DIOXIN MONITORING PROGRAM

(Including data on Dioxin-like PCBs collected in the Surface Water Ambient Toxics Monitoring Program)

2006

REPORT

DEPARTMENT OF ENVIRONMENTAL PROTECTION
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GLOSSARY

CTEh- Coplanar PCB toxic equivalents with non-detects at half the detection level

DMP- Dioxin Monitoring Program

DTEd- Dioxin toxic equivalents with non-detects at the detection level

DTEh- Dioxin toxic equivalents with non-detects at half the detection level

DTEo- Dioxin toxic equivalents with non-detects as zero

FTALr- Fish Tissue Action Level for reproduction

FTALc- Fish tissue Action Level for cancer

pFTAL- potential Fish Tissue Action Level

MCDC- Maine Center for Disease Control and Prevention (formerly Maine Bureau of Health)

SWAT- Surface Water Ambient Toxics monitoring program

TAG- SWAT Technical Advisory Group

TCDD- 2378-tetrachlorodibenzo-p-dioxin, i.e. the most toxic dioxin

TCDF- 2378-tetrachlorodibenzofuran

TEF- Toxicity equivalency factor

OVERVIEW

This report contains the findings from the 2006 Dioxin Monitoring Program with respect to the goal of the program, "to determine the nature of dioxin contamination in the waters and fisheries of the State". The three primary objectives are:

1. Human health assessment, Fish Consumption Advisories
2. Trends evaluation
3. 1997 Dioxin law, no discharge provision, continued compliance

The figures in this report also contain the (dioxin-like) coplanar PCB data gathered as part of DEP's Surface Water Ambient Toxics (SWAT) monitoring program. Coplanar PCB data are included in order to show the total exposure to dioxin-like compounds from consumption of certain fish from several Maine rivers in order for the Maine Center for Disease Control (MCDC) to make a complete assessment of the fish consumption advisories. The coplanar PCB data are distinct from the dioxin data and the reporting requirements of the Dioxin Monitoring Program. Sources of the coplanar PCBs are not known, but likely include historic use and discharge in Maine and long range transport and atmospheric deposition.

1. HUMAN HEALTH ASSESSMENT, FISH CONSUMPTION ADVISORIES

- MCDC has issued Fish Consumption Advisories for the Androscoggin, Kennebec, Penobscot, Sebasticook, and Salmon Falls Rivers, due to dioxins or a combination of dioxins and dioxin-like coplanar PCBs. These advisories are more restrictive than the statewide mercury advisory.

- An evaluation of the health implications of dioxin/furan concentrations in fish in Maine Rivers requires a comparison to a health benchmark. MCDC uses a health benchmark that is expressed as a specific fish tissue concentration of dioxins and furans, referred to as a "Fish Tissue Action Level" or FTAL[1]. For the present report, MCDC compares the most recent data on dioxins and furan levels in fish tissue to its current FTALc of 1.5 parts per trillion (ppt) for protection of cancer-related effects. MCDC also compares the sum of dioxin, furans, and coplanar PCB levels to its FTALr of 1.8 parts per ppt for protection of noncancer or reproductive related effects. MCDC additionally compares all data to a lower pFTAL of 0.4 ppt, which is under consideration as a potential revision to current FTALr, to account for background dietary exposure to dioxins and furans.

- Concentrations of dioxins and furans (DTEh) in bass, trout and white perch at all sampling locations were below the current FTALc of 1.5 ppt (Figure 1). Concentrations in white suckers below the bleached kraft pulp and paper mills on the Androscoggin River were at or exceeded the FTALc but concentrations in white suckers on the Kennebec and Penobscot rivers were below the FTALc (Figure 2).

- Concentrations of dioxins and furans in fish from some stations on the Androscoggin and Sebasticook rivers below pulp and paper mills, a tannery, and a former textile mill were at or above the pFTAL of 0.4 ppt (Figure 1). They were also above levels found in fish at reference stations unaffected by point source discharges (~0.2 ppt).

- When the concentrations of dioxin-like coplanar PCBs (CTEh) were added to the dioxin concentrations, total toxic equivalents approached or exceeded the current FTALr of 1.8 ppt at 3 locations (Sebasticook River, Androscoggin River, and Androscoggin Lake) (Figure 1). Coplanar PCB data were collected in the Surface Water Ambient Toxics (SWAT) monitoring program. Sources are unknown but likely include historic use and discharge in Maine and long-range transport and atmospheric deposition.

- Mean dioxin and furan levels in Androscoggin Lake have not been reported above the current FTALc in any species since 1996, but the mean concentration was at the pFTAL in white perch in 2006 (Figure 1). Addition of coplanar PCBs resulted in an exceedance of the pFTAL in bass and a near exceedance of the FTALr in white perch.

Figure 1. Dioxin (DTEh) and coplanar PCB (CTEh) toxic equivalents (95th UCL) in bass (and brown trout BNT, rainbow trout RBT, and white perch WHP) in the Androscoggin, Kennebec, Sebasticook, Presumpscot, and Salmon Falls rivers, 2006

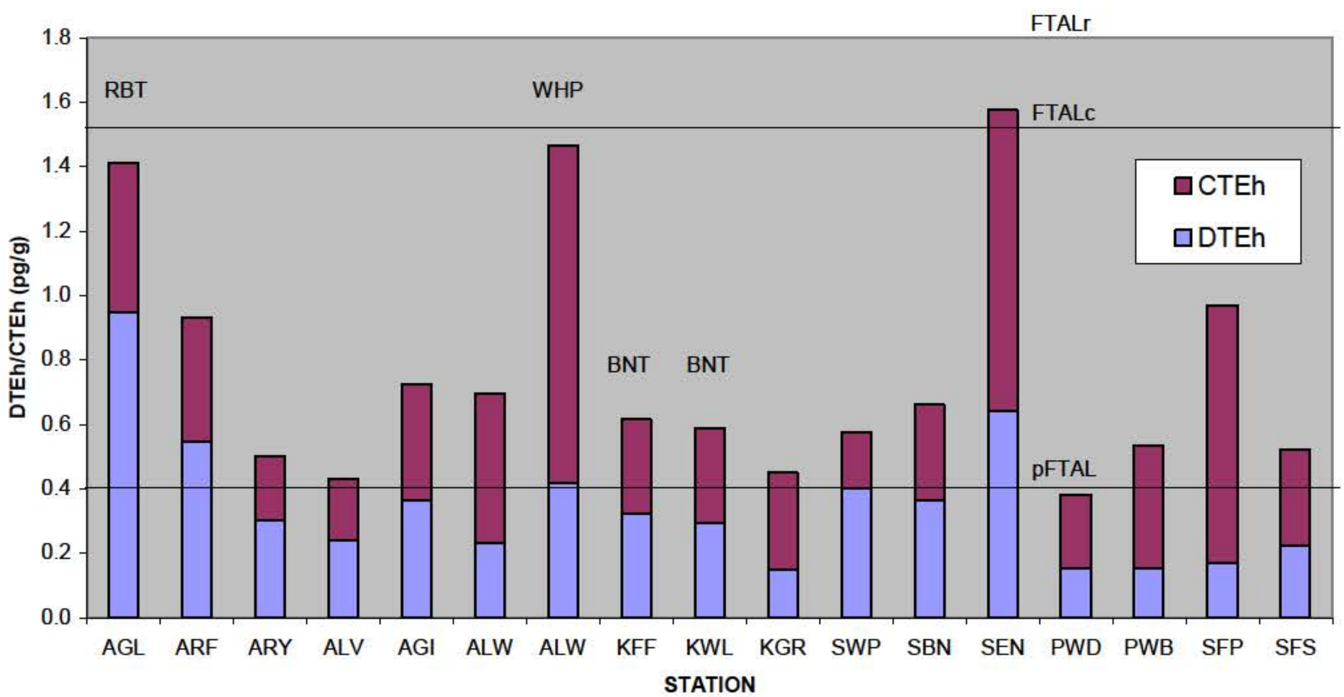
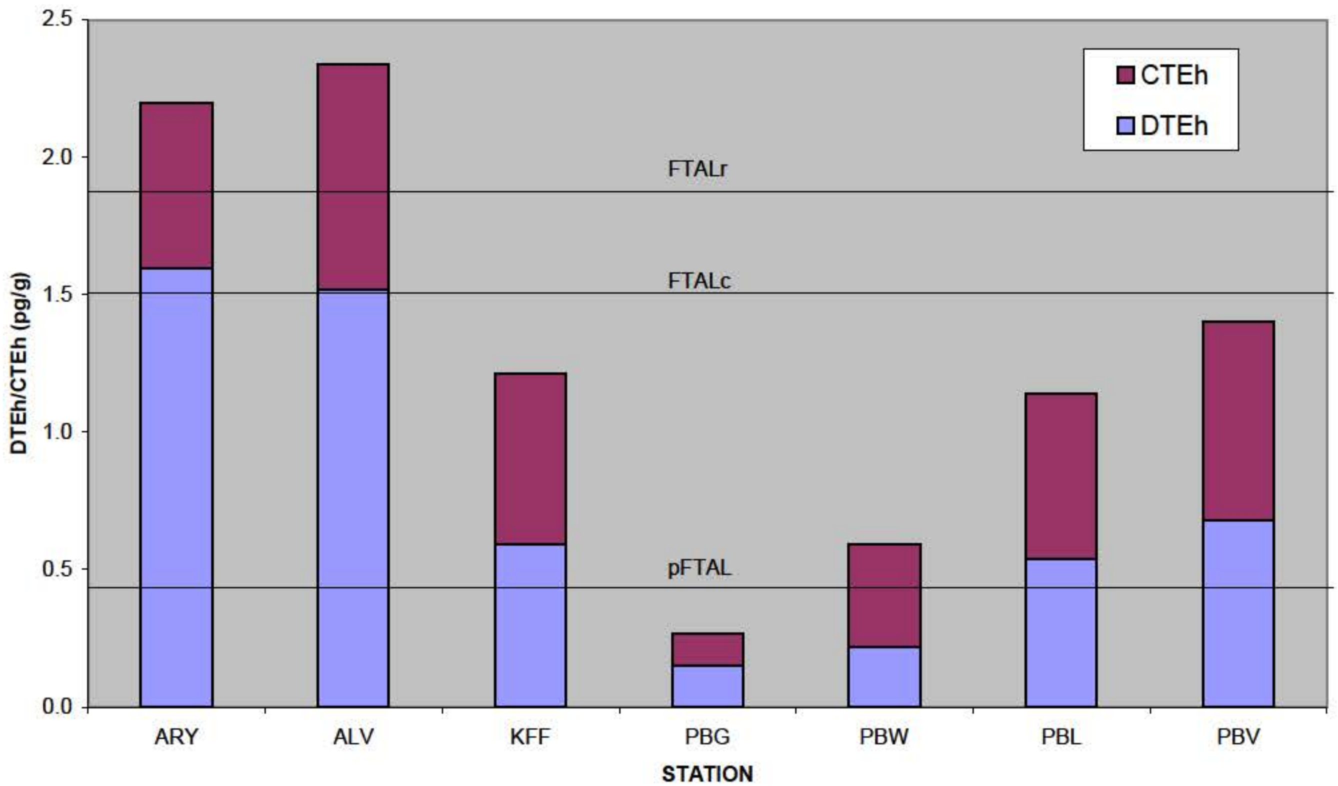


Figure 2. Dioxin (DTEh) and coplanar PCB (CTEh) toxic equivalents (95th UCL) in white suckers from the Androscoggin, Kennebec, and Penobscot rivers, 2006



2. TRENDS

There is a trend of generally declining concentrations of dioxins and furans in smallmouth bass and white suckers averaged over all stations for each of the Androscoggin, Kennebec and Penobscot rivers since 1997 (Figures 3, 4) no doubt due to reductions in discharges at the mills. Despite the overall declining trend, concentrations sometimes increase from one year to the next, due to variability or unknown cause. Trends at specific locations may not follow the general trend and will be discussed for each in the following sections.

Figure 3. Mean dioxin concentration (DTEhucl) in bass below bleached kraft pulp and paper mills on the Androscoggin, Kennebec, and Penobscot rivers

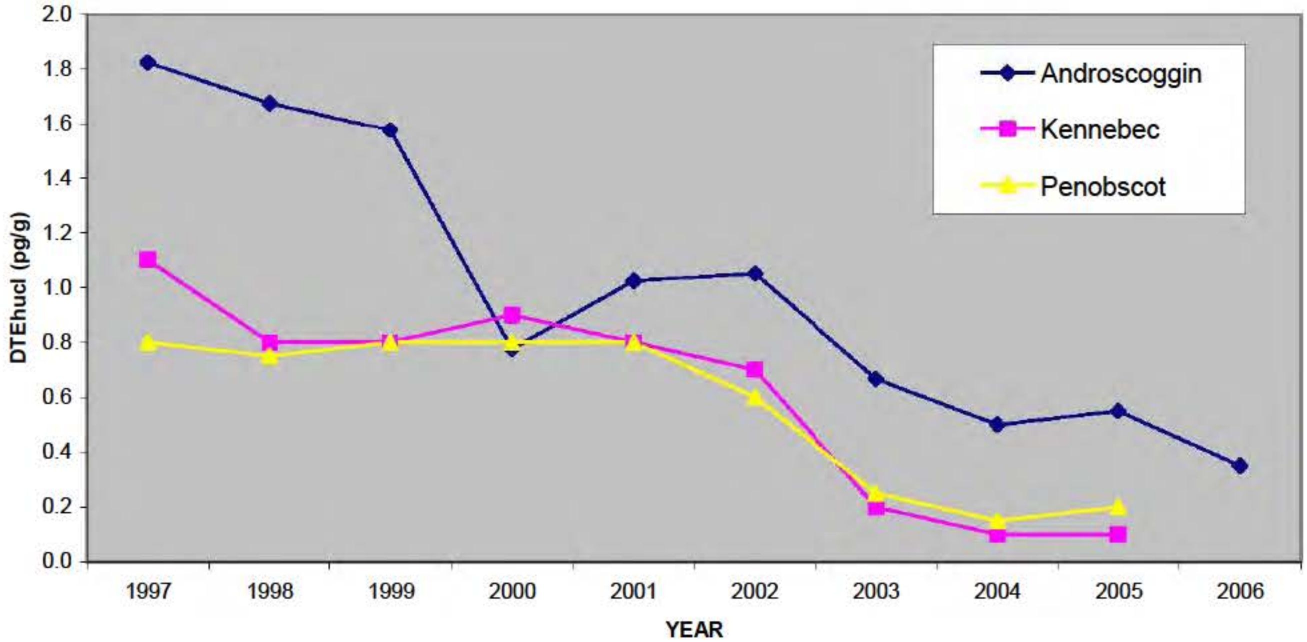
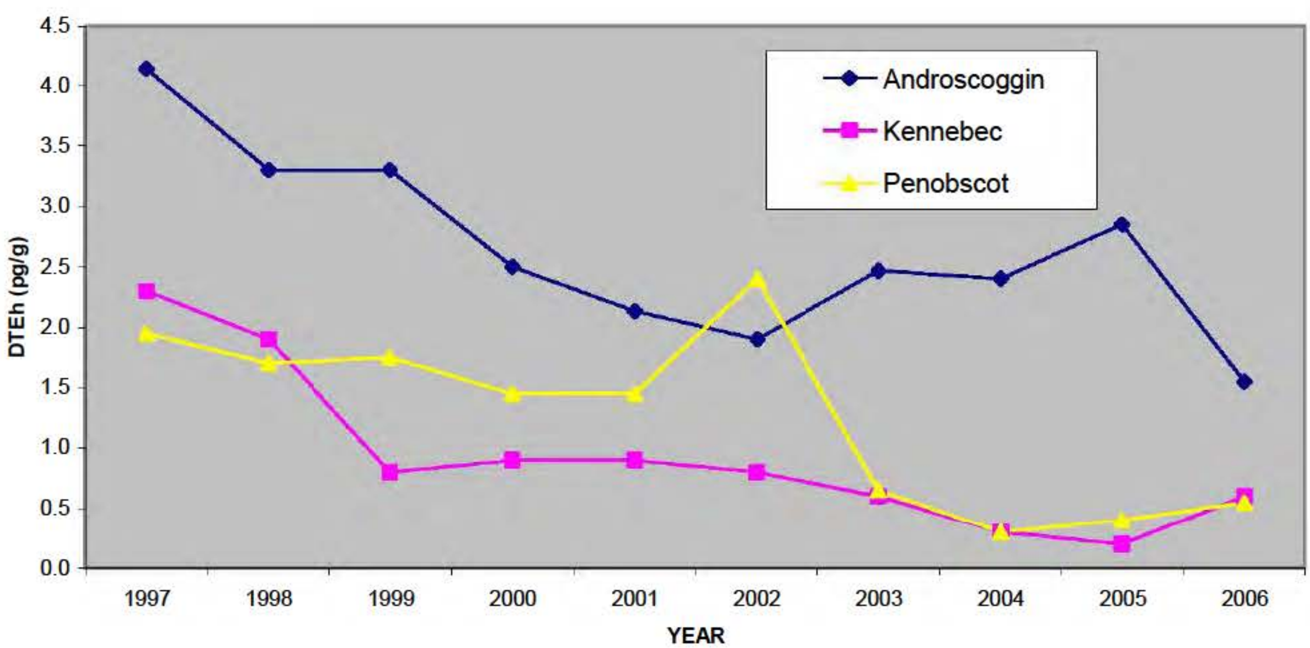


Figure 4. Mean concentrations of dioxin (DTEh, 95th UCL) in white suckers below bleached kraft pulp and paper mills on the Androscoggin, Kennebec, and Penobscot rivers



3. 1997 DIOXIN LAW, NO DISCHARGE PROVISION, CONTINUED COMPLIANCE

- The 2003-2005 results indicate that all the mills passed the A/B test and were not discharging measurable amounts of dioxin .

- Continued annual compliance with the no-discharge provision in 38 MRSA section 420 may be demonstrated by either of three methods. 1) Bleach plant effluent concentrations, monitored at quarterly and reported at the actual concentrations rather than the nominal 10 ppq limit, must remain as low as in the years in which a mill demonstrated compliance with the A/B test. 2) Bleach plant effluent concentrations must be tested as above at least once a year. In addition, the mills must provide a dioxin/furan certification that the bleach plant and defoamers continue to be operated and used in a manner similar to that in 2003 and 2004. 3) A facility may repeat and must pass the A/B fish test. Continued compliance in 2006 was demonstrated by all mills by methods 1 or 2. Nevertheless, fish samples from below Lincoln Paper and Tissue had slightly higher dioxin levels than fish upstream, unlike recent years, and warrants repeat sampling in 2007.

- Continued elevated levels above background at some locations below mills in these rivers are the legacy of the long history of discharges to the rivers.

- The current Dioxin Monitoring Program is scheduled to end in 2007. Monitoring needs to be continued to allow the Maine Center for Disease Control and Prevention's (MCDC) periodic review of Fish Consumption Advisories that are due wholly or in part to dioxin. Due to inter-annual variability, at least two consecutive years of monitoring data that show levels of dioxins below the appropriate Fish Tissue Action Level are needed before advisories should be relaxed.

BACKGROUND ON DIOXIN

Due to continuing controversy over the effects of dioxin on human and ecological health, the US Environmental Protection Agency (EPA) announced in 1991 it would begin a thorough scientific reassessment of dioxin. EPA proposed that the process would be open to the public and consequently held several meetings to share information and receive comments. A draft report was issued in 1994 and subsequent review in 1995 by EPA's Science Advisory Board called for revisions of some chapters. Revised drafts published in 2000 indicate that dioxin may exhibit reproductive and developmental effects, immuno-toxic effects, neuro-toxic effects, and cancer. In addition, the report found that concentrations of dioxin in the environment have decreased since the 1970s. Also 'EPA currently estimates that the amount of dioxin in tissues of the general human population approaches, within a factor of 10, the levels at which adverse effects might be expected to occur'. In March 2001 EPA's Scientific Advisory Board published its draft review of EPA's new revisions and is divided on whether or not dioxin is a carcinogen, but does believe EPA has underestimated non-cancer effects. The Scientific Advisory Board also does not agree that there is enough evidence to support EPA's statement about current body burdens and probable adverse health impacts.

DIOXIN MONITORING PROGRAM

Dioxin was first discovered to be a problem in Maine in 1985, when the results of an analysis of fish collected in 1984 from the Androscoggin River by the Maine Department of Environmental Protection (the Department), used as a reference station for EPA's National Dioxin Study, documented significant concentrations of dioxin. Consequently, the Maine Center for Disease Control and Prevention issued Maine's first fish consumption advisory in 1985. Additional sampling in 1985 and 1986 found similar levels in fish from other rivers below bleached kraft pulp and paper mills, but not from rivers or lakes without such sources. This led to including parts of the Kennebec River and Penobscot River in a revised fish consumption advisory in 1987. As a result there was a bill before the Maine legislature in 1988 to ban the discharge of dioxin. The bill was amended to establish a monitoring program, Maine's Dioxin Monitoring Program (DMP) and enacted into law (38 MRSA section 420-A) to end in 1990. Discovery of continuing significant concentrations in fish from these and other rivers resulted in the DMP being reauthorized in 1990, 1995, 1997, and most recently in 2002 extending until 2007. The Department has issued reports of the results of monitoring annually. Fish consumption advisories have been issued or modified in 1985, 1987, 1990, 1992, 1994, 1997, and 2000.

The goal of Maine's Dioxin Monitoring Program is "to determine the nature of dioxin contamination in the waters and fisheries of the State". Charged with administration of the program, the Department is required to sample fish once a year below no more than 12 bleached pulp mills, municipal wastewater treatment plants, or other known or likely sources of dioxin. Costs for equipment, supplies, and analysis are assessed to the selected facilities annually, and could not exceed $168,000 until 1997 when the limit was raised to $250,000 to incorporate development of the Above/Below (A/B) fish test. In recent years, much less has been spent.

The Department is advised by the Surface Water Ambient Toxic (SWAT) Monitoring Program Technical Advisory Group in implementation of the program. An annual report is required to be submitted to the Natural Resources Committee of the Maine Legislature by March 31 with the results from the previous year, including status of progress toward meeting the requirements of the Dioxin/Color law.

The primary objective of the Dioxin Monitoring Program is to monitor dioxin in fish for assessment of human health and ecological impact.

A second objective is to measure trends, progress toward reduction in environmental concentrations, and effectiveness and need for further controls.

The monitoring program is coordinated with other ongoing programs conducted by the Department, US Environmental Protection Agency (EPA), or dischargers of wastewater. The proposed annual monitoring plan must be submitted to the Surface Water Ambient Toxic (SWAT) monitoring program Technical Advisory Group (TAG), created under 38 MRSA section 420-B, for review and advice. The selected facilities must be notified of their inclusion in the proposed program at least 30 days prior to submittal to the TAG. The Department must incorporate the results of all studies into a report due the Natural Resources Committee by March 31 of the following year. A draft of the report is reviewed by the TAG before completion of the final report. Costs of sample collection and analysis are assessed as a fee to the selected facilities. Payment of the fees is a condition of the waste discharge license granted by the State for continued operation and discharge of wastewater to waters of the State. However, if the selected facility is a publicly owned treatment works (POTW), then the fees may be assessed to the known or likely industrial generator of dioxin, and payment will not be a condition of the waste discharge license of the POTW.

1997 DIOXIN/COLOR LAW

A third objective, integrated into the DMP, comes from the Dioxin/Color law. In 1997 the Maine Legislature enacted LD 1633 "An Act to Make Fish in Maine Rivers Safe to Eat and Reduce Color Pollution", the Dioxin/Color law [38 MRSA section 420(2)(I)]. The key requirement is that 'a (bleach kraft pulp) mill may not discharge dioxin into its receiving waters after December 31, 2002. To determine compliance, there are interim tests and a final test. Two interim tests, of effluent from the bleach plant require that 1) TCDD (2378-tetrachlorodibenzo-p-dioxin, the most toxic of the 17 toxic dioxins and furans) must be below 10 ppq, parts per quadrillion or picograms per gram, pg/g by July 31, 1998 and 2) TCDF (2378-tetrachlorodibenzofuran) must be below the same detection limit by December 31, 1999. As the final test to confirm that there is no discharge, by December 31, 2002 fish (or surrogate) below a bleached kraft pulp mill must have no more dioxin than fish (or surrogate) above the mill, the so-called "above/below (A/B) fish test".

Since contamination levels in fish are likely to be highest in late summer to early fall, sampling for compliance with the December 31, 2002, deadline could not begin until summer 2003. Because laboratory results of summer data are not available in time to report by December 31 of any given year, the legislature amended the 1997 Dioxin/Color law in 2003 to delay the date of DEP's report by a year, to February 16, 2004. The amendment also delayed the date by which a mill must demonstrate it no longer discharges, if the Department finds that it does in fact discharge, for a year after that. The amendment also requires the mills to make the demonstration annually. Additional legislation has combined reporting of compliance with the law with the annual Dioxin Monitoring Program report due March 31 of the year following data collection.

ABOVE/BELOW (A/B) TEST

DEP's report 'Dioxin Monitoring Program 2002-2003, Status of Dioxin in Maine's Rivers' dated February 25, 2004 established the A/B test as follows:

1) The test will measure contaminant concentrations in 3 separate species: a) bass b) suckers, and c) caged mussels.

2) A preponderance of evidence (POE) approach will be used where passage of 2 of the 3 tests will be used to indicate no discharge.

3) To achieve an overall 95% confidence with the POE approach, the level of significance for each individual test is 0.135 for both type I and II errors.

4) Compounds to be measured will be 2378-TCDD and 2378-TCDF, combined into a single metric, TCDD + (TEF x TCDF), to equivalently weight both congeners.

5) Concentrations of these compounds will be based on lipid normalized values if there is a significant relationship between contaminant concentration and lipid from linear regression, or wet weight values if there is no significant correlation.

6) Concentrations less than the detection limit (<DL) will be calculated at ½ the DL.

7) Where all of the values for the samples at an above or below station are <DL, no statistical determination will be made.

8) To compensate for the sensitivity of the tests, a mill must show no evidence of a discharge for 2 consecutive years before being deemed in compliance. Once a mill has passed the A/B test, continued compliance may be demonstrated by annual (1/year) testing of the bleach plant effluent that shows concentrations are below 10 ppq and certification that the bleach plant operation meets the following criteria:

CRITERIA FOR CERTIFICATION OF BLEACH PLANT OPERATION

In lieu of 1/Month monitoring of the bleach plant waste stream for 2,3,7,8 TCDD (dioxin) and 2,3,7,8 TCDF (furan) (40 CFR Part 430), by December 31 of each calendar year *(PCS Code 95799)*, the permittee shall sample (1/year) and report the results for said parameters and provide the Department with a certification stating:

a. Elemental chlorine gas or hypochlorite was not used in the bleaching of pulp.

b. The chlorine dioxide (ClO2) generating plant has been operated in a manner which minimizes or eliminates byproduct elemental chlorine generation per the manufacturers/suppliers recommendations.

c. Documented and verifiable purchasing procedures are in place for the procurement of defoamers or other additives without elevated levels of known dioxin precursors.

d. Fundamental design changes that affect the ClO2 plant and/or bleach plant operation have been reported to the Department prior to their implementation and said reports explained the reason(s) for the change and any possible adverse consequences.

FISH CONSUMPTION ADVISORIES

There is a statewide fish consumption advisory due to mercury for all fresh waters. There are additional advisories for a number of rivers due to 1) dioxins and dioxin-like (coplanar) PCBs, 2) total PCBs, and 3) DDTs (Appendix 1).

There are 75 dioxins and 135 related furans, 17 of which are considered toxic, but with different toxicity potencies. The total toxicity of a sample (dioxin toxic equivalents=DTE or toxic equivalents=TEQ) can be calculated as the sum of the product of the concentration and toxicity equivalency factor (TEF, relative to the most toxic dioxin, TCDD) for each of the 17 dioxin and furans.

The Maine Center for Disease Control and Prevention (MCDC) publishes fish consumption advisories to inform the public about potential risk from consuming fish contaminated with dioxin and dioxin-like compounds. These advisories are based on a comparison of a Fish Tissue Action Level (FTAL) for dioxin toxic equivalent (DTE) concentrations with the 95^{th} percentile upper confidence limit on the mean DTE in fish tissue. Should a tissue concentration exceed an FTAL, a fish consumption rate (e.g., # meals per month), which is unlikely to result in toxic effects, is determined. Two FTALs have been derived for evaluating potential toxic effects from exposure to dioxins and dioxin-like compounds. Both FTALs were developed using standard USEPA risk assessment methods (EPA 1997). For potential carcinogenic effects associated with long-term exposure, MCDC has developed a FTALc of 1.5 ppt, while for reproductive and developmental effects potentially arising from shorter exposure durations, MCDC has developed a FTALr of 1.8 ppt (Frakes, 1990). The FTALr for reproductive and developmental effects is relevant to women of childbearing age, pregnant women, and lactating women. The FTALs are compared to the concentration of DTE in edible portions of the fish, skinless filet data. Where whole fish data are reported, the DTE concentration is divided by a factor of 3.5, determined from previous studies with white suckers, to estimate skinless filet concentration. In this report all comparisons with DTE in fish are made with FTALc, since that is the lower of the two and protective against both effects.

WORKPLAN DESIGN

The primary emphasis of the 2006 workplan was to collect fish samples from the appropriate stations and species from each river such that accurate, complete, and current data are available to assess impact to wildlife and human consumers. The workplan design included sampling at least one station below each major source to document trends and sampling of historic stations that showed dioxin above background whether or not any fish consumption advisories were issued.

The 2006 workplan was initially drafted by DEP according to the objectives listed above and sent to participating facilities for comment in early May 2006. After discussion of the draft workplan at a meeting of the SWAT Technical Advisory Group (TAG) on June 20, 2006, a final workplan was determined by the Commissioner. In 2006, many historical stations were monitored for ecological and/or human health assessment and trends under this program. Fish were also collected at other stations as part of the SWAT program at the request of MCDC, for assessment of the Fish Consumption Advisories. The workplan directed at least 5 fish to be collected from each station (Table 1).

Table 1. 2006 Dioxin Monitoring Program and SWAT monitoring program

STATION	SMB	WHS	MUSSELS	OTHER	FUNDING SOURCE
Androscoggin R					
Gilead				5 RBT	SWAT
Rumford	5				Rumford Paper Co.
Riley	5	5			SWAT/Rumford Paper Co.
Livermore Falls	5	5			SWAT/International Paper
Turner (GIP)	5				International Paper
Androscoggin L	2C5			2C5 WHP	IP & Rumford Paper Co
Kennebec R					
Fairfield		5		5 BNT	SAPPI
Sidney				5 BNT	KSTD
Penobscot R					
E Br		5			SWAT
Woodville		5			SWAT
S Lincoln		5			Lincoln Paper & Tissue
Veazie		5			Georgia Pacific
Bangor				5 EELS	Georgia Pacific
Presumpscot R					
Windham	5				SWAT
Westbrook	5				SWAT
Salmon Falls R					
Lebanon, Spaulding P	5				SWAT
S Berwick	5			4 sludge	SWAT/Prime Tanning
Somersworth			SWAT	4 sludge	SWAT
E Br Sebasticook R					
Corinna	5				SWAT
W Br Sebasticook R					
Palmyra	5				Town of Hartland
Sebasticook R					
Burnham	5				SWAT

We were able to collect all samples except that we collected only 3 brown trout of the right size from the Kennebec River at Fairfield and no eels from the Penobscot River in Bangor.

All samples were analyzed for all 2378-substituted dioxins and furans as skinless filets.

The preferred sampling time is late in the summer when fish are likely to be most contaminated after being exposed to higher concentrations of dioxin during low river flows and after significant growth has occurred. At some locations there has been a problem collecting enough fish later in the summer. At those locations sampling began in mid-May to try to insure that a suitable sample was collected. These stations were also visited after the beginning of July if there was time. If fish were captured during the later period, those samples were submitted for analyses. Otherwise, the fish collected during the early period were used. Sampling at other stations began in July. Actual dates of collection are shown in Appendix 5.

SAMPLING PROCEDURES

Fish were collected by DEP with assistance of the Penobscot Indian Nation on the Penobscot River. Upon capture, fish were immediately killed, weighed and measured, rinsed in river water, wrapped in aluminum foil with the shiny side out, labeled, and placed in a cooler on ice for transport to the DEP lab. Chain-of-custody forms were used to record all field information and document all transfers. In the lab, all fish samples were frozen and later transported whole to the Pace Analytical Services lab in Minneapolis, Minnesota for analysis. All other procedures followed EPA's Sampling Guidance Manual for the National Dioxin Study (July 1984). A laboratory log was kept for an inventory of samples in the lab at any time and final disposition.

Most of the facilities in the program already sample sludge or effluent as part of their Maine Sludge Spreading Permit or Waste Discharge License or Federal NPDES permit. Data from those programs provide adequate information about sources of dioxin. Therefore, no additional sludge samples were collected as part of this program in 2006. Effluent data are also used when available to indicate sources and any trends.

CALCULATIONS

In this report, dioxins are reported in different ways for each goal of the program. Given the uncertainty of true values when results are below the detection level, for the purpose of determining the range of possible concentrations, DTE are shown as a range with non-detects calculated at zero (DTEo) and at the detection limit (DTEd) as a mean for all samples of a given species at each station (Appendix 6). For human health assessment, DTEh, calculated using non-detects at 1/2 the detection limit consistent with the policy of the Maine Center for Disease Control (MCDC, formerly Maine Bureau of Health) were compared with the FTALc. The upper 95th percentile confidence limit (UCL) was used for these comparisons, consistent with the policy of the BOH. For trends analysis TCDD and DTEh were evaluated.

A related issue is that of estimated maximum possible concentrations (EMPC). Some compounds, particularly hydroxydiphenyl ethers (DPEs), are coextracted with furans. Various steps have successfully been taken to minimize these interferences, but some DPEs remain. In this report, EMPCs were treated as non-detects.

Statistical analyses of differences in DFTEh between stations were performed using either the t-test or non-parametric Mann-Whitney test at $p=0.05$.

RESULTS AND DISCUSSION.

Results for each sampling station are discussed with respect to the three objectives of the program, 1) human health assessment, 2) trends, and 3) 1997 Dioxin law, no discharge provision, continued compliance. See Appendix 2 for raw dioxin data for 2006, Appendix 5 for fish sample data, and Appendix 6 for all historical dioxin data.

Dioxin concentrations in fish generally continued to decline from previous years, but there is some year-to-year variation among species and stations within the trends. Concentrations remained elevated above natural background levels in fish at some stations, particularly on the Androscoggin and Sebasticook rivers, but approached background levels at some stations on other rivers. Dioxin toxic equivalents (DTEh), most likely from historical discharges from the mills, exceeded or, combined with (dioxin-like) coplanar PCBs (CTEh) contributed significantly to exceedances of the Bureau of Health's Fish Tissue Action Levels at several stations (Figures 1 & 2). DTEh are compared to existing FTALc and potentially new pFTAL for the cancer endpoint. The sum of DTEh and CTEh are compared to the existing FTALr for the reproductive endpoint. Sources of CTEh, measured in DEP's SWAT program, are unknown but likely include combustion with long range transport and atmospheric deposition from local, regional, and national sources. Details are discussed below for each river and station.

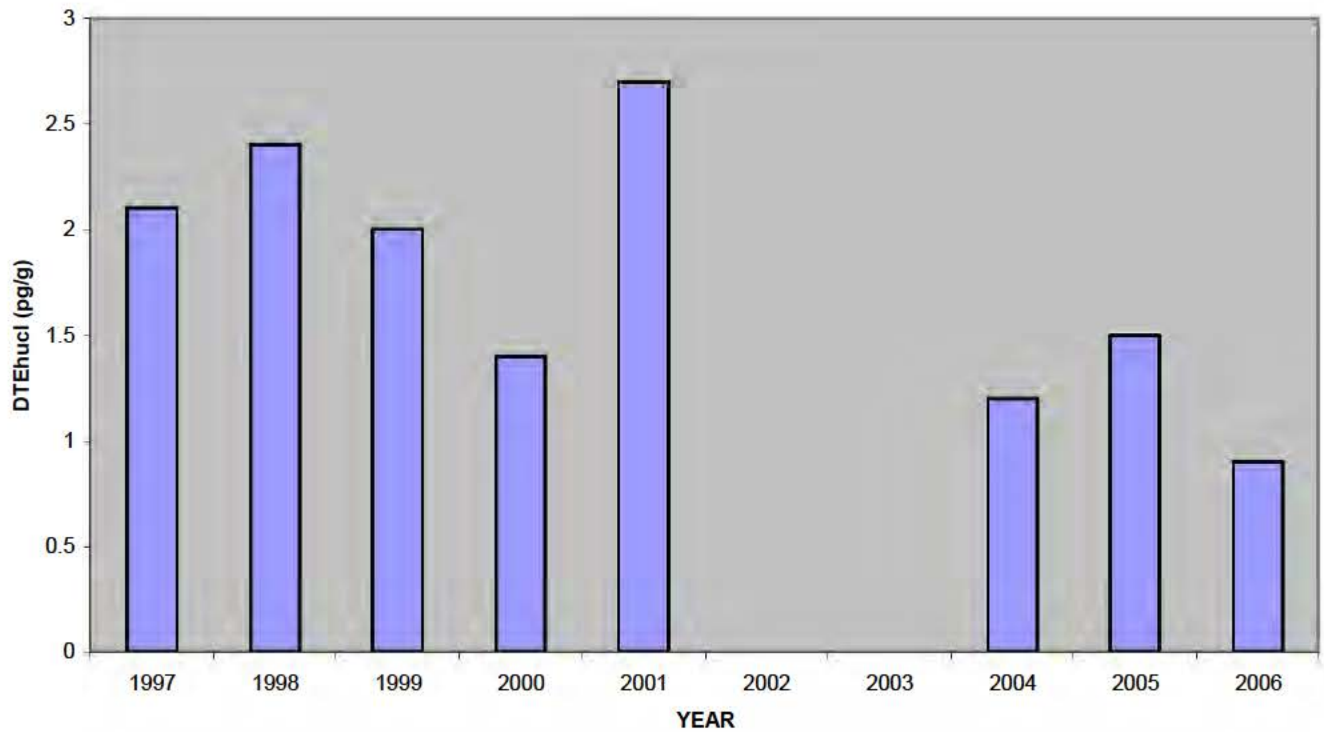
Androscoggin River

Gilead - (AGL) A total of 5 rainbow trout were collected near Peabody Island in Gilead (Appendix 5). This station is downstream of Fraser Paper Co's bleached kraft mill in Berlin, New Hampshire, but upstream of all Maine mills.

DTEh concentrations were below the FTALc (63%) but exceeded the pFTAL (Figure 1, Appendix 2). They were the highest of all fish species and stations in the state. The addition of dioxin-like (coplanar) PCBs to DTEh results in even higher levels of total toxic equivalents (TTEh).

Every year measured, DTEh in fish have been significantly higher at this station than in fish from reference stations in Maine (Appendix 6). There was no significant trend for the period 1997-2006 for rainbow trout or any other species captured at this station in the past, although concentrations of DTEh have decreased significantly in the past 3 years (Figure 5). The mill in Berlin, New Hampshire, has reported the switch to elemental chlorine free (ECF) bleaching (chlorine dioxide) in 1994. The mill closed in 2001 but the paper and pulp mills were purchased by Fraser and reopened in 2002 and 2003 respectively and then the pulp mill closed again in September 2006. The paper mill uses pulp purchased from a variety of sources including post consumer waste.

Figure 5. Dioxin concentrations (DTEhcul) in rainbow trout from the Androscoggin River at Gilead, Maine (AGL)



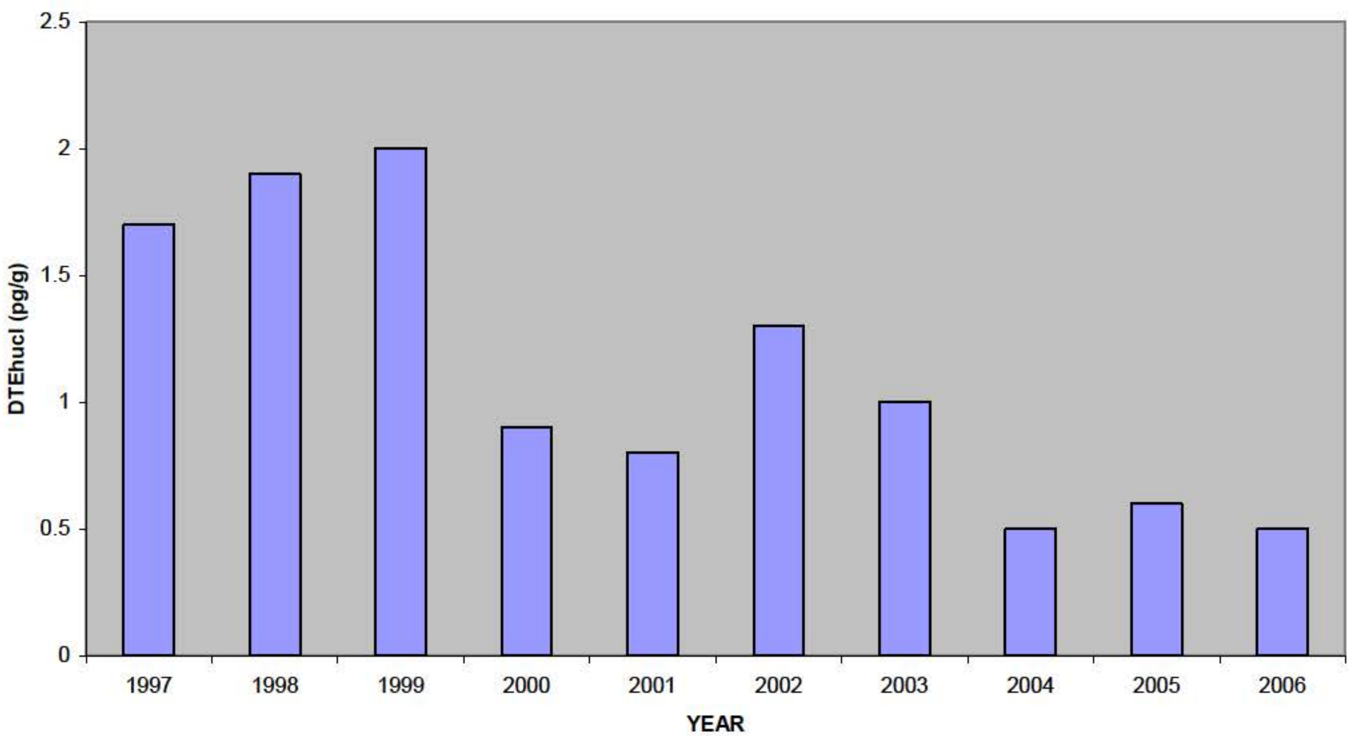
Rumford - (ARF) A total of 5 smallmouth bass were collected from the river reach from just below the discharge from NewPage Corporation's bleached kraft pulp and paper mill in Rumford downstream about 4 miles to Dixfield (Appendix 5).

Concentrations of DTEh in the bass were 36% of the FTALc but exceeded the pFTAL (Figure 1, Appendix 2). The addition of dioxin-like (coplanar) PCBs to DTEh resulted in higher levels of total toxic equivalents (TTEh) that were still well below (52%) the FTALr.

There is a significant declining trend for TCDD and DTEh for bass during the period 1997-2006 (Figure 6). TCDD was no longer much greater than reference stations unimpacted by point source discharges on other Maine rivers but DTE are still elevated (Appendix 6). Continued elevated levels of DTE below the mill are likely the legacy of the long history of discharges. This fact warrants some continued monitoring for assessing the fish consumption advisories, and can also be used to document continuing compliance with the no discharge provision, all within the Dioxin Monitoring Program.

Fish sampling in 2003 and 2004 documented that the mill was no longer discharging measurable amounts of dioxins. In a letter dated December 15, 2006, the mill partially demonstrated continued compliance with the 'no discharge' provision of the 1997 Dioxin law by certifying that it has met the performance criteria established by DEP for the bleaching process and defoamer usage (Appendix 7). An annual sample of the bleach plant effluent was analyzed for dioxins within 1 year of issuance of the Maine Pollution Discharge Elimination System permit September 21, 2005 on January 1, 2006. Concentrations of both TCDD and TCDF have been reported below a nominal 10 ppq detection limit in bleach plant effluent from 1998-2005 and below an actual and lower detection limit for the 2006 sample, all showing continued compliance (Appendix 4).

Figure 6. Dioxin concentrations (DTEhucl) in smallmouth bass from the Androscoggin River below Rumford



Riley - (ARY) A total of 5 smallmouth bass and 5 white suckers were collected from the river above the Riley Dam about 19 miles downstream of NewPage Corporation and upstream of the Verso Paper (formerly International Paper Company) discharge as part of the SWAT monitoring program and the DMP respectively (Appendix 5).

Concentrations of TCDD in bass were similar to those of historical reference stations unimpacted by point source discharges (Appendix 6). Concentrations of DTEh not much higher than those reference stations (20% of the FTALc) and below the pFTAL. When combined with dioxin-like coplanar PCBs, DTEh exceeded the pFTAL (Figure 1).

Concentrations of TCDD in suckers were slightly elevated over historical data from reference stations (Appendix 6). DTEh in the suckers exceeded the FTALc (107%, Figure 2, Appendix 2). The addition of dioxin-like (coplanar) PCBs to DTEh results in total toxic equivalents (TTEh) that exceeded the FTALr.

There is a trend of declining TCDD and DTEh concentrations in bass but not in white suckers at Riley for the period 1997-2006 (Figures 7,8). Nevertheless, TCDD and DTEh concentrations in suckers continue to be greater than those at reference stations on other Maine rivers (Appendix 6). The difference between species may reflect the impounded nature of this station, which may result in a greater exposure of the benthic dwelling suckers than the more pelagic bass to contaminated sediments.

Figure 7. Dioxin concentrations (DTEhucl) in smallmouth bass from the Androscoggin River at Riley, above Jay, Maine

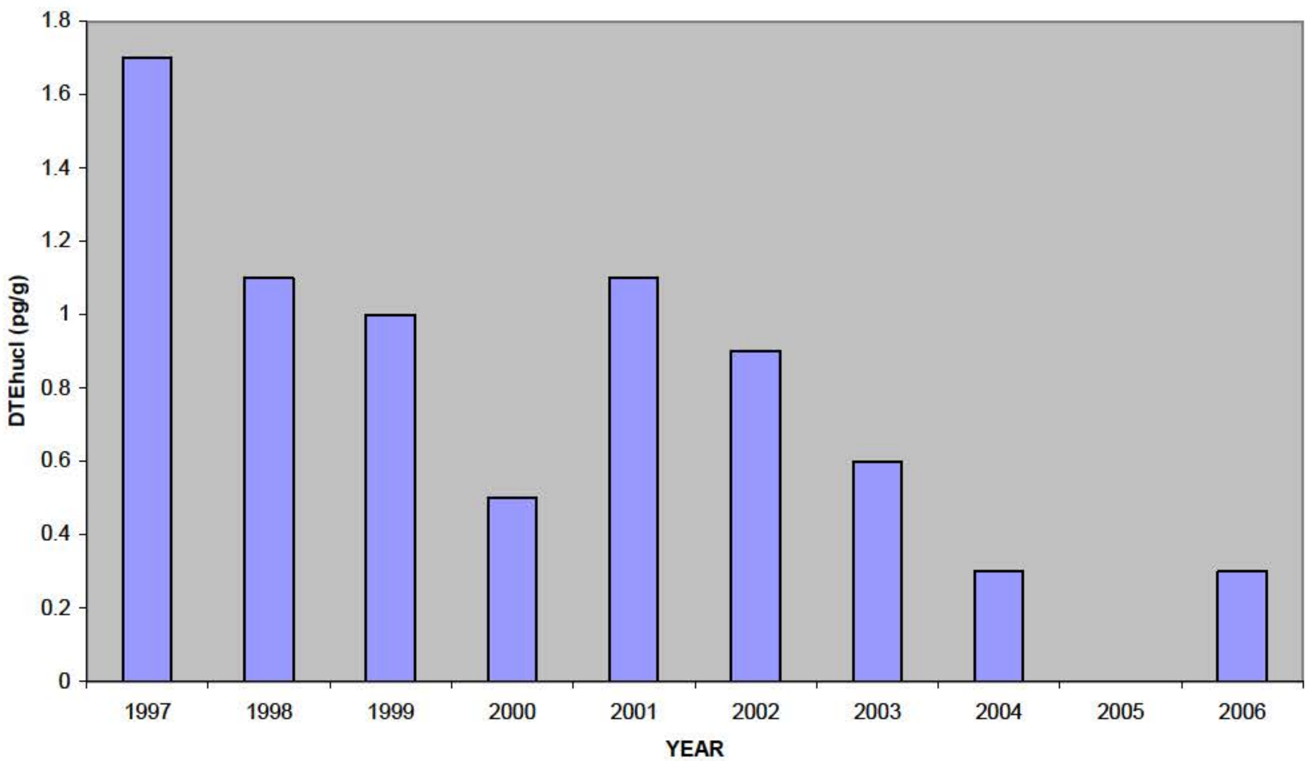
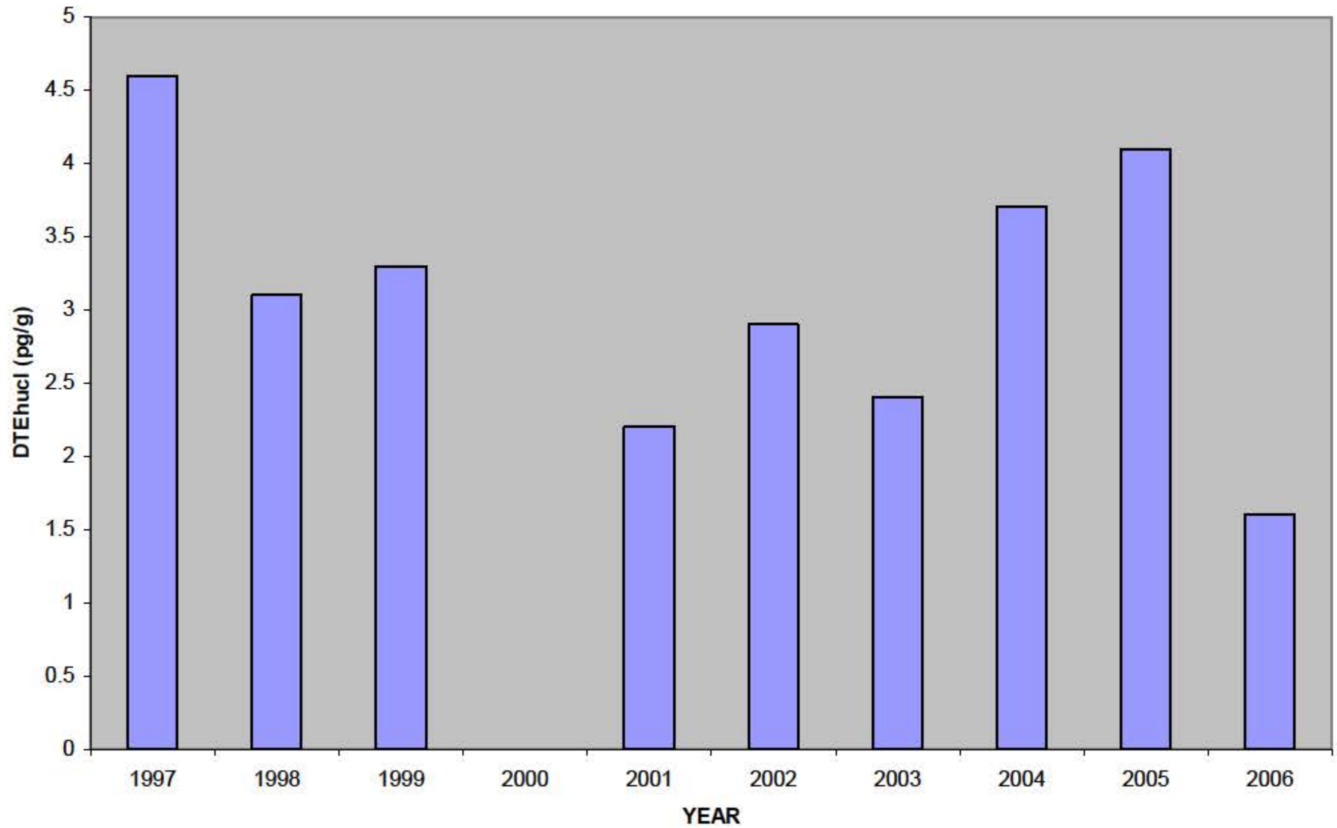


Figure 8. Dioxin concentrations (DTEhucl) in white suckers from the Androscoggin River at Riley, above Jay, Maine



Given that this station is below NewPage Corporation's discharge with no known intervening discharges of dioxins, then the demonstration of continued compliance with the 1997 Dioxin Law discussed above for the Rumford station applies here as well.

<u>Livermore Falls-</u> (ALV) A total of 5 smallmouth bass and 5 white suckers were captured in the Otis Impoundment approximately 2 miles downstream of the discharge from Verso Paper's Jay mill discharge as part of the SWAT monitoring program and the DMP respectively (Appendix 5).

Concentrations of TCDD and DTEh in bass were below the pFTAL and not significantly different than those from historical reference stations unimpacted by point source discharges (Appendix 6, Figure 1). The addition of dioxin-like (coplanar) PCBs to DTEh results in total toxic equivalents (TTEh) that exceeded the pFTAL.

Concentrations TCDD in suckers were slightly elevated over those of historical reference stations unimpacted by point source discharges (Appendix 6). DTEh in the suckers were 101% of the FTALc

(Figure 2, Appendix 2). The addition of dioxin-like (coplanar) PCBs to DTEh results in total toxic equivalents (TTEh) that exceeds the FTALr .

There is a significant declining trend for TCDD and DTEh in bass and suckers for the period 1997-2006 (Figure 9,10). Nevertheless, TCDD and DTEh in suckers are still significantly greater than reference stations on other Maine rivers (Appendix 6), likely the legacy of the long history of discharges. This fact warrants some continued monitoring, which can also be used to document continuing compliance with the no discharge provision.

Figure 9. Dioxin Concentrations (DTEhucl) in smallmouth bass from the Androscoggin River at Livermore Falls, Maine

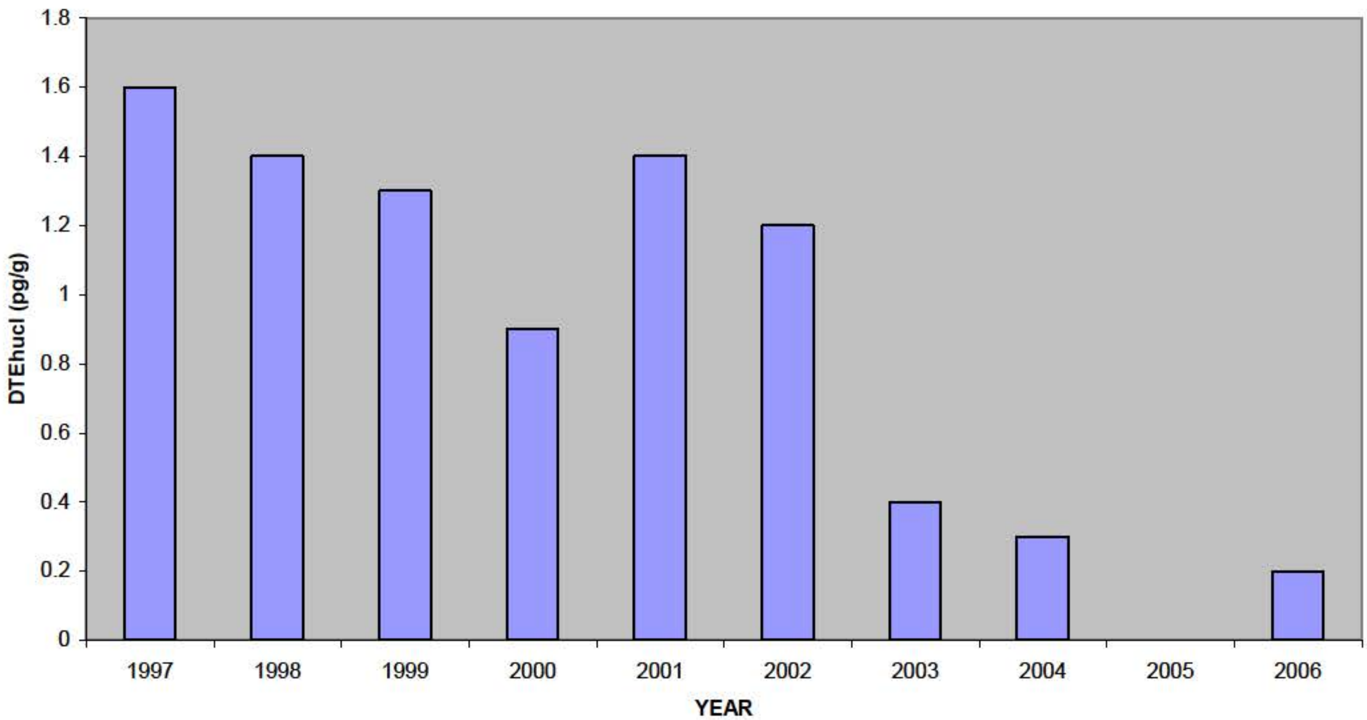
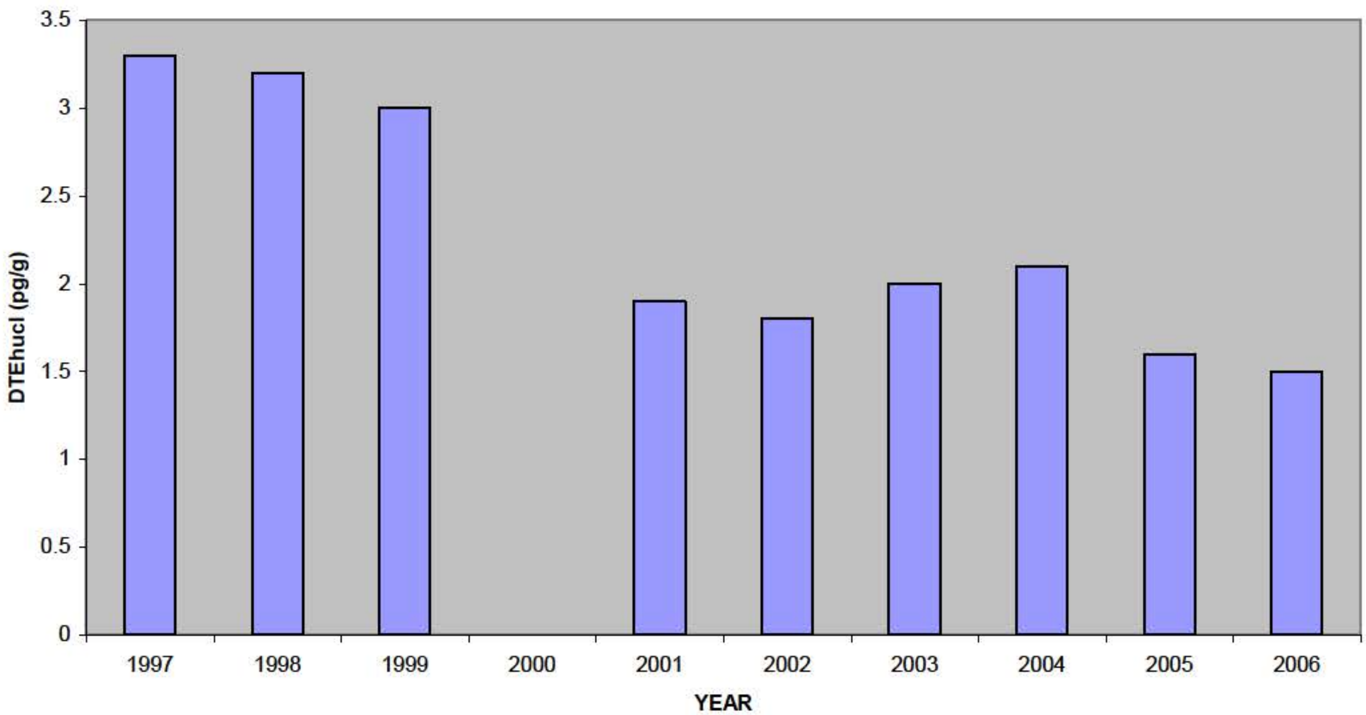


Figure 10. Dioxin concentrations (DTEhucl) in white suckers from the Androscoggin River, Livermore Falls, Maine



Fish sampling in 2003 and 2004 documented that the mill was no longer discharging measurable amounts of dioxins. In a letter dated December 21, 2006 the mill partially demonstrated continued compliance with the 'no discharge' provision of the 1997 Dioxin law by certifying that it has met the performance criteria established by DEP for the bleaching process and defoamer usage (Appendix 7). The bleach plant effluent, analyzed for dioxins in February and March 2006, documented that concentrations of both TCDD and TCDF have been reported below a 10 ppq detection limit in bleach plant effluent since 2002 and below much lower limits since 2004 (Appendix 4). There are no new sludge data since 1996.

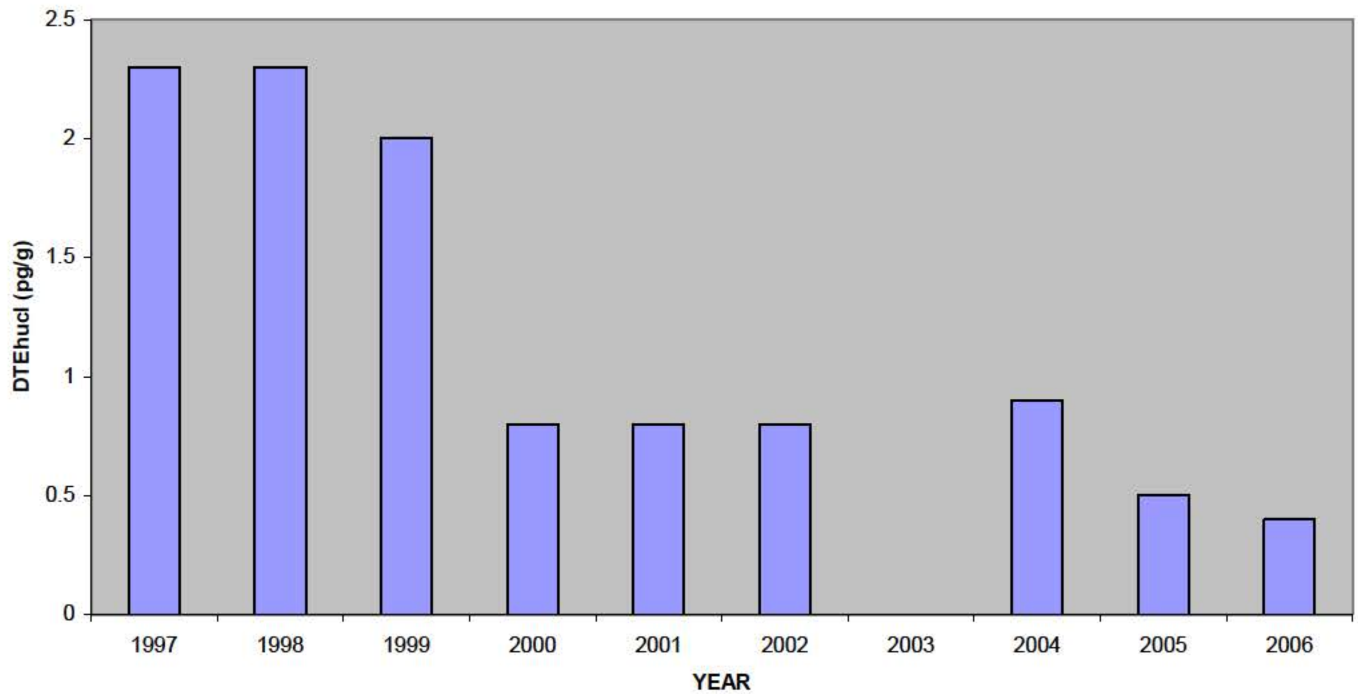
Auburn-GIP- (AGI) A total of 5 smallmouth bass were collected in Gulf Island Pond near the deep hole at Seagull Island, approximately 30 miles downstream of Verso Paper (Appendix 5).

Concentrations of TCDD were similar to those of historical reference stations unimpacted by point source discharges, but DTEh remained slightly elevated at the pFTAL (Figure 1, Appendix 2). The addition of dioxin-like (coplanar) PCBs to DTEh results in higher levels of total toxic equivalents (TTEh) that are still well below (40%) the FTALr.

There is a declining trend in TCDD and DTE in bass during the period 1997-2006 (Figure 11). Elevated DTEh concentrations are likely the legacy of the long history of discharges. As this station is a popular fishing spot, it warrants some continued monitoring for assessment of the Fish Consumption Advisories.

Given that this station is below Verso Paper's discharge with no known intervening discharges of dioxins, then the demonstration of continued compliance with the 1997 Dioxin Law discussed above for the Livermore Falls station applies here as well.

Figure 11. Dioxin concentrations (DTEhucl) in smallmouth bass from the Androscoggin River, Gulf Island Pond, Auburn, Maine.



Androscoggin Lake

Wayne- Androscoggin Lake in Wayne (ALW) and Leeds is a 4000-acre, 38-foot-deep meso-trophic lake with a unique reverse delta at the outlet formed by centuries of periodic backflow from the Androscoggin River via the Dead River into the lake. There is a dam on the Dead River that reduces, but does not prevent, the backflow into the lake, which usually occurs once or twice every year. Significant amounts of dioxin were found in fish from the lake beginning in 1996, but have been somewhat lower since.

In 2006, 10 smallmouth bass and 10 white perch were collected from the lake and analyzed as 2 composites of 5 fish each (Appendix 5). TCDD concentrations were similar to those of historical reference stations unimpacted by point source discharges for both species (Appendix 6). DTEh concentrations were below the pFTAL in smallmouth bass but exceeded it in white perch (Figure 1, Appendix 2). The addition of dioxin-like (coplanar) PCBs to DTEh results in an increase in total toxic equivalents (TTEh) that exceeded the pFTAL in bass and approached (81%) the FTALr in white perch.

There is a trend for the perioid 1996-2006 of declining concentrations in bass but not in white perch (Figures 12, 13). In 2006 concentrations of TCDD and DTEh in bass were no longer significantly greater than in game fish from all other lakes (n=8) or river reference stations that have been sampled, but concentrations in white perch appear slightly higher (Appendix 6). DTEh in bass were lower than those in bass from AGI, the nearest station on the river sampled in 2006, but concentrations in white perch were similarly elevated. Continued monitoring is needed for this popular fishing lake.

Figure 12 Dioxin concentrations (DTEhucl) in smallmouth bass from Androscoggin Lake, Wayne, Maine

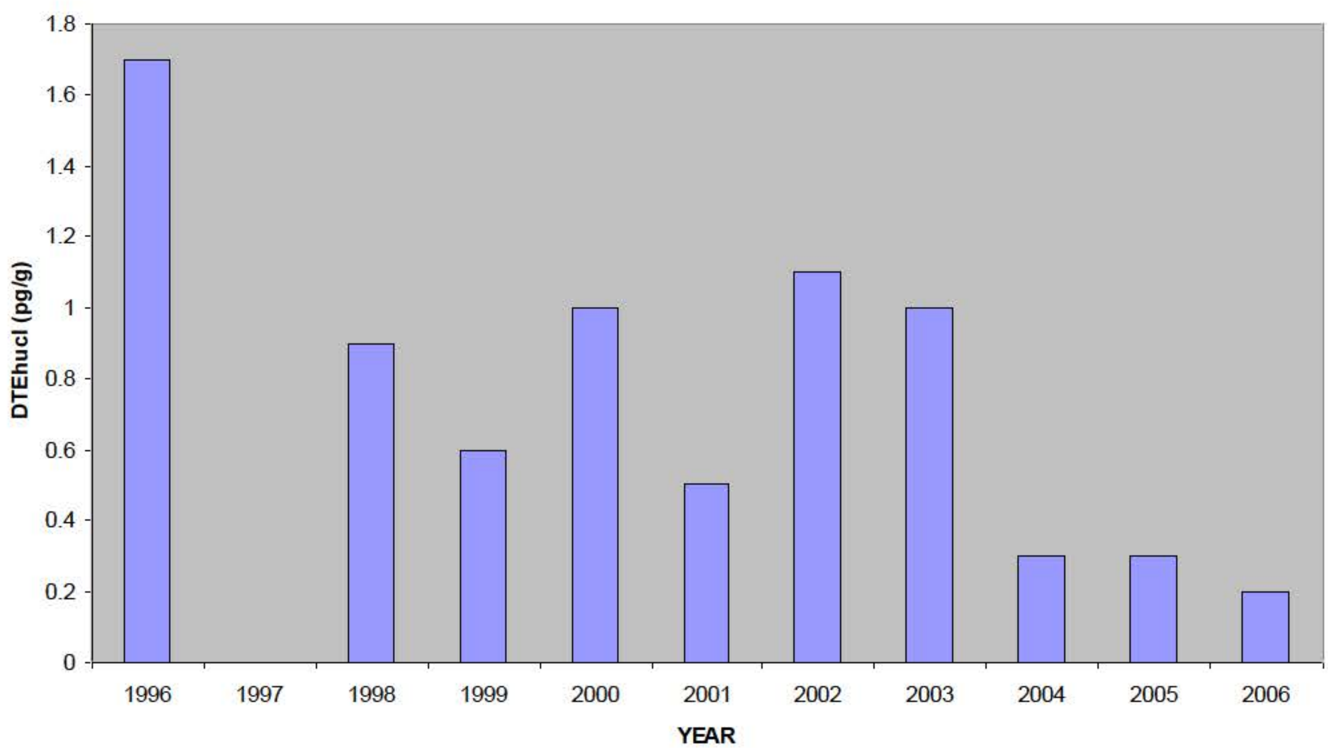
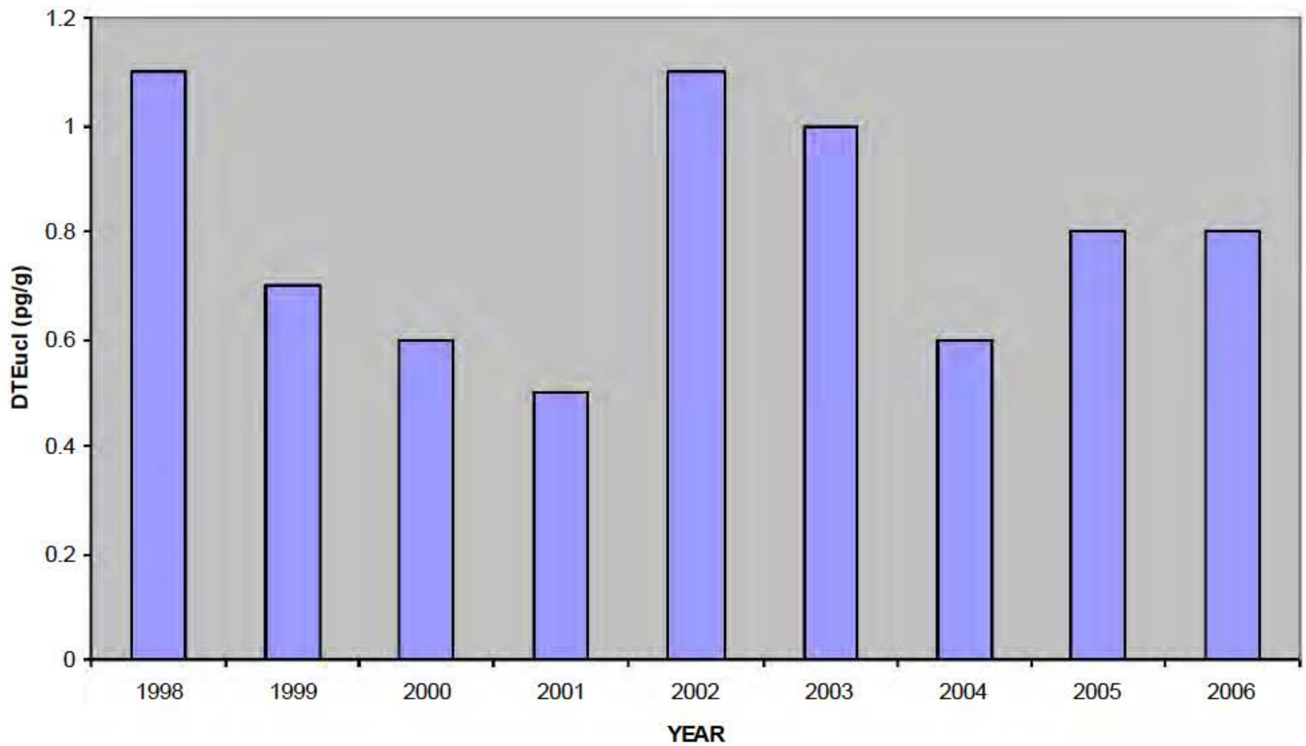


Figure 13. Dioxin concentrations (DTEhucl) in white perch from Androscoggin Lake, Wayne, Maine



Kennebec River

Fairfield- (KFF) A total of 3 brown trout and 5 white suckers were collected from the river between the Shawmut Dam and the I-95 bridge, approximately 7-8 miles below SAPPI Somerset's bleached kraft pulp and paper mill in Skowhegan (Appendix 5).

TCDD concentrations in brown trout were slightly elevated above those in historical reference stations unimpacted by point sources (Appendix 6). DTEh were also slightly elevated at just below the pFTAL (Figure 1, Appendix 2). The addition of dioxin-like (coplanar) PCBs to DTEh results in an increase in total toxic equivalents (TTEh) that are still well below (34%) the FTALr.

TCDD in white suckers were also slightly elevated above those in historical reference stations unimpacted by point sources (Appendix 6). DTEh exceeded the pFTAL (Figure 2, Appendix 2). The addition of dioxin-like (coplanar) PCBs to DTEh results in an increase in total toxic equivalents (TTEh) that further exceed the pFTAL but are below (67%) the FTALr.

There is no declining trend with brown trout, but DTEh from 2005 and 2006 appear lower than those from previous years (Figure 14). Concentrations in 2005 were similar to those of the reference station at Madison and Norridgewock from previous years, but concentrations in 2006 were slightly elevated. There was a significant declining trend for TCDD and DTEh (Figure 15) for suckers for the period 1997-2006.

Fish sampling in 2003 and 2004 documented that the mill was no longer discharging measurable amounts of dioxins. The mill has demonstrated continued compliance with the 'no discharge' provision of the 1997 Dioxin law. In a letter dated March 6, 2006 the mill certified that it has met the performance criteria established by DEP for the bleaching process and defoamer usage (Appendix 7). Sampling bleach plant effluent was conducted in 2006 documented that concentrations of both TCDD and TCDF were below detection at a low sample specific detection level (Appendix 4). Additional periodic monitoring should be continued to confirm low levels in brown trout and rainbow trout, which are fished heavily in this river reach.

Winslow- (KWL) (aka Sidney-KSD- in previous years) A total of 5 brown trout (Appendix 5) were collected below the Lockwood dam in Winslow in an area of the river receiving the discharge from the Kennebec Sanitary Treatment District, which processes effluent from the Huhtamaki paper mill.

Concentrations of TCDD were similar to those at historical reference stations unimpacted by point sources (Appendix 6). DTEh were slightly elevated at just below the pFTAL (Figure 1, Appendix 2). The addition of dioxin-like (coplanar) PCBs to DTEh results in an increase in total toxic equivalents (TTEh) that further exceed the pFTAL but are below (33%) the FTALr.

There are not enough data for trends analysis, but concentrations in 2006 were significantly lower than when last sampled in 2000 and 2001.

Figure 14. Dioxin concentrations (DTEhucl) in brown trout from the Kennebec River at Fairfield, Maine

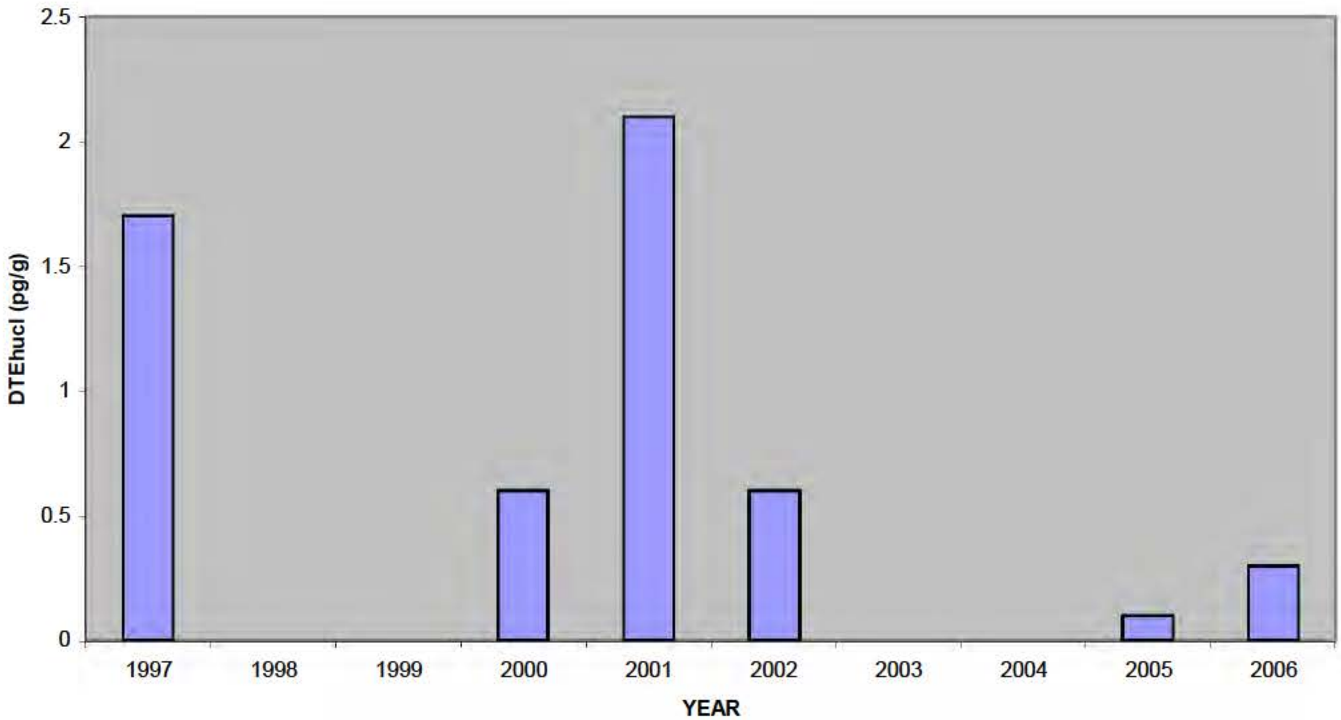
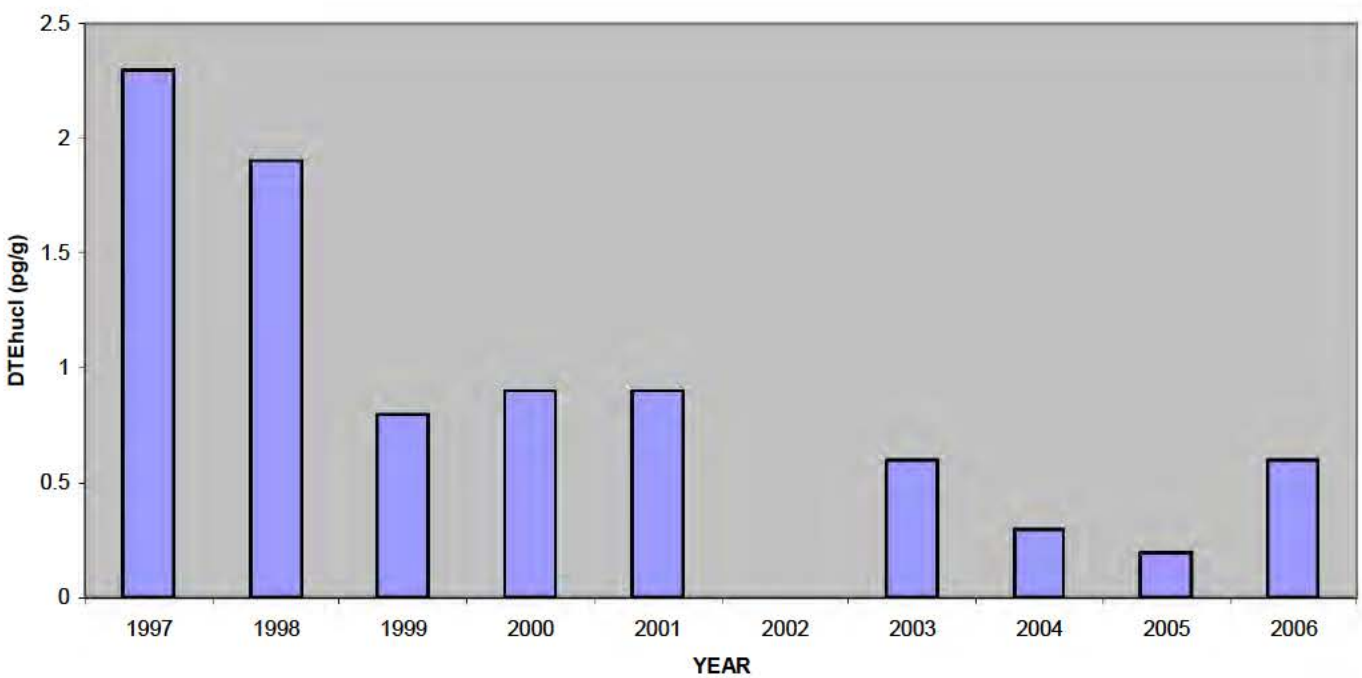


Figure 15. Dioxin concentrations (DTEhucl) in white suckers from the Kennebec River in Fairfield, Maine



Gardiner- (KGD) As part of the SWAT monitoring program 5 smallmouth bass (Appendix 5) were collected from the river at Gardiner, approximately 6 miles below the discharge of the former (Statler, Tree-Free, American Paper) recycled paper mill in Augusta. Concentrations of TCDD and DTEh (Figure 1) were similar to those of historical reference stations unimpacted by point source discharges and below the pFTAL. Both were also significantly lower than those about 3 miles upstream at Augusta/Hallowell from 1997-99 (Appendix 6). The addition of dioxin-like (coplanar) PCBs to DTEh results in an increase in total toxic equivalents (TTEh) that exceeded the pFTAL but was well below (25%) the FTALr. Elevated concentrations of total PCBs in fish from the Kennebec River below Augusta has been previously well documented. Consequently, MCDC has issued a Fish Consumption Advisory recommending no consumption of freshwater fish from this river reach (Appendix 1).

Penobscot River

East Branch at Grindstone- (PBG) The East Branch of the Penobscot River at Grindstone has no point source discharges and was used as a reference station for the Lincoln Paper and Tissue mill from 1995-1998. Due to concerns about discharges from the Millinockett mills into the West Branch that might be ascribed to the Lincoln mill, dioxin concentrations in fish from the Woodville station on the main stem below the confluence of the East and West branches was compared to those from the Grindstone station in 1997 and 1998. With a finding of no significant difference in dioxin concentrations between the two stations, the Woodville station has been used as the reference for Lincoln since 1999. In some recent years, concentrations of DTEh in white suckers from the Woodville station were elevated above historical levels and above those from Grindstone. Consequently, in 2006, as part of the SWAT program, both stations were resampled.

In 2006 5 white suckers (Appendix 5) from Grindstone were captured and analyzed for dioxins, furans and coplanar PCBs. Concentrations of TCDD and DTEh were below the pFTAL (Figure 2, Appendix 2) and similar to historical levels (Appendix 6).

Woodville (Mattaceunk Impoundment)- (PBW) As part of the SWAT monitoring program, 5 white suckers (Appendix 5) were collected from the river at Woodville, downstream of Katahdin Paper's pulp and paper mills in Millinocket and East Millinockett to compare to those from Grindstone, as described above. Fish collected at this station from 1997-2001 had similarly low concentrations of dioxin as the historical reference station at Grindstone on the East Branch, uninfluenced by any mill. Therefore, this station had served as a reference station for the Penobscot River and the upstream station for Lincoln Paper and Tissue above/below (A/B) test. Finding DTEh in suckers in 2002, 2003, and 2005 elevated above historical levels at Woodville and Grindstone, both stations were resampled in 2006.

In 2006 5 white suckers were collected from the Woodville impoundment. Concentrations of TCDD and DTEh were below the pFTAL (Figure 2, Appendix 2) and similar to those from Grindstone and to those at Woodville prior to 2002 (Appendix 6). The elevated levels seen in recent years were not measured in 2006. The addition of dioxin-like (coplanar) PCBs to DTEh results in an increase in total toxic equivalents (TTEh) that exceeds the pFTAL and is significantly higher than that at Grindstone, however.

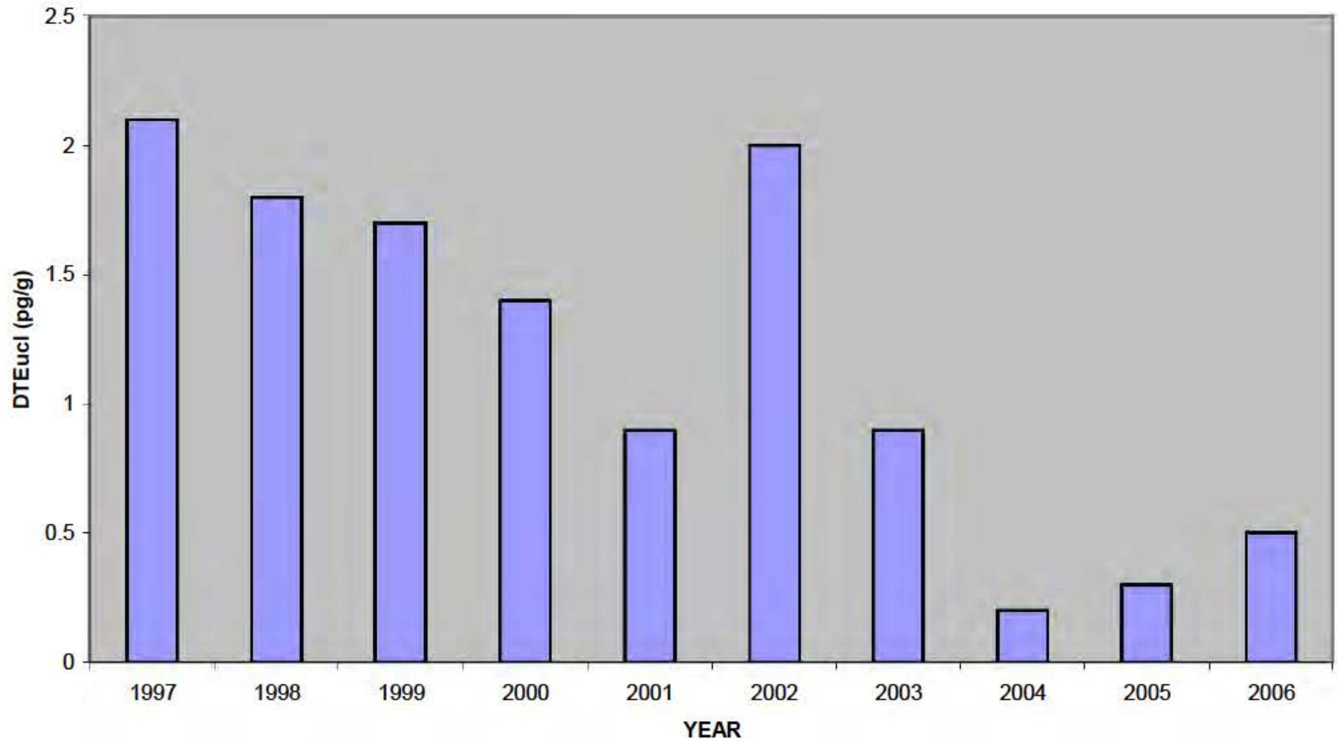
Given the varied results since 2002 and changes at the mills in Millinockett during this time, monitoring should be continued in 2007.

South Lincoln- (PBL) A total of 5 white suckers (Appendix 5) were collected from the river near the boat ramp in South Lincoln, approximately 4 miles downstream of Lincoln Paper and Tissue Company's bleached kraft mill in Lincoln

Concentrations of TCDD and DTEh were significantly elevated above those at Grindstone and Woodville, sampled in the SWAT monitoring program (Appendix 2). Concentrations of DTEh were also above the pFTAL (Figure 2). The addition of dioxin-like (coplanar) PCBs to DTEh results in an increase in total toxic equivalents (TTEh) that are still well below (63%) the FTALr.

There were declining trends in TCDD and DTE for the period 1997-2006, although levels increased significantly in 2006 (Figure 16).

Figure 16. Dioxin concentrations (DTEhucl) in white suckers from the Penobscot River at S Lincoln, Maine



The mill passed the A/B test in 2003 and 2005, and must demonstrate continuing compliance annually. Reduced discharge of dioxin from the mill has been documented by decreased concentrations of TCDD and TCDF in sludge (Appendix 3) and in effluent (Appendix 4) since a change in the mill's bleaching process from chlorine based bleaching to primarily oxygen based bleaching in 1999. These results are consistent with the declining trend seen in fish, and the finding of no measurable discharge by 2005. The results of the 2006 fish testing are conflicting. This warrants a close review of the discharge from the mill and repeat testing both above and below in 2007.

Veazie- (PBV) A total of 5 white suckers (Appendix 6) were collected from the Veazie Impoundment about 7-8 miles below the former Fort James' bleached kraft mill in Old Town (Appendix 5). This mill closed in March 2006. It was purchased by Red Shield in November 2006 and currently is operated as a biomass boiler producing power for the grid.

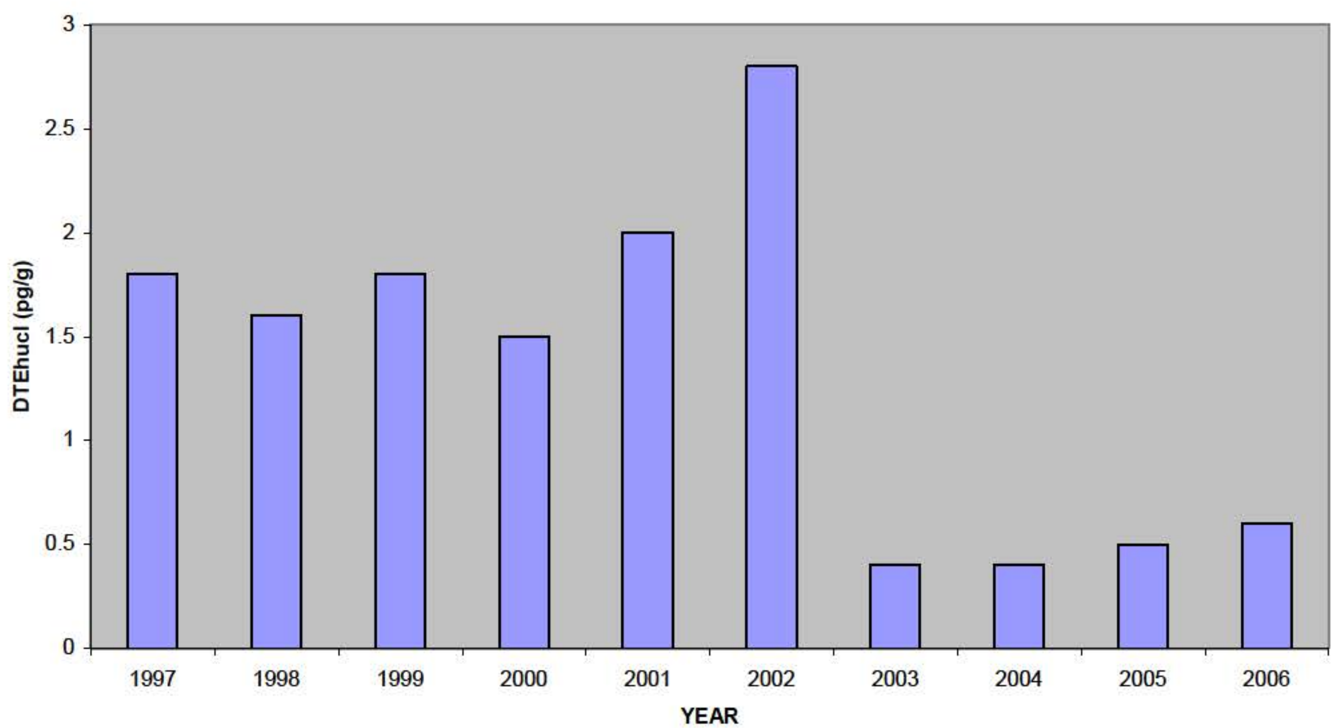
Concentrations of TCDD were similar to those at background stations unimpacted by point source discharges (Appendix 6). DTEh, however, were elevated and exceeded the pFTAL (Figure 2),

Appendix 2). The addition of dioxin-like (coplanar) PCBs to DTEh results in an increase in total toxic equivalents (TTEh) that are still below (78%) the FTALr.

There was a declining trend for TCDD for the period 1997-2006, but none for DTEh (Figure 17). This is a bit surprising since TCDD and TCDF bleach plant effluent concentrations at the Georgia Pacific mill have continued to decline since early 1998 and remain below suitably low detection levels (Appendix 4). Nevertheless, concentrations are significantly lower since 2003 compared to previous years.

The 2003 and 2004 A/B tests had documented that there was no longer a measurable discharge of dioxin from the mill. Continued compliance in 2006 was documented by non-detected concentrations in bleach plant effluent (Appendix 4). Additional periodic monitoring and certification of bleach plant operation will be necessary to confirm continued reduced concentrations under new owners and operations if the facility will be operated as a pulp and or paper mill, which may occur.

Figure 17. Dioxin concentrations (DTEhucl) in white suckers from the Penobscot River at Veazie, Maine



Presumpscot River

The Presumpscot River has not been sampled since 2002, when the A/B fish test found no significant difference in dioxin concentrations above and below SD Warrens' paper mill for the second year. The pulp mill had closed in 1999, and the paper mill continued with purchased pulp. In 2006, at the request of MCDC, fish were sampled again as part of the SWAT monitoring program.

Windham -(PWD) A total of 5 smallmouth bass (Appendix 5) were collected from the Dundee Impoundment in the river in Windham, upstream of the mill. Concentrations of TCDD and DTEh were similar to those from historical reference stations unimpacted by point source discharges (Appendix 6). This was not always the case for some unknown reason. This "reference" station had no point source discharges above it, but often had higher concentrations than all other reference stations with no point sources. The addition of dioxin-like (coplanar) PCBs to DTEh resulted in an increase in total toxic equivalents (TTEh) that approached only the pFTAL. There are not enough recent data for meaningful trends analysis.

Westbrook- (PWB) A total of 5 smallmouth bass (Appendix 5) were collected from the river below SD Warren's paper mill in Westbrook. Concentrations of TCDD and DTEh were similar to those from Windham (Appendix 2, Figure 1). The addition of dioxin-like (coplanar) PCBs to DTEh resulted in an increase in total toxic equivalents (TTEh) that exceeded the pFTAL. There was no trend in either TCDD or DTEh.

Salmon Falls River

There is currently a fish consumption advisory on the Salmon Falls River below Berwick due to a combination of dioxins and PCBs. Up through 2002, fish samples have been collected from the Salmon Falls River about 2 miles below the discharge from the Berwick Sewer District's municipal wastewater treatment plant in Berwick, whose discharge ranged from 65-70% effluent from Prime Tanning Company in the past to ~40% currently. Sampling was scheduled for 2003 and 2004 but fish were not captured. DEP's long standing policy has been that where there is a single discharger of dioxin in a river, fish sampling is the best way to determine the status of any discharge. Where there is more than one source, sampling of sludge may be used to determine discharge status. Prime Tanning Company notified DEP that there was an additional source historically in Somersworth NH. Consequently, after discussion with the New Hampshire Department of Environmental Services, testing of both Berwick and Somersworth, NH wastewater treatment plant sludge was substituted for fish testing on a quarterly basis. The results of the first 4 quarters' sampling show that concentrations from both are relatively low but similar to those from the Town of Hartland (with the discharge from Irving Tanning) below which are significantly elevated concentrations in fish (Appendix 3). Samples will be collected in the next 4 quarters as well.

In 2006 at the request of MCDC as part of DEP's SWAT monitoring program, fish were also collected above and below the Berwick discharge for analyses for dioxins and PCBs.

Spaulding Pond- SFP A total of 5 largemouth bass (Appendix 5) were collected from Spaulding Pond in Lebanon, upstream of the Berwick discharge. There are no known significant point source discharges above this station. Concentrations of TCDD and DTEh were similar to those previously reported at another reference station upstream at Acton) (Appendix 6). DTEh were below the pFTAL (Figure 1). The addition of dioxin-like (coplanar) PCBs to DTEh resulted in an increase in total toxic equivalents (TTEh) that exceeded the pFTAL but was well below (54%) the FTALr There are not enough recent data for meaningful trends analysis.

South Berwick- A total of 5 largemouth bass (Appendix 5) were collected from the Rollinsford Impoundment about 2 miles below the discharge from the Berwick Sewer District's municipal wastewater treatment plant in Berwick, whose discharge is dominated by effluent from Prime Tanning Company. Concentrations of TCDD and DTEh were similar to those at Acton (Appendix 6, Figure 1). DTEh were below the pFTAL (Figure 1). Concentrations were also significantly lower than in previous years (Appendix 6), which is consistent with low levels found in the sludge (Appendix 4). The addition of dioxin-like (coplanar) PCBs to DTEh resulted in an increase in total toxic equivalents (TTEh) that exceeded the pFTAL but was well below (29%) the FTALr. There was no trend in either TCDD or DTEh.

Sebasticook River

Historical discharges of dioxin have been documented on both the East and West Branches of the Sebasticook River. In 2006, at the request of MCDC as part of DEP's SWAT monitoring program, fish were sampled from the East Branch and main stem. Sampling of the West Branch continued under the Dioxin Monitoring Program.

East Branch at Newport- (SEN) A total of 5 largemouth bass (Appendix 5) were collected from the river just above the County Road Bridge, a popular fishing spot at the inlet to Sebasticook Lake. This station is approximately 2 miles below the Corinna Sewer District discharge, 80% of which was from the Eastland Woolen Mill. This facility treated the waste from the Eastland Woolen Mill in Corinna until 1996, when the mill ceased operation. Since then groundwater and river sediments have been found to be contaminated with a number of pollutants from the mill including dioxin. The site was placed on the National Priorities List of Superfund sites in 1999, and extensive remediation included removal of contaminated soil and the buildings in the 'downtown area' and relocation of a portion of the riverbed. In addition, the Corinna discharge was removed from the river, going to land treatment in 2005.

Concentrations of TCDD in 2006 were similar to those of historical reference stations unimpacted by point source discharges and lower than previous levels (Appendix 6). DTEh, however, were elevated above the pFTAL (Appendix 2, Figure 1). The addition of dioxin-like (coplanar) PCBs to DTEh resulted in an increase in total toxic equivalents (TTEh) that approached (88%) the pFTALr.

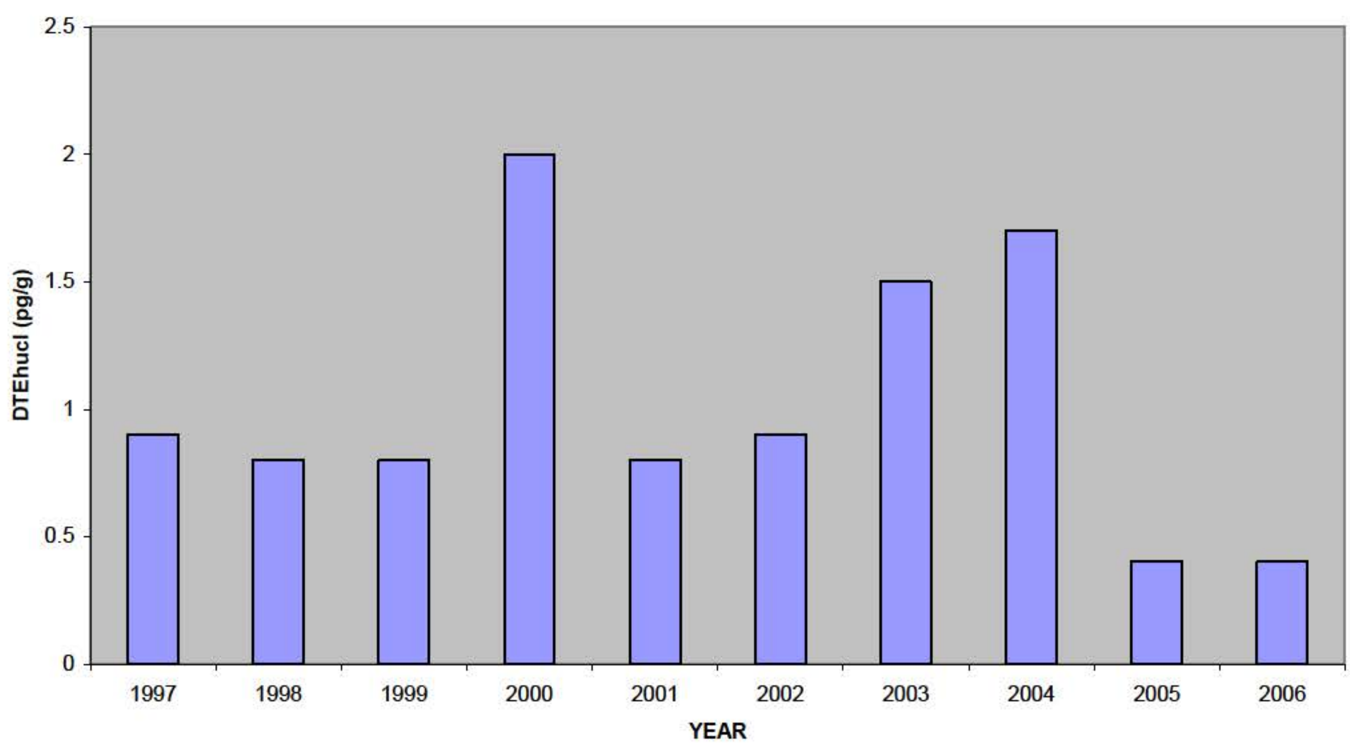
Although there are not enough recent data for meaningful trends analysis, in 2006 DTEh were somewhat lower than previous levels (Appendix 6) likely documenting the effects of remediation.

West Branch at Palmyra (SWP) A total of 5 largemouth bass were collected from the river near the US Route 2 bridge about 3-4 miles below the discharge from the Town of Hartland, whose effluent is about 85% effluent from Irving Tanning Company (Appendix 5).

TCDD concentrations were elevated slightly above those of historical reference stations unimpacted by point source discharges (Appendix 6). Concentrations of DTEh were also elevated and right at the pFTAL (Figure 1, Appendix 2). The addition of dioxin-like (coplanar) PCBs to DTEh results in total toxic equivalents (TTEh) that exceed the pFTAL but are well below (32%) the FTALr. Concentrations are still higher than those from the upstream reference station in previous years or from other reference stations in Maine.

There is no declining trend due to the wide variation among the years, but concentrations in 2006 were also much lower than in previous years (Figure 18). These results document a current or historical local source of dioxin to this reach of the river, most likely the Irving Tanning discharge. Although the only effluent sample result reported (1996) showed no detectable amount of dioxin in effluent (Appendix 4), low solubility and high bioconcentration of dioxin make effluent data less meaningful than sludge data. Sludge data from 1989 show measurable levels of TCDF (Appendix 3), but more recent data in 2000 show concentrations below reasonably low detection levels. If these recent data are representative of reduced discharges, concentrations in fish should decrease in time, the length of which will be determined by how much residual dioxin remains in the system. Because the West Branch is heavily fished, continued monitoring is warranted.

Figure 18. Dioxin concentrations (DTEhucl) in largemouth bass from the West Branch Sebasticook River at Palmyra, Maine



Burnham- (SEB) A total of 5 smallmouth bass (Appendix 5) were collected from the main stem of the Sebasticook River below the confluence of the East Branch and West Branch (Appendix 5) at the request of the MCDC as part of Maine's Surface Water Ambient Toxics (SWAT) monitoring program. This reach, then, receives water from upstream sources from SEN and SWP.

Concentrations of TCDD were slightly elevated above those at historical reference stations unimpacted by point source discharges (Appendix 6). Concentrations of DTEh were also elevated at the pFTAL (Figure 1, Appendix 2). There results are not surprising given the existence of sources upstream on each branch of the river. The addition of dioxin-like (coplanar) PCBs to DTEh results in total toxic equivalents (TTEh) that further exceed the pFTAL but are well below (37%) the FTALr.

There are not enough data for trends analysis, but concentrations were similar to those from 2005 and slightly lower than those in 2004.

APPENDIX 1.

FISH CONSUMPTION ADVISORIES

MAINE BUREAU OF HEALTH

WARNING About Eating Freshwater Fish

Warning: Mercury in Maine freshwater fish may harm the babies of pregnant and nursing mothers, and young children.

SAFE EATING GUIDELINES

Pregnant and nursing women, women who may get pregnant, and children under age 8 SHOULD NOT EAT any freshwater fish from Maine's inland waters. Except, for brook trout and landlocked salmon, 1 meal per month is safe.

All other adults and children older than 8 CAN EAT 2 freshwater fish meals per month. For brook trout and landlocked salmon, the limit is 1 meal per week.

It's hard to believe that fish that looks, smells, and tastes fine may not be safe to eat. But the truth is that fish in Maine lakes, ponds, and rivers have mercury in them. Other states have this problem too. Mercury in the air settles into the waters. It then builds up in fish. For this reason, older fish have higher levels of mercury than younger fish. Fish (like pickerel and bass) that eat other fish have the highest mercury levels.

Small amounts of mercury can harm a brain starting to form or grow. That is why unborn and nursing babies, and young children are most at risk. Too much mercury can affect behavior and learning. Mercury can harm older children and adults, but it takes larger amounts. It may cause numbness in hands and feet or changes in vision. The Safe Eating Guidelines identify limits to protect everyone.

See http://www.maine.gov/dhs/ehu/fish/2KFCA.shtml

Warning: Some Maine waters are polluted, requiring additional limits to eating fish.

Fish caught in some Maine waters have high levels of PCBs, Dioxins or DDT in them. These chemicals can cause cancer and other health effects. The Bureau of Health recommends additional fish consumption limits on the waters listed below. Remember to check the mercury guidelines. If the water you are fishing is listed below, check the mercury guideline above and follow the most limiting guidelines.

SAFE EATING GUIDELINES

Androscoggin River Gilead to Merrymeeting Bay:-------------------6-12 fish meals a year.
Dennys River Meddybemps Lake to Dead Stream:-------------------1-2 fish meals a month.
Green Pond, Chapman Pit, & Greenlaw Brook
(Limestone):--Do not eat any fish from these waters.
Little Madawaska River & tributaries
(Madwaska Dam to Grimes Mill Road):--------------Do not eat any fish from these waters.
Kennebec River Augusta to the Chops:--------------Do not eat any fish from these waters.
Shawmut Dam in Fairfield to Augusta:-------5 trout meals a year, 1-2 bass meals a month.
Madison to Fairfield: ---1-2 fish meals a month.
Meduxnekeag River: --- 2 fish meals a month.
North Branch Presque Isle River--2 fish meals a month.
Penobscot River below Lincoln:---1-2 fish meals a month
Prestile Stream:---1 fish meal a month.
Red Brook in Scarborough: -- 6 fish meals a year.
Salmon Falls River below Berwick: -------------------------------------6-12 fish meals a year.
Sebasticook River (East Branch, West Branch & Main Stem)
(Corinna/Hartland to Winslow):---2 fish meals a month.

APPENDIX 2.

DIOXIN AND FURAN CONCENTRATIONS IN 2004 FISH AND SHELLFISH SAMPLES

DEP ID			AGL RBT 4		AGL RBT 4 (Duplicate)		AGL RBT 4		AGL RBT 1		AGL RBT 2
EXT ID			L9459-78 (A)		WG20719-103 (DUP L9459-78)				L9459-75		L9459-76
			ng/kg		ng/kg		mean		ng/kg		ng/kg
Compound											
2,3,7,8-TCDF			4.82		4.65		4.735		1.24		2.15
1,2,3,7,8-PeCDF			0.726		0.78		0.753		0.575		0.244
2,3,4,7,8-PeCDF			1.31		1.33		1.32		1.3		0.547
1,2,3,4,7,8-HxCDF			0.14		0.122		0.131		0.126	<	0.0638
1,2,3,6,7,8-HxCDF		<	0.0836	<	0.0838	<	0.0837	<	0.0903	<	0.0731
2,3,4,6,7,8-HxCDF		<	0.0748		0.119		0.0969	<	0.0809	<	0.0655
1,2,3,7,8,9-HxCDF		<	0.0904	<	0.0906	<	0.0905	<	0.0977	<	0.0791
1,2,3,4,6,7,8-HpCDF		<	0.124	<	0.125	<	0.1245	<	0.134	<	0.109
1,2,3,4,7,8,9-HpCDF		<	0.104	<	0.104	<	0.104	<	0.112	<	0.091
OCDF		<	0.0962	<	0.0965	<	0.09635	<	0.104	<	0.0842
2,3,7,8-TCDD			0.142		0.139		0.1405		0.188	K	0.093
1,2,3,7,8-PeCDD		<	0.126	<	0.127	<	0.1265	<	0.137	<	0.111
1,2,3,4,7,8-HxCDD		<	0.194	<	0.195	<	0.1945	<	0.21	<	0.17
1,2,3,6,7,8-HxCDD		<	0.121		0.124		0.1225	<	0.13	<	0.105
1,2,3,7,8,9-HxCDD		<	0.0865	<	0.0867	<	0.0866	<	0.0935	<	0.0757
1,2,3,4,6,7,8-HpCDD		<	0.109	<	0.109	<	0.109	<	0.118	<	0.0952
OCDD		<	0.328	<	0.328	<	0.328	<	0.354	<	0.287
DTEo			**1.05**		**1.06**		**1.055**		**0.732**		**0.386**
DTEd			**1.25**		**1.24**		**1.245**		**0.943**		**0.606**
DTEh			**1.15**		**1.15**		**1.15**		**0.837**		**0.496**
DTEh sd											
DTEh confidence											
DTEh 95 UCL											
% FTAL											
% Lipid			3.45		3.42		3.435		0.97		1.81
Sample weight (g)			10.3		10.3		10.3		10.5		11.8
% Moisture			75.8		76.8		76.3		79.1		77.2
FLAGS	<	=not detected									
	K	=peak detected, but did not meet quantification criteria, result reported represents the estimated maximum possible									
	D	=dilution data									
	J	=concentration less than LMCL									
	B	=analyte found in sample and the associated blank									

DEP ID		AGL RBT 3		AGL RBT 5	**AGL RBT**		ARF SMB 1		ARF SMB 2		ARF SMB 3
EXT ID		L9459-77		L9459-79			L9459-80		L9459-81		L9459-82
		ng/kg		ng/kg	**MEAN**		ng/kg		ng/kg		ng/kg
Compound											
2,3,7,8-TCDF		1.55		0.822	**2.10**		1.19		0.72		1.5
1,2,3,7,8-PeCDF		0.317	K	0.161	**0.41**		0.496		0.161		0.472
2,3,4,7,8-PeCDF		0.548		0.312	**0.81**		1.1		0.434		0.825
1,2,3,4,7,8-HxCDF		0.114	<	0.0727	**0.10**		0.073	<	0.0721		0.116
1,2,3,6,7,8-HxCDF	<	0.0769	<	0.0833	**0.08**	<	0.0785	<	0.0827	<	0.0817
2,3,4,6,7,8-HxCDF	<	0.0688	<	0.0746	**0.08**	K	0.091	<	0.074		0.082
1,2,3,7,8,9-HxCDF	<	0.0831	<	0.0901	**0.09**	<	0.0849	<	0.0894	<	0.0883
1,2,3,4,6,7,8-HpCDF	<	0.114	<	0.124	**0.12**	<	0.117	<	0.123	<	0.122
1,2,3,4,7,8,9-HpCDF	<	0.0956	<	0.104	**0.10**	<	0.0977	<	0.103	<	0.102
OCDF	<	0.0885	<	0.0959	**0.09**	<	0.0904	<	0.0952	<	0.094
2,3,7,8-TCDD	K	0.07	K	0.077	**0.11**	K	0.137	K	0.104	K	0.131
1,2,3,7,8-PeCDD	<	0.116	<	0.126	**0.12**	<	0.119	<	0.125	<	0.123
1,2,3,4,7,8-HxCDD	<	0.179	<	0.194	**0.19**	<	0.183	<	0.192	<	0.19
1,2,3,6,7,8-HxCDD	<	0.111	<	0.12	**0.12**	<	0.113	<	0.119	<	0.118
1,2,3,7,8,9-HxCDD	<	0.0795	<	0.0862	**0.08**	<	0.0813	<	0.0856	<	0.0845
1,2,3,4,6,7,8-HpCDD	<	0.1	<	0.109	**0.11**	<	0.102	<	0.108	<	0.106
OCDD	<	0.301	<	0.327	**0.32**	<	0.308	<	0.324	<	0.32
DTEo		**0.34**		**0.176**	**0.54**		**0.471**		**0.207**		**0.431**
DTEd		**0.564**		**0.429**	**0.76**		**0.7**		**0.455**		**0.662**
DTEh		**0.452**		**0.302**	**0.65**		**0.586**		**0.331**		**0.547**
DTEh sd					**0.34**						
DTEh confidence					**0.30**						
DTEh 95 UCL					**0.95**						
% FTAL					**63**						
% Lipid		1.75		1.48	**1.89**		0.76		1.11		1.27
Sample weight (g)		11.2		10.3	**10.82**		11		10.4		10.5
% Moisture		76.9		78	**77.50**		78.3		77.9		79.1
FLAGS											
	concentration										

DEP ID		ARF SMB 4		ARF SMB 5	**ARF SMB**		ARY SMB 1		ARY SMB 2		ARY SMB 3		ARY SMB 4
EXT ID		L9459-83		L9459-84			L9459-15		L9459-16		L9459-17		L9459-18
		ng/kg		ng/kg	**MEAN**		ng/kg		ng/kg		ng/kg		ng/kg
Compound													
2,3,7,8-TCDF		0.724	K	0.154	**0.86**	K	0.416	K	0.726		0.734		0.415
1,2,3,7,8-PeCDF		0.225		0.113	**0.29**		0.113		0.189		0.177	<	0.0913
2,3,4,7,8-PeCDF		0.532		0.287	**0.64**		0.207		0.248		0.447		0.169
1,2,3,4,7,8-HxCDF	<	0.0674	<	0.0673	**0.08**	<	0.0741	<	0.0742	<	0.0725	<	0.0713
1,2,3,6,7,8-HxCDF	<	0.0773	<	0.0772	**0.08**	<	0.085	<	0.0851	<	0.0832	<	0.0818
2,3,4,6,7,8-HxCDF	<	0.0692	<	0.0691	**0.08**	<	0.0761	<	0.0762	<	0.0745	<	0.0732
1,2,3,7,8,9-HxCDF	<	0.0836	<	0.0835	**0.09**	<	0.0919	<	0.092	<	0.0899	<	0.0884
1,2,3,4,6,7,8-HpCDF	<	0.115	<	0.115	**0.12**	<	0.126	<	0.127	<	0.124	<	0.122
1,2,3,4,7,8,9-HpCDF	<	0.0961	<	0.0961	**0.10**	<	0.106	<	0.106	<	0.103	<	0.102
OCDF	<	0.089	<	0.0889	**0.09**	K	0.099	<	0.0979	<	0.0957	<	0.0941
2,3,7,8-TCDD	K	0.113	K	0.081	**0.11**	K	0.056	B	0.068	KB	0.105	KB	0.074
1,2,3,7,8-PeCDD	<	0.117	<	0.117	**0.12**	<	0.128	<	0.129	<	0.126	<	0.124
1,2,3,4,7,8-HxCDD	<	0.18	<	0.18	**0.19**	<	0.198	<	0.198	<	0.193	<	0.19
1,2,3,6,7,8-HxCDD	<	0.111	<	0.111	**0.11**	<	0.123	<	0.123	<	0.12	<	0.118
1,2,3,7,8,9-HxCDD	<	0.08	<	0.0799	**0.08**	<	0.0879	<	0.088	<	0.0861	<	0.0846
1,2,3,4,6,7,8-HpCDD	<	0.101	<	0.101	**0.10**	<	0.111	B	0.15	<	0.108	B	0.127
OCDD	<	0.303	<	0.303	**0.31**	<	0.333	B	0.692	<	0.326	B	0.487
DTEo		**0.239**		**0.0895**	**0.29**		**0.0655**		**0.15**		**0.213**		**0.0936**
DTEd		**0.471**		**0.326**	**0.52**		**0.325**		**0.36**		**0.463**		**0.341**
DTEh		**0.355**		**0.208**	**0.41**		**0.195**		**0.255**		**0.338**		**0.217**
DTEh sd					**0.16**								
DTEh confidence					**0.14**								
DTEh 95 UCL					**0.54**								
% FTAL					**36**								
% Lipid		0.62		0.25	**0.80**		0.57		0.64		0.69		0.44
Sample weight (g)		11.1		11.1	**10.82**		10.1		10.1		10.3		10.5
% Moisture		78.1		78.4	**78.36**		57.6		78.4		77.3		77.2
FLAGS													

DEP ID		ARY SMB 5	**ARY SMB**		ARY WHS 1		ARY WHS 1 (Duplicate)		ARY WHS 1		ARY WHS 2
EXT ID		L9459-19			L9459-20 (A)		WG20672-103 (DUP L9459-20)				L9459-21
		ng/kg	**MEAN**		ng/kg		ng/kg		mean		ng/kg
Compound											
2,3,7,8-TCDF		0.573	**0.57**		3.73		4.08		2.1514		7.62
1,2,3,7,8-PeCDF		0.122	**0.14**		0.281		0.333		0.20973		0.73
2,3,4,7,8-PeCDF		0.229	**0.26**		0.407		0.453		0.3335		1.04
1,2,3,4,7,8-HxCDF	<	0.0729	**0.07**	K	0.088	K	0.139	K	0.0805		0.256
1,2,3,6,7,8-HxCDF	<	0.0836	**0.08**	<	0.0823	<	0.0816	<	0.08302	<	0.0837
2,3,4,6,7,8-HxCDF	<	0.0748	**0.07**	<	0.0737	<	0.0731	<	0.07433	<	0.075
1,2,3,7,8,9-HxCDF	<	0.0904	**0.09**	<	0.089	<	0.0882	<	0.08976	<	0.0906
1,2,3,4,6,7,8-HpCDF	<	0.124	**0.12**	<	0.122	<	0.121	<	0.1233	<	0.125
1,2,3,4,7,8,9-HpCDF	<	0.104	**0.10**	<	0.102	<	0.102	<	0.1031	<	0.104
OCDF	<	0.0962	**0.10**	<	0.0947	<	0.0939	<	0.09564	<	0.0964
2,3,7,8-TCDD	KB	0.054	**0.07**	B	0.145	KB	0.147	KB	0.1082	B	0.206
1,2,3,7,8-PeCDD	<	0.126	**0.13**	<	0.124	<	0.123	<	0.1253	<	0.127
1,2,3,4,7,8-HxCDD	<	0.194	**0.19**	<	0.191	<	0.19	<	0.1928	<	0.195
1,2,3,6,7,8-HxCDD	<	0.121	**0.12**	<	0.119	<	0.118	<	0.12	K	0.171
1,2,3,7,8,9-HxCDD	<	0.0865	**0.09**	<	0.0852	<	0.0844	<	0.08591	<	0.0867
1,2,3,4,6,7,8-HpCDD	<	0.109	**0.12**	KB	0.153	KB	0.119	KB	0.137	B	0.29
OCDD	B	0.417	**0.45**	<	0.322	<	0.32	<	0.3865	KB	0.412
DTEo		**0.13**	**0.13**		**0.649**		**0.554**		**0.38971**		**1.33**
DTEd		**0.38**	**0.37**		**0.847**		**0.798**		**0.6104**		**1.53**
DTEh		**0.255**	**0.25**		**0.748**		**0.676**		**0.5**		**1.43**
DTEh sd			**0.05**								
DTEh confidence			**0.05**								
DTEh 95 UCL			**0.30**								
% FTAL			**20**								
% Lipid		0.6	**0.59**		2.18		2.33		1.384		4.22
Sample weight (g)		10.3	**10.26**		10.5		10.5		10.38		10.3
% Moisture		78.8	**73.86**		77.7		77.6		75.78		75.3
FLAGS											

DEP ID		ARY WHS 3		ARY WHS 4		ARY WHS 5	**ARY WHS**		ALV SMB 1		ALV SMB 2		ALV SMB 3
EXT ID		L9459-22		L9459-23		L9459-24			L9459-35		L9459-36		L9459-37
		ng/kg		ng/kg		ng/kg	**MEAN**		ng/kg		ng/kg		ng/kg
Compound													
2,3,7,8-TCDF		4.03		9.26		9.78	**6.57**	K	0.187		0.378		0.187
1,2,3,7,8-PeCDF		0.341		0.64		0.685	**0.52**		0.127		0.161	<	0.0943
2,3,4,7,8-PeCDF		0.47		1.17		1.22	**0.85**		0.268		0.345	K	0.167
1,2,3,4,7,8-HxCDF		0.103	K	0.204	K	0.166	**0.16**	<	0.0749	<	0.0743	<	0.0737
1,2,3,6,7,8-HxCDF	<	0.0743	K	0.093	<	0.0832	**0.08**	<	0.0858	<	0.0852	<	0.0845
2,3,4,6,7,8-HxCDF		0.068	K	0.078		0.086	**0.08**	<	0.0769	<	0.0762	<	0.0756
1,2,3,7,8,9-HxCDF	<	0.0803	<	0.0861	<	0.0899	**0.09**	<	0.0928	<	0.0921	<	0.0914
1,2,3,4,6,7,8-HpCDF	<	0.111	<	0.119	<	0.124	**0.12**	<	0.128	<	0.127	<	0.126
1,2,3,4,7,8,9-HpCDF	<	0.0924	<	0.0991	<	0.103	**0.10**	<	0.107	<	0.106	<	0.105
OCDF	KB	0.105	<	0.0917	<	0.0957	**0.10**	<	0.0988	<	0.098	<	0.0973
2,3,7,8-TCDD	KB	0.101	B	0.246	KB	0.266	**0.19**	K	0.077	K	0.115	K	0.065
1,2,3,7,8-PeCDD	<	0.112	<	0.12	<	0.126	**0.12**	<	0.13	<	0.129	<	0.128
1,2,3,4,7,8-HxCDD	<	0.173	<	0.185	<	0.193	**0.19**	<	0.2	<	0.198	<	0.196
1,2,3,6,7,8-HxCDD	<	0.107	<	0.115	<	0.12	**0.13**	<	0.124	<	0.123	<	0.122
1,2,3,7,8,9-HxCDD	<	0.0769	<	0.0824	<	0.0861	**0.08**	<	0.0888	<	0.0881	<	0.0874
1,2,3,4,6,7,8-HpCDD	KB	0.146	B	0.169	B	0.165	**0.18**	<	0.112	<	0.111	<	0.11
OCDD	B	0.318	<	0.312	B	0.614	**0.41**	<	0.336	<	0.334	<	0.331
DTEo		**0.571**		**1.54**		**1.37**	**1.04**		**0.0842**		**0.146**		**0.0187**
DTEd		**0.781**		**1.74**		**1.62**	**1.26**		**0.347**		**0.402**		**0.305**
DTEh		**0.676**		**1.64**		**1.5**	**1.15**		**0.216**		**0.274**		**0.162**
DTEh sd							**0.52**						
DTEh confidence							**0.46**						
DTEh 95 UCL							**1.61**						
% FTAL							**107**						
% Lipid		2.33		3.76		3.29	**3.00**		0.32		0.58		0.55
Sample weight (g)		11.6		10.8		10.3	**10.68**		10		10.1		10.2
% Moisture		75.3		74.1		75.4	**75.18**		79		77.9		78
FLAGS													

DEP ID		ALV SMB 4		ALV SMB 5	**ALV SMB**		ALV WHS 2		ALV WHS 2 (Duplicate)		ALV WHS 2
EXT ID		L9459-38		L9459-39			L9459-41 (A)		WG20674-103 (DUP L9459-41)		
		ng/kg		ng/kg	**MEAN**		ng/kg		ng/kg		mean
Compound											
2,3,7,8-TCDF	K	0.155	K	0.186	**0.22**		6.89		8.1		7.495
1,2,3,7,8-PeCDF		0.097	<	0.0951	**0.11**		0.508		0.53		0.519
2,3,4,7,8-PeCDF		0.191	K	0.159	**0.23**		0.947		1.01		0.9785
1,2,3,4,7,8-HxCDF	<	0.0723	<	0.0743	**0.07**	K	0.146		0.148		0.147
1,2,3,6,7,8-HxCDF	<	0.0829	<	0.0852	**0.08**	<	0.0847	<	0.0847	<	0.0847
2,3,4,6,7,8-HxCDF	<	0.0743	<	0.0762	**0.08**	<	0.0759	K	0.076	K	0.07595
1,2,3,7,8,9-HxCDF	<	0.0897	<	0.0921	**0.09**	<	0.0916	<	0.0916	<	0.0916
1,2,3,4,6,7,8-HpCDF	<	0.123	<	0.127	**0.13**	<	0.126	<	0.126	<	0.126
1,2,3,4,7,8,9-HpCDF	<	0.103	<	0.106	**0.11**	<	0.105	<	0.105	<	0.105
OCDF	<	0.0955	<	0.098	**0.10**	<	0.0975	<	0.0975	<	0.0975
2,3,7,8-TCDD	K	0.052	K	0.061	**0.07**		0.246	K	0.294	K	0.27
1,2,3,7,8-PeCDD	<	0.125	<	0.129	**0.13**	<	0.128	<	0.128	<	0.128
1,2,3,4,7,8-HxCDD	<	0.193	<	0.198	**0.20**	<	0.197	<	0.197	<	0.197
1,2,3,6,7,8-HxCDD	<	0.12	<	0.123	**0.12**		0.123		0.137		0.13
1,2,3,7,8,9-HxCDD	<	0.0858	<	0.0881	**0.09**	<	0.0877	<	0.0877	<	0.0877
1,2,3,4,6,7,8-HpCDD	<	0.108	<	0.111	**0.11**	K	0.129		0.132		0.1305
OCDD	<	0.325	<	0.334	**0.33**	<	0.332	<	0.332	<	0.332
DTEo		**0.0602**		**0**	**0.06**		**1.25**		**1.16**		**1.205**
DTEd		**0.313**		**0.294**	**0.33**		**1.44**		**1.39**		**1.415**
DTEh		**0.187**		**0.147**	**0.20**		**1.34**		**1.28**		**1.31**
DTEh sd					**0.05**						
DTEh confidence					**0.04**						
DTEh 95 UCL					**0.24**						
% FTAL					**16**						
% Lipid		0.22		0.35	**0.40**		2.86		2.83		2.845
Sample weight (g)		10.4		10.1	**10.16**		10.2		10.2		10.2
% Moisture		80.3		80	**79.04**		77.5		78		77.75
FLAGS											

DEP ID		ALV WHS 1		ALV WHS 3		ALV WHS 4		ALV WHS 5	**ALV WHS**		AGI SMB 1		AGI SMB 2
EXT ID		L9459-40		L9459-42		L9459-43		L9459-44			L9502-39		L9502-40
		ng/kg		ng/kg		ng/kg		ng/kg	**MEAN**		ng/kg		ng/kg
Compound													
2,3,7,8-TCDF		5.85		9.72		4.41		10.2	**7.54**		0.526		0.583
1,2,3,7,8-PeCDF		0.475		0.529		0.369		0.672	**0.51**		0.14	K	0.151
2,3,4,7,8-PeCDF		0.852		0.968		0.615		1.1	**0.90**		0.248		0.239
1,2,3,4,7,8-HxCDF	K	0.14		0.159	K	0.149		0.19	**0.16**	<	0.0749	<	0.0702
1,2,3,6,7,8-HxCDF	<	0.0843	<	0.0847	<	0.086	<	0.0857	**0.09**	<	0.0858	<	0.0805
2,3,4,6,7,8-HxCDF		0.083	K	0.086	<	0.077	<	0.0768	**0.08**	<	0.0769	<	0.072
1,2,3,7,8,9-HxCDF	<	0.0912	<	0.0915	<	0.093	<	0.0927	**0.09**	<	0.0928	<	0.087
1,2,3,4,6,7,8-HpCDF	<	0.125	<	0.126	<	0.128	<	0.128	**0.13**	<	0.128	<	0.12
1,2,3,4,7,8,9-HpCDF	<	0.105	<	0.105	<	0.107	<	0.107	**0.11**	<	0.107	<	0.1
OCDF	<	0.0971	<	0.0974		0.119	<	0.0987	**0.10**	<	0.0988	<	0.0926
2,3,7,8-TCDD		0.204	K	0.28		0.139	K	0.324	**0.24**	K	0.137	K	0.095
1,2,3,7,8-PeCDD	<	0.127	<	0.128	<	0.13		0.144	**0.13**	<	0.13	<	0.122
1,2,3,4,7,8-HxCDD	<	0.196	<	0.197	<	0.2	<	0.199	**0.20**	<	0.2	<	0.187
1,2,3,6,7,8-HxCDD	<	0.122	<	0.122	<	0.124		0.179	**0.14**	<	0.124	<	0.116
1,2,3,7,8,9-HxCDD	<	0.0873	<	0.0876	<	0.089	<	0.0887	**0.09**	<	0.0888	<	0.0833
1,2,3,4,6,7,8-HpCDD	K	0.144	K	0.117		0.182		0.191	**0.15**	<	0.112	<	0.105
OCDD	<	0.33	<	0.332	K	0.351	<	0.336	**0.34**	<	0.336	<	0.315
DTEo		**1.07**		**1.29**		**0.777**		**1.55**	**1.18**		**0.131**		**0.13**
DTEd		**1.26**		**1.54**		**0.984**		**1.66**	**1.37**		**0.389**		**0.374**
DTEh		**1.17**		**1.42**		**0.881**		**1.61**	**1.28**		**0.26**		**0.252**
DTEh sd									**0.27**				
DTEh confidence									**0.24**				
DTEh 95 UCL									**1.52**				
% FTAL									**101**				
% Lipid		2.21		1.89		1.82		4.7	**2.69**		0.5		0.53
Sample weight (g)		10.2		10.2		10		10	**10.12**		10		10.7
% Moisture		79.3		77.8		78.2		77.2	**78.05**		80		78.6
FLAGS													

DEP ID		AGI SMB 3		AGI SMB 4		AGI SMB 5	**AGI SMB**		ALW SMB 1,5,6,8,9		ALW SMB 2,3,4,7,10
EXT ID		L9502-41		L9502-42		L9502-43			L9459-3		L9459-4
		ng/kg		ng/kg		ng/kg	**MEAN**		ng/kg		ng/kg
Compound											
2,3,7,8-TCDF		0.158		1.26		0.561	**0.62**		0.308		0.177
1,2,3,7,8-PeCDF	K	0.083		0.345		0.166	**0.18**		0.096		0.097
2,3,4,7,8-PeCDF		0.159		0.611		0.291	**0.31**		0.236		0.29
1,2,3,4,7,8-HxCDF	<	0.0636	<	0.0676	<	0.0727	**0.07**	<	0.0717	<	0.0716
1,2,3,6,7,8-HxCDF	<	0.0729	<	0.0775	<	0.0833	**0.08**	<	0.0822	<	0.0821
2,3,4,6,7,8-HxCDF	<	0.0653	K	0.157		0.083	**0.09**	<	0.0736	<	0.0735
1,2,3,7,8,9-HxCDF	<	0.0788	<	0.0838	<	0.0901	**0.09**	<	0.0889	<	0.0887
1,2,3,4,6,7,8-HpCDF	<	0.108	<	0.115	<	0.124	**0.12**	<	0.122	<	0.122
1,2,3,4,7,8,9-HpCDF	<	0.0907	<	0.0964	<	0.104	**0.10**	<	0.102	<	0.102
OCDF	<	0.0839	<	0.0892	<	0.0959	**0.09**	<	0.0947	<	0.0945
2,3,7,8-TCDD	K	0.119	K	0.214	K	0.106	**0.13**	K	0.084	K	0.076
1,2,3,7,8-PeCDD	<	0.11	<	0.117	<	0.126	**0.12**	<	0.124	<	0.124
1,2,3,4,7,8-HxCDD	<	0.169	<	0.18	<	0.194	**0.19**	<	0.191	<	0.191
1,2,3,6,7,8-HxCDD	<	0.105	<	0.112	<	0.12	**0.12**	<	0.119	<	0.118
1,2,3,7,8,9-HxCDD	<	0.0754	<	0.0802	<	0.0862	**0.08**	<	0.0851	<	0.0849
1,2,3,4,6,7,8-HpCDD	<	0.0949	<	0.101	<	0.109	**0.10**	<	0.107	<	0.107
OCDD	<	0.286	<	0.304	<	0.327	**0.31**	<	0.322	<	0.322
DTEo		**0.0635**		**0.32**		**0.157**	**0.16**		**0.104**		**0.108**
DTEd		**0.284**		**0.552**		**0.399**	**0.40**		**0.351**		**0.354**
DTEh		**0.174**		**0.436**		**0.278**	**0.28**		**0.228**		**0.231**
DTEh sd							**0.10**				
DTEh confidence							**0.08**				
DTEh 95 UCL							**0.36**				
% FTAL							**24**				
% Lipid		0.3		1.16		0.57	**0.61**		0.93		0.63
Sample weight (g)		11.8		11.1		10.3	**10.78**		10.5		10.5
% Moisture		80.1		77.9		78.4	**79.00**		53		53.5
FLAGS											

DEP ID	ALW SMB		ALW WHP 1,3,5,7,9		ALW WHP 2,4,6,8,10	ALW WHP
EXT ID			L9459-1		L9459-2	
	MEAN		ng/kg		ng/kg	**MEAN**
Compound						
2,3,7,8-TCDF	**0.243**		0.506		0.61	**0.558**
1,2,3,7,8-PeCDF	**0.097**		0.19		0.18	**0.185**
2,3,4,7,8-PeCDF	**0.263**		0.588		0.711	**0.650**
1,2,3,4,7,8-HxCDF	**0.072**	K	0.08		0.095	**0.088**
1,2,3,6,7,8-HxCDF	**0.082**	<	0.0857	<	0.0834	**0.085**
2,3,4,6,7,8-HxCDF	**0.074**	<	0.0768	<	0.0747	**0.076**
1,2,3,7,8,9-HxCDF	**0.089**	<	0.0927	<	0.0902	**0.091**
1,2,3,4,6,7,8-HpCDF	**0.122**	<	0.128	<	0.124	**0.126**
1,2,3,4,7,8,9-HpCDF	**0.102**	<	0.107	<	0.104	**0.106**
OCDF	**0.095**	<	0.0987	<	0.096	**0.097**
2,3,7,8-TCDD	**0.080**	K	0.08	K	0.12	**0.100**
1,2,3,7,8-PeCDD	**0.124**	<	0.13	<	0.126	**0.128**
1,2,3,4,7,8-HxCDD	**0.191**	<	0.199	<	0.194	**0.197**
1,2,3,6,7,8-HxCDD	**0.119**	<	0.124	<	0.12	**0.122**
1,2,3,7,8,9-HxCDD	**0.085**	<	0.0887	<	0.0863	**0.088**
1,2,3,4,6,7,8-HpCDD	**0.107**	<	0.112	K	0.114	**0.113**
OCDD	**0.322**	<	0.336	<	0.327	**0.332**
DTEo	**0.106**		**0.233**		**0.289**	**0.261**
DTEd	**0.353**		**0.49**		**0.532**	**0.511**
DTEh	**0.230**		**0.362**		**0.411**	**0.387**
DTEh sd	**0.002**					**0.035**
DTEh confidence	**0.003**					**0.048**
DTEh 95 UCL	**0.23**					**0.43**
% FTAL	**15**					**29**
% Lipid	**0.771**		1.08		0.83	**0.926**
Sample weight (g)	**10.64**		10		10.3	**10.3**
% Moisture	**66**		54.5		53.8	**60.3**
FLAGS						

APPENDIX 2A.

SPECIES AND STATION CODES

SPECIES CODES

BNT	brown trout
EEL	eel
LMB	largemouth bass
RBT	rainbow trout
SMB	smallmouth bass
WHP	white perch
WHS	white sucker

STATION CODES

AGL	Androscoggin R at Gilead above NewPage
ARP	Androscoggin R at Rumford Point above NewPage
ARF	Androscoggin R below Rumford below NewPage
ARY	Androscoggin R at Riley above Verso Paper
ALV	Androscoggin R at Livermore Falls below International Paper
AGI	Androscoggin R at Gulf Island Pond, Auburn below International Paper
ALS	Androscoggin R at Lisbon Falls below International Paper
ALW	Androscoggin Lake at Wayne below International Paper
KRM	Kennebec R at Madison above SAPPI Somerset, Skowhegan
KNW	Kennebec R at Norridgewock above SAPPI Somerset, Skowhegan
KHY	Kennebec R at Hinckley, above SAPPI Somerset Skowhegan
KFF	Kennebec R at Shawmut, Fairfield below SAPPI Somerset, Skowhegan
KRS	Kennebec R at Sidney below SAPPI-Somerset & KSTD in Waterville
PBW	Penobscot R at Woodville above Lincoln Paper & Tissue
PBM	Penobscot R at Winn above Lincoln Pulp and Paper in Lincoln
PBL	Penobscot R at S Lincoln below Lincoln Pulp and Paper in Lincoln
PBC	Penobscot R at Costigan, Milford above Georgia Pacific in Old Town
PBV	Penobscot R at Veazie below Georgia Pacific in Old Town
PBO	Penobscot R at Orrington below Georgia Pacific in Old Town
PWD	Presumpscot R at Windham above SAPPI Westbrook
PWB	Presumpscot R at Westbrook below SAPPI Westbrook
SFS	Salmon Falls R at S. Berwick below Berwick POTW and Prime Tanning
SEN	E Br Sebasticook at Newport below Corinna and former Eastland Woolen mill
SED	E Br Sebasticook at Detroit below Corinna and former Eastland Woolen mill
SWP	W Br Sebasticook at Palmyra below Hartland POTW and Irving Tanning

APPENDIX 3.

TCDD & TCDF IN SLUDGE FROM MAINE WASTEWATER TREATMENT PLANTS

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREATMEI

LOCATION	DATE	%MOIST	TCDD	TCDF
AMERICAN TISSUE	880930	62.6	36.9	414.0
AUGUSTA	881223	61.4	37.6	326.0
	890403	61.6	34.6	242.0
	890628	65.5	17.7	414.0
	971125		0.5	4.3
AMERICAN PULP AND	88		104.0	2930.0
BERLIN NH				
AUBURN VPS	951005		1.3	17.9
AUBURN FIBER	970806		<0.9	9.9
AUGUSTA SANITARY	900409		<1.2	1.3
DISTRICT	900608		<3.9	2.5
	900608		E2.1	10.2
	900914		<20.0	E20.0
	900809		<20	
	910108		<5	5.0
	910220		<1.9	0.8
	910301		<1.9	4.8
	920416		1.9	1.9
	920427		<1.0	1.9
	930223		<1.3	<1.3
	940215		<1.0	<1.0
			<0.02	0.0
			<0.23	1.8
	950227		1.9	<1
	960228		<1	<1
	970408		0.9	<0.9
	980514		<1	<1
ANSON-MADISON SAN	910408		<1.3	2.2
DISTRICT	911001		1.7	4.6
BANGOR	950104		<19.9	<26.4
BERWICK SEWER DIS'	861111		<2.5	<4.0
	890301	76.4	14.0	19.9
	890927	75.3	<12.1	<12.1
	891208	87.5	1152.0	872.0
	050819	67.5	<0.40	1.7
	051221	72.6	<0.68	1.0
	060329	69.4	<0.43	1.4
	060629	73.8	<0.60	<0.9
	061230	73.7	0.20	1.1
	070404	74.4	<0.03	0.31
	070711		0.25	0.70
	071018		0.22	0.70
SOMERSWORTH, NH	050810	82.0	<0.52	2.1
	051220	79.6	<0.15	0.9
	060329	77.7	<0.39	1.1
	060629	79.4	<0.34	1.4
	061230	80.0	0.30	1.4
	070404	81.3	0.05	0.2
	070711		0.65	2.0
	071018		0.68	1.8

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREATMEN

LOCATION	DATE	%MOIST	TCDD	TCDF
BIDDEFORD	900208		7.2	30.0
	900208		39.0	310.0
	910501		<0.86	3.7
	910703		<0.57	<0.95
	920204		<1.5	2.9
	930121		<2.4	<3.2
	940209		<0.19	<0.48
	940913		<1.0	<2.9
	950815		<.22	1.6
	970218		<0.8	<1.7
BREWER	920520		<2.1	36.0
	920901		<6.0	110.0
	921116		3.8	19.0
	930202		<3.7	11.0
	930511		1.2	9.8
	930810		4.1	24.0
	931118		3.8	26.0
	940201		3.2	24.0
	940517		<0.9	14.0
	940823		4.5	26.0
	941108		5.2	36.0
	950613		<1	18.0
BREWER	960611		2.1	17.0
	970212		3.4	22.0
	980622		<1	<1
	990730		<1	1.3
	000718		1.1	1.0
	010725		<1	<1
	010807		<1	1.8
	020723	75.7	<1	2.0
	030717		<1.0	2.3
	040426		<1.0	2.0
BOOTHBAY HARBOR S	011228		<1	2.6
BOWATER				
BUCKSPORT WWTF	010919		<0.5	4.1
MILLINOCKET	850618		<0.4	
	880602		<1.9	7.3
	940414		<7.4	<8.9
	940506		<.9	6.7
	950316		<.6	4.0
	960711		<1, <1	<1
	960914		<0.4, <0.3	4.4
	960917		<1	<1
CORINNA SEWER DIS	850506			
	871117		<11.9	<28.8
	880301		<3.0	8.5
	890222		<13.0	
	890510		<5.0	
	900131		2.3	127.0
	900606		<4.0	85.4
	900606		<4.9	82.2
	900919		<10.0	50.0

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREATMEN

LOCATION	DATE	%MOIST	TCDD	TCDF
	901009		<1.5	<.8
	901024		<8.0	
	910313		<5.0	
	910514			
	920304		<3.9	<8.4
	930405		<4.8	19.9
	930811		<9.9	68.6
	940308		<13.1	46.0
	940810		<5.6	7.8
	950321		<2.1	13.3
	960206		<1.8	12.7
DOMTAR	890113	75.8	<6.2	<3.55
BAILEYVILLE	890424	74.7	<0.63	<4.74
	890718	66.0	<1.76	12.9
	891217		0.9	3.2
	910630		<1	2.0
	910630		<1	1.0
	910630		<1	<1
	910630		1.0	4.0
	910630		<1	<1
	910630		<1	2.0
	911231		<1	2.0
	911231		2.0	5.0
	911231		<1	3.0
	911231		<1	2.0
	930108		<1	<1
	940530		<5.0	<5.0
	941222		<5.0	11.9
	950331		<5.0	14.3
	950630		<5.0	<5.0
	950930		<5.0	24.5
	951231		<1.0	3.4
	011115		0.4	2.6
	020315		<0.2	J0.53
	030211		J0.3	2.3
FRASER PAPER LTD	880903	68.3	13.9	233.0
MADAWASKA	890106	79.1	E23.4	204.0
	890406	71.3	E3.83	12.9
	890930	80.1	5.0	E26.6
	940426		<.1	0.8
GARDINER WATER DI	900918		<0.87	4.6
	910401		1.4	4.4
	911002		<0.54	5.1
	920504		<3.5	9.4
	921116		<.93	<6.4
	930407		<0.13	0.9
	931115		<1.6	<18
	931115			
	931115		<0.9	
	940329		<0.2	<1.1
	941018		<1.2	<4.3
	950221		<2.8	5.2
	951003		<1.7	
	960326		4.1	27.0
	961015		0.8	11.0
	970331		<1.1	<5.8

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREATMEN

LOCATION	DATE	%MOIST	TCDD	TCDF
FORT FAIRFIELD UT	010514		<.67	3.2
GEORGIA PACIFIC	880801		12.0	34.0
OLD TOWN	881225	78.6	301.0	963.0
	890423	78.7	380.0	1197.0
	890718	68.8	50.6	478.0
	950103		8.8	65.0
GRAND ISLE WWTP	010710		<1	<1
HARTLAND WASTEWAT	881007	65.0	<2.86	<1.71
TREATMENT PLANT	881221	65.5	<7.25	E6.09
	890312	64.3	<0.28	5.6
	890627	63.3	<1.36	6.5
	000127		<0.4	E1.4
	000426		<0.5	<0.4
	000922		<2.1 <3.1	<1.9 <2.2
	001205		<0.8	<0.9
HAWK RIDGE COMPOS	1989-90	mean n=6	6.6	15.9
UNITY	1991	(1.6-13)		mean n=4
(compost)	900420		2.9	15.0
	900507		3.4	6.0
	900628		3.4	31.0
	900712		5.0	40.0
	900817		3.4	31.0
	900820		3.0	30.0
	900820		5.0	40.0
	901010		<5	30.0
	910115		0.6	6.4
	910207		4.0	59.5
	910806		1.6	15.0
	920123		2.6	18.0
	920318		<1	
	920715		<2.0	34.0
	920818		<1.0	18.0
	921007		2.2	23.0
	930111		<2.2	12.0
	930406		1.7	16.0
	930629		1.7	22.0
	931213		3.4	28.0
	940101		2.6	27.0
	940422		<1.0	12.0
	940422		<1	9.1
	940725		1.6	13.0
	941024		<2.4, 4.9	13.0, 33.0
	950724		<1	12.0
	951012		1.1	12.0
	960131		<1	8.8
	960501		<1	6.6
	960709		<1	7.6
	961007		1.4	10.0
	970110		<1	1.5
	970305		<1	3.6
	970725		<1	3.8
	971014		<1	3.8

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREATMEN

LOCATION	DATE	%MOIST	TCDD	TCDF
INTERNATIONAL PAP	850621		51.3W	
JAY	870115		190.0	760.0
	880218		24.0	130.0
	880219		23.0	121.0
	880223		14.0	75.0
	880225		57.0	250.0
	880226		15.0	79.0
	880227		13.0	79.0
	881231		16.6W	143W
	890124		15W	77W
	890126		28.0	112.0
	890323		7.7W	42.6W
	890417		24.0	150.0
	950712		7.2	39.0
	960125		2.6	16.0
	960126		2.8	16.0
	960227		<1.0	14.0
	960228		2.3	14.0
	961015		<1	4.0
	961016		<1	5.4
	961126		4.6	22.0
	961127		2.7	12.0
KENNEBEC SANITARY	870713			
TREATMENT DISTRIC	871105			
WATERVILLE	880118			
	880322			
	880518			
	880921			
	890711			
	891011			
	900410		E7.9	121.0
	900824		3.3	54.0
	901101		3.6	12.0
	901221		3.5	6.7
	901221		3.5	19.0
	910408		<2.3	<3.3
	910606		<2.9	<5.0
	910808		2.3	53.0
	910911		3.1	4.1
	920226		2.6	20.0
	920708		<1.0	11.0
	930914		1.1	6.3
	941021		<1.0	8.2
	951113		<1	1.3
	960924		<1	<1
	971010		<1	12.0
	990120		<1	<1
	990915		<1	<1
	000927		0.4, <4.8, <075,	<3.1, 2.9,
	010108		<0.10	<0.10
	011017		<0.007	1.4
	021017		<0.007	1.4
	031021		0.3	1.5
	041021		0.2	1.4
	051005		0.02	1.0
	061011		0.4	2.7

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREATMEN

LOCATION	DATE	%MOIST	TCDD	TCDF
KENNEBUNK SD	011105		EMPC	1.8
KIMBERLY-CLARK	871008		36.0	
WINSLOW	871201		13.5	
	880331		25.0	219.0
	880630		19.0	177.0
	880930		22.0	189.0
	881231		17.0	181.0
	890331		18.0	177.0
	890628		14.0	89.0
	890927		11.0	67.0
	891231		13.0	115.0
	900201		12.0	86.0
	900628		12.0	94.0
	900928		9.4	76.0
	901231		7.2	63.0
	910214		12.0	86.0
	910411		8.3	100.0
	910630		4.6	62.0
	910930		6.5	69.0
	911101		6.5	63.2
	911203		6.3	68.1
	920225		6.5	72.1
	920623		5.2	55.0
	921006		5.1	60.0
	921228		7.2	59.0
	930317		4.7	47.0
	930629		4.2	37.0
	930917		3.9	42.0
	931231		5.2	44.0
	940101		3.5	31.0
	940401		3.7	27.0
	940909		4.9	33.0
	941231			30.0
	950331		4.4	42.0
	950608		<1	24.0
	950930		2.2	25.0
	951231		3.0	34.0
	960122	RWT	3.0	34.0
	960410		3.1	29.0
	960702		4.4	36.0
	960702D		1.6	17.0
	961030		2.4	18.0
	961030D		<1	17.0
	970318	RWT	2.4	16.0
	970616	RWT	1.4	16.0
	971104	RWT	1.3	23.0
KITTERY WWTP	990319		<0.4	5.2
LEWISTON-AUBURN	871231		<1.0	n for year (n
TREATMENT PLANT	881031		0.0	
	900809		E10	9.0
	910306		<7.3	<7.3
	920610		<0.8	4.5
	930625		<1	4.4
	930922		<2.7	<2.5

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREATMEI

LOCATION	DATE	%MOIST	TCDD	TCDF
	950405		<2.2	0.8
	960625		<1	<1
	961202		<1	21.0
	990730		1.0	6.9
	000201	limed	<0.6	8.5
	020801	limed	<1	<0.1
	020801	ished comp	<1	<0.1
	030709	limed	<5	<5
	030717	ished comp	<5	<5
	040830	limed	<0.5	<1.2
	040830	solids/comp	1.1	2.0
LINCOLN PULP & PA	881119		48W	223W
LINCOLN	890123	80.9	44.0	203.0
	890123		44.0	173.0
	890407	85.1	49.0	298.0
	890407		41.0	219.0
	890831	83.5	182.0	640.0
	890831		156.0	625.0
	890831		41.0	220.0
	890831		59.0	294.0
	921231		20.4	91.6
	931014		9.1	187.5
	940331	PRI SL	14.9	154.0
	940331	SEC SL	97.1	734.0
	960302		<0.4	<0.3
	960419		4.2	21.7
	960431		4.2	25.1
	970831		3.7	20.0
	971130		<1.5	3.7
	980930		<0.7	1.2
	990531		0.3	1.5
	990930		0.4	1.0
	000130		1.3	1.5
MADAWASKA WWTP	011119		<1	2.0
NEWPAGE CORP	850621		32.0	

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREATMEI

LOCATION	DATE	%MOIST	TCDD	TCDF
RUMFORD	880602		105.0	674.0
	890108	77.1	114.0	569.0
	890407	73.1	46.5	184.0
	890628	76.8	E9.91	134.0
NORRIDGEWOCK WWTP	011116		<0.1	<0.8
NORTH JAY WWTP	011127		0.8	<1.6
OAKLAND TREATMENT	910304		<2.5	10.0
	910329		<5	10.0
	920415		<1.0	<1.0
	920415		<1	<1
	930408		<1.0	<1.0
	930501		<1.0	11.0
	940426		<1.0	<1.0
OGUNQUIT SD	010912		<1.4	1.4
OLD TOWN	880525		<3.0	<3.0
	900212		<2.2	16.7
	910918		<2.9	6.6
	910918		<2.2	
ORONO TREATMENT P	900316		2.1	
	900412		8.5	
	901001		3.5	9.2
	901021		3.9	
	910324		<2.1	9.5
	910918		<2.9	6.6
	920323		<0.6	7.6
	920328		9.4	
	920915		<0.5	5.4
	921015		1.1	
	930427		1.3	
	930427		<0.5	3.4
	940502		<0.6	2.5
PERC	910417		<2.0	9.9
PORTLAND WATER DI	861205			
PORTLAND	870402			
	871124			
	880913			
	891206		E1.2	11.3
	891206		1.6	14.5
	901002		<3	10.0
	901002		<3	20.0
	910826		<64	<32
	910828		<66	<140
	920715		<1.1	6.4
	920715		0.9	7.6
	930719		<1	2.3
	930719		<1.1	<3.2
	940718		<1.0	0.8
	950727		0.5	1.0

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREATMEI

LOCATION	DATE	%MOIST	TCDD	TCDF
	960807		<0.7	<0.1
	980811		<0.4	3.4
	980514		<1	<1
	990602		<1	5.6
	000913		<0.1	8.0
	010806		<1	3.2
	020830		<0.2	0.6
	030830		<0.3	<0.2
	040913		0.4	1.0
	040830		<0.41	<2
PORTLAND WATER DI:	861205			
WESTBROOK WWTF	870402			
	871119			
	891205		E1.6	14.5
	901001		<3.0	9.0
	910826		<64	<32
	920714		<1.1	7.6
	930719		<1.0	3.2
	980811		<0.2	4.1
	001011		<0.6	3.5
	001121			3.6
	001228		1.2	3.4
	010329		0.6	4.6
	010525		<0.7	<0.5
	010803		1.4	2.1
	020830		<0.3	0.9
	030830		<0.3	<0.7
	040830		<.1	2.4
	040913		<1	1.0
PRESQUE ISLE SEWEI	010625		<1.1	<1.1
REGIONAL WASTE SY:	890111	ash	5.5	28.0
PORTLAND	890112	ash	6.0	24.0
	890113	ash	10.0	50.0
	890114	ash	10.0	20.0
	890121	ash	6.0	90.0
	900211	ash	E20	210.0
ROBINSON MANUFACTI	870113		10.1	17.5
OXFORD	880419		<0.4	<0.2
	881004		<7.3	<9.6
	890119		<0.39	<1.2
	890119D		<2.1	<1.1
	910226		<3.0	<3.0
	910305		<3	<0.3
	910308		<3	<3
	910323		<5	<5
	910323		<3	<3
	920610		<1.2	<1.0
	960216		<1	0.1
	960315		<1	4.2
	970220		<1	<1
	980218		<1	<1
SABATTUS SANITARY	010412		<2	<2

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREATMEI

LOCATION	DATE	%MOIST	TCDD	TCDF
SAPPI -SOMERSET	861217		<2	47.0
	870519		13.0	21.0
	870930			
	871215		60.0	
	880325		27.0	88.0
	880630	EPA	67.0	33.0
	881014		40.0	98.0
	881220		54.0	177.0
	890303		54.0	92.0
	890629		23.0	53.0
	890926		<.8	16.0
	891205		18.0	52.0
	900314		<18	23.0
	900620		35.0	73.0
	900916		45.0	86.0
	901215		39.5	115.0
	910324		23.1	51.0
	910626		39.4	146.0
	910910		69.9	260.0
	920624		33.0	856.0
	920923		20.0	39.0
	921218		15.0	45.0
	930107		11.0	31.0
	930616		23.0	73.0
	930916		56.0	170.0
	931229		42.0	110.0
	940108		31.0	95.0
	940627		33.0	89.0
	940926		12.0	36.0
	941212		11.0	20.0
	950313		3.6	15.0
	950510		3.3	11.0
	950914		9.6	25.0
	951120	comb	1.2	4.2
	960327		2.0	9.6
	960624		5.1	18.0
	960910		5.2	11.0
	961014		5.2	15.0
	970319		5.5	26.0
	970624		8.5,4.9	36.0
	970917		<.71	2.0
	971216		<.28	0.7
	980316		<.79	<6.2
	980527		1.0	2.5
	980928	dredging	6.6	18.0
	981208		<.4	0.7
	990330		<.26	<4.2
	990607		<.4	0.8
	990921		<.48	<5.4
	991215		<.4	1.2
	000131		<.65	1.8
	000607		<.729	2.9
	000926	dredging	1.86	6.8
	001213		<.207	1.4
	010314		0.3	0.2
	010524		0.7	0.3
	010910		<0.561	0.2
	011217		0.2	0.1
	020318		0.3	0.1

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREATMEN

LOCATION	DATE	%MOIST	TCDD	TCDF
	020509		<0.319	0.1
	020917		3.1	1.5
	021217		0.5	0.2
	030310		<0.181	0.1
	030609		0.5	0.2
	030909		<0.121	0.0
	031217		0.2	0.1
SAPPI - WESTBROOK	850620		17.2	
	870929		31.0	
	871231		21.0	135.0
	880331		5.6	21.0
	880401		8.7	3.9
	880630		13.0	55.0
	881207		19.0	127.0
			19.0	69.0
	890106		<1.8	31.0
	890600		<1.2	13.0
	890600		5.3	35.0
	890600		<.2	0.2
	890600		<.4	8.8
	890600		69.9	60.0
	891031		5.0	30.0
	891130		3.0	30.0
	891231		7.0	50.0
	900131		6.0	20.0
	900228		2.7	24.6
	900331		5.1	33.6
	900430		5.9	34.6
	900531		5.3	25.8
	900630		19.0	26.0
	900730		5.2	20.6
	900831		2.9	12.1
	900930		2.5	10.0
	901231		7.7	35.7
	910917		70.0	275.0
	910331		3.4	21.5
	910630		2.9	19.6
	910930		3.8	14.2
	911231		2.4	25.1
	920331		1.2	19.4
	920505		1.6	10.8
	920821			24.5
	940131		0.9	11.6
	940324			12.3
	940728		2.1	17.3
	941213		5.3	29.2
	950329		1.2	20.0
	950602		1.0	10.1
	950911			18.3
	951120		1.1	23.3
	960327		2.0	9.6
	990113		4.0	61.0
	990407		2.9	36.0
	990728		1.0	14.0
	990830		<0.9	4.0
	990928		<1.0	2.8
CITY OF SOUTH PORTLAND				
S PORTLAND STP	880000		<8.65	<48

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREATMEN

LOCATION	DATE	%MOIST	TCDD	TCDF
	900314		<5.3	<3.5
	900314		<2.7	<5.4
	910508			<10
	910531		<5	
	920401		<1.0	<0.8
	920428		<0.8	1.4
	920714		0.9	6.4
	930324		<2.8	<2.8
	940315		<1.0	3.9
	941005		8.7	48.0
	950405		<1	3.3
	960610		<1	5.3
	970616		<1	15.0
	000912		<1	2.6
	010205		<3	<2
	010918		<1	1.8
	040913		<0.96	1.0
WELLS SANITARY DI	011109		<0.4	0.9
YORK SD	010806		<1	<1
VAN BUREN WWTP	000918		0.6	4.0

D=duplicate analysis

APPENDIX 4.

TCDD & TCDF IN WASTEWATER FROM MAINE PULP AND PAPER MILLS

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLAN

SOURCE	DATE	TCDD (pg/l)	TCDF (pg/l)
ANSON MADISON	920408	<3	<3
	921001	<3	20
BREWER	920624	<5.9	
	930429	<3.9	
	941129	7.4	
	950503	<3.6	
	960416	<10	
	000501	<10	
GEORGIA PACIFIC OLD TOWN	880630	39	
	890131	27	120
	890222	210	340
	890223	92	290
	890224	77	340
	890320		34
	890324		24
	890325	36	73
	890405	30	110
	890410	17	52
	890411	32	89
	890824	32	94
	890831	13	150
	890911	<4.1	14
	890915	<3.3	<8.1
	890921	<5.7	13
	890927	<5.3	9.7
	891011	<3	11
	891019	<5.2	14
	891102	<6	18
	891106	6.7	22
	891114	<9.5	<7.1
	891127	<6.4	20
	891206	<8.4	13
	891213	<8.3	20
	891221	<4.7	23
	900105	<6.8	<8.3
	900111	<9	<8.5
	900118	<5.9	6.1
	900125	<6.7	10
	900207	<4.6	17
	900214	<6.6	23
	900222	<7.3	15
	900301	<6	11
	900308	<3	12
	900315	<4	16
	900329	<7.4	14
	900407	<7.2	24
	900502	<7	19
	900729	<9.9	49

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLAN'

SOURCE	DATE		TCDD (pg/l)	TCDF (pg/l)
	910330		17	70
	910430		19	65
	910530		9.5	41
	910630		6.8	43
	910830		11	66
	911030			7.9
	911130		<7.7	<16
	920330		<5.7	50
	920730		16	69
	920830		<4.9	23
	921030		<3.0	
	921230		4.8	
	930130		<5.0	14
	930330		<4.9	12
	930530		<4.2	11
	930630		<2.8	15
	930830		<1.6	9.2
	930930		<3.5	7.6
	931130		<3.1	32
	931230		<3.2	19
	940230		<4.8	7.7
	940330		<4.6	12
	940530		<1.5	<4.5
	940630		<3.5	9.2
	940830		<2.0	<4.8
	940930		<4.6	<6.8
	941130		<9.5	<10
	941230		<1.1	5.8
	942730		<1.1	5.8
	950130		<2.4	8.2
	950119		<2.4	8.2
	951230		<1.1	5.8
	950430		<1.4	5.6
	950430		8	36
	950421		<1.4	5.6
	950622		<2	6.8
	950928		<3.8	8.1
	951129		<5.4	13
	951228		<1.4	6.2
	980115	BPA	<2.8	<5.8
		BPB	<11	53
	980130		<3	9.4
		BPA	<2.9	18
		BPB	<2.8	8.9
	980219	BPA	<1.7	12
		BPB	<3.9	39
	980230		<2.6	8.7
	980328	BPA	<5.8	11
		BPB	<5.2	13
	980330		<2	9.1
	980730		<3	<4

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLAN

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
	980830	BP	<3.5	BP	<4.2
	980930		<3.2		<4.8
		BP	5.9	BP	28
	981030		<3.2		<4.8
		BP	<3.5	BP	<4.2
	981130		<5.5		<5.4
		BP	<3.4	BP	<4.6
	981230		<1.6		8.7
		BP	<3.1	BP	6.5
	990130		<3.4		<2.6
		BP	<3	BP	<3.9
	990230		<10		<10
		BP	<10	BP	<10
	990330	BP	<2.3	BP	<1.8
	990530		<1.9<4.7		<2.9<3.3
		BP	<3.2	BP	<4.8
	990630		<1.3		<1.8
		BP	<2.3	BP	7.3
	990730		<.93		<1.4
		BP	<2.6	BP	<1.8
	990930		<.68		<2.1
		BP	<1.3	BP	<5
	991030		<2.5		<2.1
		BP	<3	BP	<3.6
	000130		<8.4		<4.9
		BP	<9.0	BP	<5.4
	000330		<3.4		<3.1
		BP	<2.9	BP	<2.3
	000430		<7.4		<7.6
		BP	<5.0	BP	<5.5
	000630		<2.2		<1.5
		BP	<4.0	BP	<3.0
	000830		<1.2		<1.1
		BP	<3.0	BP	<3.2
	001030		<2.3		<2.6
		BP	<3.4	BP	<3.4
	001130		<2.7		<1.4
		BP	<2.7	BP	<3.2
	010130		<3.3		<2.1
		BP	<3.9	BP	<3.1
	010330		<4.7		<3.2
		BP	<2.4	BP	<4.5
	010530		<2.9		<2.5
		BP	<6.7	BP	<5.4
	010630		<1.7		<1.5
		BP	<3.2	BP	<3.2
	010730		<2.0		<1.5
		BP	<2.7	BP	<2.2
	010930		<3.2		<2.5
		BP	<2.3	BP	<1.7

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLAN

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
	011130		<4.7		<3.9
		BP	<3.4	BP	<2.6
	020115		<2.7		<1.9
	020115	BP	<2.5	BP	<1.8
	020225		<4.2		<3.0
	020227	BP	<3.9	BP	<4.2
	020416		<1.4		<1.5
	020416	BP	<2.4	BP	<2.3
	020625		<4.1		<4.4
	020730		ND		ND
	020723	BP	<4.1	BP	<2.5
	020830		ND		ND
	021010	BP	<3.2	BP	<3.1
	020930		<4.7		<3.1
	021030		<3.2		<3.1
	021130		<10		<10
	021106	BP	<10	BP	<10
	021230		<0.69		<1.6
	021203	BP	<0.69	BP	<1.6
	030130		<0.49		<0.93
	030230		<1.4		<1.6
	030330		<1.8		<1.5
	030430		<1.4		<2.4
	030530		<6.8		<8.9
	030630		<5.0		<3.6
	030730		<2.2		<1.4
	030830		<3.4		<3.2
	030930		<7.0		<5.1
	031030		NS		NS
	031130		<10		<10
	031230		<2.9		<1.7
	040130	BP	<10	BP	<10
	040230	BP	<10	BP	<10
	040330	BP	<10	BP	<10
	040430	BP	<10	BP	<10
	040530	BP	<10	BP	<10
	040630	BP	<1.6	BP	<1.2
	040730	BP	<3.1	BP	<2.1
	040830	BP	<10	BP	<10
	040930	BP	<10	BP	<10
	041030	BP	<10	BP	<10
	041130	BP	<10	BP	<10
	050131	BP		BP	<10
	050228	BP	<10	BP	<10
	050331	BP	<10	BP	<10
	050430	BP	<10	BP	<10
	050531	BP	<10	BP	<10
	050630	BP	<3.5	BP	<3.1
	050731	BP	<4.7	BP	<2.2
	050831	BP	<8.4	BP	<7.5
	050930	BP	<0.42	BP	<0.39

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLAN'

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
	051031	BP	<0.42	BP	<0.39
	051130	BP	0.86	BP	0.96
	051231	BP	0.31	BP	<0.5
	060129	BP	<0.68	BP	<0.72
	060226	BP	<0.69	BP	<0.81
	060326	BP	<0.7	BP	<0.52
DOMTAR	880101		6.8		25
Baileyville	900316		<5		4
	900423		<3		<6
	900531		<8		<5
	900619		<3		<1
	900716		<1		<3
	900807		<2		<5
	910630		<10		<10
	910630		<10		<10
	910630		<11		<11
	910630		<11		<11
	910630		<11		<11
	910630		<11		<11
	910630		<10		<10
	910630		<11		<11
	910630		<11		<11
	911231		<10		<10
	911231		<10		<10
	911231		<11		<11
	911231		<11		<11
	911231		<10		<10
	911231		<11		<11
	911231		<10		<10
	911231		<11		<11
	911231		<11		<11
	930408		<10		<10
	930506		<10		<10
	930713		<10		<10
	940530		<10		<10
	941222		<10		<10
	950331		<10		<10
	950630		<10		<10
	950930		<10		<10
	951231		<10		<10
	980330				60
	980421		<10		60
	980825		<10		40
		BP	<10	BP	10
	981230		<10		<10
		BP	<10	BP	<10
	990430		<10		<10
		BP	<10	BP	<10
	990930		<4		<3

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLAN

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
			<2		<6
		BP	C<2 A<4	BP	C<2 A<7
		BP	C<5 A<3	BP	C<4 A<3
	991030		<5		<3
		BP	C<7 A<5	BP	C<8 A<3
	991130		<1		<6
		BP	C<1 A<2	BP	C<5 A<3A
	000130		<4.2		<3.4
		BP	C<2.0 A<2.0	BP	C<4.0 A<3.0
			<5.0		<4.0
		BP	C<3.0 A<3.0	BP	C<3.0 A<2.0
	000930	BP	C<7.1 A<3.4	BP	C<5.6 A<2.4
		BP	C<2.3 A<2.5	BP	C<1.6 A<1.7
	001200	BP	C<5.9 A<3.8	BP	C<5.3 A<2.1
		BP	C<5.1 A<4.0	BP	C<4.0 A<3.0
	020319	BP	C<4.7 A<5.1	BP	C<4.0 A<4.2
	020610		<2.4		<3.1
	020615	BP	C<2.6	BP	C<2.1
	020918	BP	C<1.9 A<1.3	BP	C<4.7 A<1.3
	030211		<4.7		J7.3
	030312	BP	C<4.0 A<2.6	BP	C<4.3 2.6
	031023	BP	C<5.8 A<3.5	BP	C<4.3 A<2.5
	040630	BP	<10	BP	
	060430	BP	<10	BP	<10
INTERNATIONAL PAPER	880101		88		420
VERSO	880715		30		150
Jay	890307		30, E6		100, E20
	890310		16		74
	890616		<8		980
	890621		17		140
	890713		<16		50
	890720	DEP	30		150
	890818		20		110
	900413		<10		90
	910924		<10		60
	910926		<10		60
	911129		50		210
	911219		<20		<80
	920125		20		110
	920126		20		110
	920127		30		100
	920128		30		100
	920129		13.7		49.9
	920312		19.3		65.6
	920320		14.8		73.9
	920423		<13.9		59.1
	920610		<5.7		29.5
	920617		<6.3		30.8

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLAN'

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
	920723		<8.4		33.6
	920819		6.6		29.7
	920923		<2.6		<2.0
	921111		<6.1		22.4
	921202		<2.6		<14.4
	930125		5.4		19.6
	930222		<5.3		25.5
	930420		<2.0		16.7
	930527		4.3		10.3
	930716		<5.2		28.9
	930826		<5.3, <6.5		21.5, 19.2
	930910		<8.6		9.4
	931022				19.5
	931119		<3.6		19.5
	931224		10.9		31.1
	940125		<4.1		21.6
	940226		7.3		38
	940422		7.7		41.1
	940520		4.1		25.6
	940722		<3.4		16.7
	940829		<7.9		31.8
	941027		<3.4		25.3
	941125		<6.8		24.4
	950126		<5.0		20.9
	950222		<3.6		21.4
	950420		<2.5		25.6
	950527		<1.8		24.1
	950724		<3.2		16.1
	950826		<4.9		7.5
	950929		<6.0		15.4
	951020		<8.5		12.9
	951122		<3.8		10.5
	960228		<10		6.5
	960430		<10		12.8
	960530		<10		15.7
	961030		<10		7.7
	961130		<10		<10
	970130		<10		<10
	970228		<10		11.5
	970330		<10		<10
	970330	BPA	<6.2	BPA	<6.3
		BPB	<5.1	BPB	<3.7
	970430		<10		14.4
	970522	BPA	4.9	BPA	5.6
		BPB	10.9	BPB	9.6
	970406	BPA	<4.9	BPA	10.9
		BPB	<5.6	BPB	9.6
	970630		<10		6.8
	970730		<10		<10
	970728	BPA	<5.2	BPA	11.5
		BPB	<5.4	BPB	6.3

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLAN

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
	970830		<10		<10
	971030		<10		
	971013	BPA	<4.3	BPA	<5
		BPB	<7.2	BPB	<8.3
	971130		<10		
	980117		<2.1		7.1
	980126	BPA	<3.5		<3.2
		BPB	<1.2		<1.7
	980221		<3.7		<3.7
	980406	BPA	<0.6		<2.3
		BPB	<1.4		<1.3
	980516		<3		8
	980613		<1.4		<2.2
	980706	BPA	<2.8		19
		BPB	<1.2		4.8
	980711		<2.3		4.9
	980814		<2.2		<1.1
	981012	BPA	<2.0		45
		BPB	<2.9		<1.6
	981016		<2		5.1
	981116	BPA	<6.8		9.9
	981119		<7		<8.6
	981130	BPB	<3.3		<5.2
	990117		<2.8		3.6
	990112	BPA	<.99		54
		BPB	<.97		4
	990312		<3		7.4
	990304	BPA	<2.1		9.7
		BPB	<2.7		<5.9
	990412		<5.9		18
	990408	BPA	<2.6		7.4
		BPB	<5.5		<5
	990618		<5.1		<4.2
	990622	BPA	<8.6		<9
		BPB	<3.3		<4.1
	990723		<2.2		<1.6
	990720	BPA	<2.9		130
		BPB	<2.5		<2.3
	990917		<6.2		<6.5
	990913	BPA	<3.8		<1.6
		BPB	<3.4		<1.4
	991008		<5.6		6.6
	991005	BPA	<2		<1.6
		BPB	<3		<1.3
	991112		<2.7		<6.5
	991110	BPA	<2.7		<4
		BPB	<2.1		<2.1
	000104	BPA	<2.5		<1.8
		BPB	<3.0		<2.8
	000306	BPA	<1.6		<5.0
		BPB	<1.1		<2.6

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLAN'

SOURCE	DATE		TCDD (pg/l)	TCDF (pg/l)
	000419	BPA	<2.9	<1.6
		BPB	<2.7	<1.8
	000612	BPA	<3.7	<2.6
		BPB	<1.51	<0.59
	000705	BPA	<2.43	<4.57
		BPB	<2.07	<1.8
	000829	BPA	<2.28	<3.57
		BPB	<1.69	<2.20
	001019	BPA	<0.573	<1.91
		BPB	<0.698	<1.61
	001207	BPA	<1.80	<1.89
		BPB	<0.825	<1.19
	020130		ND	ND
	020230		ND	ND
	020430		ND	ND
	020530		ND	ND
	020730		ND	ND
	020830		ND	ND
	021030		ND	ND
	021130		ND	ND
	030130		ND	ND
	030230		ND	ND
	030330		ND	ND
	030430		ND	ND
	030630		ND	ND
	031030		ND	ND
	031130		ND	ND
	040130		<2.5	<1.5
			<1.3	4.2
	040224		<3.8	<3.9
			<3.8	<2.9
	040520		<1.7	<1.2
			<2.0	<1.2
	040622		<1.9	7.9
			<3.7	<2.5
	040722		>1.3	<0.79
			<6.7	<5.6
	040824		<3.3	<2.6
			<2.1	<2.1
	041021		<0.68	<0.75
			<0.71	<0.80
	041111		<0.70	2.8
			<0.57	2
	050112		<0.35	<0.54
			<0.77	<1.0
	050217		<2.8	<2.9
			<4.0	<3.7
	050608		<0.62	<7.3
			<0.56	<8.2
	050622		<6.2	<4.1
			<0.33	<4.8

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLAN

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
	050825		<1.7		<1.1
			<1.2		<1.4
	050912		<0.62		<0.72
			<0.61		<9.6
	051107		<0.34		<0.54
			<0.61		<0.99
	051212		<0.52		<2.6
			<0.57		<0.32
	060207		<0.26		<0.54
			<0.20		<0.48
	060306		<1.1		<0.89
			<0.54		<0.67
HARTLAND	960530		<0.06		
KIMBERLY-CLARK	930308		<10		<12
	930623		<4.6		<3.9
LINCOLN PAPER & TISSUE	881130		32		130
	920817		11.2		69.8
	920908		<11		27.3
	921117		7.7		39.1
	921216		<1.9		9.5
	931230		<5.5		<17.3
	940417		1.9		7.5
	950824		1.3		8.5
	960409		1.3		8.5
	970116	BP	25.4	BP	103
	970212	BP	11	BP	43.1
	970522	BP	11.4	BP	27.6
	970813	BP	6.4	BP	14.4
	971001	BP	1.6	BP	1.9
	971231	BP	<2.4	BP	<3.83
	980330	BP	<3.4	BP	<3.7
	980430	BP	<10	BP	13.2
	980630	BP	<8.9	BP	<4
	980830	BP	<7.1	BP	<7.6
	980930	BP	<2.3<4.1	BP	<2.3<3.2
	981130	BP	<2.6<4.9	BP	<2.7<3.6
	981230	BP	<1.5	BP	<1.3
	990230	BP	<1.1	BP	<2.1
	990330	BP	<2.5	BP	<3.8
	990430	BP	<2.8	BP	<3.2
	990630	BP	<4.4	BP	<4.5
	990830	BP	<4.3	BP	<2.8
	990930	BP	<1.3	BP	<.44
	991030	BP	<2.3	BP	<2.2
	991130	BP	<3	BP	<2.9
	000130	BP	<1.4	BP	<1.4

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLAN

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
	000330	BP	<3.0	BP	<1.2
	000430	BP	<1.6	BP	<1.3
	000630	BP	<7.14	BP	<3.63
	000730	BP	<2.07	BP	<1.25
	000830	BP	<2.14	BP	<3.17
	001030	BP	<3.39	BP	<2.17
	001130	BP	<2.08	BP	<4.43
	010228	BP	<2.11	BP	<2.39
	010330	BP	<0.56	BP	<0.618
	010530	BP	<3.28	BP	<7.31
	010630	BP	<2.05	BP	<1.97
	010830	BP	<1.25	BP	<3.56
	010930	BP	<4.01	BP	<3.37
	011130	BP	<2.18	BP	<6.19
	011230	BP	<4.97	BP	<4.79
	020230	BP	<1.68	BP	<1.22
	020330	BP	<2.27	BP	<1.31
	'020530	BP	<1.34	BP	<1.08
	020630	BP	<.841	BP	<1.03
	021030	BP	<.381	BP	<.548
	021130	BP	<.612	BP	<.340
	030230	BP	<1.16	BP	<.630
	030330	BP	<.995	BP	<.590
	030530	BP	<1.63	BP	<1.17
	030630	BP	<2.15	BP	<.447
	030730	BP	<2.82	BP	<2.76
	030830	BP	<3.76	BP	<3.02
	040830	BP	<0.785	BP	<2.12
	040930	BP	<0.824	BP	<0.769
	041130	BP	<1.92	BP	<1.57
	041230	BP	<1.81	BP	<1.37
	050228	BP	<1.44	BP	<1.39
	050330	BP	**5.52**	BP	<0.934
	050530	BP	<0.975	BP	<0.904
	050630	BP	<0.910	BP	<1.25
	050830	BP	<1.25	BP	<1.66
	050930	BP	<1.38	BP	<1.53
	051130	BP	<1.03	BP	<1.29
	051230	BP	<0.982	BP	<0.632
	060228	BP	<0.718	BP	<0.587
	060330	BP	<0.655	BP	<0.570
	060530	BP	<0.734	BP	<0.857
	060630	BP	<1.94	BP	<2.10
	060830	BP	<0.865	BP	<1.01
	060930	BP	<0.631	BP	<0.910
	061130	BP	<2.24	BP	<1.78
	061230	BP	<1.32	BP	<1.32
NEWPAGE CORP	880518		120		570
	890301		25		80

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLAN'

SOURCE	DATE	TCDD (pg/l)	TCDF (pg/l)
	890807	<6	20
	890810	<13	20
	890814	<5	13
	890817	<5	18
	890821	<8	21
	890824	<5	10
	890829	<5	18
	890831	<11	20
	890905	<11	20
	890907	<9	18
	891023	<3	7
	891026	<5	6
	891222	<5	20
	900216	<2	6
	900216	<1	7
	900515	<10	<8
	900515	<1	5
	900627	<3	8
	900627	<3	9
	920217	<4.6	14
	920221	<4.6	13
	920311	<4.6	9.9
	920316	3.2	8.7
		3.5	12
		4.6	17
	920326	4.5	8.5
	920412	6.3	24
	920613	<4.6	6.8
	920708	<4.6	<5.8
	920831	<4.6	3.5
	920904	<3.8	
	921104	<3.7	
	921201	<2.4	
	930105	<2.4	
	930201	<2.4	<10
	930401	<2.8	<10
	930501	<2.4	<10
	930701	<3.9	12
	930801	<2.8	<3.4
	931001	<3.2	<10
	931101	<3.9	<3.6
	940130	<2.8	<5.2
	940219	<1.9	<1.3
	940417	<3.3	<2.4
	940509	<3.6	<1.2
	940728	<3.7	<1.7
	940829	<2.7	<2.0
	941024	<2.1	<1.1
	941205	<2.7	<1.8
	950131	<10	<10

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLAN

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
	950229		<10		<10
	950430		<10		<10
	950531		<10		<10
	950731		<10		<10
	950831		<10		<10
	951031		<10		<10
	951130		<10		<10
	960130		<10		<10
	960330		<10		<10
	960430		<10		<10
	960530		<10		<10
	960730		<10		<10
	960830		<10		<10
	961030		<10		<10
	961130		<10		<10
	970317		<10		<10
	980130		<10		<10
	980230		<10		<10
	980430		<10		<10
	980530		<10		<10
	980609	BP	<10		<10
	980730		<10		<10
	980830	BP	<10		<10
	981030	BP	<10		<10
	981130	BP	<10		<10
	990130		<10		<10
		BP	<10	BP	<10
	990230		<10		<10
		BP	<10	BP	<10
	990430		<10		<10
		BP	<10	BP	<10
	990530		<10		<10
		BP	<10	BP	<10
	990730		<10		<10
		BP	<10	BP	<10
	990830		<10		<10
		BP	<10	BP	<10
	991030		<10		<10
		BP	<10	BP	<10
	991130		<10		<10
		BP	<10	BP	<10
	000113	BP	<10	BP	<10
	000224	BP	<10	BP	<10
	000410	BP	<10	BP	<10
	000505	BP	<10	BP	<10
	000718	BP	<10	BP	<10
	001003	BP	<10	BP	<10
	001106	BP	<10	BP	<10
	010112	BP	<10	BP	<10
	010201	BP	<10	BP	<10
	010408	BP	<10	BP	<10

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLAN

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
	010502	BP	<10	BP	<10
	010711	BP	<10	BP	<10
	010808	BP	<10	BP	<10
	011009	BP	<10	BP	<10
	011102	BP	<10	BP	<10
	020105	BP	<10	BP	<10
	020202	BP	<10	BP	<10
	020408	BP	<10	BP	<10
	020503	BP	<10	BP	<10
	020712	BP	<10	BP	<10
	020817	BP	<10	BP	<10
	021001	BP	<10	BP	<10
	021106	BP	<10	BP	<10
	030102	BP	<10	BP	<10
	030201	BP	<10	BP	<10
	030406	BP	<10	BP	<10
	030512	BP	<10	BP	<10
	030706	BP	<10	BP	<10
	030811	BP	<10	BP	<10
	031020	BP	<10	BP	<10
	031110	BP	<10	BP	<10
	040130		<10		<10
	040230				<10
	040330		<10		<10
	040430				<10
	040530				<10
	040630		<10		<10
	040730				<10
	040830				<10
	040930		<10		<10
	041030				<10
	041130				<10
	050110		<10		<10
	050207		<10		<10
	050404		<10		<10
	050530		<10		<10
	050704		<10		<10
	050815		<10		<10
	060101		<0.619		<0.523
SAPPI - SOMERSET	880630		16,19		63,100
	900710		<7.1		8.4
	900716		<6.1		5.9
	dup		<5.5		<7.3
	900724		<3.6		<3.9
	930105		<3.4		9.2
	930224		<4.7		15

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLAN'

SOURCE	DATE		TCDD (pg/l)	TCDF (pg/l)
	930311		<4.0	10
	930409		6.8	18
	930616		6.3	14
	930917		7	17
	931203		7.6	19
	940107		<3.8	9.2
	940624		<10	13
	940923		<11	8.7
	941209		<4.6	6.6
	950310		9	11.6
	950505		<10.3	6.6
	950616		<3.9	<9.4
	950807		5.8	14.5
	950911		2.8	15.3
	951124		<4.2	38.7
	951208		<7.4	29
	960112		<1.6	<2.3
	960209		<3.2	<4.8
	960405		<2.7	<2.7
	960610		<3.6	6.5
	960712		<3.0	4.2
	960809		5.8	15
	961108		<4.9	11
	961206		<4.1	9.7
	970103		<4.3	6.2
	970207		<2.0	7.5
	970411		<2.2	5.7
	970509		8.2	12
	970708	BP	<3.0	
	970711		<3.2	<2.9
	970805	BP	<2.9	
	970807	BP	<3.5	
	970815		<3	<3.3
	970820	BP	<3.7	
	980825	BP	<2.3	
	970916	BP	<2.6	
	971017		<9.1	<6.3
	971114		<3.8	<0.51
	980109		<3.5	<1.9
	980112	BP	<3.2	
	980206		<4.3	<2
	980410		<1.6	<1.6
	980608		<5.7	<1.7
	980810		<1.6	<2.5
	980911		<1.9	<2
	981009		<1.9	<1.9
	981106		<2.2	<1
	990210		<1.5	<1.2
	990310		<2.6	<2
	990410		<4.6	<3.3
	990510		<3.4	<4.5

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLAN

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
	990710		<3.5		<3.9
	990910		<7.3		<6
	991010		<4.1		<6.1
	991110		<2.2		<1.1
	000204		<3.4		<4.7
	000310		<3.1		<3.1
	000407		<3.3		<3.3
	000505		<5.7		<4.5
	000728		<2.24		<1.22
	000908		<4.34		<4.67
	001110		<0.556		<1.13
	001208		<3.61		<3.09
	020130	BP	<0.993	BP	<0.696
	020230	BP	<3.29	BP	<2.16
	020330	BP	<2.64	BP	<1.09
	020430	BP	<0.328	BP	<0.475
	020530	BP	<0.471	BP	<0.473
	020630	BP	<0.926	BP	<0.982
	020730	BP	<0.903	BP	<0.708
	020830	BP	<0.955	BP	<1.19
	020930	BP	<2.41	BP	<2.25
	021030	BP	<0.661	BP	1.73
	021130	BP	<1.77	BP	<1.66
	021230	BP	ND	BP	<1.68
	030130	BP	<0.933	BP	<0.435
	030230	BP	<1.91	BP	<2.36
	030330	BP	<1.18	BP	<1.20
	030430	BP	<1.82	BP	<1.21
	030530	BP	<0.878	BP	<0.874
	030630	BP	<0.841	BP	<0.847
	030730	BP	<1.18	BP	<0.985
	030830	BP	<2.04	BP	<1.42
	030930	BP	<0.672	BP	<0.573
	031030	BP	<1.28	BP	<1.20
	031130	BP	<1.41	BP	<1.49
	031230	BP	<3.04	BP	<3.38
	040130	BP	<1.96	BP	<2.13
	040230	BP	<1.95	BP	<1.94
	040330	BP	<0.440	BP	<0.642
	040430	BP	<0.691	BP	<0.628
	040530	BP	<0.532	BP	<0.498
	040630	BP	<1.08	BP	<1.58
	040730	BP	<1.34	BP	<1.06
	040830	BP	<0.904	BP	<0.576
	040930	BP	<1.47	BP	<1.31
	041130	BP	<2.01	BP	<2.09
	050131	BP		BP	<0.551
	050228	BP	<2.06	BP	<1.76
	050331	BP	<0.541	BP	<0.527
	050430	BP	<0.938	BP	<0.543

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLAN'

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
	050531	BP	<0.790	BP	<0.890
	050630	BP	<1.06	BP	<0.873
	060226	BP	<2.5	BP	
	060924	BP	<0.350	BP	<0.933
SAPPI - WESTBROOK	880101		6.3		
	1989		1		
	901118		<3		8
	910425		<5		<5
	910716		<8		<5
	911203		<8		<5
	920218		<2.8		7
	920507		<1.2		4.6
	920715		<5.8		<4.9
	921114		<1.8		3.9
	930303		<7.8		16
	930617		<1.5		<6.4
	930915		<2.4		5.7
	931208		<3.4		<7.3
	940130		<6.5		<9.8
	940324				<5.9
	940727		3.6		7.8
	941212		<6.0		<15.8
	950730		<5.4		9.8
	950615		<2.8		<9.9
	950815		<4.3		<21.9
	970519	BP	<7.9	BP	<10
	970808	BP	5.05	BP	<8.2
	971002	BP	<	BP	13.46
	980324		<1.6		5.9
	980914	BP	13.4	BP	130
	980915		<1.0		11
	980921		<1.9		<1.9
		BP	<10	BP	110
	981118		<10		<10
		BP	<10	BP	130
	981208	BP	<10	BP	140
	981209		<11		<11
	990113		<10		<10
	990131				<11
		BP	10	BP	140
	990209		<10		<10
	990318		<10		<10
	990331				<10
		BP	<11	BP	150
	990407		<10		<10
	990526		<11		15
	990617		<10		<10
	990630				15
		BP	<11	BP	130
	990728		<9.5		<9.5

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLAN

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
	990731	BP	<10	BP	54
	990830		<10		<10
	990830		<10		<10

APPENDIX 5.

LENGTHS AND WEIGHTS FOR 2006 FISH SAMPLES

LENGTHS AND WEIGHTS FOR 2006 FISH SAMPLES

FISH SAMPLES 2006 field ID	DATE SAMPLED	L mm	W gm.
ANDROSCOGGIN RIVER			
GILEAD			
AGL-RBT-1	5/17/2006	410	690
AGL-RBT-2	5/17/2006	390	600
AGL-RBT-3	5/17/2006	380	570
AGL-RBT-4	5/17/2006	385	580
AGL-RBT-5	5/17/2006	362	450
RUMFORD POINT			
RUMFORD			
ARF-SMB-1	7/28/2006	378	730
ARF-SMB-2	7/28/2006	378	720
ARF-SMB-3	7/28/2006	355	620
ARF-SMB-4	7/28/2006	415	950
ARF-SMB-5	7/28/2006	365	640
RILEY			
ARY-SMB-01	8/29/2006	411	860
ARY-SMB-02	8/29/2006	375	650
ARY-SMB-03	8/29/2006	334	485
ARY-SMB-04	8/29/2006	330	480
ARY-SMB-05	8/29/2006	358	620
ARY-WHS-1	7/28/2006	454	1010
ARY-WHS-2	7/28/2006	465	1060
ARY-WHS-3	7/28/2006	469	1160
ARY-WHS-4	7/28/2006	485	1170
ARY-WHS-5	7/28/2006	450	870
LIVERMORE			
ALV-SMB-01	8/28/2006	340	495
ALV-SMB-02	8/28/2006	333	430
ALV-SMB-03	8/28/2006	331	490
ALV-SMB-04	8/28/2006	390	730
ALV-SMB-05	8/28/2006	321	400
ALV-WHS-1	7/28/2006	500	1320
ALV-WHS-2	7/28/2006	490	1250
ALV-WHS-3	7/28/2006	444	980
ALV-WHS-4	7/28/2006	445	1010
ALV-WHS-5	7/28/2006	498	1350

LENGTHS AND WEIGHTS FOR 2006 FISH SAMPLES

FISH SAMPLES 2006 field ID	DATE SAMPLED	L mm	W gm.
GULF ISLAND POND			
AGI-SMB-1	7/26/2006	355	570
AGI-SMB-2	7/26/2006	312	370
AGI-SMB-3	7/26/2006	322	380
AGI-SMB-4	7/26/2006	341	590
AGI-SMB-5	7/26/2006	391	830
ANDROSCOGGIN L.			
ALW-SMB-1	7/26/2006	412	860
ALW-SMB-2	7/26/2006	406	970
ALW-SMB-3	7/26/2006	415	960
ALW-SMB-4	7/26/2006	412	870
ALW-SMB-5	7/26/2006	351	540
ALW-SMB-6	7/26/2006	412	860
ALW-SMB-7	7/26/2006	369	630
ALW-SMB-8	7/26/2006	380	590
ALW-SMB-9	7/26/2006	392	730
ALW-SMB-10	7/26/2006	382	650
ALW-WHP-1	7/26/2006	320	460
ALW-WHP-2	7/26/2006	260	200
ALW-WHP-3	7/26/2006	275	240
ALW-WHP-4	7/26/2006	280	280
ALW-WHP-5	7/26/2006	281	250
ALW-WHP-6	7/26/2006	300	320
ALW-WHP-7	7/26/2006	335	460
ALW-WHP-8	7/26/2006	333	500
ALW-WHP-9	7/26/2006	324	440
ALW-WHP-10	7/26/2006	320	410
KENNEBEC RIVER			
FAIRFIELD			
KFF-BNT-1	5/30/2006	430	750
KFF-BNT-2	5/30/2006	435	850
KFF-BNT-3	6/1/2005	440	820
KFF-BNT-4			
KFF-BNT-5			
KFF-WHS-1	10/18/2006	450	1010
KFF-WHS-2	10/18/2006	492	1620
KFF-WHS-3	10/18/2006	465	1150
KFF-WHS-4	10/18/2006	440	1050
KFF-WHS-5	10/18/2006	472	1310

LENGTHS AND WEIGHTS FOR 2006 FISH SAMPLES

FISH SAMPLES 2006 field ID	DATE SAMPLED	L mm	W gm.
WINSLOW			
KWL-BNT-1	5/8/2006	410	670
KWL-BNT-6	5/10/2006	439	810
KWL-BNT-7	5/10/2006	402	660
KWL-BNT-8	5/10/2006	380	480
KWL-BNT-9	5/10/2006	370	500
KWL-RBT-1	5/7/2006	445	810
KWL-RBT-2	5/8/2006	380	470
KWL-RBT-3	5/8/2006	350	340
KWL-RBT-4	5/8/2006	360	410
KWL-RBT-5	5/10/2006	375	390
GARDINER			
KGD-SMB-01	8/12/2006	320	380
KGD-SMB-02	8/12/2006	335	410
KGD-SMB-03	8/12/2006	340	450
KGD-SMB-04	8/12/2006	315	340
KGD-SMB-05	8/12/2006	314	340
PENOBSCOT RIVER			
E BR GRINDSTONE			
PBGWHS01	8/9/2006	450	930
PBGWHS02	8/9/2006	466	1010
PBGWHS03	8/9/2006	430	1050
PBGWHS04	8/9/2006	470	1230
PBGWHS05	8/9/2006	460	1010
MATTASEUNK IMPOUNDMENT (WOODVILLE)			
PBW-WHS-01	8/31/2006	455	956
PBW-WHS-02	8/31/2006	466	1143
PBW-WHS-03	8/31/2006	450	957
PBW-WHS-04	8/31/2006	445	942
PBW-WHS-05	8/31/2006	480	1138
LINCOLN			
PBL-WHS-1	9/14/2006	467	1260
PBL-WHS-2	9/14/2006	422	917
PBL-WHS-3	9/14/2006	482	1434
PBL-WHS-4	9/14/2006	465	1200
PBL-WHS-5	9/14/2006	435	1069

LENGTHS AND WEIGHTS FOR 2006 FISH SAMPLES

FISH SAMPLES 2006 field ID	DATE SAMPLED	L mm	W gm.
VEAZIE			
PBV-WHS1	11/7/2006	530	1840
PBV-WHS2	11/7/2006	505	1580
PBV-WHS3	11/7/2006	491	1480
PBV-WHS4	11/7/2006	516	1720
PBV-WHS5	11/7/2006	449	1360
PRESUMPSCOT R			
WINDHAM			
PWD-SMB01	8/14/2006	430	1070
PWD-SMB02	8/14/2006	380	620
PWD-SMB03	8/14/2006	412	920
PWD-SMB04	8/14/2006	330	440
PWD-SMB05	8/14/2006	430	1275
PWB-SMB01	7/17/2006	360	580
PWB-SMB02	7/17/2006	415	870
PWB-SMB03	7/17/2006	340	470
PWB-SMB04	7/17/2006	322	390
PWB-SMB05	7/17/2006	320	280
SEBASTICOOK RIVER			
PALMYRA			
SWP-LMB-1	7/14/2006	400	890
SWP-LMB-2	7/14/2006	485	2010
SWP-LMB-3	7/14/2006	412	1060
SWP-LMB-4	7/14/2006	430	1100
SWP-LMB-5	7/14/2006	370	800
BURNHAM			
SBN-SMB-1	7/5/2006	500	
SBN-SMB-2	7/5/2006	305	
SBN-SMB-3	7/5/2006	320	
SBN-SMB-4	7/5/2006	425	
SBN-SMB-5	7/5/2006	310	
NEWPORT			
SEN-LMB-1	7/14/2006	390	970
SEN-LMB-2	7/14/2006	395	900
SEN-LMB-3	7/14/2006	404	760
SEN-LMB-4	7/14/2006	405	1130
SEN-LMB-5	7/14/2006	305	350

LENGTHS AND WEIGHTS FOR 2006 FISH SAMPLES

FISH SAMPLES 2006 field ID	DATE SAMPLED	L mm	W gm.
SALMON FALLS			
Spaulding P-SMB-01	10/2/2006	405	910
Spaulding P-SMB-02	10/2/2006	330	490
Spaulding P-SMB-03	10/2/2006	370	860
Spaulding P-SMB-04	10/2/2006	385	620
Spaulding P-SMB-05	10/2/2006	342	540
SFS-LMB-01	8/11/2006	338	520
SFS-LMB-02	8/11/2006	330	500
SFS-LMB-03	8/11/2006	352	640
SFS-LMB-04	8/11/2006	310	410
SFS-LMB-05	8/11/2006	380	740
BERWICK SLUDGE1	12/30/2006		
BERWICK SLUDGE2	12/30/2006		
BERWICK SLUDGE3	12/30/2006		
BERWICK SLUDGE4	12/30/2006		
SOMERSWORTH SLUDGE1	12/30/2006		
SOMERSWORTH SLUDGE2	12/30/2006		
SOMERSWORTH SLUDGE3	12/30/2006		
SOMERSWORTH SLUDGE4	12/30/2006		

APPENDIX 6.

SUMMARY OF DIOXINS AND FURANS IN FISH AND SHELLFISH SAMPLES, 1984-2006

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

			NDS/NBS	MAINE					
			1984-86	1988- 1990		19 91		19 92	
WATER/STATION	SPECIES	TISSUE	TCDD	TCDD	DTE	TCDD	DTE	TCDD	DTE
ANDROSCOGGIN LAKE									
Wayne	bn trout	f							
	bass	f							
	w perch								
	sucker	w/f							
POCASSET LAKE									
Wayne	bass								
	SMB comp								
	WHP comp								
ANDROSCOGGIN R									
Gilead	rb trout								
	bn trout								
	juv bass								
	bass								
	sucker	w	1.8f/6.5w						
Rumford	bass	f				1.4	2.3-2.8	0.6	1.0-1.2
	juv bass								
	sucker	w						3.0	7.4-8.0
Riley	bass								
	sucker	w	<2.1f/13w						
Jay	bass	f		17.6	24.0-29.1			1.2	1.9-2.3
	sucker	w						5.4	12.9-13.9
Livermore Fall:	bass	f				2.4	3.1-3.3	1.1	1.4-1.5
	sucker	w						3.8	7.4-8.0
	sucker comp								
Livermore ALF	bass								
	sucker								
N Turner	sucker	w	6.2f/30w						
Auburn-GIP	bass	f	3.7f/24w					1.7	2.6-2.8
	lm bass	f						1.1	1.6-1.8
	sucker	w	8.3f/29w					5.6	14.3-15.4
	bullhead	w	7.8f/29.6w						
Lisbon Falls	bn trout	f		5.3	6.5-6.9				
	bass	f		4.5	5.5-5.8			0.7	1.0
	sucker	w	5.1f/12w					3.4	8.1-8.7
Brunswick	sucker	w	19.0						

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

WATER/STATION	SPECIES	TISSUE	NDS/NBS 1984-86 TCDD	MAINE 1988- 1990 TCDD	MAINE 1988- 1990 DTE	19 91 TCDD	19 91 DTE	19 92 TCDD	19 92 DTE
	carp	f	11.0						
BEARCE LAKE									
Baring	pickerel	f	<0.1						
BRAVE BOAT HARBOR									
Kittery	lobster	m							
	lobster	t							
BROOKLYN	lobster	m							
	lobster	t							
COREA	lobster	t							
JONES CREEK									
Scarborough	clam	m						<0.1	0.02-0.3
KENNEBEC R									
Madison	bn trout	f							
	bass	f						<0.1	0.02-0.1
	sucker	w						0.1	0.3
Norridgewock	bass								
	bn trout								
	sucker								
Fairfield	bass	f				1.4	1.6-1.7	0.6	0.6-0.7
	trout	f		6.2	6.9-8.0			1.4	1.6-1.8
	sucker	w	6.4	10.3	16.8-18.1			2.0	3.1-3.3
Sidney	bass	f	20.3w			1.0	1.4-2.4	0.4	0.6-1.0
	bn trout								
	sucker	w	1.2f/11.4w					2.7	4.4-4.8
Augusta	bn trout	f		2.2	2.9-4.9			1.9	2.5-4.3
	bass	f						0.4	0.6-1.0
	sucker	w		5.0	7.3-8.4			1.5	2.6-2.8
Hallowell	smelt	c						0.2	0.5-0.8
Gardiner	bass								
Richmond	eel	f							
Phippsburg	clam	m						0.3	0.6-0.9
	lobster	m							

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

			NDS/NBS	MAINE					
			1984-86	1988- 1990		19 91		19 92	
WATER/STATION	SPECIES	TISSUE	TCDD	TCDD	DTE	TCDD	DTE	TCDD	DTE
	lobster	t							
MESSALONSKEE LAKE									
Belgrade	bass					<0.09	0.04-0.3		
NARRAGUAGUS R									
Cherryfield	fallfish	w	<1.0						
NORTH POND									
Chesterfield	sucker	w	0.4						
	pickerel	f	<0.1						
PENOBSCOT R									
E Br Grindstone	bass	f		<0.1	0.09-0.2				
	sucker	w		<0.4	0.02-0.6				
E Millinocket	bass	f		<0.2	0.4-0.8				
	sucker	w		0.7	3.6-4.2				
Woodville	bass								
	sucker								
Winn	bass								
	sucker								
N Lincoln	bass	f		<0.4	0.2-0.8				
	sucker	w		<0.5-20.8	2.0-41.6				
S Lincoln	bass	f	5.0	1.7	2.3-2.7	0.9	1.2-1.3	0.7	1.0-1.2
	sucker	w		37.0	66.4-67.2			3.3	6.8
Passadumkeag	bass	f		1.8	2.9				
	sucker	w		2.8	7.6-7.7				
Milford	bass	f		0.9	1.4-1.7			0.3	0.4-0.5
	sucker	w		9.7	19.9-20.1			2.2	4.6
Veazie	bass	f	4.6w	1.9	2.4-2.6	1.2	1.5-1.7	0.4	0.6
	sucker	w	2.6f/7.6w	5.9	9.8-9.9	2.5	4.9-5.0	2.2	4.8-4.9
Bangor	eel	f							
Bucksport	clam	m						0.1	0.8-0.9
Stockton Springs	lobster	m							
	lobster	t							
OWLS HEAD	mussel	m	<0.8						
PISCATAQUIS R									

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

			NDS/NBS	MAINE					
			1984-86	1988- 1990		19 91		19 92	
WATER/STATION	SPECIES	TISSUE	TCDD	TCDD	DTE	TCDD	DTE	TCDD	DTE
Sangerville	bass	f				<0.2	0.03-0.3		
	bn trout	f				<0.4	0.03-0.4		
	sucker	w				0.26	0.6-0.7		
Howland	bass	f		<0.2	0.02-0.6				
PRESUMPSCOT R									
Windham	bass	f							
	sucker	w							
Westbrook	bass	f		1.8	2.4-4.5	0.2	0.2-0.4	0.1	0.2-0.4
	pickerel	f		<2.6	0.06-5.9				
	w perch	f		1.2	2.5-3.1	0.4	0.9-1.0		
	sucker	w	5.2	5.1	8.2-9.6	0.6	1.6-1.7	0.3	0.8-0.9
Falmouth	clam	m						<0.1	0.2-0.4
Portland	lobster	m							
	lobster	t							
ST CROIX R									
Woodland	bass	f							
	sucker								
Baring	bass			0.3	0.5-1.0	<0.1	0.04-0.3		
	sucker	w	<0.7	0.6	1.0-1.1				
Robbinston	lobster	t							
ST JOHN R									
Frenchville	sucker	w							
Madawaska	y perch	f		<0.5	0.08-0.8				
	bk trout	f							
	sucker	w							
SACO R									
Dayton	sucker	w	<0.3						
SACO BAY									
Scarborough	lobster	m							
	lobster	t							
SALMON FALLS R									
Acton	lm bass								

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

			NDS/NBS	MAINE					
			1984-86	1988- 1990		19 91		19 92	
WATER/STATION	SPECIES	TISSUE	TCDD	TCDD	DTE	TCDD	DTE	TCDD	DTE
	sucker								
Lebanon	lm bass								
S Berwick	bass	f		0.4	0.5-0.6				
	lm bass								
	pickerel	f		0.2	0.3				
	sucker	w		1.5	2.1-2.2			2.4	3.4-3.6
SANDY P									
	bass	f	<1.0						
SEBAGO L									
Naples	bass	w	<0.6						
SEBASTICOOK R									
E Br Corinna	lm bass								
	bass								
	sucker								
Newport	bass	f						0.1	0.3-0.4
	lm bass	f	<0.2					<0.2	0.2-0.4
	w perch	f		1.0	1.6-2.1				
Sebastcook L	bass	f							
	w perch	f							
Detroit	bass	f							
Burnham	bass								
W Br Harmony	bass								
	sucker								
W Br Palmyra	bass	f		1.2	1.4-1.8			0.4	0.5-0.6
	pickerel	f	<0.1					0.2	0.2
	sucker	w	1.6	3.3	4.3-4.6			1.1	1.4-1.6
WEBBER POND									

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

			NDS/NBS	MAINE					
			1984-86	1988- 1990		19 91		19 92	
WATER/STATION	SPECIES	TISSUE	TCDD	TCDD	DTE	TCDD	DTE	TCDD	DTE
Vassalboro	bass	f				<0.08	0.04-0.4		

f=fillet
m=meat
t=tomalley
w=whole

DTE= dioxin toxic equivalents using WHO 98 toxic equivalency factors (TEF).
Range shown at nd=0 and nd=mdl, ie DTEo-DTEd

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

			19 93		19 94		19 95		19 96		19 97	
WATER/STATION	SPECIES	TISSUE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE
ANDROSCOGGIN LAKE												
Wayne	bn trout	f							0.7	1.1-2.3		
	bass	f							0.6	1.2-2.2		
	w perch											
	sucker	w/f							w 0.4	1.4-2.5		
POCASSET LAKE												
Wayne	bass											
	SMB comp											
	WHP comp											
ANDROSCOGGIN R												
Gilead	rb trout						1.2	2.4-2.9	0.9	2.0-2.6	0.5	1.6-2.1
	bn trout								0.4	1.0-1.5		
	juv bass											
	bass						0.9	3.8-4.1				
	sucker	w					1.7	6.1-6.7	0.7	4.4-5.3	0.5	3.4-3.8
Rumford	bass	f	2.9	4.5-5.4	3.8	5.7-6.2	2.2	3.5-4.1			0.5	1.2-1.8
	juv bass											
	sucker	w	5.8	13.6-14.6	4.0	11.4-11.9			0.8	4.1-5.2	0.5	3.6-4.9
Riley	bass										0.3	1.1-2.2
	sucker	w									0.5	3.8-4.8
Jay	bass	f	1.4	1.8-2.2	1.6	2.2-2.8			0.5	1.3-1.4		
	sucker	w	4.5	10.9-11.8	4.7	11.5-12.3	2.3	6.9-7.6				
Livermore Falls	bass	f	1.4	1.6-1.8	1.4	1.6-2.3	0.5	0.8-1.3			0.3	1.2-1.4
	sucker	w	3.6	6.8-7.3	2.2	4.8-5.3			0.6	3.4-3.9	0.5	2.8-2.9
	sucker comp											
Livermore ALF	bass											
	sucker											
N Turner	sucker	w										
Auburn-GIP	bass	f	1.2	1.8-1.9	1.3	2.0-2.7			0.6	2.1-2.5	0.4	2.0-2.2
	lm bass	f										
	sucker	w	3.7	9.0-9.8	1.6	4.4-5.4	1.4	3.8-5.0				
	bullhead	w	2.1	3.0-3.3	1.3	2.3-2.8						
Lisbon Falls	bn trout	f										
	bass	f	1.2	1.7-1.8	0.6	0.8-1.7	0.9	1.4-2.4			0.6	1.3-1.8
	sucker	w	2.7	6.1-6.6	2.4	5.8-6.2			0.7	1.6-2.8		
Brunswick	sucker	w										

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

			1993		1994		1995		1996		1997	
WATER/STATION	SPECIES	TISSUE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE
	carp	f										
BEARCE LAKE												
Baring	pickerel	f										
BRAVE BOAT HARBOR												
Kittery	lobster	m			<0.1	<0.1-1.2			1.7	13.8-15.5		
	lobster	t			1.3	9.7-11.5	1.6	6.7-9.9				
BROOKLYN	lobster	m					0.8	4.9-8.2				
	lobster	t										
COREA	lobster	t							0.6	6.6-7.3		
JONES CREEK												
Scarborough	clam	m										
KENNEBEC R												
Madison	bn trout	f					<0.1	0.1-0.7				
	bass	f							<0.1	0.1-0.8	<0.2	0.03-1.6
	sucker	w					0.1	0.3-1.0	<0.1	0.3-1.0	<0.1	0.2-0.8
Norridgewock	bass											
	bn trout											
	sucker											
Fairfield	bass	f	1.5	1.7-2.0	0.9	1.1-1.8					0.6	0.6-1.2
	trout	f	1.4	1.6-1.9	2.2	2.5-3.8	1.6	1.7-2.5			1.2	1.3-1.9
	sucker	w	1.6	2.2-2.6	2.2	2.9-3.8			1.6	2.1-2.7	1.2	1.7-2.1
Sidney	bass	f	0.6	0.8-1.4	0.3	0.4-1.3			0.2	0.4-1.0	0.2	0.3-0.9
	bn trout											
	sucker	w	1.5	2.5-2.7	2.3	3.0-4.0	1.2	1.7-2.5				
Augusta	bn trout	f					1.0	1.3-3.5			0.6	1.0-1.3
	bass	f	0.6	0.9-1.5	1.0	1.3-3.7					0.5	0.8-1.6
	sucker	w	1.9	3.3-3.6	2.3	4.0-5.8			2.2	2.6-3.3		
Hallowell	smelt	c										
Gardiner	bass											
Richmond	eel	f	0.6	0.8-1.4								
Phippsburg	clam	m										
	lobster	m	0.2	0.3-1.2	<0.1	<0.1-1.6						

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

WATER/STATION	SPECIES	TISSUE	1993 TCDD	1993 DTE	1994 TCDD	1994 DTE	1995 TCDD	1995 DTE	1996 TCDD	1996 DTE	1997 TCDD	1997 DTE
	lobster	t	7.9	27.5-27.6	6.5	23.4-26.6	4.6	13.5-17.1	3.6	16.7-18.6		
MESSALONSKEE LAKE												
Belgrade	bass											
NARRAGUAGUS R												
Cherryfield	fallfish	w										
NORTH POND												
Chesterfield	sucker	w										
	pickerel	f										
PENOBSCOT R												
E Br Grindstone	bass	f					<0.1	0.1-0.7	<0.1	0.1-0.8	<0.1	0.04-0.7
	sucker	w					<0.1	0.1-0.6	<0.1	0.1-0.8	<0.1	0.07-0.7
E Millinocket	bass	f									<0.1	0.04-0.7
	sucker	w									<0.1	0.09-0.7
Woodville	bass										<0.1	0.07-0.7
	sucker										<0.1	0.09-0.7
Winn	bass											
	sucker											
N Lincoln	bass	f										
	sucker	w										
S Lincoln	bass	f	1.2	1.6-1.8	0.4	0.4-1.7	0.5	0.7-1.3	0.3	0.5-1.2	0.2	0.4-1.0
	sucker	w	1.7	3.5-3.6	2.2	5.8-6.1			1.6	2.2-3.2	1.2	1.6-2.2
Passadumkeag	bass	f										
	sucker	w										
Milford	bass	f									0.2	0.4-0.9
	sucker	w									1.0	1.6-2.0
Veazie	bass	f	0.6	0.8-1.0	0.2	0.2-1.3	0.3	0.4-1.9	0.3	0.3-1.5	0.3	0.4-0.9
	sucker	w	1.1	2.7-3.0	0.6	1.6-2.8	0.5	1.4-2.5	0.4	0.9-2.0	1.1	1.3-1.9
Bangor	eel	f	1.0	1.1-1.2					0.3	0.4-1.5		
Bucksport	clam	m										
Stockton Sprinc	lobster	m	0.1	0.3-1.1	<0.1	0.1-1.0						
	lobster	t	4.0	28.0	2.3	18.1-27.9	1.3	7.2-14.6	0.9	12.5-13.2		
OWLS HEAD	mussel	m										
PISCATAQUIS R												

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

			1993		1994		1995		1996		1997	
WATER/STATION	SPECIES	TISSUE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE
Sangerville	bass	f										
	bn trout	f										
	sucker	w										
Howland	bass	f										
PRESUMPSCOT R												
Windham	bass	f	<0.1	<0.1-0.3	<0.1	<0.1-1.1			<0.1	0.5-1.5	<0.1	0.5-0.7
	sucker	w	0.3	0.7-0.8	0.2	1.4-2.4	0.3	2.4-7.7			0.2	1.2-1.4
Westbrook	bass	f	<0.2	0.1-0.5	0.2	0.3-1.2			0.2	0.4-0.9	0.1	0.4-0.9
	pickerel	f										
	w perch	f										
	sucker	w	1.1	1.8-2.3	0.9	2.1-3.7	0.8	1.6-2.6			0.2	1.6-2.0
Falmouth	clam	m										
Portland	lobster	m	<0.1	0.1-0.8	<0.1	0.2-1.0			2.7	18.9-21.6		
	lobster	t	3.4	18.5-18.7	2.5	17.2-21.3	2.2	9.5-12.8				
ST CROIX R												
Woodland	bass	f									<0.1	0.02-0.7
	sucker										<0.1	0.09-0.7
Baring	bass										<0.1	0.03-0.7
	sucker	w									<0.1	0.07-0.8
Robbinston	lobster	t							1.0	10.2-11.2		
ST JOHN R												
Frenchville	sucker	w			0.1	0.2-1.0						
Madawaska	y perch	f										
	bk trout	f			<0.3	<0.1-2.3						
	sucker	w			<0.1	0.2-0.8						
SACO R												
Dayton	sucker	w										
SACO BAY												
Scarborough	lobster	m	<0.1	0.1-0.8	<0.1	<0.1-0.8						
	lobster	t	2.0	11.3-14.6	1.3	9.7-12.0						
SALMON FALLS R												
Acton	lm bass						<0.1	<0.1-0.7	<0.1	0.1-1.0		

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

			19 93		19 94		19 95		19 96		19 97	
WATER/STATION	SPECIES	TISSUE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE
	sucker											
Lebanon	lm bass											
S Berwick	bass	f	0.2	0.2-0.9	0.5	0.7-3.3	0.4	0.4-4.0			0.2	0.3-0.6
	lm bass											
	pickerel	f									0.6	0.8-1.0
	sucker	w	1.9	3.6-3.8	2.1	4.7-6.1			2.0	3.2-4.5		
SANDY P												
	bass	f										
SEBAGO L												
Naples	bass	w										
SEBASTICOOK R												
E Br Corinna	lm bass						0.1	0.2-1.1			<0.1	0.1-0.7
	bass											
	sucker											
Newport	bass	f									0.2	1.2-1.4
	lm bass	f					0.3	1.1-2.0				
	w perch	f							0.3	1.6-2.3		
Sebastcook L	bass	f										
	w perch	f										
Detroit	bass	f										
Burnham	bass											
W Br Harmony	bass						<0.1	0.1-0.8			<0.1	0.06-0.7
	sucker								0.1	0.1-1.2		
W Br Palmyra	bass	f	0.9	1.2-1.6	0.4	0.4-1.3	0.8	1.7-2.2			0.3	0.6-0.9
	pickerel	f										
	sucker	w	1.0	2.6-2.7	1.2	4.0-4.3			1.2	2.2-3.6		
WEBBER POND												

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

			19 93		19 94		19 95		19 96		19 97	
WATER/STATION	SPECIES	TISSUE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE
Vassalboro	bass	f										

f=fillet
m=meat
t=tomalley
w=whole

DTE= dioxin toxic equivalents ι
Range shown at nd=0 and nd=mdl,

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

				1998		1999			2000			2001	
WATER/STATION	SPECIES	TISSUE		TCDD	DTE	TCDD	DTE		TCDD	DTE		TCDD	DTE
ANDROSCOGGIN LAKE													
Wayne	bn trout	f											
	bass	f		0.2	0.4-1.0	0.1	0.2-0.8		<0.1	0.02-1.3		<0.1	0.1-0.8
	w perch			0.5	0.6-1.2	0.2	0.3-0.9		0.2	0.2-0.8		0.1	0.2-0.7
	sucker	w/f	w	0.4	0.9-1.1			w	<0.1	0.1-1.1	f	<0.1	0.1-0.7
POCASSET LAKE													
Wayne	bass												
	SMB comp												
	WHP comp												
ANDROSCOGGIN R													
Gilead	rb trout			0.4	1.5-2.0	0.7	1.7-2.3		0.4	0.9-1.4		0.8	2.1-2.5
	bn trout					0.4	1.0-1.5		0.1	0.4-1.0		0.8	2.5-2.7
	juv bass												
	bass					0.4	1.4-1.5		0.2	0.8-1.2		0.3	1.0-1.4
	sucker	w		0.9	3.1-3.5	0.8	2.9-3.3		0.3	1.8-2.2		0.1	0.7-1.1
Rumford	bass	f		0.4	1.1-1.5	0.6	1.5-1.9		0.2	0.6-1.1		0.2	0.5-1.0
	juv bass												
	sucker	w		0.4	3.0-3.4	0.4	2.8-3.2		0.3	1.9-2.3		0.3	2.0-2.4
Riley	bass			0.2	0.8-1.0	<0.1	0.6-0.9		<0.1	0.2-0.6		0.2	0.8-1.0
	sucker	w		0.3	2.5-2.8	0.3	2.6-2.8					0.3	1.9-2.1
Jay	bass	f											
	sucker	w											
Livermore Fall:	bass	f		0.2	1.1-1.2	0.2	0.9-1.2		0.2	0.6-1.0		0.3	0.9-1.4
	sucker	w		0.5	2.8-2.9	0.4	2.4					0.3	1.6-1.7
	sucker comp												
Livermore ALF	bass												
	sucker												
N Turner	sucker	w											
Auburn-GIP	bass	f		0.4	1.6-1.8	0.4	1.6-1.8		0.1	0.4-0.9		0.2	0.4-0.9
	lm bass	f											
	sucker	w										0.2	0.6-0.9
	bullhead	w											
Lisbon Falls	bn trout	f											
	bass	f		0.5	1.1-1.5	0.7	1.7-2.1		0.2	0.5-1.0		0.4	0.9-1.3
	sucker	w											
Brunswick	sucker	w											

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

WATER/STATION	SPECIES	TISSUE	1998 TCDD	1998 DTE	1999 TCDD	1999 DTE	2000 TCDD	2000 DTE	2001 TCDD	2001 DTE
	carp	f								
BEARCE LAKE										
Baring	pickerel	f								
BRAVE BOAT HARBOR										
Kittery	lobster	m								
	lobster	t								
BROOKLYN	lobster	m								
	lobster	t								
COREA	lobster	t								
JONES CREEK										
Scarborough	clam	m								
KENNEBEC R										
Madison	bn trout	f							<0.1	<0.1-0.7
	bass	f								
	sucker	w								
Norridgewock	bass		<0.1	0.03-0.6	<0.1	0.03-0.7	<0.1	0.05-0.7	<0.1	0.1-0.8
	bn trout						<0.1	0.04-0.7		
	sucker		<0.1	0.2-0.7	<0.1	0.03-0.7	<0.1	0.05-0.7	<0.1	<0.1-0.7
Fairfield	bass	f	0.3	0.4-1.0	0.4	0.4-1.0	0.4	0.5-1.1	0.2	0.4-0.9
	trout	f							1.0	1.2-1.8
	sucker	w	0.9	1.4-1.8	0.3	0.4-1.0	0.4	0.5-1.0	0.3	0.5-1.1
Sidney	bass	f					0.2	0.2-0.8	0.2	0.4-0.9
	bn trout						0.3	0.3-0.8	0.4	0.5-1.1
	sucker	w								
Augusta	bn trout	f								
	bass	f	0.3	0.6-0.9	0.3	0.6-0.9				
	sucker	w								
Hallowell	smelt	c								
Gardiner	bass									
Richmond	eel	f								
Phippsburg	clam	m								
	lobster	m								

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

WATER/STATION	SPECIES	TISSUE	1998 TCDD	1998 DTE	1999 TCDD	1999 DTE	2000 TCDD	2000 DTE	2001 TCDD	2001 DTE
	lobster	t								
MESSALONSKEE LAKE										
Belgrade	bass									
NARRAGUAGUS R										
Cherryfield	fallfish	w								
NORTH POND										
Chesterfield	sucker	w								
	pickerel	f								
PENOBSCOT R										
E Br Grindstone	bass	f	<0.1	0.04-0.7						
	sucker	w	<0.1	0.07-0.7						
E Millinocket	bass	f	<0.1	0.04-0.7						
	sucker	w	<0.1	0.09-0.7						
Woodville	bass		<0.1	0.06-0.7	<0.1	0.08-0.7	<0.1	0.1-0.7	<0.1	0.1-0.7
	sucker		<0.1	0.08-0.7	<0.1	0.1-0.7	<0.1	0.1-0.7	<0.1	0.1-0.7
Winn	bass				<0.1	0.2-0.8	<0.1	0.1-0.7	<0.1	<0.1-0.7
	sucker				<0.1	0.2-0.9	<0.1	0.1-0.8	<0.1	<0.1-0.7
N Lincoln	bass	f								
	sucker	w								
S Lincoln	bass	f	0.2	0.4-0.9	0.4	0.6-1.0	0.2	0.3-0.9	0.4	0.5-1.1
	sucker	w	1.0	1.4-2.0	1.0	1.4-1.6	0.7	1.0-1.5	0.3	0.5-1.1
Passadumkeag	bass	f								
	sucker	w								
Milford	bass	f	0.2	0.2-0.8	0.1	0.4-0.7	0.2	0.3-0.9	0.3	0.5-1.1
	sucker	w	1.0	1.5-2.0	1.0	1.5-1.6	0.8	1.1-1.6	0.4	0.5-1.0
Veazie	bass	f	0.2	0.3-0.9	0.3	0.4-0.9	0.4	0.5-1.1	0.2	0.3-0.8
	sucker	w	1.0	1.2-1.8	1.1	1.3-1.7	0.9	1.2-1.7	1.3	1.7-2.2
Bangor	eel	f					1.6	2.0-2.5	1.1	1.5-2.0
Bucksport	clam	m								
Stockton Sprinc	lobster	m								
	lobster	t								
OWLS HEAD	mussel	m								
PISCATAQUIS R										

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

			1998		1999		2000		2001	
WATER/STATION	SPECIES	TISSUE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE
Sangerville	bass	f								
	bn trout	f								
	sucker	w								
Howland	bass	f								
PRESUMPSCOT R										
Windham	bass	f	<0.1	0.4-0.8			<0.1	0.1-0.7	<0.1	0.1-0.7
	sucker	w	0.2	1.2-1.4					0.2	1.4-1.5
Westbrook	bass	f	<0.1	0.3-0.8			<0.1	0.2-0.8	<0.1	<0.1-0.7
	pickerel	f								
	w perch	f								
	sucker	w	0.2	1.6-2.0					0.2	1.3-1.7
Falmouth	clam	m								
Portland	lobster	m								
	lobster	t								
ST CROIX R										
Woodland	bass	f	<0.1	0.06-0.7	<0.1	0.06-0.7				
	sucker		<0.1	0.08-0.7	<0.1	0.07-0.7				
Baring	bass		<0.1	0.05-0.7	<0.1	0.05-0.7				
	sucker	w	<0.1	0.08-0.8	<0.1	0.08-0.7				
Robbinston	lobster	t								
ST JOHN R										
Frenchville	sucker	w								
Madawaska	y perch	f								
	bk trout	f								
	sucker	w								
SACO R										
Dayton	sucker	w								
SACO BAY										
Scarborough	lobster	m								
	lobster	t								
SALMON FALLS R										
Acton	lm bass									

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

WATER/STATION	SPECIES	TISSUE	1998 TCDD	1998 DTE	1999 TCDD	1999 DTE	2000 TCDD	2000 DTE	2001 TCDD	2001 DTE
	sucker									
Lebanon	lm bass									
S Berwick	bass	f			0.1	0.3-0.6	0.1	0.2-0.8	0.2	0.4-0.8
	lm bass				0.2	0.5-0.8				
	pickerel	f								
	sucker	w								
SANDY P										
	bass	f								
SEBAGO L										
Naples	bass	w								
SEBASTICOOK R										
E Br Corinna	lm bass									
	bass									
	sucker									
Newport	bass	f							0.1	0.6-0.9
	lm bass	f								
	w perch	f								
Sebastcook L	bass	f					0.1	0.5-0.8		
	w perch	f					0.2	0.8-0.9		
Detroit	bass	f							0.1	0.2-0.8
Burnham	bass									
W Br Harmony	bass									
	sucker									
W Br Palmyra	bass	f	0.2	0.5-0.8	0.2	0.6-0.8	0.1	0.4-2.7	0.2	0.5-0.8
	pickerel	f								
	sucker	w								
WEBBER POND										

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

			1998		1999		2000		2001	
WATER/STATION	SPECIES	TISSUE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE
Vassalboro	bass	f								

f=fillet
m=meat
t=tomalley
w=whole

DTE= dioxin toxic equivalents ι
Range shown at nd=0 and nd=mdl,

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

WATER/STATION	SPECIES	TISSUE	2002 TCDD	2002 DTE	2003 TCDD	2003 DTE	2004 TCDD	2004 DTE	2005 TCDD	2005 DTE	2006 TCDD	2006 DTE
ANDROSCOGGIN LAKE												
Wayne	bn trout	f										
	bass	f	<0.1	0.3-1.3	0.2	0.8-1.0	<0.1	0.2-0.4	<0.1	0.1-0.3	<0.1	0.1-0.4
	w perch		<0.1	0.4-1.4	0.1	0.7-0.9	<0.1	0.4-0.8	0.1	0.8-0.9	<0.1	0.3-0.5
	sucker	w/f										
POCASSET LAKE												
Wayne	bass		<0.1	<0.1-1.2	<0.1	<0.1-0.5						
	SMB comp				<0.1	0.2-0.5						
	WHP comp				<0.1	0.3-0.6						
ANDROSCOGGIN R												
Gilead	rb trout						<0.1	0.8-1.1	<0.1	1.0-1.2	0.1	0.5-0.8
	bn trout											
	juv bass		<0.1	1.9-2.8								
	bass		<0.1	1.4-2.3	0.1	1.1-1.4	0.1	1.6-1.8				
	sucker	w	0.1	1.4-2.2	<0.1	1.2-1.5	<0.1	1.2-1.5				
Rumford	bass	f	0.1	0.6-1.5	<0.1	0.6-0.9	<0.1	0.3-0.5	0.1	0.4-0.5	<0.1	0.3-0.5
	juv bass		<0.1	0.8-1.4								
	sucker	w	<0.1	0.4-1.5	0.2	1.8-2.1	<0.1	1.0-1.2				
Riley	bass		<0.1	0.2-1.3	<0.1	0.3-0.7	<0.1	0.2-0.3			<0.1	0.1-0.4
	sucker	w	0.1	0.6-1.6	0.2	1.9-2.1	0.3	2.8-2.9	0.3	2.8-2.9	0.1	1.0-1.3
Jay	bass	f										
	sucker	w										
Livermore Falls	bass	f	0.1	0.3-1.4	<0.1	0.2-0.6	<0.1	0.2-0.3			<0.1	<0.1-0.3
	sucker	w	0.2	0.9-1.9	0.3	1.6-1.9	0.3	1.8-1.9	0.2	1.1-1.3	0.1	1.2-1.4
	sucker comp				0.2	1.5-1.7						
Livermore ALF	bass				<0.1	0.2-0.6						
	sucker				0.1	0.6-0.9						
N Turner	sucker	w										
Auburn-GIP	bass	f	0.1	0.2-1.3			0.1	0.4-0.6	<0.1	0.2-0.5	<0.1	0.2-0.4
	lm bass	f										
	sucker	w	0.3	0.8-1.2								
	bullhead	w										
Lisbon Falls	bn trout	f										
	bass	f					0.1	0.2-0.3				
	sucker	w										
Brunswick	sucker	w										

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

			20 02		20 03		20 04		20 05		20 06	
WATER/STATION	SPECIES	TISSUE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE
	carp	f										
BEARCE LAKE												
Baring	pickerel	f										
BRAVE BOAT HARBOR												
Kittery	lobster	m										
	lobster	t										
BROOKLYN	lobster	m										
	lobster	t										
COREA	lobster	t										
JONES CREEK												
Scarborough	clam	m										
KENNEBEC R												
Madison	bn trout	f										
	bass	f										
	sucker	w										
Norridgewock	bass		<0.1	<0.1-1.3	<0.1	<0.1-0.5	<0.1	<0.1-0.2				
	bn trout		<0.1	<0.1-1.0								
	sucker				<0.1	<0.1-0.5	<0.1	0.2-0.4				
Fairfield	bass	f	<0.1	<0.1-1.2	<0.1	<0.1-0.5	<0.1	<0.1-0.2				
	trout	f	0.1	0.1-1.0					<0.1	<0.1-0.2	0.1	0.1-0.3
	sucker	w			0.2	0.3-0.6	0.1	0.2-0.4	<0.1	<0.1-0.3	0.1	0.2-0.5
Sidney	bass	f	0.1	<0.1-1.3								
	bn trout										<0.1	0.1-0.4
	sucker	w										
Augusta	bn trout	f										
	bass	f										
	sucker	w										
Hallowell	smelt	c										
Gardiner	bass										<0.1	<0.1-0.3
Richmond	eel	f										
Phippsburg	clam	m										
	lobster	m										

			20 02		20 03		20 04		20 05		20 06	
WATER/STATION	**SPECIES**	**TISSUE**	**TCDD**	**DTE**	**TCDD**	**DTE**	**TCDD**	**DTE**	**TCDD**	**DTE**	**TCDD**	**DTE**
	lobster	t										
MESSALONSKEE LAKE												
Belgrade	bass											
NARRAGUAGUS R												
Cherryfield	fallfish	w										
NORTH POND												
Chesterfield	sucker	w										
	pickerel	f										
PENOBSCOT R												
E Br Grindstone	bass	f										
	sucker	w									<0.1	<0.1-0.3
E Millinocket	bass	f										
	sucker	w										
Woodville	bass		<0.1	<0.1-1.0	<0.1	<0.1-0.6	<0.1	<0.1-0.2	<0.1	<0.1-0.3		
	sucker		<0.1	1.6-1.9	<0.1	0.5-0.8	<0.1	<0.1-0.3	<0.1	0.3-0.5	<0.1	<0.1-0.3
Winn	bass		<0.1	<0.1-1.2	<0.1	<0.1-0.5						
	sucker		0.2	1.1-1.8	<0.1	0.3-0.6						
N Lincoln	bass	f										
	sucker	w										
S Lincoln	bass	f	<0.1	<0.1-1.2	<0.1	<0.1-0.5	<0.1	<0.1-0.2	<0.1	<0.1-0.3		
	sucker	w	0.3	1.6-2.0	0.1	0.6-0.8	<0.1	<0.1-0.3	<0.1	0.2-0.4	0.1	0.3-0.5
Passadumkeag	bass	f										
	sucker	w										
Milford	bass	f	<0.1	<0.1-1.2	<0.1	<0.1-0.5	<0.1	<0.1-0.2				
	sucker	w	0.3	1.0-1.7	<0.1	0.3-0.7	<0.1	0.3-0.4				
Veazie	bass	f	<0.1	<0.1-1.2	<0.1	<0.1-0.5	<0.1	<0.1-0.2	<0.1	0.1-0.2		
	sucker	w	0.4	1.4-2.0	0.1	0.2-0.6	<0.1	0.2-0.3	<0.1	0.3-0.5	<0.1	0.4-0.5
Bangor	eel	f	0.1	0.2-1.3								
			<0.1	0.1-1.3								
Bucksport	clam	m										
Stockton Sprin(	lobster	m										
	lobster	t										
OWLS HEAD	mussel	m										
PISCATAQUIS R												

			2002		2003		2004		2005		2006	
WATER/STATION	SPECIES	TISSUE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE
Sangerville	bass	f										
	bn trout	f										
	sucker	w										
Howland	bass	f										
PRESUMPSCOT R												
Windham	bass	f	<0.1	<0.1-1.5							<0.1	<0.1-0.3
	sucker	w	<0.1	0.1-1.3								
Westbrook	bass	f	<0.1	<0.1-1.2								
	pickerel	f										
	w perch	f										
	sucker	w	<0.1	0.1-1.3							<0.1	<0.1-0.3
Falmouth	clam	m										
Portland	lobster	m										
	lobster	t										
ST CROIX R												
Woodland	bass	f										
	sucker											
Baring	bass											
	sucker	w										
Robbinston	lobster	t										
ST JOHN R												
Frenchville	sucker	w										
Madawaska	y perch	f										
	bk trout	f										
	sucker	w										
SACO R												
Dayton	sucker	w										
SACO BAY												
Scarborough	lobster	m										
	lobster	t										
SALMON FALLS R												
Acton	lm bass											

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

			20 02		20 03		20 04		20 05		20 06	
WATER/STATION	SPECIES	TISSUE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE
	sucker											
Lebanon	lm bass										<0.1	<0.1-0.3
S Berwick	bass	f	0.1	0.1-1.2								
	lm bass										<0.1	<0.1-0.3
	pickerel	f										
	sucker	w										
SANDY P												
	bass	f										
SEBAGO L												
Naples	bass	w										
SEBASTICOOK R												
E Br Corinna	lm bass											
	bass											
	sucker											
Newport	bass	f					0.1	0.7-0.8				
	lm bass	f									<0.1	0.3-0.5
	w perch	f										
Sebastcook L	bass	f					<0.1	0.4-0.6				
	w perch	f										
Detroit	bass	f										
Burnham	bass						0.2	0.4-0.5	0.1	0.2-0.4	0.1	0.2-0.4
W Br Harmony	bass											
	sucker											
W Br Palmyra	bass	f	0.3	0.4-1.2	0.4	0.9-1.1	0.5	1.2-1.3	0.1	0.2-0.4	0.1	0.2-0.4
	pickerel	f										
	sucker	w										
WEBBER POND												

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

			2002		2003		2004		2005		2006	
WATER/STATION	SPECIES	TISSUE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE
Vassalboro	bass	f										

f=fillet
m=meat
t=tomalley
w=whole

DTE= dioxin toxic equivalents ι
Range shown at nd=0 and nd=mdl,

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

WATER/STATION	SPECIES	TISSUE	20 07 TCDD DTE
ANDROSCOGGIN LAKE			
Wayne	bn trout	f	
	bass	f	
	w perch		
	sucker	w/f	
POCASSET LAKE			
Wayne	bass		
	SMB comp		
	WHP comp		
ANDROSCOGGIN R			
Gilead	rb trout		
	bn trout		
	juv bass		
	bass		
	sucker	w	
Rumford	bass	f	
	juv bass		
	sucker	w	
Riley	bass		
	sucker	w	
Jay	bass	f	
	sucker	w	
Livermore Falls	bass	f	
	sucker	w	
	sucker comp		
Livermore ALF	bass		
	sucker		
N Turner	sucker	w	
Auburn-GIP	bass	f	
	lm bass	f	
	sucker	w	
	bullhead	w	
Lisbon Falls	bn trout	f	
	bass	f	
	sucker	w	
Brunswick	sucker	w	

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

			20	07
WATER/STATION	**SPECIES**	**TISSUE**	**TCDD**	**DTE**
	carp	f		
BEARCE LAKE				
Baring	pickerel	f		
BRAVE BOAT HARBOR				
Kittery	lobster	m		
	lobster	t		
BROOKLYN	lobster	m		
	lobster	t		
COREA	lobster	t		
JONES CREEK				
Scarborough	clam	m		
KENNEBEC R				
Madison	bn trout	f		
	bass	f		
	sucker	w		
Norridgewock	bass			
	bn trout			
	sucker			
Fairfield	bass	f		
	trout	f		
	sucker	w		
Sidney	bass	f		
	bn trout			
	sucker	w		
Augusta	bn trout	f		
	bass	f		
	sucker	w		
Hallowell	smelt	c		
Gardiner	bass			
Richmond	eel	f		
Phippsburg	clam	m		
	lobster	m		

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

WATER/STATION	SPECIES	TISSUE	20 07 TCDD DTE
	lobster	t	
MESSALONSKEE LAKE			
Belgrade	bass		
NARRAGUAGUS R			
Cherryfield	fallfish	w	
NORTH POND			
Chesterfield	sucker	w	
	pickerel	f	
PENOBSCOT R			
E Br Grindstone	bass	f	
	sucker	w	
E Millinocket	bass	f	
	sucker	w	
Woodville	bass		
	sucker		
Winn	bass		
	sucker		
N Lincoln	bass	f	
	sucker	w	
S Lincoln	bass	f	
	sucker	w	
Passadumkeag	bass	f	
	sucker	w	
Milford	bass	f	
	sucker	w	
Veazie	bass	f	
	sucker	w	
Bangor	eel	f	
Bucksport	clam	m	
Stockton Sprinc	lobster	m	
	lobster	t	
OWLS HEAD	mussel	m	
PISCATAQUIS R			

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

WATER/STATION	SPECIES	TISSUE	20 TCDD	07 DTE
Sangerville	bass	f		
	bn trout	f		
	sucker	w		
Howland	bass	f		
PRESUMPSCOT R				
Windham	bass	f		
	sucker	w		
Westbrook	bass	f		
	pickerel	f		
	w perch	f		
	sucker	w		
Falmouth	clam	m		
Portland	lobster	m		
	lobster	t		
ST CROIX R				
Woodland	bass	f		
	sucker			
Baring	bass			
	sucker	w		
Robbinston	lobster	t		
ST JOHN R				
Frenchville	sucker	w		
Madawaska	y perch	f		
	bk trout	f		
	sucker	w		
SACO R				
Dayton	sucker	w		
SACO BAY				
Scarborough	lobster	m		
	lobster	t		
SALMON FALLS R				
Acton	lm bass			

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

WATER/STATION	SPECIES	TISSUE	20 07 TCDD DTE
	sucker		
Lebanon	lm bass		
S Berwick	bass	f	
	lm bass		
	pickerel	f	
	sucker	w	
SANDY P			
	bass	f	
SEBAGO L			
Naples	bass	w	
SEBASTICOOK R			
E Br Corinna	lm bass		
	bass		
	sucker		
Newport	bass	f	
	lm bass	f	
	w perch	f	
Sebastcook L	bass	f	
	w perch	f	
Detroit	bass	f	
Burnham	bass		
W Br Harmony	bass		
	sucker		
W Br Palmyra	bass	f	
	pickerel	f	
	sucker	w	
WEBBER POND			

APPENDIX 7. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

WATER/STATION	SPECIES	TISSUE	20 07 TCDD DTE
Vassalboro	bass	f	

f=fillet
m=meat
t=tomalley
w=whole

DTE= dioxin toxic equivalents ι
Range shown at nd=0 and nd=mdl,