

LAND USE COMPATIBILITY – NOISE & ODOUR

Annik Forristal, Mary Flynn-Guglietti & Henry Krupa

McMillan LLP

Introduction

One of the greatest challenges facing municipal governments is determining how and where to accommodate growth within its boundaries. Whether it is a small rural town or a large metropolis it is often a difficult balancing act to accommodate growth and ensure a harmonious co-existence between the varied and often incompatible land uses. A new residential subdivision next to a farm may seem quiet, remote and idealic until the new owner wakes up to the smell of manure one fine spring morning or the owner of a new luxury condominium, with the fabulous view of the lake, suddenly realizes that the quaint little factory across the street unloads its delivery trucks starting at the crack of dawn every morning.

In order to determine whether an application should be permitted to rezone lands for residential development, the municipality must first determine whether its location is compatible with adjoining land uses. A residential land use is considered a sensitive land use and if it is located in close proximity to an existing industrial operation it can pose a significant challenge to both the ability of the industry to conduct its business efficiently and for the residential user to enjoy his/her home.

The provincial government has long understood the difficulty of achieving a harmonious balance between competing land uses. In 2005 the provincial government issued a Policy Statement (the

“PPS”) recognizing under section 1.1.1 that healthy, liveable and safe communities are provided by avoiding development and land use patterns which may cause environment or public health and safety concerns.

The emphasis in the PPS is not only to protect residential uses but also to ensure the economic prosperity of Ontario’s industries. Section 1.7.1 of the PPS specifically states that planning should ensure that major facilities such as airports, transportation/transit/rail infrastructure and corridors, intermodal facilities, sewage treatment facilities, water management systems, oil and gas pipelines, industries and resource extraction activities and sensitive land uses are appropriately designed, buffered and/or separated from each other to prevent adverse effects from odor, noise and other contaminants and minimize risk to public health and safety.

Pursuant to section 3 of the *Planning Act* all land use decisions must be consistent and conform with any provincial policy statements issued under section 3 of the *Planning Act*. The PPS is issued under section 3 of the *Planning Act*, therefore all municipal land use approvals must be consistent and conform with the PPS.

In addition to the principles set out in the PPS the provincial government, through the Ministry of the Environment, has published Land Use (“D-Series”) Guidelines (“**Guidelines**”) to provide guidance and direction to municipalities in assessing land use compatibility when considering development applications that require permission to rezone and/or re-designate land uses.

The Guidelines are applicable when a new sensitive land use such as a residential subdivision or condominium requires a land use amendment and is proposed to be located within the influence or potential influence area of an impacting use, such as an existing industrial user. It is also

applicable when a new industrial use requires a land use amendment and it is intended to be located near an existing sensitive residential use.

In addition to the Guidelines provincial legislation such as the *Environmental Protection Act* (“the “**EPA**”) prohibits the discharge of a contaminant to the natural environment that causes or may cause an adverse effect.

In compliance with the PPS most municipalities have incorporated policies in their official plans and zoning by-laws to provide guidance and direction regarding compatibility. City of Toronto’s Official Plan at section 3.4.21 incorporates the language found in section 1.7.1 of the PPS and further adds that when considering applications to amend its official plan and zoning by-laws that involve compatibility issues, applicants “may be required to prepare studies in accordance with guidelines established for this purpose”.

The topic today will focus on two main issues that commonly arise when sensitive land uses are proposed in close proximity to existing industrial uses: namely the potential adverse impacts that may be caused by noise and odour and what if any steps must be taken to mitigate the impacts.

MOE Prohibition Against Adverse Effect

Section 14 of *Environmental Protection Act* (the “**EPA**”) prohibits the discharge of a contaminant to the natural environment that causes or may cause an adverse effect. Contaminant is broadly defined as” any solid, liquid, gas, odour, heat, sound, vibration, radiation or combination of any of them resulting directly or indirectly from human activities that causes or may cause an adverse effect”. Similarly, adverse effect is broadly defined to mean one or more of “impairment of the quality of the natural environment for any use that can be made of it;

injury or damage to property or to plant or animal life; harm or material discomfort to any person; an adverse effect on the health of any person; impairment of the safety of any person; rendering any property or plant or animal life unfit for human use; loss of enjoyment of normal use of property; and interference with the normal conduct of business”. Thus, any discharge from an industrial activity that causes noise or an odour may be considered a contaminant causing an adverse effect contrary to section 14 of the EPA.

Section 14 of the EPA is not to be confused with section 9 of the EPA that prohibits the use or operation of a facility that may discharge a contaminant into the natural environment (other than water) without an environmental compliance approval (“**ECA**”). Most industrial operations will be required to apply for an ECA to permit the discharge of contaminants resultant from their operations pursuant to section 9. Notably, however, a facility may be in compliance with section 9 and operating in accordance with an ECA, but may still be violation of section 14 for discharging a contaminant that causes an adverse effect, such as material discomfort to any person. Ensuring compatibility between land uses means avoiding adverse effects that may result from incompatible land uses.

As described in greater detail below, where sensitive uses, such as residential uses are located in close proximity to industrial uses, the MOE can issue orders under the EPA to enforce compliance with section 14. Therefore, orders can be issued by the MOE requiring a facility to take steps to address noise and odour issues. If an industry is suddenly required to implement expensive mitigation measures it may result in the industrial user closing an otherwise viable economic engine.

In order to prevent the occurrence of discharges of contaminants such as noise and odour that cause an adverse effect, the MOE has issued regulations and guidelines intended to regulate the emission of noise and odour. When seeking approval of development applications, in accordance with policies such as Policy 3.4.21 of the City of Toronto Official Plan, developers are often required to provide reports to demonstrate compliance with these regulations and guidelines.

MOE's Land Use ("D-Series") Guidelines

The MOE has published six D-Series Guidelines as follows:

- D-1: Land Use and Compatibility
- D-2: Compatibility between Sewage Treatment and Sensitive Land Use
- D-3: Environmental Considerations for Gas or Oil Pipelines and Facilities
- D-4: Land Use On or Near Landfills and Dumps
- D-5: Planning for Sewage and Water Services
- D-6: Compatibility between Industrial Facilities and Sensitive Land Uses

The D-Series Guidelines are intended for use when preparing and assessing applications made pursuant to both environmental legislation and legislation administered by other ministries and agencies that involves changes in land use. The D-Series Guidelines are also intended to inform municipalities when drafting and implementing planning policies and documents such as its official plans and zoning by-laws. For example, the D-6 Guideline is "intended to be applied in the land use planning process to prevent or minimize future land use problems due to the

encroachment of sensitive land uses and industrial land uses on one another”. Notably, the D-Series Guidelines are simply guidelines and, as a result, are not binding upon the Ministry or municipalities.

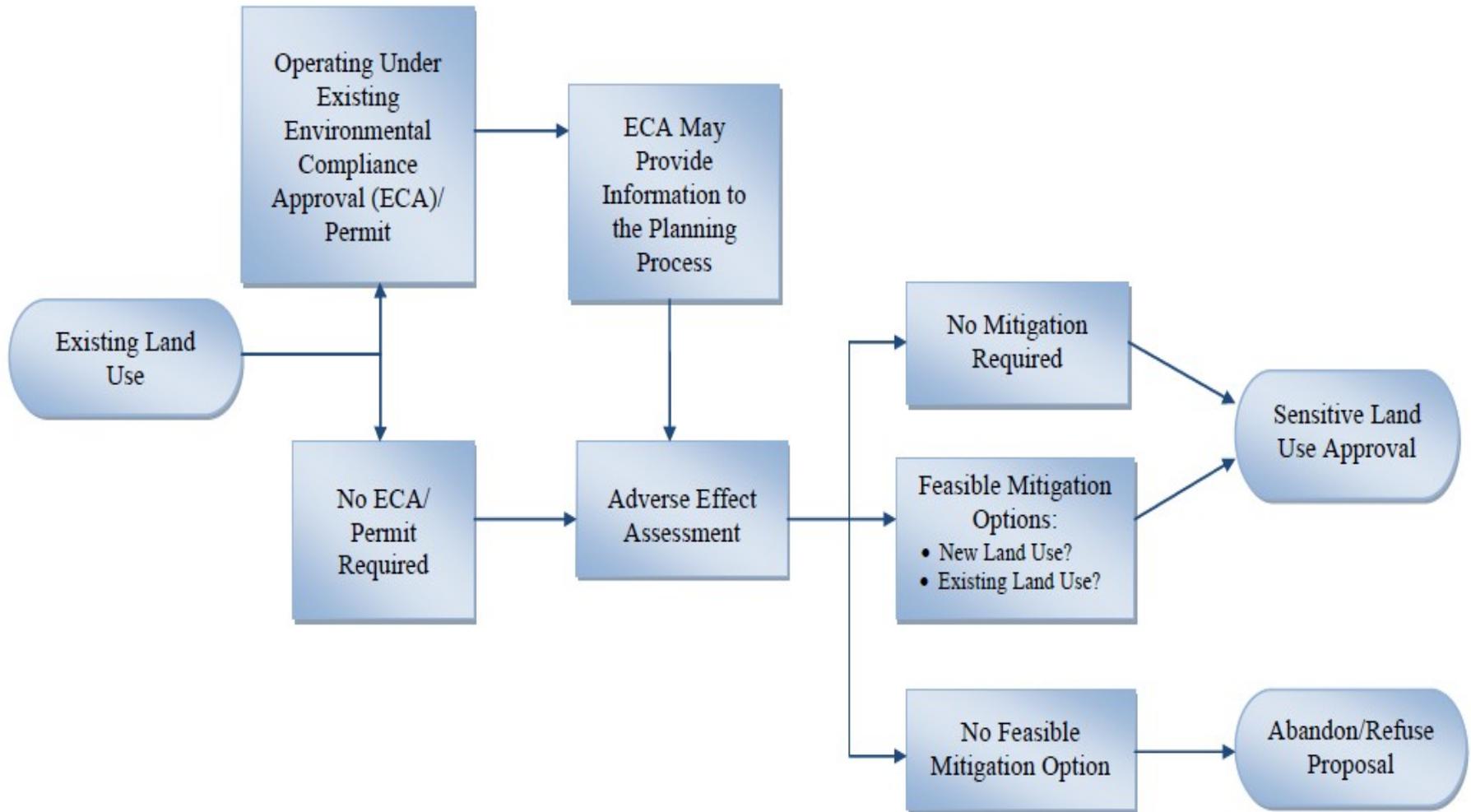
Generally, the D-Series Guidelines are applicable when:

- a new sensitive land use is proposed to be located within the influence or potential influence area of an impacting land use (*i.e.* new residential use locating near an existing industrial use); and/or
- an impacting land use is proposed where an existing sensitive land use would be within the impacting land use area of influence or potential influence (*i.e.* new industrial use location near an existing sensitive use).

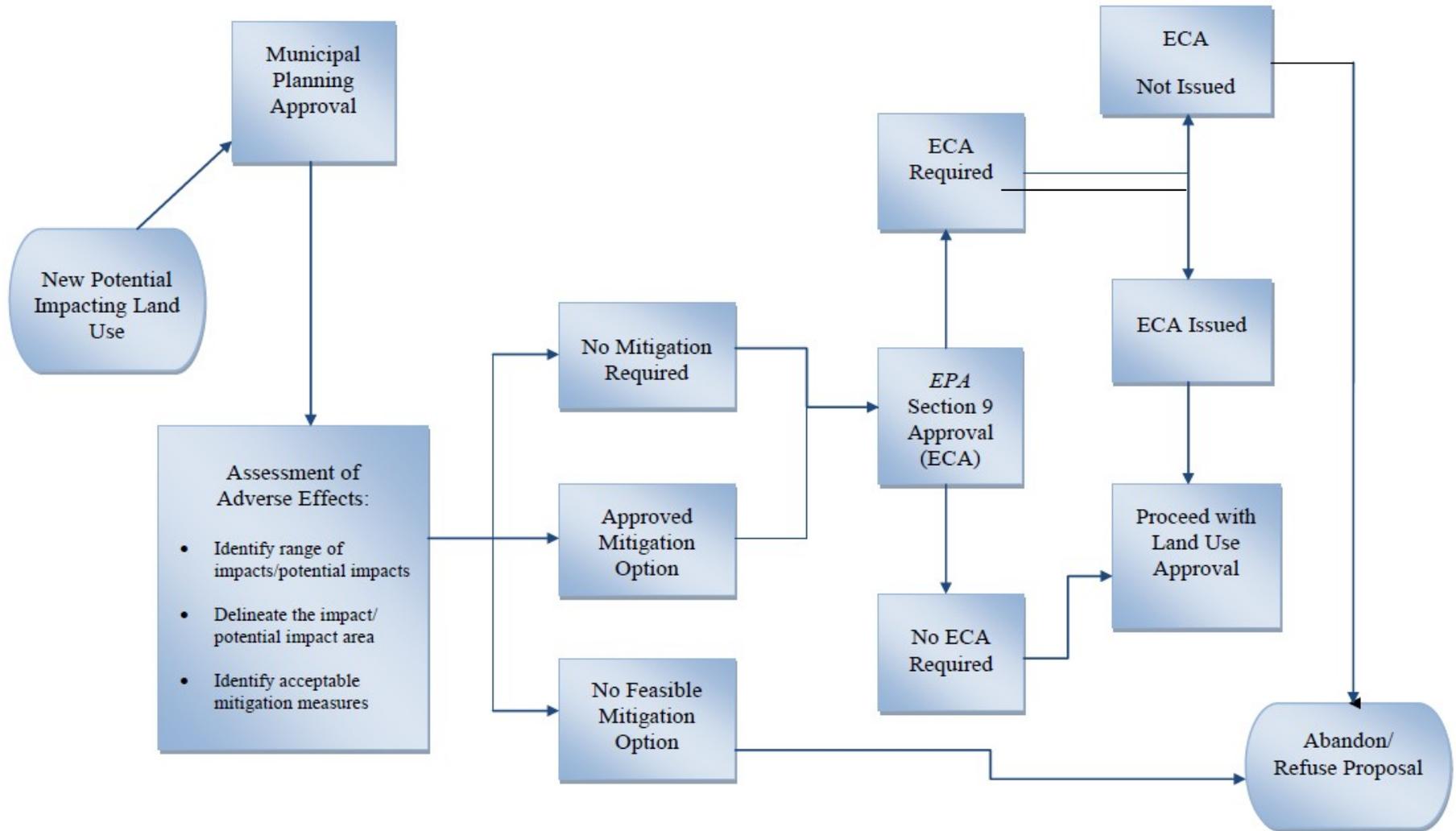
The D-Series Guidelines, however, are not applicable when:

- incompatible land uses already exist;
- no application or approval for a proposed land use is required under the *Planning Act* or other legislation;
- the change in land use, expansion of a land use, or proposed new development are permitted under the existing planning instruments or structure; and/or
- public safety is being addressed.

New Sensitive Land Use Locating Near to an Existing Impacting Land Use



New Impacting Land Use Locating Near a Sensitive Land Use



Noise Guidelines

In October 2013 the MOE released the new Environmental Noise Guideline, Stationary and Transportation Sources - Approval and Planning – Publication NPC-300 (the “**NPC-300 Guidelines**”), replacing older guidelines including Publication LU-131 – Noise Assessment Criteria in Land Use Planning and Publication NPC-205 – Sound Level Limits for Stationary Sources in Class 1 and 2 Areas (Urban). The NPC-300 Guidelines are intended to address the control of sources of noise emissions to the environment by providing sound level limits for stationary sources such as industrial establishments. Compliance with the NPC-300 Guidelines must be demonstrated by applicants for ECAs under the EPA. The sound level limits may also be applied when noise complaints are made to the MOE and an investigation is undertaken to determine if such noise constitutes an adverse effect contrary to section 14 of the EPA. The NPC-300 Guidelines also provide advice, sound level limits and guidance that may be used in the land use planning process including when sensitive land uses are proposed adjacent to noise-producing facilities.

Under the NPC-300 Guidelines the proponent of a development application is responsible for ensuring compliance with the applicable sound level limits set out under the guideline. Demonstration of compliance with the NPC-300 Guidelines begins with the preparation of a Noise Impact Study. Noise impacts are measured at points of reception which are locations on noise sensitive land uses where noise from a stationary source is received. Noise impacts at a point of reception are typically described in one-hour equivalent sound levels (L_{eq}) which is the sound level in decibels (dBA) averaged over a one hour time period. A Noise Impact Study is intended to assess the impact of all noise sources affecting the proposed development and to then

identify whether the proposed development is compatible with surrounding uses. A Noise Impact Study should also identify noise mitigation measures required to ensure compatibility which may include changes to the development's layout or design.

New Features Under the NPC-300 Guidelines

A number of changes to the old MOE noise guidelines have been included under the new NPC-300 Guidelines. Included here is a summary of some of these changes that will particularly impact land use compatibility.

A significant change under the new NPC-300 Guidelines impacting land use compatibility is the introduction of a new area class, called Class 4. In the past, MOE noise guidelines only included three area classes – urban (Class 1), suburban (Class 2) and rural (Class 3). The new Class 4 is intended to apply to infill developments. Specifically, Class 4 areas must be:

- located in Class 1 (urban) or Class 2 (suburban) areas;
- intended for the development of new noise sensitive land uses that are not yet built;
- there must be no existing noise sensitive land uses in the area; and
- in proximity to existing, lawfully established stationary sources (such as an existing industrial facility).

Notably, a land use planning authority must also formally confirm classification of a property as Class 4. The City of Toronto is the only municipality to identify a Class 4 property and it has only identified a single property. It remains unclear exactly what is required from a municipality in order to obtain such classification. The NPC-300 Guidelines do not provide clear direction regarding identifying lands subject to this classification and to date no municipalities, including

the City of Toronto, have included any policies or guidelines in their official plan regarding the process and requirements for making such a determination.

Class 4 areas are subject to standards under the NPC-300 Guidelines that will make them particularly desirable as such a designation will be beneficial to both residential developers and to existing industry. For example, the use of enclosed noise buffers such as enclosed balconies will be permitted in Class 4 areas (subject to zoning and other requirements). For developers, the use of such balconies would result in the elimination of a point of reception providing new options for ensuring compliance with the NPC-300 Guidelines. Additionally, Class 4 areas are subject to sound level limits that are higher than those permitted in Class 1 or Class 2 areas. This is beneficial for existing industrial facilities as it permits higher levels of noise to be emitted from an industrial facility in proximity to a Class 4 area.

Another new feature of the NPC-300 Guidelines that will assist with land use compatibility is the allowance for the provision of receptor-based noise control measures. These are noise control measures that are implemented at the location of the point of reception as opposed to at the location of the source of the noise and may include inoperable windows or the use of special acoustical building materials. For developers, this provides increased options for noise mitigation measures, allowing greater flexibility and increasing a developer's ability to ensure compliance with the NCP-300 Guidelines.

Finally, sound levels must be determined for all points of reception at all times of the day. Although different sound level limits are provided for different times of day (e.g. a higher permitted sound level during the day versus at night), a distinction is no longer made under the NCP-300 Guidelines between the nature of the point of reception. For example, in the past,

where the point of reception was a bedroom window, assessment of the sound level limit for this point of reception was only required for the night-time hours. Under the new NPC-300 Guidelines, all sound levels limits provided for both the day and the night must be met. This will result in higher sound level limits being applied to some points of reception such as bedroom windows and could result in the requirement for additional noise mitigation measures. This stricter standard may negatively impact existing industries that are currently in proximity to sensitive uses as the noise mitigation measures currently in place may no longer be enough to meet the higher standard applied under the new NPC-300 Guidelines.

Odour Regulations and Guidelines

Unlike noise which can be measured in decibels, sensitivity to odour is much more subjective and difficult to measure. Five factors are commonly used to describe the potential of an odour to become a nuisance:

- Frequency – how often odour may occur
- Intensity – how strong odour may be
- Duration – how long odour may persist
- Offensiveness – the character, or hedonic tone, of an odour that is linked to a positive or negative response from an exposed individual
- Location – where the odour is occurring

Each of these five factors can be reasonably measured except for offensiveness which remains subjective and is often tied to an individual's ability to recognize an odour.

O. Reg. 419/05 and Regulation of Odours

Ontario Regulation 419/05 – Air Pollution – Local Air Quality (“**O. Reg. 419/05**”) under the EPA regulates contaminant concentrations over time and in this way attempts to provide prescribed standards that regulate odours and thus minimize the occurrence of adverse effects from discharged contaminants. Sections 19 and 20 of O. Reg. 419/05 prohibits the discharge of a contaminant into the air if such discharge results in a concentration of the contaminant at a point of impingement (“**POI**”) that exceeds the standards set out in tables found under Schedules 2 and 3. The standards prescribed under O. Reg. 419/05 are measured in $\mu\text{g}/\text{m}^3$ and are time based, providing for maximum permitted concentrations over 24 hour, 1hour, 30 minute or 10 minute intervals. The 10-minute standards under O. Reg. 419/05 relate to contaminants with particularly offensive odours such as total reduced sulphur, hydrogen sulphide (H_2S) and mercaptans. .

To demonstrate compliance with O. Reg. 419/05 an Emission Summary and Dispersion Modelling (“**ESDM**”) Report is prepared. Pursuant to section 22 of O. Reg. 419/05, compliance with O. Reg. 419/05 is required for the issuance of an ECA and thus an ESDM Report must be submit with any application for an ECA. To complete an ESDM Report, O. Reg. 419/05 provides for the use of specified and approved atmospheric dispersion models to predict the concentration of contaminants that can be expected at a POI. These models consider all pertinent information such as discharge rates of contaminants, distance to buildings and property lines and meteorological data. Once completed, the ESDM Report will conclude whether or not a facility complies with the concentration standards prescribed in Schedules 2 and 3. .

Notably, O. Reg. 419/05 is contaminant-specific and is used to assess emissions from a single facility. Compliance with the standards prescribed in O. Reg. 419/05 does not imply or guarantee compliance with section 14 of the EPA which can apply to any discharge from the facility that causes a nuisance odour. No regulations under the EPA specifically address odour impacts caused by exposure to a mixture of various odorous compounds in unknown quantities.

Odour Panel Testing

The Ministry of the Environment's Ontario Source Testing Code dated June 2010 (PIBs #1310e03) includes methods and procedures for the measurement of odours from stationary sources under Method ON-6: Determination of Odour Emissions from Stationary Sources ("**Method ON-6**"). Specifically, Method ON-6 sets out the procedures to be used to determine the odour concentration and emission rate of undefined mixtures of gaseous odorants.

Odororous compounds that are not tied to a specific contaminant or that are difficult to quantify are typically described in odour units per cubic meter of air (**OU/m³**). One OU/m³ is defined as the point where 50% of a normal population could just detect that an odour is present. Notably, recognition of most odours by a normal population does not occur until the 3 to 7 OU/m³ range.

The MOE typically requires facilities to meet a standard of 1 OU/m³. This standard may be imposed as a condition under an ECA. .

As set out in Method ON-6, the measurement of OUs for a specific source emission is usually determined through odour panel testing. An odour panel constitutes a minimum of 8 assessors trained to sense odours. Each assessor is required to meet specific selection criteria. Samples of

the mixture of gaseous odorants are first collected in accordance with the procedures set out in Method ON-6. These samples are then diluted with neutral gas (i.e. clean air). During each round, each assessor is presented with three samples – one containing the diluted odour sample and two that are odour free – and are asked to identify which of the samples is different. Each assessor indicates whether the sample identified was a guess, a detection or a recognition. During the next round the concentration of odorant gas is doubled and each assessor is again presented with three samples and asked to identify which sample is different. This process continues until the odorant gas has been detected by each assessor. .

The odour panel testing results are then used to define the level of dilution that equates to 1 OU/m³ – being the level of dilution of the odour gas where 50% of the panel just detected the odour. As in an ESDM Report prepared under O. Reg. 419/05, atmospheric dispersion models are used to predict the level of dilution of the odorous gas that can be expected at a POI. The level of dilution is then converted into OU/m³ using the odour panel testing results. .

Impacts on Developers – Development Applications

In order to comply with planning policies including the Provincial Policy Statement and municipal Official Plans, developers will be required to demonstrate that no adverse impacts will result from the development. As a result, when applying for approval of a residential development in close proximity to an existing industrial operation, developers will be required to submit additional expert reports evaluating any adverse impacts of the development that may result in adverse impacts resulting from noise or odours. This could include completion of a Noise Impact Study, an ESDM Report or Odour Panel Testing, as appropriate.

Additionally, in the event that mitigation measures are required to address the impacts of noise or odour, approval of a proposed development may be conditional upon the provision of such mitigation measures. Furthermore, the developer may be required to bear the costs of implementing the mitigation measures, including those to be implemented at an existing industrial facility. In order to ensure that mitigation measures are secured the municipality may require the developer to enter into various agreements such as a section 37 agreement, a development agreement, a plan of subdivision or a site plan agreement.

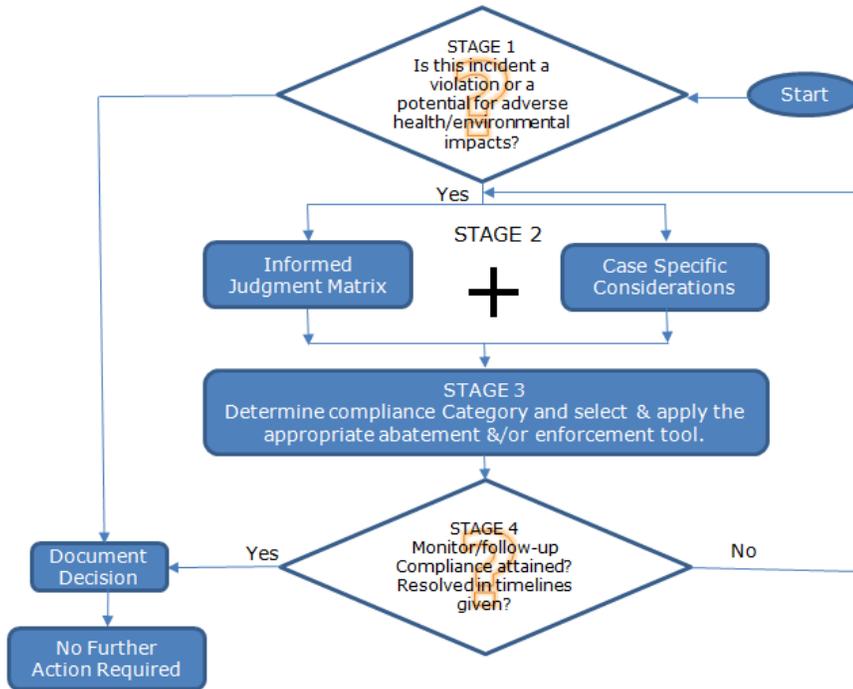
Impacts on Industry –Complaints, MOE Orders and Prosecutions

In the event that a sensitive land use, such as a residential use, is approved and developed in close proximity to an industrial facility new residents may file complaints regarding noise or odour with the MOE. The filing of such complaints by neighbours can result in inspection of the industrial facilities by the MOE to ensure compliance with the EPA. The MOE's inspection will determine if abatement (compliance) actions and or enforcement (prosecution) action is appropriate in the circumstances.

Generally, when addressing an incident such as a complaint, the MOE determines its course of action as shown in the decision tree and informed judgment matrix below:

Determining the Appropriate Abatement and/or Enforcement Tool

DECISION TREE



Compliance Policy F-2, May 2007

Informed Judgment Matrix

Informed Judgment Matrix (IJM)		Health/Environmental Consequences					
		1. Administrative	2. Minor Environmental	3. Minor Health	4. Medium Environmental	5. Major Environmental	6. Medium/Major Health
Compliance History	A. No history / Good Compliance History	Compliance Category I			Compliance Category III		
	B. Previous Violation (unrelated)						
	C. Previous Violation (related)	Compliance Category II					
	D. Ongoing Violation Not Resolved Despite Ministry Directions						
	E. Previous Significant Convictions or Environmental Penalty Orders						
	F. Obstruction/ False Information**	Compliance Category II					

Compliance Policy F-2, May 2007

When determining the appropriate course of action in response to complaints received, the MOE will also consider case-by-case factors such as:

- Did the facility have an appropriate ECA?
- Was the facility operating in compliance with its ECA?
- Is there public concern about the incident?
 - Number of complaints
 - Has the incident been reported in the press?
- Is the responsible person someone with whom the ministry can work to achieve a positive environmental outcome?
- Did the responsible person disclose the incident voluntarily?
- Did the responsible person co-operate?
- How swiftly did the responsible person respond to the incident?
- Did the actions taken by the responsible person effectively resolve the incident and prevent its recurrence?
- What resources did the responsible person expend responding to the incident?
- Given the sophistication of the responsible person, would education and outreach be more effective to assist the person in understanding, managing and complying with ministry legislation, than issuing an order or prosecuting?
- When responding to an incident, is there a need to promote specific or general deterrence?
- Was the incident the result of gross negligence and/or deliberate actions by a responsible person?

As indicated by the questions above, the consequences to health and the environment as well as the responsible person's compliance history will play a large role in this decision-making process. The MOE will then identify the appropriate Compliance Category as follows:

- **Compliance Category I:** Recommend Education & Outreach, Notice of Violation, Abatement Plan &/or Amend Authorizing Document (Control Documents (e.g. Orders), EP Order, Ticket, or IEB Referral for Investigation may be considered)

- **Compliance Category II:** Recommend Amend Authorizing Document, Control Document (e.g. Order) or EP Order. May write a *Provincial Offences Act* Part I Ticket and shall consider Investigation and Enforcement Branch (IEB) Referral for Investigation except when a ticket is used¹.

- **Compliance Category III:** Recommend Amend Authorizing Document, Control Documents (e.g. Order) or EP Order. Shall refer to IEB for Investigation (No Ticket)².

Under the EPA, the MOE may issue orders in the event a facility does not conform to its ECA-application which includes supporting documentation or comply with the conditions included in its ECA which may include conditions relating to compliance with noise standards under NPC-300 or with specified odour levels in OU/m³. The MOE may also issue orders to ensure compliance with regulated standards such as those set out in O. Reg. 419/05. Additionally, the MOE can issue orders under the EPA to enforce compliance with section 14. Therefore, orders

¹ IEB referrals are used to determine if the alleged offence warrants prosecution under Part III of the *Provincial Offences Act*.

² *ibid.*

can be issued by the MOE requiring a facility to take steps to address noise and odour issues. These steps may be quite costly and may include the installation of noise berms and barriers, noise buffer balconies, odour abatement technologies or adjustment of the facility's operations. Complying with an order issued by the MOE lowers the risk that the MOE will take enforcement or prosecution action. However, the failure to comply with any order issued by the MOE raises the risk to almost a certainty of prosecution of both the owners and operators of a facility.

Conclusion

The accommodation of growth while ensuring harmonious co-existence between various land uses poses many challenges to municipalities. When determining whether an application to permit a residential development should be approved, consideration of its relationship with neighbouring land uses is essential. In particular, if the proposed residential development is in close proximity to an existing industrial operation the viability of this industry may be significantly impacted.

Policies implemented by the province, including the MOE, and by municipalities attempt to address these complex relationships and to provide guidance when determining the compatibility of land uses. This assessment frequently includes consideration of the potential adverse impacts that may result due to the proximity of uses such as noise and odour. At a minimum, this evaluation requires the preparation of additional studies and reports by developers when applying for development approval and may also require such developers to implement any identified mitigation measures.

Once approved, the industrial operation must still be ever vigilant to prevent the occurrence of an adverse effect. Compliance with environmental approvals such as ECAs by industrial operations does not guarantee that an adverse effect will not result from their operations, such as noise and odour causing discomfort to persons in nearby residences. In the event of complaints to the MOE from new residents, an investigation and subsequent order or prosecution by the MOE may result.

In order to minimize such conflicts between neighbouring uses, it is recommended that both developers and industry representatives work closely with the province and municipalities to identify incompatible uses or to ensure appropriate mitigation well in advance of the development's approval.