Executive Summary - Hopewell Risk Assessment Report

Date: October 1, 2010

Introduction – This Executive Summary to the "Risk Analysis for Air Monitoring Results" (Risk Assessment Report) is intended to review the results of the risk analysis performed using the data from the Hopewell Air Toxics Monitoring Study. In addition to reviewing the results, this summary will also describe the actions the Department of Environmental Quality (DEQ) is planning to undertake to address any excess risk identified in the analysis. This summary sets forth pollutant evaluation and emission reduction approaches developed pursuant to the Department of Environmental Quality's regulatory authority.

In order to properly evaluate the results of the Risk Assessment Report, it is important to recognize the following limitations to the Risk Assessment Process:

- 1. Uncertainty and variability are inherent in all risk assessment processes.
- 2. The air monitoring performed as part of this assessment cannot attribute exposure levels to specific sources.
- 3. Air monitoring cannot estimate exposures below the detection levels.
- 4. The goal of a risk assessment process is to identify ways to reduce risk to an acceptable level. A zero risk level is not attainable.

Due to these basic limitations, subjectivity is a necessary part of the risk assessment process. Even when quantifying risks, a certain amount of subjective judgment is unavoidable. Nevertheless, such subjectivity by itself does not diminish the value or credibility of the risk assessment process.

Statement of Purpose and Expectations - The purpose of the Hopewell Project is two-fold:

- 1. To identify chemicals of potential concern through sampling and analysis of the ambient air in Hopewell, and
- 2. To develop responses, within DEQ's regulatory authority, to pollutants identified through the risk analysis process as having unacceptable additional risk.

To achieve this purpose, DEQ will direct its efforts towards prioritizing those pollutants that represent the highest contribution to the overall risk level. By identifying the largest contributors to the overall risk, DEQ will be able to focus resources on identifying and reducing those compounds that have the highest impact on possible citizen exposure. In applying this prioritization strategy, DEQ expects that evaluation of the Risk Assessment results will provide a specific and realistic set of tasks directed at reducing overall risk to the citizens of Hopewell.

Description of the Monitoring Project - In 2006, DEQ applied for a special grant to establish and operate a comprehensive Air Toxics monitoring project in the Hopewell area. The Office of Air Quality Planning and Standards (OAQPS) of US Environmental

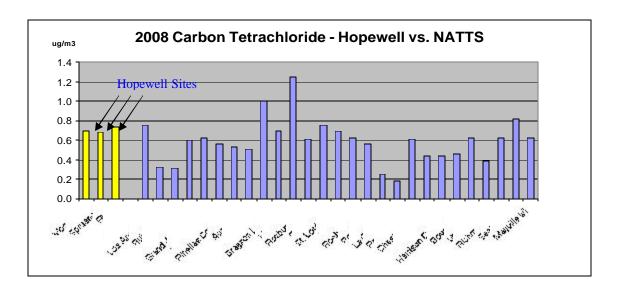
Protection Agency (EPA) awarded DEQ Office of Air Quality Monitoring (AQM) funding for this study. The project enabled DEQ to perform ambient air sampling in the Hopewell area for a limited number of air pollutants classified as toxic air pollutants in the Virginia Regulations for the Control and Abatement of Air Pollution. The formal sample gathering phase of the Hopewell Toxics study ended on September 30, 2008.

The air quality monitoring portion of the Hopewell study was conducted using a stakeholder group approach of informing the public. The stakeholder process began with an initial meeting on May 23, 2007 where the project was described to the stakeholders. The process included an open house held for the general public to view the monitoring site at the Spruance location on December 2, 2006 and a follow-up informational meeting for the stakeholders in July of 2008. The data report from the air monitoring portion of the project was presented to the stakeholders and the general public on March 31, 2009.

The risk assessment process adopted by DEQ for this study and implemented by the Risk Assessment Program is the National Academy of Sciences (NAS) "Risk Assessment Paradigm" which is described in further detail in the Introduction to the report. The Risk Assessment Report is the assessment of the potential risks developed from the data gathered during the monitoring study phase of the Hopewell Project.

Description of Pollutants – Based on the results of the Risk Assessment Report, DEQ was able to identify pollutants that contributed most to the increased risks. The following pollutants would be the focus of the pollutant evaluation and emissions reductions efforts:

Carbon Tetrachloride



Carbon Tetrachloride was identified as a contributor to the overall risk in the Risk Assessment Report. The monitoring phase of the project did not detect Carbon Tetrachloride at concentrations in the range of Virginia's ambient toxic standard. Evaluation of the possible emissions sources of Carbon Tetrachloride indicates that the sources of this compound are primarily point sources. Evaluation of national toxics sites

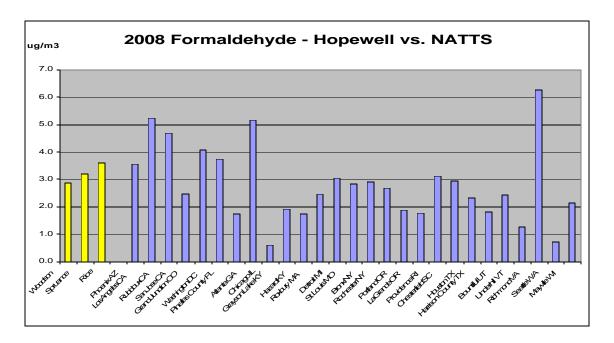
indicates that Carbon Tetrachloride is found at each of the sites. The figure above plots the Hopewell Carbon Tetrachloride results versus the results from the national sites.

Formaldehyde

Formaldehyde was detected during the monitoring phase of the Hopewell study in concentrations above Virginia's ambient toxic standard. Formaldehyde is another pollutant that is broadly detectable in a number of locations. As described on the EPA's Technology Transfer Network:

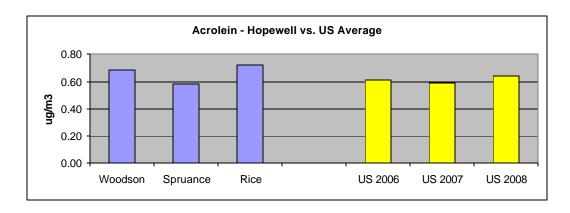
Formaldehyde is used mainly to produce resins used in particleboard products and as an intermediate in the synthesis of other chemicals. It also has minor uses in agriculture, as an analytical reagent, in concrete and plaster additives, cosmetics, disinfectants, fumigants, photography, and wood preservation. One of the most common uses of formaldehyde in the U.S is manufacturing urea-formaldehyde resins, used in particleboard products.

The figure below plots the Hopewell Formaldehyde results versus the results from the national toxics trend sites.



Acrolein

Acrolein was one of the compounds identified during the monitoring phase of the Hopewell study as being above or near Virginia's ambient toxics standard. Additional sampling after the official end of the monitoring phase puts the averages for Acrolein at each site below the toxic standard. However, the Acrolein results are higher than the 1.0 non-cancer risk value. Note in the figure below that Acrolein appears to be a nationwide issue based on averages from 2006 to 2008.



Acrolein has become a pollutant of interest to EPA due to the evaluation of the results from the School Air Toxics (SAT) study (www.epa.gov/ttnamti1/airtoxschool.html). Acrolein was found to be a potential issue in several of the VOC sampling projects that were undertaken during the SAT study. EPA is currently evaluating the Acrolein issue nationally. The recommended analytical method for Acrolein was changed in 2006, which creates a problem when trying to compare results with historical information. DEQ is currently working with the state laboratory on this issue.

Action Items – DEQ proposes to address these pollutants of interest as follows:

Acrolein – The US Environmental Protection Agency has begun evaluating Acrolein information due to the results of other studies performed at the national level. EPA is focusing on the sample handling methods used in the Acrolein analysis.

<u>ACTION</u> - DEQ has already begun evaluating this compound. DEQ is working with Virginia's Division of Consolidated Laboratories to evaluate the sample handling, storage and analytical procedures to ensure that Acrolein concentrations measured during the Hopewell Project are not a result of the sample handling methods. Once this evaluation is complete, if it is determined that there was no issue with the sampling methods used for the Hopewell Project, then DEQ will investigate possible regional and local approaches to Acrolein reduction.

Formaldehyde - DEQ has already begun additional study of Formaldehyde concentrations in the Commonwealth. The Office of Air Quality Monitoring maintained a Formaldehyde monitoring system in Surry County for one year for the purpose of gathering additional Formaldehyde data.

<u>ACTION</u> – DEQ will evaluate the Formaldehyde data from Surry and correlate it with information from the toxics sites at Woodson and Virginia Beach to determine the possible regional component of the Formaldehyde concentrations.

Carbon Tetrachloride – While this pollutant was not identified during the monitoring phase of this program due to its low concentrations, the risk analysis indicates that it does contribute to the overall excess risk in the Hopewell area.

<u>ACTION</u> – DEQ will address this pollutant by performing the following:

- 1. DEQ will gather source specific emissions information for this compound.
- 2. DEQ will plot source specific data relative to the monitoring sites.
- 3. DEQ will then develop an approach to evaluate the impact of reductions from various contributors.