

Wastewater Emissions Modeling with Toxchem™



Trinity Consultants is a leading global environmental consulting firm that brings 50 years of experience providing services and solutions in the EHS Regulatory Compliance, Built Environment, Life Sciences, and Water & Ecology markets. Trinity has the technical expertise, industry depth, and specialized capabilities to help clients achieve their goals across the natural and built environments.

Trinity Consultants excels in a broad range of environmental services for companies across the nation and internationally, including performing wastewater modeling for industrial facilities, utilities, and local government agencies. Facilities for which we assist with wastewater modeling include, but are not limited to, chemical manufacturing plants, petroleum refineries, and publicly owned treatment works.

Trinity provides unparalleled expertise and service estimating air emissions from wastewater collection, treatment, and disposal facilities for permitting applications and regulatory compliance using these modeling tools: WATER9 by EPA, and Toxchem by Hydromantis Environmental Software Solutions.

EPA no longer provides support for its WATER9 model and environmental professionals are increasingly using Toxchem as the preferred model for estimating volatile organic compound (VOC) air emissions from wastewater collection.

Wastewater Emissions Modeling with Toxchem

Toxchem was developed in the early 1990s by Hydromantis Environmental Software Solutions as an alternative to EPA's WATER8 (now WATER9) model as the next new, state-of-the-science wastewater model¹. Similar to WATER9, Toxchem is used to estimate VOC emissions as result of stripping and volatilization. Toxchem utilizes fate and transport mechanisms for specific air contaminants along with process-specific mass balance equations such as:

- Liquid/gas mass transfer (volatilization)
- Liquid/liquid mass transfer (molecular movement in the liquid, partitioning of water-oil)
- Solid-liquid mass transfer (adsorption onto solid surface)
- Biotransformation (biodegradation of chemical compounds)
- Abiotic transformation (user-defined chemical reactions)

Besides estimating air emissions, Toxchem can be used to estimate concentrations of chemical compounds in the effluent (i.e., discharge).



Toxchem Advantages

Following are a few of the many benefits of using Toxchem, as compared to WATER9:

- More accurately models air emissions:
 - Typically lower VOC emissions
- Assumes non-equilibrium for rising air bubbles
- Built-in library:
 - Over 50 unit processes and approximately 800 chemical compounds
 - Chemical database contains WATER9 chemical compound properties for several contaminants to perform evaluations between models (WATER9 vs. Toxchem)
- User-friendly:
 - Easy interface to setup wastewater model and import chemical compounds/concentrations
 - Microsoft Excel® compatible. Inputs can be imported via an Excel spreadsheet and output reports are generated in Excel
- Advanced features:
 - Sensitivity analysis tool provides the user the ability to evaluate the relationship between input parameters and model results (i.e., determine optimal operational settings)
 - Back solver tool allows for upstream calculation of flows and concentrations

Wastewater Emissions Permitting

Trinity has assisted clients with New Source Review (NSR) permitting applications utilizing Toxchem. Our extensive air permitting expertise provides practical experience that is critical when negotiating with state and federal agencies.

Trinity's local and regional modeling experience allows us to provide site-specific or state-specific insight for each project, and develop the most beneficial strategies to meet client needs.

Wastewater Regulatory Compliance (NSPS/NESHAP)

Trinity's experience includes applicability and compliance support for facilities subject to 40 CFR Part 60, Subpart QQQ, 40 CFR Part 61, Subpart FF and 40 CFR Part 63, Subpart G. We are able to efficiently determine your applicability and assist with a compliance strategy that helps your facility meet regulatory requirements at both the state and federal level.

Customized Training

Trinity also provides custom training in wastewater modeling for both EPA WATER9 and Toxchem models to meet clients' needs.

Why Choose Trinity

In short, there is no better choice for your wastewater modeling needs. Our experience is multi-faceted and extensive. Our strategies are innovative, time saving, and cost-effective. Our staff and tools make us an excellent partner for meeting your goals.

ISO 9001:2015 certified at our corporate office in Dallas, Texas

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CONTACT OUR TEAM!

For more information about how we can help your organization, please contact us.

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¹ Toxchem was included in Appendix C of 40 CFR Part 63 as an accepted alternative to WATER9.