

AQ-4: Developing Air Toxics Rules in North Carolina

Ted Palma, EPA


Developing Air Toxics Rules in North Carolina: Risk and Technology Review Update

7th Annual North Carolina Environmental, Health & Safety (EHS) School

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USEPA Office of Air Quality and Planning and Standards


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Outline

- Background
- Residual Risk Decision Framework
- Previous Approach
- New RTR Approach
- Grouping of Categories and Schedule
- RTR and the NEI
- Risk Characterization


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Background

- Section 112(f)(2) Residual Risk
 - Assess remaining risk within 8 years after promulgation of MACT standard
 - Set standards to provide an ample margin of safety based on the Benzene NESHAP Decision Framework if MACT standards do not reduce cancer risks to less than 1-in-1 million
 - Set standards to prevent an adverse environmental effect considering cost
- Section 112(d)(6) Technology Review
 - Review and revise MACT standard, as necessary, every 8 years
 - Evaluate developments in practices, processes, and control technologies

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Residual Risk Decision Framework


Goals:

- Limit Maximum Individual Risk (MIR) for cancer to no higher than about 100-in-1 million (MIR is the person exposed to maximum lifetime HAP concentrations)
- Protect the greatest number of persons to less than 1-in-1 million lifetime cancer risk

Step one - Achieve “acceptable risk” of approximately 100-in-1 million or less considering all health information, including uncertainty and without consideration of costs

Step two - Set standard to provide “ample margin of safety” considering health information and other relevant factors (costs, feasibility)

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Previous Approach

Performed separate risk and technology reviews for the first 8 MACT standards

- Met consent decree schedules
- First 8 reviews show MACT generally did a good job
 - Two MACT standards posed low risks
 - Three MACT standards did not pose low risks but ample margin of safety (AMOS) was met without requiring additional controls
 - Three MACT standards required additional controls
- Each review required significant Agency resources and only three reduced risk

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RTR Phase I

Completed first 8 reviews

- April 2005
 - Coke ovens
- March 2006
 - Industrial cooling towers
 - Magnetic tape
 - Ethylene oxide sterilizers
 - Gasoline distribution
- July 2006
 - Dry Cleaning (litigation)
- December 2006
 - Hazardous Organic NESHAP (HON) (litigation)
- April 2007
 - Halogenated Solvents (reconsideration)

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What is the New Approach?

- Bin Risk and Technology Review (RTR) MACT standards into phases/groups
- Extract MACT category data from latest emissions inventory
 - For the first 33 MACT standards used 2002 NEI
 - Supplement with industry supplied data
- Model each MACT category to obtain inhalation risks, including cancer risk and incidence, population cancer risk, non-cancer effects (chronic and acute)
- Perform screening level multipathway analysis if necessary
- Solicit public review and comment on inventory and present risk results and obtain better source data (via ANPRM)
- Propose and promulgate RTR results

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What are the Advantages of the New Approach?

- More closely meet statutory dates (without schedule suits, if possible)
- Minimize resources by using available data and focusing attention on high-risk sources
- Provide better consistency in our analysis and decisions

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RTR Phase II

- Group 1**
 - Polymers and Resins I (4 source categories)
 - Polymers and Resins II (2 source categories)
 - Hydrogen Fluoride
 - Acetal Resins
- Group 2A**
 - Group I Polymers and Resins (5 source categories)
 - Pharmaceuticals Production
 - Marine Tank Vessel Loading Operations
 - Mineral Wool Production
 - Printing and Publishing Industry
- Group 2B**
 - Aerospace Manufacturing and Rework Facilities
 - Natural Gas Transmission and Storage
 - Oil and Natural Gas Production
- Group 2C**
 - Primary Aluminum Reduction Plants
 - Group IV Polymers and Resins (7 source categories)
 - Shipbuilding Coatings

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RTR Phase II

- Group 3**
 - Polycarbonates
 - Acrylic/Modacrylic Fibers
 - Off-Site Waste Treatment
 - Phosphate Fertilizer
 - Phosphoric Acid
 - Primary Lead Smelting
 - POTW
 - Ferroalloys
 - Steel Pickling
 - Secondary Lead
 - Chrome Electroplating (3 source categories)
 - Flexible Polyurethane Foam
 - Secondary Aluminum
 - Pulp and Paper MACTs I, II and III
 - Wood Furniture
 - Wool Fiberglass
 - Polyether Polyols

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RTR Schedule

- Group 1
 - Went directly to NPRM (12/15/07, 72 FR 70543) and proposed no additional standards for 6 low-risk source categories
- Petroleum Refineries
 - Published the NPRM for Petroleum Refineries on 9/4/07, 72 FR 50716
- Group 2A
 - ANPRM 3/29/07, 72 FR 14734
 - NPRM 8/08
- Group 2B
 - ANPRM 3/29/07, 72 FR 14734
 - NPRM 6/09
- Group 2C
 - ANPRM 3/29/07, 72 FR 14734
 - NPRM 8/09
- Group 3
 - ANPRM 10/09

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RTR and the National Emission Inventory (NEI)

- RTR process supports development of NEI
 - Comments from ANPRM and NPRM
- NEI supports development of risk for RTR
 - Use pre-ANPRM inventory to support preliminary assessment of risk
 - Use post-ANPRM inventory to support proposed rulemaking

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RTR and the National Emission Inventory (NEI)

- Start with the a base inventory
 - 2002 National Emissions Inventory (NEI) Version 3 - current
 - 2005 NEI in early 2008
- Internal review of inventory by OAQPS MACT engineers
 - Consistency
 - Representative of source category
- Solicit comments via ANPRM process
 - Provide facility specific inventory and preliminary risk results
 - www.epa.gov/ttn/atw/risk/rtrpg.html
 - Request comments and clarifications on anomalies
 - 90 day comment period

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RTR and the National Emission Inventory (NEI)

- **Comments accepted only electronically, via ANPRM database**
 - Documentation must accompany proposed revisions
- **EPA will evaluate and incorporate proposed revisions**
 - Review proposed revisions and documentation
 - Resolve data discrepancies between proposed revisions and original data source
 - Share comments with S/L/T as needed
- **Incorporate revisions**
 - Develop inventory for rulemaking (NPRM database)
- **Key issues from initial ANPRM**
 - Emissions
 - Applicability (MACT codes)
 - Missing sources
 - Source locations
 - Speciation (Hg, Chromium, Dioxin, and PAH's)
 - Acute multiplier

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U.S. Environmental Protection Agency
Technology Transfer Network
Air Toxics Website

Risk and Technology Review

The Risk and Technology Review (RTR) is a combined effort to evaluate both risk and technology as required by the Clean Air Act (CAA) after the application of maximum achievable control technology (MACT) standards. Section 112(d) of the CAA requires EPA to complete a Report to Congress that includes a discussion of methods the EPA would use to evaluate the risks remaining after the application of MACT standards. These are known as residual risks. EPA published the [Residual Risk Report to Congress](#) in March 1999. Section 112(d)(2) directs EPA to conduct risk assessments on each source category subject to MACT standards, and to determine if additional standards are needed to reduce residual risks. Section 112(d)(3) of the CAA requires EPA to review and revise the MACT standards, as necessary, taking into account developments in practices, processes and control technologies.

RTR Phase I consists of the first 8 residual risk standards completed to date (except for the Halogenated Solvents residual risk rule with a promulgation date extension to April 2007). EPA plans to streamline the residual risk standard development process in RTR Phase II by opening the next MACT source categories requiring residual risk and technology reviews. The methodology for conducting these reviews is described in the [RTR Assessment Plan](#). The Science Advisory Board (SAB) consultation on the RTR Assessment Plan is complete and written comments are available at the [SAB website](#). Below is a list of MACT source categories evaluated under RTR Phase I and those being considered for RTR Phase II and the corresponding EPA contacts. Emissions data and source category summaries for each RTR Phase II Group 2 source category are presented below. EPA is requesting comment on the emissions data through the RTR Phase II Advanced Notice of Proposed Rulemaking (ANPRM). It will be used to assess the residual risk associated with each source category. Click here for [detailed instructions for downloading and updating the emissions data](#). Emissions data for each RTR Phase II Group 2 source category is also presented below. The Group 1 source category information will be summarized in a document that will be released with the upcoming Group 1 Notice of Proposed Rulemaking (NPRM) in Summer 2007.

Date	Description	File
3/26/2007	Fact Sheet Advance notice of proposed rulemaking (ANPRM) Risk and Technology Review, Phase II, Group 2	Download

MACT Source Category Review of 2002 NEI Data

Please read the instructions before exploring and revising the data.

- [View Instructions](#)
- [View Summary Data](#)
- [Revise Data](#)
- [Review Revisions](#)
- [Submit Revisions](#)

Very Important !!!

RTR: Risk Characterization

- Inhalation Assessment
 - Utilizes Human Exposure Model 3 (HEM3)
- Multipathway/Ecological Assessment
 - HHRAP Approach
 - Utilize TRIM Screen Model

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Facility HEM-3

Tool for Human Exposure Modeling
Version 1.2.0 Beta

Prepared for: Risk and Exposure Assessment Group, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711

Prepared by: ECR Incorporated, 6330 Quadrangle Drive, Suite 325, Chapel Hill, NC 27517


EPA Contract 68-D-01-071

Buttons: [Exit] [Help]

Available at:
http://www.epa.gov/ttn/fera/human_hem.html


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RTR: HEM3 Summary 


- Based on AERMOD (07026)
- Run for each facility in source category to predict both chronic & acute; cancer & noncancer risks
- Receptors based on 2000 census blocks
- Meteorological data selected for each facility
 - 5 stations in NC
 - 3 stations in SC

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RTR: Inhalation Assessment Results 


- **Chronic**
 - Maximum Individual Risk (MIR) - highest risk at a census block centroid (cancer & noncancer)
 - Cancer incidence
 - Cancer risk distributions
- **Acute**
 - Maximum off-site impact – highest of census block and polar grid receptors
- **Population risk levels**
 - Facility and source category cancer incidence levels

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RTR: Multipathway and Ecological Screening 


- **Goals**
 - Identify source categories with potential human multipathway or ecological risks
 - Set them on separate, refined analytical path
- **Approach**
 - Iterative process for source categories emitting PBT- HAPS
 - HHRAP emission thresholds developed using "worst-case facility"
 - TRIM model in screening mode
 - TRIM model in refined mode

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RTR: Multipathway and Ecological Screening 

- **Compare emission rates to ANPRM data for all categories**
- **Multipathway and ecological pollutants of concern include:**
 - POM Hydrogen chloride
 - Mercury compounds Hydrogen fluoride
 - Dioxins/furans
- **PB-HAPs of concern from several source categories including:**
 - Ferroalloys
 - Pulp and paper
 - Petroleum refineries
 - Primary and secondary aluminum
 - Portland cement
- **Will flag these as emission inventory is reviewed**

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Hon Litigation Update 

- NRDC filed suit on HON Residual Risk Rule alleging that:
 - Under Section 112(f)(2), EPA must reduce MIR to less than 1 in a million, and that EPA must at least set additional standards if MIR exceeds 1 in a million
 - Under Section 112 (d)(6), EPA must not use risk as a factor in reviewing technology, and EPA must revisit the MACT floor determination every 8 years
- The NRDC lawsuit also questioned:
 - The quality and extent of the data upon which the risk assessment is based
 - Whether EPA has included all relevant emissions data in its risk assessment, alleging the omission of allowable versus actual emissions, upset emissions, clustered facility emissions, and background ambient concentrations
- Oral arguments heard on 4/10/2008
- US Court of Appeals decided favorably towards EPA on 6/6/2008

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