WORK SUMMARY AND DATA REPORT FOR THE COLLECTION OF EGGS FROM AMERICAN PEREGRINE FALCON, HUDSON RIVER, NEW YORK

HUDSON RIVER NATURAL RESOURCE DAMAGE ASSESSMENT

HUDSON RIVER NATURAL RESOURCE TRUSTEES

STATE OF NEW YORK

U.S. DEPARTMENT OF COMMERCE

U.S. DEPARTMENT OF THE INTERIOR

FINAL

DECEMBER 24, 2004

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1305 East-West Highway, Rm 10219
Silver Spring, MD 20910-3281

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PREPARED FOR HUDSON RIVER NATURAL RESOURCE TRUSTEES

STATE OF NEW YORK

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DECEMBER 24, 2004

EXECUTIVE SUMMARY

Natural resources of the Hudson River have been contaminated through past and ongoing discharges of polychlorinated biphenyls (PCBs). The Hudson River Natural Resource Trustees - New York State, the U.S. Department of Commerce, and the U.S. Department of the Interior - are conducting a natural resource damage assessment (NRDA) to assess and restore those natural resources injured by PCBs. This Work Summary and Data Report provides the results of a preliminary investigation of contamination of eggs of American peregrine falcon (*Falco peregrinus anatum*), a New York State-listed endangered species, conducted pursuant to the NRDA.

In May and June 2002 five eggs from American peregrine falcon were collected from two locations on the Hudson River. The eggs were collected only when it became apparent that they were not going to hatch. No viable eggs were collected; only addled eggs were collected.

The contents of the peregrine falcon eggs were subsequently analyzed for various contaminants, including PCBs, dioxins and furans, various pesticides, polybrominated diphenylether compounds, and metals (mercury, cadmium, and lead). Percent lipid and percent moisture of each egg were also determined.

Total PCB concentrations (as sum of homologues), in four of the five peregrine falcon eggs, range from 5.29 parts per million (ppm) to 6.69 ppm on a wet weight basis (that is, not adjusted for moisture loss). The PCB value for the fifth egg - which was cracked and severely dessicated - is not included in this range due to the potential loss of egg contents prior to its collection.

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WORK SUMMARY AND DATA REPORT: PEREGRINE FALCON EGG COLLECTION

1. INTRODUCTION

Past and continuing discharges of polychlorinated biphenyls (PCBs) have contaminated the natural resources of the Hudson River. The Hudson River Natural Resource Trustees - New York State, the U.S. Department of Commerce, and the U.S. Department of the Interior - are conducting a natural resource damage assessment (NRDA) to assess and restore those natural resources injured by PCBs (Hudson River Natural Resource Trustees 2002). This Work Summary and Data Report provides the results of a preliminary investigation of contamination of American peregrine falcon (*Falco peregrinus anatum*) eggs conducted pursuant to the NRDA.

The Hudson River and surrounding area support more than 150 species of birds, including waterfowl, wading birds, shorebirds, songbirds, and rare species such as the bald eagle, peregrine falcon, and osprey (Andrle and Carroll, 1988). Birds are an integral part of the ecosystem and provide a number of important ecosystem services such as seed distribution, plant pollination, and insect control. Birds are also an important source of prey to other species. Birds may be exposed to PCBs through direct ingestion of contaminated water, sediment, and soil, and through consumption of food items that contain PCBs derived from the Hudson River and its floodplain.

Peregrine falcons feed primarily on other birds, such as songbirds, shorebirds, and ducks; in urban areas their diet may include starlings and pigeons (USFWS 1999a). PCBs are known to be present in Hudson River birds upon which peregrine falcon may be feeding, including American coot, black duck, blue-winged teal, gadwall, green-winged teal, mallard and wood duck, and tree swallow (Kim et al. 1984, Kim et al. 1985, U.S. Geological Survey 1996, and Secord et al. 1999).

In 1970, the American peregrine falcon subspecies was listed as endangered under the Endangered Species Conservation Act of 1969 (the law preceding the Endangered Species Act of 1973), reflecting their critical biological status. On August 25, 1999, the U.S. Fish and Wildlife Service (USFWS) determined that the American peregrine falcon was no longer an endangered or threatened species pursuant to the Endangered Species Act of 1973, as amended (USFWS 1999b). The American peregrine falcon remains State-listed by New York State as endangered.

This Work Summary and Data Report, focused on peregrine falcon eggs, supplements the avian egg data from the Trustees' Hudson River avian egg exposure preliminary investigation which was conducted from April 2002 through June 2002. The Data Report for that investigation (Hudson River Natural Resource Trustees 2004) provides the results of chemical analysis of 168 egg samples from the following avian species: belted kingfisher (*Ceryle alcyon*), American robin (*Turdus migratorius*), Eastern phoebe (*Sayornis phoebe*), spotted sandpiper (*Actitis macularia*), red-winged blackbird (*Agelaius phoenicius*), American woodcock (*Scolopax minor*), Eastern screech owl (*Otus asio*), common grackle (*Quiscalus quiscula*), northern rough-winged swallow (*Stelgidopteryx serripennis*), barn swallow (*Hirundo rustica*), and Eastern bluebird (*Sialia sialis*).

This preliminary investigation of peregrine falcon eggs was undertaken by the Trustees to assist in determining the extent to which peregrine falcon in the Hudson River are currently contaminated with PCBs, and to determine if additional pathway and injury assessment studies focused on this or other avian species should be conducted as part of the Hudson River NRDA. This work will be used to help determine whether future studies will be performed, and if so, to help in their design.

2. SAMPLING

2.1 Egg Collection

Peregrine falcon eggs were collected by New York State Department of Environmental Conservation (NYSDEC) personnel from two locations on the Hudson River:

- the Dunn Memorial Bridge which spans the Hudson River between the Cities of Albany and Rensselaer, New York; and,
- the Rip Van Winkle Bridge, which spans the Hudson River at Catskill, about 30 miles south of Albany, New York.

Two eggs were collected from the Rip Van Winkle Bridge site on May 30, 2002, and three eggs were collected from the Dunn Memorial Bridge site on June 11, 2002. Each collected egg was assigned a unique identification number and wrapped in bubble wrap. Once collected, the wrapped eggs were frozen, and on June 21, 2002, were delivered to the NYSDEC Hale Creek Field Station for processing.

All peregrine falcon eggs collected were addled (rotten). The eggs were collected only when it became apparent that they were not going to hatch. No viable eggs were collected.

The three eggs collected from the Dunn Memorial Bridge were part of a clutch of four eggs, none of which hatched, which were laid by peregrine falcons between March 26, 2002 and April 3, 2002, based on observations from a NYSDEC camera placed to monitor the nest. The peregrine pair had incubated those eggs from the time the clutch was complete on April 3, 2002 until the eggs were removed by a NYSDEC biologist on June 11, 2002, 69 days after the clutch was complete. The normal incubation period for peregrine falcon eggs is 28-32 days. One of the four eggs from the nest disappeared just prior to collection, thus only three intact eggs were collected from the nest.

The dates of egg laying of the two eggs collected from the Rip Van Winkle Bridge are not known. However it is known that on May 23, 2002, a NYSDEC biologist observed an approximately 10 day old chick, along with two unhatched eggs in the nest box. On May 30, 2002 the one chick, a week older, was again observed, as were the two unhatched eggs. Those two unhatched eggs were collected on that May 30, 2002 visit.

2.2 Egg Processing

In the laboratory the eggs were thawed and the egg contents collected into individual chemically clean jars, by a technician wearing nitrile gloves using chemically clean instruments. Egg contents weights were determined at that time. Each jar was labeled. Egg contents were stored (at a temperature of minus 20 degrees C) at the NYSDEC Hale Creek laboratory until they were shipped to the program analytical laboratory for chemical analysis.

2.3 Egg Analyses

A total of five eggs were submitted to the analytical laboratory for analysis. The egg tissue was prepped, extracted, and analyzed using laboratory analytical methods noted in the Data Validation Report for the Peregrine Falcon Egg Collection (Data Validation Report, see Appendix A). Egg analysis was conducted in November and December 2002.

Four of the five egg samples were analyzed for PCB congeners, PCB homologues, Aroclors, organochlorine pesticides, polybrominated diphenylether (PBDE) compounds, PBDE homologues, dioxin/furan compounds, cadmium, lead, and mercury. Due to limited sample size, one egg (Rip Van Winkle Nest #1 ESU 1219a) was only analyzed for PCBs (congeners, homologues and Aroclors). Percent lipid and percent moisture of each egg were also determined.

2.4 QUALITY ASSURANCE/QUALITY CONTROL

Data validation was conducted by the Trustees and was based on the quality control criteria documented in the analytical methods noted in the Data Validation Report (Appendix A), National Functional Guidelines for Organic Data Review (U.S. Environmental Protection Agency (USEPA 1999), and National Functional Guidelines for Inorganic Data Review (USEPA 1994).

The data packages submitted by the laboratory were reviewed for completeness.

For the organic analyses, the laboratory narrative indicated no problems with sample receipt. The laboratory submitted all of the necessary deliverables. Adequate corrective action processes were followed and anomalies were described in the case narrative.

For the inorganic analyses, the laboratory narrative indicated no problems with sample receipt. The laboratory submitted all of the necessary deliverables, with the exception of the raw data printout for the Inductively Coupled Plasma-Mass Spectrometry analysis. Adequate corrective action processes were followed and anomalies were described in the case narrative.

For the dioxin/furan compounds, some data were qualified as "do-not-report" (DNR) to indicate which result (of duplicate results) should be used. Data qualified as DNR should not be used for any purpose, and are not included in the data tables reported in Appendix B. All other data, as qualified, are acceptable for use.

3. RESULTS

Appendix B contains the peregrine falcon egg analytical chemistry data. A brief description of some of the features of the PCB data follows. Please note that the unit pg/g used in Appendix B is equivalent to parts per trillion (pptr). However, the unit used in the discussion of these data in this Data Report is parts per million (ppm).

Total PCB concentrations (as sum of PCB homologues, wet weight basis) of the peregrine egg samples are detailed in Table 1. PCB values in Table 1 are reported to three significant figures.

Table 1. Hudson River Peregrine Falcon Eggs Summary: Egg Weights, Total PCBs (as sum of homologues) and Notes on Egg Condition

Peregrine Falcon Egg Location and Identifier	Egg Contents Weight (grams)	Total PCBs as sum of homologues (ppm, wet weight)	Notes
Dunn Memorial Bridge #1 ESU 1203a	32.55	5.29	Egg contained nearly fully developed embryo.
Dunn Memorial Bridge #2 ESU 1203b	30.24	6.31	Egg contained nearly fully developed embryo.
Dunn Memorial Bridge #3 ESU 1203c	31.98	6.37	Egg contained nearly fully developed embryo.
Rip Van Winkle Nest #1 ESU 1219a	3.1	34.2	Egg cracked and severely dessicated; no embryo observed.
Rip Van Winkle Nest #2 ESU 1219b	34.9	6.69	Small crack in egg; visible embryo 6-7 mm long

It is important to note that the values reported in Appendix B and Table 1 are on a wet weight basis, and have not been corrected for moisture loss. Correction for moisture loss is an adjustment to compensate for the loss of moisture in avian eggs (Stickel et al. 1973).

To correct for moisture loss, per the method of Stickel et al. (1973), a correction factor is determined as follows:

$$\text{Correction factor (CF)} = \frac{\text{Egg contents weight (g)}}{\text{Egg volume (cm}^3\text{)}}$$

The contaminant value adjusted for moisture loss is then derived by multiplying the laboratory determined contaminant concentration by the correction factor.

For example:

$$\text{CF} = \frac{\text{Egg contents weight}}{\text{Egg volume}} = \frac{6.32 \text{ grams}}{6.67 \text{ cm}^3} = 0.9475$$

CF x PCB concentration = corrected PCB concentration

0.9475 x 1,820 ppb PCBs = 1,724 ppb PCBs

In this example, the PCB value corrected for moisture loss is 1,724 ppb.

However, for the peregrine falcon eggs that are the subject of this Data Report, individual egg volumes were not determined prior to egg contents collection, thus contaminant values cannot be corrected for moisture loss using the formula noted above. An alternative approach to estimate volume based on egg dimensions (Hoyt 1979), which uses typical lengths and breadths for eggs, is not feasible due to the variability in peregrine falcon egg length and breadth (Burnham et al. 2003, 1984), and the further lack of such data in this instance.

For this reason, the values reported in Appendix B and Table 1 are on a wet weight basis, uncorrected for moisture loss. As a result of not correcting for moisture loss, these values likely overstate the contaminant concentrations that would have been present in these eggs when they were freshly laid, prior to moisture loss during incubation and prior to collection.

Further, for peregrine falcon egg ESU 1219a from Rip Van Winkle Nest #1 the low percent moisture value indicates that the egg was severely dessicated. The egg was also cracked, had a low contents weight and no embryo was observed in the egg, suggesting that there may have been a loss of egg contents prior to collection. For that reason, although the contents of this egg were analyzed and the data are contained in Appendix B and Table 1, this egg is not considered further in this Data Report in reporting concentration ranges.

As noted in Table 1, total PCB concentrations (as sum of homologues), in four of the five peregrine falcon eggs collected and analyzed in this preliminary investigation, range from 5.29 ppm to 6.69 ppm on a wet weight basis (that is, not adjusted for moisture loss).

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Appendix A

Data Validation Report
Peregrine Falcon Egg Collection

DATA VALIDATION REPORT
PEREGRINE FALCON
EGG COLLECTION

HUDSON RIVER NATURAL RESOURCE DAMAGE ASSESSMENT

HUDSON RIVER NATURAL RESOURCE TRUSTEES

STATE OF NEW YORK

U.S. DEPARTMENT OF COMMERCE

U.S. DEPARTMENT OF THE INTERIOR

PUBLIC RELEASE VERSION*

VERSION 1.2

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Damage Assessment Center, N/ORR31
1305 East-West Highway, Rm 10219
Silver Spring, MD 20910-3281

** Names of certain individuals and affiliations have been removed to maintain confidentiality.*

DATA VALIDATION REPORT

HUDSON RIVER NATURAL RESOURCE DAMAGE ASSESSMENT

Peregrine Falcon Egg Collection

VERSION 1.2

Prepared for:

State of New York
Department of Environmental Conservation

U.S. Department of Commerce
National Oceanic and Atmospheric Administration

U.S. Department of the Interior
Fish and Wildlife Service

December 31, 2003

Project Narrative

This report summarizes the results of data validation performed on peregrine falcon egg samples collected May 30 and June 11, 2002 in New York State and submitted for analysis by the New York State Department of Environmental Conservation (NYSDEC). A report of the data review organized by analytical fraction follows.

Analytical methods are listed below. The egg from Rip Van Winkle Bridge Nest #1 was analyzed only for PCBs due to limited sample size.

Analysis	Method
Organochlorine Pesticides	High Resolution Gas Chromatography/Mass Spectroscopy
Polychlorinated Biphenyl (PCB) Congeners	High Resolution Gas Chromatography/Mass Spectroscopy (EPA 1668a)
Polychlorinated Biphenyl (PCB) Aroclor	Calculated[1]
Percent Lipids and Percent Moisture	Gravimetric
Polybrominated Diphenylether Compounds	High Resolution Gas Chromatography/Mass Spectroscopy
Dioxin/Furan Compounds	High Resolution Gas Chromatography/Mass Spectroscopy (EPA 1613 Ver. B)
Total Cadmium and Lead	Inductively Coupled Plasma (ICP) Mass Spectroscopy
Total Mercury	Cold Vapor Atomic Absorption (CVAA)

[1] Total Aroclor results were calculated by using the PCB congener results and a laboratory-developed algorithm. Appendix C is a Technical Memorandum summarizing the information provided regarding the Aroclor results and recommendation to estimate all Aroclor results.

Data validation was based on the quality control (QC) criteria documented in the methods listed above, *National Functional Guidelines for Organic Data Review,* USEPA, 1999; and *National Functional Guidelines for Inorganic Data Review,* USEPA, 1994.

Data qualifier definitions and reason codes are listed in **APPENDIX A**. **APPENDIX B** contains a Technical Memorandum regarding qualification of all Aroclor results. Data validation worksheets, which document the technical review, are on file.

FULL DATA REVIEW

Polychlorinated Biphenyl (PCB) Congeners
Method: High Resolution Gas Chromatography/Mass Spectroscopy (EPA 1668a)
SDG: FWH02-1015

Analytical data for five peregrine falcon egg samples were reviewed. The samples were collected May 30 and June 11, 2002. The samples were analyzed for all 209 PCB congeners by high resolution mass spectroscopy. Percent moisture and percent lipids results were reported with these analyses. Refer to the table below for a complete listing of samples.

Sample ID	Matrix	Sample ID	Matrix
Dunn Memorial Bridge #1 ESU 1230a	Egg	Rip Van Winkle Nest #1 ESU 1219a	Egg
Dunn Memorial Bridge #2 ESU 1230b	Egg	Rip Van Winkle Nest #2 ESU 1219b	Egg
Dunn Memorial Bridge #3 ESU 1230c	Egg		

I. Data Package Completeness

The laboratory narrative indicated no problems with sample receipt. The laboratory submitted all of the necessary deliverables. Adequate corrective action processes were followed and anomalies were discussed in the case narrative. The laboratory was not initially provided with a field chain of custody (COC) form by the samplers, the form was subsequently provided by NYSDEC staff.

II. Technical Data Validation

The QC requirements that were reviewed are listed below.

Technical Holding Times and Sample Receipt	1	Blanks
GC/MS Instrument Performance Check		Labeled Compound Recovery
Initial Calibration (ICAL)		Ongoing Precision Recovery (OPR)
Continuing Verification (CVER)		Compound Identification
Isomer Specificity	2	Compound Quantitation and Reporting Limits

[1] ***Quality control results are discussed below, but no data were qualified.***
[2] ***Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.***

Blanks

Several compounds were detected in the method blank. As these compounds were either not detected in the samples or were at concentrations greater than five times the amount found in the blank, no action was taken.

Compound Quantitation and Reporting Limits

Several compound results were flagged 'R' by the laboratory to indicate the ion abundance ratio criteria were not met. Since the ion abundance ratio is the primary identification criterion for high resolution mass spectroscopy, an outlier indicates that the reported result may be a false positive. Due to this, all 'R'-flagged results were qualified as not detected (U-14).

Several compounds were detected at concentrations greater than the upper calibration range of the instrument. In each case, the sample was reanalyzed at a dilution and the compound concentration was within the linear range. The laboratory only reported one result for each compound. No action was necessary.

Overall Assessment

Laboratory accuracy was acceptable as demonstrated by the recovery values for the OPR.

Laboratory precision was not evaluated, as replicate analyses were not performed.

Data were qualified as not detected due to ion ratio criteria outliers.

All data, as qualified, are acceptable for use.

FULL DATA REVIEW

Organochlorine Pesticides
Method: High Resolution Gas Chromatography/Mass Spectroscopy
SDG: FWH02-1015

Analytical data for four peregrine falcon egg samples were reviewed. The samples were collected May 30 and June 11, 2002. The samples were analyzed for organochlorine pesticide compounds using high resolution mass spectroscopy analysis. Refer to the table below for a complete listing of samples.

Sample ID	Matrix
Dunn Memorial Bridge #1 ESU 1230a	Egg
Dunn Memorial Bridge #2 ESU 1230b	Egg
Dunn Memorial Bridge #3 ESU 1230c	Egg
Rip Van Winkle Nest #2 ESU 1219b	Egg

I. Data Package Completeness

The laboratory narrative indicated no problems with sample receipt. The laboratory submitted all of the necessary deliverables. Adequate corrective action processes were followed and anomalies were discussed in the case narrative. The laboratory was not initially provided with a field chain of custody (COC) form by the samplers, the form was subsequently provided by NYSDEC staff.

II. Technical Data Validation

The QC requirements that were reviewed are listed below.

Technical Holding Times and Sample Receipt	1	Blanks
GC/MS Instrument Performance Check	2	Labeled Compound Recovery
Initial Calibration (ICAL)		Ongoing Precision Recovery (OPR)
Continuing Verification (CVER)		Compound Identification
Isomer Specificity	2	Compound Quantitation and Reporting Limits

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[1] ***Quality control results are discussed below, but no data were qualified.***
[2] ***Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.***

Blanks

Several compounds were detected in the method blank. As these compounds were either not detected in the samples or were at concentrations greater than five times the amount found in the blank, no action was taken.

Labeled Compound Recovery

The percent recovery (%R) values for the labeled endrin standard were greater than the laboratory control limit of 150% in Samples Dunn Memorial Bridge #3 ESU 1230c and Rip Van Winkle Nest #2 ESU 1219b. Endrin was detected in both samples, the results were estimated (J-19) with a possible high bias. Endrin aldehyde and endrin ketone were not detected in either sample. As the %R outlier indicates a possible high bias, the detection limits were not qualified.

Compound Quantitation and Reporting Limits

Several compound results were flagged 'R' by the laboratory to indicate the ion abundance ratio criteria were not met. Since the ion abundance ratio is the primary identification criterion for high resolution mass spectroscopy, an outlier indicates that the reported result may be a false positive. Due to this, all 'R'-flagged results were qualified as not detected (U-14).

Several compounds were detected at concentrations greater than the upper calibration range of the instrument. In each case, the sample was reanalyzed at a dilution and the compound concentration was within the linear range. The laboratory only reported one result for each compound. No action was necessary.

Overall Assessment

Laboratory accuracy was acceptable as demonstrated by the recovery values for the OPR.

Laboratory precision was not evaluated, as replicate analyses were not performed.

Data were qualified as not detected due to ion ratio criteria outliers. Data were estimated due to the labeled compound percent recovery outliers.

All data, as qualified, are acceptable for use.

FULL DATA REVIEW

Dioxin/Furan Compounds
Method: High Resolution Gas Chromatography/Mass Spectroscopy (EPA 1613 Ver. B)
SDG: FWH02-1015

Analytical data for four peregrine falcon egg samples were reviewed. The samples were collected May 30 and June 11, 2002. The samples were analyzed using high resolution mass spectroscopy analysis. Refer to the table below for a complete listing of samples.

Sample ID	Matrix
Dunn Memorial Bridge #1 ESU 1230a	Egg
Dunn Memorial Bridge #2 ESU 1230b	Egg
Dunn Memorial Bridge #3 ESU 1230c	Egg
Rip Van Winkle Nest #2 ESU 1219b	Egg

I. Data Package Completeness

The laboratory narrative indicated no problems with sample receipt. The laboratory submitted all of the necessary deliverables. Adequate corrective action processes were followed and anomalies were discussed in the case narrative. The laboratory was not initially provided with a field chain of custody (COC) form by the samplers, the form was subsequently provided by NYSDEC staff.

II. Technical Data Validation

The QC requirements that were reviewed are listed below.

Technical Holding Times and Sample Receipt	1	Blanks
GC/MS Instrument Performance Check		Labeled Compound Recovery
Initial Calibration (ICAL)		Ongoing Precision Recovery (OPR)
Continuing Verification (CVER)		Compound Identification
Isomer Specificity	2	Compound Quantitation and Reporting Limits

[1] ***Quality control results are discussed below, but no data were qualified.***
[2] ***Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.***

Blanks

Several compounds were detected in the method blank. As these compounds were either not detected in the samples or were at concentrations greater than five times the amount found in the blank, no action was taken.

Compound Quantitation and Reporting Limits

All positive results for 2378-TCDF were confirmed on a DB-225 column as required by the method. The 2378-TCDF results on the DB-5 column were qualified as do-not-report (DNR-14), and the results from the DB-225 column should be used instead.

The laboratory assigned an R-flag to the 123789-HxCDF value in Sample Rip Van Winkle Nest #2 ESU 1219b to indicate the ion ratio criterion was not met. Since the ion abundance ratio is the primary identification criterion for high resolution mass spectroscopy, an outlier indicates that the reported result may be a false positive. Due to this, the result was qualified as not detected (U-14).

Overall Assessment

As determined by this evaluation, the laboratory followed the specified method. Laboratory accuracy was acceptable as demonstrated by the recovery values for the OPR and labeled compounds. Laboratory precision was not evaluated, as replicate analyses were not performed.

Data were qualified as do-not-report due to indicate which result (of duplicate results) should be used. Data were qualified as not detected due to ion ratio criteria outliers.

Data qualified as do-not-report should not be used for any purpose. All other data, as qualified, are acceptable for use.

FULL DATA REVIEW

Polybrominated Diphenylether (PBDE) Compounds
Method: High Resolution Gas Chromatography/Mass Spectroscopy
SDG: FWH02-1015

Analytical data for four peregrine falcon egg samples were reviewed. The samples were collected May 30 and June 11, 2002. The samples were analyzed for PBDE compounds using high resolution mass spectroscopy analysis. Refer to the table below for a complete listing of samples.

Sample ID	Matrix
Dunn Memorial Bridge #1 ESU 1230a	Egg
Dunn Memorial Bridge #2 ESU 1230b	Egg
Dunn Memorial Bridge #3 ESU 1230c	Egg
Rip Van Winkle Nest #2 ESU 1219b	Egg

I. Data Package Completeness

The laboratory narrative indicated no problems with sample receipt. The laboratory submitted all of the necessary deliverables. Adequate corrective action processes were followed and anomalies were discussed in the case narrative. The laboratory was not initially provided with a field chain of custody (COC) form by the samplers, the form was subsequently provided by NYSDEC staff

.

II. Technical Data Validation

The QC requirements that were reviewed are listed below.

Technical Holding Times and Sample Receipt	1	Blanks
GC/MS Instrument Performance Check	2	Labeled Compound Recovery
Initial Calibration (ICAL)		Ongoing Precision Recovery (OPR)
Continuing Verification (CVER)		Compound Identification
Isomer Specificity	2	Compound Quantitation and Reporting Limits

[1] ***Quality control results are discussed below, but no data were qualified.***
[2] ***Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.***

Blanks

Several compounds were detected in the method blank. As these compounds were either not detected in the samples or were at concentrations greater than five times the amount found in the blank, no action was taken.

Labeled Compound Recovery

All samples were analyzed at a 50x or higher dilution factor. Due to this, the labeled compounds added to the sample prior to extraction were diluted out, and no recoveries could be calculated. To be able to calculate the concentration of the target analytes, the laboratory added an additional aliquot of the labeled compounds to the sample extracts. However, as these labeled compounds were not taken through the extraction/clean-up process, the additional labeled compounds provide no information regarding the extraction efficiency or analytical accuracy.

Due to this, all target compound results were estimated (J/UJ). The direction of bias, if any, could not be determined.

Compound Quantitation and Reporting Limits

Several compound results were flagged 'R' by the laboratory to indicate the ion abundance ratio criteria were not met. Since the ion abundance ratio is the primary identification criterion for high resolution mass spectroscopy, an outlier indicates that the reported result may be a false positive. Due to this, all 'R'-flagged results were qualified as not detected (U-14).

As noted in the **Labeled Compound Recovery** section above, all samples were analyzed at elevated dilution factors. Only the results from the dilutions were reported. Due to this, all reported limits are elevated. As no target reporting limits were specified, no action was taken.

Overall Assessment

Laboratory accuracy was acceptable as demonstrated by the recovery values for the OPR.

Laboratory precision was not evaluated, as replicate analyses were not performed.

Data were qualified as not-detected due to ion ratio criteria outliers. Also, data were estimated due to the lack of usable labeled compound recovery results.

All data, as qualified, are acceptable for use.

FULL DATA REVIEW

Total Cadmium, Lead, and Mercury
Method: ICP-MS and CVAA
SDG: FWH02-1015

Analytical data for four peregrine falcon egg samples were reviewed. The samples were collected May 30 and June 11, 2002. Refer to the table below for a complete listing of samples.

Sample ID	Matrix
Dunn Mem Bridge #1	Egg
Dunn Mem Bridge #2	Egg
Dunn Mem Bridge #3	Egg
Rip Van Winkle #2	Egg

I. Data Package Completeness

The laboratory narrative indicated no problems with sample receipt. The laboratory submitted all of the necessary deliverables, with the exception of the raw data printout for the ICP-MS analysis. Adequate corrective action processes were followed and anomalies were discussed in the case narrative.

II. Technical Data Validation

The QC requirements that were reviewed are listed below.

	Technical Holding Times and Sample Receipt		Blank Spikes
	Initial Calibration (ICAL)		Matrix Spikes/Matrix Spike Duplicates (MS/MSD)
	Continuing Calibration Verification (CCV)		Laboratory Duplicates
1	Blanks (Instrument and Method)		Internal Standards
2	Certified Reference Materials (CRM)	1	Compound Quantitation and Reporting Limits

[1] ***Quality control results are discussed below, but no data were qualified.***
[2] ***Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.***

Blanks

Mercury and cadmium were detected at levels greater than the estimated method detection limit (EMDL) in some instrument blanks. To evaluate the effect on the sample data, action levels of 5x the blank concentrations were established. For mercury, all sample results were greater than the action level. There were no positive results for cadmium in the field samples. No qualification of sample results based on blank contamination was necessary.

Four preparation blanks were analyzed. The average concentrations were all less than the EMDL.

Certified Reference Materials

The laboratory analyzed three different CRMs. NIST 2976 (mussel tissue) was analyzed for cadmium and lead, NRC DORM-2 (dogfish muscle) was analyzed for mercury, and NIST 8415 (powdered egg) was analyzed for all three elements.

The recoveries for NIST 2976 and NRC DORM-2 were within the certified acceptance limits. For NIST 8415, the mercury recovery (84.3%) was acceptable. The cadmium value reported for this CRM is not certified and is for informational purposes only. The value is also less than the laboratory reporting limit and so the laboratory result was not evaluated for this analyte. The recovery for lead (33.6%) was significantly less than the lower control limit of 80.3%. Because this CRM most closely approximates the matrix of the falcon eggs, the field samples were qualified based on the lead recovery. All lead results were estimated (J-10/UJ-10) to indicate a potential low bias.

Compound Quantitation and Reporting Limits

Sample results were reported on an 'as received basis'. Percent solid and percent lipid information was submitted with the data.

The laboratory blank-corrected all analytical results. The instrument concentration was corrected for the average of four instrument blanks analyzed prior to the samples. The final sample concentration was then corrected for the average of four preparation blanks.

Overall Assessment

As determined by this evaluation, the laboratory followed the specified methods. Laboratory accuracy was acceptable as demonstrated by the matrix spike/matrix spike duplicate (MS/MSD) and CRM recovery results, with the exception of low recovery indicated for lead. Laboratory precision was also acceptable as demonstrated by the laboratory duplicate and MS/MSD relative percent difference values.

Results for lead were estimated because of a low CRM recovery.

All data, as qualified, are acceptable for use.

APPENDIX A
DATA QUALIFIER DEFINITIONS
REASON CODES

DATA VALIDATION QUALIFIER CODES

NATIONAL FUNCTIONAL GUIDELINES

The following definitions provide brief explanations of the qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

The following qualifier that may also be assigned in the data review process:

DNR	Do-not-report. Duplicate results exist due to reanalyses. This result should not be reported.

DATA QUALIFIER REASON CODES

1	Holding Times
2	Sample Preservation
3	Sample Custody
4	Missing Deliverables
5A	Calibration (initial)
5B	Calibration (continuing)
6	Field Blanks
7	Laboratory Blanks
8	Matrix Spike
9	Precision (Duplicate, or Matrix Spike Duplicate)
10	Laboratory Control Sample
11	Detection Limit
12	Standards
13	Surrogates
14	Other
15	Furnace QC
16	ICP Serial Dilution
17	Chemical Recoveries
18	Trip Blanks
19	Internal Standards
20	Linear Range Exceeded
21	Potential False Positives

APPENDIX B
TECHNICAL MEMORANDUM

M E M O R A N D U M

DATE: 11/24/03

SUBJECT: **Peregrine Falcon Egg**
Total Aroclor Values

The laboratory reported both total homologue results and total Aroclor results for the PCB analysis of the peregrine falcon eggs. **Table 1** is a comparison of these results.

The total homologue results are based on a summation of analytical results of all 209 PCB congeners as determined by USEPA method 1668, revision A. The total Aroclor result would usually be based on the recognition of the pattern of congeners unique to each Aroclor. However, no recognizable pattern is present in the falcon eggs, thus the laboratory reported the samples as a mixture of Aroclors 1242, 1254, and 1260. The laboratory calculated these Aroclor values by summing the concentrations of congeners characteristic of the specific Aroclor and multiplying that sum by a "quantification factor". The following are the congeners and quantification factors used:

Aroclor	Congeners	Quantification Factor
1242	8, 30/18, 31, 28/20	3.0
1254	83/99, 108/119/86/97/128/87	8.0
1260	183/185, 180/193, 170	5.0

Note: Congener numbers separated by a slash denote co-elutions.

A total Aroclor value is then determined by summing the calculated concentrations of the three Aroclors.

The selection of the characteristic congeners and the determination of the quantification factors are based on published data in the following references: *Complete Characterization of Polychlorinated Biphenyl Congeners in Commercial Aroclor and Clophen Mixtures by Multidimensional Gas Chromatography-Electron Capture Detection,* (Schulz, Petrick and Duinker, 1989. Environ. Sci. & Tech., Vol 23, No. 7, pp852-859), and *Complete PCB Congener Distributions for 17 Aroclor Mixtures Determined by Three HRGC Systems Optimized for Comprehensive, Qualitative, Congener Specific Analysis,* (Frame, Cochran, Bowadt, 1996. J Chrom Resol Chromatogr Vol 19.), plus analyses performed using the laboratory specific analytical column and methods. The laboratory's data set supporting the development of these factors was not provided. Because the underlying data for the Aroclors is not available for review, all Aroclor results should be considered estimates.

TABLE 1

Sample	Total Homologues μg/kg wet weight	Total Aroclors μg/kg wet weight	Percent Difference
Dunn Memorial Bridge #1 ESU 1230a	5,290	9,090	71.8 %
Dunn Memorial Bridge #2 ESU 1230b	6,310	11,295	79.0 %
Dunn Memorial Bridge #3 ESU 1230c	6,370	10,572	66.0 %
Rip Van Winkle Nest#1 ESU1291a	34,200	46,350	35.5 %
Rip Van Winkle Nest#2 ESU1291b	6,690	8,057	20.4 %

Percent difference = | (Total Homologue – Total Aroclor) / (Total Homologue) |

Appendix B

Peregrine Falcon Egg Analytical Chemistry Data

Falcon Egg
PCB Congener

CLIENT ID	Dunn Memorial Bridge #1 ESU 1203a		Dunn Memorial Bridge #2 ESU 1203b		Dunn Memorial Bridge #3 ESU 1203c		Rip Van Winkle Nest #1 ESU 1219a[1]		Rip Van Winkle Nest #2 ESU 1219b		SPIKED MATRIX
LAB ID	L5214-1		L5214-2		L5214-3		L5214-4		L5214-5		WG7272-103
UNITS	pg/g (wet)		pg/g (wet)		pg/g (wet)		pg/g (wet)		pg/g (wet)		% REC
Percent Moisture	85		84		85		30		82		
Percent Lipids	3.2		2.8		3.2		25		5.5		
		IQ		IQ		IQ		IQ		IQ	
PCB-1	1.21	U	1.03		0.629	U	3.74		2.03		87.6
PCB-2	0.846	U	0.535	U	0.498	U	1.19	U	0.901	U	
PCB-3	0.708	U	0.478	U	0.408	U	2.34	U	1.39	U	84.2
PCB-4	1.55	U	1.48	U	2.59	U	6.65	U	3.87	U	97
PCB-5	0.960	U	1.02	U	1.86	U	5.04	U	2.83	U	
PCB-6	0.917	U	0.973	U	1.74	U	4.73	U	2.65	U	
PCB-7	0.916	U	0.972	U	1.72	U	4.66	U	2.61	U	
PCB-8	0.98		1.21	U	1.63	U	7.31		2.89	U	
PCB-9	0.898	U	0.953	U	1.69	U	4.58	U	2.57	U	
PCB-10	0.978	U	1.04	U	1.74	U	4.73	U	2.65	U	
PCB-11	1.01	U	1.07	U	1.86	U	5.05	U	2.83	U	
PCB-12/13	1.75	U	1.05	U	1.83	U	4.97	U	2.79	U	
PCB-14	0.947	U	1.00	U	1.78	U	4.82	U	2.71	U	
PCB-15	15.9		15.7		18.5		2530		493		93.8
PCB-16	1.66	U	1.10	U	1.08	U	3.00	U	1.58	U	
PCB-17	1.46	U	1.14		0.973		7.19		3.29		
PCB-18/30	1.43		1.26		1.37		5.38		2.61		
PCB-19	1.66	U	1.03	U	0.998	U	2.52	U	1.37	U	100
PCB-20/28	2490		2440		2960		471000		86900		
PCB-21/33	1.31	U	0.878	U	0.920	U	2.27	U	0.983	U	
PCB-22	1.40	U	0.937	U	0.979	U	2.42	U	1.05	U	
PCB-23	1.39	U	0.931	U	0.929	U	2.29	U	0.992	U	
PCB-24	1.07	U	0.708	U	0.691	U	1.91	U	1.01	U	
PCB-25	1.23	U	0.828	U	0.847	U	2.09	U	0.905	U	
PCB-26/29	2.79		2.87		2.09		2.23	U	0.965	U	
PCB-27	1.03	U	0.677	U	0.652	U	1.80	U	0.949	U	
PCB-31	14.9		15.1		25.3		11400		2080		
PCB-32	1.30	U	0.870	U	0.867	U	2.14	U	0.927	U	
PCB-34	1.35	U	0.903	U	0.928	U	2.29	U	0.992	U	

IQ = Interpretive Qualifier

[1] Analyzed for PCBs only due to limited sample size.

Falcon Egg
PCB Congener

CLIENT ID	Dunn Memorial Bridge #1 ESU 1203a	Dunn Memorial Bridge #2 ESU 1203b	Dunn Memorial Bridge #3 ESU 1203c	Rip Van Winkle Nest #1 ESU 1219a[1]	Rip Van Winkle Nest #2 ESU 1219b	SPIKED MATRIX
LAB ID	L5214-1	L5214-2	L5214-3	L5214-4	L5214-5	WG7272-103
UNITS	pg/g (wet)	pg/g (wet)	pg/g (wet)	pg/g (wet)	pg/g (wet)	% REC
Percent Moisture	85	84	85	30	82	
Percent Lipids	3.2	2.8	3.2	25	5.5	
	IQ	IQ	IQ	IQ	IQ	
PCB-35	1.44 U	0.963 U	0.966 U	2.38 U	1.03 U	
PCB-36	1.28 U	0.855 U	0.865 U	2.13 U	0.924 U	
PCB-37	50.2	47.8	57.2	2960	592	109
PCB-38	1.36 U	0.911 U	0.925 U	255	59.3	
PCB-39	1.3 U	0.870 U	0.880 U	98.2	19.4	
PCB-40/41/71	1.69 U	1.14 U	0.863 U	2.53 U	1.58 U	
PCB-42	1.84 U	1.24 U	0.932 U	2.74 U	1.71 U	
PCB-43	1.97 U	1.33 U	0.966 U	2.84 U	1.77 U	
PCB-44/47/65	1620	1730	1960	664000	126000	
PCB-45/51	1.57 U	1.06 U	0.820 U	2.41 U	1.51 U	
PCB-46	1.87 U	1.26 U	0.985 U	2.90 U	1.81 U	
PCB-48	4.86	4.53	3.5	2.46 U	1.54 U	
PCB-49/69	10.4	9.6	14.4	3460	581	
PCB-50/53	1.53 U	1.03 U	0.797 U	2.34 U	1.46 U	
PCB-52	5.6	5.09	7.47	1300	213	
PCB-54	1.29 U	0.844 U	0.617 U	1.76 U	1.15 U	98.5
PCB-55	1.01 U	0.921 U	1.16 U	4.44 U	0.855 U	
PCB-56	1.01 U	0.918 U	1.17 U	4.46 U	0.860 U	
PCB-57	0.957 U	0.873 U	1.10 U	71.9	0.812 U	
PCB-58	0.926 U	0.845 U	1.06 U	234	53.7	
PCB-59/62/75	46.6	47.4	57	27600	5420	
PCB-60	1390	1360	1710	4.53 U	24800	
PCB-61/70/74/76	24700	24900	30500	544000	102000	
PCB-63	682	717	848	3.96 U	0.763 U	
PCB-64	1.31 U	0.927	2.24	671	97.1	
PCB-66	3340	3350	4250	481000	91100	
PCB-67	0.871 U	0.795 U	0.969 U	3.70 U	0.713 U	
PCB-68	133	135	159	3.83 U	0.737 U	
PCB-72	0.897 U	0.818 U	1.02 U	3.89 U	0.750 U	

IQ = Interpretive Qualifier

[1] Analyzed for PCBs only due to limited sample size.

Falcon Egg
PCB Congener

CLIENT ID	Dunn Memorial Bridge #1 ESU 1203a	Dunn Memorial Bridge #2 ESU 1203b	Dunn Memorial Bridge #3 ESU 1203c	Rip Van Winkle Nest #1 ESU 1219a[1]	Rip Van Winkle Nest #2 ESU 1219b	SPIKED MATRIX
LAB ID	L5214-1	L5214-2	L5214-3	L5214-4	L5214-5	WG7272-103
UNITS	pg/g (wet)	pg/g (wet)	pg/g (wet)	pg/g (wet)	pg/g (wet)	% REC
Percent Moisture	85	84	85	30	82	
Percent Lipids	3.2	2.8	3.2	25	5.5	
	IQ	IQ	IQ	IQ	IQ	
PCB-73	1.20 U	0.808 U	0.639 U	1.88 U	1.17 U	
PCB-77	171	166	188	4210	850	93.5
PCB-78	1.10 U	1.00 U	1.19 U	4.55 U	0.877 U	
PCB-79	0.889 U	0.811 U	0.983 U	3.75 U	72.3	
PCB-80	0.914 U	0.834 U	1.07 U	4.08 U	0.786 U	
PCB-81	67	69.3	80.3	1230	271	92.9
PCB-82	4.61 U	3.44 U	1.74 U	20.3 U	74.9	
PCB-83/99	51600	60800	57900	1250000	228000	
PCB-84	4.27 U	3.18 U	1.67 U	19.4 U	7.85 U	
PCB-85/116/117	3910	3930	4730	15.1 U	35500	
PCB-86/87/97/108/119/125	163	184	218	81300	15600	
PCB-88/91	3.67 U	2.74 U	1.44 U	745	118	
PCB-89	3.99 U	2.97 U	1.57 U	18.3 U	7.38 U	
PCB-90/101/113	294	302	354	78500	37900	
PCB-92	26.4	31.3	34.7	22600	4190	
PCB-93/95/98/100	28.6	27.4	38.4 U	18400	3770	
PCB-94	3.82 U	2.84 U	1.55 U	18.0 U	7.27 U	
PCB-96	8.66 U	4.13 U	1.16 U	13.1 U	31.1 U	
PCB-103	3.23 U	2.41 U	1.29 U	15.0 U	6.08 U	
PCB-104	8.87 U	3.99 U	1.11 U	6.87 U	17.0 U	95.3
PCB-105	21300	20800	25400	393000	72600	102
PCB-106	0.762 U	0.745 U	0.766 U	7.91 U	1.98 U	
PCB-107/124	0.747 U	0.730 U	0.796 U	1490	244 U	
PCB-109	2250	2110	2320	87100	17800	
PCB-110/115	2040	2050	2460	13.4 U	12500	
PCB-111	99.2	102	119	6620	1370	
PCB-112	2.98 U	2.22 U	1.12 U	13.0 U	5.25 U	
PCB-114	4550	4480	5580	51500	10400	104
PCB-118	99700	118000	129000	1770000	325000	105

IQ = Interpretive Qualifier

[1] Analyzed for PCBs only due to limited sample size.

Falcon Egg
PCB Congener

CLIENT ID	Dunn Memorial Bridge #1 ESU 1203a		Dunn Memorial Bridge #2 ESU 1203b		Dunn Memorial Bridge #3 ESU 1203c		Rip Van Winkle Nest #1 ESU 1219a[1]		Rip Van Winkle Nest #2 ESU 1219b		SPIKED MATRIX
LAB ID	L5214-1		L5214-2		L5214-3		L5214-4		L5214-5		WG7272-103
UNITS	pg/g (wet)		pg/g (wet)		pg/g (wet)		pg/g (wet)		pg/g (wet)		% REC
Percent Moisture	85		84		85		30		82		
Percent Lipids	3.2		2.8		3.2		25		5.5		
		IQ		IQ		IQ		IQ		IQ	
PCB-120	270		268		321		12600		2550		
PCB-121	6.43		5.83		1.10	U	3790		862		
PCB-122	0.832	U	0.813	U	0.857	U	8.84	U	2.21	U	
PCB-123	1490		1520		1930		25500		5310		107
PCB-126	197		195		245		3410		638		103
PCB-127	291		282		372		6640		1460		
PCB-128/166	52400		64100		84800		446000		81900		
PCB-129/138/160/163	534000		643000		655000		4100000		803000		
PCB-130	1520		1610		1810		95000		19800		
PCB-131	1.24	U	0.972	U	1.02	U	3.09	U	1.13	U	
PCB-132	1.27	U	0.994	U	1.04	U	393		1.15	U	
PCB-133	3800		3960		4980		110000		22900		
PCB-134/143	1.25	U	0.977	U	1.03	U	3.11	U	1.14	U	
PCB-135/151/154	469		504		619		60400		12800		
PCB-136	2.99	U	2.28	U	1.45	U	8.08	U	3.01	U	
PCB-137	7870		8210		9910		124000		25300		
PCB-139/140	964		1030		1300		23500		5260		
PCB-141	1.20	U	0.940	U	0.972	U	2.93	U	1320	U	
PCB-142	1.24	U	0.970	U	1.05	U	3.16	U	1.16	U	
PCB-144	4.74		4.22	U	4.81		370	U	116		
PCB-145	3.02	U	2.30	U	1.47	U	8.19	U	3.05	U	
PCB-146	61400		67200		89900		1040000		220000		
PCB-147/149	415		450		523		68800		14500		
PCB-148	6.52		6.02		7.38	U	11.1	U	520		
PCB-150	2.98	U	2.27	U	1.41	U	7.84	U	2.92	U	
PCB-152	2.96	U	2.26	U	1.40	U	7.80	U	2.91	U	
PCB-153/168	1020000		1270000		1410000		6940000		1530000		
PCB-155	8.35		7.01		9.44		3560		714		96.1
PCB-156/157	70100		69000		78100		379000		72400		92.5

IQ = Interpretive Qualifier

[1] Analyzed for PCBs only due to limited sample size.

Falcon Egg
PCB Congener

CLIENT ID	Dunn Memorial Bridge #1 ESU 1203a		Dunn Memorial Bridge #2 ESU 1203b		Dunn Memorial Bridge #3 ESU 1203c		Rip Van Winkle Nest #1 ESU 1219a[1]		Rip Van Winkle Nest #2 ESU 1219b		SPIKED MATRIX
LAB ID	L5214-1		L5214-2		L5214-3		L5214-4		L5214-5		WG7272-103
UNITS	pg/g (wet)		pg/g (wet)		pg/g (wet)		pg/g (wet)		pg/g (wet)		% REC
Percent Moisture	85		84		85		30		82		
Percent Lipids	3.2		2.8		3.2		25		5.5		
		IQ		IQ		IQ		IQ		IQ	
PCB-158	13000		13300		15200		207000		39500		
PCB-159	4.47	U	0.794	U	0.756	U	542		116		
PCB-161	0.912	U	0.713	U	0.745	U	2.25	U	0.824	U	
PCB-162	514		481		542		3580		890		
PCB-164	4.48	U	0.796	U	0.726	U	2.19	U	0.802	U	
PCB-165	91.1		84		105		7950		1750		
PCB-167	19400		19000		21800		156000		30300		95.3
PCB-169	93.6	U	656	U	685	U	1920	U	573	U	92.1
PCB-170	384000		469000		449000		1290000		219000		
PCB-171/173	76700		75800		87400		323000		58500		
PCB-172	49300		48500		57800		271000		74100		
PCB-174	1.44	U	1.79	U	4.44	U	14800		2840		
PCB-175	2300		2440		2680		28500		5550		
PCB-176	0.986	U	1.22	U	3.04	U	257		80.8		
PCB-177	23200		22700		27200		373000		88600		
PCB-178	22900		23700		27900		241000		73400		
PCB-179	0.950	U	1.17	U	2.94	U	2.33	U	11.5	U	
PCB-180/193	1130000		1410000		1320000		4560000		782000		
PCB-181	888		884		1000		15700		2830		
PCB-182	67.5		1.74	U	4.15	U	7600		1390		
PCB-183/185	218000		271000		246000		994000		167000		
PCB-184	21.1	U	1.14	U	2.97	U	4250		761		
PCB-186	1.02	U	1.26	U	3.14	U	2.49	U	1.03	U	
PCB-187	173000		212000		202000		2190000		364000		
PCB-188	12.5		11.8		2.01	U	1110		206		104
PCB-189	14100		13900		15000		47900		9600		98.9
PCB-190	73000		90600		83600		248000		63600		
PCB-191	17200		17100		18600		50400		9640		
PCB-192	1.25	U	1.54	U	3.74	U	2.97	U	1.23	U	

IQ = Interpretive Qualifier

[1] Analyzed for PCBs only due to limited sample size.

Falcon Egg
PCB Congener

CLIENT ID	Dunn Memorial Bridge #1 ESU 1203a		Dunn Memorial Bridge #2 ESU 1203b		Dunn Memorial Bridge #3 ESU 1203c		Rip Van Winkle Nest #1 ESU 1219a[1]		Rip Van Winkle Nest #2 ESU 1219b		SPIKED MATRIX
LAB ID	L5214-1		L5214-2		L5214-3		L5214-4		L5214-5		WG7272-103
UNITS	pg/g (wet)		pg/g (wet)		pg/g (wet)		pg/g (wet)		pg/g (wet)		% REC
Percent Moisture	85		84		85		30		82		
Percent Lipids	3.2		2.8		3.2		25		5.5		
		IQ		IQ		IQ		IQ		IQ	
PCB-194	259000		296000		321000		835000		150000		
PCB-195	62500		75000		84400		193000		41600		
PCB-196	121000		132000		120000		289000		71200		
PCB-197/200	7270		7130		8040		24400		4.97	U	
PCB-198/199	172000		211000		173000		833000		141000		
PCB-201	5380		5390		5960		39700		8030		
PCB-202	12800		12300		13400		94800		19800		90
PCB-203	193000		239000		183000		599000		99700		
PCB-204	6.85		8.12		3.78	U	400		95		
PCB-205	9440		9360		9540		25700		5230		103
PCB-206	184000		194000		206000		476000		84900		93.9
PCB-207	14600		12300		14400		37400		7170		
PCB-208	30700		29000		30700		174000		25400		95.8
PCB-209	17100		16400		16000		91100		18400		89.3

IQ = Interpretive Qualifier

[1] Analyzed for PCBs only due to limited sample size.

Falcon Egg
PCB Homologue

CLIENT ID	Dunn Memorial Bridge #1 ESU 1203a		Dunn Memorial Bridge #2 ESU 1203b		Dunn Memorial Bridge #3 ESU 1203c		Rip Van Winkle Nest #1 ESU 1219a[1]		Rip Van Winkle Nest #2 ESU 1219b	
LAB ID	L5214-1		L5214-2		L5214-3		L5214-4		L5214-5	
UNITS	pg/g (wet)		pg/g (wet)		pg/g (wet)		pg/g (wet)		pg/g (wet)	
Percent Moisture	85		84		85		30		82	
Percent Lipids	3.2		2.8		3.2		25		5.5	
		IQ		IQ		IQ		IQ		IQ
Total Monochloro Biphenyls	0.846	U	1.03		0.498	U	3.74		2.03	
Total Dichloro Biphenyls	16.9		15.7		18.5		2540		493	
Total Trichloro Biphenyls	2560		2510		3050		486000		89600	
Total Tetrachloro Biphenyls	32100		32500		39800		1730000		352000	
Total Pentachloro Biphenyls	188000		215000		231000		3810000		775000	
Total Hexachloro Biphenyls	1790000		2160000		2380000		13800000		2880000	
Total Heptachloro Biphenyls	2190000		2660000		2540000		10700000		1920000	
Total Octachloro Biphenyls	843000		987000		918000		2930000		537000	
Total Nonachloro Biphenyls	229000		236000		251000		686000		117000	
Decachloro Biphenyl	17100		16400		16000		91100		18400	
TOTAL PCBs	5290000		6310000		6370000		34200000		6690000	

IQ = Interpretive Qualifier

[1] Analyzed for PCBs only due to limited sample size.

Falcon Egg
Pesticide

CLIENT ID	Dunn Memorial Bridge #1 ESU 1203a		Dunn Memorial Bridge #2 ESU 1203b		Dunn Memorial Bridge #3 ESU 1203c		Rip Van Winkle Nest #2 ESU 1219b		SPIKED MATRIX
LAB ID	L5214-1		L5214-2		L5214-3		L5214-5		WG7272-103
UNITS	ng/g (wet)		ng/g (wet)		ng/g (wet)		ng/g (wet)		% REC
Percent Moisture	85		84		85		82		
Percent Lipids	3.2		2.8		3.2		5.5		
		IQ		IQ		IQ		IQ	
Hexachlorobenzene	1.54		1.46		1.74		8.86		97.6
HCH, alpha	0.083		0.08		0.043		0.025		86
HCH, beta	0.828		0.809		1.1		1.92		102
HCH, gamma	0.02		0.042		0.135		0.395		95.1
Heptachlor	0.002		0.0035	U	0.004	U	0.0098	U	97.5
Aldrin	0.017		0.018		0.022	U	0.046		96
Chlordane, oxy-	48.4		45.9		19.5		43		96.1
Chlordane, gamma (trans)	0.288		0.28		0.31		0.671		94.5
Chlordane, alpha (cis)	0.459		0.565		1.27		13.2		98.6
Nonachlor, trans-	3.3		3.26		4.2		81		97.7
Nonachlor, cis-	0.922		0.853		0.99		6.06		101
2,4'-DDD	0.0108	U	0.0095	U	0.0061	U	0.197	U	108
4,4'-DDD	8.22		7.37		8.41		9.59		100
2,4'-DDE	0.0058	U	0.0077	U	0.0055	U	0.0190	U	108
4,4'-DDE	1390		1560		1180		10700		119
2,4'-DDT	0.0124	U	0.0110	U	0.0070	U	0.0114	U	93.5
4,4'-DDT	0.018		0.119		0.104		34.9		93.4
Mirex	25.6		24.7		36.7		96.5		98.2
Heptachlor Epoxide	12.4		13.1		17.1		43.5		102
alpha-Endosulphan	0.0112	U	0.0155	U	0.0260	U	0.0392	U	95
Dieldrin	11.6		10.8		14.4		109		99.8
Endrin	0.072		0.071		0.113	J	0.2	J	98.8
beta-Endosulphan	0.0173	U	0.0222	U	0.0377	U	0.0975	U	91.8
Endosulphan Sulphate	0.0163	U	0.0209	U	0.0355	U	0.0918	U	92.1
Endrin Aldehyde	0.0010	U	0.005		0.0007	U	0.0012	U	80.6
Endrin Ketone	0.007		0.0060		0.0062	U	0.0057	U	91.8
Methoxychlor	0.0026	U	0.0034	U	0.0039	U	0.0032	U	103

IQ = Interpretive Qualifier

Falcon Egg
Aroclor

CLIENT ID	Dunn Memorial Bridge #1 ESU 1203a		Dunn Memorial Bridge #2 ESU 1203b		Dunn Memorial Bridge #3 ESU 1203c		Rip Van Winkle Nest #1 ESU 1219a[1]		Rip Van Winkle Nest #2 ESU 1219b	
LAB ID	L5214-1		L5214-2		L5214-3		L5214-4		L5214-5	
UNITS	pg/g (wet)		pg/g (wet)		pg/g (wet)		pg/g (wet)		pg/g (wet)	
Percent Moisture	85		84		85		30		82	
Percent Lipids	3.2		2.8		3.2		25		5.5	
		IQ		IQ		IQ		IQ		IQ
Aroclor 1016	3.43	UJ	2.56	UJ	4.41	UJ	190	UJ	85.1	UJ
Aroclor 1221	1.25	UJ	1.33	UJ	2.29	UJ	6.21	UJ	3.49	UJ
Aroclor 1232	4.04	UJ	2.66	UJ	2.60	UJ	7.19	UJ	3.79	UJ
Aroclor 1242	7510	J	7360	J	8970	J	1450000	J	267000	J
Aroclor 1248	9.48	UJ	6.41	UJ	6.54	UJ	6470	UJ	1540	UJ
Aroclor 1254	413000	J	488000	J	463000	J	10700000	J	1950000	J
Aroclor 1260	8670000	J	10800000	J	10100000	J	34200000	J	5840000	J

IQ = Interpretive Qualifier

[1] Analyzed for PCBs only due to limited sample size.

Falcon Egg
Dioxin

CLIENT ID	Dunn Memorial Bridge #1 ESU 1203a		Dunn Memorial Bridge #2 ESU 1203b		Dunn Memorial Bridge #3 ESU 1203c		Rip Van Winkle Nest #2 ESU 1219b		SPIKED MATRIX
LAB ID	L5214-1		L5214-2		L5214-3		L5214-5		WG7275-102
UNITS	pg/g (wet)		pg/g (wet)		pg/g (wet)		pg/g (wet)		% REC
Percent Moisture	85		84		85		82		
Percent Lipids	3.2		2.8		3.2		5.5		
		IQ		IQ		IQ		IQ	
2,3,7,8-TCDD	1.01		1.05		1.31		3.24		95.1
1,2,3,7,8-PeCDD	4.52		4.34		5.25		7.08		97
1,2,3,4,7,8-HxCDD	4.09		3.88		4.71		5.35		92.2
1,2,3,6,7,8-HxCDD	15.4		15		17.6		13.9		96.1
1,2,3,7,8,9-HxCDD	1.76		1.65		2.06		2.44		94.6
1,2,3,4,6,7,8-HpCDD	19.2		17.4		19.4		29.4		95.1
OCDD	12		8.58		7.42		147		96.8
2,3,7,8-TCDF(C)	1.15		1.07		1.41		3.04		98.5
1,2,3,7,8-PeCDF	0.183		0.166		0.24		0.333		96.7
2,3,4,7,8-PeCDF	4.1		3.95		4.64		4.57		95.1
1,2,3,4,7,8-HxCDF	2.48		2.39		2.7		1.66		93.4
1,2,3,6,7,8-HxCDF	2.12		2.14		2.41		1.74		96.3
1,2,3,7,8,9-HxCDF	0.0400	U	0.0370	U	0.0390	U	0.048	U	95.8
2,3,4,6,7,8-HxCDF	1.13		1.15		1.29		1		96.7
1,2,3,4,6,7,8-HpCDF	2.87		2.42		2.55		0.973		96.9
1,2,3,4,7,8,9-HpCDF	0.323		0.253		0.247		0.121		95.9
OCDF	0.497		0.342		0.281		0.301		91.1
Total Tetra-Dioxins	1.01		1.09		1.31		3.29		
Total Penta-Dioxins	4.54		4.34		5.25		7.18		
Total Hexa-Dioxins	21.7		20.5		24.5		22		
Total Hepta-Dioxins	19.7		17.6		19.6		30.1		
Total Tetra-Furans	1.26		1.15		1.35		4.58		
Total Penta-Furans	4.28		4.4		5.28		5.7		
Total Hexa-Furans	7.39		6.77		7.75		4.61		
Total Hepta-Furans	4.37		3.35		3.39		1.25		

IQ = Interpretive Qualifier

Falcon Egg
Polybrominated Diphenylether (PBDE) Congener

CLIENT ID	Dunn Memorial Bridge #1 ESU 1203a		Dunn Memorial Bridge #2 ESU 1203b		Dunn Memorial Bridge #3 ESU 1203c		Rip Van Winkle Nest #2 ESU 1219b		SPIKED MATRIX
LAB ID	L5214-1		L5214-2		L5214-3		L5214-5		WG7272-103
UNITS	pg/g (wet)		pg/g (wet)		pg/g (wet)		pg/g (wet)		% REC
Percent Moisture	85		84		85		82		
Percent Lipids	3.2		2.8		3.2		5.5		
		IQ		IQ		IQ		IQ	
PBDE-1	105	UJ	119	UJ	104	UJ	785	UJ	
PBDE-2	105	UJ	119	UJ	104	UJ	785	UJ	92.4
PBDE-3	105	UJ	119	UJ	104	UJ	785	UJ	
PBDE-7	8.26	UJ	7.62	UJ	6.81	UJ	74.5	UJ	
PBDE-8 + 11	8.26	UJ	7.62	UJ	6.81	UJ	74.5	UJ	98.8
PBDE-10	8.26	UJ	7.62	UJ	6.81	UJ	74.5	UJ	
PBDE-12	8.26	UJ	7.62	UJ	6.81	UJ	74.5	UJ	
PBDE-13	8.26	UJ	8.75	UJ	6.81	UJ	74.5	UJ	
PBDE-15	8.26	UJ	7.62	UJ	6.81	UJ	74.5	UJ	
PBDE-17	13.9	UJ	20.6	UJ	14.2	UJ	181	UJ	95.7
PBDE-25	13.4	UJ	19.8	UJ	13.7	UJ	174	UJ	
PBDE-28 + 33	12.9	UJ	19.1	UJ	13.2	UJ	168	UJ	96.3
PBDE-30	13.4	UJ	19.8	UJ	13.7	UJ	174	UJ	
PBDE-32	13.4	UJ	19.8	UJ	13.7	UJ	174	UJ	
PBDE-35	13.4	UJ	19.8	UJ	13.7	UJ	174	UJ	
PBDE-37	13.4	UJ	19.8	UJ	13.7	UJ	174	UJ	
PBDE-47	926	J	818	J	826	J	47400	J	101
PBDE-49	19.2	UJ	16.8	UJ	18.1	UJ	233	UJ	
PBDE-66	26.5	UJ	23.4	UJ	25.1	UJ	328	UJ	94.6
PBDE-71	19.2	UJ	16.8	UJ	18.1	UJ	233	UJ	
PBDE-75	18.6	UJ	16.5	UJ	17.7	UJ	231	UJ	91
PBDE-77	19.2	UJ	16.8	UJ	18.1	UJ	233	UJ	
PBDE-85	66.9	UJ	88.8	UJ	61.6	UJ	953	J	91.1
PBDE-99	9420	J	8860	J	8960	J	123000	J	105
PBDE-100	2470	J	2330	J	2500	J	41500	J	99.7
PBDE-105	45.5	UJ	55.9	UJ	39.8	UJ	517	UJ	
PBDE-116	45.5	UJ	55.9	UJ	39.8	UJ	517	UJ	
PBDE-119	375	J	444	J	384	J	517	UJ	
PBDE-126	45.5	UJ	55.9	UJ	39.8	UJ	517	UJ	
PBDE-138 + 166	437	UJ	413	J	396	J	1210	UJ	96

IQ = Interpretive Qualifier

Falcon Egg
Polybrominated Diphenylether (PBDE) Congener

CLIENT ID	Dunn Memorial Bridge #1 ESU 1203a		Dunn Memorial Bridge #2 ESU 1203b		Dunn Memorial Bridge #3 ESU 1203c		Rip Van Winkle Nest #2 ESU 1219b		SPIKED MATRIX
LAB ID	L5214-1		L5214-2		L5214-3		L5214-5		WG7272-103
UNITS	pg/g (wet)		pg/g (wet)		pg/g (wet)		pg/g (wet)		% REC
Percent Moisture	85		84		85		82		
Percent Lipids	3.2		2.8		3.2		5.5		
		IQ		IQ		IQ		IQ	
PBDE-140	182	J	15.9	UJ	22.0	UJ	305	UJ	
PBDE-153	92200	J	87500	J	85200	J	68200	J	102
PBDE-154	7170	J	6970	J	6990	J	19700	J	99.2
PBDE-155	65.4	UJ	57.1	UJ	47.7	J	653	UJ	
PBDE-181	486	UJ	437	J	470	J	428	UJ	
PBDE-183	35700	J	33700	J	33300	J	9390	J	97.3
PBDE-190	392	J	392	J	357	UJ	678	UJ	95.9
PBDE-206	184	UJ	159	UJ	164	UJ	242	UJ	
PBDE-207	3600	J	3160	J	3170	J	1920	UJ	
PBDE-208	1240	J	1080	J	839	J	609	J	
PBDE-209	9810	J	8230	J	8480	UJ	6740	UJ	96.7

IQ = Interpretive Qualifier

Falcon Egg
PBDE Homologues

CLIENT ID	Dunn Memorial Bridge #1		Dunn Memorial Bridge #2		Dunn Memorial Bridge #3		Rip Van Winkle Nest #2	
LAB ID	L5214-1		L5214-2		L5214-3		L5214-5	
UNITS	pg/g (wet)		pg/g (wet)		pg/g (wet)		pg/g (wet)	
Percent Moisture	85		84		85		82	
Percent Lipids	3.2		2.8		3.2		5.5	
		IQ		IQ		IQ		IQ
Total MonoBDE	156	UJ	119	UJ	121	UJ	1050	UJ
Total DiBDE	8.26	UJ	7.62	UJ	6.81	UJ	74.5	UJ
Total TriBDE	58.8	J	78.5	J	17.2	J	1240	J
Total TetraBDE	926	J	818	J	826	J	47400	J
Total PentaBDE	20400	J	19100	J	18800	J	174000	J
Total HexaBDE	99600	J	95600	J	92900	J	90000	J
Total HeptaBDE	50100	J	48500	J	47100	J	14800	J
Total OctaBDE	42900	J	39700	J	39700	J	6270	J
Total NonaBDE	4850	J	4250	J	4000	J	609	J
Total DecaBDE	9810	J	8230	J	8480	J	6740	J

IQ = Interpretive Qualifier

Falcon Egg
Metals

CLIENT ID	Dunn Memorial Bridge #1		Dunn Memorial Bridge #2		Dunn Memorial Bridge #3		Rip Van Winkle Nest #2	
LAB ID	L5214-1		L5214-2		L5214-3		L5214-5	
UNITS - Hg	ng/g (wet)		ng/g (wet)		ng/g (wet)		ng/g (wet)	
UNITS - Cd / Pb	mg/kg (wet)		mg/kg (wet)		mg/kg (wet)		mg/kg (wet)	
Percent Moisture	85		84		85		82	
Percent Lipids	3.2		2.8		3.2		5.5	
		IQ		IQ		IQ		IQ
Cadmium	0.001	U	0.001	U	0.001	U	0.001	U
Mercury	7.78		7.16		36.8		61.3	
Lead	0.035	J	0.021	J	0.035	J	0.006	UJ

IQ = Interpretive Qualifier


U.S. DEPARTMENT OF THE INTERIOR
MARCH 3, 1849


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