DIOXIN MONITORING PROGRAM

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

2005

REPORT

DEPARTMENT OF ENVIRONMENTAL PROTECTION
AUGUSTA, MAINE

April 2006

DEPLW0754-2006

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OVERVIEW

This report contains the findings from the 2005 Dioxin Monitoring Program with respect to the three primary goals of the program:

1. assessment of the nature and extent of dioxin contamination in waters and fisheries of the state and its effect on human health,
2. evaluation of trends, and
3. measurement of compliance with the no discharge of dioxin provision of the 1997 Dioxin Law via the above/below (A/B) fish test for the remaining kraft pulp & paper mill still in the program.

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 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 Above/Below test. Sources of the coplanar PCBs are not known, but likely include historic use and discharge in Maine and long range transport and atmospheric deposition.

HUMAN HEALTH FINDINGS

- There are 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. The Bureau of Health 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, the Bureau 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. The Bureau also compares dioxin, furans, and coplanar PCB levels to its FTALr of 1.8 parts per ppt for protection of noncancer or reproductive related effects. The Bureau additionally compares all data to a lower pFTALc of 0.4 ppt , which is under consideration as a potential revision to current FTALs, to account for background dietary exposure to dioxins and furans.

- Concentrations of dioxins and furans in bass tissue at all sampling locations above and below Maine pulp and paper mills were below the current FTALc of 1.5 ppt (Figure 1). Concentrations in white suckers on the Androscoggin River exceeded the FTALc but concentrations in white suckers on the Kennebec and Penobscot rivers were below the FTALc (Figure 2). Concentrations in rainbow trout in Gilead, Maine, above the Maine mills but downstream of the bleached kraft mill in Berlin, NH, were right at the FTALc.

[1] See page 10 for definitions

- Concentrations of dioxins and furans in both species at all sampling locations on the Androscoggin River were above the pFTALc of 0.4 ppt. Concentrations in both bass and suckers on the Kennebec River were below the pFTALc as were the concentrations for bass on the Penobscot River.

- When the concentrations of dioxin-like coplanar PCBs were added to the dioxin concentrations, there were exceedances for the current FTALr of 1.8 ppt in rainbow trout at Gilead on the Androscoggin River, in suckers at Riley and Livermore Falls on the Androscoggin River, and at Lincoln on the Penobscot River. These 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.

- Average dioxin and furan levels in Androscoggin Lake have not been reported above the current FTALc of 1.5 ppt in any species since 1996, although addition of coplanar PCBs resulted in exceedance in white perch and a near exceedance in smallmouth bass (Figure 1). Concentrations of dioxins and furans in white perch exceeded the pFTALc of 0.4 ppt, but concentrations in bass did not.

- Dioxin concentrations in bass from the West Branch of the Sebasticook River in Palmyra were at the pFTALc. Dioxin concentrations in bass from the main stem at Burnham are lower than the FTALc, but exceed the pFTALc of 0.4 ppt.

Figure 1. Dioxin (DTEh95ucl) and coplanar PCB (CTEh95ucl) toxic equivalents in smallmouth bass (and white perch WHP, brown trout BNT and rainbow trout RBT) from the Androscoggin (Axy), Kennebec (Kxy), Penobscot (Pxy) and Sebasticook (Sxy) rivers, 2005

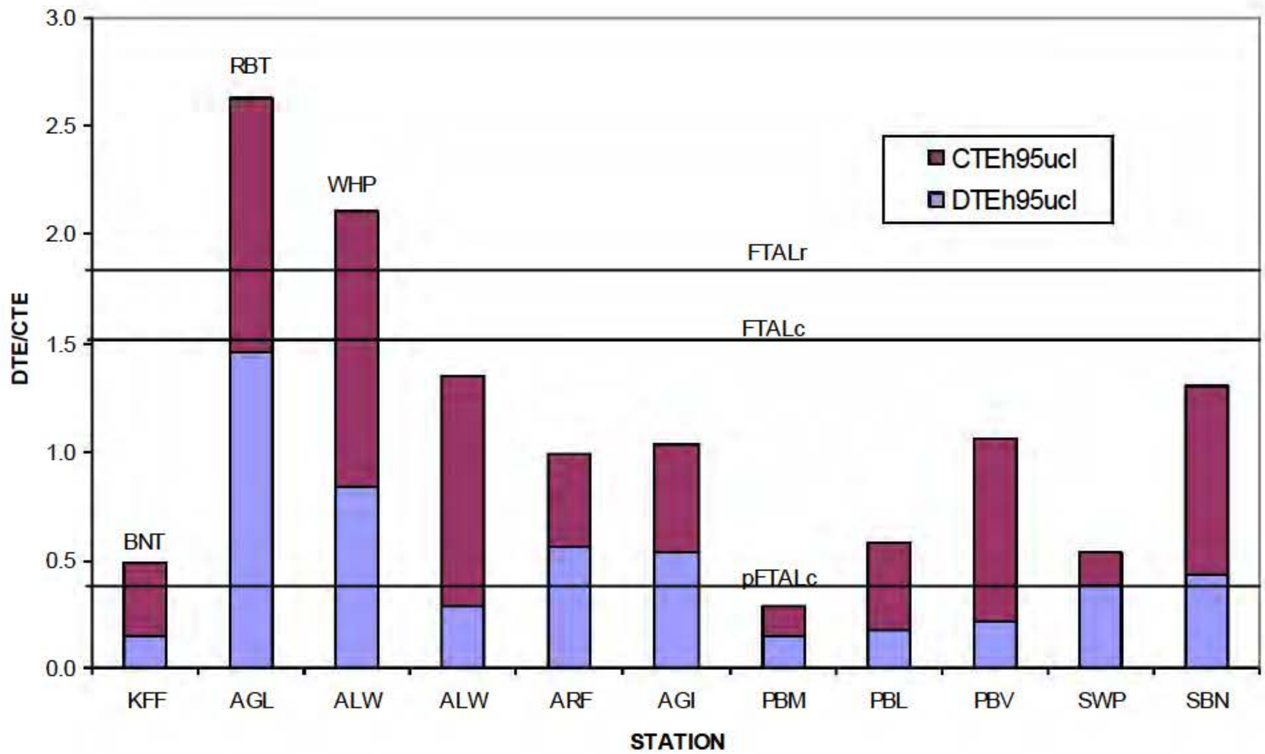
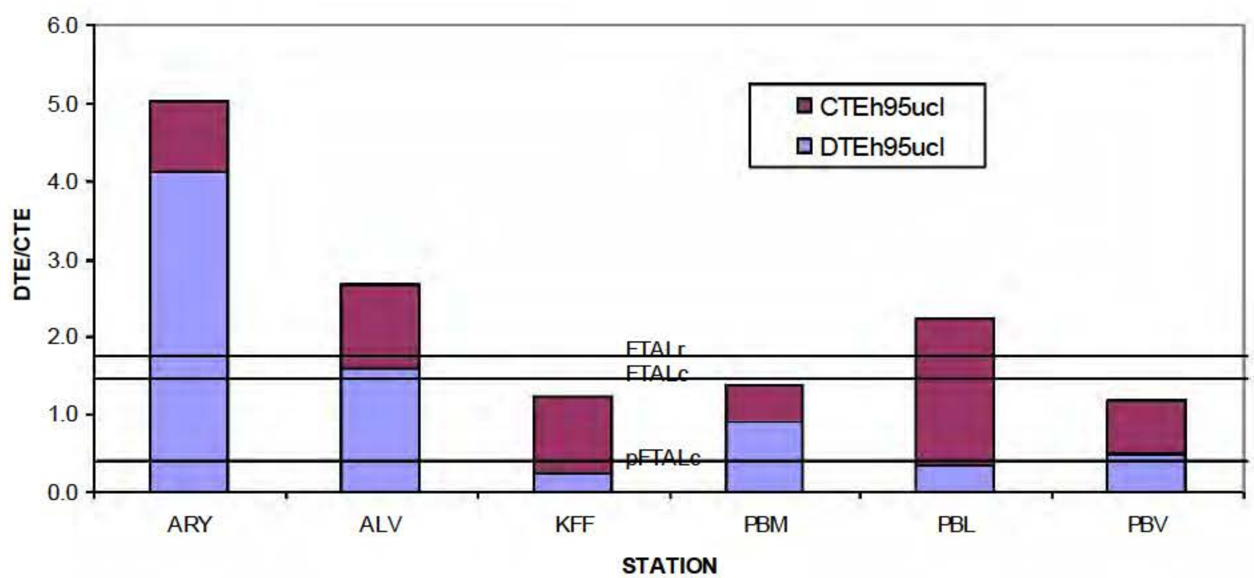


Figure 2. 2005 dioxin (DTEh95ucl) and 2001 coplanar PCB (CTEh95ucl) toxic equivalents in white suckers from the Androscoggin (Axy), Kennebec (Kxy), and Penobscot (Pxy) rivers, 2005



FINDINGS ON DISCHARGES FROM BLEACHED KRAFT PULP AND PAPER MILLS

- Results of the Above/Below (A/B) test had indicated by 2004 that there was no longer a discharge of dioxin from the NewPage mill in Rumford, the International Paper mill in Jay, the SAPPI-Somerset mill in Skowhegan, or the Georgia-Pacific mill in Old Town. This left just the Lincoln Pulp and Tissue Mill in Lincoln needing to demonstrate compliance with the test.

- Due to unprecedented rainfall, caged mussels deployed in the Penobscot River as part of the Dioxin above/below (A/B) test for Lincoln Paper and Tissue could not be retrieved. Nevertheless, for the two fish species, there was no significant difference in concentrations of dioxins in either smallmouth bass or white suckers above and below the mill. This second year finding of no difference above and below the mill is evidence that the mill is no longer discharging significant amounts of dioxin. The mill therefore passes the A/B test.

- For those mills that have passed the A/B test previously, continued annual compliance with the no-discharge provision in 38 MRSA section 420 may be demonstrated by either of two methods. 1). Bleach plant effluent concentrations, monitored at least once per year and reported at the actual concentrations rather than the nominal 10 ppq limit, must remain as low as the years in which a mill demonstrated compliance with the A/B test. 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. 2) Compliance may also be demonstrated by repeating the A/B fish test.

- Continued compliance in 2005 was demonstrated for the NewPage mill in Rumford (formerly MeadWestvaco), International Paper mill in Jay and SAPPI Somerset mill in Skowhegan by dioxin/furan certification of bleach plant operation and bleach plant effluent data. Continued compliance at Georgia Pacific was demonstrated by continuing low concentrations in the bleach plant effluent.

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

- The Dioxin Monitoring Program will need to be continued as currently specified by 38 MRSA § 420-A to monitor continuing elevated levels of dioxin in fish from some of these rivers for the Fish Consumption Advisories

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 closely 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 Bureau of Health 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, but 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 sunset 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.

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, 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 dioxins and dioxin-like (coplanar) PCBs, other advisories due to total PCBs, and still other advisories due to DDTs (Appendix 1).

There are 75 dioxins and 135 related furans, 17 of which are considered toxic, but with different toxicities. 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.

For informing the public about potential risk from consuming fish contaminated with dioxin and dioxin-like compounds, the Maine Bureau of Health (BOH) publishes fish consumption advisories. 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 deleterious effects, is determined. Two FTALs have been derived for evaluating potential deleterious 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, BOH has developed a FTALc of 1.5 ppt, while for reproductive and developmental effects potentially arising from shorter exposure durations, BOH 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 2005 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. Finally the workplan was modified to evaluate the A/B test.

The 2005 workplan was initially drafted by DEP according to the objectives listed above and sent to participating facilities for comment in early May 2005. After discussion of the draft workplan at a meeting of the SWAT Technical Advisory Group (TAG) on June 9, 2005, a final workplan was determined by the Commissioner.

In 2005 all stations were to be monitored for ecological and/or human health assessment and trends. At least 5 game fish (bass or other important species) were to be collected from each station (Table 1). We were unable to capture brown trout of the right size from the Kennebec River at Sidney, nor eels from the Penobscot River in Bangor. White suckers were collected at several stations for use in both ecological and human health assessment. At some stations, the fish were analyzed individually, while at other stations, fish were combined into composite samples in order to minimize cost and remain under the monetary cap.

For the A/B test, the goal was to reduce the variability of results thereby decreasing the minimum significant difference (MSD) that could be detected statistically between the above and below stations. Decreasing the MSD increases the sensitivity and power of the A/B test. Two ways to reduce variability are to use composite samples instead of single fish and to use a large sample size. Given these objectives and realistic sampling effort and cost, the target was to collect 30 smallmouth bass and 30 white suckers at historical stations above and below Lincoln Paper and Tissue Company. The 30 fish were combined into 10 composites of 3 fish each (10C3). In addition, caged mussels were deployed at the same A/B stations as the fish sampling. The caged mussels in the Penobscot River were lost, however, during fall flooding just prior to scheduled retrieval.

All samples were analyzed for all 2378-substituted dioxins and furans. All fish were analyzed for human health 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 6.

Table 1. 2005 Dioxin Monitoring Program

STATION	BASS	SUCKER	MUSSELS	OTHER	FACILITY
Androscoggin R					
Rumford	5				NewPage
Riley		5			NewPage
Livermore Falls		5			International Paper
Turner (GIP)	5				International Paper
Androscoggin L	2C5			2C5 white perch	IP & NewPage
Kennebec R					
Fairfield		5		5 brown trout	SD Warren
Sidney				5 brown trout	KSTD
Penobscot R					
Woodville	10C3	10C3	10C10	3C10 T-0 mussels	Lincoln Paper & Tissue
S Lincoln	10C3	10C3	10C10		Lincoln Paper & Tissue
Veazie		5			Georgia Pacific
Bangor				5 eels	Georgia Pacific
Salmon Falls R					
S Berwick				4 sludge	Berwick Sewer Distict
W Br Sebasticook R					
Palmyra	5				Hartland

SAMPLING PROCEDURES

Fish were collected by DEP with assistance of state agencies and the Penobscot Indian Nation. 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. 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 7). 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 95^{th} percentile confidence limit (UCL) was used for these comparisons, consistent with the policy of the BOH. For the A/B test, TCDD and TCDF were used. Because raw values for TCDF are much larger than those for TCDD, and in order to give more equal influence to both, TCDF was converted to TCDD equivalents using its TEF. The TCDD equivalent was then added to the TCDD concentration, essentially calculating a TEQ or DTE for TCDD and TCDF only with non-detects at ½ the detection limit (DFTEh).

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.

RESULTS AND DISCUSSION.

Results for each sampling station are discussed with respect to the three objectives of the program, 1) human health, 2) trends, and 3) where pertinent, the no discharge provision (A/B test). See Appendix 2 for raw dioxin data for 2005, Appendix 6 for fish sample data, and Appendix 7 for all historical dioxin data.

Dioxin concentrations in fish generally continued to decline from previous years, but there is some year-to-year variation in 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 (FTAL) at several stations (Figures 1 & 2). DTEh are compared to existing FTALc and potentially new pFTALc for the cancer endpoint. The sum of DTEh and CTEh are compared to the existing FTALr for the reproductive endpoint. CTEh, which are measured in the SWAT program, were measured in bass, white perch, brown trout and rainbow trout in 2005. CTEh data for suckers, which was not collected in 2005, are taken from the most recent year sampled, 2001. 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 station.

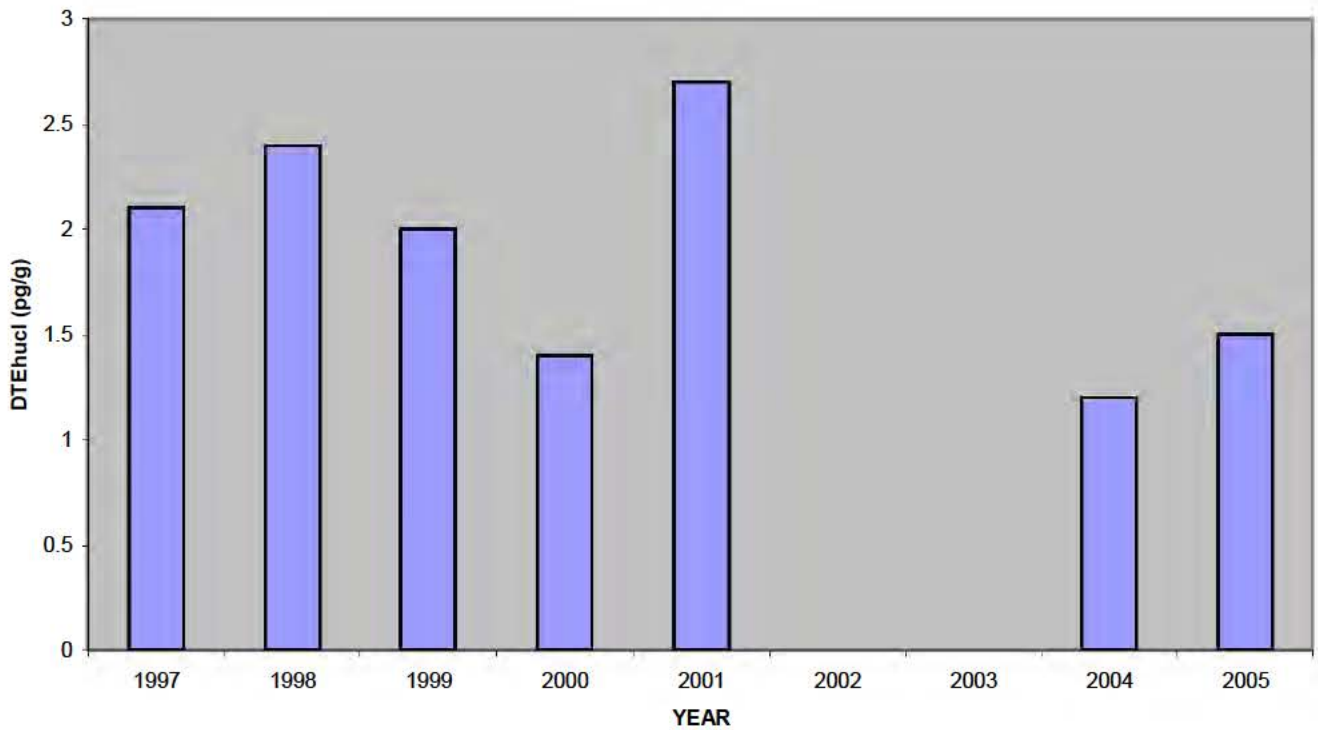
Androscoggin River

Gilead - (AGL) A total of 5 rainbow trout were collected near Peabody Island in Gilead (Appendix 6). 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 essentially at the FTALc and the highest of all fish species and stations in the state (Figure 1, Appendix 2). The addition of dioxin-like (coplanar) PCBs to DTEh results in even higher levels of total toxic equivalents (TTEh) that exceed the FTALr.

Every year measured, TCDD and DTEh in fish have been significantly higher at this station than in fish from reference stations in Maine (Appendix 7). There was no significant trend for the period 1997-2005 for rainbow trout or any other species captured at this station in the past, although concentrations of TCDD have decreased significantly in the past two years (Figure 3). The mill in Berlin, New Hampshire, has reported to have switched 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.

Figure 3. Dioxin levels (DTEhucl) in rainbow trout from the Androscoggin River at Gilead Maine



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 6).

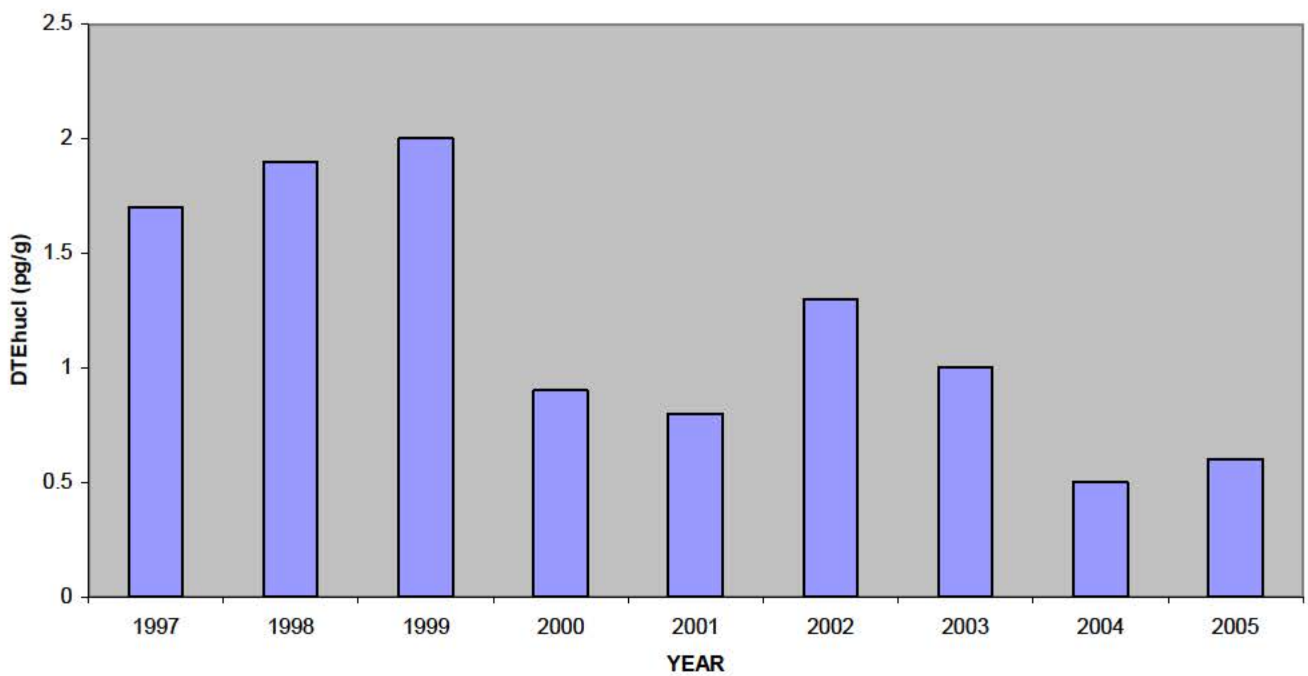
Concentrations of DTEh in the bass were 38% of the FTALc but exceeded the pFTALc (Figure 1, , Appendix 2). The addition of dioxin-like (coplanar) PCBs to DTEh results in higher levels of total toxic equivalents (TTEh) that were still below the FTALc.

There is a significant declining trend for TCDD and DTEo for bass during the period 1997-2005 (Figure 4). TCDD was no longer much greater than reference stations unimpacted by point source discharges on other Maine rivers but DTE is still elevated (Appendix 7). 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 28, 2005 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 8).

An annual sample of the bleach plant effluent will be analyzed for dioxins within 1 year of issuance of the Maine Pollution Discharge Elimination System permit in September 2005. Concentrations of both TCDD and TCDF have been reported below variable detection levels in final effluent since 1993 and below a 10 ppq detection limit in bleach plant effluent since 1998 up through 2004, the latest that data are available (Appendix 4).

Figure 4. Dioxin levels (DTEhucl) in smallmouth bass from the Androscoggin River below Rumford

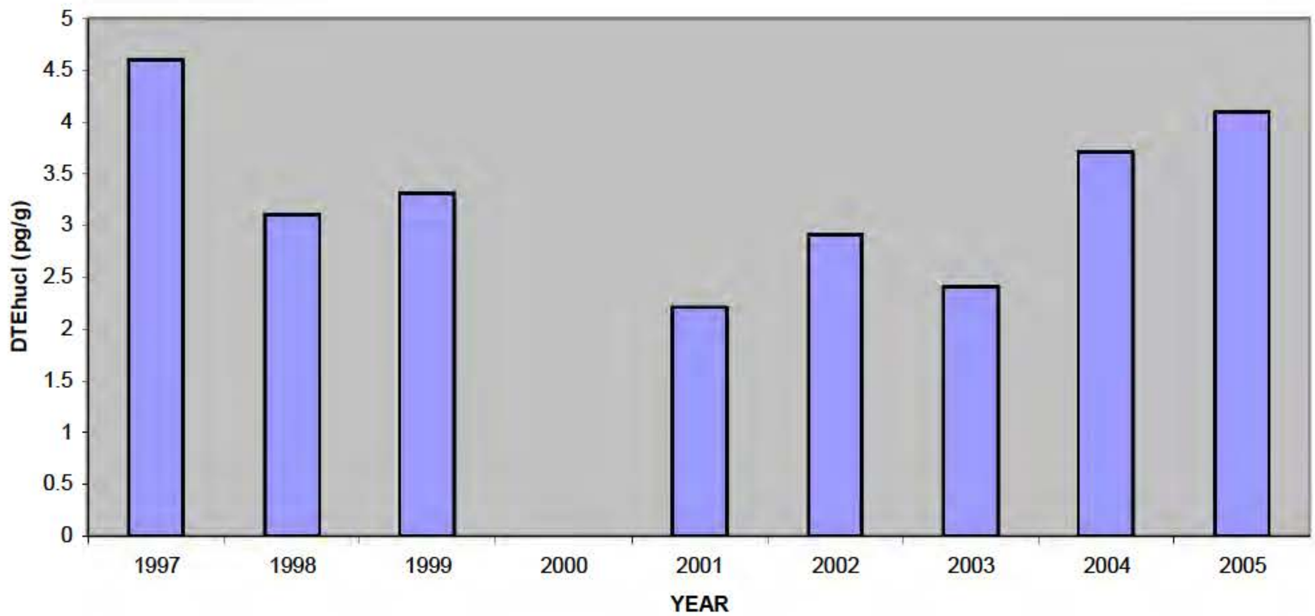


Riley - (ARY) A total of 5 white suckers were collected from the river above the Riley Dam about 19 miles downstream of NewPage Corporation and upstream of International Paper Company's discharge (Appendix 6).

Concentrations of DTEh in the suckers were 274% of the FTALc and exceed the FTALr (Figure 2, Appendix 2). The addition of dioxin-like (coplanar) PCBs to DTEh results in total toxic equivalents (TTEh) that further exceed the FTALr.

Unlike concentrations in bass at ARF, there is no trend of declining TCDD or DTEh concentrations in white suckers at Riley for the period 1997-2005 (Figure 5). Nevertheless, TCDD and DTEh concentrations continue to be greater than those at reference stations on other Maine rivers (Appendix 7). The fact that concentrations of dioxin in suckers have been historically higher here than upstream at ARF, in spite of the fact that there are no known or likely sources in between, may be due to the fact that

Figure 5. Dioxin levels (DTEhucl) in white suckers from the Androscoggin River at Riley, above Jay Maine



ARY is in an impoundment, a depositional area for settleable solids bound dioxin, whereas ARF is free-flowing, making ARY a better sampling location for detection of any contamination.

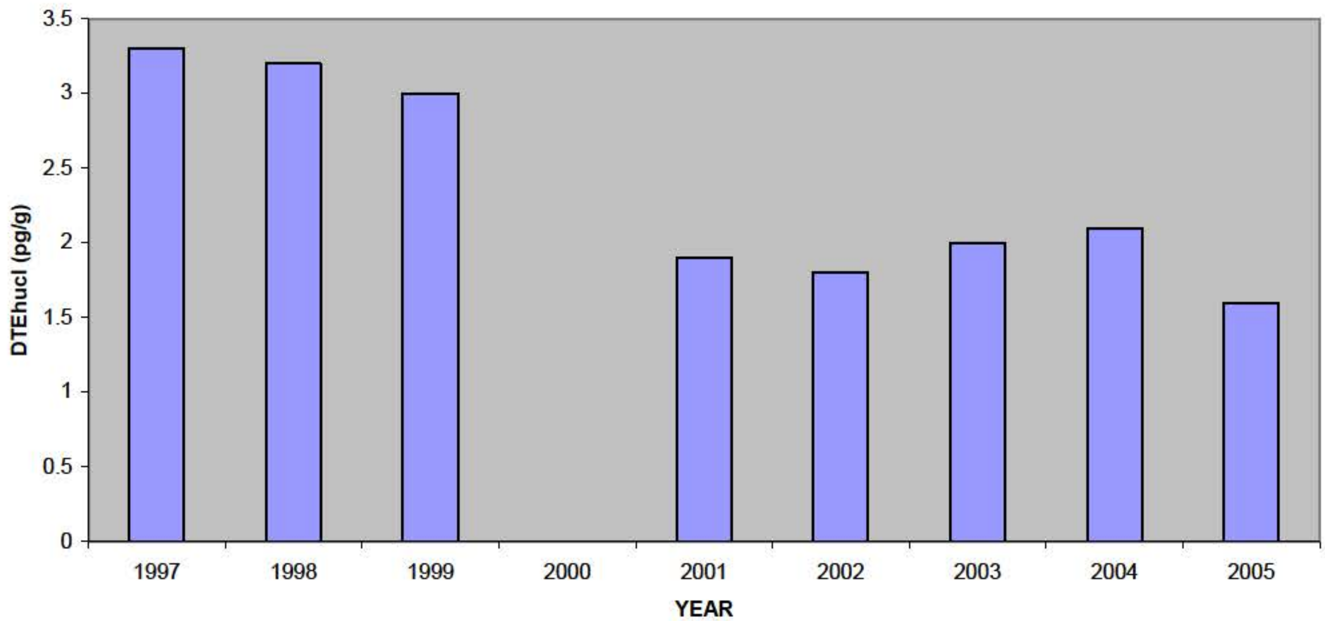
Given that this station is below NewPage Corporation's discharge with no known intervening discharges of dioxins, then the demonstration of continued compliance with the 1997 Dioxin Law discussed above for the Rumford station applies here as well.

Livermore Falls- (ALV) A total of 5 white suckers were captured in the Otis Impoundment approximately 2 miles downstream of the discharge from International Paper Company's Jay mill (Appendix 6).

Concentrations of DTEh in the suckers were 106% of the FTALc (Figures 1 and 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 suckers for the period 1997-2005 (Figure 6). Nevertheless, TCDD and DTEh are still significantly greater than reference stations on other Maine rivers (Appendix 7), 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 6. Dioxin levels (DTEhucl) in white suckers from the Androscoggin River at Livermore Falls Maine



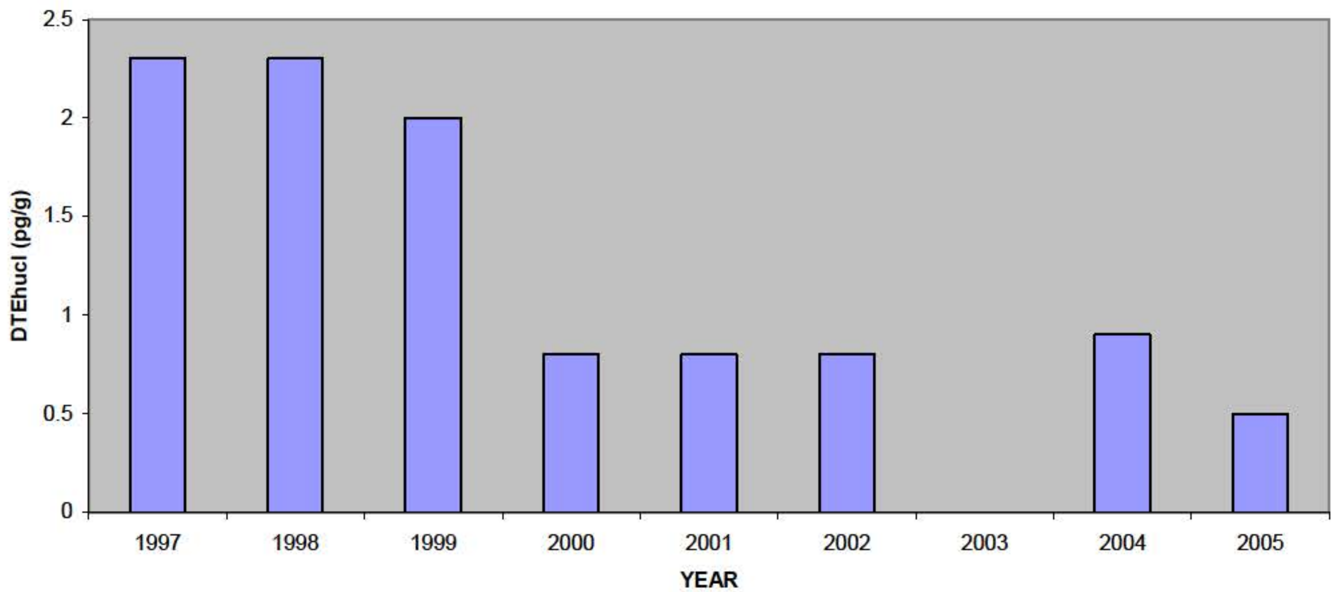
Fish sampling in 2003 and 2004 documented that the mill was no longer discharging measurable amounts of dioxins. In a letter dated December 19, 2005 the mill partially demonstrated continued compliance with the 'no discharge' provision of the 1997 Dioxin law by certifying that it has met the performance criteria established by DEP for the bleaching process and defoamer usage (Appendix 8). An annual sample of the bleach plant effluent will be analyzed for dioxins within 1 year of issuance of the Maine Pollution Discharge Elimination System permit in September 2005. Concentrations of both TCDD and TCDF have been reported below a 10 ppq detection limit in bleach plant effluent since 2002 up through 2004, the latest that data are available (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 International Paper Company (Appendix 6). Concentrations of DTEh in the bass were 35% of the FTALc respectively but exceeded the pFTALc (Figure 1, Appendix 2). The addition of dioxin-like (coplanar) PCBs to DTEh results in higher levels of total toxic equivalents (TTEh) that do not exceed the FTALc.

There is a declining trend in TCDD and DTE in bass during the period 1997-2005 (Figure 7). TCDD and DTEh concentrations were still significantly greater than reference stations on other Maine rivers (Appendix 7), 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 International Paper Company's discharge with no known intervening ischarges 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 7. Dioxin levels (DTEhucl) in smallmouth bass from the Androscoggin River at 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 2005, 10 smallmouth bass and 10 white perch were collected from the lake and analyzed as 2 composites of 5 fish each (Appendix 6). DTEh were 19%, and 56% of the FTALc for bass and white perch respectively, and DTEh in white perch exceeded the pFTALc (Figure 1, Appendix 2). The addition of dioxin-like (coplanar) PCBs to DTEh results in an increase in total toxic equivalents (TTEh) in these fish, causing concentrations in white perch to exceed the FTALr.

Concentrations in bass and white perch are generally lower in the recent years compared to when first monitored in 1996, although there is no trend in recent years (Figures 8 and 9). Concentrations of TCDD and DTEo 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 7). Concentrations in bass were similar to those in bass from AGI, the nearest station on the river sampled in 2005, but concentrations in white perch were slightly higher than those for bass. Continued monitoring is needed.

Figure 8. Dioxin levels (DTEhucl) in smallmouth bass from Androscoggin Lake, Wayne, Maine

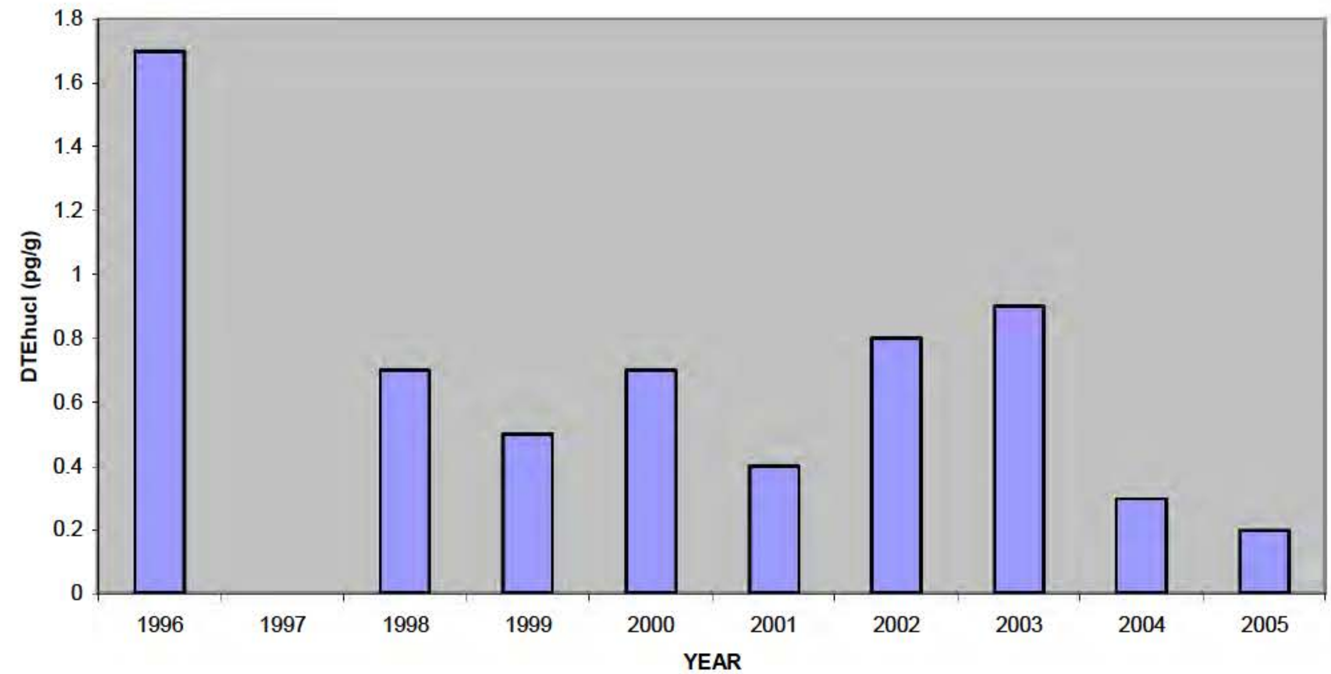
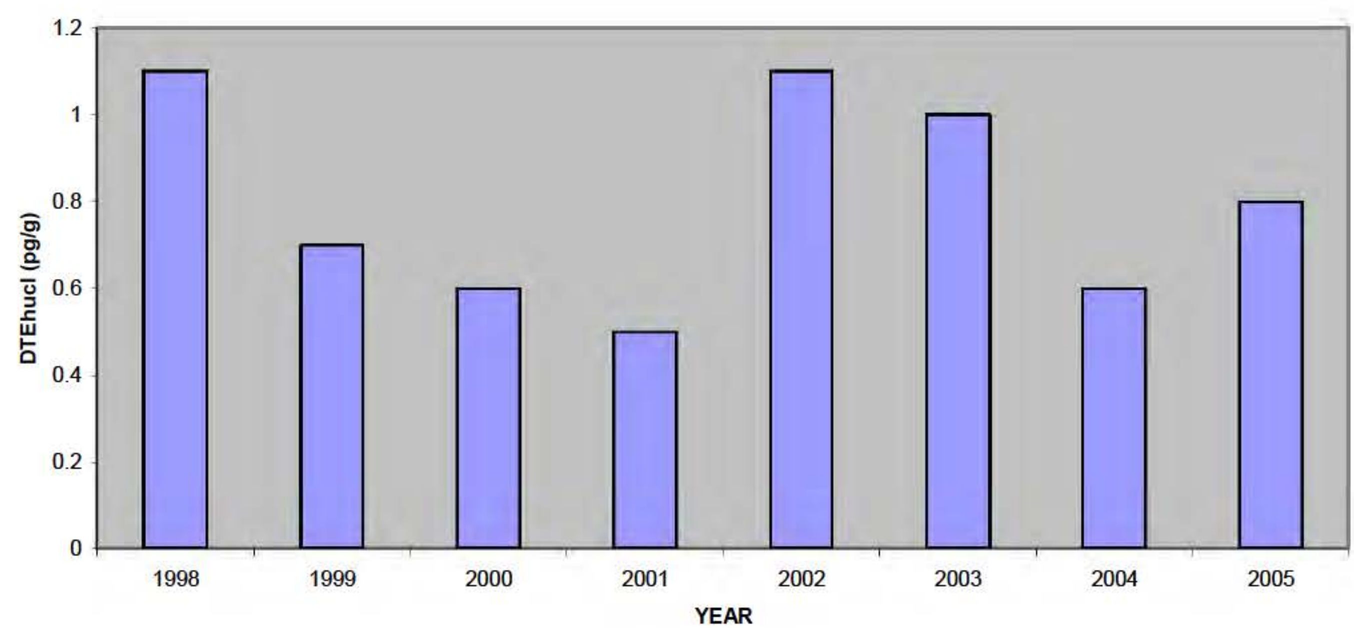


Figure 9. Dioxin levels (DTEhucl) in white perch from Androscoggin Lake, Wayne, Maine



Kennebec River

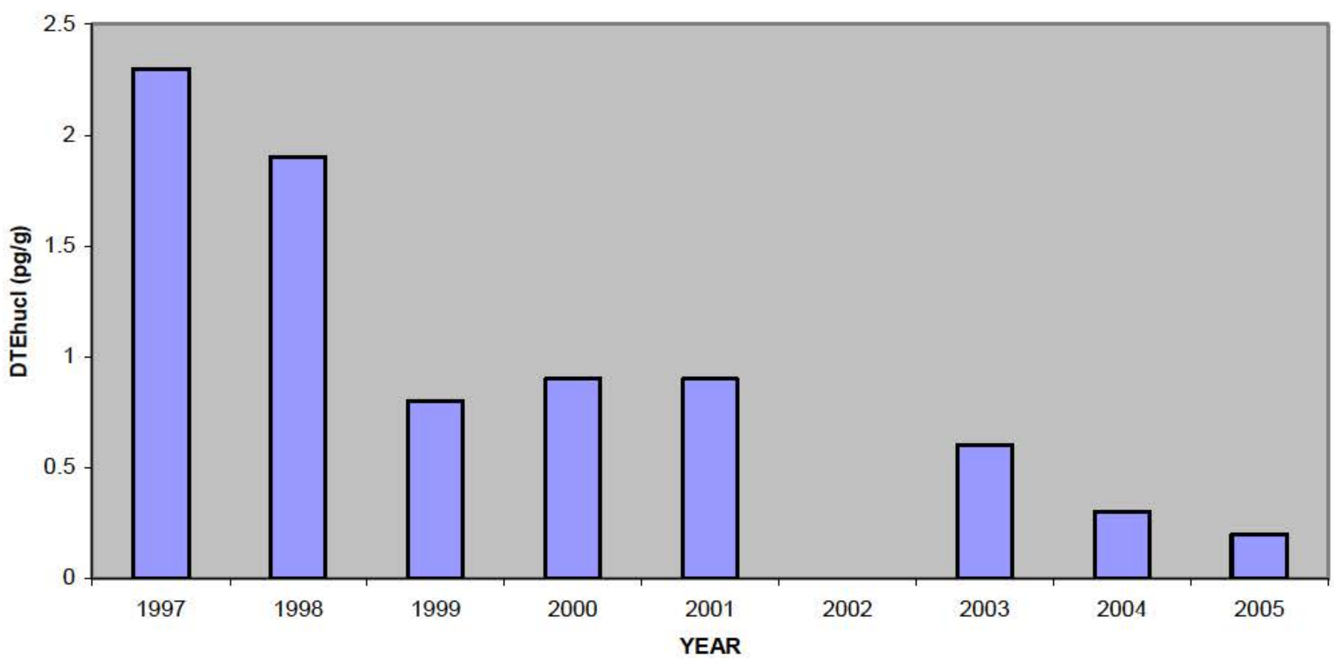
Fairfield- (KFF) A total of 4 brown trout and 5 white suckers were collected from the river between the Shawmut Dam and the I-95 bridge, approximately 7-8 miles below SAPPI Somerset's bleached kraft pulp and paper mill in Skowhegan (Appendix 6).

Concentrations of DTEh in trout and suckers were 10%, and 16% of the FTALc respectively and are below the pFTAL (Figures 1 and 2, Appendix 2). The addition of dioxin-like (coplanar) PCBs to DTEh results in an increase in total toxic equivalents (TTEh) that are below the FTALr but exceed the pFTAL.

There was a significant declining trend for TCDD and DTE for suckers for the period 1997-2005 (Figure 10). There are not enough data for trends analysis with brown trout, but concentrations in fish from 2002 and 2005 are significantly lower than those from the mid 1990s and 2001. Concentrations are similar to those of the reference station at Madison and Norridgewock from previous years.

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 8). Sampling bleach plant effluent was conducted for the first half of 2005. Concentrations of both TCDD and TCDF have been reported below various low detection limits in bleach plant effluent since 2002 (Appendix 4). There are no new sludge data since 1999 (Appendix 3). Additional periodic monitoring should be continued to confirm low levels in brown trout and rainbow trout, which are fished heavily in this river reach.

Figure 10. Dioxin levels (DTEhucl) in white suckers from the Kennebec River at Fairfield, Maine



Penobscot River

Woodville (Mattaceunk Impoundment)- (PBM) A total of 30 smallmouth bass and 30 white suckers were collected from the river at Woodville, downstream of Katahdin Paper's pulp and paper mills in Millinocket and East Millinocket, and combined into 10 composites of 3 fish each. 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 serves as a reference station for the Penobscot River and the upstream station for Lincoln Paper and Tissue above/below (A/B) test. Also as part of the A/B test, 5 cages of 20 mussels each were deployed at Winn below the confluence with the Mattawamkeag River about 8 miles above the mill discharge. Unfortunately, heavy fall rains and resulting flooding for months prevented retrieval of the mussels.

Concentrations of DTEh in bass and suckers were 10% and 38% of the FTALc respectively and in suckers exceeds the pFTAL (Figures 1 and 2, Appendix 2). The addition of dioxin-like (coplanar) PCBs to DTEh results in an increase in total toxic equivalents (TTEh) that is still below the FTALr.

Concentrations of TCDD and DTEh were similar to those of past years and at other reference stations for bass (Appendix 7). From 2002-2005, for 3 of 4 years DTE concentrations in suckers have been slightly higher that those historically at this station or at other reference stations. While there have been changes at the mills in Millinockett during this time, including purchasing of some kraft pulp for both mills, the amounts are relatively small and the timing is such that it is not clear where the increased DTE levels are originating. Additional sampling may be necessary in 2006.

South Lincoln- (PBL) A total of 30 smallmouth bass and 30 white suckers 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 and combined into 10 composites of 3 fish each for both species for the A/B test (Appendix 6). Also as part of the A/B test, 5 cages of 20 mussels each were deployed at the same site.

Concentrations of DTEh in bass and suckers were 12% and 22% of the FTALc respectively, below the pFTAL (Figures 1 and 2, Appendix 2). The addition of dioxin-like (coplanar) PCBs to DTEh results in an increase in total toxic equivalents (TTEh) that exceed the pFTAL for both species and the FTALr in suckers.

There were declining trends in DTE for both species (Figures 11 and 12) and for TCDD in suckers for the period 1997-2005. TCDD concentrations in bass are approaching levels seen at the reference station at Woodville but the declining trend was only marginally significant ($p \sim 0.08$) for the period.

The mill passed the A/B test in 2003, but must pass in 2 consecutive years to ensure that there is no discharge of dioxin. The test was not conducted in 2004 since the mill had been closed for several months early in the year. In 2005, the test was repeated including deployment of caged mussels. Unfortunately, heavy fall rains and resulting flooding for months prevented retrieval of the mussels. The results of the fish samples show that there was no significant difference in the metric (DFTEh, dioxin/furan toxic equivalents at non-detects equaling one-half the detection limit) for white suckers above and below the mill. As reported by the lab, concentrations in smallmouth bass below the mill initially appeared to be slightly but significantly higher than in fish above the mill. The difference, however, was due to different detection levels in fish above and below the mill. TCDD was not detected in any of the 10 samples upstream and in only 1 of 10 samples downstream, and that one was below the nominal detection limit and barely above the actual detection limit for the other samples where TCDD was not detected. Substitution of a common set of detection levels for all non-detects both above and below the mill resulted in no significant difference in the combined metric above and below the mill (Appendix 5). Furthermore, there was no significant difference in TCDF concentrations in fish above and below the mill providing assurance that there was in fact no difference. Consequently, the mill has passed the A/B test for the second year demonstrating that it no longer discharges significant amounts of dioxins.

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 significant discharge in 2005.

Figure 11. Dioxin levels (DTEhucl) in smallmouth bass from the Penobscot River at South Lincoln, Maine

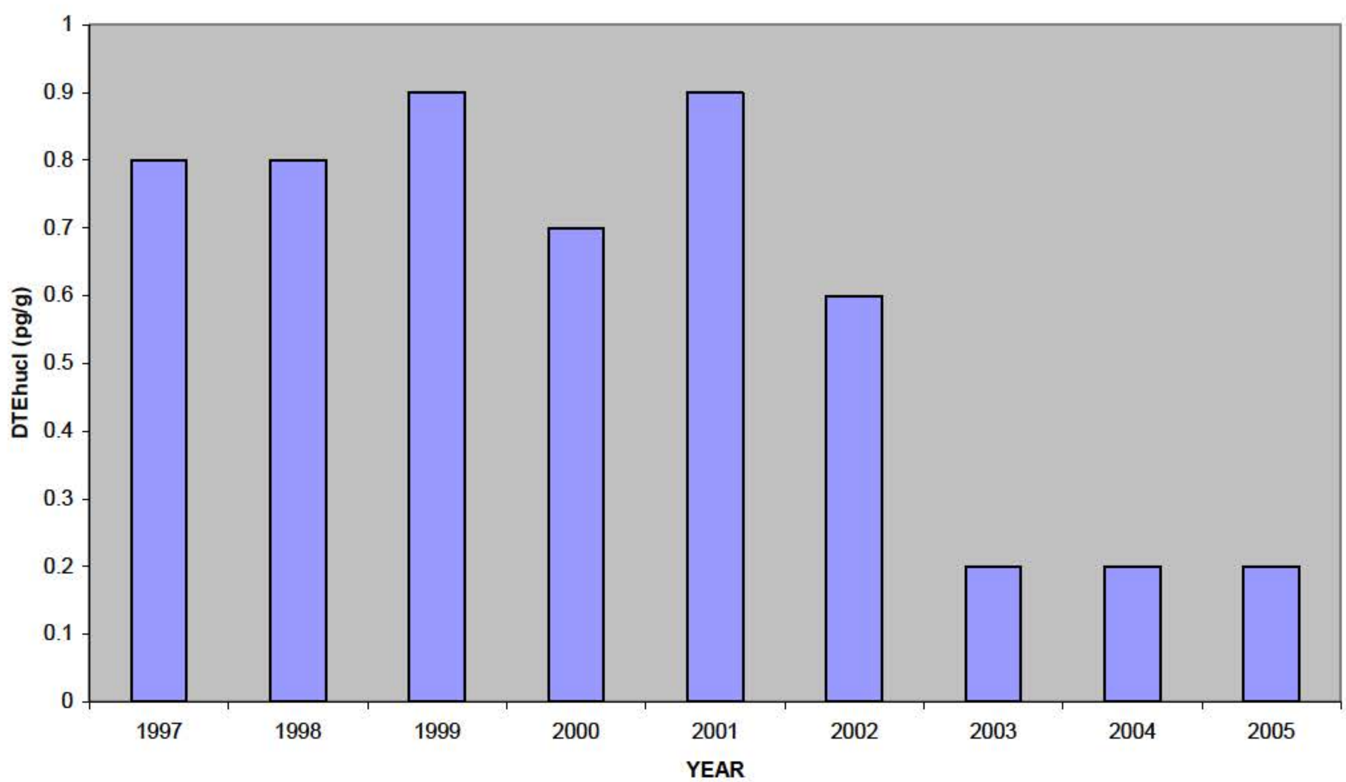
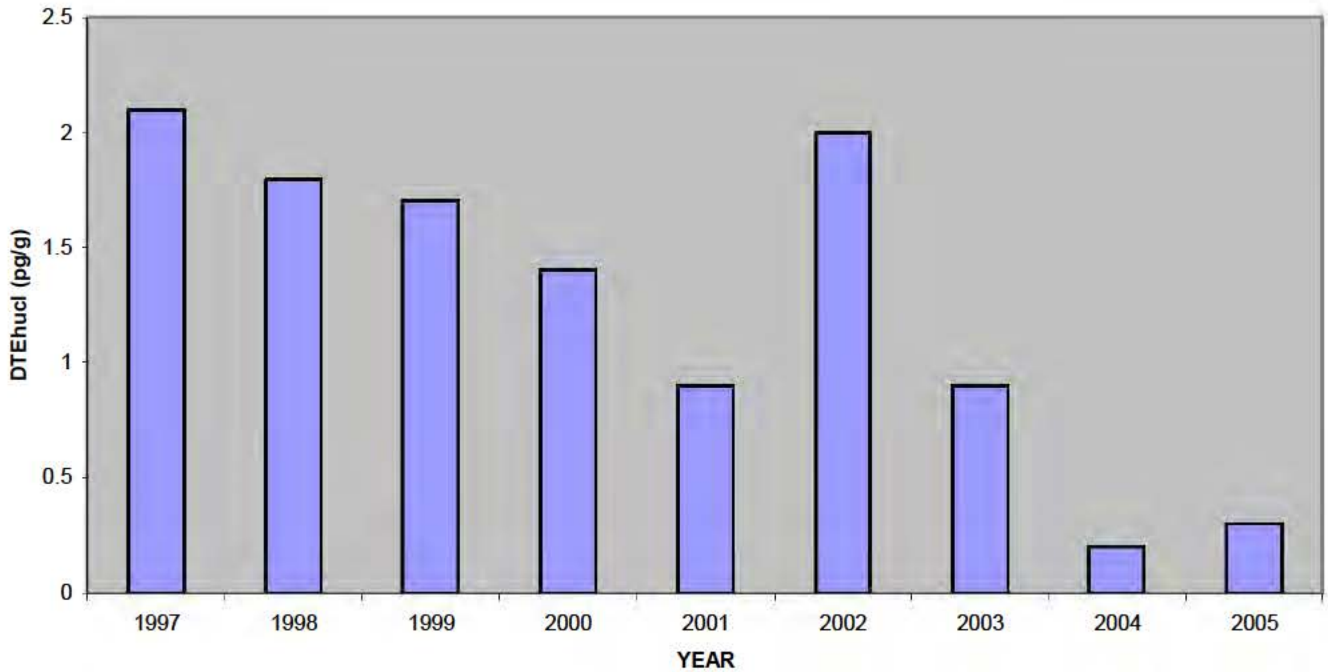


Figure 12. Dioxin levels (DTEhucl) in white suckers from the Penobscot River at South Lincoln, Maine



Veazie- (PBV) A total of 5 smallmouth bass and 5 white suckers (Appendix 7) were collected from the Veazie Impoundment about 7-8 miles below Fort James' bleached kraft mill in Old Town (Appendix 6). The smallmouth bass were substituted for the eels, called for in the 2005 workplan and which were not collected.

Concentrations of DTEh in bass and suckers were 14% and 33% of the FTALc respectively and were below the pFTAL in bass but above it in suckers (Figures1 and 2), Appendix 2). The addition of dioxin-like (coplanar) PCBs to DTEh results in an increase in total toxic equivalents (TTEh) but that is still below the FTALr.

There was a declining trend for TCDD for both species for the period 1997-2005, but there was only a marginal ($p \sim 0.09$) decline in DTEh (Figures 13 and 14). 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).

The 2003 and 2004 A/B tests had documented that there was no longer a discharge of dioxin from the mill. Continued compliance in 2005 was documented by low or 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.

Figure 13. Dioxin levels (DTEhucl) in smallmouth bass from the Penobscot River at Veazie

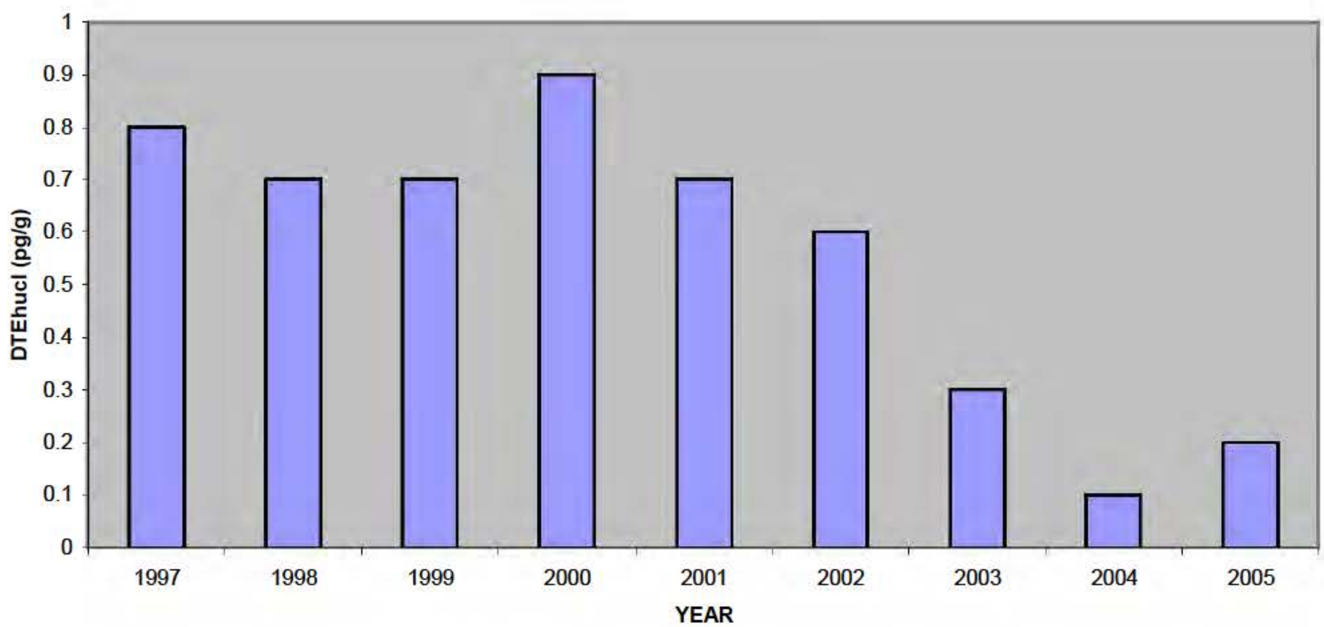
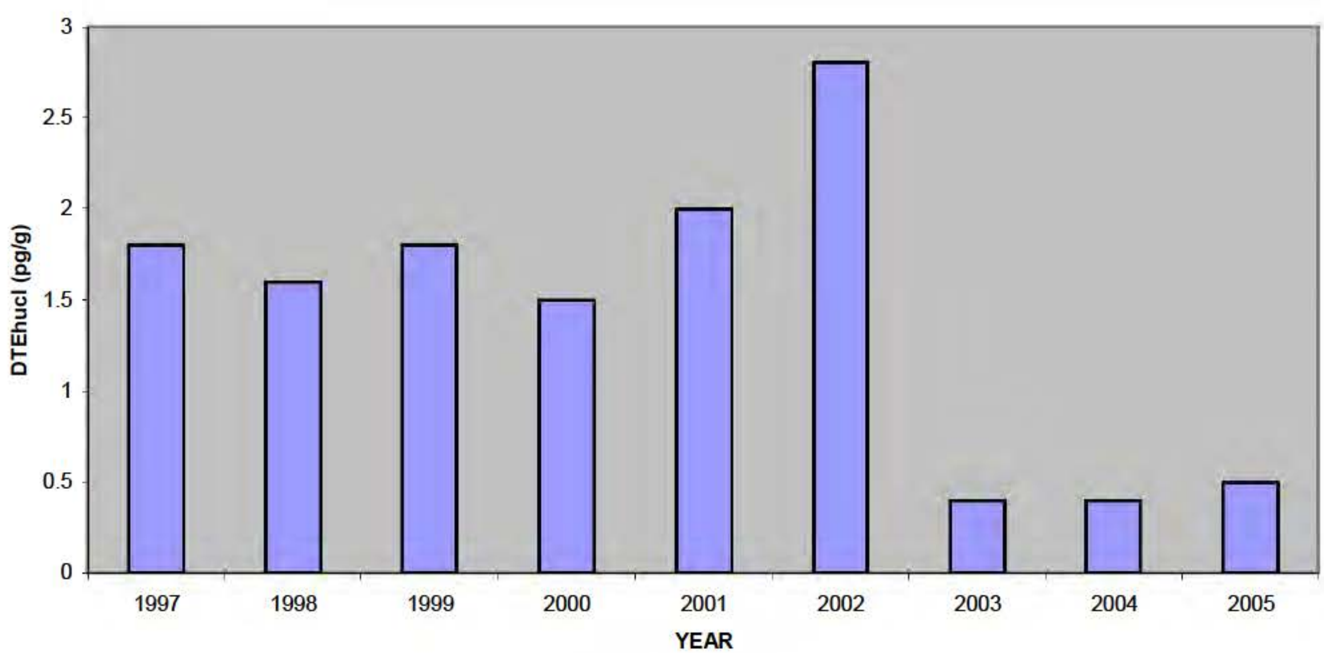


Figure 14. Dioxin levels (DTEhucl) in white suckers from the Penobscot River at Veazie, Maine



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 is 85% effluent from Prime Tanning Company, in order to document current status of fish for assessment of the fish consumption advisory and any trends in the discharges. 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 two quarters' sampling show that concentrations from both are relatively low and similar to those from the Town of Hartland and Irving Tanning below which are significantly elevated concentrations in fish (Appendix 3). Samples will be collected in then next two quarters before a decision is made regqarding further action.

Sebasticook River

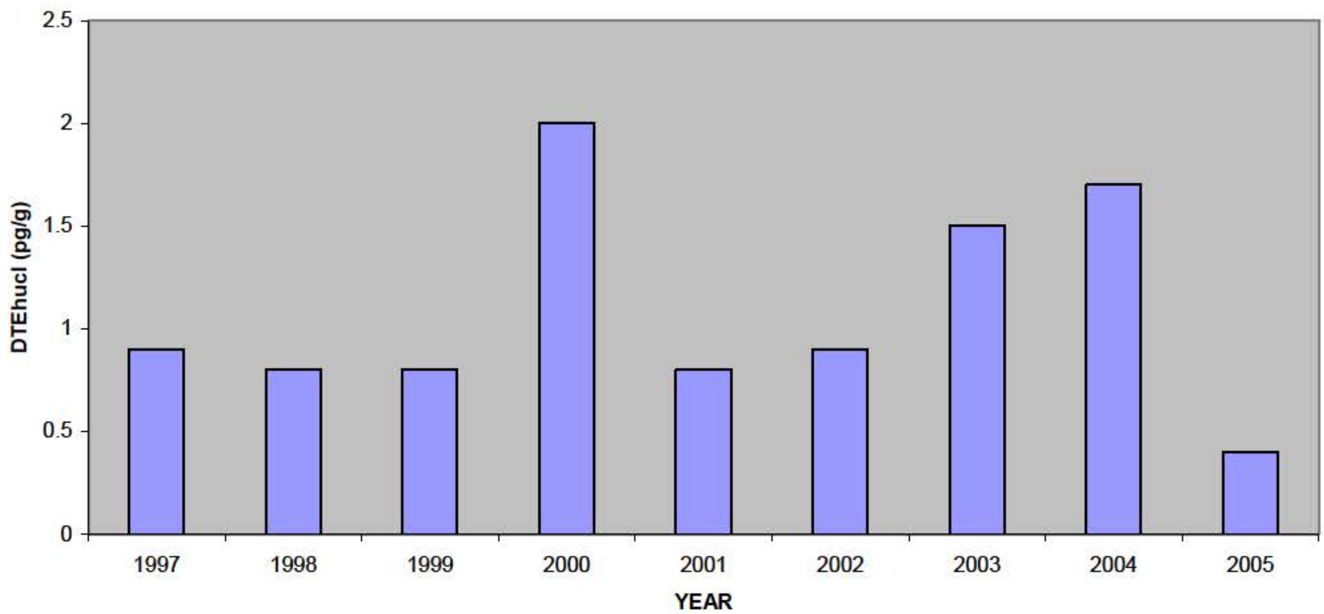
West Branch at Palmyra (SWP) A total of 5 smallmouth bass were collected from the river near the US Route 2 bridge about 3-4 miles below the discharge from the Town of Hartland, whose effluent is about 85% effluent from Irving Tanning Company (Appendix 6).

Concentrations of DTEh were 26% of the FTALc 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 the FTALr. Concentrations are still higher than those from the upstream reference station in previous years or from other reference stations in Maine.

Concentrations were also much lower than in previous years, but still higher than those following the pattern of the past few years, with wide variation from one year to the next (Appendix 7). Consequently, there is no declining trend (Figure 15). As this station is heavily fished, continued monitoring is warranted.

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.

Figure 15. Dioxin levels (DTEhucl) in smallmouth bass from the West Branch Sebasticook River at Palmyra, Maine



Burnham- (SEB) A total of 5 smallmouth bass were collected from the main stem of the Sebasticook River after the confluence of the East Branch and West Branch (Appendix 6) at the request of the Maine Center for Disease Control and Prevention (formerly the Maine Bureau of Health) as part of Maine's Surface Water Ambient Toxics (SWAT) monitoring program. This reach, then, receives water from upstream sources from SEN (not sampled in 2005) and SWP. Results are reported here for ease of comparison with other dioxin data.

Concentrations of DTEh were 29 % of the FTALc and exceeded the pFTALc (Figure 1, Appendix 2). TCDD levels were elevated above those of reference stations likely reflecting the effect of the upstream sources. Concentrations were slightly lower than those in 2004 similar to those at SWP. The addition of dioxin-like (coplanar) PCBs to DTEh results in total toxic equivalents (TTEh) that are higher but still below the FTALr.

References

Applied Biomontoring, 2004. Final report, 2003 Kennebec River caged mussel study, submitted to Friends of Merrymeeting Bay, Richmond, Me. 71 pp.

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 1		AGL RBT 3		AGL RBT 2		AGL RBT 4		AGL RBT 5
EXT ID		1022352026		1022352028		1022352027		1022352029		1022352030
		ng/Kg		ng/Kg		ng/Kg		ng/Kg		ng/Kg
Compound										
2,3,7,8-TCDF		**0.951**		**3.35**		**5.76**		**4.01**		**3.07**
1,2,3,7,8-PeCDF	<	0.253		0.378		1.1		0.468		0.5
2,3,4,7,8-PeCDF		1.28		0.631		1.85		0.867		0.865
1,2,3,4,7,8-HxCDF	<	0.111	<	0.0953		0.585		0.129		0.172
1,2,3,6,7,8-HxCDF		0.28	<	0.106		0.228	<	0.0444	<	0.0556
2,3,4,6,7,8-HxCDF	<	0.0977	<	0.0693	<	0.0586	<	0.0401	<	0.045
1,2,3,7,8,9-HxCDF	<	0.154	<	0.0948	<	0.0657	<	0.0358	<	0.0477
1,2,3,4,6,7,8-HpCDF	<	0.116	<	0.1		0.22	<	0.08	<	0.0562
1,2,3,4,7,8,9-HpCDF	<	0.262	<	0.168	<	0.0547	<	0.0622	<	0.0536
OCDF		0.138	<	0.0946		0.215		0.178		0.142
2,3,7,8-TCDD	**<**	**0.0991**	**<**	**0.0942**		**0.118**		**0.0727**		**0.0866**
1,2,3,7,8-PeCDD	<	0.144	<	0.137	<	0.0666	<	0.0638	<	0.0753
1,2,3,4,7,8-HxCDD	<	0.165	<	0.0994	<	0.0581	<	0.0433	<	0.0394
1,2,3,6,7,8-HxCDD	<	0.174	<	0.0835		0.234	<	0.0459	<	0.0468
1,2,3,7,8,9-HxCDD	<	0.152	<	0.102	<	0.0694	<	0.0496	<	0.0384
1,2,3,4,6,7,8-HpCDD	<	0.144	<	0.147		0.332		0.132		0.146
OCDD		0.357		0.278		1.05		0.508		0.537
DTEo		0.762		0.6693		1.786		0.9451		0.87
DTEd		1.108		0.9699		1.878		1.036		0.9736
DTEh		0.935		0.8196		1.832		0.99055		0.9218
DTEh sd										
DTEh confidence										
DTEh 95 UCL										
% FTAL										
% Lipids		0.878		2.04		2.29		2.49		1.8
Sample weight (g)		25		25.5		25		25.8		25.3
% Solids		19.8		23.4		23.1		23.4		23.5

For samples with some detects, TCDD and TCDF for all non-detects (<) calculated at 1/2 the detection limit.
If all samples are <, then the result is < mean of DLs

AGL RBT mean		ARF SMB 1 1022352021 ng/Kg		ARF SMB 2 1022352022 ng/Kg		ARF SMB 3 1022352023 ng/Kg		ARF SMB 4 1022352024 ng/Kg		ARF SMB 5 1022352025 ng/Kg	**ARF SMB mean**	
3.43		**0.637**		**0.553**		**0.733**		**0.552**		**0.678**	**0.63**	
0.54	<	0.114	<	0.102	<	0.11	<	0.201		0.381	**0.18**	
1.10		0.507		0.497		0.268		0.45		0.647	**0.47**	
0.22	<	0.0761	<	0.0481	<	0.0497	<	0.0758	<	0.0645	**0.06**	
0.14	<	0.044	<	0.0568	<	0.0554	<	0.0865	<	0.0844	**0.07**	
0.06	<	0.0421	<	0.043	<	0.0482	<	0.0983	<	0.103	**0.07**	
0.08	<	0.0546	<	0.0586	<	0.0584	<	0.0932	<	0.134	**0.08**	<
0.11		0.0733	<	0.0611	<	0.0779	<	0.0866	<	0.0796	**0.08**	
0.12	<	0.0539	<	0.0587	<	0.0727	<	0.112	<	0.138	**0.09**	<
0.15		0.169	<	0.0662	<	0.0828	<	0.0699		0.127	**0.10**	
0.09	**<**	**0.0512**	**<**	**0.0999**	**<**	**0.0896**		**0.152**		**0.121**	**0.10**	**<**
0.10	<	0.0577	<	0.0493	<	0.0561	<	0.115	<	0.134	**0.08**	<
0.08	<	0.0517	<	0.0708	<	0.0695	<	0.105	<	0.089	**0.08**	
0.12	<	0.0814	<	0.0592	<	0.0644	<	0.117	<	0.101	**0.08**	<
0.08	<	0.0503	<	0.0574	<	0.0789	<	0.11	<	0.105	**0.08**	<
0.18	<	0.0381		0.0711		0.0816	<	0.13		0.142	**0.09**	
0.55		0.365		0.26		0.326		0.39		0.581	**0.38**	
1.01		0.3181		0.3047		0.2083		0.4323		0.5327	**0.36**	
1.19		0.4736		0.4996		0.4035		0.6292		0.7373	**0.55**	
1.10		0.39585		0.40215		0.3059		0.53075		0.635	**0.45**	
0.41											**0.13**	
0.36											**0.11**	
1.46											**0.57**	
98											**38**	
1.90		0.272		0.314		0.285		0.417		0.427	**0.34**	
25.32		25.4		25.4		25.4		25.1		25	**25.26**	
22.64		20.4		21		21.9		20.1		22	**21.08**	

ARY WHS 1 1022352006 ng/Kg		ARY WHS 2 1022352007 ng/Kg		ARY WHS 3 1022352008 ng/Kg		ARY WHS 4 1022352009 ng/Kg		ARY WHS 5 1022352010 ng/Kg	**ARY WHS mean**		ALV WHS 1 1023229001 ng/Kg	
10.2		**14.9**		**25.6**		**11.9**		**10.2**	**14.56**		**8.24**	
0.722		0.763		1.06		0.748		0.472	**0.75**	<	0.102	
1.35		1.94		3.32		1.35		1.23	**1.84**		0.89	
0.26		0.373		0.554		0.123	<	0.0306	**0.27**	<	0.0605	<
0.135		0.155		0.188	<	0.0458		0.0786	**0.12**	<	0.0643	<
0.0921		0.127		0.0723	<	0.031		0.106	**0.09**	<	0.0607	<
0.035	<	0.0604	<	0.0942	<	0.0337	<	0.0451	**0.05**	<	0.0669	<
0.124	<	0.0584	<	0.0689	<	0.0409		0.0889	**0.08**	<	0.0659	<
0.0497	<	0.0652	<	0.104	<	0.0534	<	0.0596	**0.07**	<	0.0684	<
0.205	<	0.0718		0.227		0.234		0.185	**0.18**		0.237	
0.0592		**0.302**		**0.559**		**0.268**	**<**	**0.0662**	**0.25**		**0.26**	
0.0667		0.177		0.286		0.13	<	0.0586	**0.14**	<	0.0831	
0.0876	<	0.0728	<	0.116	<	0.0361	<	0.0652	**0.08**	<	0.085	<
0.12		0.18		0.26	<	0.0499		0.0927	**0.14**	<	0.0701	<
0.0739	<	0.114	<	0.123	<	0.0672	<	0.0785	**0.09**	<	0.0772	<
0.207	<	0.0507		0.212		0.11		0.102	**0.14**		0.203	
0.415		0.38		0.344		0.493		0.326	**0.39**		1.1	<
1.795		3.06		5.23		2.313		1.688	**2.82**		1.532	
1.945		3.087		5.265		2.34		1.836	**2.89**		1.67	
1.87		3.0735		5.2475		2.3265		1.762	**2.86**		1.601	
									1.43			
									1.26			
									4.11			
									274			
2.93		4.02		5.81		3.02		2.26	**3.61**		2.8	
25		25.3		25.5		25.1		25.1	**25.20**		25.1	
23.5		22.4		23.6		21.2		21	**22.34**		20.5	

ALV WHS 2 1023229002 ng/Kg		ALV WHS 3 1023229003 ng/Kg		ALV WHS 4 1023229004 ng/Kg		ALV WHS 5 1023229005 ng/Kg	**ALV WHS mean**		AGI SMB 1 1022352001 ng/Kg		AGI SMB 2 1022352002 ng/Kg	
7.21		**6.26**		**6.15**		**0.879**	**5.75**		**0.249**		**0.246**	
0.353		0.241		0.41	<	0.114	**0.24**	<	0.128	<	0.131	<
0.936		0.647		0.593		0.112	**0.64**	<	0.103	<	0.0932	
0.0736	<	0.0922	<	0.072	<	0.0538	**0.07**	<	0.0749	<	0.114	<
0.0844	<	0.0954	<	0.0721	<	0.0764	**0.08**	<	0.086	<	0.136	
0.0715	<	0.0943	<	0.0686	<	0.0442	**0.07**	<	0.07	<	0.0463	<
0.103	<	0.122	<	0.0978	<	0.0508	**0.09**	<	0.0977	<	0.0778	<
0.0912	<	0.0897	<	0.0893		0.126	**0.09**	<	0.0842	<	0.0632	<
0.0982	<	0.0931	<	0.142	<	0.0602	**0.09**	<	0.122	<	0.0836	<
0.11	<	0.0706	<	0.0885	<	0.0293	**0.11**		0.273		0.115	
0.201		**0.181**	**<**	**0.104**		**0.108**	**0.17**	**<**	**0.0552**	**<**	**0.0577**	**<**
0.123	<	0.0762	<	0.118		0.165	**0.11**	<	0.0902	<	0.0826	<
0.0906	<	0.145	<	0.107	<	0.0485	**0.10**	<	0.0774	<	0.0878	<
0.115	<	0.098	<	0.0929		0.266	**0.13**	<	0.0852	<	0.0776	<
0.131	<	0.141	<	0.109	<	0.0508	**0.10**	<	0.0976	<	0.0928	<
0.137		0.148		0.127		0.398	**0.20**		0.225	<	0.109	<
0.111		0.448	<	0.147		1.83	**0.73**		1.93		0.321	<
1.531		1.144		0.9326		0.4481	**1.12**		0.02741		0.02465	
1.6		1.301		1.219		0.4869	**1.26**		0.2919		0.2839	
1.5655		1.2225		1.0758		0.4675	**1.19**		0.159655		0.154275	
							0.46					
							0.40					
							1.59					
							106					
2.5		2.02		1.99		1.64	**2.19**		0.335		0.413	
25.5		25.6		25.3		25.6	**25.42**		25.3		25.5	
20.4		20.2		19.8		20.8	**20.34**		21.8		20	

AGI SMB 3 1022352003 ng/Kg		AGI SMB 4 1022352004 ng/Kg		AGI SMB 5 1022352005 ng/Kg	**AGI SMB mean**		ALW SMB C (1-5) 1022351001 ng/Kg		ALW SMB C (6-10) 1022351002 ng/Kg
0.789		**0.303**		**1.73**	**0.66**		**0.427**		**0.267**
0.148	<	0.103		0.348	**0.17**	<	0.107	<	0.0959
0.513		0.149		0.668	**0.31**		0.241		0.145
0.1	<	0.0583	<	0.0898	**0.09**	<	0.0815	<	0.0792
0.183	<	0.0528	<	0.101	**0.11**		0.0989		0.112
0.101	<	0.0324	<	0.0769	**0.07**	<	0.0653	<	0.0608
0.117	<	0.0583	<	0.0877	**0.09**	<	0.0685	<	0.094
0.0843	<	0.0481	<	0.0941	**0.07**	<	0.0665	<	0.0517
0.12	<	0.0676	<	0.113	**0.10**	<	0.0716	<	0.0507
0.106		0.223		0.168	**0.18**		0.148		0.177
0.0696		**0.141**	**<**	**0.0692**	**0.08**	**<**	**0.0655**	**<**	**0.0897**
0.0947	<	0.0729	<	0.1	**0.09**	<	0.0538	<	0.0416
0.099	<	0.074	<	0.0896	**0.09**	<	0.0583	<	0.048
0.0681	<	0.0743	<	0.0974	**0.08**	<	0.0612	<	0.068
0.0816	<	0.0718	<	0.105	**0.09**	<	0.0676	<	0.0791
0.0912		0.186		0.106	**0.14**	<	0.0515	<	0.0436
0.0913		1.57		0.389	**0.86**		0.23		0.411
0.3536		0.2479		0.5256	**0.24**		0.173		0.1103
0.5849		0.3692		0.762	**0.46**		0.3398		0.2908
0.46925		0.30855		0.6438	**0.35**		0.2564		0.20055
					0.21				
					0.18				
					0.53 **35**				
0.376		0.307		0.612	**0.41**		0.858		0.568
25.3		25.8		25.5	**25.48**		25.2		25
20.8		21.6		21.3	**21.10**		21.2		20.6

ALW SMB mean		ALW WHP C (1-5) 1022349001 ng/Kg		ALW WHP C (6-10) 1022349002 ng/Kg	ALW WHP mean
0.35		**1.27**		**1.12**	**1.20**
0.10	<	0.115	<	0.106	**0.11**
0.19		0.829		0.955	**0.89**
0.08	<	0.0413		0.178	**0.11**
0.11		0.139		0.147	**0.14**
0.06		0.133		0.0749	**0.10**
0.08	<	0.0664	<	0.0636	**0.07**
0.06	<	0.0589		0.0881	**0.07**
0.06	<	0.0764	<	0.0498	**0.06**
0.16		0.177		0.199	**0.19**
0.08		**0.12**		**0.0839**	**0.10**
0.05		0.129		0.102	**0.12**
0.05	<	0.108	<	0.0563	**0.08**
0.06	<	0.0588	<	0.0615	**0.06**
0.07	<	0.0562	<	0.0581	**0.06**
0.05		0.137		0.23	**0.18**
0.32		0.473		0.708	**0.59**
0.14		0.8188		0.8194	**0.82**
0.32		0.859		0.8492	**0.85**
0.23		0.8389		0.8343	**0.84**
0.04					**0.003**
0.05					**0.005**
0.28					**0.84**
19					**56**
0.71		1.8		2.01	**1.91**
25.10		25.6		25.7	**25.65**
20.90		22.4		22.2	**22.30**

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 International 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 Pulp and Paper
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 TREA

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
SOMERSWORTH, NH	050810	82.0	<0.52	2.1
	051220	79.6	<0.15	0.9
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

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREA

LOCATION	DATE	%MOIST	TCDD	TCDF
	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
	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

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREA

LOCATION	DATE	%MOIST	TCDD	TCDF
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
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 WASTEWATI	881007	65.0	<2.86	<1.71
TREATMENT PLANT	881221	65.5	<7.25	E6.09

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREA

LOCATION	DATE	%MOIST	TCDD	TCDF
	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	ean n=	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
HAWK RIDGE COMPOS'	950724		<1	12.0
UNITY	951012		1.1	12.0
(compost)	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
INTERNATIONAL PAPI	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

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREA

LOCATION	DATE	%MOIST	TCDD	TCDF
	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, <0 5,	<3.1, 2.9,
	010108		<.10	<.10
	011017		<0.007	1.4
	021017		<0.007	1.4
	031021		0.3	1.5
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

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREA

LOCATION	DATE	%MOIST	TCDD	TCDF
	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
	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	hed co	<1	<0.1
	030709	limed	<5	<5
	030717	hed co	<5	<5
	040830	limed	<0.5	<1.2
	040830	lids/cc	1.1	2.0
LINCOLN PULP & PA	881119		48W	223W
LINCOLN	890123	80.9	44.0	203.0
	890123		44.0	173.0

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREA

LOCATION	DATE	%MOIST	TCDD	TCDF
	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	
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

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREA

LOCATION	DATE	%MOIST	TCDD	TCDF
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
	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

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREA

LOCATION	DATE	%MOIST	TCDD	TCDF
	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 SEWE	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 MANUFACT	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
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

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREA

LOCATION	DATE	%MOIST	TCDD	TCDF
	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	redgin	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	redgin	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
	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

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREA

LOCATION	DATE	%MOIST	TCDD	TCDF
	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
	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

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREA

LOCATION	DATE	%MOIST	TCDD	TCDF
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 PLANTS

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 PLANTS

SOURCE	DATE		TCDD (pg/l)	TCDF (pg/l)
GEORGIA PACIFIC	910330		17	70
OLD TOWN	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 PLANTS

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
GEORGIA PACIFIC	980830	BP	<3.5	BP	<4.2
OLD TOWN	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 PLANTS

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
GEORGIA PACIFIC	011130		<4.7		<3.9
OLD TOWN		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 PLANTS

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
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
DOMTAR	911231		<11		<11
Baileyville	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
			<2		<6
		BP	C<2 A<4	BP	C<2 A<7
		BP	C<5 A<3	BP	C<4 A<3

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

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
	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		<10		
INTERNATIONAL PAPER	880101		88		420
Jay	880715		30		150
	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
	920723		<8.4		33.6
	920819		6.6		29.7
	920923		<2.6		<2.0

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

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
	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
INTERNATIONAL PAPER	950724		<3.2		16.1
Jay	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
	970830		<10		<10
	971030		<10		
	971013	BPA	<4.3	BPA	<5

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

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
		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
INTERNATIONAL PAPER	990304	BPA	<2.1		9.7
Jay		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
	000419	BPA	<2.9		<1.6
		BPB	<2.7		<1.8
	000612	BPA	<3.7		<2.6

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

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
		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		<10		<10
	040230		<10		<10
	040430		<10		<10
	040530		<10		<10
	040730		<10		<10
	040830		<10		<10
	041030		<10		<10
	041130		<10		<10
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

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

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
	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
	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
LINCOLN PAPER & TISSUE	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

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

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
	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
NEWPAGE CORP	880518		120		570
	890301		25		80
	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		
NEWPAGE CORP	921201		<2.4		
	930105		<2.4		
	930201		<2.4		<10
	930401		<2.8		<10
	930501		<2.4		<10

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

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
	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
	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
NEWPAGE CORP		BP	<10	BP	<10
	990730		<10		<10
		BP	<10	BP	<10
	990830		<10		<10
		BP	<10	BP	<10

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

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
	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
	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

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

SOURCE	DATE		TCDD (pg/l)	TCDF (pg/l)
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
	930311		<4.0	10
	930409		6.8	18
SAPPI - SOMERSET	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

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

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
	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
	990710		<3.5		<3.9
	990910		<7.3		<6
SAPPI - SOMERSET	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

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

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
	040930	BP	<1.47	BP	<1.31
	041130	BP	<2.01	BP	<2.09
	050131				<0.551
	050228		<2.06		<1.76
	050331		<0.541		<0.527
	050430		<0.938		<0.543
	050531		<0.790		<0.890
	050630		<1.06		<0.873
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
SAPPI - WESTBROOK	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

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

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
	990407		<10		<10
	990526		<11		15
	990617		<10		<10
	990630				15
		BP	<11	BP	130
	990728		<9.5		<9.5
	990731	BP	<10	BP	54
	990830		<10		<10
	990830		<10		<10

APPENDIX 6.

LENGTHS AND WEIGHTS FOR 2004 FISH SAMPLES

FISH SAMPLES 2005 11/15/2005 field ID	DATE SAMPLED	L mm	W gm.	PREP N	COMP. ID	D/F N 1613
ANDROSCOGGIN RIVER						
GILEAD						
AGL-RBT-1	6/5/2005	396		1		1
AGL-RBT-2	6/5/2005	342		1		1
AGL-RBT-3	6/5/2005	335		1		1
AGL-RBT-4	6/5/2005	335		1		1
AGL-RBT-5	6/5/2005	330		1		1
RUMFORD POINT						
RUMFORD						
ARF-SMB-1	7/11/2005	430		1		1
ARF-SMB-2	7/11/2005	432		1		1
ARF-SMB-3	7/11/2005	380		1		1
ARF-SMB-4	7/11/2005	390		1		1
ARF-SMB-5	7/11/2005	418		1		1
RILEY						
ARY-WHS-1	7/12/2005	492		1		1
ARY-WHS-2	7/12/2005	510		1		1
ARY-WHS-3	7/12/2005	455		1		1
ARY-WHS-4	7/12/2005	450	1100	1		1
ARY-WHS-5	7/12/2005	455	1030	1		1
LIVERMORE						
ALV-WHS-1	7/13/2005	500	1600	1		1
ALV-WHS-2	7/13/2005	445	980	1		1
ALV-WHS-3	7/14/2005	492	1450	1		1
ALV-WHS-4	7/14/2005	506	1310	1		1
ALV-WHS-5	7/14/2005	490	1390	1		1
GULF ISLAND POND						
AGI-SMB-1	7/14/2005	357	550	1		1
AGI-SMB-2	7/14/2005	379	675	1		1
AGI-SMB-3	7/14/2005	364	600	1		1
AGI-SMB-4	7/14/2005	362	550	1		1
AGI-SMB-5	7/14/2005	347	525	1		1
ANDROSCOGGIN L.						
ALW-SMB-1	7/15/2005	352	500	1	C1	2C5
ALW-SMB-2	7/15/2005	340	480	1	C1	
ALW-SMB-3	7/15/2005	336	525	1	C1	
ALW-SMB-4	7/20/2005	433	925	1	C1	
ALW-SMB-5	7/20/2005	411	900	1	C1	
ALW-SMB-6	7/20/2005	414	1000	1	C2	
ALW-SMB-7	7/21/2005	431	775	1	C2	

ALW-SMB-8	7/21/2005	412	1125	1	C2	
ALW-SMB-9	7/21/2005	371	700	1	C2	
ALW-SMB-10	7/21/2005	374	750	1	C2	
ALW-WHP-1	7/15/2005	290	325	1	C1	2C5
ALW-WHP-2	7/15/2005	275	250	1	C1	
ALW-WHP-3	7/15/2005	278	225	1	C1	
ALW-WHP-4	7/15/2005	294	350	1	C1	
ALW-WHP-5	7/15/2005	314	400	1	C1	
ALW-WHP-6	7/15/2005	310	400	1	C2	
ALW-WHP-7	7/15/2005	235	175	1	C2	
ALW-WHP-8	7/15/2005	256	225	1	C2	
ALW-WHP-9	7/15/2005	251	200	1	C2	
ALW-WHP-10	7/15/2005	266	200	1	C2	

KENNEBEC RIVER

FAIRFIELD

KFF-BNT-1	6/14/2005	384	810	1		1
KFF-BNT-2	6/14/2005	374	750	1		1
KFF-BNT-3	6/14/2005	370	780	1		1
KFF-BNT-4	6/14/2005	370	780	1		1
KFF-BNT-5	TBC?			1		1
KFF-WHS-1	7/19/2005	465	1180	1		1
KFF-WHS-2	7/19/2005	467	1200	1		1
KFF-WHS-3	7/19/2005	460	1100	1		1
KFF-WHS-4	7/19/2005	496	1400	1		1
KFF-WHS-5	7/19/2005	432	910	1		1

WINSLOW

KWL-BNT-1	TBC?			1		1
KWL-BNT-2	TBC?			1		1
KWL-BNT-3	TBC?			1		1
KWL-BNT-4	TBC?			1		1
KWL-BNT-5	TBC?			1		1

PENOBSCOT RIVER

MATTASEUNK IMPOUNDMENT (WOODVILLE)

PBM-SMB-01	8/22/2005	365	630	1	C1	10C3
PBM-SMB-02	8/22/2005	340	450	1	C1	
PBM-SMB-03	9/1/2005	356	533	1	C1	
PBM-SMB-04	9/1/2005	367	703	1	C2	
PBM-SMB-05	9/1/2005	330	447	1	C2	
PBM-SMB-06	9/2/2005	336	570	1	C2	
PBM-SMB-07	9/2/2005	346	580	1	C3	
PBM-SMB-10	9/2/2005	345	540	1	C3	
PBM-SMB-11	9/3/2005	356	558	1	C3	

PBM-SMB-12	9/3/2005	353	544	1	C4	
PBM-SMB-13	9/3/2005	339	446	1	C4	
PBM-SMB-14	9/4/2005	364	641	1	C4	
PBM-SMB-16	9/6/2005	345	474	1	C5	
PBM-SMB-17	9/7/2005	344	548	1	C5	
PBM-SMB-20	9/10/2005	325	444	1	C5	
PBM-SMB-21	9/11/2005	324	433	1	C6	
PBM-SMB-22	9/12/2005	340	495	1	C6	
PBM-SMB-23	9/13/2005	315	421	1	C6	
PBM-SMB-24	9/14/2005	330	430	1	C7	
PBM-SMB-25	9/15/2005	330	447	1	C7	
PBM-SMB-26	9/16/2005	350	562	1	C7	
PBM-SMB-27	9/17/2005	331	458	1	C8	
PBM-SMB-28	9/18/2005	343	477	1	C8	
PBM-SMB-29	9/19/2005	337	460	1	C8	
PBM-SMB-30	9/20/2005	357	585	1	C9	
PBM-SMB-31	9/21/2005	355	516	1	C9	
PBM-SMB-32	9/22/2005	349	513	1	C9	
PBM-SMB-33	9/23/2005	346	515	1	C10	
PBM-SMB-34	9/24/2005	363	582	1	C10	
PBM-SMB-35	9/25/2005	361	549	1	C10	
PBM-WHS-01	8/30/2005	458	1184	1	C1	10C3
PBM-WHS-02	8/30/2005	450	983	1	C1	
PBM-WHS-03	8/30/2005	448	1044	1	C1	
PBM-WHS-04	8/30/2005	460	939	1	C2	
PBM-WHS-05	8/31/2005	460	969	1	C2	
PBM-WHS-06	8/31/2005	450	892	1	C2	
PBM-WHS-07	8/31/2005	466	1110	1	C3	
PBM-WHS-08	8/31/2005	464	1092	1	C3	
PBM-WHS-09	8/31/2005	474	911	1	C3	
PBM-WHS-10	8/31/2005	464	1061	1	C4	
PBM-WHS-11	8/31/2005	465	1082	1	C4	
PBM-WHS-12	9/1/2005	480	1151	1	C4	
PBM-WHS-13	9/1/2005	483	792	1	C5	
PBM-WHS-14	9/1/2005	447	983	1	C5	
PBM-WHS-15	9/1/2005	466	961	1	C5	
PBM-WHS-16	9/1/2005	450	1012	1	C6	
PBM-WHS-17	9/1/2005	455	971	1	C6	
PBM-WHS-18	9/1/2005	480	1107	1	C6	
PBM-WHS-19	9/1/2005	454	1114	1	C7	
PBM-WHS-20	9/1/2005	456	951	1	C7	
PBM-WHS-21	9/1/2005	450	942	1	C7	
PBM-WHS-22	9/1/2005	450	1050	1	C8	
PBM-WHS-23	9/1/2005	475	868	1	C8	
PBM-WHS-24	9/1/2005	483	1081	1	C8	
PBM-WHS-25	9/1/2005	464	977	1	C9	
PBM-WHS-26	9/1/2005	465	858	1	C9	
PBM-WHS-27	9/1/2005	485	1053	1	C9	
PBM-WHS-28	9/1/2005	465	973	1	C10	
PBM-WHS-29	9/1/2005	460	1075	1	C10	
PBM-WHS-30	9/1/2005	446	863	1	C10	

LINCOLN

PBL-SMB-1	9/13/2005	375	632.2	1	C1	10C3
PBL-SMB-2	9/13/2005	368	678.3	1	C1	
PBL-SMB-3	9/13/2005	360	629.8	1	C1	
PBL-SMB-4	9/14/2005	365	333.9	1	C2	
PBL-SMB-5	9/14/2005	362	636.5	1	C2	
PBL-SMB-6	9/15/2005	370	676.2	1	C2	
PBL-SMB-7	9/20/2005	364	585	1	C3	
PBL-SMB-8	9/20/2005	366	660.3	1	C3	
PBL-SMB-9	9/21/2005	360	?	1	C3	
PBL-SMB-10	9/22/2005	345	521	1	C4	
PBL-SMB-11	9/22/2005	345	535.2	1	C4	
PBL-SMB-12	9/22/2005	350	550	1	C4	
PBL-SMB-13	9/22/2005	323	451.4	1	C5	
PBL-SMB-14	9/22/2005	360	510	1	C5	
PBL-SMB-15	9/22/2005	345	518.3	1	C5	
PBL-SMB-16	9/23/2005	350	565.4	1	C6	
PBL-SMB-17	9/23/2005	332	437.6	1	C6	
PBL-SMB-18	9/23/2005	325	418.4	1	C6	
PBL-SMB-19	9/23/2005	367	659.6	1	C7	
PBL-SMB-20	9/27/2005	361	609.9	1	C7	
PBL-SMB-21	9/29/2005	342	510.3	1	C7	
PBL-SMB-22	9/29/2005	330	455.7	1	C8	
PBL-SMB-23	9/29/2005	355	568.3	1	C8	
PBL-SMB-24	9/29/2005	340	497.2	1	C8	
PBL-SMB-25	9/29/2005	366	611	1	C9	
PBL-SMB-26	9/29/2005	357	545.3	1	C9	
PBL-SMB-27	9/29/2005	352	586.7	1	C9	
PBL-SMB-28	9/29/2005	350	577.5	1	C10	
PBL-SMB-29	9/29/2005	344	519.8	1	C10	
PBL-SMB-31	9/29/2005	327	481	1	C10	
PBL-WHS-1	9/13/2005	460	1067.4	1	C1	10C3
PBL-WHS-2	9/13/2005	455	1191.4	1	C1	
PBL-WHS-3	9/13/2005	455	1189	1	C1	
PBL-WHS-4	9/13/2005	458	1094.8	1	C2	
PBL-WHS-5	9/13/2005	455	1185.1	1	C2	
PBL-WHS-6	9/13/2005	470	1174.5	1	C2	
PBL-WHS-7	9/13/2005	450	1176.3	1	C3	
PBL-WHS-8	9/13/2005	460	1007.3	1	C3	
PBL-WHS-9	9/14/2005	460	1242.2	1	C3	
PBL-WHS-10	9/16/2005	465	1075.6	1	C4	
PBL-WHS-11	9/16/2005	462	1091.4	1	C4	
PBL-WHS-12	9/16/2005	480	1224.4	1	C4	
PBL-WHS-13	9/16/2005	484	1364.6	1	C5	
PBL-WHS-14	9/20/2005	465	1102.6	1	C5	
PBL-WHS-15	9/20/2005	468	1287.4	1	C5	
PBL-WHS-16	9/20/2005	460	1137.6	1	C6	
PBL-WHS-17	9/20/2005	458	1291.4	1	C6	

PBL-WHS-18	9/21/2005	470	?	1	C6	
PBL-WHS-19	9/23/2005	471	1183.1	1	C7	
PBL-WHS-20	9/23/2005	455	1145.4	1	C7	
PBL-WHS-21	9/23/2005	485	1344.5	1	C7	
PBL-WHS-22	9/23/2005	474	1310.9	1	C8	
PBL-WHS-23	9/23/2005	493	1272.8	1	C8	
PBL-WHS-24	9/23/2005	462	1233.4	1	C8	
PBL-WHS-25	9/23/2005	467	1201.8	1	C9	
PBL-WHS-26	9/27/2005	485	1321.9	1	C9	
PBL-WHS-27	9/27/2005	484	1499.9	1	C9	
PBL-WHS-28	9/27/2005	475	1347.1	1	C10	
PBL-WHS-29	9/27/2005	483	1349.2	1	C10	
PBL-WHS-30	9/27/2005	464	1258.1	1	C10	

Veazie

PBVSMB1	11/2/2005	410		1		1
PBVSMB2	11/2/2005	405		1		1
PBVSMB3	11/3/2005	375		1		1
PBVSMB4	11/3/2005	370		1		1
PBVSMB5	11/3/2005	480		1		1
PBV-WHS1	11/1/2005	450	1210	1		1
PBV-WHS2	11/1/2005	448	1215	1		1
PBV-WHS3	11/2/2005	475		1		1
PBV-WHS4	11/2/2005	490		1		1
PBV-WHS5	11/2/2005	455		1		1

SEBASTICOOK RIVER

PALMYRA

SWP-SMB-1	8/9/2005	355	650	1		1
SWP-SMB-2	8/9/2005	365	600	1		1
SWP-SMB-3	8/9/2005	462	1240	1		1
SWP-SMB-4	8/9/2005	424	915	1		1
SWP-SMB-5	8/9/2005	310	390	1		1

BURNHAM

SBN-SMB-1	8/10/2005	458	1225	1		1
SBN-SMB-2	8/10/2005	380	650	1		1
SBN-SMB-3	8/10/2005	416	1150	1		1
SBN-SMB-4	8/10/2005	309	350	1		1
SBN-SMB-5	8/10/2005	396	850	1		1

NEWPORT

SEN-SMB1	TBC?			1		1
SEN-SMB2	TBC?			1		1
SEN-SMB3	TBC?			1		1
SEN-SMB4	TBC?			1		1
SEN-SMB5	TBC?			1		1

SALMON FALLS

BERWICK SLUDGE1	8/5/2005	1	1
BERWICK SLUDGE2	12/21/2005	1	1
BERWICK SLUDGE3	TBC?	1	1
BERWICK SLUDGE4	TBC?	1	1
SOMERSWORTH SLUDGE1	8/5/2005	1	1
SOMERSWORTH SLUDGE2	12/21/2005	1	1
SOMERSWORTH SLUDGE3	TBC?	1	1
SOMERSWORTH SLUDGE4	TBC?	1	1

APPENDIX 7.

SUMMARY OF DIOXINS AND FURANS IN FISH AND SHELLFISH SAMPLES, 1984-2004

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

			NDS/NBS 1984-86	MAINE 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 Falls	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)

			NDS/NBS	MAINE					
			1984-86	1988- 1990		19 91		19 92	
WATER/STATION	SPECIES	TISSUE	TCDD	TCDD	DTE	TCDD	DTE	TCDD	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
Richmond	eel	f							
Phippsburg	clam	m						0.3	0.6-0.9
	lobster	m							
	lobster	t							

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
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 Spring	lobster	m							
	lobster	t							
OWLS HEAD	mussel	m	<0.8						
PISCATAQUIS R									
Sangerville	bass	f				<0.2	0.03-0.3		

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
	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								
	sucker								

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
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									
Vassalboro	bass	f				<0.08	0.04-0.4		

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

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
WATER/STATION	SPECIES	TISSUE	TCDD	DTE	TCDD	DTE	TCDD	DTE		TCDD	DTE	TCDD
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
	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
Rumford	bass	f	2.9	4.5-5.4	3.8	5.7-6.2	2.2	3.5-4.1				0.5
	juv bass											
	sucker	w	5.8	13.6-14.6	4.0	11.4-11.9				0.8	4.1-5.2	0.5
Riley	bass											0.3
	sucker	w										0.5
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 Fall:	bass	f	1.4	1.6-1.8	1.4	1.6-2.3	0.5	0.8-1.3				0.3
	sucker	w	3.6	6.8-7.3	2.2	4.8-5.3				0.6	3.4-3.9	0.5
	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
	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
	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)

			19 93		19 94		19 95		19 96		19
WATER/STATION	**SPECIES**	**TISSUE**	**TCDD**	**DTE**	**TCDD**	**DTE**	**TCDD**	**DTE**	**TCDD**	**DTE**	**TCDD**
	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
	sucker	w					0.1	0.3-1.0	<0.1	0.3-1.0	<0.1
Norridgewock	bass										
	bn trout										
	sucker										
Fairfield	bass	f	1.5	1.7-2.0	0.9	1.1-1.8					0.6
	trout	f	1.4	1.6-1.9	2.2	2.5-3.8	1.6	1.7-2.5			1.2
	sucker	w	1.6	2.2-2.6	2.2	2.9-3.8			1.6	2.1-2.7	1.2
Sidney	bass	f	0.6	0.8-1.4	0.3	0.4-1.3			0.2	0.4-1.0	0.2
	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
	bass	f	0.6	0.9-1.5	1.0	1.3-3.7					0.5
	sucker	w	1.9	3.3-3.6	2.3	4.0-5.8			2.2	2.6-3.3	
Hallowell	smelt	c									
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					
	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	

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

			19 93		19 94		19 95		19 96		19
WATER/STATION	SPECIES	TISSUE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD
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
	sucker	w					<0.1	0.1-0.6	<0.1	0.1-0.8	<0.1
E Millinocket	bass	f									<0.1
	sucker	w									<0.1
Woodville	bass										<0.1
	sucker										<0.1
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
	sucker	w	1.7	3.5-3.6	2.2	5.8-6.1			1.6	2.2-3.2	1.2
Passadumkeag	bass	f									
	sucker	w									
Milford	bass	f									0.2
	sucker	w									1.0
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
	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
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			0.9	12.5-13.2	
	lobster	t	4.0	28.0	2.3	18.1-27.9	1.3	7.2-14.6			
OWLS HEAD	mussel	m									
PISCATAQUIS R											
Sangerville	bass	f									

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

			19 93		19 94		19 95		19 96		19
WATER/STATION	SPECIES	TISSUE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD
	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
	sucker	w	0.3	0.7-0.8	0.2	1.4-2.4	0.3	2.4-7.7			0.2
Westbrook	bass	f	<0.2	0.1-0.5	0.2	0.3-1.2			0.2	0.4-0.9	0.1
	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
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
	sucker										<0.1
Baring	bass										<0.1
	sucker	w									<0.1
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	
	sucker										

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

			19 93		19 94		19 95		19 96		19
WATER/STATION	**SPECIES**	**TISSUE**	**TCDD**	**DTE**	**TCDD**	**DTE**	**TCDD**	**DTE**	**TCDD**	**DTE**	**TCDD**
S Berwick	bass	f	0.2	0.2-0.9	0.5	0.7-3.3	0.4	0.4-4.0			0.2
	lm bass										
	pickerel	f									0.6
	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
	bass										
	sucker										
Newport	bass	f									0.2
	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
	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
	pickerel	f									
	sucker	w	1.0	2.6-2.7	1.2	4.0-4.3			1.2	2.2-3.6	
WEBBER POND											
Vassalboro	bass	f									

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

			19 93		19 94		19 95		19 96		19
WATER/STATION	SPECIES	TISSUE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD

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)

			97		19 98		19 99			20 00			20
WATER/STATION	SPECIES	TISSUE	DTE		TCDD	DTE	TCDD	DTE		TCDD	DTE		TCDD
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
	w perch				0.5	0.6-1.2	0.2	0.3-0.9		0.2	0.2-0.8		0.1
	sucker	w/f		w	0.4	0.9-1.1			w	<0.1	0.1-1.1	f	<0.1
POCASSET LAKE													
Wayne	bass												
	SMB comp												
	WHP comp												
ANDROSCOGGIN R													
Gilead	rb trout		1.6-2.1		0.4	1.5-2.0	0.7	1.7-2.3		0.4	0.9-1.4		0.8
	bn trout						0.4	1.0-1.5		0.1	0.4-1.0		0.8
	juv bass												
	bass						0.4	1.4-1.5		0.2	0.8-1.2		0.3
	sucker	w	3.4-3.8		0.9	3.1-3.5	0.8	2.9-3.3		0.3	1.8-2.2		0.1
Rumford	bass	f	1.2-1.8		0.4	1.1-1.5	0.6	1.5-1.9		0.2	0.6-1.1		0.2
	juv bass												
	sucker	w	3.6-4.9		0.4	3.0-3.4	0.4	2.8-3.2		0.3	1.9-2.3		0.3
Riley	bass		1.1-2.2		0.2	0.8-1.0	<0.1	0.6-0.9		<0.1	0.2-0.6		0.2
	sucker	w	3.8-4.8		0.3	2.5-2.8	0.3	2.6-2.8					0.3
Jay	bass	f											
	sucker	w											
Livermore Falls	bass	f	1.2-1.4		0.2	1.1-1.2	0.2	0.9-1.2		0.2	0.6-1.0		0.3
	sucker	w	2.8-2.9		0.5	2.8-2.9	0.4	2.4					0.3
	sucker comp												
Livermore ALF	bass												
	sucker												
N Turner	sucker	w											
Auburn-GIP	bass	f	2.0-2.2		0.4	1.6-1.8	0.4	1.6-1.8		0.1	0.4-0.9		0.2
	lm bass	f											
	sucker	w											0.2
	bullhead	w											
Lisbon Falls	bn trout	f											
	bass	f	1.3-1.8		0.5	1.1-1.5	0.7	1.7-2.1		0.2	0.5-1.0		0.4
	sucker	w											
Brunswick	sucker	w											

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

			97	19 98		19 99		20 00		20
WATER/STATION	SPECIES	TISSUE	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD
	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
	bass	f	0.03-1.6							
	sucker	w	0.2-0.8							
Norridgewock	bass			<0.1	0.03-0.6	<0.1	0.03-0.7	<0.1	0.05-0.7	<0.1
	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
Fairfield	bass	f	0.6-1.2	0.3	0.4-1.0	0.4	0.4-1.0	0.4	0.5-1.1	0.2
	trout	f	1.3-1.9							1.0
	sucker	w	1.7-2.1	0.9	1.4-1.8	0.3	0.4-1.0	0.4	0.5-1.0	0.3
Sidney	bass	f	0.3-0.9					0.2	0.2-0.8	0.2
	bn trout							0.3	0.3-0.8	0.4
	sucker	w								
Augusta	bn trout	f	1.0-1.3							
	bass	f	0.8-1.6	0.3	0.6-0.9	0.3	0.6-0.9			
	sucker	w								
Hallowell	smelt	c								
Richmond	eel	f								
Phippsburg	clam	m								
	lobster	m								
	lobster	t								

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

			97	19 98		19 99		20 00		20
WATER/STATION	**SPECIES**	**TISSUE**	**DTE**	**TCDD**	**DTE**	**TCDD**	**DTE**	**TCDD**	**DTE**	**TCDD**
MESSALONSKEE LAKE										
Belgrade	bass									
NARRAGUAGUS R										
Cherryfield	fallfish	w								
NORTH POND										
Chesterfield	sucker	w								
	pickerel	f								
PENOBSCOT R										
E Br Grindstone	bass	f	0.04-0.7	<0.1	0.04-0.7					
	sucker	w	0.07-0.7	<0.1	0.07-0.7					
E Millinocket	bass	f	0.04-0.7	<0.1	0.04-0.7					
	sucker	w	0.09-0.7	<0.1	0.09-0.7					
Woodville	bass		0.07-0.7	<0.1	0.06-0.7	<0.1	0.08-0.7	<0.1	0.1-0.7	<0.1
	sucker		0.09-0.7	<0.1	0.08-0.7	<0.1	0.1-0.7	<0.1	0.1-0.7	<0.1
Winn	bass					<0.1	0.2-0.8	<0.1	0.1-0.7	<0.1
	sucker					<0.1	0.2-0.9	<0.1	0.1-0.8	<0.1
N Lincoln	bass	f								
	sucker	w								
S Lincoln	bass	f	0.4-1.0	0.2	0.4-0.9	0.4	0.6-1.0	0.2	0.3-0.9	0.4
	sucker	w	1.6-2.2	1.0	1.4-2.0	1.0	1.4-1.6	0.7	1.0-1.5	0.3
Passadumkeag	bass	f								
	sucker	w								
Milford	bass	f	0.4-0.9	0.2	0.2-0.8	0.1	0.4-0.7	0.2	0.3-0.9	0.3
	sucker	w	1.6-2.0	1.0	1.5-2.0	1.0	1.5-1.6	0.8	1.1-1.6	0.4
Veazie	bass	f	0.4-0.9	0.2	0.3-0.9	0.3	0.4-0.9	0.4	0.5-1.1	0.2
	sucker	w	1.3-1.9	1.0	1.2-1.8	1.1	1.3-1.7	0.9	1.2-1.7	1.3
Bangor	eel	f						1.6	2.0-2.5	1.1
Bucksport	clam	m								
Stockton Sprin	lobster	m								
	lobster	t								
OWLS HEAD	mussel	m								
PISCATAQUIS R										
Sangerville	bass	f								

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

			97	19 98		19 99		20 00		20
WATER/STATION	**SPECIES**	**TISSUE**	**DTE**	**TCDD**	**DTE**	**TCDD**	**DTE**	**TCDD**	**DTE**	**TCDD**
	bn trout	f								
	sucker	w								
Howland	bass	f								
PRESUMPSCOT R										
Windham	bass	f	0.5-0.7	<0.1	0.4-0.8			<0.1	0.1-0.7	<0.1
	sucker	w	1.2-1.4	0.2	1.2-1.4					0.2
Westbrook	bass	f	0.4-0.9	<0.1	0.3-0.8			<0.1	0.2-0.8	<0.1
	pickerel	f								
	w perch	f								
	sucker	w	1.6-2.0	0.2	1.6-2.0					0.2
Falmouth	clam	m								
Portland	lobster	m								
	lobster	t								
ST CROIX R										
Woodland	bass	f	0.02-0.7	<0.1	0.06-0.7	<0.1	0.06-0.7			
	sucker		0.09-0.7	<0.1	0.08-0.7	<0.1	0.07-0.7			
Baring	bass		0.03-0.7	<0.1	0.05-0.7	<0.1	0.05-0.7			
	sucker	w	0.07-0.8	<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									
	sucker									

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

			97	19 98		19 99		20 00		20
WATER/STATION	SPECIES	TISSUE	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD
S Berwick	bass	f	0.3-0.6			0.1	0.3-0.6	0.1	0.2-0.8	0.2
	lm bass					0.2	0.5-0.8			
	pickerel	f	0.8-1.0							
	sucker	w								
SANDY P										
	bass	f								
SEBAGO L										
Naples	bass	w								
SEBASTICOOK R										
E Br Corinna	lm bass		0.1-0.7							
	bass									
	sucker									
Newport	bass	f	1.2-1.4							0.1
	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
Burnham	bass									
W Br Harmony	bass		0.06-0.7							
	sucker									
W Br Palmyra	bass	f	0.6-0.9	0.2	0.5-0.8	0.2	0.6-0.8	0.1	0.4-2.7	0.2
	pickerel	f								
	sucker	w								
WEBBER POND										
Vassalboro	bass	f								

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

		97	19 98		19 99		20 00		20
WATER/STATION	SPECIES TISSUE	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD

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)

			01	20 02		20 03		20 04		20 05	
WATER/STATION	**SPECIES**	**TISSUE**	**DTE**	**TCDD**	**DTE**	**TCDD**	**DTE**	**TCDD**	**DTE**	**TCDD**	**DTE**
ANDROSCOGGIN LAKE											
Wayne	bn trout	f									
	bass	f	0.1-0.8	<0.1	0.3-1.3	0.2	0.8-1.0	<0.1	0.2-0.4	<0.1	0.1-0.3
	w perch		0.2-0.7	<0.1	0.4-1.4	0.1	0.7-0.9	<0.1	0.4-0.8	0.1	0.8-0.9
	sucker	w/f	0.1-0.7								
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		2.1-2.5					<0.1	0.8-1.1	<0.1	1.0-1.2
	bn trout		2.5-2.7								
	juv bass			<0.1	1.9-2.8						
	bass		1.0-1.4	<0.1	1.4-2.3	0.1	1.1-1.4	0.1	1.6-1.8		
	sucker	w	0.7-1.1	0.1	1.4-2.2	<0.1	1.2-1.5	<0.1	1.2-1.5		
Rumford	bass	f	0.5-1.0	0.1	0.6-1.5	<0.1	0.6-0.9	<0.1	0.3-0.5	0.1	0.4-0.5
	juv bass			<0.1	0.8-1.4						
	sucker	w	2.0-2.4	<0.1	0.4-1.5	0.2	1.8-2.1	<0.1	1.0-1.2		
Riley	bass		0.8-1.0	<0.1	0.2-1.3	<0.1	0.3-0.7	<0.1	0.2-0.3		
	sucker	w	1.9-2.1	0.1	0.6-1.6	0.2	1.9-2.1	0.3	2.8-2.9	0.3	2.8-2.9
Jay	bass	f									
	sucker	w									
Livermore Falls	bass	f	0.9-1.4	0.1	0.3-1.4	<0.1	0.2-0.6	<0.1	0.2-0.3		
	sucker	w	1.6-1.7	0.2	0.9-1.9	0.3	1.6-1.9	0.3	1.8-1.9	0.2	1.1-1.3
	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	0.4-0.9	0.1	0.2-1.3			0.1	0.4-0.6	<0.1	0.2-0.5
	lm bass	f									
	sucker	w	0.6-0.9	0.3	0.8-1.2						
	bullhead	w									
Lisbon Falls	bn trout	f									
	bass	f	0.9-1.3					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)

			01	20 02		20 03		20 04		20 05	
WATER/STATION	**SPECIES**	**TISSUE**	**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	<0.1-0.7								
	bass	f									
	sucker	w									
Norridgewock	bass		0.1-0.8	<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		<0.1-0.7			<0.1	<0.1-0.5	<0.1	0.2-0.4		
Fairfield	bass	f	0.4-0.9	<0.1	<0.1-1.2	<0.1	<0.1-0.5	<0.1	<0.1-0.2		
	trout	f	1.2-1.8	0.1	0.1-1.0					<0.1	<0.1-0.2
	sucker	w	0.5-1.1			0.2	0.3-0.6	0.1	0.2-0.4	<0.1	<0.1-0.3
Sidney	bass	f	0.4-0.9	0.1	<0.1-1.3						
	bn trout		0.5-1.1								
	sucker	w									
Augusta	bn trout	f									
	bass	f									
	sucker	w									
Hallowell	smelt	c									
Richmond	eel	f									
Phippsburg	clam	m									
	lobster	m									
	lobster	t									

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

			01	20 02		20 03		20 04		20 05	
WATER/STATION	SPECIES	TISSUE	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE
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		0.1-0.7	<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		0.1-0.7	<0.1	1.6-1.9	<0.1	0.5-0.8	<0.1	<0.1-0.3	<0.1	0.3-0.5
Winn	bass		<0.1-0.7	<0.1	<0.1-1.2	<0.1	<0.1-0.5				
	sucker		<0.1-0.7	0.2	1.1-1.8	<0.1	0.3-0.6				
N Lincoln	bass	f									
	sucker	w									
S Lincoln	bass	f	0.5-1.1	<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	0.5-1.1	0.3	1.6-2.0	0.1	0.6-0.8	<0.1	<0.1-0.3	<0.1	0.2-0.4
Passadumkeag	bass	f									
	sucker	w									
Milford	bass	f	0.5-1.1	<0.1	<0.1-1.2	<0.1	<0.1-0.5	<0.1	<0.1-0.2		
	sucker	w	0.5-1.0	0.3	1.0-1.7	<0.1	0.3-0.7	<0.1	0.3-0.4		
Veazie	bass	f	0.3-0.8	<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	1.7-2.2	0.4	1.4-2.0	0.1	0.2-0.6	<0.1	0.2-0.3	<0.1	0.3-0.5
Bangor	eel	f	1.5-2.0	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											
Sangerville	bass	f									

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

			01	20 02		20 03		20 04		20 05	
WATER/STATION	SPECIES	TISSUE	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE
	bn trout	f									
	sucker	w									
Howland	bass	f									
PRESUMPSCOT R											
Windham	bass	f	0.1-0.7	<0.1	<0.1-1.5						
	sucker	w	1.4-1.5	<0.1	0.1-1.3						
Westbrook	bass	f	<0.1-0.7	<0.1	<0.1-1.2						
	pickerel	f									
	w perch	f									
	sucker	w	1.3-1.7	<0.1	0.1-1.3						
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										
	sucker										

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

			01	20 02		20 03		20 04		20 05	
WATER/STATION	**SPECIES**	**TISSUE**	**DTE**	**TCDD**	**DTE**	**TCDD**	**DTE**	**TCDD**	**DTE**	**TCDD**	**DTE**
S Berwick	bass	f	0.4-0.8	0.1	0.1-1.2						
	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	0.6-0.9					0.1	0.7-0.8		
	lm bass	f									
	w perch	f									
Sebastcook L	bass	f						<0.1	0.4-0.6		
	w perch	f									
Detroit	bass	f	0.2-0.8								
Burnham	bass							0.2	0.4-0.5	0.1	0.2-0.4
W Br Harmony	bass										
	sucker										
W Br Palmyra	bass	f	0.5-0.8	0.3	0.4-1.2	0.4	0.9-1.1	0.5	1.2-1.3	0.1	0.2-0.4
	pickerel	f									
	sucker	w									
WEBBER POND											
Vassalboro	bass	f									

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

			01	20 02		20 03		20 04		20 05	
WATER/STATION	SPECIES	TISSUE	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE

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

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

APPENDIX 8

CERTIFICATIONS OF BLEACH PLANT OPERATION

Delivering on the Promise of Paper TM 1 NewPage

December 28, 2005
Beth DeHaas
Maine Department of Environmental Protection
17 State House Station
Augusta, Maine 04333-0017

Subject: DioxinfFuran Certification (PCS Code 95799) Dear Ms. DeHaas:

Special Condition L of the MEPDES Permit requires an annual certification in lieu of monthly sampling and testing of the bleach plant effluent. This correspondence provides the required certification.

Neither chlorine nor sodium hypochlorite was used in the bleach plant in the past year. The chlorine dioxide plant has been operated in a manner consistent with recommendations for generating minimal chlorine. First, this is satisfied because the "R8" chemistry that Rumford uses is known to be a chlorine dioxide generation process that generates negligible chlorine and the manufacturer of the generation plant annually visits the plant.

Shortly after receiving the water license, the mill has instituted written procedures for purchasing defoamer. The current defoamer has been tested and any future defoamer change or trial request is accompanied by a written request for precursor information that must be tested and less than the numeric standard adopted by Canada to be introduced into the mill.

Fundamental design changes to the C102 stages of the bleach plants have not been made this year. Attached is the required language certified by an appropriate company official.

Sincerely,
Mike Sincrair
NewPage Corporation
35 Hartford Street, Rumford, ME 04276

Annual DioxinlFuran Certification Required per Special Condition L.
This is to certify that:
• Elemental chlorine or hypochiorite was not used in the bleaching of pulp.
• The chlorine dioxide (Cl02) generating plant has been operated in a manner which minimizes or eliminates byproduct elemental chlorine generation per the manufacturers/suppliers recommendations.
• Documented and verifiable purchasing procedures are in place for the procurement of defoamers or other additives without elevated levels of known dioxin precursors.
• Fundamental design changes to the Cl02 stages of the bleach plant have been reported to the Department prior to implementation and said reports have explained the reason(s) for the change and any possible adverse consequences if any.

Gary Curtis, Maine Operations Date 12/28/05

SAPPI Fine Paper North America S.D. Warren Company
1329 Waterville Road
Skowhegan ME 04976
March 6, 2006
Te +1 207 453 9301 Fax +1 207 238 3485

Ms. Denise Behr
Maine Department of Environmental Protection
Bureau of Land & Water Quality
17 State House Station
Augusta, ME 04333-00 17

Re: MEPDES Permit #ME0021521 Dear Ms. Behr:

Special Condition P was added to Somerset's MEPDES Permit in an administrative modification issued by Gregg Wood on July 12, 2005. This condition reduces the frequency of bleach plant dioxin monitoring from once per month to once per year provided that Somerset submit an annual certification to the Department regarding certain bleach plant operating conditions and purchasing procedures. Therefore Somerset certifies the following for calendar year 2005:

a) Elemental chlorine gas or hypochiorite was not used in the bleaching of pulp.
b) The chlorine dioxide (C102) generating plant has been operated in a manner which minimizes or eliminates byproduct elemental chlorine generation per the manufacturers/suppliers recommendations.
c) Purchasing procedures are in place for the procurement of defoamers or other additives without elevated levels of known dioxin precursors.
d) Fundamental design changes to the Cl02 plant and/or bleach plant operation have been reported to the Department and said reports explained the reason(s) for the change and any possible consequences if any.
In regards to bullet (d) above there were no fundamental design changes to the C102 plant and/or bleach plant operation during calendar year 2005.
In addition to this certification as you requested attached is a table summarizing the bleach plant dioxin results for 2005.

If you require additional information or have any questions please contact me.
File: XV.F.2
Sincerely,

Thomas E. Griffin
Environmental Manager