

Identification of hazardous activities as required by the Convention on the Transboundary Effects of Industrial Accidents

Case studies



UNECE

Case study 1 is located 8 km from border. It is not in the basin of a transboundary watercourse.

Case study 2 is located on a transboundary watercourse 300 km upstream of the border, with an average flow rate of 1.5 m/s

Case studies

Determine whether or not the following facilities fall within the scope of the Convention (i.e.: are they “hazardous activities”?)

According to Article 1 (b) of the Convention

“**Hazardous activity**” is any activity:

- in which one or more hazardous substances are present or may be present at or in excess of the threshold quantities listed in Annex I, **and**
- which is capable of causing transboundary effects (location criteria)



Case studies

- Guidelines for location criteria*
 - Within 15 kilometres from the border
 - for activities involving substances that may cause a fire or explosion or involving toxic substances that may be released into the air in the event of an accident
 - Along or within the catchment areas of transboundary and border rivers, transboundary or international lakes, or within the catchment areas of transboundary groundwaters,
 - for activities involving substances falling under category 3, 4, 5 or 8 of part I of Annex I to the Convention and that may be released into watercourses in the event of an accident. Whether or not such an activity is capable of causing a transboundary effect in such an event should be decided by the competent authority of the Party of origin, preferably in consultation with joint bodies. The decision should depend, among other things, on the existence of river warning and alarm systems and the distance* between the location of the hazardous activity and the border.

* in accordance with Decision 2000/3 as amended by decision 2004/2

** this distance should correspond to approx. a flowing period of two days of average flow velocity

Case study 1

- Facility with several tanks containing gasoline, jet fuel, diesel fuel and home heating oil
 - 2 x 10,000 m³ and 1 x 5,000 m³ gasoline tanks
 - 2 x 5,000 m³ diesel fuel tanks
 - 1 x 1,500 m³ jet fuel tanks
 - 1 x 1,500 m³ heavy fuel oil tanks
- The operator has submitted information about the substances and their Safety Data Sheets

	Gasoline	Diesel fuel	Jet fuel	Heavy fuel oil
density (kg/m ³)	750	830	780	950

Determine whether or not the facility falls within the scope of the Convention (i.e.: is it a “hazardous activity”?)

Case study 1

Hazardous substances and quantity criteria

- Is one or more of the hazardous substances present or may be present at or in excess of the threshold quantities listed in Annex I?

Part II.

Named substances

<i>Substance</i>	<i>Threshold quantity (metric tons)</i>
30. Petroleum products and alternative fuels: (a) Gasolines and naphthas; (b) Kerosenes (including jet fuels); (c) Gas oils (including diesel fuels, home heating oils and gas oil blending streams); (d) Heavy fuel oils; (e) Alternative fuels serving the same purposes and with similar properties as regards flammability and environmental hazards as the products referred to in points (a) to (d)	25 000

Case study 1

Hazardous substances and quantity criteria

ATTENTION!

Data are given in cubic meters. The threshold is given in metric tons:
Need data on density for each substance to convert units -> SDS

Substance	Amount/tank capacity (m ³)	Density (kg/m ³)	Units conversion	Total amount (metric tons)	Threshold limit (metric tons)
Gasoline	2 x 10.000 1 x 5.000	750	$\frac{25.000 \times 750}{1000}$	18.750	
Diesel fuel	2 x 5.000	830	$\frac{10.000 \times 830}{1000}$	8.300	
Jet fuel	1 x 1.500	780	$\frac{1.500 \times 780}{1000}$	1.170	
Heavy fuel oil	1 x 1.500	950	$\frac{1.500 \times 950}{1000}$	1.425	
				29.645	25.000

29.645 > 25.000 : Facility within the scope of the Convention
(as regards quantity of hazardous substances)



Case study 1

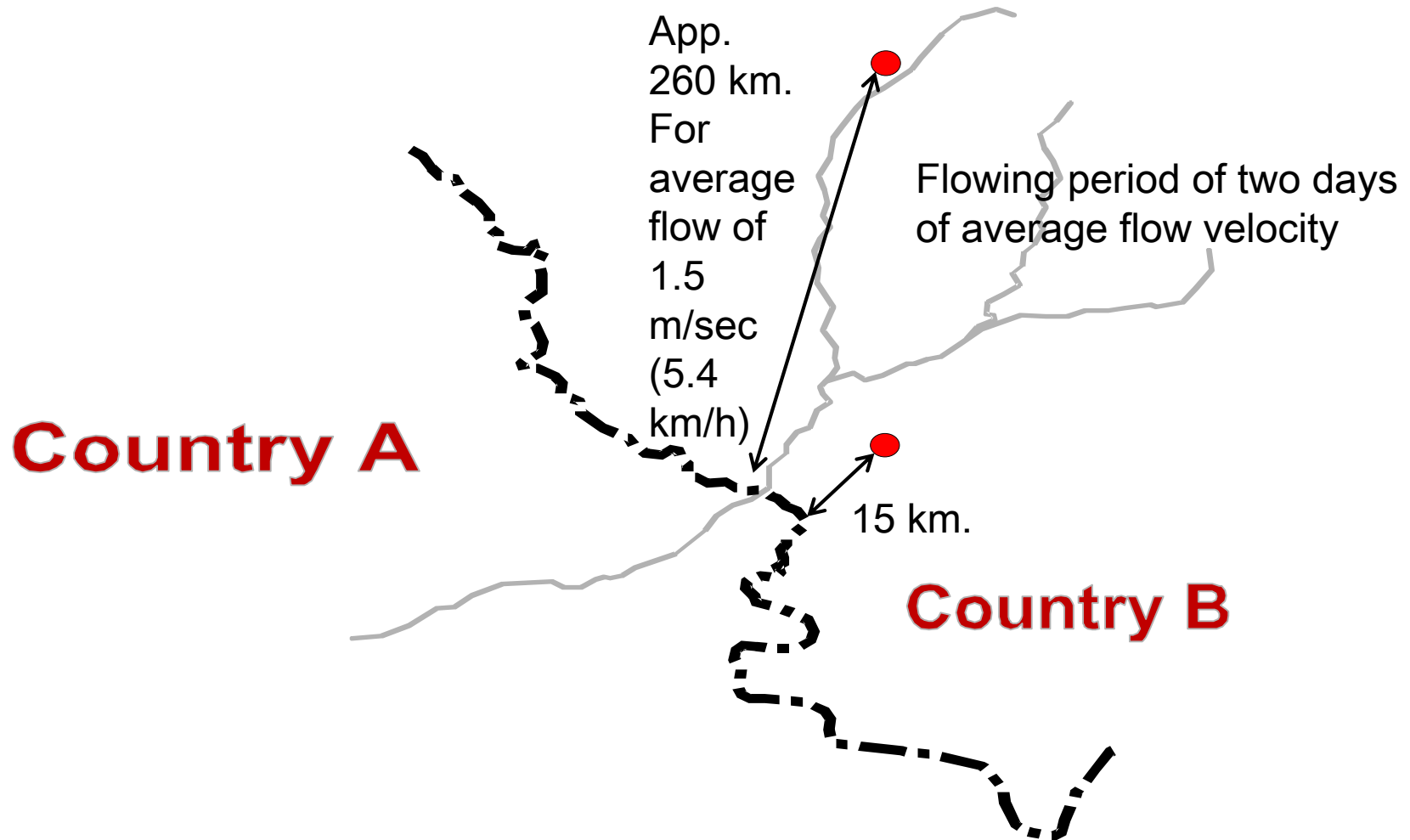
Location criteria

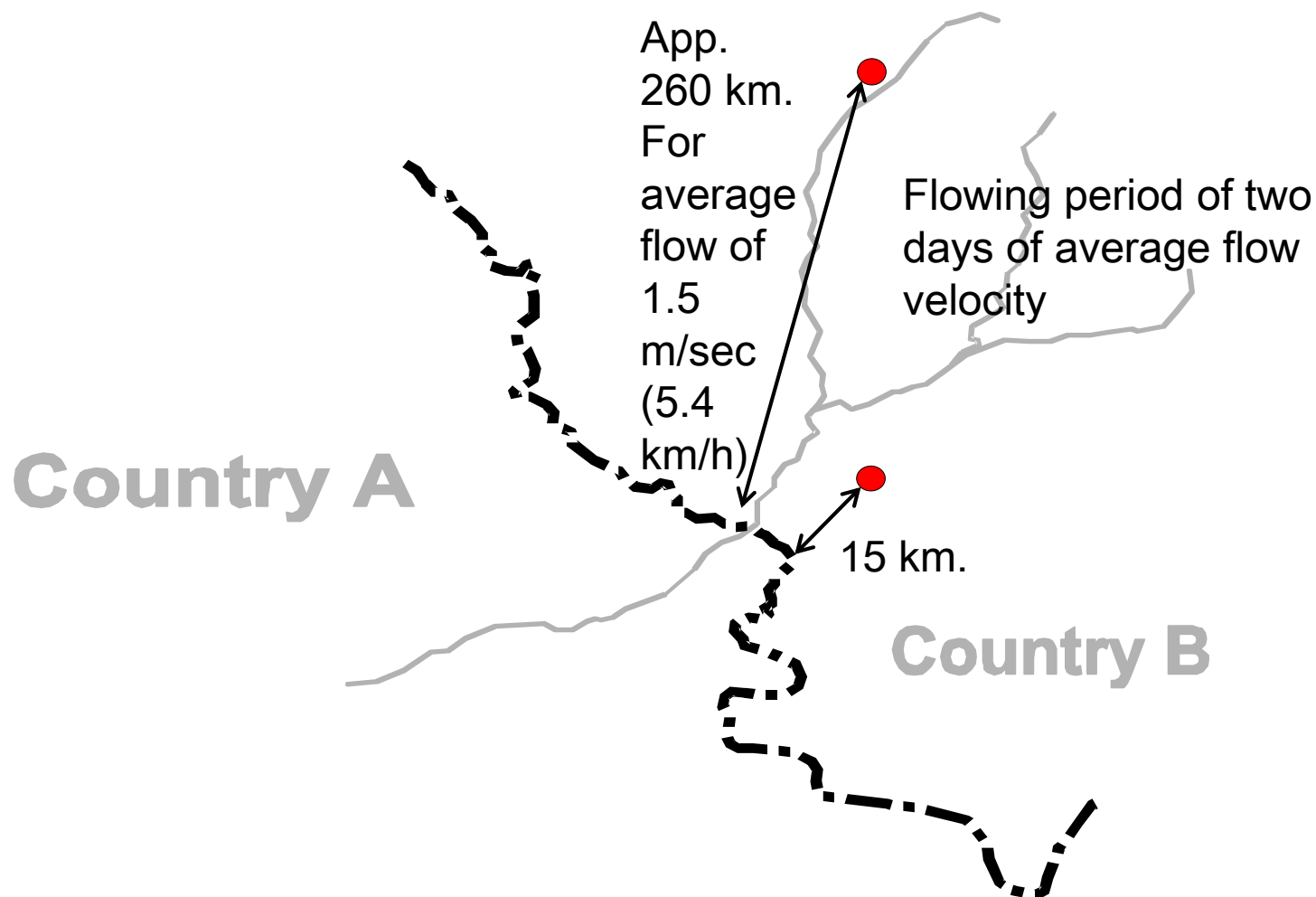
- **Location criteria: is the activity capable of causing transboundary effects?**
- Guidelines for location criteria
 - Within 15 kilometres from the border
 - for activities involving substances that may cause a fire or explosion or involving toxic substances that may be released into the air in the event of an accident
 - Along or within the catchment areas of transboundary and border rivers, transboundary or international lakes, or within the catchment areas of transboundary groundwaters,
 - for activities involving substances falling under category 3, 4, 5 or 8 of part I of Annex I to the Convention and that may be released into watercourses in the event of an accident. Whether or not such an activity is capable of causing a transboundary effect in such an event should be decided by the competent authority of the Party of origin, preferably in consultation with joint bodies. The decision should depend, among other things, on the existence of river warning and alarm systems and the distance* between the location of the hazardous activity and the border.

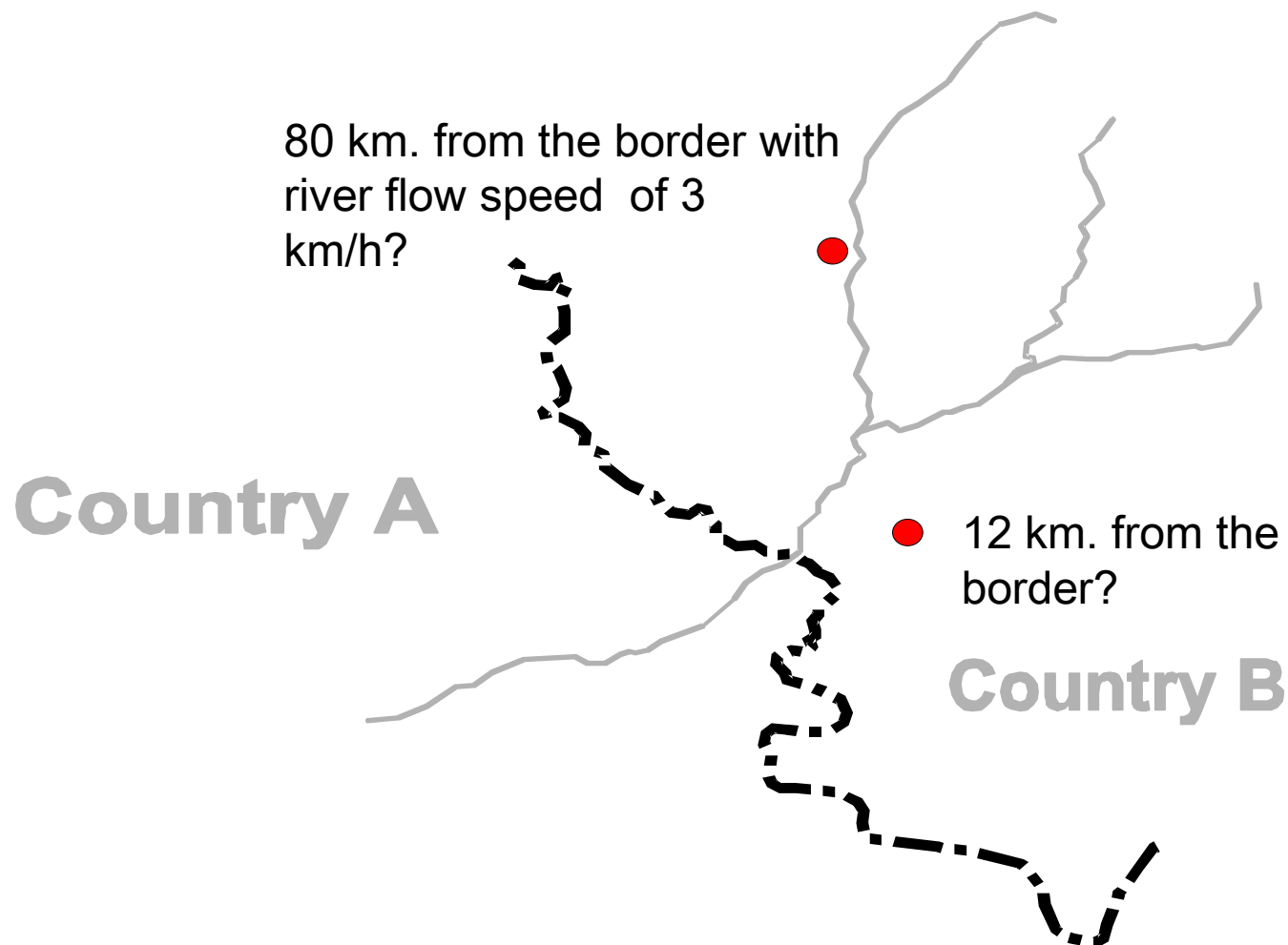
* this distance should correspond to approximately a flowing period of two days of average flow velocity

Case study 1

Location criteria







Case study 2

- Facility storing 21 tons of sodium cyanide
- The operator submitted information about the substance (SDS)
 - Corrosive to metals Cat.1
 - Acute toxicity (oral) Cat.1
 - Acute toxicity (dermal) Cat.1
 - Acute toxicity (inhalation) Cat.1
 - STOT- repeated exposure Cat.1
 - Aquatic toxicity, Acute 1

LD_{50} (rat) = 4.7 mg/l

LD_{50} (rabbit) = 10.4 mg/l

LC_{50} (rat, 4h) \leq 0.5 mg/l

LC_{50} (fish, 96h) = 0.04 mg/l

LC_{50} (crustacea, 96h) = 0.09 mg/l

EC_{50} (algae, 72h) = 0.051 mg/l



Determine whether or not the facility falls within the scope of the Convention (i.e.: is it a “hazardous activity”?)

Case study 2

- Is sodium cyanide present or may be present at or in excess of the threshold quantities listed in Annex I?
 - Not in the list of named substances in Part II
 - Acute toxicity Cat.1 (oral, dermal, inhalation)

Part I.

Categories of substances and mixtures not specifically named in Part II

<i>Category in accordance with the United Nations Globally Harmonized System (GHS) of Classification and Labelling of Chemicals</i>		<i>Threshold quantity (metric tons)</i>
1.	Acute toxic, Category 1, all exposure routes ²	20
2.	Acute toxic: Category 2, all exposure routes ³ Category 3, inhalation exposure route ⁴	200

21 tons > 20 : Facility within the scope of the Convention
(as regards quantity of hazardous substances)



Case study 2

- Location criteria

- Along or within the catchment areas of transboundary and border rivers, transboundary or international lakes, or within the catchment areas of transboundary groundwaters,
- for activities involving substances falling under category 3, 4, 5 or 8 of part I of Annex I to the Convention and that may be released into watercourses in the event of an accident. Whether or not such an activity is capable of causing a transboundary effect in such an event should be decided by the competent authority of the Party of origin, preferably in consultation with joint bodies. The decision should depend, among other things, on the existence of river warning and alarm systems and the distance* between the location of the hazardous activity and the border.

ATTENTION!

The categories referred to in the location criteria above refer to the old classification system. Based on the data provided, we need to find out the correspondence with the current GHS classification criteria.

* this distance should correspond to approximately a flowing period of two days of average flow velocity

Case study 2

- Location criteria

- for activities involving substances falling under category 3, 4, 5 or 8 of part I of Annex I to the Convention

Need to check the applicable criteria for each category in the notes

- Toxic substances*
- Very toxic substances*
- Oxidizing substances* and
- Substances dangerous for the environment*

Case study 2

• Location criteria

⁶ Very toxic: substances with properties corresponding to those in table 3 or table 4 and which, owing to their physical and chemical properties, are capable of creating industrial accident hazards (LD: lethal dose; LC: lethal concentration).

Table 3

LD ₅₀ (oral)(1) mg/kg body weight LD ₅₀ ≤ 25	LD ₅₀ (dermal)(2) mg/kg body weight LD ₅₀ ≤ 50	LC ₅₀ (3) mg/l (inhalation) LC ₅₀ ≤ 0.5
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(1) LD₅₀ oral in rats.

(2) LD₅₀ dermal in rats or rabbits.

(3) LC₅₀ by inhalation (four hours) in rats.

Acute toxicity Cat.1 (oral, dermal, inhalation)

LD50 (rat) = 4.7 mg/l

LD50 (rabbit) = 10.4 mg/l

LC50 (rat, 4h) ≤ 0.5 mg/l



⁹ Dangerous for the environment (LC: lethal concentration; EC: effective concentration; IC: inhibiting concentration) — toxic to aquatic organisms with long-term adverse effects in the aquatic environment with:

(a) Acute toxicity:

(i) 96 hr LC₅₀ (for fish): 1 mg/l < LC₅₀ ≤ 10 mg/l; or

(ii) 48 hr EC₅₀ (for daphnia): 1 mg/l < EC₅₀ ≤ 10 mg/l; or

(iii) 72 hr IC₅₀ (for algae): 1 mg/l < IC₅₀ ≤ 10 mg/l; and

(b) Persistency: the substance is not readily degradable or the log Pow (log octanol/water partition coefficient) ≥ 3.0

.. (unless the experimentally determined bio-concentration factor BCF ≤ 100).

Aquatic toxicity, Acute 1

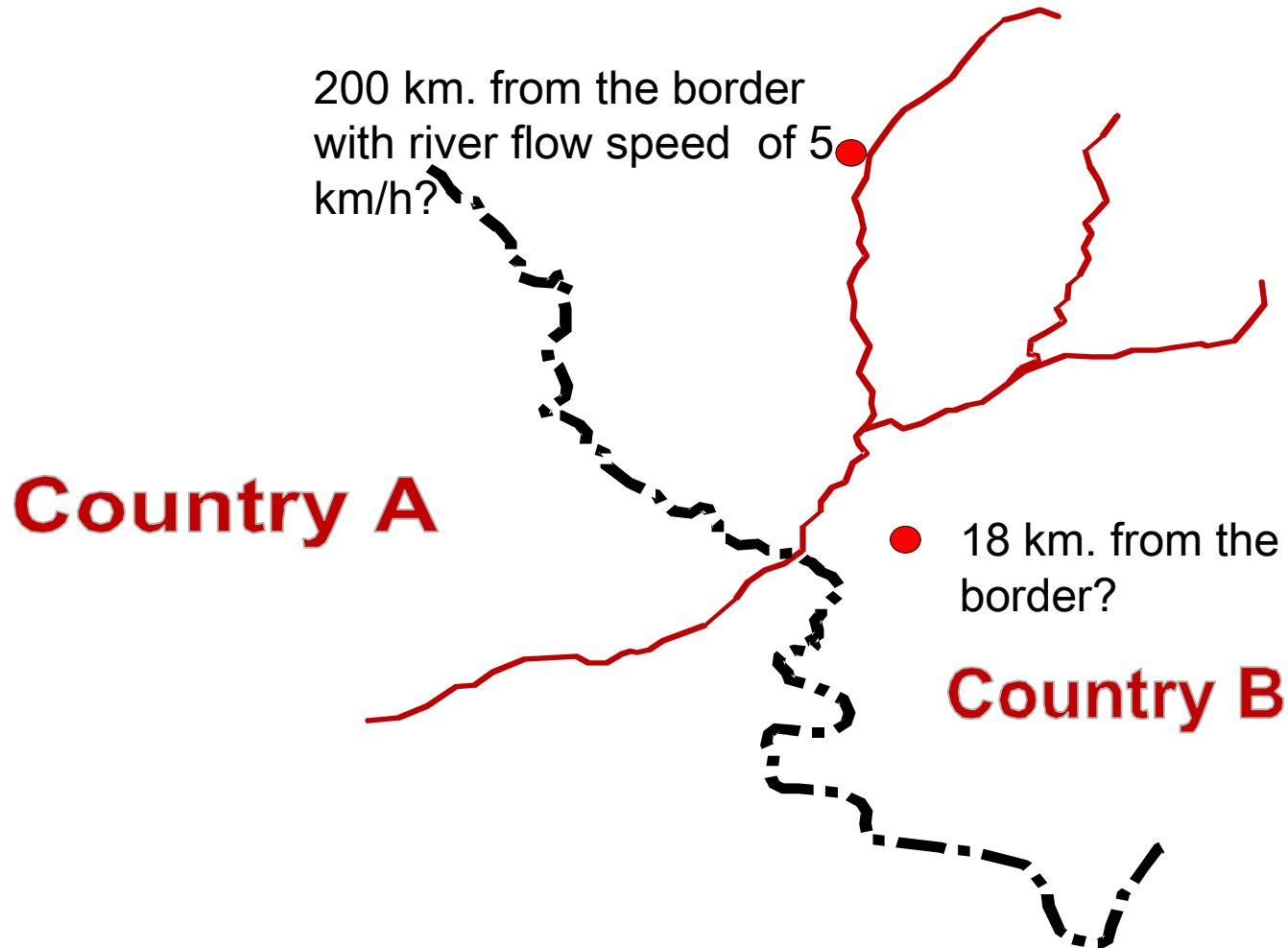
LC50 (fish, 96h) = 0.04 mg/l

LC50 (crustacea, 96h) = 0.09 mg/l

EC50 (algae, 72h) = 0.051 mg/l



Case study 2



Thank you!

