

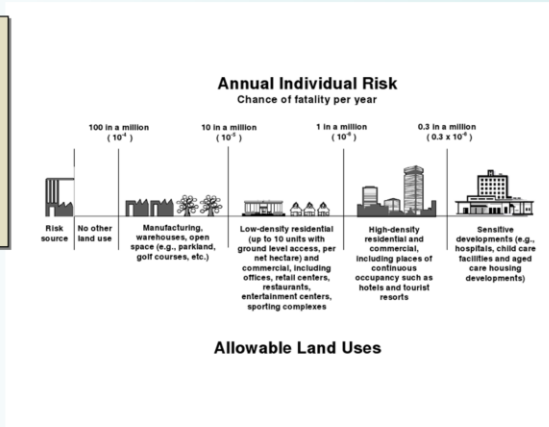
Implementing MIACC Criteria into Risk Based Land Use Planning Bylaws Requires Several Activities to be Successful

Presented by Doug McCutcheon, P.Eng., MCIC

doug.mccutcheon@ualberta.ca
Phone 250.349.5515

CSCHE-PSM (MIACC) Land Use Planning Criteria

How do we make this work??
???



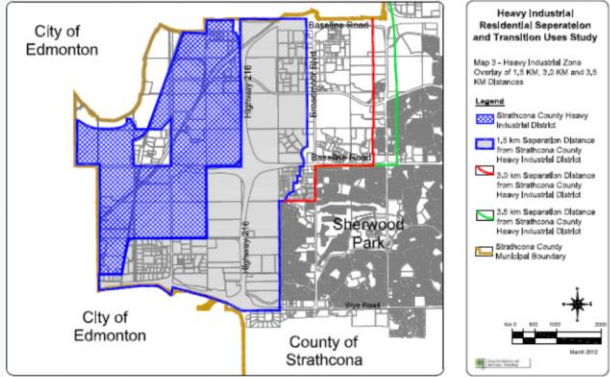
Why a Bylaw

Have found a joint need:

- For the County development officers guidance
- For industry to locate and exist on good terms
- For developers to have a “level playing field”

Strathcona County 2001 Risk Based Land Use Bylaw

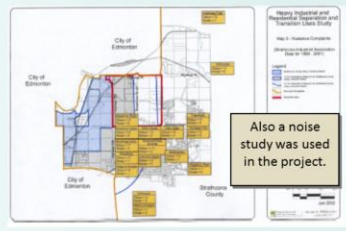
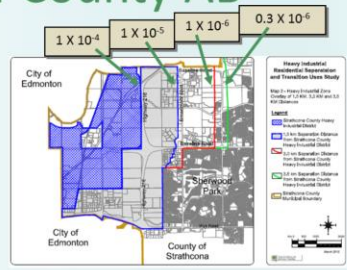
What I would like to talk about is how this was done back in 2001, is it working and my experience with other jurisdictions.



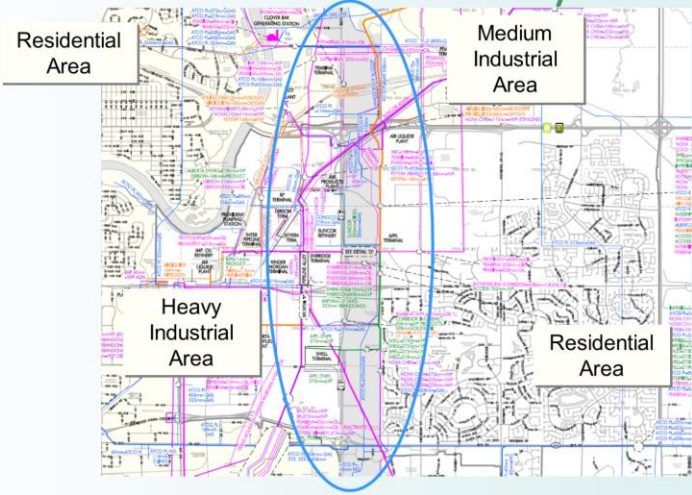
Strathcona County AB

Bylaw Development Involvement

- Risk Assessment expert
- City planning expert
- Emergency management
- Developers
- Public
- Industry representatives
- Strathcona elected officials
- Representatives from Edmonton
- Representative from the Province (observers)

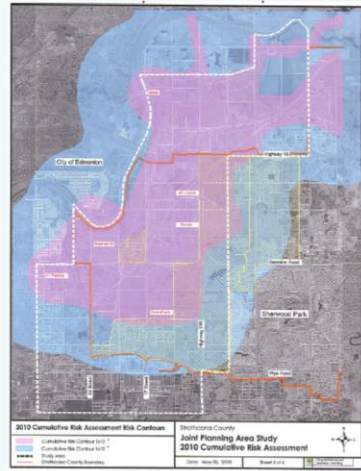


Strathcona County AB



Strathcona County AB

2010
Cumulative
Risk Study



Challenges

- What does “risk” mean?
- Ethical, Professional approach and Due-diligence
- OH&S Acts (..... what does practicable mean?)
- ALARP
- What distances for the individual MIACC risk zones?
- What is the balance between industry and the community?
- Cost.
- Who is impacted?
- A management tool for development officers.

What does “risk” mean?

What does “risk” mean to everyone else but us?

- No idea
- Fear
- Not in my backyard
- “Death Zone”

Ethical, Professional Approach and Due-diligence

- Risk assessments are done by professionals
 - For validation
 - As a profession (P.Eng.) it is a requirement to look after the health, safety, environment and clients best interests (Professions Act).
- Highlights the concept of risk which no-one else understands.
- Provides a basis for:
 - Peer analysis
 - Risk management programs
 - Jurisdictional oversight
 - Knowledge growth
 - For industry to survive

OH&S Acts and ALARP

- The health and safety of workers and the public.
- The term practicable means a responsibility to make choices wisely
- As Low As Reasonably Practicable (ALARP)
 - A professional opinion
 - Open to scrutiny
 - Realistic and do-able

OH&S Law

- 2(1) Every employer shall ensure, as far as it is reasonably practicable for him to do so,
- (a) The health and safety of workers engaged in the work of that employer, and

Reasonably Practicable

This general statutory obligation conveys a message to the courts that the standard of care within OH&S Legislation is not an absolute obligation, but, a strict obligation. Once a danger is likely to be considered a known and foreseeable hazard it should become reasonably practicable to do something about it.

In the eyes of the law, if something is reasonably practicable, then it must be done. It is up to the employer to find a reasonable and practicable means to reach the objective and to continue to keep up-to-date on new developments in the field. (If it can be done, it must be done to the technology of today).

Liabilities & Due-diligence

ABSOLUTE LIABILITY: Obligation or command to do something. You don't have a choice, you must do it.

STRICT LIABILITY: Express possibility of right to choose to do something. You have the option of deciding if you do or don't proceed based upon the circumstances.

Strict liability laws express the possibility of rational decision making, depending upon the circumstances.

Instead of complying with the specific provision in the law, you could do everything "reasonably practicable" and demonstrate DUE DILIGENCE.

REMEMBER: due diligence is the level of judgement, care, prudence, determination, and activity that a person would reasonably be expected to do under particular circumstances.

An Early Summary

Through out the process of developing the bylaw it became very apparent this needed to have a strong basis.

As you can see that from my point of view this is not just about “applying science” it is more in line with being a part of a larger process.

Professional Engineers are needed to make this valid enough to become the basis for building open, solid and meaningful ways to implement the *“CSCHE-PSM (MIACC) Risk-based Land Use Planning criteria”*.

Distances for Each Risk Zone

- Assumption the risk level within the company property line will not exceed 1×10^{-4} at the property line.
- What type of “Heavy Industry” are we considering?
 - Fixed
 - Railroads, highway transport, pipelines
 - Dense gas (toxic), flammable, explosive impacts
- What does the jurisdiction want in terms of industrial development?



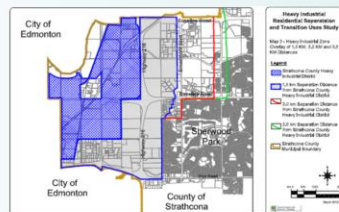
Distances for Each Risk Zone (cont'd)

- What impacts does industry not want to deal with?
 - Injury or fatalities
 - Nuisance complaints
 - Potential legal involvement with community, developers, citizens
- What distances between industry and community exist?
- How fast will a toxic or flammable cloud travel?
- Can an emergency plan be effectively enacted in time?



Distances for Each Risk Zone (cont'd)

- Not to be forgotten is possible “grand fathering” of existing facilities and a plan to rectify.
- Cost (a big one talked about later)



Balance between Industry and Community

A fundamental starting point

- Will industry want to be close to residents?
- Does the jurisdiction desire to have industry in the area?

Industry	Jurisdiction
Long term commitment	A tax base
Need to grow	Local economy
Need to be current with demands for their product/services	Quality of life
Need for proximity to utilities, roads, rail and pipelines	Jobs
Need for an employee pool	Growth
Need for local suppliers	Facilities

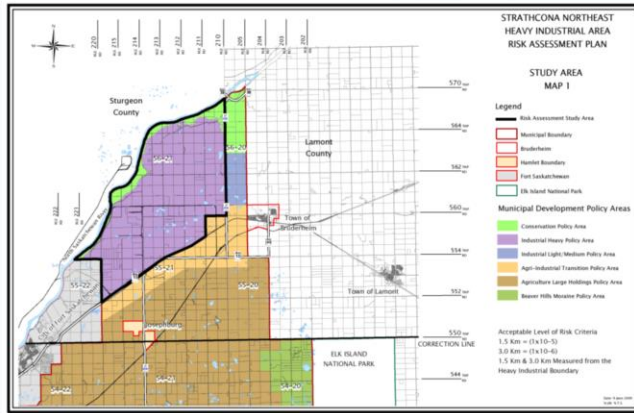
Cost

- From a community point of view uses up valuable land.
- From an industry point of view consumes more capital depending on risk zone distances.
- More risk management activities based on risk zone distances.
- Restrictions on what industrial activities can take place within the allocated distances.
- Emergency planning needs.
- Etc.

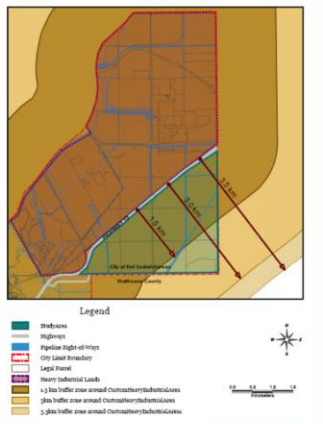
Some Additional Examples

- Strathcona County Industrial Heartland
- City of Fort Saskatchewan
- Sturgeon County
- City of Edmonton
- Leduc County
- City of Medicine Hat
- District of North Vancouver
- City of Auckland NZ
- Guelph ON / Union Gas and the Ontario Technical Standards and Safety Authority

Strathcona Heartland Area



City of Fort Saskatchewan



Sturgeon County

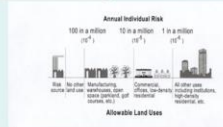


The cumulative risk level will not exceed 1×10^{-5} of a fatality at this boundary

The cumulative risk level will not exceed 1×10^{-5} of a fatality at this boundary

The cumulative risk level will not exceed 1×10^{-1} of a fatality at this boundary

Company "X" will need to ensure any risk does not exceed 1×10^{-1} of a fatality beyond its property line.



City of Edmonton AB

The City of Edmonton Bylaw:

14.6 Assessment of Risk for Industrial Activities

Bylaw 14127

January 11, 2006

When an application for a Development Permit is for an activity involving the use or storage of hazardous substances, the Development Officer may require the application to contain an Assessment of Risk prepared by an environmental professional such as an engineer, biologist, planner, geologist or hydrogeologist, and the Development Officer may impose any conditions necessary to mitigate the risks associated with the use or storage of hazard substances identified in the assessment."

The Assessment of Risk shall:

1. Identify hazardous substances and their quantities;
2. Estimate the expected frequency of the occurrence of a hazardous event;
3. Assess the possible consequences of such an event;
4. Determine annual individual risk and compare to MIACC's risk acceptability criteria;
5. Demonstrate how the proposed facility and operations shall contribute to the following risk management objectives:
 - risk reduction at source (siting of facilities, modifications to processes, conformity to legislation e.g. The Safety Codes Act, the Dangerous Goods Act, monitoring, technical changes, training, etc.);
 - risk reduction through land use planning around industrial Sites and pipeline and dangerous goods corridors;
 - emergency preparedness;
 - emergency response;
 - risk communication and public participation; and
 - identify and recommend risk-based separation distances and other mitigative measures to reduce risk.

Leduc County



District of North Vancouver



COMPANY	CHEMICAL	IMPACT
Canexus	Chlorine	As described in the Alp Risk Assessment report the risk of a fatality will be (1 X 10 ⁻⁶) just north of Front Street.
	Hydrogen Chloride (gas)	A release will impact beyond the Canexus property line but within the impact distances for Chlorine.
	Hydrogen (explosion)	An impact of up to 28 metres from inside the site with no impact beyond the property line.
NEWALTA	H ₂ S	A release from the Hydro-treater unit will not be impactful beyond the property line.
	Lubricating Oil	A lubricating oil spill and possible fire will not impact beyond the property line.
UNIVAR	Ethanol	A major tanks spill to the diked area will have a radiant heat impact about 155 metres from the tanks but will not impact the Maplewood Village area.
HTEC	Hydrogen (explosion)	Can impact up to 200 metres from the site location and will not impact beyond the property line.
	Hydrogen (fire)	An impact of up to 100 metres with no impact beyond the property line.
ERCO Worldwide	None of note	None of note

District of North Vancouver



Proposed Upgraded
community of
Maplewood

Risk Assessment
centered on the
Canexux Chlorine
Facility

District of North Vancouver

Figure 13: NEWA/TA Site



Figure 14: ERCD Worldwide:

(None of note that would have an impact beyond the property line)

However, of note is Sodium Chlorate and Potassium Peroxide, "oxidizing agents", which will accelerate burning when involved in a fire situation, if any lighter combustibles.



Figure 15: Proposed HTEC Fatality Risk Contours for Radiant Heat and Explosion Shockwave Impacts



Figure 16: UNIVAR Canada Site:



District of North Vancouver



City of Medicine Hat Alberta

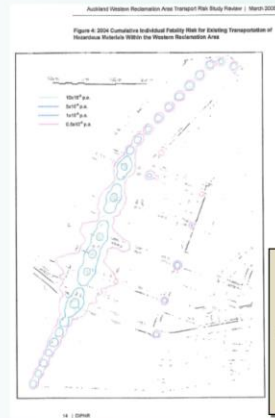
Industrial
"Buffer"
Distances



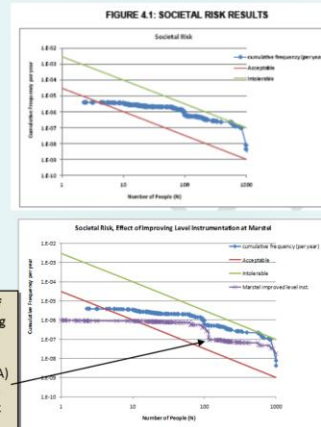
Auckland NZ Reclamation Project



Auckland NZ Reclamation Project



The result of implementing Layer of Protection Analysis (LOPA) will result in lowering risk levels.



Guelph High Pressure Natural Gas Pipeline

Technical Standards and Safety Authority of Ontario (TSSA)

– Intervener

Existing 3,500kPa (500psi) natural gas pipeline



Summary

- Everyone is Different.
- A recognized “best practice” guideline for bylaws is suggested including criteria for risk assessments and the skills needed for doing them.
- Additionally consider moving towards including requirements for “risk management programs” for industry.

Any Questions?

