



# Application of the guide for planners and designers on land-use planning and methodologies for calculating AN risks

Estonian Rescue Board

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# Land-use planning - Legislation

**Planning Act** (spatial plan) and **Building Code** (building design documentation)

**Chemicals Act** → Requirements for drawing up the mandatory documents of dangerous enterprises and enterprises with a major hazard, requirements for information given to the public and for notification of an accident ([Regulation 18](#))

## Special Requirements for Handling Ammonium Nitrate Regulation ([Regulation 5](#))

Main/basic requirements  
Relevant in land-use planning

- Residential areas, public buildings, stadium – **500 meters**
- Public main roads or railways – **500 meters** (if stored in bulk)
- Industrial buildings – **50 meters**

**A guide for planners and designers according to Chemicals Act requirements on land-use planning**

**Methodology for reviewing and granting permission for spatial plans and building design documentation according to Chemicals Act**

<https://www.rescue.ee/et/kemikaaliseaduse-32-juhendid>



## ESTONIA Ammonium Nitrate in numbers

Upper-tier – 5 (35)

Lower-tier – 3 (28)

Non-Seveso – 1 (235)

Non-Seveso establishments start with 100 tons





# Implementation of Legislation

The **comprehensive, special or detailed spatial plans** and **building design documentation** must be submitted to the Rescue Board for approval in the following events:

- 1) upon selection of the location of a new establishment (**dangerous enterprise** and of **an enterprise with a major hazard**)
- 2) upon **expansion** of the operations of an existing establishment
- 3) upon **planning an area located in the danger zone** or upon **planning construction works** there

Upon approval...  
the Rescue Board assesses:

- 1) whether the plan or construction works **increases the major-accident hazard** or **the severity of the consequences**
- 2) whether the **measures planned for prevention of an accident are sufficient**
- 3) before the establishment of the plan or granting of a building permit, the operator of the establishment must submit additional information to the local authority and to the Rescue Board **E.g - a Risk Analysis**

The Rescue Board **may refuse to grant** its approval if the activity planned in the plan or in the building design documentation **increases the risk of a major accident** or the **severity of the consequences** thereof and the measures planned for the **prevention of an accident are not sufficient**





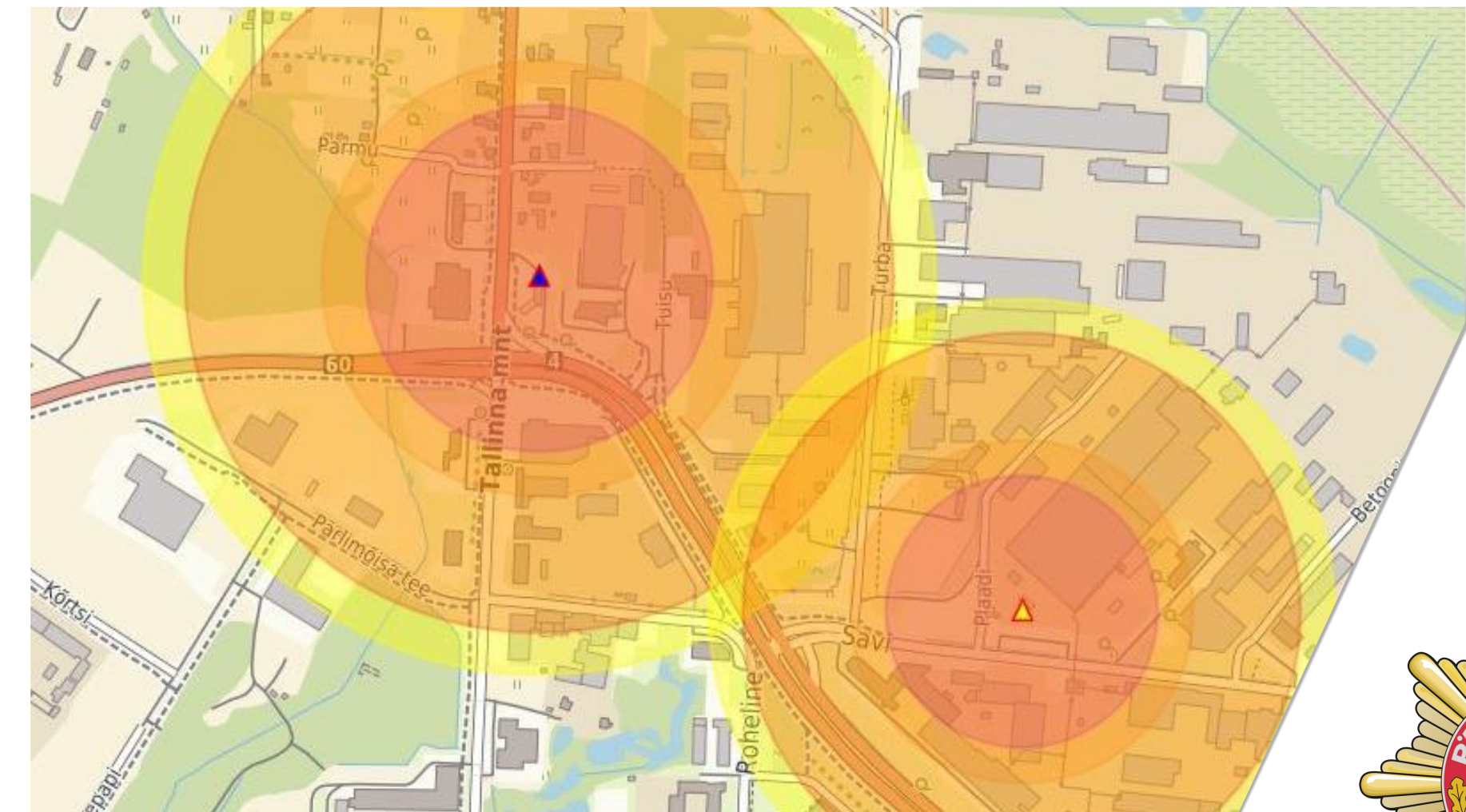
# The methodology for deciding

- **Firstly checked** if the distances are **in accordance** with Special Requirements for Handling **Ammonium Nitrate Act**
- **Then** Decision **matrix** is used
- Decision is related by **three zone** and the **sensitivity level** (four levels) of a proposed development

## A Risk Analysis must contain

- Description of the major-accident risk, possible consequences to human life and health and to the environment
- Size of the impact zones
- Overview of accident prevention measures and principles for prevention of a major accident and for mitigation consequences
- If construction is not allowed by the decision matrix, there must be measures implemented, so they reduce and/or minimize the impact of possible accident or minimize the risk of consequences of potential hazard

Sensitivity level	Zones		
	I	II	III
1	YES	YES	YES
2	NO	YES	YES
3	NO	NO	YES
4	NO	NO	NO



# Methodologies for calculating AN risks

For finding threat zones radiuses a following formula is used

$$R = (\text{TNTEquivalence} \times m)^{1/3} \times k$$

where,

- R – radius, [m]
- TNTEquivalence – depends of the methodology or type of ammonium nitrate
- m – mass of ammonium nitrate, [kg]
- K – reduced distance value (based on appendix 1, Regulation 18)

Regulation 18, appendix 1:

Threat zone	Overpressure (bar/kPa) and value of k
I	0,24 bar / 24 kPa k = 7,2
II	0,16 bar / 16 kPa k = 9,6
III	0,05 bar / 5 kPa k = 22,2

## Methodologies

- Great Britain (storing in stacks) – TNTEquivalence 0,14
- Australia (storing in bulk) – TNTEquivalence 0,20-0,25 (UN 2067)
- Yara (storing in stacks and bulk) – TNTEquivalence 0,20
- Estonia (storing in bulk) – TNTEquivalence 0,25 (UN 2067)
- Estonia (porous prills) – TNTEquivalence 0,40-0,60 (UN 1942)





Any question?  
**Thank you for listening!**



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