0.000588	0.000588	<	0.000588	0.000588	<	0.000588	0.000588
<	0.000208	0.000208	<	0.000208	0.000208	<	0.000208	0.000208
<	0.0005	0.0005	<	0.0005	0.0005	<	0.0005	0.0005
<	0.000111	0.000111	<	0.000111	0.000111	<	0.000111	0.000111
<	0.0000862	0.0000862	<	0.0000862	0.0000862	<	0.0000862	0.0000862
<	0.0000909	0.0000909	<	0.0000909	0.0000909	<	0.0000909	0.0000909

PCB# 205	PCB# 206	PCB# 206	PCB# 206	PCB# 206	PCB# 207	PCB# 207	PCB# 207
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
	<	0.0000671	0.0000671		<	0.0000671	0.0000671
	<	0.0000943	0.0000943			0.00135	0.0000943
	<	0.0001	0.0001		<	0.0001	0.0001
	<	0.000105	0.000105		<	0.000105	0.000105
		0.000202	0.000098			0.00137	0.000098
		0.00108	0.0000355			0.00818	0.0000355
		0.000155	0.0000763			0.00145	0.0000763
	<	0.0000943	0.0000943			0.0301	0.0000943
	<	0.000099	0.000099		<	0.000099	0.000099
		0.00342	0.0000952			0.0114	0.0000952
		0.000415	0.0001			0.0012	0.0001
COM M - CONFIRMED BY GC/MS		0.00573	0.0000108	COM M - CONFIRMED BY GC/MS		0.00413	0.0000108
		0.00574	0.0000971			0.00234	0.0000971
		0.00234	0.00000977			0.00216	0.00000977
		0.000449	0.000068			0.00164	0.000068
		0.00173	0.0000106			0.00165	0.0000106
		0.000616	0.0000758			0.00151	0.0000758
		0.00105	0.0000116			0.000603	0.0000116
	<	0.0000909	0.0000909		<	0.0000909	0.0000909
	<	0.0000917	0.0000917			0.00151	0.0000917
		0.000823	0.0000901			0.00152	0.0000901
		0.00356	0.0000199			0.00201	0.0000199
		0.00033	0.0000614			0.00118	0.0000614
		0.000536	0.0000155			0.00406	0.0000155
	<	0.000103	0.000103		<	0.000103	0.000103
	<	0.0000917	0.0000917		<	0.0000917	0.0000917
		0.000504	0.0000625			0.00118	0.0000625
		0.00145	0.0000146			0.000862	0.0000146
		0.000281	0.0000893			0.0015	0.0000893
	<	0.0000518	0.0000518			0.00827	0.0000518
		0.000506	0.0000971	COM M - CONFIRMED BY GC/MS		0.00144	0.0000971
COM M - CONFIRMED BY GC/MS		0.0019	0.0000176	COM M - CONFIRMED BY GC/MS		0.00281	0.0000176
	<	0.000625	0.000625		<	0.000625	0.000625
	<	0.000278	0.000278		<	0.000278	0.000278

<	0.000588	0.000588	<	0.000588	0.000588
<	0.000208	0.000208	<	0.000208	0.000208
<	0.0005	0.0005	<	0.0005	0.0005
<	0.000111	0.000111		0.00348	0.000111
<	0.0000862	0.0000862	<	0.0000862	0.0000862
<	0.0000909	0.0000909	<	0.0000909	0.0000909

PCB# 207	PCB# 209	PCB# 209	PCB# 209	PCB# 209	PCB# 22/51	PCB# 22/51	PCB# 22/51	PCB# 22/51
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments
	<	0.0000671	0.0000671		<	0.0000671	0.0000671	
		0.00231	0.0000943		<	0.0000943	0.0000943	
	<	0.0001	0.0001		<	0.0001	0.0001	
	<	0.000105	0.000105		<	0.000105	0.000105	
		0.000521	0.000098			0.00316	0.000098	
COM POSSIBLE BLANK CONTAMINATION		0.000494	0.0000355		<	0.0000355	0.0000355	
	<	0.0000763	0.0000763			0.00146	0.0000763	
	<	0.0000943	0.0000943		<	0.0000943	0.0000943	
	<	0.000099	0.000099		<	0.000099	0.000099	
	<	0.0000952	0.0000952		<	0.0000952	0.0000952	
		0.000461	0.0001			0.00193	0.0001	
COM M - CONFIRMED BY GC/MS		0.00404	0.0000108	COM M - CONFIRMED BY GC/MS		0.000106	0.0000108	
		0.00204	0.0000971			0.00293	0.0000971	COM M - CONFIRMED BY GC/MS
COM POSSIBLE BLANK CONTAMINATION		0.00214	0.00000977			0.000296	0.00000977	
		0.000324	0.000068			0.00162	0.000068	
COM POSSIBLE BLANK CONTAMINATION		0.00354	0.0000106		<	0.0000106	0.0000106	
	<	0.0000758	0.0000758			0.0012	0.0000758	
COM POSSIBLE BLANK CONTAMINATION		0.000446	0.0000116			0.000272	0.0000116	
	<	0.0000909	0.0000909		<	0.0000909	0.0000909	
	<	0.0000917	0.0000917			0.0022	0.0000917	
	<	0.0000901	0.0000901			0.00237	0.0000901	
COM POSSIBLE BLANK CONTAMINATION		0.00243	0.0000199			0.0004	0.0000199	
	<	0.0000614	0.0000614			0.00162	0.0000614	
COM POSSIBLE BLANK CONTAMINATION		0.000478	0.0000155			0.000084	0.0000155	
		0.00666	0.000103		<	0.000103	0.000103	
	<	0.0000917	0.0000917		<	0.0000917	0.0000917	
	<	0.0000625	0.0000625			0.00282	0.0000625	
COM POSSIBLE BLANK CONTAMINATION		0.000773	0.0000146		<	0.0000146	0.0000146	
		0.000285	0.0000893			0.00131	0.0000893	
COM POSSIBLE BLANK CONTAMINATION	<	0.0000518	0.0000518		<	0.0000518	0.0000518	
		0.000133	0.0000971	COM M - CONFIRMED BY GC/MS		0.0022	0.0000971	
COM M - CONFIRMED BY GC/MS		0.000532	0.0000176	COM M - CONFIRMED BY GC/MS	<	0.0000176	0.0000176	
	<	0.000625	0.000625		<	0.000625	0.000625	
	<	0.000278	0.000278		<	0.000278	0.000278	

<	0.000588	0.000588	<	0.000588	0.000588
<	0.000208	0.000208	<	0.000208	0.000208
<	0.0005	0.0005	<	0.0005	0.0005
<	0.000111	0.000111	<	0.000111	0.000111
<	0.0000862	0.0000862	<	0.0000862	0.0000862
<	0.0000909	0.0000909	<	0.0000909	0.0000909

PCB# 24/27	PCB# 24/27	PCB# 24/27	PCB# 24/27	PCB# 25	PCB# 25	PCB# 25	PCB# 25	PCB# 26	PCB# 26
DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm
<	0.0000671	0.0000671		<	0.0000671	0.0000671		<	0.0000671
<	0.0000943	0.0000943		<	0.0000943	0.0000943		<	0.0000943
<	0.0001	0.0001			0.013	0.0001		<	0.0001
<	0.000105	0.000105			0.0081	0.000105		<	0.000105
	0.00103	0.000098			0.00268	0.000098			0.00174
	0.000225	0.0000355			0.00385	0.0000355			0.00312
	0.000205	0.0000763			0.00335	0.0000763			0.00244
<	0.0000943	0.0000943		<	0.0000943	0.0000943		<	0.0000943
<	0.000099	0.000099		<	0.000099	0.000099		<	0.000099
<	0.0000952	0.0000952			0.00377	0.0000952		<	0.0000952
<	0.0001	0.0001			0.000784	0.0001	COM POSSIBLE BLANK CONTAMINATION		0.00154
	0.000072	0.0000108			0.00148	0.0000108	COM M - CONFIRMED BY GC/MS		0.00548
<	0.0000971	0.0000971			0.0017	0.0000971	COM M - CONFIRMED BY GC/MS		0.0105
	0.000406	0.00000977			0.00289	0.00000977			0.00444
	0.000955	0.000068			0.000731	0.000068	COM POSSIBLE BLANK CONTAMINATION		0.000462
	0.000012	0.0000106			0.00154	0.0000106			0.00282
<	0.0000758	0.0000758			0.000911	0.0000758	COM POSSIBLE BLANK CONTAMINATION		0.00154
	0.000151	0.0000116			0.000939	0.0000116			0.0022
<	0.0000909	0.0000909			0.0102	0.0000909		<	0.0000909
	0.00208	0.0000917		<	0.0000917	0.0000917		<	0.0000917
<	0.0000901	0.0000901			0.000652	0.0000901	COM POSSIBLE BLANK CONTAMINATION		0.00116
	0.00007	0.0000199			0.00146	0.0000199			0.0027
	0.000748	0.0000614			0.000384	0.0000614	COM POSSIBLE BLANK CONTAMINATION		0.000547
	0.000161	0.0000155			0.0012	0.0000155			0.0022
<	0.000103	0.000103		<	0.000103	0.000103			0.00329
<	0.0000917	0.0000917			0.00737	0.0000917		<	0.0000917
	0.00138	0.0000625			0.00118	0.0000625	COM POSSIBLE BLANK CONTAMINATION		0.00112
<	0.0000146	0.0000146			0.00132	0.0000146			0.00258
	0.000199	0.0000893			0.00162	0.0000893	COM POSSIBLE BLANK CONTAMINATION		0.00137
<	0.0000518	0.0000518			0.00116	0.0000518			0.00242
	0.000773	0.0000971	COM M - CONFIRMED BY GC/MS		0.00227	0.0000971	COM M - CONFIRMED BY GC/MS		0.00108
<	0.0000176	0.0000176			0.00121	0.0000176	COM M - CONFIRMED BY GC/MS		0.00275
<	0.000625	0.000625		<	0.000625	0.000625		<	0.000625
<	0.000278	0.000278		<	0.000278	0.000278		<	0.000278

<	0.000588	0.000588		0.0274	0.000588	COM M - CONFIRMED BY GC/MS	<	0.000588
<	0.000208	0.000208	<	0.000208	0.000208		<	0.000208
<	0.0005	0.0005	<	0.0005	0.0005		<	0.0005
<	0.000111	0.000111	<	0.000111	0.000111		<	0.000111
<	0.0000862	0.0000862	<	0.0000862	0.0000862		<	0.0000862
<	0.0000909	0.0000909		0.00989	0.0000909			0.00266

PCB# 26	PCB# 26	PCB# 28	PCB# 28	PCB# 28	PCB# 28	PCB# 29	PCB# 29	PCB# 29
Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
0.0000671		<	0.0000671	0.0000671		<	0.0000671	0.0000671
0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943
0.0001		<	0.0001	0.0001		<	0.0001	0.0001
0.000105			0.00135	0.000105		<	0.000105	0.000105
0.000098			0.00293	0.000098			0.000598	0.000098
0.0000355			0.00409	0.0000355		<	0.0000355	0.0000355
0.0000763			0.00418	0.0000763			0.000173	0.0000763
0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943
0.000099		<	0.000099	0.000099		<	0.000099	0.000099
0.0000952		<	0.0000952	0.0000952		<	0.0000952	0.0000952
0.0001			0.00199	0.0001			0.000101	0.0001
0.0000108	COM M - CONFIRMED BY GC/MS		0.00834	0.0000108	COM M - CONFIRMED BY GC/MS		0.000147	0.0000108
0.0000971	COM M - CONFIRMED BY GC/MS		0.0235	0.0000971	COM M - CONFIRMED BY GC/MS		0.00203	0.0000971
0.00000977			0.00658	0.00000977			0.000111	0.00000977
0.000068	CONTAMINATION		0.00316	0.000068			0.00089	0.000068
0.0000106			0.00584	0.0000106			0.000029	0.0000106
0.0000758			0.00278	0.0000758			0.000545	0.0000758
0.0000116			0.00238	0.0000116			0.000272	0.0000116
0.0000909		<	0.0000909	0.0000909		<	0.0000909	0.0000909
0.0000917			0.00936	0.0000917		<	0.0000917	0.0000917
0.0000901			0.000407	0.0000901			0.00105	0.0000901
0.0000199			0.00865	0.0000199			0.000205	0.0000199
0.0000614	CONTAMINATION		0.00161	0.0000614		<	0.0000614	0.0000614
0.0000155			0.00437	0.0000155			0.000191	0.0000155
0.000103		<	0.000103	0.000103		<	0.000103	0.000103
0.0000917			0.025	0.0000917	COM M - CONFIRMED BY GC/MS	<	0.0000917	0.0000917
0.0000625			0.00265	0.0000625			0.000321	0.0000625
0.0000146			0.0085	0.0000146		<	0.0000146	0.0000146
0.0000893			0.00326	0.0000893		<	0.0000893	0.0000893
0.0000518			0.000891	0.0000518		<	0.0000518	0.0000518
0.0000971	COM M - CONFIRMED BY GC/MS		0.00304	0.0000971	COM M - CONFIRMED BY GC/MS		0.000114	0.0000971
0.0000176	COM M - CONFIRMED BY GC/MS		0.0093	0.0000176	COM M - CONFIRMED BY GC/MS	<	0.0000176	0.0000176
0.000625		<	0.000625	0.000625		<	0.000625	0.000625
0.000278		<	0.000278	0.000278		<	0.000278	0.000278

0.000588	<	0.000588	0.000588	<	0.000588	0.000588
0.000208	<	0.000208	0.000208	<	0.000208	0.000208
0.0005	<	0.0005	0.0005	<	0.0005	0.0005
0.000111	<	0.000111	0.000111	<	0.000111	0.000111
0.0000862	<	0.0000862	0.0000862	<	0.0000862	0.0000862
0.0000909		0.00987	0.0000909	<	0.0000909	0.0000909

PCB# 29	PCB# 30	PCB# 30	PCB# 30	PCB# 30	PCB# 31	PCB# 31	PCB# 31	PCB# 31
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments
	<	0.0000671	0.0000671			0.0167	0.0000671	
	<	0.0000943	0.0000943			0.0123	0.0000943	
	<	0.0001	0.0001			0.0171	0.0001	
	<	0.000105	0.000105			0.011	0.000105	
	<	0.000098	0.000098			0.00169	0.000098	
	<	0.0000355	0.0000355			0.00277	0.0000355	
	<	0.0000763	0.0000763			0.00268	0.0000763	
	<	0.0000943	0.0000943		<	0.0000943	0.0000943	
	<	0.000099	0.000099		<	0.000099	0.000099	
	<	0.0000952	0.0000952			0.00805	0.0000952	
	<	0.0001	0.0001			0.00115	0.0001	
COM M - CONFIRMED BY GC/MS	<	0.0000108	0.0000108	COM M - CONFIRMED BY GC/MS		0.00404	0.0000108	COM M - CONFIRMED BY GC/MS
	<	0.0000971	0.0000971			0.0126	0.0000971	COM M - CONFIRMED BY GC/MS
	<	0.00000977	0.00000977			0.00369	0.00000977	
	<	0.000068	0.000068			0.00131	0.000068	
	<	0.0000106	0.0000106			0.00284	0.0000106	
	<	0.0000758	0.0000758			0.000457	0.0000758	
	<	0.0000116	0.0000116			0.00192	0.0000116	
	<	0.0000909	0.0000909			0.0137	0.0000909	
	<	0.0000917	0.0000917		<	0.0000917	0.0000917	
	<	0.0000901	0.0000901			0.00176	0.0000901	
	<	0.0000199	0.0000199			0.000548	0.0000199	
	<	0.0000614	0.0000614			0.00071	0.0000614	
	<	0.0000155	0.0000155			0.00249	0.0000155	
	<	0.000103	0.000103		<	0.000103	0.000103	
	<	0.0000917	0.0000917			0.00469	0.0000917	COM M - CONFIRMED BY GC/MS
	<	0.0000625	0.0000625			0.00126	0.0000625	
	<	0.0000146	0.0000146		<	0.0000146	0.0000146	
	<	0.0000893	0.0000893			0.00176	0.0000893	
	<	0.0000518	0.0000518			0.000782	0.0000518	
	<	0.0000971	0.0000971			0.00145	0.0000971	COM M - CONFIRMED BY GC/MS
	<	0.0000176	0.0000176		<	0.0000176	0.0000176	
	<	0.000625	0.000625		<	0.000625	0.000625	
	<	0.000278	0.000278		<	0.000278	0.000278	

<	0.000588	0.000588		0.201	0.000588	COM M - CONFIRMED BY GC/MS
<	0.000208	0.000208		0.0452	0.000208	
<	0.0005	0.0005	<	0.0005	0.0005	
<	0.000111	0.000111		0.00947	0.000111	
<	0.0000862	0.0000862		0.0133	0.0000862	
<	0.0000909	0.0000909		0.00289	0.0000909	

PCB# 33/20	PCB# 33/20	PCB# 33/20	PCB# 33/20	PCB# 39	PCB# 39	PCB# 39	PCB# 39	PCB# 40	PCB# 40	PCB# 40
DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
<	0.0000671	0.0000671		<	0.0000671	0.0000671		<	0.0000671	0.0000671
	0.00333	0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943
<	0.0001	0.0001		<	0.0001	0.0001		<	0.0001	0.0001
<	0.000105	0.000105		<	0.000105	0.000105		<	0.000105	0.000105
<	0.000098	0.000098		<	0.000098	0.000098		<	0.000098	0.000098
<	0.0000355	0.0000355		<	0.0000355	0.0000355		<	0.0000355	0.0000355
	0.000251	0.0000763			0.000244	0.0000763			0.000093	0.0000763
<	0.0000943	0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943
<	0.000099	0.000099		<	0.000099	0.000099		<	0.000099	0.000099
	0.00206	0.0000952		<	0.0000952	0.0000952		<	0.0000952	0.0000952
	0.000313	0.0001		<	0.0001	0.0001		<	0.0001	0.0001
	0.000618	0.0000108	COM M - CONFIRMED BY GC/MS		0.000122	0.0000108			0.000147	0.0000108
	0.00181	0.0000971	COM M - CONFIRMED BY GC/MS		0.0019	0.0000971			0.000413	0.0000971
	0.0003	0.00000977			0.000849	0.00000977			0.000359	0.00000977
	0.000253	0.000068			0.000306	0.000068			0.000345	0.000068
<	0.0000106	0.0000106		<	0.0000106	0.0000106			0.000066	0.0000106
	0.000326	0.0000758			0.00017	0.0000758			0.000109	0.0000758
	0.000198	0.0000116			0.000522	0.0000116			0.000117	0.0000116
<	0.0000909	0.0000909		<	0.0000909	0.0000909		<	0.0000909	0.0000909
<	0.0000917	0.0000917			0.00706	0.0000917			0.0451	0.0000917
	0.000645	0.0000901			0.000188	0.0000901			0.000106	0.0000901
	0.000194	0.0000199		<	0.0000199	0.0000199		<	0.0000199	0.0000199
	0.000266	0.0000614			0.000389	0.0000614			0.000132	0.0000614
	0.000191	0.0000155			0.000245	0.0000155			0.000085	0.0000155
<	0.000103	0.000103		<	0.000103	0.000103		<	0.000103	0.000103
<	0.0000917	0.0000917		<	0.0000917	0.0000917		<	0.0000917	0.0000917
	0.0004	0.0000625		<	0.0000625	0.0000625		<	0.0000625	0.0000625
<	0.0000146	0.0000146		<	0.0000146	0.0000146		<	0.0000146	0.0000146
	0.000313	0.0000893		<	0.0000893	0.0000893		<	0.0000893	0.0000893
<	0.0000518	0.0000518		<	0.0000518	0.0000518		<	0.0000518	0.0000518
	0.000291	0.0000971		<	0.0000971	0.0000971		<	0.0000971	0.0000971
<	0.0000176	0.0000176		<	0.0000176	0.0000176		<	0.0000176	0.0000176
<	0.000625	0.000625		<	0.000625	0.000625		<	0.000625	0.000625
<	0.000278	0.000278		<	0.000278	0.000278		<	0.000278	0.000278

	0.0269	0.000588	COM M - CONFIRMED BY GC/MS	<	0.000588	0.000588	<	0.000588	0.000588
<	0.000208	0.000208		<	0.000208	0.000208	<	0.000208	0.000208
<	0.0005	0.0005		<	0.0005	0.0005	<	0.0005	0.0005
	0.00429	0.000111		<	0.000111	0.000111	<	0.000111	0.000111
<	0.0000862	0.0000862		<	0.0000862	0.0000862	<	0.0000862	0.0000862
	0.00337	0.0000909			0.00972	0.0000909	<	0.0000909	0.0000909

PCB# 40	PCB# 41/64	PCB# 41/64	PCB# 41/64	PCB# 41/64	PCB# 42/59/37	PCB# 42/59/37	PCB# 42/59/37
Result Modifier Comments	DL Rel Symbol	Wet Weight Result	Wet Weight Detection Limit	Result Modifier Comments	DL Rel Symbol	Wet Weight Result	Wet Weight Detection Limit
		ppm	ppm			ppm	ppm
	<	0.0000671	0.0000671		<	0.0000671	0.0000671
	<	0.0000943	0.0000943		<	0.0000943	0.0000943
	<	0.0001	0.0001		<	0.0001	0.0001
	<	0.000105	0.000105		<	0.000105	0.000105
	<	0.000098	0.000098			0.000222	0.000098
	<	0.0000355	0.0000355		<	0.0000355	0.0000355
	<	0.0000763	0.0000763		<	0.0000763	0.0000763
	<	0.0000943	0.0000943		<	0.0000943	0.0000943
	<	0.000099	0.000099		<	0.000099	0.000099
		0.00239	0.0000952			0.0011	0.0000952
	<	0.0001	0.0001		<	0.0001	0.0001
COM M - CONFIRMED BY GC/MS		0.000507	0.0000108	COM M - CONFIRMED BY GC/MS		0.000616	0.0000108
		0.00234	0.0000971	COM M - CONFIRMED BY GC/MS	<	0.0000971	0.0000971
	<	0.00000977	0.00000977			0.00117	0.00000977
		0.000155	0.000068			0.00063	0.000068
	<	0.0000106	0.0000106		<	0.0000106	0.0000106
		0.000397	0.0000758		<	0.0000758	0.0000758
		0.00042	0.0000116			0.000521	0.0000116
	<	0.0000909	0.0000909		<	0.0000909	0.0000909
	<	0.0000917	0.0000917		<	0.0000917	0.0000917
		0.000224	0.0000901			0.00044	0.0000901
	<	0.0000199	0.0000199		<	0.0000199	0.0000199
		0.000536	0.0000614			0.000251	0.0000614
		0.000742	0.0000155			0.000301	0.0000155
	<	0.000103	0.000103		<	0.000103	0.000103
	<	0.0000917	0.0000917		<	0.0000917	0.0000917
	<	0.0000625	0.0000625			0.000192	0.0000625
	<	0.0000146	0.0000146		<	0.0000146	0.0000146
	<	0.0000893	0.0000893		<	0.0000893	0.0000893
	<	0.0000518	0.0000518		<	0.0000518	0.0000518
	<	0.0000971	0.0000971			0.000396	0.0000971
	<	0.0000176	0.0000176		<	0.0000176	0.0000176
	<	0.000625	0.000625		<	0.000625	0.000625
	<	0.000278	0.000278		<	0.000278	0.000278

	0.0605	0.000588	<	0.000588	0.000588
<	0.000208	0.000208	<	0.000208	0.000208
<	0.0005	0.0005	<	0.0005	0.0005
<	0.000111	0.000111	<	0.000111	0.000111
<	0.0000862	0.0000862	<	0.0000862	0.0000862
<	0.0000909	0.0000909		0.00285	0.0000909

PCB# 42/59/37	PCB# 44	PCB# 44	PCB# 44	PCB# 44	PCB# 45	PCB# 45	PCB# 45	PCB# 45
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments
	<	0.0000671	0.0000671		<	0.0000671	0.0000671	
	<	0.0000943	0.0000943		<	0.0000943	0.0000943	
	<	0.0001	0.0001		<	0.0001	0.0001	
	<	0.000105	0.000105		<	0.000105	0.000105	
		0.00115	0.000098			0.0113	0.000098	COM POSSIBLE BLANK CONTAMINATION
		0.00234	0.0000355			0.00144	0.0000355	
		0.00239	0.0000763			0.0066	0.0000763	COM POSSIBLE BLANK CONTAMINATION
	<	0.0000943	0.0000943			0.00257	0.0000943	
	<	0.000099	0.000099		<	0.000099	0.000099	
		0.00173	0.0000952		<	0.0000952	0.0000952	
		0.00122	0.0001			0.00904	0.0001	COM POSSIBLE BLANK CONTAMINATION
COM M - CONFIRMED BY GC/MS		0.00283	0.0000108	COM M - CONFIRMED BY GC/MS		0.000398	0.0000108	COM M - CONFIRMED BY GC/MS
COM M - CONFIRMED BY GC/MS		0.0102	0.0000971	COM M - CONFIRMED BY GC/MS		0.00492	0.0000971	COM POSSIBLE BLANK CONTAMINATION
		0.00232	0.00000977			0.00159	0.00000977	
		0.00126	0.000068			0.00191	0.000068	COM POSSIBLE BLANK CONTAMINATION
		0.000132	0.0000106			0.0013	0.0000106	
		0.000405	0.0000758			0.00831	0.0000758	COM POSSIBLE BLANK CONTAMINATION
		0.00174	0.0000116			0.000329	0.0000116	
	<	0.0000909	0.0000909		<	0.0000909	0.0000909	
	<	0.0000917	0.0000917			0.184	0.0000917	
		0.000784	0.0000901			0.00887	0.0000901	COM POSSIBLE BLANK CONTAMINATION
		0.00166	0.0000199			0.00179	0.0000199	
		0.000226	0.0000614			0.00488	0.0000614	COM POSSIBLE BLANK CONTAMINATION
		0.0014	0.0000155			0.000475	0.0000155	
	<	0.000103	0.000103		<	0.000103	0.000103	
		0.00467	0.0000917	COM M - CONFIRMED BY GC/MS	<	0.0000917	0.0000917	
		0.00126	0.0000625			0.00699	0.0000625	COM POSSIBLE BLANK CONTAMINATION
		0.00194	0.0000146			0.000764	0.0000146	
		0.000696	0.0000893			0.00908	0.0000893	COM POSSIBLE BLANK CONTAMINATION
		0.0015	0.0000518			0.00218	0.0000518	
		0.000342	0.0000971	COM M - CONFIRMED BY GC/MS		0.0134	0.0000971	COM POSSIBLE BLANK CONTAMINATION
		0.00215	0.0000176	COM M - CONFIRMED BY GC/MS		0.000323	0.0000176	COM M - CONFIRMED BY GC/MS
	<	0.000625	0.000625		<	0.000625	0.000625	
	<	0.000278	0.000278		<	0.000278	0.000278	

COM M - CONFIRMED BY GC/MS		0.0599	0.000588	COM M - CONFIRMED BY GC/MS	<	0.000588	0.000588
		0.0438	0.000208		<	0.000208	0.000208
	<	0.0005	0.0005		<	0.0005	0.0005
		0.013	0.000111		<	0.000111	0.000111
	<	0.0000862	0.0000862		<	0.0000862	0.0000862
		0.00443	0.0000909			0.00197	0.0000909

PCB# 46	PCB# 46	PCB# 46	PCB# 46	PCB# 47/75	PCB# 47/75	PCB# 47/75	PCB# 47/75	PCB# 48	PCB# 48	PCB# 48
DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
<	0.0000671	0.0000671			0.00152	0.0000671		<	0.0000671	0.0000671
<	0.0000943	0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943
<	0.0001	0.0001		<	0.0001	0.0001		<	0.0001	0.0001
<	0.000105	0.000105		<	0.000105	0.000105		<	0.000105	0.000105
	0.000885	0.000098		<	0.000098	0.000098			0.000707	0.000098
<	0.0000355	0.0000355		<	0.0000355	0.0000355			0.00187	0.0000355
	0.000451	0.0000763			0.000649	0.0000763			0.00296	0.0000763
<	0.0000943	0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943
<	0.000099	0.000099			0.00559	0.000099		<	0.000099	0.000099
<	0.0000952	0.0000952			0.0122	0.0000952		<	0.0000952	0.0000952
<	0.0001	0.0001		<	0.0001	0.0001			0.00304	0.0001
	0.000272	0.0000108	COM M - CONFIRMED BY GC/MS	<	0.0000108	0.0000108			0.0135	0.0000108
	0.000949	0.0000971	COM M - CONFIRMED BY GC/MS		0.00173	0.0000971			0.0209	0.0000971
	0.000542	0.00000977		<	0.00000977	0.00000977			0.00853	0.00000977
	0.000288	0.000068			0.000631	0.000068			0.00179	0.000068
	0.000069	0.0000106		<	0.0000106	0.0000106			0.00631	0.0000106
	0.000701	0.0000758			0.000144	0.0000758			0.00104	0.0000758
	0.000195	0.0000116			0.000179	0.0000116			0.00416	0.0000116
<	0.0000909	0.0000909		<	0.0000909	0.0000909		<	0.0000909	0.0000909
<	0.0000917	0.0000917		<	0.0000917	0.0000917		<	0.0000917	0.0000917
	0.000526	0.0000901		<	0.0000901	0.0000901			0.00434	0.0000901
	0.000434	0.0000199		<	0.0000199	0.0000199			0.00913	0.0000199
	0.000833	0.0000614		<	0.0000614	0.0000614			0.00134	0.0000614
	0.00037	0.0000155			0.000324	0.0000155			0.00355	0.0000155
<	0.000103	0.000103		<	0.000103	0.000103		<	0.000103	0.000103
<	0.0000917	0.0000917		<	0.0000917	0.0000917			0.00591	0.0000917
	0.000619	0.0000625		<	0.0000625	0.0000625			0.00226	0.0000625
<	0.0000146	0.0000146		<	0.0000146	0.0000146			0.00424	0.0000146
	0.000519	0.0000893		<	0.0000893	0.0000893			0.00106	0.0000893
<	0.0000518	0.0000518		<	0.0000518	0.0000518			0.00136	0.0000518
<	0.0000971	0.0000971			0.000801	0.0000971	CONFIRMED BY		0.00388	0.0000971
<	0.0000176	0.0000176		<	0.0000176	0.0000176			0.012	0.0000176
<	0.000625	0.000625		<	0.000625	0.000625		<	0.000625	0.000625
<	0.000278	0.000278		<	0.000278	0.000278		<	0.000278	0.000278

<	0.000588	0.000588	<	0.000588	0.000588		0.0724	0.000588
<	0.000208	0.000208	<	0.000208	0.000208	<	0.000208	0.000208
<	0.0005	0.0005	<	0.0005	0.0005	<	0.0005	0.0005
<	0.000111	0.000111		0.00263	0.000111	<	0.000111	0.000111
<	0.0000862	0.0000862		0.00492	0.0000862	<	0.0000862	0.0000862
	0.00443	0.0000909		0.0115	0.0000909	<	0.0000909	0.0000909

PCB# 48	PCB# 49	PCB# 49	PCB# 49	PCB# 49	PCB# 52	PCB# 52	PCB# 52	PCB# 52	PCB# 53
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol
	<	0.0000671	0.0000671			0.00126	0.0000671		<
	<	0.0000943	0.0000943			0.0056	0.0000943		<
		0.0034	0.0001			0.00505	0.0001		<
		0.00871	0.000105			0.00166	0.000105		<
		0.00277	0.000098			0.00584	0.000098		
		0.00366	0.0000355			0.00886	0.0000355		<
	<	0.0000763	0.0000763			0.00797	0.0000763		
	<	0.0000943	0.0000943			0.00552	0.0000943		<
	<	0.000099	0.000099			0.00551	0.000099		<
		0.00511	0.0000952			0.0135	0.0000952		<
	<	0.0001	0.0001			0.00789	0.0001		
COM M - CONFIRMED BY GC/MS	<	0.0000108	0.0000108			0.000195	0.0000108		
		0.0103	0.0000971	COM M - CONFIRMED BY GC/MS		0.0448	0.0000971		
		0.000414	0.00000977			0.0101	0.00000977		
		0.00338	0.000068			0.00561	0.000068		
		0.00597	0.0000106			0.00978	0.0000106		
	<	0.0000758	0.0000758			0.00369	0.0000758		
		0.000181	0.0000116			0.0053	0.0000116		
		0.00257	0.0000909			0.00409	0.0000909		<
	<	0.0000917	0.0000917			0.0221	0.0000917		<
		0.00437	0.0000901			0.00683	0.0000901		
		0.00324	0.0000199			0.0138	0.0000199		<
		0.004	0.0000614			0.00275	0.0000614		
		0.000499	0.0000155			0.00626	0.0000155		<
	<	0.000103	0.000103		<	0.000103	0.000103		<
COM M - CONFIRMED BY GC/MS		0.0185	0.0000917	COM M - CONFIRMED BY GC/MS		0.0161	0.0000917	COM M - CONFIRMED BY GC/MS	<
		0.00254	0.0000625			0.00387	0.0000625		
	<	0.0000146	0.0000146			0.00895	0.0000146		
		0.00296	0.0000893			0.000882	0.0000893		
		0.00286	0.0000518			0.00757	0.0000518		<
COM M - CONFIRMED BY GC/MS	<	0.0000971	0.0000971			0.00818	0.0000971	COM M - CONFIRMED BY GC/MS	
COM M - CONFIRMED BY GC/MS	<	0.0000176	0.0000176			0.0174	0.0000176	COM M - CONFIRMED BY GC/MS	<
	<	0.000625	0.000625		<	0.000625	0.000625		<
	<	0.000278	0.000278		<	0.000278	0.000278		<

COM M - CONFIRMED BY GC/MS		0.0629	0.000588	COM M - CONFIRMED BY GC/MS		0.145	0.000588	COM M - CONFIRMED BY GC/MS	<
		0.0207	0.000208			0.0633	0.000208		<
	<	0.0005	0.0005		<	0.0005	0.0005		<
	<	0.000111	0.000111			0.0183	0.000111		<
		0.00847	0.0000862			0.0251	0.0000862		<
		0.0185	0.0000909			0.026	0.0000909		<

PCB# 53	PCB# 53	PCB# 53	PCB# 60/56	PCB# 60/56	PCB# 60/56	PCB# 60/56	PCB# 63	PCB# 63
Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm
0.0000671	0.0000671		<	0.0000671	0.0000671		<	0.0000671
0.0000943	0.0000943		<	0.0000943	0.0000943		<	0.0000943
0.0001	0.0001		<	0.0001	0.0001		<	0.0001
0.000105	0.000105		<	0.000105	0.000105		<	0.000105
0.00194	0.000098			0.000377	0.000098	COM POSSIBLE BLANK CONTAMINATION	<	0.000098
0.0000355	0.0000355		<	0.0000355	0.0000355		<	0.0000355
0.000743	0.0000763			0.000087	0.0000763	COM POSSIBLE BLANK CONTAMINATION	<	0.0000763
0.0000943	0.0000943		<	0.0000943	0.0000943		<	0.0000943
0.000099	0.000099		<	0.000099	0.000099		<	0.000099
0.0000952	0.0000952			0.000462	0.0000952		<	0.0000952
0.000962	0.0001			0.0128	0.0001		<	0.0001
0.000255	0.0000108	COM M - CONFIRMED BY GC/MS	<	0.0000108	0.0000108		<	0.0000108
0.00367	0.0000971	COM M - CONFIRMED BY GC/MS		0.00153	0.0000971	COM M - CONFIRMED BY GC/MS	<	0.0000971
0.00186	0.00000977		<	0.00000977	0.00000977			0.00197
0.000596	0.000068			0.000719	0.000068	COM POSSIBLE BLANK CONTAMINATION		0.000603
0.00113	0.0000106			0.00311	0.0000106		<	0.0000106
0.000644	0.0000758			0.00044	0.0000758	COM POSSIBLE BLANK CONTAMINATION	<	0.0000758
0.000363	0.0000116			0.000224	0.0000116			0.000606
0.0000909	0.0000909		<	0.0000909	0.0000909		<	0.0000909
0.0000917	0.0000917		<	0.0000917	0.0000917		<	0.0000917
0.000783	0.0000901			0.000173	0.0000901	COM POSSIBLE BLANK CONTAMINATION		0.00132
0.0000199	0.0000199		<	0.0000199	0.0000199		<	0.0000199
0.000692	0.0000614			0.000265	0.0000614	COM POSSIBLE BLANK CONTAMINATION	<	0.0000614
0.0000155	0.0000155			0.000094	0.0000155			0.00101
0.000103	0.000103		<	0.000103	0.000103			0.0065
0.0000917	0.0000917		<	0.0000917	0.0000917		<	0.0000917
0.000238	0.0000625			0.000232	0.0000625	COM POSSIBLE BLANK CONTAMINATION	<	0.0000625
0.000183	0.0000146		<	0.0000146	0.0000146		<	0.0000146
0.000821	0.0000893			0.000279	0.0000893	COM POSSIBLE BLANK CONTAMINATION		0.000199
0.0000518	0.0000518		<	0.0000518	0.0000518		<	0.0000518
0.000286	0.0000971		<	0.0000971	0.0000971		<	0.0000971
0.0000176	0.0000176		<	0.0000176	0.0000176		<	0.0000176
0.000625	0.000625		<	0.000625	0.000625		<	0.000625
0.000278	0.000278		<	0.000278	0.000278		<	0.000278

0.000588	0.000588	<	0.000588	0.000588	<	0.000588
0.000208	0.000208	<	0.000208	0.000208	<	0.000208
0.0005	0.0005	<	0.0005	0.0005	<	0.0005
0.000111	0.000111		0.00247	0.000111	<	0.000111
0.0000862	0.0000862	<	0.0000862	0.0000862	<	0.0000862
0.0000909	0.0000909	<	0.0000909	0.0000909	<	0.0000909

PCB# 63	PCB# 63	PCB# 66	PCB# 66	PCB# 66	PCB# 66	PCB# 67	PCB# 67	PCB# 67
Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
0.0000671		<	0.0000671	0.0000671		<	0.0000671	0.0000671
0.0000943			0.00418	0.0000943		<	0.0000943	0.0000943
0.0001		<	0.0001	0.0001		<	0.0001	0.0001
0.000105			0.00684	0.000105		<	0.000105	0.000105
0.000098			0.00279	0.000098			0.000207	0.000098
0.0000355		<	0.0000355	0.0000355		<	0.0000355	0.0000355
0.0000763			0.00379	0.0000763			0.000081	0.0000763
0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943
0.000099			0.00241	0.000099		<	0.000099	0.000099
0.0000952			0.00643	0.0000952		<	0.0000952	0.0000952
0.0001			0.00345	0.0001			0.000138	0.0001
0.0000108			0.016	0.0000108	COM M - CONFIRMED BY GC/MS		0.00022	0.0000108
0.0000971			0.0165	0.0000971	COM M - CONFIRMED BY GC/MS		0.000789	0.0000971
0.00000977			0.00914	0.00000977			0.000303	0.00000977
0.000068			0.00189	0.000068			0.000119	0.000068
0.0000106			0.00505	0.0000106		<	0.0000106	0.0000106
0.0000758			0.00301	0.0000758		<	0.0000758	0.0000758
0.0000116			0.00326	0.0000116			0.000325	0.0000116
0.0000909			0.000945	0.0000909		<	0.0000909	0.0000909
0.0000917			0.00812	0.0000917		<	0.0000917	0.0000917
0.0000901			0.00348	0.0000901			0.000586	0.0000901
0.0000199			0.0102	0.0000199		<	0.0000199	0.0000199
0.0000614			0.00214	0.0000614			0.00041	0.0000614
0.0000155			0.00322	0.0000155			0.000252	0.0000155
0.000103		<	0.000103	0.000103		<	0.000103	0.000103
0.0000917		<	0.0000917	0.0000917		<	0.0000917	0.0000917
0.0000625			0.00391	0.0000625		<	0.0000625	0.0000625
0.0000146			0.0079	0.0000146		<	0.0000146	0.0000146
0.0000893			0.00063	0.0000893			0.000472	0.0000893
0.0000518			0.00125	0.0000518		<	0.0000518	0.0000518
0.0000971			0.00564	0.0000971	COM M - CONFIRMED BY GC/MS		0.000312	0.0000971
0.0000176			0.0153	0.0000176	COM M - CONFIRMED BY GC/MS	<	0.0000176	0.0000176
0.000625		<	0.000625	0.000625		<	0.000625	0.000625
0.000278		<	0.000278	0.000278		<	0.000278	0.000278

0.000588		0.147	0.000588	COM M - CONFIRMED BY GC/MS	<	0.000588	0.000588
0.000208		0.0641	0.000208		<	0.000208	0.000208
0.0005	<	0.0005	0.0005		<	0.0005	0.0005
0.000111		0.00874	0.000111		<	0.000111	0.000111
0.0000862		0.00426	0.0000862		<	0.0000862	0.0000862
0.0000909		0.0073	0.0000909		<	0.0000909	0.0000909

PCB# 67	PCB# 69	PCB# 69	PCB# 69	PCB# 69	PCB# 7/9	PCB# 7/9	PCB# 7/9	PCB# 7/9	PCB# 70	PCB# 70
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm
	<	0.0000671	0.0000671		<	0.0000671	0.0000671		<	0.0000671
	<	0.0000943	0.0000943		<	0.0000943	0.0000943		<	0.0000943
	<	0.0001	0.0001		<	0.0001	0.0001		<	0.0001
	<	0.000105	0.000105		<	0.000105	0.000105		<	0.000105
		0.000358	0.000098			0.000883	0.000098		<	0.000098
	<	0.0000355	0.0000355		<	0.0000355	0.0000355		<	0.0000355
	<	0.0000763	0.0000763			0.000898	0.0000763		<	0.0000763
	<	0.0000943	0.0000943			0.000451	0.0000943		<	0.0000943
	<	0.000099	0.000099		<	0.000099	0.000099		<	0.000099
	<	0.0000952	0.0000952		<	0.0000952	0.0000952		<	0.0000952
	<	0.0001	0.0001		<	0.0001	0.0001			0.00167
COM M - CONFIRMED BY GC/MS		0.000034	0.0000108			0.000255	0.0000108			0.000299
		0.000334	0.0000971			0.00166	0.0000971		<	0.0000971
		0.000039	0.00000977			0.000771	0.00000977			0.000187
		0.000147	0.000068			0.00152	0.000068			0.000296
		0.000013	0.0000106			0.000115	0.0000106			0.00006
		0.000231	0.0000758		<	0.0000758	0.0000758		<	0.0000758
		0.000131	0.0000116			0.000885	0.0000116			0.000139
	<	0.0000909	0.0000909		<	0.0000909	0.0000909		<	0.0000909
	<	0.0000917	0.0000917		<	0.0000917	0.0000917			0.0165
		0.000272	0.0000901			0.000489	0.0000901			0.000412
	<	0.0000199	0.0000199			0.000077	0.0000199		<	0.0000199
		0.000185	0.0000614			0.000666	0.0000614			0.000078
		0.000139	0.0000155		<	0.0000155	0.0000155			0.000084
	<	0.000103	0.000103		<	0.000103	0.000103		<	0.000103
	<	0.0000917	0.0000917		<	0.0000917	0.0000917		<	0.0000917
	<	0.0000625	0.0000625			0.000529	0.0000625		<	0.0000625
	<	0.0000146	0.0000146		<	0.0000146	0.0000146		<	0.0000146
	<	0.0000893	0.0000893		<	0.0000893	0.0000893			0.000096
	<	0.0000518	0.0000518		<	0.0000518	0.0000518		<	0.0000518
		0.00024	0.0000971		<	0.0000971	0.0000971		<	0.0000971
	<	0.0000176	0.0000176		<	0.0000176	0.0000176		<	0.0000176
		0.55	0.000625			0.0674	0.000625		<	0.000625
	<	0.000278	0.000278		<	0.000278	0.000278		<	0.000278

<	0.000588	0.000588		0.153	0.000588	<	0.000588
<	0.000208	0.000208		0.018	0.000208	<	0.000208
<	0.0005	0.0005	<	0.0005	0.0005	<	0.0005
<	0.000111	0.000111		0.0154	0.000111	<	0.000111
	0.0176	0.0000862	<	0.0000862	0.0000862	<	0.0000862
<	0.0000909	0.0000909	<	0.0000909	0.0000909	<	0.0000909

PCB# 70	PCB# 70	PCB# 72	PCB# 72	PCB# 72	PCB# 72	PCB# 74/61	PCB# 74/61	PCB# 74/61	PCB# 74/61
Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments
0.0000671		<	0.0000671	0.0000671		<	0.0000671	0.0000671	
0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943	
0.0001		<	0.0001	0.0001		<	0.0001	0.0001	
0.000105		<	0.000105	0.000105		<	0.000105	0.000105	
0.000098		<	0.000098	0.000098		<	0.000098	0.000098	
0.0000355		<	0.0000355	0.0000355		<	0.0000355	0.0000355	
0.0000763		<	0.0000763	0.0000763			0.000126	0.0000763	
0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943	
0.000099		<	0.000099	0.000099		<	0.000099	0.000099	
0.0000952		<	0.0000952	0.0000952			0.00869	0.0000952	
0.0001			0.000737	0.0001			0.00262	0.0001	
0.0000108			0.000826	0.0000108	COM M - CONFIRMED BY GC/MS		0.000541	0.0000108	
0.0000971			0.00392	0.0000971	COM M - CONFIRMED BY GC/MS		0.000258	0.0000971	COM M - CONFIRMED BY GC/MS
0.00000977			0.000316	0.00000977			0.000364	0.00000977	
0.000068			0.000864	0.000068		<	0.000068	0.000068	
0.0000106			0.000124	0.0000106		<	0.0000106	0.0000106	
0.0000758			0.000459	0.0000758		<	0.0000758	0.0000758	
0.0000116			0.000521	0.0000116			0.000162	0.0000116	
0.0000909		<	0.0000909	0.0000909		<	0.0000909	0.0000909	
0.0000917		<	0.0000917	0.0000917		<	0.0000917	0.0000917	
0.0000901			0.000986	0.0000901			0.000489	0.0000901	
0.0000199		<	0.0000199	0.0000199		<	0.0000199	0.0000199	
0.0000614			0.000127	0.0000614			0.00007	0.0000614	
0.0000155			0.000387	0.0000155			0.000057	0.0000155	
0.000103		<	0.000103	0.000103		<	0.000103	0.000103	
0.0000917		<	0.0000917	0.0000917		<	0.0000917	0.0000917	
0.0000625		<	0.0000625	0.0000625		<	0.0000625	0.0000625	
0.0000146		<	0.0000146	0.0000146		<	0.0000146	0.0000146	
0.0000893		<	0.0000893	0.0000893			0.00062	0.0000893	
0.0000518		<	0.0000518	0.0000518		<	0.0000518	0.0000518	
0.0000971		<	0.0000971	0.0000971		<	0.0000971	0.0000971	
0.0000176			0.000564	0.0000176	COM M - CONFIRMED BY GC/MS	<	0.0000176	0.0000176	
0.000625		<	0.000625	0.000625		<	0.000625	0.000625	
0.000278		<	0.000278	0.000278		<	0.000278	0.000278	

0.000588	<	0.000588	0.000588		0.0526	0.000588	COM M - CONFIRMED BY GC/MS
0.000208	<	0.000208	0.000208		0.0217	0.000208	
0.0005	<	0.0005	0.0005	<	0.0005	0.0005	
0.000111	<	0.000111	0.000111	<	0.000111	0.000111	
0.0000862	<	0.0000862	0.0000862	<	0.0000862	0.0000862	
0.0000909	<	0.0000909	0.0000909	<	0.0000909	0.0000909	

PCB# 77	PCB# 77	PCB# 77	PCB# 77	PCB# 8/5	PCB# 8/5	PCB# 8/5	PCB# 8/5	PCB# 81	PCB# 81	PCB# 81
DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
<	0.0000671	0.0000671		<	0.0000671	0.0000671		<	0.0000671	0.0000671
<	0.0000943	0.0000943			0.00725	0.0000943		<	0.0000943	0.0000943
<	0.0001	0.0001		<	0.0001	0.0001		<	0.0001	0.0001
<	0.000105	0.000105			0.00338	0.000105		<	0.000105	0.000105
<	0.000098	0.000098			0.000959	0.000098		<	0.000098	0.000098
<	0.0000355	0.0000355			0.00131	0.0000355		<	0.0000355	0.0000355
<	0.0000763	0.0000763			0.00119	0.0000763		<	0.0000763	0.0000763
<	0.0000943	0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943
<	0.000099	0.000099		<	0.000099	0.000099		<	0.000099	0.000099
<	0.0000952	0.0000952			0.00547	0.0000952		<	0.0000952	0.0000952
<	0.0001	0.0001		<	0.0001	0.0001		<	0.0001	0.0001
<	0.0000108	0.0000108			0.000686	0.0000108	COM M - CONFIRMED BY GC/MS	<	0.0000108	0.0000108
<	0.0000971	0.0000971			0.00292	0.0000971	COM M - CONFIRMED BY GC/MS	<	0.0000971	0.0000971
<	0.00000977	0.00000977			0.00113	0.00000977		<	0.00000977	0.00000977
	0.00012	0.000068			0.00125	0.000068		<	0.000068	0.000068
	0.00013	0.0000106			0.00164	0.0000106		<	0.0000106	0.0000106
<	0.0000758	0.0000758		<	0.0000758	0.0000758		<	0.0000758	0.0000758
	0.000065	0.0000116			0.00103	0.0000116		<	0.0000116	0.0000116
<	0.0000909	0.0000909		<	0.0000909	0.0000909		<	0.0000909	0.0000909
<	0.0000917	0.0000917			0.0166	0.0000917		<	0.0000917	0.0000917
<	0.0000901	0.0000901			0.00178	0.0000901		<	0.0000901	0.0000901
<	0.0000199	0.0000199			0.00149	0.0000199		<	0.0000199	0.0000199
<	0.0000614	0.0000614			0.00155	0.0000614		<	0.0000614	0.0000614
<	0.0000155	0.0000155			0.00188	0.0000155		<	0.0000155	0.0000155
<	0.000103	0.000103		<	0.000103	0.000103		<	0.000103	0.000103
<	0.0000917	0.0000917		<	0.0000917	0.0000917		<	0.0000917	0.0000917
<	0.0000625	0.0000625			0.000752	0.0000625	CONTAMINATION	<	0.0000625	0.0000625
<	0.0000146	0.0000146			0.00133	0.0000146		<	0.0000146	0.0000146
<	0.0000893	0.0000893			0.00043	0.0000893	CONTAMINATION	<	0.0000893	0.0000893
	0.00014	0.0000518		<	0.0000518	0.0000518		<	0.0000518	0.0000518
<	0.0000971	0.0000971			0.0001	0.0000971	COM M - CONFIRMED BY GC/MS	<	0.0000971	0.0000971
	0.000145	0.0000176			0.000763	0.0000176	COM M - CONFIRMED BY GC/MS	<	0.0000176	0.0000176
<	0.000625	0.000625		<	0.000625	0.000625		<	0.000625	0.000625
<	0.000278	0.000278		<	0.000278	0.000278		<	0.000278	0.000278

<	0.000588	0.000588		0.138	0.000588	COM M - CONFIRMED BY GC/MS	<	0.000588	0.000588
<	0.000208	0.000208		0.00857	0.000208		<	0.000208	0.000208
<	0.0005	0.0005	<	0.0005	0.0005		<	0.0005	0.0005
<	0.000111	0.000111		0.00868	0.000111		<	0.000111	0.000111
<	0.0000862	0.0000862		0.006	0.0000862		<	0.0000862	0.0000862
<	0.0000909	0.0000909		0.00592	0.0000909		<	0.0000909	0.0000909

PCB# 81	PCB# 82	PCB# 82	PCB# 82	PCB# 82	PCB# 83	PCB# 83	PCB# 83	PCB# 83	PCB# 84
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol
	<	0.0000671	0.0000671		<	0.0000671	0.0000671		<
	<	0.0000943	0.0000943		<	0.0000943	0.0000943		
	<	0.0001	0.0001		<	0.0001	0.0001		<
	<	0.000105	0.000105		<	0.000105	0.000105		
	<	0.000098	0.000098			0.000284	0.000098		<
	<	0.0000355	0.0000355		<	0.0000355	0.0000355		<
		0.000934	0.0000763			0.00113	0.0000763		<
	<	0.0000943	0.0000943		<	0.0000943	0.0000943		<
	<	0.000099	0.000099		<	0.000099	0.000099		
	<	0.0000952	0.0000952			0.000543	0.0000952		<
		0.000526	0.0001			0.000205	0.0001		
		0.00118	0.0000108	COM M - CONFIRMED BY GC/MS		0.000862	0.0000108	COM M - CONFIRMED BY GC/MS	<
		0.00351	0.0000971			0.00699	0.0000971		
		0.000464	0.00000977			0.0019	0.00000977		<
	<	0.000068	0.000068			0.001	0.000068		
		0.00148	0.0000106			0.00017	0.0000106		
		0.000546	0.0000758			0.000162	0.0000758		<
		0.00135	0.0000116			0.00147	0.0000116		
	<	0.0000909	0.0000909		<	0.0000909	0.0000909		<
	<	0.0000917	0.0000917		<	0.0000917	0.0000917		<
		0.00034	0.0000901			0.000525	0.0000901		<
	<	0.0000199	0.0000199			0.00159	0.0000199		<
	<	0.0000614	0.0000614			0.000358	0.0000614		
		0.000773	0.0000155			0.000862	0.0000155		
	<	0.000103	0.000103		<	0.000103	0.000103		<
	<	0.0000917	0.0000917		<	0.0000917	0.0000917		<
		0.0011	0.0000625		<	0.0000625	0.0000625		
		0.000398	0.0000146			0.000874	0.0000146		<
		0.000482	0.0000893		<	0.0000893	0.0000893		
	<	0.0000518	0.0000518		<	0.0000518	0.0000518		<
	<	0.0000971	0.0000971			0.000849	0.0000971	COM M - CONFIRMED BY GC/MS	
		0.00104	0.0000176	COM M - CONFIRMED BY GC/MS		0.0018	0.0000176	COM M - CONFIRMED BY GC/MS	<
	<	0.000625	0.000625		<	0.000625	0.000625		<
	<	0.000278	0.000278		<	0.000278	0.000278		

	0.012	0.000588	COM M - CONFIRMED BY GC/MS	<	0.000588	0.000588	<
<	0.000208	0.000208		<	0.000208	0.000208	<
<	0.0005	0.0005		<	0.0005	0.0005	<
<	0.000111	0.000111		<	0.000111	0.000111	<
<	0.0000862	0.0000862		<	0.0000862	0.0000862	<
<	0.0000909	0.0000909		<	0.0000909	0.0000909	<

PCB# 84	PCB# 84	PCB# 84	PCB# 85	PCB# 85	PCB# 85	PCB# 85	PCB# 87/115	PCB# 87/115	PCB# 87/115
Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
0.0000671	0.0000671		<	0.0000671	0.0000671		<	0.0000671	0.0000671
0.00791	0.0000943		<	0.0000943	0.0000943		<	0.0000943	0.0000943
0.0001	0.0001		<	0.0001	0.0001		<	0.0001	0.0001
0.0152	0.000105			0.00404	0.000105		<	0.000105	0.000105
0.000098	0.000098			0.000433	0.000098			0.00138	0.000098
0.0000355	0.0000355			0.000875	0.0000355			0.000916	0.0000355
0.0000763	0.0000763			0.000085	0.0000763			0.00202	0.0000763
0.0000943	0.0000943			0.00295	0.0000943		<	0.0000943	0.0000943
0.011	0.000099		<	0.000099	0.000099		<	0.000099	0.000099
0.0000952	0.0000952		<	0.0000952	0.0000952			0.00457	0.0000952
0.00051	0.0001			0.000424	0.0001			0.00204	0.0001
0.0000108	0.0000108		<	0.0000108	0.0000108		<	0.0000108	0.0000108
0.00325	0.0000971	COM M - CONFIRMED BY GC/MS		0.000794	0.0000971			0.00989	0.0000971
0.00000977	0.00000977			0.000389	0.00000977			0.00298	0.00000977
0.000368	0.000068			0.000596	0.000068			0.000594	0.000068
0.00188	0.0000106			0.0037	0.0000106			0.00664	0.0000106
0.0000758	0.0000758			0.000174	0.0000758			0.000578	0.0000758
0.000907	0.0000116			0.00022	0.0000116			0.00193	0.0000116
0.0000909	0.0000909			0.00707	0.0000909		<	0.0000909	0.0000909
0.0000917	0.0000917		<	0.0000917	0.0000917			0.00143	0.0000917
0.0000901	0.0000901		<	0.0000901	0.0000901			0.000525	0.0000901
0.0000199	0.0000199		<	0.0000199	0.0000199			0.00336	0.0000199
0.000072	0.0000614			0.000361	0.0000614			0.000376	0.0000614
0.000767	0.0000155			0.000118	0.0000155			0.00132	0.0000155
0.000103	0.000103		<	0.000103	0.000103			0.000863	0.000103
0.0000917	0.0000917		<	0.0000917	0.0000917		<	0.0000917	0.0000917
0.000766	0.0000625			0.000065	0.0000625			0.000719	0.0000625
0.0000146	0.0000146		<	0.0000146	0.0000146			0.00228	0.0000146
0.000194	0.0000893			0.00011	0.0000893			0.00013	0.0000893
0.0000518	0.0000518		<	0.0000518	0.0000518		<	0.0000518	0.0000518
0.00118	0.0000971	COM M - CONFIRMED BY GC/MS	<	0.0000971	0.0000971			0.0012	0.0000971
0.0000176	0.0000176		<	0.0000176	0.0000176			0.00365	0.0000176
0.000625	0.000625		<	0.000625	0.000625		<	0.000625	0.000625
0.102	0.000278		<	0.000278	0.000278			0.00577	0.000278

0.000588	0.000588	<	0.000588	0.000588		0.143	0.000588
0.000208	0.000208	<	0.000208	0.000208		0.0218	0.000208
0.0005	0.0005	<	0.0005	0.0005	<	0.0005	0.0005
0.000111	0.000111	<	0.000111	0.000111		0.00292	0.000111
0.0000862	0.0000862	<	0.0000862	0.0000862	<	0.0000862	0.0000862
0.0000909	0.0000909	<	0.0000909	0.0000909	<	0.0000909	0.0000909

PCB# 87/115	PCB# 92	PCB# 92	PCB# 92	PCB# 92	PCB# 95/80	PCB# 95/80	PCB# 95/80	PCB# 95/80	PCB# 97
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol
	<	0.0000671	0.0000671		<	0.0000671	0.0000671		<
	<	0.0000943	0.0000943		<	0.0000943	0.0000943		<
	<	0.0001	0.0001		<	0.0001	0.0001		<
	<	0.000105	0.000105		<	0.000105	0.000105		<
	<	0.000098	0.000098		<	0.000098	0.000098		
	<	0.0000355	0.0000355			0.000939	0.0000355		
	<	0.0000763	0.0000763			0.00267	0.0000763		
	<	0.0000943	0.0000943		<	0.0000943	0.0000943		<
		0.00173	0.000099		<	0.000099	0.000099		<
		0.0442	0.0000952		<	0.0000952	0.0000952		<
		0.00184	0.0001			0.00249	0.0001		
		0.0129	0.0000108	COM M - CONFIRMED BY GC/MS	<	0.0000108	0.0000108		
		0.0145	0.0000971	COM M - CONFIRMED BY GC/MS		0.015	0.0000971		
		0.00368	0.00000977		<	0.00000977	0.00000977		
		0.00234	0.000068			0.00155	0.000068		
		0.00742	0.0000106			0.0048	0.0000106		<
		0.00161	0.0000758		<	0.0000758	0.0000758		
		0.00254	0.0000116			0.000899	0.0000116		
		0.0411	0.0000909		<	0.0000909	0.0000909		<
		0.00574	0.0000917		<	0.0000917	0.0000917		<
		0.00429	0.0000901			0.000277	0.0000901		
		0.00899	0.0000199		<	0.0000199	0.0000199		
		0.000415	0.0000614		<	0.0000614	0.0000614		
		0.00234	0.0000155			0.00237	0.0000155		
	<	0.000103	0.000103		<	0.000103	0.000103		<
	<	0.0000917	0.0000917		<	0.0000917	0.0000917		<
		0.00114	0.0000625		<	0.0000625	0.0000625		
		0.00485	0.0000146		<	0.0000146	0.0000146		
	<	0.0000893	0.0000893			0.001	0.0000893		<
	<	0.0000518	0.0000518		<	0.0000518	0.0000518		<
COM M - CONFIRMED BY GC/MS		0.00256	0.0000971	COM M - CONFIRMED BY GC/MS	<	0.0000971	0.0000971		<
COM M - CONFIRMED BY GC/MS		0.0117	0.0000176	COM M - CONFIRMED BY GC/MS	<	0.0000176	0.0000176		
		0.187	0.000625		<	0.000625	0.000625		<
	<	0.000278	0.000278		<	0.000278	0.000278		

COM M - CONFIRMED BY GC/MS	0.277	0.000588	COM M - CONFIRMED BY GC/MS	<	0.000588	0.000588		
	0.109	0.000208		<	0.000208	0.000208		
	0.101	0.0005		<	0.0005	0.0005		<
	0.0319	0.000111		<	0.000111	0.000111		<
	0.0292	0.0000862		<	0.0000862	0.0000862		<
	0.0306	0.0000909		<	0.0000909	0.0000909		<

PCB# 97	PCB# 97	PCB# 97	PCB# 99	PCB# 99	PCB# 99	PCB# 99	1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8-HpCDD
Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
0.0000671	0.0000671		<	0.0000671	0.0000671		<	0.0000442	0.0000442
0.0000943	0.0000943			0.0103	0.0000943		<	0.00005	0.00005
0.0001	0.0001			0.00459	0.0001		<	0.0000476	0.0000476
0.000105	0.000105			0.00439	0.000105		<	0.0000532	0.0000532
0.00213	0.000098			0.0047	0.000098		<	0.0000489	0.0000489
0.00083	0.0000355			0.00696	0.0000355		<	0.0000177	0.0000177
0.00231	0.0000763			0.00716	0.0000763		<	0.0000383	0.0000383
0.0000943	0.0000943			0.00457	0.0000943		<	0.0000472	0.0000472
0.000099	0.000099		<	0.000099	0.000099		<	0.0000454	0.0000454
0.0000952	0.0000952			0.0343	0.0000952		<	0.0000526	0.0000526
0.000785	0.0001			0.00628	0.0001		<	0.0000499	0.0000499
0.00114	0.0000108	COM M - CONFIRMED BY GC/MS	<	0.0000108	0.0000108			0.0000216	0.00000542
0.00654	0.0000971			0.0309	0.0000971		<	0.0000487	0.0000487
0.00156	0.00000977			0.0108	0.00000977		<	0.00000488	0.00000488
0.000201	0.000068			0.000398	0.000068		<	0.0000341	0.0000341
0.0000106	0.0000106			0.00959	0.0000106		<	0.00000532	0.00000532
0.000758	0.0000758			0.00384	0.0000758		<	0.0000378	0.0000378
0.00122	0.0000116			0.00611	0.0000116		<	0.00000577	0.00000577
0.0000909	0.0000909		<	0.0000909	0.0000909		<	0.0000481	0.0000481
0.0000917	0.0000917		<	0.0000917	0.0000917		<	0.0000516	0.0000516
0.000179	0.0000901			0.00555	0.0000901		<	0.0000452	0.0000452
0.000939	0.0000199			0.0164	0.0000199		<	0.00000993	0.00000993
0.000949	0.0000614			0.00295	0.0000614		<	0.0000308	0.0000308
0.00102	0.0000155			0.00597	0.0000155		<	0.00000773	0.00000773
0.000103	0.000103		<	0.000103	0.000103		<	0.000045	0.000045
0.0000917	0.0000917			0.00176	0.0000917	COM M - CONFIRMED BY GC/MS	<	0.0000521	0.0000521
0.00035	0.0000625			0.00415	0.0000625		<	0.0000312	0.0000312
0.00118	0.0000146			0.00967	0.0000146		<	0.00000729	0.00000729
0.0000893	0.0000893			0.000966	0.0000893		<	0.0000445	0.0000445
0.0000518	0.0000518			0.00444	0.0000518		<	0.0000259	0.0000259
0.0000971	0.0000971			0.00762	0.0000971	COM M - CONFIRMED BY GC/MS	<	0.0000485	0.0000485
0.00175	0.0000176	COM M - CONFIRMED BY GC/MS		0.0237	0.0000176	COM M - CONFIRMED BY GC/MS	<	0.00000882	0.00000882
0.000625	0.000625		<	0.000625	0.000625				
0.0301	0.000278		<	0.000278	0.000278				

0.0591	0.000588		0.0966	0.000588	COM M - CONFIRMED BY GC/MS			
0.0182	0.000208		0.0252	0.000208				
0.0005	0.0005	<	0.0005	0.0005				
0.000111	0.000111		0.00795	0.000111				
0.0000862	0.0000862	<	0.0000862	0.0000862		<	0.0000481	0.0000481
0.0000909	0.0000909		0.00515	0.0000909		<	0.0000463	0.0000463

1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8-HpCDF	1,2,3,4,6,7,8-HpCDF	1,2,3,4,6,7,8-HpCDF	1,2,3,4,6,7,8-HpCDF	1,2,3,4,7,8,9-HpCDF	1,2,3,4,7,8,9-HpCDF	1,2,3,4,7,8,9-HpCDF	1,2,3,4,7,8,9-HpCDF	1,2,3,4,7,8-HxCDD	1,2,3,4,7,8-HxCDD
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm
	<	0.0000442	0.0000442		<	0.0000442	0.0000442		<	0.0000442
	<	0.00005	0.00005		<	0.00005	0.00005		<	0.00005
	<	0.0000476	0.0000476		<	0.0000476	0.0000476		<	0.0000476
	<	0.0000532	0.0000532		<	0.0000532	0.0000532		<	0.0000532
	<	0.0000489	0.0000489		<	0.0000489	0.0000489		<	0.0000489
	<	0.0000177	0.0000177		<	0.0000177	0.0000177		<	0.0000177
	<	0.0000383	0.0000383		<	0.0000383	0.0000383		<	0.0000383
	<	0.0000472	0.0000472		<	0.0000472	0.0000472		<	0.0000472
	<	0.0000454	0.0000454		<	0.0000454	0.0000454		<	0.0000454
	<	0.0000526	0.0000526		<	0.0000526	0.0000526		<	0.0000526
	<	0.0000499	0.0000499		<	0.0000499	0.0000499		<	0.0000499
	<	0.00000542	0.00000542		<	0.00000542	0.00000542		<	0.00000542
	<	0.0000487	0.0000487		<	0.0000487	0.0000487		<	0.0000487
	<	0.00000488	0.00000488		<	0.00000488	0.00000488		<	0.00000488
	<	0.0000341	0.0000341		<	0.0000341	0.0000341		<	0.0000341
	<	0.00000532	0.00000532		<	0.00000532	0.00000532		<	0.00000532
	<	0.0000378	0.0000378		<	0.0000378	0.0000378		<	0.0000378
	<	0.00000577	0.00000577		<	0.00000577	0.00000577		<	0.00000577
	<	0.0000481	0.0000481		<	0.0000481	0.0000481		<	0.0000481
	<	0.0000516	0.0000516		<	0.0000516	0.0000516		<	0.0000516
	<	0.0000452	0.0000452		<	0.0000452	0.0000452		<	0.0000452
	<	0.00000993	0.00000993		<	0.00000993	0.00000993		<	0.00000993
	<	0.0000308	0.0000308		<	0.0000308	0.0000308		<	0.0000308
	<	0.00000773	0.00000773		<	0.00000773	0.00000773		<	0.00000773
	<	0.000045	0.000045		<	0.000045	0.000045		<	0.000045
	<	0.0000521	0.0000521		<	0.0000521	0.0000521		<	0.0000521
	<	0.0000312	0.0000312		<	0.0000312	0.0000312		<	0.0000312
	<	0.00000729	0.00000729		<	0.00000729	0.00000729		<	0.00000729
	<	0.0000445	0.0000445		<	0.0000445	0.0000445		<	0.0000445
	<	0.0000259	0.0000259		<	0.0000259	0.0000259		<	0.0000259
	<	0.0000485	0.0000485		<	0.0000485	0.0000485		<	0.0000485
	<	0.00000882	0.00000882		<	0.00000882	0.00000882		<	0.00000882

<	0.0000481	0.0000481	<	0.0000481	0.0000481	<	0.0000481
<	0.0000463	0.0000463	<	0.0000463	0.0000463	<	0.0000463

1,2,3,4,7,8-HxCDD	1,2,3,4,7,8-HxCDD	1,2,3,4,7,8-HxCDF	1,2,3,4,7,8-HxCDF	1,2,3,4,7,8-HxCDF	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDD	1,2,3,6,7,8-HxCDD	1,2,3,6,7,8-HxCDD	1,2,3,6,7,8-HxCDD	1,2,3,6,7,8-HxCDF
Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol
0.0000442		<	0.0000442	0.0000442		<	0.0000442	0.0000442		<
0.00005		<	0.00005	0.00005		<	0.00005	0.00005		<
0.0000476		<	0.0000476	0.0000476		<	0.0000476	0.0000476		<
0.0000532		<	0.0000532	0.0000532		<	0.0000532	0.0000532		<
0.0000489		<	0.0000489	0.0000489		<	0.0000489	0.0000489		<
0.0000177		<	0.0000177	0.0000177		<	0.0000177	0.0000177		<
0.0000383		<	0.0000383	0.0000383		<	0.0000383	0.0000383		<
0.0000472		<	0.0000472	0.0000472		<	0.0000472	0.0000472		<
0.0000454		<	0.0000454	0.0000454		<	0.0000454	0.0000454		<
0.0000526		<	0.0000526	0.0000526		<	0.0000526	0.0000526		<
0.0000499		<	0.0000499	0.0000499		<	0.0000499	0.0000499		<
0.00000542		<	0.00000542	0.00000542		<	0.00000542	0.00000542		<
0.0000487		<	0.0000487	0.0000487		<	0.0000487	0.0000487		<
0.00000488		<	0.00000488	0.00000488		<	0.00000488	0.00000488		<
0.0000341		<	0.0000341	0.0000341		<	0.0000341	0.0000341		<
0.00000532		<	0.00000532	0.00000532		<	0.00000532	0.00000532		<
0.0000378		<	0.0000378	0.0000378		<	0.0000378	0.0000378		<
0.00000577		<	0.00000577	0.00000577		<	0.00000577	0.00000577		<
0.0000481		<	0.0000481	0.0000481		<	0.0000481	0.0000481		<
0.0000516		<	0.0000516	0.0000516		<	0.0000516	0.0000516		<
0.0000452		<	0.0000452	0.0000452		<	0.0000452	0.0000452		<
0.00000993		<	0.00000993	0.00000993		<	0.00000993	0.00000993		<
0.0000308		<	0.0000308	0.0000308		<	0.0000308	0.0000308		<
0.00000773		<	0.00000773	0.00000773		<	0.00000773	0.00000773		<
0.000045		<	0.000045	0.000045		<	0.000045	0.000045		<
0.0000521		<	0.0000521	0.0000521		<	0.0000521	0.0000521		<
0.0000312		<	0.0000312	0.0000312		<	0.0000312	0.0000312		<
0.00000729		<	0.00000729	0.00000729		<	0.00000729	0.00000729		<
0.0000445		<	0.0000445	0.0000445		<	0.0000445	0.0000445		<
0.0000259		<	0.0000259	0.0000259		<	0.0000259	0.0000259		<
0.0000485		<	0.0000485	0.0000485		<	0.0000485	0.0000485		<
0.00000882		<	0.00000882	0.00000882		<	0.00000882	0.00000882		<

0.0000481	<	0.0000481	0.0000481	<	0.0000481	0.0000481	<
0.0000463	<	0.0000463	0.0000463	<	0.0000463	0.0000463	<

1,2,3,6,7,8-HxCDF	1,2,3,6,7,8-HxCDF	1,2,3,6,7,8-HxCDF	1,2,3,7,8,9-HxCDD	1,2,3,7,8,9-HxCDD	1,2,3,7,8,9-HxCDD	1,2,3,7,8,9-HxCDD	1,2,3,7,8,9-HxCDF	1,2,3,7,8,9-HxCDF	1,2,3,7,8,9-HxCDF	1,2,3,7,8,9-HxCDF
Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments
0.0000442	0.0000442		<	0.0000442	0.0000442		<	0.0000442	0.0000442	
0.00005	0.00005		<	0.00005	0.00005		<	0.00005	0.00005	
0.0000476	0.0000476		<	0.0000476	0.0000476		<	0.0000476	0.0000476	
0.0000532	0.0000532		<	0.0000532	0.0000532		<	0.0000532	0.0000532	
0.0000489	0.0000489		<	0.0000489	0.0000489		<	0.0000489	0.0000489	
0.0000177	0.0000177		<	0.0000177	0.0000177		<	0.0000177	0.0000177	
0.0000383	0.0000383		<	0.0000383	0.0000383		<	0.0000383	0.0000383	
0.0000472	0.0000472		<	0.0000472	0.0000472		<	0.0000472	0.0000472	
0.0000454	0.0000454		<	0.0000454	0.0000454		<	0.0000454	0.0000454	
0.0000526	0.0000526		<	0.0000526	0.0000526		<	0.0000526	0.0000526	
0.0000499	0.0000499		<	0.0000499	0.0000499		<	0.0000499	0.0000499	
0.00000542	0.00000542		<	0.00000542	0.00000542		<	0.00000542	0.00000542	
0.0000487	0.0000487		<	0.0000487	0.0000487		<	0.0000487	0.0000487	
0.00000488	0.00000488		<	0.00000488	0.00000488		<	0.00000488	0.00000488	
0.0000341	0.0000341		<	0.0000341	0.0000341		<	0.0000341	0.0000341	
0.00000532	0.00000532		<	0.00000532	0.00000532		<	0.00000532	0.00000532	
0.0000378	0.0000378		<	0.0000378	0.0000378		<	0.0000378	0.0000378	
0.00000577	0.00000577		<	0.00000577	0.00000577		<	0.00000577	0.00000577	
0.0000481	0.0000481		<	0.0000481	0.0000481		<	0.0000481	0.0000481	
0.0000516	0.0000516		<	0.0000516	0.0000516		<	0.0000516	0.0000516	
0.0000452	0.0000452		<	0.0000452	0.0000452		<	0.0000452	0.0000452	
0.00000993	0.00000993		<	0.00000993	0.00000993		<	0.00000993	0.00000993	
0.0000308	0.0000308		<	0.0000308	0.0000308		<	0.0000308	0.0000308	
0.00000773	0.00000773		<	0.00000773	0.00000773		<	0.00000773	0.00000773	
0.000045	0.000045		<	0.000045	0.000045		<	0.000045	0.000045	
0.0000521	0.0000521		<	0.0000521	0.0000521		<	0.0000521	0.0000521	
0.0000312	0.0000312		<	0.0000312	0.0000312		<	0.0000312	0.0000312	
0.00000729	0.00000729		<	0.00000729	0.00000729		<	0.00000729	0.00000729	
0.0000445	0.0000445		<	0.0000445	0.0000445		<	0.0000445	0.0000445	
0.0000259	0.0000259		<	0.0000259	0.0000259		<	0.0000259	0.0000259	
0.0000485	0.0000485		<	0.0000485	0.0000485		<	0.0000485	0.0000485	
0.00000882	0.00000882		<	0.00000882	0.00000882		<	0.00000882	0.00000882	

0.0000481	0.0000481	<	0.0000481	0.0000481	<	0.0000481	0.0000481
0.0000463	0.0000463	<	0.0000463	0.0000463	<	0.0000463	0.0000463

1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	1,2,3,7,8-PeCDF	1,2,3,7,8-PeCDF	2,3,4,7,8-PeCDF	2,3,4,7,8-PeCDF	2,3,4,7,8-PeCDF	2,3,4,7,8-PeCDF
DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments
<	0.0000442	0.0000442		<	0.0000442	0.0000442	<	0.0000442	0.0000442	
<	0.00005	0.00005		<	0.00005	0.00005	<	0.00005	0.00005	
<	0.0000476	0.0000476		<	0.0000476	0.0000476	<	0.0000476	0.0000476	
<	0.0000532	0.0000532		<	0.0000532	0.0000532	<	0.0000532	0.0000532	
<	0.0000489	0.0000489		<	0.0000489	0.0000489	<	0.0000489	0.0000489	
<	0.0000177	0.0000177		<	0.0000177	0.0000177	<	0.0000177	0.0000177	
<	0.0000383	0.0000383		<	0.0000383	0.0000383	<	0.0000383	0.0000383	
<	0.0000472	0.0000472		<	0.0000472	0.0000472	<	0.0000472	0.0000472	
<	0.0000454	0.0000454		<	0.0000454	0.0000454	<	0.0000454	0.0000454	
<	0.0000526	0.0000526		<	0.0000526	0.0000526	<	0.0000526	0.0000526	
<	0.0000499	0.0000499		<	0.0000499	0.0000499	<	0.0000499	0.0000499	
<	0.00000542	0.00000542		<	0.00000542	0.00000542	<	0.00000542	0.00000542	
<	0.0000487	0.0000487		<	0.0000487	0.0000487	<	0.0000487	0.0000487	
<	0.00000488	0.00000488		<	0.00000488	0.00000488	<	0.00000488	0.00000488	
<	0.0000341	0.0000341		<	0.0000341	0.0000341	<	0.0000341	0.0000341	
<	0.00000532	0.00000532		<	0.00000532	0.00000532	<	0.00000532	0.00000532	
<	0.0000378	0.0000378		<	0.0000378	0.0000378	<	0.0000378	0.0000378	
<	0.00000577	0.00000577		<	0.00000577	0.00000577	<	0.00000577	0.00000577	
<	0.0000481	0.0000481		<	0.0000481	0.0000481	<	0.0000481	0.0000481	
<	0.0000516	0.0000516		<	0.0000516	0.0000516	<	0.0000516	0.0000516	
<	0.0000452	0.0000452		<	0.0000452	0.0000452	<	0.0000452	0.0000452	
<	0.00000993	0.00000993		<	0.00000993	0.00000993	<	0.00000993	0.00000993	
<	0.0000308	0.0000308		<	0.0000308	0.0000308	<	0.0000308	0.0000308	
<	0.00000773	0.00000773			0.000008	0.00000773	<	0.00000773	0.00000773	
<	0.000045	0.000045		<	0.000045	0.000045	<	0.000045	0.000045	
<	0.0000521	0.0000521		<	0.0000521	0.0000521	<	0.0000521	0.0000521	
<	0.0000312	0.0000312		<	0.0000312	0.0000312	<	0.0000312	0.0000312	
<	0.00000729	0.00000729		<	0.00000729	0.00000729	<	0.00000729	0.00000729	
<	0.0000445	0.0000445		<	0.0000445	0.0000445	<	0.0000445	0.0000445	
<	0.0000259	0.0000259		<	0.0000259	0.0000259	<	0.0000259	0.0000259	
<	0.0000485	0.0000485		<	0.0000485	0.0000485	<	0.0000485	0.0000485	
<	0.00000882	0.00000882		<	0.00000882	0.00000882	<	0.00000882	0.00000882	

<	0.0000481	0.0000481	<	0.0000481	0.0000481	<	0.0000481	0.0000481
<	0.0000463	0.0000463	<	0.0000463	0.0000463	<	0.0000463	0.0000463

2,3,7,8-TCDD	2,3,7,8-TCDD	2,3,7,8-TCDD	2,3,7,8-TCDD	2,3,7,8-TCDF	2,3,7,8-TCDF	2,3,7,8-TCDF	2,3,7,8-TCDF	OCDD	OCDD	OCDD
DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm
<	0.00000885	0.00000885		<	0.00000885	0.00000885		<	0.0000885	0.0000885
<	0.00001	0.00001		<	0.00001	0.00001		<	0.0001	0.0001
<	0.00000952	0.00000952		<	0.00000952	0.00000952		<	0.0000952	0.0000952
<	0.0000106	0.0000106		<	0.0000106	0.0000106		<	0.000106	0.000106
<	0.00000978	0.00000978		<	0.00000978	0.00000978		<	0.0000978	0.0000978
<	0.00000355	0.00000355		<	0.00000355	0.00000355		<	0.0000355	0.0000355
<	0.00000766	0.00000766		<	0.00000766	0.00000766		<	0.0000766	0.0000766
<	0.00000943	0.00000943		<	0.00000943	0.00000943		<	0.0000943	0.0000943
<	0.00000909	0.00000909		<	0.00000909	0.00000909		<	0.0000909	0.0000909
<	0.0000105	0.0000105		<	0.0000105	0.0000105			0.000136	0.000105
<	0.00000998	0.00000998			0.0000147	0.00000998		<	0.0000998	0.0000998
<	0.00000108	0.00000108		<	0.00000108	0.00000108		<	0.0000108	0.0000108
<	0.00000975	0.00000975		<	0.00000975	0.00000975		<	0.0000975	0.0000975
<	0.00000098	0.00000098			0.0000046	0.00000098		<	0.00000977	0.00000977
<	0.00000682	0.00000682		<	0.00000682	0.00000682		<	0.0000682	0.0000682
<	0.00000106	0.00000106			0.0000036	0.00000106		<	0.0000106	0.0000106
<	0.00000755	0.00000755		<	0.00000755	0.00000755		<	0.0000755	0.0000755
<	0.00000115	0.00000115		<	0.00000115	0.00000115		<	0.0000115	0.0000115
<	0.00000962	0.00000962		<	0.00000962	0.00000962		<	0.0000962	0.0000962
<	0.0000103	0.0000103		<	0.0000103	0.0000103		<	0.000103	0.000103
<	0.00000903	0.00000903		<	0.00000903	0.00000903		<	0.0000903	0.0000903
<	0.00000199	0.00000199		<	0.00000199	0.00000199		<	0.0000199	0.0000199
<	0.00000615	0.00000615			0.0000075	0.00000615		<	0.0000615	0.0000615
<	0.00000155	0.00000155		<	0.00000155	0.00000155		<	0.0000155	0.0000155
<	0.00000901	0.00000901		<	0.00000901	0.00000901		<	0.0000901	0.0000901
<	0.0000104	0.0000104		<	0.0000104	0.0000104		<	0.000104	0.000104
<	0.00000623	0.00000623		<	0.00000623	0.00000623		<	0.0000623	0.0000623
<	0.00000146	0.00000146			0.0000016	0.00000146		<	0.0000146	0.0000146
<	0.0000089	0.0000089		<	0.0000089	0.0000089		<	0.000089	0.000089
<	0.00000517	0.00000517		<	0.00000517	0.00000517		<	0.0000517	0.0000517
<	0.00000971	0.00000971		<	0.00000971	0.00000971		<	0.0000971	0.0000971
<	0.00000176	0.00000176			0.0000074	0.00000176		<	0.0000176	0.0000176

<	0.00000962	0.00000962	<	0.00000962	0.00000962	<	0.0000962	0.0000962
<	0.00000926	0.00000926	<	0.00000926	0.00000926	<	0.0000926	0.0000926

OCDD	OCDF	OCDF	OCDF	OCDF
Result Modifier Comments	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Result Modifier Comments
	<	0.0000885	0.0000885	
	<	0.0001	0.0001	
	<	0.0000952	0.0000952	
	<	0.000106	0.000106	
	<	0.0000978	0.0000978	
	<	0.0000355	0.0000355	
	<	0.0000766	0.0000766	
	<	0.0000943	0.0000943	
	<	0.0000909	0.0000909	
	<	0.000105	0.000105	
	<	0.0000998	0.0000998	
	<	0.0000108	0.0000108	
	<	0.0000975	0.0000975	
	<	0.00000977	0.00000977	
	<	0.0000682	0.0000682	
	<	0.0000106	0.0000106	
	<	0.0000755	0.0000755	
	<	0.0000115	0.0000115	
	<	0.0000962	0.0000962	
	<	0.000103	0.000103	
	<	0.0000903	0.0000903	
	<	0.0000199	0.0000199	
	<	0.0000615	0.0000615	
	<	0.0000155	0.0000155	
	<	0.0000901	0.0000901	
	<	0.000104	0.000104	
	<	0.0000623	0.0000623	
	<	0.0000146	0.0000146	
	<	0.000089	0.000089	
	<	0.0000517	0.0000517	
	<	0.0000971	0.0000971	
	<	0.0000176	0.0000176	

<	0.0000962	0.0000962
<	0.0000926	0.0000926

American eel inorganic data

Sample	% Moisture Percent Result	% Moisture Result Modifier Comments	Ag DL Rel Symbol	Ag Wet Weight Result	Ag Wet Weight Detection Limit	Ag Method Codes	Ag Result Modifier Comments	Al DL Rel Symbol	Al Wet Weight Result	Al Wet Weight Detection Limit	Al Method Codes
Units	percent			ppm	ppm				ppm	ppm	
Eel16e	87.8			0.0172	0.00107	1016			0.339	0.107	1016
Eel16m	78.9			0.00264	0.00196	1016			3	0.196	1016
Eel1Se	86.5			0.0117	0.00127	1016			0.39	0.127	1016
Eel1Sm	73.3			0.00659	0.0024	1016			10.1	0.24	1016
Eel3e	86.5			0.0105	0.00125	1016			0.381	0.125	1016
Eel3m	69.7			0.0106	0.00267	1016			2.2	0.267	1016
Eel6e	81.8			0.044	0.00158	1016			0.613	0.158	1016
Eel6m	61.2			0.0173	0.00341	1016			2.72	0.341	1016
EelSSe	86.2			0.0159	0.00124	1016			0.798	0.124	1016
EelSSm	75.3			0.00405	0.00228	1016			5.34	0.228	1016
Eel11e	86.7			0.00415	0.0013	1016			0.564	0.13	1016
Eel11m	64.5		<	0.00332	0.00332	1016			1.88	0.332	1016
Eel12e	84			0.00818	0.0015	1016			0.47	0.15	1016
Eel12m	62.6		<	0.00369	0.00369	1016			2.18	0.369	1016
Eel14e	86.4			0.00256	0.00131	1016			0.54	0.131	1016
Eel14m	66.8		<	0.00328	0.00328	1016			2.67	0.328	1016
Eel33e	87.7			0.00162	0.00123	1016			0.459	0.123	1016
Eel33m	77.7		<	0.00215	0.00215	1016			3.08	0.215	1016
Eel4e	85.6			0.00425	0.00135	1016			0.586	0.135	1016
Eel4m	73			0.00313	0.0026	1016			7.32	0.26	1016
Eel5e	84			0.00978	0.00145	1016			0.549	0.145	1016
Eel5m	70.2		<	0.00275	0.00275	1016			2.26	0.275	1016
Eel811e	87			0.00364	0.00125	1016			0.541	0.125	1016
Eel811m	69.1		<	0.00302	0.00302	1016			2.24	0.302	1016
Eel812e	88.5			0.0101	0.00112	1016			0.385	0.112	1016
Eel812m	72.4			0.00328	0.00274	1016			2.14	0.274	1016
Eel9e	87.4			0.00188	0.0012	1016			0.388	0.12	1016
Eel9m	68.5		<	0.00301	0.00301	1016			2.32	0.301	1016
EelS1e	86.4			0.0199	0.00131	1016			0.53	0.131	1016
EelS1m	74.6		<	0.00248	0.00248	1016			1.65	0.248	1016
EelS4e	88.4			0.0126	0.00114	1016			0.368	0.114	1016
EelS4m	81.2			0.00286	0.00176	1016			2.56	0.176	1016
EelC1											
EelC2nC3											
EelH1											
EelH2											
EelH3											
NMS1											
NMS4	68.9			0.00466	0.00279	1016			1.52	0.279	1016
NMS5	66.1			0.00749	0.00298	1016			1.37	0.298	1016

Al Result Modifier Comments	As Wet Weight Result ppm	As DL Rel Symbol	As Wet Weight Result ppm	As Wet Weight Detection Limit ppm	As Method Codes	As Result Modifier Comments	B DL Rel Symbol	B Wet Weight Result ppm	B Wet Weight Detection Limit ppm	B Method Codes	B Result Modifier Comments
	0.01075	<	0.0215	0.0215	1016		<	0.107	0.107	1016	
	0.0447		0.0447	0.0392	1016			0.21	0.196	1016	
	0.0127	<	0.0254	0.0254	1016			0.293	0.127	1016	
	0.02405	<	0.0481	0.0481	1016		<	0.24	0.24	1016	
	0.0125	<	0.025	0.025	1016			0.216	0.125	1016	
	0.02665	<	0.0533	0.0533	1016		<	0.267	0.267	1016	
	0.01585	<	0.0317	0.0317	1016			0.43	0.158	1016	
	0.145		0.145	0.0683	1016			1.17	0.341	1016	
	0.0124	<	0.0248	0.0248	1016		<	0.124	0.124	1016	
	0.0227	<	0.0454	0.0454	1016		<	0.228	0.228	1016	
	0.00843		0.00843	0.0065	1016		<	0.13	0.13	1016	
	0.184		0.184	0.0166	1016		<	0.332	0.332	1016	
	0.00375	<	0.0075	0.0075	1016		<	0.15	0.15	1016	
	0.0647		0.0647	0.0184	1016		<	0.369	0.369	1016	
	0.00928		0.00928	0.00653	1016			0.256	0.131	1016	
	0.201		0.201	0.0164	1016			0.654	0.328	1016	
	0.003075	<	0.00615	0.00615	1016			0.14	0.123	1016	
	0.0248		0.0248	0.0107	1016			0.303	0.215	1016	
	0.003375	<	0.00675	0.00675	1016		<	0.135	0.135	1016	
	0.0869		0.0869	0.013	1016			0.266	0.26	1016	
	0.00364	<	0.00728	0.00728	1016		<	0.145	0.145	1016	
	0.0297		0.0297	0.0138	1016			0.304	0.275	1016	
	0.0127		0.0127	0.00623	1016		<	0.125	0.125	1016	
	0.127		0.127	0.0151	1016		<	0.302	0.302	1016	
	0.0028	<	0.0056	0.0056	1016		<	0.112	0.112	1016	
	0.0364		0.0364	0.0137	1016			0.315	0.274	1016	
	0.00299	<	0.00598	0.00598	1016			0.159	0.12	1016	
	0.0375		0.0375	0.015	1016			0.313	0.301	1016	
	0.003285	<	0.00657	0.00657	1016		<	0.131	0.131	1016	
	0.0208		0.0208	0.0124	1016		<	0.248	0.248	1016	
	0.002855	<	0.00571	0.00571	1016		<	0.114	0.114	1016	
	0.00439	<	0.00878	0.00878	1016			0.312	0.176	1016	
	0.056	<	0.056	0.056	1016		<	0.279	0.279	1016	
	0.078		0.078	0.0597	1016		<	0.298	0.298	1016	

Ba DL Rel Symbol	Ba Wet Weight Result	Ba Wet Weight Detection Limit	Ba Method Codes	Ba Result Modifier Comments	Be DL Rel Symbol	Be Wet Weight Result	Be Wet Weight Detection Limit	Be Method Codes	Be Result Modifier Comments	Cd DL Rel Symbol	Cd Wet Weight Result
	ppm	ppm				ppm	ppm				ppm
	3.7	0.00536	1016		<	0.00536	0.00536	1016			0.00312
	0.118	0.00979	1016		<	0.00979	0.00979	1016			0.0057
	0.0216	0.00633	1016		<	0.00633	0.00633	1016			0.014
	0.121	0.012	1016		<	0.012	0.012	1016			0.09
	0.035	0.00624	1016		<	0.00624	0.00624	1016		<	0.0025
	0.0676	0.0134	1016		<	0.0134	0.0134	1016		<	0.00533
	0.0278	0.0079	1016		<	0.0079	0.0079	1016		<	0.00317
	0.21	0.017	1016		<	0.017	0.017	1016			0.00857
	0.0215	0.00622	1016		<	0.00622	0.00622	1016			0.00702
	0.0739	0.0114	1016		<	0.0114	0.0114	1016			0.0107
<	0.0065	0.0065	1016		<	0.0065	0.0065	1016		<	0.0065
	0.0246	0.0166	1016		<	0.0166	0.0166	1016		<	0.0166
<	0.0075	0.0075	1016		<	0.0075	0.0075	1016		<	0.0075
	0.0486	0.0184	1016		<	0.0184	0.0184	1016		<	0.0184
<	0.00653	0.00653	1016		<	0.00653	0.00653	1016		<	0.00653
	0.0445	0.0164	1016		<	0.0164	0.0164	1016		<	0.0164
	0.00737	0.00615	1016		<	0.00615	0.00615	1016		<	0.00615
	0.0586	0.0107	1016		<	0.0107	0.0107	1016		<	0.0107
<	0.00675	0.00675	1016		<	0.00675	0.00675	1016		<	0.00675
	0.0945	0.013	1016		<	0.013	0.013	1016		<	0.013
<	0.00728	0.00728	1016		<	0.00728	0.00728	1016		<	0.00728
	0.039	0.0138	1016		<	0.0138	0.0138	1016		<	0.0138
<	0.00623	0.00623	1016		<	0.00623	0.00623	1016		<	0.00623
	0.125	0.0151	1016		<	0.0151	0.0151	1016		<	0.0151
	0.00738	0.0056	1016		<	0.0056	0.0056	1016		<	0.0056
	0.0428	0.0137	1016		<	0.0137	0.0137	1016		<	0.0137
<	0.00598	0.00598	1016		<	0.00598	0.00598	1016		<	0.00598
	0.0297	0.015	1016		<	0.015	0.015	1016		<	0.015
	0.0163	0.00657	1016		<	0.00657	0.00657	1016			0.0121
	0.0696	0.0124	1016		<	0.0124	0.0124	1016			0.0419
	0.00955	0.00571	1016		<	0.00571	0.00571	1016			0.00595
	0.125	0.00878	1016		<	0.00878	0.00878	1016			0.0321
	0.102	0.014	1016		<	0.014	0.014	1016			0.0417
	0.106	0.0149	1016		<	0.0149	0.0149	1016			0.133

Cd Wet Weight Detection Limit	Cd Method Codes	Cd Result Modifier Comments	Co DL Rel Symbol	Co Wet Weight Result	Co Wet Weight Detection Limit	Co Method Codes	Co Result Modifier Comments	Cr DL Rel Symbol	Cr Wet Weight Result	Cr Wet Weight Detection Limit
ppm				ppm	ppm				ppm	ppm
0.00215	1016			0.0122	0.00215	1016			0.0362	0.0215
0.00392	1016			0.0085	0.00392	1016			0.392	0.0392
0.00254	1016			0.0121	0.00254	1016		<	0.0254	0.0254
0.00481	1016			0.0105	0.00481	1016			0.182	0.0481
0.0025	1016			0.00612	0.0025	1016		<	0.025	0.025
0.00533	1016			0.00712	0.00533	1016			0.839	0.0533
0.00317	1016			0.00743	0.00317	1016		<	0.0317	0.0317
0.00683	1016			0.0107	0.00683	1016			0.411	0.0683
0.00248	1016			0.00857	0.00248	1016			0.0418	0.0248
0.00454	1016			0.00815	0.00454	1016			0.241	0.0454
0.0065	1016			0.00678	0.00261	1016			0.00857	0.0065
0.0166	1016		<	0.00664	0.00664	1016			0.174	0.0166
0.0075	1016			0.00395	0.00301	1016			0.0186	0.0075
0.0184	1016		<	0.00737	0.00737	1016			0.0935	0.0184
0.00653	1016			0.00374	0.00261	1016			0.0105	0.00653
0.0164	1016			0.00727	0.00654	1016			0.133	0.0164
0.00615	1016			0.00464	0.00246	1016			0.0629	0.00615
0.0107	1016			0.0161	0.0043	1016			0.198	0.0107
0.00675	1016			0.00523	0.00271	1016			0.00985	0.00675
0.013	1016			0.0174	0.00518	1016			0.227	0.013
0.00728	1016			0.00626	0.00291	1016			0.0262	0.00728
0.0138	1016			0.00685	0.00551	1016			0.125	0.0138
0.00623	1016			0.0161	0.0025	1016			0.0107	0.00623
0.0151	1016			0.00748	0.00603	1016			0.171	0.0151
0.0056	1016			0.00365	0.00224	1016			0.012	0.0056
0.0137	1016			0.00822	0.00549	1016			0.192	0.0137
0.00598	1016			0.00329	0.00239	1016			0.0272	0.00598
0.015	1016			0.00709	0.00602	1016			0.0724	0.015
0.00657	1016			0.0192	0.00262	1016		<	0.00657	0.00657
0.0124	1016			0.0141	0.00495	1016			1.8	0.0124
0.00571	1016			0.00553	0.00229	1016			0.00577	0.00571
0.00878	1016			0.0114	0.00352	1016			0.183	0.00878
0.0056	1016			0.0119	0.0056	1016			0.209	0.056
0.00597	1016			0.00966	0.00597	1016			0.134	0.0597

Cr Method Codes	Cr Result Modifier Comments	Cu DL Rel Symbol	Cu Wet Weight Result ppm	Cu Wet Weight Detection Limit ppm	Cu Method Codes	Cu Result Modifier Comments	Fe DL Rel Symbol	Fe Wet Weight Result ppm	Fe Wet Weight Detection Limit ppm	Fe Method Codes	Fe Result Modifier Comments
1016			0.343	0.0215	1016			89.1	0.536	1016	
1016			0.435	0.0392	1016			7.81	0.979	1016	
1016			0.404	0.0254	1016			1.97	0.633	1016	
1016			0.443	0.0481	1016			5.31	1.2	1016	
1016			0.383	0.025	1016			2.71	0.624	1016	
1016			0.342	0.0533	1016			10.4	1.34	1016	
1016			0.395	0.0317	1016			3.42	0.79	1016	
1016			0.528	0.0683	1016			13.3	1.7	1016	
1016			0.461	0.0248	1016			2.26	0.622	1016	
1016			0.299	0.0454	1016			4.3	1.14	1016	
1016			0.352	0.0065	1016			2.34	0.13	1016	
1016			0.437	0.0166	1016			7.31	0.332	1016	
1016			0.331	0.0075	1016			2.21	0.15	1016	
1016			0.411	0.0184	1016			10.7	0.369	1016	
1016			0.337	0.00653	1016			1.71	0.131	1016	
1016			0.322	0.0164	1016			7.8	0.328	1016	
1016			0.208	0.00615	1016			1.56	0.123	1016	
1016			0.785	0.0107	1016			6.67	0.215	1016	
1016			0.307	0.00675	1016			1.8	0.135	1016	
1016			0.292	0.013	1016			12.1	0.26	1016	
1016			0.354	0.00728	1016			2.54	0.145	1016	
1016			0.405	0.0138	1016			8.52	0.275	1016	
1016			0.296	0.00623	1016			1.98	0.125	1016	
1016			0.355	0.0151	1016			6.89	0.302	1016	
1016			0.276	0.0056	1016			1.33	0.112	1016	
1016			0.373	0.0137	1016			6.51	0.274	1016	
1016			0.256	0.00598	1016			1.65	0.12	1016	
1016			0.298	0.015	1016			4.35	0.301	1016	
1016			0.328	0.00657	1016			1.67	0.131	1016	
1016			0.48	0.0124	1016			24.7	0.248	1016	
1016			0.278	0.00571	1016			1.38	0.114	1016	
1016			0.822	0.00878	1016			11.8	0.176	1016	
1016			0.323	0.056	1016			6.13	1.4	1016	
1016			0.376	0.0597	1016			9.73	1.49	1016	

Hg DL Rel Symbol	Hg Wet Weight Result ppm	Hg Wet Weight Detection Limit ppm	Hg Method Codes	Hg Result Modifier Comments	Li DL Rel Symbol	Li Wet Weight Result ppm	Li Wet Weight Detection Limit ppm	Li Method Codes	Li Result Modifier Comments	Mg DL Rel Symbol	Mg Wet Weight Result ppm
	0.112	0.000537	24		<	0.107	0.107	1016			51
	1.5	0.000971	24		<	0.196	0.196	1016			151
	0.00693	0.000608	24		<	0.127	0.127	1016			119
	0.215	0.00123	24		<	0.24	0.24	1016			208
	0.0225	0.00054	24		<	0.125	0.125	1016			105
	0.536	0.00115	24		<	0.267	0.267	1016			214
	0.228	0.000819	24		<	0.158	0.158	1016			148
	2.32	0.00155	24		<	0.341	0.341	1016			363
	0.0152	0.000593	24		<	0.124	0.124	1016			49.4
	0.484	0.000988	24		<	0.228	0.228	1016			225
	0.0481	0.000625	24			0.014	0.0065	1016			44.6
	0.848	0.00167	24			0.0209	0.0166	1016			120
	0.0286	0.00072	24		<	0.0075	0.0075	1016			43.8
	0.711	0.0015	24		<	0.0184	0.0184	1016			162
	0.0165	0.000612	24			0.0154	0.00653	1016			52.9
	0.392	0.00159	24		<	0.0164	0.0164	1016			207
	0.0296	0.000541	24			0.0169	0.00615	1016			53.8
	0.578	0.00105	24			0.0216	0.0107	1016			193
	0.023	0.000677	24			0.0107	0.00675	1016			50.3
	0.497	0.00127	24			0.0195	0.013	1016			153
	0.0259	0.000704	24			0.0112	0.00728	1016			57.8
	0.536	0.00116	24			0.0195	0.0138	1016			151
	0.028	0.000637	24			0.00832	0.00623	1016			49.8
	0.593	0.00148	24			0.0213	0.0151	1016			154
	0.015	0.000529	24			0.00944	0.0056	1016			35.2
	0.422	0.00127	24			0.0221	0.0137	1016			200
	0.0367	0.000504	24			0.013	0.00598	1016			83.7
	0.945	0.00148	24			0.0192	0.015	1016			173
	0.0212	0.000639	24			0.0112	0.00657	1016			59.3
	0.485	0.00124	24			0.0205	0.0124	1016			168
	0.0761	0.000522	24			0.0114	0.00571	1016			48.3
	1.13	0.000827	24			0.0273	0.00878	1016			157
	0.19	0.00124	24		<	0.279	0.279	1016			213
	0.132	0.00139	24		<	0.298	0.298	1016			234

Mg Wet Weight Detection Limit ppm	Mg Method Codes	Mg Result Modifier Comments	Mn DL Rel Symbol	Mn Wet Weight Result ppm	Mn Wet Weight Detection Limit ppm	Mn Method Codes	Mn Result Modifier Comments	Mo DL Rel Symbol	Mo Wet Weight Result ppm	Mo Wet Weight Detection Limit ppm
0.0536	1016			0.505	0.00215	1016		<	0.0107	0.0107
0.0979	1016			0.546	0.00392	1016		<	0.0196	0.0196
0.0633	1016			0.359	0.00254	1016		<	0.0127	0.0127
0.12	1016			1.52	0.00481	1016		<	0.024	0.024
0.0624	1016			0.281	0.0025	1016		<	0.0125	0.0125
0.134	1016			0.4	0.00533	1016		<	0.0267	0.0267
0.079	1016			0.464	0.00317	1016		<	0.0158	0.0158
0.17	1016			1.42	0.00683	1016		<	0.0341	0.0341
0.0622	1016			0.48	0.00248	1016		<	0.0124	0.0124
0.114	1016			0.608	0.00454	1016		<	0.0228	0.0228
0.065	1016			0.138	0.00261	1016		<	0.013	0.013
0.166	1016			0.23	0.00664	1016		<	0.0332	0.0332
0.075	1016			0.213	0.00301	1016		<	0.015	0.015
0.184	1016			0.221	0.00737	1016		<	0.0369	0.0369
0.0653	1016			0.258	0.00261	1016		<	0.0131	0.0131
0.164	1016			0.342	0.00654	1016		<	0.0328	0.0328
0.0615	1016			0.148	0.00246	1016		<	0.0123	0.0123
0.107	1016			0.473	0.0043	1016		<	0.0215	0.0215
0.0675	1016			0.19	0.00271	1016		<	0.0135	0.0135
0.13	1016			0.613	0.00518	1016		<	0.026	0.026
0.0728	1016			0.17	0.00291	1016		<	0.0145	0.0145
0.138	1016			0.465	0.00551	1016		<	0.0275	0.0275
0.0623	1016			0.192	0.0025	1016		<	0.0125	0.0125
0.151	1016			0.331	0.00603	1016		<	0.0302	0.0302
0.056	1016			0.332	0.00224	1016		<	0.0112	0.0112
0.137	1016			0.795	0.00549	1016		<	0.0274	0.0274
0.0598	1016			0.198	0.00239	1016		<	0.012	0.012
0.15	1016			0.334	0.00602	1016		<	0.0301	0.0301
0.0657	1016			0.4	0.00262	1016		<	0.0131	0.0131
0.124	1016			0.78	0.00495	1016			0.0399	0.0248
0.0571	1016			0.251	0.00229	1016		<	0.0114	0.0114
0.0878	1016			1.68	0.00352	1016		<	0.0176	0.0176
0.14	1016			0.666	0.0056	1016		<	0.0279	0.0279
0.149	1016			1.7	0.00597	1016		<	0.0298	0.0298

Mo Method Codes	Mo Result Modifier Comments	Ni DL Rel Symbol	Ni Wet Weight Result ppm	Ni Wet Weight Detection Limit ppm	Ni Method Codes	Ni Result Modifier Comments	Pb DL Rel Symbol	Pb Wet Weight Result ppm	Pb Wet Weight Detection Limit ppm	Pb Method Codes
1016			0.0289	0.0107	1016			0.0116	0.00171	1016
1016			0.0996	0.0196	1016			0.0715	0.00314	1016
1016		<	0.0127	0.0127	1016			0.0177	0.00202	1016
1016			0.136	0.024	1016			0.702	0.00384	1016
1016		<	0.0125	0.0125	1016			0.00248	0.002	1016
1016			0.0742	0.0267	1016			0.0227	0.00427	1016
1016		<	0.0158	0.0158	1016			0.00408	0.00253	1016
1016			0.625	0.0341	1016			0.0272	0.00543	1016
1016		<	0.0124	0.0124	1016			0.00428	0.00199	1016
1016			0.0815	0.0228	1016			0.0462	0.00366	1016
1016		<	0.0065	0.0065	1016			0.0141	0.0065	1016
1016			0.038	0.0166	1016		<	0.0166	0.0166	1016
1016			0.01	0.0075	1016		<	0.0075	0.0075	1016
1016			0.0404	0.0184	1016		<	0.0184	0.0184	1016
1016			0.0115	0.00653	1016		<	0.00653	0.00653	1016
1016			0.0452	0.0164	1016		<	0.0164	0.0164	1016
1016			0.0209	0.00615	1016		<	0.00615	0.00615	1016
1016			0.0774	0.0107	1016			0.0112	0.0107	1016
1016			0.00927	0.00675	1016		<	0.00675	0.00675	1016
1016			0.259	0.013	1016			0.0478	0.013	1016
1016			0.0166	0.00728	1016		<	0.00728	0.00728	1016
1016			0.0527	0.0138	1016		<	0.0138	0.0138	1016
1016			0.00632	0.00623	1016		<	0.00623	0.00623	1016
1016			0.0961	0.0151	1016		<	0.0151	0.0151	1016
1016			0.00979	0.0056	1016		<	0.0056	0.0056	1016
1016			0.268	0.0137	1016		<	0.0137	0.0137	1016
1016			0.0114	0.00598	1016		<	0.00598	0.00598	1016
1016			0.0457	0.015	1016		<	0.015	0.015	1016
1016			0.0117	0.00657	1016		<	0.00657	0.00657	1016
1016			0.0869	0.0124	1016			0.0371	0.0124	1016
1016			0.00851	0.00571	1016		<	0.00571	0.00571	1016
1016			0.0666	0.00878	1016			0.0622	0.00878	1016
1016			0.0566	0.0279	1016			0.103	0.00448	1016
1016			0.0519	0.0298	1016			1.61	0.00475	1016

Pb Result Modifier Comments	Sb DL Rel Symbol	Sb Wet Weight Result	Sb Wet Weight Detection Limit	Sb Method Codes	Sb Result Modifier Comments	Se DL Rel Symbol	Se Wet Weight Result	Se Wet Weight Detection Limit	Se Method Codes	Se Result Modifier Comments	Sn DL Rel Symbol
		ppm	ppm				ppm	ppm			
	<	0.00536	0.00536	1016			0.217	0.0536	1016		
	<	0.00979	0.00979	1016			0.162	0.0979	1016		<
	<	0.00633	0.00633	1016			1.07	0.0633	1016		<
	<	0.012	0.012	1016			1.25	0.12	1016		<
	<	0.00624	0.00624	1016			0.0896	0.0624	1016		<
	<	0.0134	0.0134	1016			0.146	0.134	1016		<
	<	0.0079	0.0079	1016			0.304	0.079	1016		<
	<	0.017	0.017	1016			0.366	0.17	1016		<
	<	0.00622	0.00622	1016			0.243	0.0622	1016		<
	<	0.0114	0.0114	1016			0.236	0.114	1016		<
	<	0.0013	0.0013	1016			0.383	0.013	1016		
	<	0.00332	0.00332	1016			0.408	0.0332	1016		
	<	0.0015	0.0015	1016			0.438	0.015	1016		
	<	0.00369	0.00369	1016			0.453	0.0369	1016		
	<	0.00131	0.00131	1016			0.333	0.0131	1016		
	<	0.00328	0.00328	1016			0.328	0.0328	1016		
	<	0.00123	0.00123	1016			0.29	0.0123	1016		
	<	0.00215	0.00215	1016			0.317	0.0215	1016		
	<	0.00135	0.00135	1016			0.419	0.0135	1016		
		0.00405	0.0026	1016			0.494	0.026	1016		
	<	0.00145	0.00145	1016			0.39	0.0145	1016		
	<	0.00275	0.00275	1016			0.271	0.0275	1016		
	<	0.00125	0.00125	1016			0.335	0.0125	1016		
	<	0.00302	0.00302	1016			0.306	0.0302	1016		
	<	0.00112	0.00112	1016			0.112	0.0112	1016		
	<	0.00274	0.00274	1016			0.16	0.0274	1016		
	<	0.0012	0.0012	1016			0.215	0.012	1016		
	<	0.00301	0.00301	1016			0.309	0.0301	1016		
	<	0.00131	0.00131	1016			0.268	0.0131	1016		
		0.00279	0.00248	1016			0.269	0.0248	1016		
	<	0.00114	0.00114	1016			0.181	0.0114	1016		
		0.0018	0.00176	1016			0.241	0.0176	1016		
	<	0.014	0.014	1016			0.516	0.14	1016		<
	<	0.0149	0.0149	1016			0.773	0.149	1016		<

Sn Wet Weight Result ppm	Sn Wet Weight Detection Limit ppm	Sn Method Codes	Sn Result Modifier Comments	Sr DL Rel Symbol	Sr Wet Weight Result ppm	Sr Wet Weight Detection Limit ppm	Sr Method Codes	Sr Result Modifier Comments	V DL Rel Symbol	V Wet Weight Result ppm
0.0381	0.0107	1016			0.207	0.107	1016		<	0.0536
0.0196	0.0196	1016			0.945	0.196	1016		<	0.0979
0.0127	0.0127	1016			0.347	0.127	1016		<	0.0633
0.024	0.024	1016			1.94	0.24	1016		<	0.12
0.0125	0.0125	1016			0.278	0.125	1016		<	0.0624
0.0267	0.0267	1016			0.385	0.267	1016		<	0.134
0.0158	0.0158	1016			0.85	0.158	1016		<	0.079
0.0341	0.0341	1016			3.38	0.341	1016		<	0.17
0.0124	0.0124	1016		<	0.124	0.124	1016		<	0.0622
0.0228	0.0228	1016			0.941	0.228	1016		<	0.114
					0.178	0.013	1016		<	0.0065
					0.607	0.0332	1016		<	0.0166
					0.061	0.015	1016		<	0.0075
					0.52	0.0369	1016		<	0.0184
					0.119	0.0131	1016		<	0.00653
					0.76	0.0328	1016		<	0.0164
					0.151	0.0123	1016		<	0.00615
					1.12	0.0215	1016		<	0.0107
					0.156	0.0135	1016		<	0.00675
					1.27	0.026	1016		<	0.013
					0.0701	0.0145	1016		<	0.00728
					0.679	0.0275	1016		<	0.0138
					0.0656	0.0125	1016		<	0.00623
					0.791	0.0302	1016		<	0.0151
					0.0674	0.0112	1016		<	0.0056
					1.32	0.0274	1016		<	0.0137
					0.411	0.012	1016		<	0.00598
					0.69	0.0301	1016		<	0.015
					0.175	0.0131	1016		<	0.00657
					0.8	0.0248	1016		<	0.0124
					0.151	0.0114	1016		<	0.00571
					2.44	0.0176	1016			0.0126
0.0279	0.0279	1016			0.765	0.279	1016		<	0.14
0.0298	0.0298	1016			0.695	0.298	1016		<	0.149

V Wet Weight Detection Limit ppm	V Method Codes	V Result Modifier Comments	Zn DL Rel Symbol	Zn Wet Weight Result ppm	Zn Wet Weight Detection Limit ppm	Zn Method Codes	Zn Result Modifier Comments	Th DL Rel Symbol	Th Wet Weight Result ppm	Th Wet Weight Detection Limit ppm
0.0536	1016			15.9	0.0215	1016				
0.0979	1016			14.3	0.0392	1016				
0.0633	1016			16.5	0.0254	1016				
0.12	1016			14.6	0.0481	1016				
0.0624	1016			19.6	0.025	1016				
0.134	1016			19.2	0.0533	1016				
0.079	1016			25.1	0.0317	1016				
0.17	1016			25.9	0.0683	1016				
0.0622	1016			17	0.0248	1016				
0.114	1016			13.4	0.0454	1016				
0.0065	1016			25.5	0.0261	1016		<	0.0065	0.0065
0.0166	1016			16.3	0.0664	1016		<	0.0166	0.0166
0.0075	1016			19.4	0.0301	1016		<	0.0075	0.0075
0.0184	1016			15.6	0.0737	1016		<	0.0184	0.0184
0.00653	1016			20.5	0.0261	1016		<	0.00653	0.00653
0.0164	1016			16.5	0.0654	1016		<	0.0164	0.0164
0.00615	1016			18.9	0.0246	1016		<	0.00615	0.00615
0.0107	1016			19.4	0.043	1016		<	0.0107	0.0107
0.00675	1016			19.2	0.0271	1016		<	0.00675	0.00675
0.013	1016			15.7	0.0518	1016		<	0.013	0.013
0.00728	1016			21.3	0.0291	1016		<	0.00728	0.00728
0.0138	1016			27.1	0.0551	1016		<	0.0138	0.0138
0.00623	1016			18.2	0.025	1016		<	0.00623	0.00623
0.0151	1016			24.5	0.0603	1016		<	0.0151	0.0151
0.0056	1016			14.3	0.0224	1016		<	0.0056	0.0056
0.0137	1016			14	0.0549	1016		<	0.0137	0.0137
0.00598	1016			15.6	0.0239	1016		<	0.00598	0.00598
0.015	1016			13.6	0.0602	1016		<	0.015	0.015
0.00657	1016			15.2	0.0262	1016		<	0.00657	0.00657
0.0124	1016			15.9	0.0495	1016		<	0.0124	0.0124
0.00571	1016			14.7	0.0229	1016		<	0.00571	0.00571
0.00878	1016			13.2	0.0352	1016		<	0.00878	0.00878
0.14	1016			18	0.056	1016				
0.149	1016			21	0.0597	1016				

Th	Ti	Ti	Ti	Ti	U	U	U	U
Method Codes	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Method Codes	DL Rel Symbol	Wet Weight Result ppm	Wet Weight Detection Limit ppm	Method Codes
1016	<	0.0013	0.0013	1016	<	0.0013	0.0013	1016
1016	<	0.00332	0.00332	1016	<	0.00332	0.00332	1016
1016		0.00203	0.0015	1016	<	0.0015	0.0015	1016
1016	<	0.00369	0.00369	1016	<	0.00369	0.00369	1016
1016	<	0.00131	0.00131	1016	<	0.00131	0.00131	1016
1016	<	0.00328	0.00328	1016	<	0.00328	0.00328	1016
1016	<	0.00123	0.00123	1016	<	0.00123	0.00123	1016
1016	<	0.00215	0.00215	1016	<	0.00215	0.00215	1016
1016	<	0.00135	0.00135	1016	<	0.00135	0.00135	1016
1016	<	0.0026	0.0026	1016	<	0.0026	0.0026	1016
1016	<	0.00145	0.00145	1016	<	0.00145	0.00145	1016
1016	<	0.00275	0.00275	1016	<	0.00275	0.00275	1016
1016	<	0.00125	0.00125	1016	<	0.00125	0.00125	1016
1016	<	0.00302	0.00302	1016	<	0.00302	0.00302	1016
1016	<	0.00112	0.00112	1016	<	0.00112	0.00112	1016
1016	<	0.00274	0.00274	1016	<	0.00274	0.00274	1016
1016	<	0.0012	0.0012	1016	<	0.0012	0.0012	1016
1016	<	0.00301	0.00301	1016	<	0.00301	0.00301	1016
1016	<	0.00131	0.00131	1016	<	0.00131	0.00131	1016
1016	<	0.00248	0.00248	1016	<	0.00248	0.00248	1016
1016		0.00124	0.00114	1016	<	0.00114	0.00114	1016
1016		0.00192	0.00176	1016	<	0.00176	0.00176	1016

APPENDIX B. Roe 2006. Working Draft of American Eel Contaminants Review 4-5-06. US Fish and Wildlife Service, New York Field Office, Cortland New York.

WORKING DRAFT of American Eel Contaminants Review

Introduction

A number of potential impacts may be contributing to the decline of the American eel (*Anguilla rostrata*) population. The focus of this review is on potential impacts that bioaccumulative contaminants might have on the American eel. Before a review of contaminant impacts can begin, it is necessary to give a brief overview of important life history traits of the American eel. These life history traits will play an important role in how contaminants might be impacting the American eel population.

Life History

The American eel is a panmictic catadromous teleost fish species (Facey and Van Den Avyle 1987, Helfman et al. 1987, Barbin and McCleave 1997). This species spawns in the Sargasso Sea and then matures in coastal and freshwater habitats within North America. The mature eels, also called silver eels, begin the migration back to the Sargasso Sea where they spawn and then die.

Male and female American eels are known to have several different life history traits. Female eels are known to inhabit all estuarine and freshwater habitats while male eels are abundant in estuaries and are rarely known to occur in freshwater habitats (Facey and Van Den Avyle 1987, Helfman et al. 1987). Male eels also tend to inhabit the southeastern region of North America and are known to occur less frequently in the northern regions of North America (Facey and Van Den Avyle 1987, Helfman et al. 1987). Freshwater eels are mobile and have a larger home range while estuary eels tend to be sedentary with a smaller home range (Facey and Van Den Avyle 1987, Helfman et al. 1987). Male eels in estuaries also tend to mature faster and are smaller in size than female eels from northern freshwater habitats (Facey and Van Den Avyle 1987, Helfman et al. 1987).

Barbin and McCleave (1997) suggest that American eels from the northern region of North America contribute a greater proportion of reproductive potential to the species as a whole than American eels from the more southern region of North America. They hypothesized that the increase in reproductive potential may be due to apparent increases in average female size and the percentage of females in a population with increasing latitude (Barbin and McCleave 1997). The authors suggest that future research to determine eel reproductive trends should focus on fecundity and lipid reserves of migrating females from different latitudes (Barbin and McCleave 1997).

Lipid reserves are very important in the seaward migration of silver eels (Amin 1991, van Ginneken and van den Thillart 2000, Robinet and Feuteun 2002). In order to successfully complete their seaward migration, to complete sexual maturation, and to successfully spawn, silver eel lipid reserves must exceed 20% of their total body weight at the start of migration (van Ginneken and van den Thillart 2000, Robinet and Feunteun 2002). Silver eels are known to stop feeding during their migration to the Sargasso Sea. Their energy for the migration, completion of sexual maturation, and spawning is derived from stored lipids in their fat and muscle (Amin

1991, van Ginneken and van den Thillart 2000, Robinet and Feunteun 2002, van den Thillart et al. 2005).

Eels are known to be very efficient swimmers (van Ginneken and van den Thillart 2000, van Ginneken et al. 2005). In a study of energy consumption of European eels (*Anguilla anguilla*), van Ginneken and van den Thillart (2000) concluded that after successful migration to the Sargasso Sea, approximately 60% of the eel's initial fat reserves could be used for gonad development. In another study on European eels that assessed energy requirements for migration and sexual development, it was determined that approximately 35% of the total energy expenditure was utilized for migration and routine metabolism (Amin 1991). The approximate European eel total energy expenditure utilized in oogenesis for ovulation and spermatogenesis was 25% and 20%, respectively; approximately 15-17% of the total energy expenditure was utilized for ovulation and spermiation, respectively (Amin 1991).

Bioaccumulative Contaminants

Contaminants that are generally of greatest concern in the environment are ones that are persistent in the environment, that bioaccumulate in organisms, have the potential to biomagnify (move up the food chain, in higher concentrations, to the top predators), and that can interfere with biological processes involved with growth, reproduction, immune health, and abnormal development (e.g., cancer, deformities). Environmental contaminants such as polychlorinated biphenyls (PCBs), pesticides such as dichlorodiphenyltrichloroethane (DDT), and dioxins/furans are lipophilic (lipid soluble) which means they concentrate in the fatty tissues of an organism such as the liver, ovaries, and testes.

Contaminant Concentrations in American Eels

American eel contaminant literature was reviewed and is compiled in Table 1. American eel contaminant concentrations reported varied by tissue type and by year for each geographic location. Geographic locations with reported contaminant concentrations included Canada, Lake Ontario/St. Lawrence River, Connecticut, Maine, New Jersey, New York, Pennsylvania, Georgia, and Mexico. Total PCB tissue concentrations were the most frequently reported contaminant in the American eel literature. Concentrations of total PCBs ranged from 0.005 to 95.52 parts per million (ppm) wet weight (ww) in the American eel. The pesticides (total DDT, mirex, chlordane, dieldrin, and endrin), dioxins/furans, and mercury were the next most frequently reported contaminants in tissues of the American eel.

PCBs

In general, New York and Connecticut had the highest total PCB concentrations reported in American eels (Table 1). The Hudson River, New York (Sloan et al. 2005), had the highest reported mean total PCB concentration in American eel of the studied geographic locations (95.52 ppm in whole body tissues, without head, skin, and viscera, 1975). The second highest total PCB concentration (23.39 ppm) was reported in Connecticut within the Housatonic River in 1992 (Connecticut Department of Environmental Protection Bureau of Water Management 2005). American eel from the Lake Ontario/St. Lawrence River geographic location from 1984 (6.69 ppm PCBs, Dutil et al. 1987) and from rivers in the New Jersey geographic location from

1981 to 1982 (4.80 ppm PCBs, Kennish and Ruppel 1996) had the third and fourth highest reported total PCB concentrations.

In general, the available existing data suggest that mean total PCB concentrations have declined over the years in the Lake Ontario/St. Lawrence River, Connecticut, Maine, New Jersey, New York, and Pennsylvania geographic locations studied (Table 1). Mean total PCB concentrations of 6.69 ppm (Dutil et al. 1987), 6.32 ppm (Desjardins et al. 1983a,b, Hodson et al. 1992), and 4.90 ppm (Ryan et al. 1984) reported in Lake Ontario, prior to and in 1984, in American carcasses, eel flesh, and filet, respectively, were greater than the total PCB concentrations reported in the St. Lawrence River in 1990 (Hodson et al. 1992) for American eel carcasses (1.08 ppm) or gonad (0.894 ppm) tissues. Connecticut Housatonic River mean total PCB concentrations ranged from 3.0 ppm to 7.29 ppm during the 1990 to 1992 time period (Patrick Center for Environmental Research 2001, Connecticut Department of Environmental Protection Bureau of Water Management 2005) and decreased to 1.74 ppm by 1995 (Connecticut Department of Environmental Protection Bureau of Water Management 2005). Concentrations of mean total PCBs ranged from 0.0549 to 0.515 ppm in Maine rivers (Maine Department of Environmental Protection 2004, Friedman 2005). Total PCB concentrations from rivers within New Jersey ranged around 4.8 ppm in 1981 and 1982 (Kennish et al. 1992, Belton et al. 1983) and decreased to a range of 0.08 ppm to 1.60 ppm during the time period of 1998 to 2000 (Ashley et al. 2003).

Mean concentrations of total PCBs in Hudson River eels declined from the 1975 concentration of 95.52 ppm to a mean of 10.06 ppm in 1999 and a mean of 1.33 ppm in 2003 (Sloan et al. 2005). However, the number of sampling stations sampled in 1999 (23 stations) compared to 2003 (3 stations) may have had some influence on the yearly mean total PCB concentrations. Pennsylvania mean total PCB concentrations from the Schuylkill River ranged from 2.0 to 3.7 ppm in 1980 (Barker 1984) and were reported at a mean concentration of 0.28 ppm in the Lehigh River during 1998 to 2000 (Ashley et al. 2003). However, it is difficult to definitively conclude that there were consistent decreases over time in total PCB concentrations within the geographic locations cited above because different studies evaluated different rivers, sampling stations, or eel tissues.

The time span of reported total PCB data within the American eel literature also varied within the different geographic locations, which increased the difficulty of detecting trends over time (Table 1). The total PCB data from the Hudson River, New York, geographic location spanned the greatest time period from 1975 to 2003 (Sloan et al. 2005). New Jersey river total PCB data spanned the time period from 1981 to 2000. Total PCB data for Lake Ontario/St. Lawrence River spanned the time period from 1982 to 1990. Connecticut total PCB data represented the time period from 1990 to 1995. Pennsylvania total PCB contaminant data were first reported in 1980 and again during the time period from 1998 to 2000. Maine contaminant data were only available for two years (2002 and 2004) while Canada and Mexico total PCB data were both only represented by one year.

Pesticides

Pesticide concentrations were reported in American eel tissues from the Lake Ontario/St. Lawrence River, Connecticut, Maine, and Pennsylvania geographic locations

(Table 1). Concentrations of mirex were only reported in the Lake Ontario/St. Lawrence River and Maine geographic locations. Concentrations of mirex in the St. Lawrence River ranged from 0.012 to 0.19 ppm in 1982 (Desjardins et al. 1983a,b, Hodson et al. 1992), 0.056 to 0.301 ppm in 1984 (Dutil et al. 1987), and from 0.011 to 0.158 in 1990 (Hodson et al. 1992). Concentrations of mirex ranged from 0.00004 to 0.00016 ppm in 2004 at the Benton Falls Dam in Maine (Friedman 2005).

Total DDT concentrations were reported in the Lake Ontario/St. Lawrence River, Connecticut, Maine, and Pennsylvania geographic locations. St. Lawrence River mean total DDT concentrations ranged from 0.296 to 0.734 ppm in 1984 (Dutil et al. 1987) and from 0.161 to 0.581 ppm in 1990 (Hodson et al. 1992). The mean total DDT concentration from Beaver Dam Lake in Stratford, Connecticut, was 0.090 ppm in 1993 (Connecticut Department of Environmental Protection Bureau of Water Management 2005). Concentrations of total DDT ranged from 0.033 to 1.48 in American eel tissues collected in 2004 at the Benton Falls Dam in Maine (Friedman 2005). Pennsylvania mean total DDT concentrations ranged from 0.14 to 0.29 ppm in 1980 (Barker 1984).

Concentrations of chlordane, dieldrin, and endrin were reported within the Lake Ontario/St. Lawrence River, Connecticut, Maine, and Pennsylvania geographic locations. Mean concentrations of chlordane, dieldrin, and endrin reported within the St. Lawrence River in 1984 (Dutil et al. 1987) ranged from 0.057 to 0.105 ppm, 0.034 to 0.103 ppm, and 0.007 to 0.015 ppm, respectively; concentrations of chlordane, dieldrin, and endrin in 1990 (Hodson et al. 1992) ranged from 0.029 to 0.052 ppm, 0.030 to 0.063 ppm, and 0.004 to 0.010 ppm, respectively. Beaver Dam Lake, Connecticut, mean concentrations of chlordane, dieldrin, and endrin in 1993 were reported as 0.20 ppm, 0.19 ppm, and 0.20 ppm, respectively (Connecticut Department of Environmental Protection Bureau of Water Management 2005). Concentrations of chlordane, dieldrin, and endrin at the Benton Falls Dam in Maine in 2004 ranged from 0.0017 to 0.0035 ppm, 0.0012 to 0.0018 ppm, and non-detect (ND) to 0.00008 ppm, respectively (Friedman 2005). Concentrations of chlordane, dieldrin, and endrin ranged from 0.18 to 0.59 ppm, 0.035 to 0.099 ppm, and 0.002 to 0.0092 ppm, respectively, in fillet tissues sampled in 1980 from Pennsylvania rivers (Barker 1984).

Dioxins/furans

Concentrations of total dioxins and furans were reported within the Lake Ontario/St. Lawrence River and Maine geographic locations. Concentrations of dioxins ranged from 0.0064 to 0.0385 ppm in Lake Ontario prior to 1984 (Ryan et al. 1984) and mean concentrations of total dioxins ranged from 0.017 to 0.131 ppm in 1990 from the St. Lawrence River (Hodson et al. 1992). Mean concentrations of total furans ranged from 0.020 to 0.075 from the St. Lawrence River in 1990 (Hodson et al. 1992). Concentrations of mean total dioxins in 2004 at the Benton Falls Dam in Maine ranged from ND to 0.00034 ppm (Friedman 2005). Mean total furan concentrations from the Benton Falls Dam in Maine in 2004 ranged from ND to 0.000068 ppm (Friedman 2005).

PAHs

There are indications that American eels originating from the Lake Ontario/St. Lawrence geographic location are exposed to genotoxic polycyclic aromatic hydrocarbons (PAHs).

Preneoplastic liver lesions, the foci of hepatocellular alteration, were found in migrating American eels captured in the St. Lawrence River Estuary at Kamouraska, Quebec in 1990 (Couillard et al. 1997). The authors (Couillard et al. 1997) noted that the prevalences of basophilic foci were correlated with the proportion of heavily contaminated eels and not with individual contaminant concentrations. Coulliard et al. (1997) also noted that PAH contaminants may be responsible for the lesions.

Metals

Mercury concentrations were reported within the Canada, Lake Ontario/St. Lawrence River, Connecticut, Maine, and Georgia geographic locations. The mean mercury concentration from the Medway River in Nova Scotia, Canada, from 1971 and 1972 was 0.72 ppm (Freeman and Horne 1972). Lake Ontario/St. Lawrence River mean concentrations of mercury ranged from 0.34 to 0.39 ppm in 1984 (Dutil et al. 1987) and from 0.218 to 0.278 in 1990 from the St. Lawrence River (Hodson et al. 1992). Mean concentrations of mercury were approximately 0.22 ppm from 1993 to 1995 in the Connecticut and Housatonic Rivers in Connecticut (Connecticut Department of Environmental Protection Bureau of Water Management 2005). The Benton Falls Dam, Maine, mean mercury concentrations ranged from 0.023 to 0.412 ppm in 2004 (Friedman 2005). The mean mercury concentration from the Savannah River, Georgia, from 1997 to 1998 was 0.15 ppm (Burger et al. 2001).

Contaminant Impacts

General Impacts of Contaminants on Fish

PCBs

PCBs have been shown to have biochemical and immunological impacts on fish species at concentrations as low as 0.28 ppm whole body ww (Table 2). Bills and Marking (1977) and Bills et al. (1981) reported an increase in trout sensitivity to toxicity of other contaminants at PCB concentrations of 0.49 and 0.28 ppm ww, respectively. Jorgensen et al. (1999) reported an increase in fin erosion and alterations in arctic char (*Salvelinus alpinus* Linnaeus) liver lipids at PCB concentrations of 0.5 ppm ww. At PCB concentrations of approximately 5 to 9 ppm whole body ww, Barron et al. (2000) reported that tumors, preneoplastic lesions, immunological changes, liver enzyme induction, and disease prevalence were reported in wild fish. Significant changes in biochemical and immunological functions were reported in various salmon and trout species with PCB concentrations greater than 25 to 50 ppm whole body ww (Thuvander et al. 1993, Monosson 1999).

PCB concentrations have also been reported to have impacts on fish growth and survival (Table 2). Matta et al. (2001) reported a decrease in growth and survival of second generation *Fundulus* fish at a concentration of 1.3 ppm ww PCBs. Mac and Seeley (1981) reported a 30% and 100% increase in fry mortality at PCB concentrations of 3 and 5 ppm ww, respectively, in lake trout (*Salvelinus namaycush*). Fry growth decreased significantly at PCB concentrations of 71 ppm whole body ww and significant mortalities were also noted in brook trout (*Salvelinus fontinalis*) (Mauck et al. 1978).

Concentrations of PCBs have also had impacts on fish reproduction (Table 2). Impacts to hatchability and embryological and larval survival have been documented in studies with PCB-contaminated starry flounder (*Platichthys stellatus*), salmonids, and other fish species

(Bengtsson 1980, von Westerhagen et al. 1981, Spies and Rice 1988, Kime 1995, Monosson 1999, Robinet and Feunteun 2002, and van den Thillart et al. 2005). Total whole body PCB concentrations of 15 ppm ww in the minnow (*Phoxinus phoxinus*) had significantly reduced hatching times compared to the controls (Bengtsson 1980). The early hatching resulted in increased fry mortality (Bengtsson 1980). von Westerhagen et al. (1981) suggested an ovary PCB concentration of 0.120 ppm as a threshold concentration above which viable hatch was significantly reduced in Baltic flounder (*Platichthys flesus*). A highly significant correlation between reduced embryological success and concentrations of total PCBs in eggs was noted for starry flounder (Spies and Rice 1988). Total PCB concentrations in the starry flounder eggs ranged from approximately 4 to 30 ppm (Spies and Rice 1988). Mac and Schwartz (1992) and Mac et al. (1993) observed negative correlations between egg hatchability and total PCB concentrations in Great Lakes lake trout eggs. Hatchability was reduced by approximately 50% at 3 to 5 ppm in eggs (Mac and Schwartz 1992) and by 27% from 1 to 10 ppm in eggs (Mac et al. 1993). In a review of the ecotoxicological literature, Monosson (1999) determined that decreased larval survival begins at a PCB concentration of approximately 5 ppm ww in larvae and approximately at a PCB concentration of 25 ppm ww in adult fish livers. The PCB concentrations implicated with biochemical and immunological impacts (0.28 to 50 ppm), growth and survival (1.3 to 71 ppm), and reproductive impacts (1 to 30 ppm) in the above studies on various fish species are well within the range of PCB concentrations reported within the American eel literature (Table 1).

Pesticides

Pesticide concentrations have been shown to impact fish reproduction and survival. Kime (1995) reviewed impacts of a variety of pollutants on fish reproduction and noted that the pesticides mirex, DDT, dieldrin, and endrin impacted ovarian and testes growth, decreased fertilization, reduced viable hatch, and increased fry mortality. Peakall (1996) reviewed concentrations of dieldrin and endrin in wildlife and noted that concentrations of 0.0019 ppm and 0.0018 ppm, respectively, in water were the lethal doses to kill 50% of the fish studied in the toxicity tests. Peakall (1996) also reviewed the lethal endrin concentrations in tissues and a blood concentration of 0.30 ppm ww was reported to be lethal to channel catfish (*Ictalurus punctatus*) (Table 2).

Dioxins/Furans

Dioxin and dioxin-like compound concentrations were implicated in reduction of lake trout populations in Lake Ontario over a 40-year period in the twentieth century (Cook et al. 2003) (Table 2). The concentration of dioxins known to cause sac fry mortality in lake trout was reported as 0.00003 ppm ww (Cook et al. 2003). The concentration of dioxin reported to cause 100% sac fry mortality in lake trout was 0.0001 ppm ww; the authors suggest that 100% mortality of lake trout occurred in Lake Ontario from 1948 to 1976 (Cook et al. 2003). Sijm and Opperhuizen (1996) reviewed impacts of dioxins and furans in fish and noted early life stage impacts, growth inhibition, increased lesions, decreased hatchability, decreased reproduction, and increased mortality. The dioxin concentrations implicated with mortality (0.00003 to 0.0001 ppm) in lake trout (Cook et al. 2003) are well within the range of dioxin concentrations reported within the American eel literature (Table 1). However, salmonids are generally considered to be one of the most sensitive groups of fish to the effects of planar chlorinated hydrocarbons.

Sublethal impacts of dioxin and dioxin-like compounds could also have impacts on growth and survival of larvae. Cook et al. (2003) noted that the sublethal impacts of dioxin-like chemicals became an important factor to Lake Ontario lake trout populations after the mid 1980s. Reported sublethal dioxin-like contaminant impacts to trout embryos and sac fry include: skeletal malformations, growth reductions, reduced energy for feeding, reduced heart size and reduced blood flow, and visual impairment after fry swim-up which could lead to greater chances of mortality by predation and lesser ability to find prey (Cook et al. 2003).

PAHs

There is a considerable body of evidence that indicates a causal relationship between exposure to PAHs and genotoxic impacts such as tumor frequency, deformities, and other lesions in fish, particularly bottom feeding fish (Grizzle et al. 1981, Black 1983, Couch and Harshbarger 1985, Hendricks et al. 1985, Metcalfe 1989, Hickey et al. 1990, Metcalfe et al. 1990, Baumann 1992, Hirethota 1992, Balch et al. 1995, **Baumann and Harshbarger 1995**, Baumann et al. 1996, and **Johnson et al. 1998**). In particular, Hirethota (1992), Baumann and Harshbarger 1995, and Baumann et al. (1996) conclude, based on research and the literature, that it is highly probable that the etiology of hepatic cancers in bullheads and suckers from the Great Lakes is associated with exposure to environmental contaminants, such as PAHs.

Fish lesions and tumors are used in several fish species as biomarkers for exposure to PAHs. The initial step in chemical carcinogenesis is the formation of DNA adducts. If the DNA alterations are not repaired, these modifications may eventually lead to mutations and ultimately cancer. **Maccubbin et al. (1990)** analyzed liver DNA from Buffalo River bullhead fish to determine chemical-DNA interactions. The digested DNA were enriched in hydrophobic, bulky adducts and were identified as a variety of bulky, hydrophobic, aromatic genotoxic compounds (Maccubbin et al. 1990). Analysis of bile revealed that the Buffalo River fish had recent exposure to multi-ringed aromatic compounds, currently referred to as PAHs (Maccubbin et al. 1990). **Nigro et al. (2002)** presented preliminary results, in European eels, of induction of cell DNA strand breakage after exposure to a PAH.

Research has shown that induction of enzyme activity has also been used as a biomarker for exposure to PAHs and similar structured contaminants, such as PCBs and dioxins, in fish from contaminated aquatic environments. In North America, **Schlezinger and Stegeman (2000)** dosed American eels with three contaminants known to bind to cell receptors and trigger responses and measured enzyme activity levels in wild American eels captured from a site contaminated with PAHS and PCBs. Induction of enzyme activity in European eels exposed to PAHs and PCBs has been more recently documented (**Doyotte et al. 2001, Bonacci et al. 2003, and Mariottini et al. 2003**). Doyotte et al. (2001) conducted laboratory enzyme induction exposure studies and measured enzyme activity from wild European eels collected from United Kingdom estuaries. Bonacci et al. (2003) measured enzyme induction from wild eels collected off the Mediterranean coast of Italy. Matiottini et al. (2003) measured enzyme induction in eels off the Mediterranean coast of Italy after exposure to PCBs.

Fish PAH exposure has also been associated with immunosuppression and reproductive impairment (Johnson et al. 1998 **and Reynaud and Deschaux 2005**). Exposure to PAHs can impact specific and non-specific fish immunity and induce cell death, or apoptosis (Nigro et al.

2002 and Reynaud and Deschaux 2005). Johnson et al. (1998) noted field studies where flat fish exposed to sediment contaminated with high concentrations of PAHs had reproductive impairments such as lower plasma concentrations of 17β-estradiol, decreased gonadal development, inhibited spawning ability, and reduced viability of the eggs and larvae.

Mercury

Impacts of mercury concentrations on fish were reviewed by Kime (1995) and Wiener and Spry (1996). Mercury concentrations in fish have been reported to impact appetite, growth, activity, reproduction, and cause lethality (Kime 1995, Wiener and Spry 1996). Wiener and Spry (1996) suggest concentrations of 6 to 20 ppm ww in muscle tissue are associated with toxicity and lethality (Table 2). The range of mercury concentrations implicated with toxicity and lethality (Wiener and Spry 1996) exceeds the range of mercury concentrations reported within the American eel literature (Table 1).

New and Emergent Contaminants

The impacts of new and emergent chemical contaminants in fish are unclear. Polybrominated diphenyl ethers (PBDEs) are a group of chemicals used as flame retardants in a multitude of consumer products (**ATSDR 2004**). PBDEs are similar to PCBs in that they are lipophilic, persistent in the environment, and they bioaccumulate in organisms. However, the impacts to fish and other aquatic organisms have not been completely defined. There is evidence that PBDEs cause enzyme activity alterations, delayed embryonic hatching, and behavioral alterations (**Timme-Laragy et al. 2006**). Concentrations of a PBDEs were measured in European eels (Anguilla anguilla) from Dutch rivers and lakes with concentrations ranging from <20 to 1700 ng/g lipid (**de Boer 1990**). Concentrations of PBDEs ranged from 1.98 to 14.0 ng/g wet weight in European eel livers from lakes and canals in Flanders, Belgium (**Covaci et al. 2004**). In North American, PBDEs have been measured in Great Lakes lake trout (*Salvelinus namaycush*), herring gull (*Larus argentatus*) eggs, and beluga whales (*Delphinapterus leucas*) from the St Lawrence River Estuary (**Lebeuf et al. 2004**).

An example of another emergent contaminant of concern is Dechlorane plus. Dechlorane plus is a chlorinated flame retardant that was introduced as a substitute for the banned fire retardant, Mirex (also called dechlorane), in the mid-1960s. (**Hoh et al. 2006**). This fire retardant, which is still presently being used, has recently been documented in air, sediment, and fish samples collected from the Great Lakes (Hoh et al. 2006). The authors (Hoh et al. 2006) indicated that Dechlorane plus had not been previously identified in the environment and that more research is needed to study its bioaccumulation and toxicity.

Short-term Exposure to Non-persistent Contaminants

The short-term exposure of non-persistent contaminants during critical American eel life stages may also be of concern. Endocrine disrupting environmental contaminants such as 4-nonylphenol and the pesticides atrazine and diazinon have been shown to cause physiological changes, inhibit growth and therefore inhibit the survival of wild Atlantic salmon (*Salmo salar*) along the Canadian Atlantic coast (**Moore and Waring 1996**, **Fairchild et al. 1999, Brown et al. 2003, Arsenault et al. 2004, Waring and Moore 2004**). Arsenault et al. (2004) noted that discharges from sewage treatment plants are the primary source of 4-nonylphenol to the environment and that current discharges into rivers supporting sea-run salmon stocks are of

concern due to the potential estrogenic impacts that may occur during seaward migration. Recent declines, in the past few decades, in Canadian Atlantic salmon have been attributed to insecticide spraying, with 4-nonylphenol as the primary solvent, that occurred in the Canadian Atlantic forests to control budworm infestation (Fairchild et al. 1999). There were significant negative relationships between salmon smolt mortality/returns of salmon and usage of the budworm insecticide (Fairchild et al. 1999).

The widely used pesticides atrazine and diazinon have been reported to impact Atlantic salmon saltwater survival. Moore and Waring (1996) pre-exposed Atlantic salmon smolts to atrazine and reported osmoregulatory changes and an increase in mortality after the freshwater to seawater exchange. The authors indicated that freshwater atrazine exposure appears to have an impact on Atlantic salmon seawater survival (Moore and Waring 1996). In a more recent study, the authors Waring and Moore (2004) reported the pesticide, diazinon, had sublethal effects on the olfactory function in mature male Atlantic salmon parr, which could potentially impact reproduction.

Currently, there is no information on the sensitivity of American eels to short-term exposure of non-persistent contaminants such as endocrine disrupting chemicals and pesticides. However, it has been noted that Lake Ontario/St. Lawrence River maturing silver eels are sporadically exposed to relatively high concentrations of these contaminants during their migration through the St. Lawrence River to the Sargasso Sea (Pham et al. 2000). Lake Ontario has been reported to be the major source of triazine pesticides to the St. Lawrence River (Pham et al. 2000). In addition, the largest primary physio-chemical municipal sewage treatment plant in North America is located in Montreal and treated effluent is discharged to the St. Lawrence River (**Environment Canada 2006**). The Montreal wastewater treatment plant treats 50% (2.5 million m3/day) of all Quebec's wastewater. The rate of organic contaminant removal from the waste water is approximately 80% and over 50% for metals (Environment Canada 2006). There is evidence of endocrine disruption in aquatic organisms exposed to the effluent, 50 km upstream and 50 km downstream of the plant (**Aravindakshan et al 2004 and Gagné et al. 2004)**.

Cumulative Impacts of Complex Mixtures of Contaminants

Fish and other wildlife are not exposed to single contaminants in the aquatic environment; they are exposed to complex mixtures of environmental contaminants. Contaminants within the complex mixtures may interact and have additive (Dioxin-like contaminants; Safe 1990 and Van den Berg et al. 1998) or synergistic (PAHs; **DiGiulio and Richard 2004**) effects. However, the cumulative impacts of complex mixtures of contaminants on the eel species are unknown.

Antioxidant Vitamin Deficiency

In addition to the larvae contaminant induced mortality discussed above, decreased concentrations of antioxidant vitamins such as thiamine, vitamin B1, and astaxanthin, a precursor to vitamin A, have been associated with increased sac-fry mortality in salmon and trout species (Fitzsimons 1995a, 1995b, **Vuorinen et al. 1997, and Fitzsimons et al. 2001**). These mortality syndromes have been documented in the Great Lakes, the finger lakes of the New York, and in the Baltic Sea (Fitzsimons et al. 2001) and have been associated with low concentrations of thiamine and astaxanthin (Vuorinen et al. 1997 and Fitzsimons et al. 2001).

It has been suggested that the occurrence of the mortality syndrome in Lake Ontario lake trout is related to alewife and their high thiaminase content (Fitzsimons 1995b). Fitzsimons (1995b) noted that the Lake Ontario prey base for lake trout is primarily alewife (*Alosa pseudoharengus*), which contain high concentrations of thiaminase (Fitzsimons 1995b). Thiaminase are a group of enzymes that break down thiamine in the body. In relation to American eels feeding in Lake Ontario, the impact of thiaminase containing prey on the health of the adults or their eggs/leptocephali is uncertain.

Impacts of Complex Mixtures of Contaminants and Other Stressors/Diseases, Such as Parasites, and Bacterial and Viral Infections

As stated previously, contaminants can impact the immune system and therefore increase the organism's susceptibility to other stressors such as diseases, parasites, and bacterial and viral infections (**Arkoosh et al. 1996 and 1998**, **Grassman et al. 1996,** Couillard et al. 1997, Johnson et al. 1998, **Van Lovern et al. 2000**, and **Zelikoff et al. 2000**). Research on English sole (*Pleuronectes vetulus*) from Puget Sound indicated proliferation of splenic leukocytes was linked to PAH exposure within Puget Sound (Arkoosh et al. 1996). Grassman et al. (1996) demonstrated organochlorine contaminant-associated suppression of T-cell-mediated immunity in prefledgling chicks of two species of fish-eating birds from the Great Lakes that were perinatally exposed to high concentrations of organochlorine contaminated Great Lakes prey. Smallmouth bass (*Micropterus dolomieui*) collected from a PCB contaminated site demonstrated significantly reduced phagocyte function and antioxidant activity compared to reference site fish (Zelikoff et al. 2000).

The cumulative stress of the complex mixtures of environmental contaminants in and other stressors may potentially lead to increased mortality. Field studies have documented decreased host resistance to infections in European and North American species. Chinook salmon (*Oncorhynchus tshawytscha*) collected from a PAH/PCB polluted coastal river in Oregon displayed reduced host resistance against a bacterial pathogen challenge test (Arkoosh et al. 1998). Contaminants were linked to mass virus mortalities that occurred in seals from Northwestern Europe (Van Lovern et al. 2000). Although a morbillivirus had been isolated, the authors concluded that exposure to immunotoxic contaminants, including PCBs and PCDDs, potentially contributed to the severity of the virus outbreaks (Van Lovern et al. 2000). Zelikoff et al. (2000) also noted other studies that demonstrated reduced resistance of fish exposed to pyrethroid and organophosphorus insecticides against Gram-negative bacterial pathogens.

Bacterial pathogens have been isolated in American eels and increased prevalence may potentially be related to stress and subsequent decreased immune resistance. Pathogens isolated from American eels cultured over a two year period in South Carolina included *Aeromonas hydrophila, A. salmonicida,* and *Vibrio* and *Pseudomonas* spp (**Davis and Hayasaka 1983**). *A. hydrophila* was found to be responsible for lesions and mortality that occurred during the first two years of culture while *A. salmonicida* has been noted to primarily impact yellow eels (Hayasaka and Sullivan 1981 and Davis and Hayasaka 1983). An increase in pathogen occurrence was confirmed during months when eels were culled, which has been noted to be an added stress to the eels (Davis and Hayasaka 1983).

Other pathogens that have been isolated in American eel include (Hayasaka and Sullivan 1981, Inman and Bland 1981, and Komourdjian et al 1977)

Contaminant Impacts on Migration and Reproduction
In addition to contaminant impacts to embryos and larvae, mobilization of lipid reserves and of sequestered lipophilic environmental contaminants during migration, when the eels are fasting, may potentially impact adult migration, survival, and therefore reproduction. During migration and lipid reserve mobilization, the environmental contaminants that were sequestered in the lipid stores become remobilized and are redistributed to lipophilic organs such as the liver, kidney, and brain. Studies with Arctic charr (*Salvelinus alpinus*) have shown that after PCB exposure and a fasting period, to mimic migration, elevated PCB concentrations were associated with altered enzyme activity, increased susceptibility to infectious diseases, and endocrine and osmoregulatory disturbances (**Jørgensen et al. 2002a, 2002b, 2004 and Maule et al. 2005**). These impacts could result in the unsuccessful migration and subsequent reproduction of the mature fish. Currently, there are no published studies that have examined the impacts of contaminants on migrating adult American eels, however, the long residence time American eels spend in freshwater (greater time period to bioaccumulate environmental contaminants), long migration period to the Sargasso Sea, and energetic requirements of migration make the eel vulnerable to these impacts.

Impacts of Contaminants on Eel Species
Authors that have documented or reviewed impacts of contaminant concentrations in American and European eels include: Agradi et al. (2000), Brusle (1991), Castonguay et al. (1994), Castonguay et al. (1997), Couillard et al. (1997), de Boer et al. (1994), Gimeno et al. (1995), Hodson et al. (1992), Hodson et al. (1994), Knights (1997), Ribeiro et al. (2005), Richkus and Whalen (2000), Robinet and Feunteun (2002), and Wirth and Bernatchez (2003).

Mortality
Brusle (1991) reviewed the effects of organic chemical pollutants on eels. Lethality was noted in European eels with laboratory exposure to phenols, pesticides (lindane, methyl parathion, endrin, and endosulfan), surfactants, ammonia, and PAHs (Brusle 1991). Lethality was also noted in wild European eels from the Rhine River in 1986 and in western France and in American eels from the St. Lawrence River (Brusle 1991). A November 1986 spill of chemicals and pesticides, including atrazine, fenitrothion, and parathion, at the Basel, Switzerland, Sandoz plant was implicated as the cause of the eel mortality event in the Rhine River (Brusle 1991). Acute environmental contaminant concentrations in the St. Lawrence River estuary were suggested to be the cause of American eel mortality events from 1960-1970 (Dutil et al. 1987, Castonguay et al. 1994, Hodson et al. 1994). The authors argued that acute exposure to environmental contaminants affected gas exchange at the gill and that eels died from ion loss (Dutil et al. 1987, Castonguay et al. 1994, Hodson et al. 1994). The current literature review on contaminant concentrations in American and European eels revealed additional potential mortality events that were caused by environmental contaminants. The mortality events occurred in Hungary in 1991 and 1995 (Bálint et al. 1997). It was suggested by the authors that the European eel die-offs that occurred in Hungary on Lake Balaton in 1991 and 1995 were the result of deltamethrin poisoning, the active ingredient of an insecticide used against mosquitoes (Bálint et al. 1997).

Migration/Reproduction AFTER THIS, ADD SOMETHING ABOUT FOCI LIVER ALTERATIONS (COUILLARD ET AL 1997)

American eels bioaccumulate environmental contaminants, such as PCBs, in their lipid reserves, liver, ovaries, and testes. The eel's long life span may allow for concentrations of contaminants within the eel to bioaccumulate over a longer period of time than they would bioaccumulate in other fish species who have a shorter life span. As the lipid reserves are mobilized during the seaward migration to the spawning grounds, PCBs are also remobilized into the blood stream (Robinet and Feunteun 2002). The recirculating environmental contaminants can then have an impact on the lipid-rich developing reproductive system, spawning, and embryological survival.

Environmental contaminants, such as PCBs, have the potential to impact processes involved in the migration (Robinet and Feunteun 2002), reproductive development (Robinet and Feunteun 2002, van den Thillart et al. 2005), spawning, hatchability, and embryological and larval survival in American eels. Research on impacts of environmental contaminants on eel reproduction is noticeably lacking. One recent study conducted on the reproductive capacity of European eels by van den Thillart et al. (2005) indicated that a preliminary study on PCB impacts to maturation and fertilization showed negative impacts on egg quality and embryonic development. The preliminary study measured PCB concentrations in wild eels and also dosed 81 eels with PCBs 153, 126, and 77 and then induced maturation (van den Thillart et al. 2005). Higher PCB dose concentrations (5 mg/kg eel PCB 153, 7 ug/kg eel PCB 126, and 50 ug/kg eel PCB 77) caused embryonic development to cease and to show malformations earlier in time (van den Thillart et al. 2005).

The preliminary studies dosed eels with PCBs and also measured PCB concentrations in wild eels and then induced maturation and artificially fertilized the eggs (van den Thillart et al. 2005 and Palstra et al. 2006).

More focus on the potential PCB impacts to American eel migration and reproduction was presented due to the large amount of PCB contaminant data available within the American eel contaminant literature and the extensive literature on the impact of PCBs documented in other teleost fish species. Other environmental contaminants, which have not been measured in American eel tissues, may also have impacts on American eels. Brown et al. (2004) noted that the fish thyroid cascade could be impacted by many of the known classes of environmental contaminants. However, due to the ability of the thyroid cascade to compensate for contaminants impacts, the authors (Brown et al. 2004) stated that "a xenobiotic-induced change in fish thyroid function has yet to be casually linked directly to decreased fitness or survival." In addition, Brown et al. (2004) suggested that other contaminants that have not been extensively studied in fish could impact thyroid function based on their chemical and physical properties.

Knights (1997) used a risk assessment approach to determine impacts of environmental contaminants on the *Anguilla* species. Knights (1997) acknowledges that transfer of a critical load of contaminants to eggs could take place during lipid mobilization which occurs during migration, sexual maturation, and reproduction. A transfer of a critical load of contaminants could potentially have negative impacts to eel embryos. As shown in the preliminary study on PCB impacts to maturation and fertilization (van de Thillart et al. 2005), concentrations of PCBs did stop eel embryo development and caused embryonic malformations to occur earlier in time.

In order to determine impacts of contaminants on American eels, more research is needed on impacts of contaminants on embryological development of American eels. Another area of research that is needed in order to determine impacts of contaminants on American eel is to evaluate and monitor present day concentrations of environmental contaminants in American eels from major freshwater rivers and lakes they are known to inhabit throughout North America. Knowledge of the current environmental contaminant load would allow for a better assessment of potential impacts that environmental contaminants might currently have on the American eel.

Although concentrations of PCBs reported in American eel literature are within the range of PCB concentrations associated with impacts in other species, there is no direct evidence that PCBs have contributed significantly to the decline of the American eel in PCB-contaminated areas. As an example, in the St. Lawrence River, the declines in American eels at the Moses Saunders Dam have been occurring as PCB concentrations in this river system experience a general decline. The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) also concluded in 2006 (COSEWIC 2006) that there is little evidence to conclude that environmental contaminants caused the sudden decline in eel recruitment in Lake Ontario and the Upper St. Lawrence River.

Table 1. Environmental Contaminant Concentrations in American Eels.

Reference	Tissue Type	Time period	Location		Arithmetic mean if more than one sample, unless otherwise stated **Total PCBs ppm ww**	**Mirex ppm ww**	**Total DDT ppm ww**	**Total PCDD ppm ww**
			CANADA		**0.44**			
Sims et al. 1977 in Brusle 1991	whole fish	<1977	Canada	Atlantic coast of Canada	0.44 (Aroclors 1254 and 1260)			
Freeman and Horne 1972	muscle	1971-1972	Canada	Medway River, Nova Scotia, Canada				
			LO SLR		**0.001 – 6.688**	**0.001-0.301**	**0.020-0.734**	**0.0064-0.131**
Ryan et al. 1984 in Brusle 1991	fillet	<1984	LO SLR	Lake Ontario (LO)	4.90			Range: 0.0064-0.0385
Dutil et al. 1985 in Brusle 1991	fillet	<1985	LO SLR	St. Lawrence River (SLR)		Range 0.12-0.19		
Bertrand et al. 1986 in Brusle 1991	whole fish	<1986	LO SLR	St. Lawrence Estuary, Canada	Range: 0.77-1.61			
Desjardins et al. 1983a,b in Hodson et al. 1992	Flesh	1982	LO SLR	LO SLR	6.32	0.196		
Dutil et al. 1987	carcass w/o viscera, gonads, and heads	1984	LO SLR	SLR at St Nicolas and Kamouraska	Mean Range 3.03-6.688	Mean Range 0.056-0.301	Mean Range 0.296-0.734	
Hodson et al. 1992	carcass w/o viscera, gonads, and heads	1990	LO SLR	SLR at Kamouraska	Mean Range 0.327-1.080	Mean Range 0.011 - 0.158	Mean Range 0.161-0.581	0.075 Mean Range 0.017-0.131
Hodson et al. 1992	gonads	1990	LO SLR	SLR at Kamouraska	0.894			
Hodson et al. 1992	whole bodies	1990	LO SLR	SLR at Kamouraska	0.767			
Hodson et al. 1992	carcass w/o viscera and gonads	1990	LO SLR	Trib to SLR Riviere aux Pins (reference site)	0.001	0.001	0.020	
Hodson et al. 1992	carcass w/o viscera and gonads	1990	LO SLR	North Shore of SLR-Saint Irenne	0.712	0.106	0.510	
Hodson et al. 1992	carcass w/o viscera and gonads	1990	LO SLR	South Shore of SLR-Cacouna	0.739	0.068	0.412	

Table 1. Environmental Contaminant Concentrations in American Eels, Continued.

Reference	Tissue Type	Time period	Location		Total PCDF ppm ww	Chlordane ppm ww	Dieldrin ppm ww	Endrin ppm ww	Mercury ppm ww
			CANADA						**0.72**
Sims et al. 1977 in Brusle 1991	whole fish	<1977	Canada	Atlantic coast of Canada					
Freeman and Horne 1972	muscle	1971-1972	Canada	Medway River, Nova Scotia, Canada					0.72
			LO SLR		**0.020-0.075**	**0.003-0.105**	**0.003-0.103**	**0.001-0.015**	**0.218-0.39**
Ryan et al. 1984 in Brusle 1991	fillet	<1984	LO SLR	Lake Ontario (LO)					
Dutil et al. 1985 in Brusle 1991	fillet	<1985	LO SLR	St. Lawrence River (SLR)					
Bertrand et al 1986 in Brusle 1991	whole fish	<1986	LO SLR	St. Lawrence Estuary, Canada					
Desjardins et al. 1983a,b in Hodson et al. 1992	flesh	1982	LO SLR	LO SLR					
Dutil et al. 1987	carcass w/o viscera, gonads, and heads	1984	LO SLR	SLR at St Nicolas and Kamouraska		Mean Range 0.057-0.105	Mean Range 0.034-0.103	Mean Range 0.007-0.015	Mean Range 0.34-0.39
Hodson et al. 1992	carcass w/o viscera, gonads, and heads	1990	LO SLR	SLR at Kamouraska	0.043 Mean Range 0.020-0.075	Mean Range 0.029-0.052	Mean Range 0.030-0.063	Mean Range 0.004-0.010	Mean Range 0.218-0.278
Hodson et al. 1992	gonads	1990	LO SLR	SLR at Kamouraska					
Hodson et al. 1992	whole bodies	1990	LO SLR	SLR at Kamouraska					
Hodson et al. 1992	carcass w/o viscera and gonads	1990	LO SLR	Trib to SLR Riviere aux Pins (reference site)		0.003	0.003	0.001	0.256
Hodson et al. 1992	carcass w/o viscera and gonads	1990	LO SLR	North Shore of SLR-Saint Irenne		0.044	0.045	0.005	0.272
Hodson et al. 1992	carcass w/o viscera and gonads	1990	LO SLR	South Shore of SLR-Cacouna		0.034	0.033	0.005	0.253

Table 1. Environmental Contaminant Concentrations in American Eels, Continued.

Reference	Tissue Type	Time period		Location	Total PCBs ppm ww	Mirex ppm ww	Total DDT ppm ww	Total PCDD ppm ww
			CT		**0.029 - 23.39**		**0.090**	
CTDEP Bureau of Water Management 2005		1990	CT	Lake Zoar, Housatonic River	3.00 Range: 0.34-8.96			
Patrick Center for Environmental Research 2001		1992	CT	Lake Zoar, Housatonic River	5.30			
CTDEP Bureau of Water Management 2005		1992	CT	Lake Zoar, Housatonic River	7.29 Range: 1.23-23.39			
CTDEP Bureau of Water Management 2005	skinned fillet	1993	CT	Beaver Dam Lake, Stratford	0.029		0.090	
CTDEP Bureau of Water Management 2005	skinned fillet	1994	CT	Connecticut River	0.681 (Aroclor 1254)			
CTDEP Bureau of Water Management 2005	skinned fillet	1995	CT	Housatonic River	1.742 (Aroclor 1254)			
			ME		**0.0124 – 0.726**	**ND-0.00016**	**0.033 - 1.48**	**ND - 0.00034**
Maine DEP SWAT Report 2004		2002	ME	Kennebec River-Bowdoinham	0.377 Range: (0.232-0.726)			
Maine DEP SWAT Report 2004		2002	ME	Penobscot River-Orrington large eel	0.0983 Range: (0.0124-0.272)			
Maine DEP SWAT Report 2004		2002	ME	Penobscot River-Orrington large eel	0.0549 Range: (0.0414-0.0685)			
Friedman 2005	unknown	2004	ME	Benton Falls Dam	0.05948	0.00016	0.03324	0.000001
Friedman 2005	unknown	2004	ME	Benton Falls Dam	0.49609	ND	1.37878	0.00008
Friedman 2005	unknown	2004	ME	Benton Falls Dam,	0.47506	ND	1.34171	0.00011
Friedman 2005	unknown	2004	ME	Benton Falls Dam	0.41891	ND	1.08358	0.00034
Friedman 2005	unknown	2004	ME	Benton Falls Dam	0.51509	0.00004	1.48024	ND

Table 1. Environmental Contaminant Concentrations in American Eels, Continued.

Reference	Tissue Type	Time period		Location	Total PCDF ppm ww	Chlordane ppm ww	Dieldrin ppm ww	Endrin ppm ww	Mercury ppm ww
			CT			**0.20**	**0.19**	**0.20**	**0.22-0.227**
CTDEP Bureau of Water Management 2005		1990	CT	Lake Zoar, Housatonic River					
Patrick Center for Environmental Research 2001		1992	CT	Lake Zoar, Housatonic River					
CTDEP Bureau of Water Management 2005		1992	CT	Lake Zoar, Housatonic River					
CTDEP Bureau of Water Management 2005	skinned fillet	1993	CT	Beaver Dam Lake, Stratford		0.20	0.19	0.20	
CTDEP Bureau of Water Management 2005	skinned fillet	1994	CT	Connecticut River					0.227
CTDEP Bureau of Water Management 2005	Skinned Fillet	1995	CT	Housatonic River					0.22
			ME		**ND - 0.000068**	**0.0017-0.0037**	**0.0018-0.0165**	**ND-0.00008**	**0.023-0.412**
Maine DEP SWAT Report 2004		2002	ME	Kennebec River-Bowdoinham					
Maine DEP SWAT Report 2004		2002	ME	Penobscot River-Orrington large eel					
Maine DEP SWAT Report 2004		2002	ME	Penobscot River-Orrington large eel					
Friedman 2005	unknown	2004	ME	Benton Falls Dam	ND	0.0017	0.0018	0.00008	0.412
Friedman 2005	unknown	2004	ME	Benton Falls Dam	0.000046	0.0035	0.0134	ND	0.023
Friedman 2005	unknown	2004	ME	Benton Falls Dam,	0.000023	0.0031	0.0124	ND	0.031
Friedman 2005	unknown	2004	ME	Benton Falls Dam	0.000039	0.0031	0.0124	ND	0.032
Friedman 2005	unknown	2004	ME	Benton Falls Dam	0.000068	0.0037	0.0165	ND	0.030

Table 1. Environmental Contaminant Concentrations in American Eels, Continued.

Reference	Tissue Type	Time period		Location	Total PCBs ppm ww	Mirex ppm ww	Total DDT ppm ww	Total PCDD ppm ww
			NJ		**0.080 - 4.86**			
Kennish et al. 1992 from Robinet and Feunteun 2002	whole body	1981-1982	NJ	New Jersey	4.86 sum of Aroclors 1254 and 1248			
Belton et al. 1983 from Kennish and Ruppel 1996	fillet	1982	NJ	NJ-North East: sites within Hudson, Raritan, Hackensack, and Passaic river drainages	4.80			
Hague 1993 from Kennish and Ruppel 1996	fillet	1988-1991	NJ	NJ-Camden:Stewart Lake, Cooper River, Pennsauken Ck, and Newton Ck drainages	1.11			
Hague 1993 from Kennish and Ruppel 1996	fillet	1988-1991	NJ	NJ-Delaware: main stem of Delaware River, tribs to Delaware River and Delaware Bay	0.60			
Hague 1993 from Kennish and Ruppel 1996	fillet	1988-1991	NJ	NJ-North Coast: all ocean and estuarine sites between Sandy Hook and Seaside Park	0.89			
Hague 1993 from Kennish and Ruppel 1996	fillet	1988-1991	NJ	NJ-North East: sites within Hudson, Raritan, Hackensack, and Passaic river drainages	2.03			
Hague 1993 from Kennish and Ruppel 1996	fillet	1988-1991	NJ	NJ-South Coast: all ocean and estuary sites between Seaside Park and Cape May and sites in Delaware Bay	0.56			
Ashley et al. 2003	unknown	1998-2000	NJ	Cohansey River, NJ	0.08			
Ashley et al. 2003	unknown	1998-2000	NJ	Delaware River below Trenton	0.58			
Ashley et al. 2003	unknown	1998-2000	NJ	Delaware River near Ft Mifflin	1.60			
Ashley et al. 2003	unknown	1998-2000	NJ	Maurice River	0.13			
Ashley et al. 2003	unknown	1998-2000	NJ	Mullica River	0.12			
Ashley et al. 2003	unknown	1998-2000	NJ	Navesink River	0.20			
Ashley et al. 2003	unknown	1998-2000	NJ	Passaic River	0.50			
Ashley et al. 2003	unknown	1998-2000	NJ	Pennsauken River	0.33			
Ashley et al. 2003	unknown	1998-2000	NJ	Raccoon Creek	0.90			
Ashley et al. 2003	unknown	1998-2000	NJ	Raritan Bay	1.10			
Ashley et al. 2003	unknown	1998-2000	NJ	Shark River	0.51			
Ashley et al. 2003	unknown	1998-2000	NJ	Shrewsbury River	0.23			
Ashley et al. 2003	unknown	1998-2000	NJ	Toms River	0.20			
Connor et al. 2005	whole body	1999-2000	NJ	Passaic River	1.199 congeners 1.927 homologues			

Table 1. Environmental Contaminant Concentrations in American Eels, Continued.

Reference	Tissue Type	Time period	Location		Total PCDF ppm ww	Chlordane ppm ww	Dieldrin ppm ww	Endrin ppm ww	Mercury ppm ww
			NJ						
Kennish et al. 1992 from Robinet and Feunteun 2002	whole body	1981-1982	NJ	New Jersey					
Kennish and Ruppel 1996 from Belton et al. 1983	fillet	1982	NJ	NJ-North East: sites within Hudson, Raritan, Hackensack, and Passaic river drainages					
Hague 1993 from Kennish and Ruppel 1996	fillet	1988-1991	NJ	NJ-Camden: Stewart Lake, Cooper River, Pennsauken Ck, and Newton Ck drainages					
Hague 1993 from Kennish and Ruppel 1996	fillet	1988-1991	NJ	NJ-Delaware: main stem of Delaware River, tribs to Delaware River and Delaware Bay					
Hague 1993 from Kennish and Ruppel 1996	fillet	1988-1991	NJ	NJ-North Coast: all ocean and estuarine sites between Sandy Hook and Seaside Park					
Hague 1993 from Kennish and Ruppel 1996	fillet	1988-1991	NJ	NJ-North East: sites within Hudson, Raritan, Hackensack, and Passaic River drainages					
Hague 1993 from Kennish and Ruppel 1996	fillet	1988-1991	NJ	NJ-South Coast: all ocean and estuary sites between Seaside Park and Cape May and sites in Delaware Bay					
Ashley et al. 2003	Unknown	1998-2000	NJ	Cohansey River, NJ					
Ashley et al. 2003	Unknown	1998-2000	NJ	Delaware River below Trenton					
Ashley et al. 2003	Unknown	1998-2000	NJ	Delaware River near Ft Mifflin					
Ashley et al. 2003	Unknown	1998-2000	NJ	Maurice River					
Ashley et al. 2003	Unknown	1998-2000	NJ	Mullica River					
Ashley et al. 2003	Unknown	1998-2000	NJ	Navesink River					
Ashley et al. 2003	Unknown	1998-2000	NJ	Passaic River					
Ashley et al. 2003	Unknown	1998-2000	NJ	Pennsauken River					
Ashley et al. 2003	Unknown	1998-2000	NJ	Raccoon Creek					
Ashley et al. 2003	Unknown	1998-2000	NJ	Raritan Bay					
Ashley et al. 2003	Unknown	1998-2000	NJ	Shark River					
Ashley et al. 2003	Unknown	1998-2000	NJ	Shrewsbury River					
Ashley et al. 2003	Unknown	1998-2000	NJ	Toms River					
Connor et al. 2005	whole body	1999-2000	NJ	Passaic River					

Table 1. Environmental Contaminant Concentrations in American Eels, Continued.

Reference	Tissue Type	Time period	Location			Total PCBs ppm ww	Mirex ppm ww	Total DDT ppm ww	Total PCDD ppm ww
			NY			**0.74 - 95.52**			
Sloan et al. 2005	whole body w/o head, skin and viscera	1975	NY	Hudson River		95.52			
Sloan et al. 2005	" "	1976	NY	Hudson River		17.42			
Sloan et al. 2005	" "	1978	NY	Hudson River		31.75			
Sloan et al. 2005	" "	1980	NY	Hudson River		8.51			
Sloan et al. 2005	" "	1981	NY	Hudson River		11.51			
Sloan et al. 2005	" "	1982	NY	Hudson River		17.22			
Sloan et al. 2005	" "	1983	NY	Hudson River		8.67			
Sloan et al. 2005	" "	1986	NY	Hudson River		24.11			
Sloan et al. 2005	" "	1991	NY	Hudson River		4.23			
Sloan et al. 2005	" "	1992	NY	Hudson River		9.94			
Sloan et al. 2005	" "	1993	NY	Hudson River		6.85			
Sloan et al. 2005	" "	1997	NY	Hudson River		0.74			
Sloan et al. 2005	" "	1998	NY	Hudson River		4.07			
Sloan et al. 2005	" "	1999	NY	Hudson River		10.06			
Sloan et al. 2005	" "	2000	NY	Hudson River		1.84			
Sloan et al. 2005	" "	2001	NY	Hudson River		7.71			
Sloan et al. 2005	" "	2003	NY	Hudson River		1.33			
Ashley et al. 2003	Unknown	1998-2000	NY	Hudson River at Albany		6.50			
Ashley et al. 2003	Unknown	1998-2000	NY	Hudson River at Athens		1.80			
Ashley et al. 2003	Unknown	1998-2000	NY	Hudson River at Kingston		4.00			
Ashley et al. 2003	Unknown	1998-2000	NY	Hudson River at Newburgh		7.73			
Ashley et al. 2003	Unknown	1998-2000	NY	Hudson River at Haverstraw		2.82			
Ashley et al. 2003	Unknown	1998-2000	NY	Hudson River at GW Bridge		4.00			

Table 1. Environmental Contaminant Concentrations in American Eels, Continued.

Reference	Tissue Type	Time period	Location		Total PCDF ppm ww	Chlordane ppm ww	Dieldrin ppm ww	Endrin ppm ww	Mercury ppm ww
			NY						
Sloan et al. 2005	whole body w/o head, skin and viscera	1975	NY	Hudson River					
Sloan et al. 2005	" "	1976	NY	Hudson River					
Sloan et al. 2005	" "	1978	NY	Hudson River					
Sloan et al. 2005	" "	1980	NY	Hudson River					
Sloan et al. 2005	" "	1981	NY	Hudson River					
Sloan et al. 2005	" "	1982	NY	Hudson River					
Sloan et al. 2005	" "	1983	NY	Hudson River					
Sloan et al. 2005	" "	1986	NY	Hudson River					
Sloan et al. 2005	" "	1991	NY	Hudson River					
Sloan et al. 2005	" "	1992	NY	Hudson River					
Sloan et al. 2005	" "	1993	NY	Hudson River					
Sloan et al. 2005	" "	1997	NY	Hudson River					
Sloan et al. 2005	" "	1998	NY	Hudson River					
Sloan et al. 2005	" "	1999	NY	Hudson River					
Sloan et al. 2005	" "	2000	NY	Hudson River					
Sloan et al. 2005	" "	2001	NY	Hudson River					
Sloan et al. 2005	" "	2003	NY	Hudson River					
Ashley et al. 2003	unknown	1998-2000	NY	Hudson River at Albany					
Ashley et al. 2003	unknown	1998-2000	NY	Hudson River at Athens					
Ashley et al. 2003	unknown	1998-2000	NY	Hudson River at Kingston					
Ashley et al. 2003	unknown	1998-2000	NY	Hudson River at Newburgh					
Ashley et al. 2003	unknown	1998-2000	NY	Hudson River at Haverstraw					
Ashley et al. 2003	unknown	1998-2000	NY	Hudson River at GW Bridge					

Table 1. Environmental Contaminant Concentrations in American Eels, Continued.

Reference	Tissue Type	Time period		Location	Total PCBs ppm ww	Mirex ppm ww	Total DDT ppm ww	Total PCDD ppm ww
			PA		**0.28 - 3.70**		**0.14-0.29**	
Barker 1984	fillet	1980	PA	Schuylkill River, Penn Street, Reading	3.70		0.28	
Barker 1984	fillet	1980	PA	Schuylkill River, South Street, Reading	2.60		0.29	
Barker 1984	fillet	1980	PA	Schuylkill River, Manayunk, Philadelphia	2.10		0.14	
Barker 1984	fillet	1980	PA	Schuylkill River, Fairmont Pool, Philadelphia	2.00		0.22	
Ashley et al. 2003	unknown	1998-2000	PA	Delaware River at Lehigh River	0.28			
			GA					
Burger et al. 2001	fillet	1997-1998	GA	Savannah River				
			Mexico		**0.015**			
Giam et al. 1978 in Brusle 1991	whole fish	<1978	Mexico	Northwest Gulf of Mexico	0.015			

Table 2. Concentrations of Environmental Contaminants and Impacts Reported in Fish.

Fish Species	PCB Concentration Range Low*	High	Unit	Effect	Source
Baltic flounder	< 0.120		ppm ww	Ovary concentration above which viable hatch was significantly reduced.	von Westerhagen et al. 1981
Trout	0.28		ppm ww	Decreased LC50 to toxics (i.e., toxicity to other contaminants increased after exposure to PCBs).	Bills et al. 1981
Trout	0.46		ppm ww	Decreased LC50 to toxics (i.e., toxicity to other contaminants increased after exposure to PCBs).	Bills and Marking 1977
Arctic char	0.5		ppm ww	Increased fin erosion and alterations in liver lipid.	Jorgensen et al. 1999
Lake trout	1	10	ppm ww	27% decrease in hatching.	Mac et al. 1993
Minnow	1.3		ppm ww	Effect on F1 generation growth.	Matta et al. 2001
Lake trout	3		ppm ww	30% increase in fry mortality.	Mac and Seeley 1981
Lake trout	3	5	eggs ppm	50% decrease in egg hatchability.	Mac and Schwartz 1992
Walleye	4.6	8.6	ppm ww	20% of population showed greater incidence of tumors, preneoplastic lesions, immunological changes, EROD, and disease prevalence.	Barron et al. 2000
Starry Flounder	4	30	eggs ppm	Highly significant correlation with reduced embryological success.	Spies and Rice 1988
Lake trout	5		ppm ww	100% increase in mortality.	Mac and Seeley 1981
Fish	5		ppm ww	Impacts on larval survival.	Monosson 1999
Minnow	15		ppm ww	Inhibition of reproductive development (spawning).	Bengtsson 1980
Fish (trout and salmon)	25		ppm ww	Adult liver concentrations that impact larval survival.	Monosson 1999
Fish (trout and salmon)	25	50	ppm ww	50% changes in biochemical and immunological function.	Monosson 1999
Rainbow trout	26.6		ppm ww	Biochemical and physiological effects.	Thuvander et al. 1993
Brook trout	71		ppm ww	Significant decrease in fry growth, vitamin C and hydroxyproline concentrations, and impairment of fry backbone development, and mortality.	Mauck et al. 1978
	Pesticide – Endrin Concentration				
Channel catfish	0.30		ppm ww	Lethal.	Peakall 1996
	Dioxin Concentration				
Lake trout	> 0.00003		ppm ww	Causes sac fry mortality.	Cook et al. 2003
Lake trout		0.0001	ppm ww	Causes 100% sac fry mortality.	Cook et al. 2003
	Mercury Concentration				
Fish	6	20	ppm ww	Associated with toxicity and lethality.	Wiener and Spry 1996

* Note: If only one concentration was reported (i.e., not a range), that concentration is listed in the "Low" column for organizational purposes.

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