

GP HVS Dioxin Results Q&A

What is being announced?

The U.S. Environmental Protection Agency (EPA) has issued a report providing results of water quality samples collected in September 2008 and subsequently analyzed for dioxins from the Georgia Pacific (GP) paper mill wastewater effluent.

In the summer of 2008, the Florida Department of Environmental Protection requested that the EPA sample the GP discharge for dioxin using a relatively new and sensitive sampling technique known as high volume sampling, or HVS. Previous testing of the GP discharge using the standard EPA approved sampling and analytical methods did not detect dioxin in the GP wastewater discharge.

However, fish tissue samples previously collected and analyzed from Rice Creek have indicated that dioxin could potentially be present in the waters of Rice Creek above the EPA's promulgated water quality standard of 0.014 picograms/liter (pg/l or parts per quadrillion) for 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD).

As GP has requested a renewal of their National Pollutant Discharge Elimination System (NPDES) permit, which is required to discharge their wastewater into Florida's surface waters, the DEP requested this special sampling to better understand the characteristics and potential impacts of GP's effluent.

What is HVS?

EPA's federal dioxin water quality criterion and ambient water column concentrations are well below the currently approved reporting limit of 10 parts per quadrillion (ppq). High volume sampling (HVS), however, is a new approach at this facility and which, for the first time, allows for the measurement of dioxin levels at extremely low concentrations that are below the EPA water quality criterion.

This is accomplished by drawing a very large volume of water first through glass fiber filters, which separate and collect the suspended solids. The filtered water then passes through special resin columns that extract the dioxin in the dissolved phase. The filters and columns are then analyzed separately to quantify dioxin levels in both the particulate and dissolved phases.

HVS sampling has had limited use in the U.S.; however, interest in this technique, is increasing due to its potential to allow the detection of certain pollutants at extremely low concentrations.

What were the results from the EPA's HVS sampling?

EPA sampled both the GP discharge and water from Orange Creek, a nearby reference stream that is not expected to be impacted by the GP discharge, and would therefore be representative of natural conditions in Northeast Florida streams. Duplicate samples were also collected from the GP discharge and Orange Creek.

There were no detections of 2,3,7,8-TCDD from the samples collected from Orange Creek. However, both the sample and duplicate sample collected from the Georgia Pacific effluent contained concentrations of 2,3,7,8-TCDD which were higher than the EPA water quality criterion for 2,3,7,8-TCDD of 0.014 pg/l. The EPA criteria for this compound is based on an annual average condition, therefore this single sampling event by itself is not sufficient to conclude a criteria exceedance. The following

chart summarizes the sampling results and includes the total concentration of 2,3,7,8-TCDD along with the concentrations found in both the dissolved and particulate phases of the samples.

Results for 2,3,7,8-TCDD

Sample Location	Units	Dissolved Phase	Particulate Phase	Total
Orange Creek	pg/l	0.002U	0.002U	0.002U
Orange Creek - duplicate sample	pg/l	0.002U	0.002U	0.002U
Georgia Pacific Discharge	pg/l	0.014	0.063	0.077
Georgia Pacific Discharge - duplicate sample	pg/l	0.014	0.028	0.042

U – 2,3,7,8 -TCDD was not detected at or above the analytical method reporting limit.

EPA water quality criterion - 0.014 pg/l

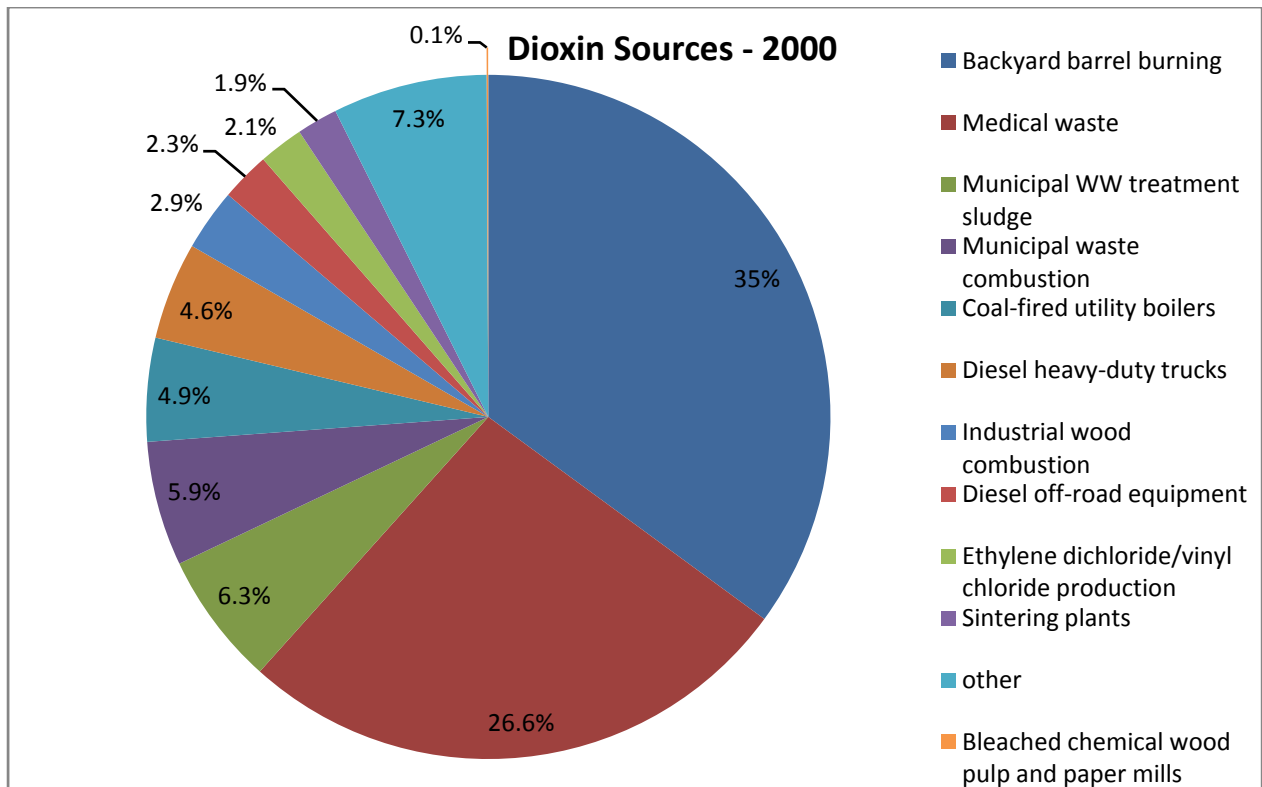
About 75% of the reported dioxin was found to be in the particulate phase.

What are dioxins and 2,3,7,8 -TCDD?

The presence of dioxins in the environment has attracted considerable attention over the last decade from both the public and scientific community, and has been the focus of intense research. Dioxins have existed in our environment for a long time and we all have some levels of dioxins in our bodies and it exists naturally in varying background levels, throughout the environment.

When found in the environment, dioxins are usually a mixture of chlorinated dioxins, furans, and some polychlorinated biphenyls (PCBs). Dioxins are not intentionally produced and have no known use. Not all dioxins have the same toxicity or ability to cause illness and adverse health effects. Historically, commercial or municipal waste incineration, manufacture and use of certain herbicides and chlorine bleaching of pulp and paper were the major sources of dioxins to the air and water. In the US, regulatory actions along with voluntary actions from industries has resulted in significant reductions from these sources.

The uncontrolled burning of residential waste is thought to be the largest source of dioxins to the environment in the US today. The following chart summarizes the relative contributions of various sources of dioxins to the environment in the US based on data collected by the EPA in 2000.



It is not known whether people exposed to low levels of dioxins will experience the same health effects seen in animal studies. However, based on the available information, dioxins are believed to have the potential to cause a wide range of adverse effects in humans, including cancer. The EPA has characterized the mixture of dioxins to which people are commonly exposed as "likely human carcinogens." The EPA has also characterized 2,3,7,8-TCDD as a "human carcinogen."

The EPA, U. S. Department of Health and Human Services, U. S. Department of Agriculture, and other federal agencies have developed a comprehensive series of questions and answers on dioxins, their health effects, and steps that people can take to limit their exposure to these compounds. This information can be accessed at:

<http://www.cfsan.fda.gov/~lrd/dioxinqa.html>

Should people eat fish from Rice Creek?

The primary exposure pathway for people is from the consumption of animal fats, as dioxins may be concentrated in the food chain so that animals have higher concentrations than the plants, water, soil, or sediments around them (referred to as bio-accumulation).

The Florida Department of Health (FDOH) had previously reviewed fish tissue samples collected and analyzed from Rice Creek and the St. Johns River and determined the levels found do not constitute a potential health hazard that would warrant the need for a fish consumption advisory.

GP is required to annually assess the levels of dioxin in fish from Rice Creek. Persons wishing to limit their exposure to dioxins should review the document above or contact their local FDOH office for further advice.

To view Florida fish consumption advisory information visit: www.doh.state.fl.us/floridafishadvice.

What actions has GP taken to reduce dioxin in their wastewater?

GP has invested more than \$200 million dollars over the last several years in manufacturing improvements at its Palatka facility that have resulted in significant improvements in the quality of their discharge to Rice Creek, including:

- a. Installation of an enhanced (i.e. two stage) oxygen delignification system;
- b. Replacement of existing brownstock washing lines with new brownstock washing systems;
- c. Installation of green liquor dregs filter;
- d. Minimization of all pulping liquor leaks and spills;
- e. Handling the chlorine dioxide generator waste (i.e. salt cake);
- f. Evaluating the potential for a viable, long term sustainable market for such material; and
- g. Assessing alternative technologies for treating such materials.

GP currently meets or exceeds all EPA requirements intended to minimize the formation of dioxins. However, the new HVS sampling results suggests that dioxins have not been entirely eliminated from the GP wastewater discharge and that further actions by the company may be possible to address the findings of the report.

What will DEP do with the HVS Results?

The HVS technique for dioxin is considered by DEP to be a “Research Method” until sufficient data are available to validate its use. Therefore, the HVS results cannot be used for compliance or enforcement purposes. However, DEP can use the HVS results, along with other relevant information, to better assess the potential impacts of GP’s current discharge to Rice Creek and the relocation of the discharge to the St. Johns River. Hydrologic and water quality modeling is also being conducted to provide additional insights on potential exposure pathways. This report is just one more piece of a much larger puzzle. Our understanding of the sources and pathways by which dioxins are introduced into Rice Creek and the St. Johns River and how these chemicals are subsequently bio-accumulated in fish is still quite limited. However, DEP believes that the EPA HVS sampling effort was a necessary step in an effort to better understand these issues.

DEP has confidence in the EPA report and believes the results indicate that some level of dioxins remain in the GP wastewater despite their efforts to minimize dioxin and otherwise improve the quality of its wastewater discharge through the company’s process improvements. DEP can now discuss these findings with GP and explore opportunities for additional treatment or process changes to further reduce dioxin levels in the effluent.