



87 Northline Road

Updates on Technical Standards and Site-Specific Standards

November 1, 2012 – Presentation to the Air Practitioners Group

Purpose

1. Updates for Site-Specific Standards
2. Overview of the Technical Standard compliance approach under Local Air Quality Regulation (O. Reg. 419/05)
3. Overview of current sectors that have requested a technical standard
 - Status of development of all proposed Technical Standards
4. Next Steps for Technical Standards
5. Some Further Work...
 1. Technical Standards Development: identifying the key contributors to exceedences (“significance” analysis).
 2. Estimating annual average emissions

Objectives Under Local Air Quality Regulation

- Ontario's Local Air Quality Regulation (O. Regulation 419/05) is the main tool used by the Ministry of the Environment to regulate air contaminants released by industrial facilities in order to protect local communities.
- Our goal is to protect the environment and to allow industry to operate both competitively and responsibly under a set of rules that are publicly transparent.
- The regulation includes three compliance approaches for industry to demonstrate environmental performance, and make improvements when required.

Ontario's Local Air Quality Regulation

Three Compliance Approaches

- Ontario's Local Air Quality Regulation (O. Regulation 419/05) is the main tool used by the Ministry of the Environment to regulate air contaminants released by industrial facilities in order to protect local communities.
- There are three compliance approaches under the regulation:
 - Meet the air standard by the phase-in date; OR
 - Request and meet a site-specific standard; OR
 - Register under a technical standard, if available.
- These compliance approaches provide industry with a flexible approach and allow for technical or economic barriers to be taken into account as facilities work towards improving their environmental performance.

Site-Specific Standard Compliance Approach

- The regulation includes a “Director’s Approval” (and associated order) for a Site-Specific Standard which differs from an Environmental Compliance Approvals (Air).
- A site-specific standard is a standard established for an individual facility that is challenged in meeting a provincial air standard due to technical and/or economic issues.
- This compliance approach allows a facility the time needed to make significant adjustments and investments to improve their environmental performance over time.
- The process requires a public meeting to be held before the request is made to MOE. The company’s request will also be posted on Ontario’s Environmental Registry for public comment.
- **A facility that meets its site-specific standard is in compliance with the regulation.**

Summary of Requests for Site-Specific Standards

Approvals Issued:

- Oxy Vinyls, Niagara: Approved from Jan 2009 to Feb 2017 [Vinyl Chloride].
- ArcelorMittal Dofasco, Hamilton: Approved from July 2010 to July 2014 [Suspended Particulate Matter; Total Reduced Sulphur; included review of Benzo-a-pyrene (BaP) and Benzene].
- Xstrata-Copper, Timmins; Approved from Feb 2010 to Feb 2014 [Sulphur Dioxide; Lead].
- Vale, Sudbury: Nickel [December 2011 to December 2021].

Requests Submitted and Under review:

- Xstrata-Nickel, Sudbury: Sulphur Dioxide
- Xstrata-Nickel, Sudbury: Cadmium
- U.S. Steel Canada, Hamilton Works: Suspended Particulate Matter; Sulphur Dioxide; includes review of Benzo-a-pyrene (BaP) and Benzene
- U.S. Steel Canada, Lake Erie Works – Nanticoke: Suspended Particulate Matter; Sulphur Dioxide; includes review of Benzo-a-pyrene (BaP); and Benzene
- Vale, Sudbury: Sulphur Dioxide
- Archer Daniels Midland, Windsor: Suspended Particulate Matter

Technical Standards Compliance Approach

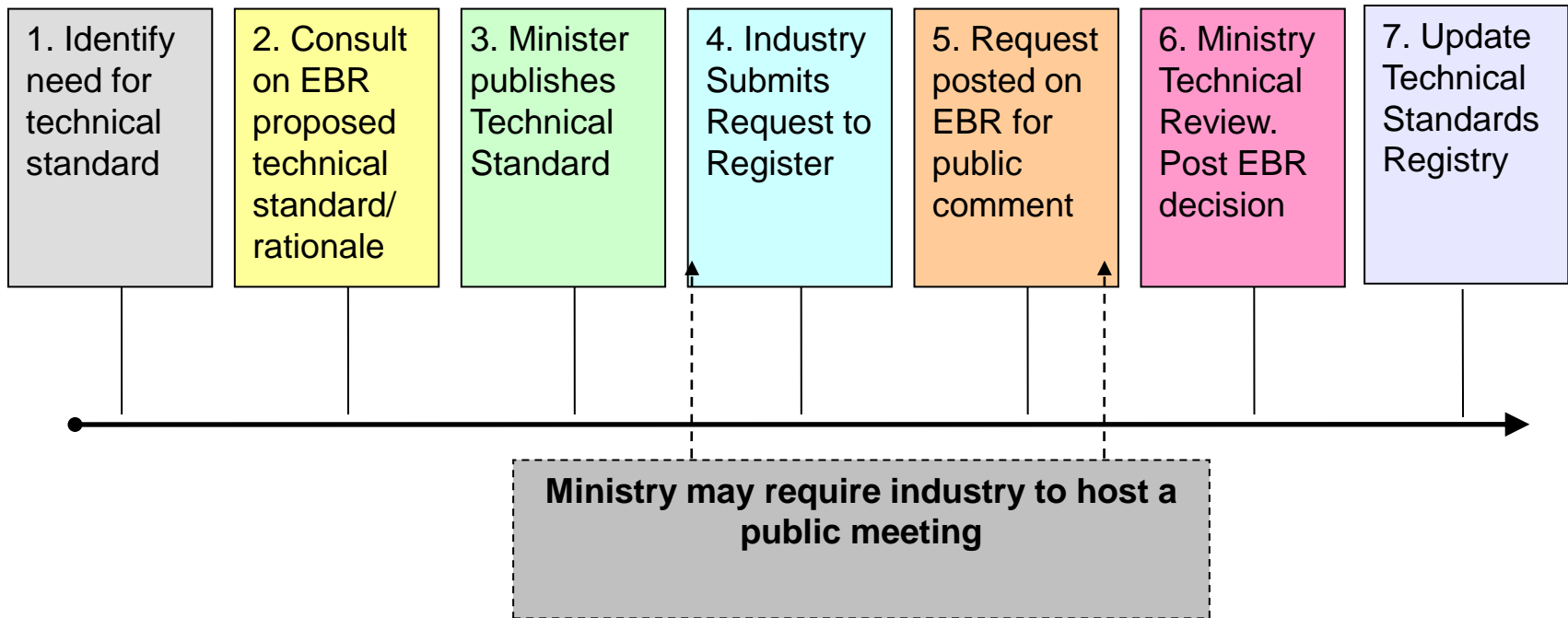
- In 2009, the newest compliance approach of Technical Standards was introduced to address emissions of multiple pollutants from multiple facilities.
- It also allowed us to address sector-wide issues in the Foundry and Forest Products sectors. The Minister now has the authority to establish technical standards for any sector.
- Technical standards are technology-based approaches to managing air emissions. They allow a sector-wide approach to managing air pollution approach rather than a facility-by-facility approach.
- Sectors are eligible to request a technical standard if there are at least two facilities in a sector that cannot meet at least one air standard. Once this criterion is met, the technical standard can include a wide range of contaminants.

Technical Standards Compliance Approach

- There are two types of technical standards:
 - **Industry standards** (deals with all sources of specified contaminants from a specific sector)
 - **Equipment standards** (addresses one source of contaminant, but may apply to one or multiple sectors)
- There are currently two sectors with Technical Standards: Foundries – Industry Standard; and Forest Products – Industry Standard.
- The benefit of a Technical Standard also includes the opportunity to align with similar rules in the U.S. and with proposed Canadian federal air pollution initiatives (i.e. Base Level Industry Emission Requirements [BLIERs]).

Note 1: equipment standards are not intended to be used to avoid reasonable/cost-effective levels of control for other major sources of the relevant contaminants within a facility.

Overview of Technical Standards Process



Key Steps in the Development of Technical Standards

- The need to develop a technical standard may be requested by industry or identified by the Ministry who may then approach the industry sector.
- The key steps in developing a proposed draft technical standard include:
 - Organizing an external technical committee with industry stakeholders (with terms of reference);
 - Develop a consultation plan (with approval of senior management);
 - Develop a rationale document which includes:
 - Identification of key sources and contaminants;
 - Jurisdictional review and identification of best available control or operational practices;
 - Assessment of technical feasibility and cost effectiveness; and
 - Recommendations for phase-in of improved pollution control or operational practices.
- Regular check-in with senior management of all stakeholders... ie., obtaining regular buy-in from key decision-makers

Technical Standards Intent & Development

- The development of a technical standard is similar to the site-specific standard process. For example, several studies were conducted with Ontario Foundries over the past few years including a CAMM analysis to better understand sources and a sector technology benchmarking report.
- MOE assesses all sources of a contaminant (related to a NAICS sector code) and makes a decision as to whether or not that source needs to be better controlled, monitored or managed.
 - Specific requirements are included in the technical standard for those sources that are determined to need better management or control.
 - Generally, the focus is on the types of sources that would contribute most to the maximum POI (i.e. exposures to local community).
 - The specific requirements have specified timeframes for implementation.
 - Development of a technical standard also considers economics.

Requests to Develop New or Updated Technical Standards

- The following industry sectors have approached MOE with a formal request to develop a proposed Technical Standard:
 - Pulp and Paper: Update to Forest Products Industry Standard
 - Foundries: Update to Foundries Industry Standard
 - Integrated Iron and Steel Mills: Equipment Standard for Coke Ovens
 - Metal Finishers (includes chrome plating facilities): Industry Standard
 - Petroleum refineries: Industry Standard
- All proposed technical standards will undergo public consultation and must be approved by the Minister.

Forest Products

- The OFIA has been working with the ministry since 2010 towards a proposed update of the Forest Products Industry Standard. The current technical standard addresses acrolein only.
- Ontario kraft pulp mills may benefit from a technical standard for the new Total Reduced Sulphur (TRS) air standard which comes into force in February 2013.
- A proposed Pulp and Paper Industry Standard would include not only TRS but also other contaminants such as chlorine, chlorine dioxide, chloroform, and others.
- Facilities, such as pulp and paper mills, using large wood-fired combustors, may also have challenges with the benzo-a-pyrene (as a surrogate for PAHs) air standard that comes into force in July 2016.
- A proposed technical standard for the larger wood combustor units would also benefit other sectors.

Foundries

- The ministry worked closely with the Canadian Foundry Association (CFA) to develop the current Foundries Industry Standard.
- CFA has requested the Foundry Industry Standard to be updated to include additional contaminants and sources (i.e. heating sources, painting operations, and heat cleaning ovens).
- The ministry recently conducted a follow up “pilot project” to assess the effectiveness of the technical standard and to identify gaps between current practices and the foundry industry standard requirements.
- Ministry will incorporate recommendations from the pilot project into the proposed update to foundry industry standard update.
- Foundries are listed in the sectors for Schedule 5 of the regulation which means they will have requirements to use the more advanced air dispersion models by February 2013.

Integrated Iron and Steel Mills

- The Ministry has been working with the CSPA to develop a proposed technical standard for integrated iron and steel mills that will set out methods and technologies to reduce the emissions of benzene, benzo(a)pyrene and, possibly, sulphur dioxide.
- The new air standards for benzene, benzo(a)pyrene which take effect July, 2016 will create challenges for CSPA members.
- The proposal will include an opportunity to align with the Federally proposed Base Level Industry Emission Requirement [BLIER] for this sector for coke making operations.
- A terms of reference for the process has been developed and accepted by the CSPA members setting out the process for the development of the proposed technical standard.
- In accordance with a consultation plan, community consultation has begun. More consultation will be conducted at key intervals through out the development of the proposed technical standard.

Metal Finishers

- The Ministry has begun to work with members of the Canadian Surface Finishers Association (CASF) to develop a proposed industry standard for metal finishers.
- The new air standard for hexavalent chromium which takes effect July, 2016 may create challenges for some CASF members.
- The request is that the ministry develop a proposed technical standard for the metal finishing sector to address discharges of hexavalent chromium and possibly other contaminants such as nickel.
- Part of the metal finishing sector is already required to meet the federal *Chromium Electroplating, Chromium Anodizing and Reverse Etching Regulation*. The ministry will work with the federal government to ensure there is harmonization of provincial and federal requirements in the proposed metal finishers technical standard in order to avoid burden and duplication.

Petroleum Refining

- The Ministry has begun to work with members of the Canadian Petroleum Products Institute (CPPI) to develop a proposed industry standard for petroleum refineries.
- The new air standards for benzene and benzo-a-pyrene (as a surrogate for PAHs) which take effect July, 2016 may pose challenges for petroleum refining sector.
- The request is that the ministry develop a proposed Technical Standard for the petroleum refining sector to address discharges of benzene and benzo-a-pyrene (as a surrogate for PAHs), and possibly other contaminants, to be determined from subsequent evaluations.
- The petrochemical sector has also been invited to participate in some of these discussions due to potential overlaps in the sectors (however no formal request has been received from the petro-chemical sector).
- Consultation with local communities and interested stakeholders will be conducted at key intervals through out the development of the proposed technical standard.

Registration to a Technical Standards

- A specific facility may choose to comply with either of the standard, a site-specific standard or technical standard (if available).
- If a facility chooses the technical standard compliance approach (once it is available), it involves the following:
 - Each facility who requests registration under a technical standard must be posted on the Environmental Registry for a minimum 30 day comment period.
 - In some situations, similar to the site-specific standard process, a facility may be required to do further notification and consultation with affected stakeholders as part of the registration process for a Technical Standard.
 - In addition, the Ministry must publish on the website the Technical Standards Registry – Air Pollution that lists all registered facilities.

General Next Steps

- Finalize rationale documents that outline proposed approaches in the draft Technical Standards.
- Develop draft legal version of the technical standard (based on the rationale document).
- Where possible, meet with local communities, health units or interested groups at key milestones before proposals are posted on the Environmental Registry for broader public comment.
- Post draft technical standard and rationale document on the Environmental Registry for broader public consultation.
- Propose to finalize technical standard for publication by the Minister.

External Working Group

- An external working group was formed by the ministry in 2010 with the objective of providing input on new air standards and the implementation of Regulation 419/05.
- It is comprised of representatives of industry, environmental non-governmental organizations, community organizations and a first nation community.
- It is hosted by the ministry and currently co-chaired by a representative of the Canadian Fuels Association and the Environment Hamilton community group.
- The external working group continues to meet every few months.

Proposed Role of External Working Group in Technical Standards

- An External Working Group was formed by the ministry in 2010 comprised of representatives of industry, environmental non-governmental organizations, community organizations and a first nation community. The original purpose was to provide input on the ministry's proposal in 2010 for new air standards.
- Preliminary feedback from meetings with local community groups and questions from the External Working Group include:
 - There is a need to ensure that the Technical Standards compliance approach is effective for each sector. How can we measure or monitor success?
 - Is this compliance approach doing enough to drive continuous improvement?
 - What will be the drivers to review or update the requirements for the Technical standards? (i.e. US EPA MACT standards have requirements to review risk and technology every 8 years).
 - Mechanisms to ensure that moving forward with equipment standards are not used to avoid reasonable/cost-effective levels of control for other major sources of the relevant contaminants within a facility.
 - Better understanding of enforceability and tools.
 - What does community consultation look like for sectors with small to medium sized facilities (i.e. metal finishers and foundries) vs sectors with large industry?
- A subgroup of the External Working Group has been formed to discuss the above outstanding questions for Technical Standards compliance approach.

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Some Further Work...

**Technical Standards Development:
identifying the key contributors to exceedences**

MACT vs Technical Standards Development

- A key difference between the development of a US EPA Maximum Achievable Control Technology (MACT) standard in the United States and a technical standard under Regulation 419/05 is the approach to identifying significant contaminants and sources...
 - MACT standards development uses emission cut-offs to differentiate between major and minor sources.
 - Whereas, the technical standards development process assesses significance based upon impact on local air quality (i.e. contributions to Point of Impingement)

Overview of “Significance” Analysis

- Often industrial facilities emit hundreds of contaminants but the vast majority are not significant relative to the relevant air standard.
- The first step is to identify the suite of significant contaminants emitted from the sector or a type of equipment. Considerations include:
 - proximity to the relevant point of impingement limit; and
 - data quality/conservatism in the estimate.
- The second step is to identify the significant sources of the priority contaminants.

Overview of Significance Analysis

- Assessing the significance of sources is completed through:
 - Conducting dispersion modelling on sub-sets of sources to determine the most significant contributors to point of impingement concentrations... at multiple points of impingement (not just the point of maximum concentration).
 - Assessing the dispersion factor (ie., $\mu\text{g}/\text{m}^3$ per g/s emission)... this is a factor that is independent of emission rate. For example, a source may initially be deemed insignificant because of an insignificant contribution to POI but then identified as significant or requiring further analysis because of a high dispersion factor and marginal data quality on the emission estimate.
- In summary, significance is based upon a comprehensive review of impact on local air quality.

Simplified Example Tabulation

Source Description	Data Quality	% Contribution to POI	Dispersion Factor ($\mu\text{g}/\text{m}^3$ per g/s)
Source A			
Source B			

Big/Complex vs Small/Medium Sized

- An analysis to identify the key contributors to exceedences is particularly important for the larger more complex industrial facilities.
- For example, this type of analysis may identify significant commonality of issues between large complex facilities.
- Commonality between facilities in a sector is a key factor in whether or not a technical standard compliance option is a feasible and reasonable compliance approach.

Summary of Outcomes

- The outcome of the “significance” analysis and subsequent jurisdictional review for the significant contaminants and sources may be:
 - Clarity on best available control for the significant issues; and/or
 - The need for further analysis to inform future up-dates to the technical standard.
- The overall intent is to use an analytical approach to develop a more focused result. This also maximizes the use of available resources to minimize impacts on local air quality.

Some Further Work...

Estimating Annual Average emissions

Technical Standards Development Process

- Overview of steps and aspects:
 - Consultation plan.
 - Identify most significant contaminants and sources.
 - Jurisdictional review to identify options to minimize air pollution for the significant contaminants and sources.
 - Assess cost effectiveness and economic feasibility.
 - Develop rationale document and legal draft.
 - Harmonization with other related initiatives (if possible).
 - Propose to finalize technical standard for publication by the Minister
 - Other factors to consider: include new versus existing equipment; phase-in periods; alignment with equipment replacement and business planning cycles.

Estimating Annual Average Emissions

- Estimating emissions on an annual-average basis includes consideration of variation in emissions on a daily, weekly and monthly basis.
- The following general scenarios are intended to represent some common type of situations that affect how annual average emission estimates are developed for input into atmospheric dispersion models:
 - Source with intermittent and regular (ie., same time of day) emissions, every day of the year.
 - Source with intermittent and irregular (ie., any time of day) emissions, every day of the year.
 - Source with intermittent and irregular emissions, but only two days per week.
 - Source with intermittent and regular emissions, but for only the same two months per year.

Estimating Annual Average Emissions

- Example 1: Intermittent and Regular (ie., **same** time of day) Emissions; Every Day of the Year
 - Source with intermittent (ie., not constant) and regular (ie., occur at the same time of day) emissions that average 1 g/s for any three hours between 6am and noon, every day of the year.
 - Note: In this example, emissions between noon and 6am on the following day are zero.
- In this situation, an appropriate approach would be to use the variable emissions tool and input 0.5 g/s for each of the six hours between 6am and noon and 0 g/s for the remaining hours. This pattern would be applicable to every day in the year.

Where,

emissions input for 6am-Noon = $1 \text{ g/s} \times (3 \text{ hours}/6 \text{ hours}) = \underline{0.5 \text{ g/s}}$

Estimating Annual Average Emissions

- Example 2: Intermittent and Irregular (ie., **any** time of day) Emissions; Every Day of the Year
 - Source with intermittent and irregular (ie., occur **any** time of day) emissions that average 1 g/s for any three hours during the day, every day of the year.
- In this situation, the appropriate approach would be to input 0.125 g/s for each of the twenty-four hours in a day. This pattern would be applicable to every day in the year and there is no need to use variable emissions input tool for this type of situation.

Where,

emissions input for every hour = $1 \text{ g/s} \times (3 \text{ hours}/24 \text{ hours}) = 0.125 \text{ g/s}$

Estimating Annual Average Emissions

- Example 3: Intermittent and Irregular (ie., any time of day) Emissions; **Only Two Days per Week**
 - Source with intermittent and irregular (ie., occur any time of day) emissions that average 1 g/s for any three hours during the day and **only two days per week**.
- In this situation, the appropriate approach would be to input 0.036 g/s for each of the twenty-four hours. This pattern would be applicable to every day in the year.

Where,

emissions input for every hour = $1 \text{ g/s} \times (3 \text{ hours}/24 \text{ hours}) \times (2 \text{ days}/7 \text{ days}) = \underline{0.036 \text{ g/s}}$

Estimating Annual Average Emissions

- Example 4: Intermittent and Regular (ie., same time of day) Emissions; **Only for the Same Two Months Every Year**
 - Source with intermittent and regular emissions that average 1 g/s for any twenty-four hours per day **but only for the same two months per year (ie., zero emissions, other months).**
- In this situation, the appropriate approach would be to use the variable emissions tool and input 1 g/s for all 24-hours but only for the two months of emissions and 0 g/s for all other months in the year.