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IRSN

**IRSN expertise for the management of
post-accidental situations :
example of the zoning for the radiological
protection of populations**

IRSN's work on the management of post-accidental situations

- Field experiment following Chernobyl accident
- European programs
 - TEMAS
 - Contribution to FARMING and EURANOS programmes
- IRSN as an actor of the response system in the emergency phase
- IRSN as the major support of the French Safety Authority in the definition of post-accidental doctrine
 - Involvement in the French Post-accident Management Steering Committee (CODIR-PA)

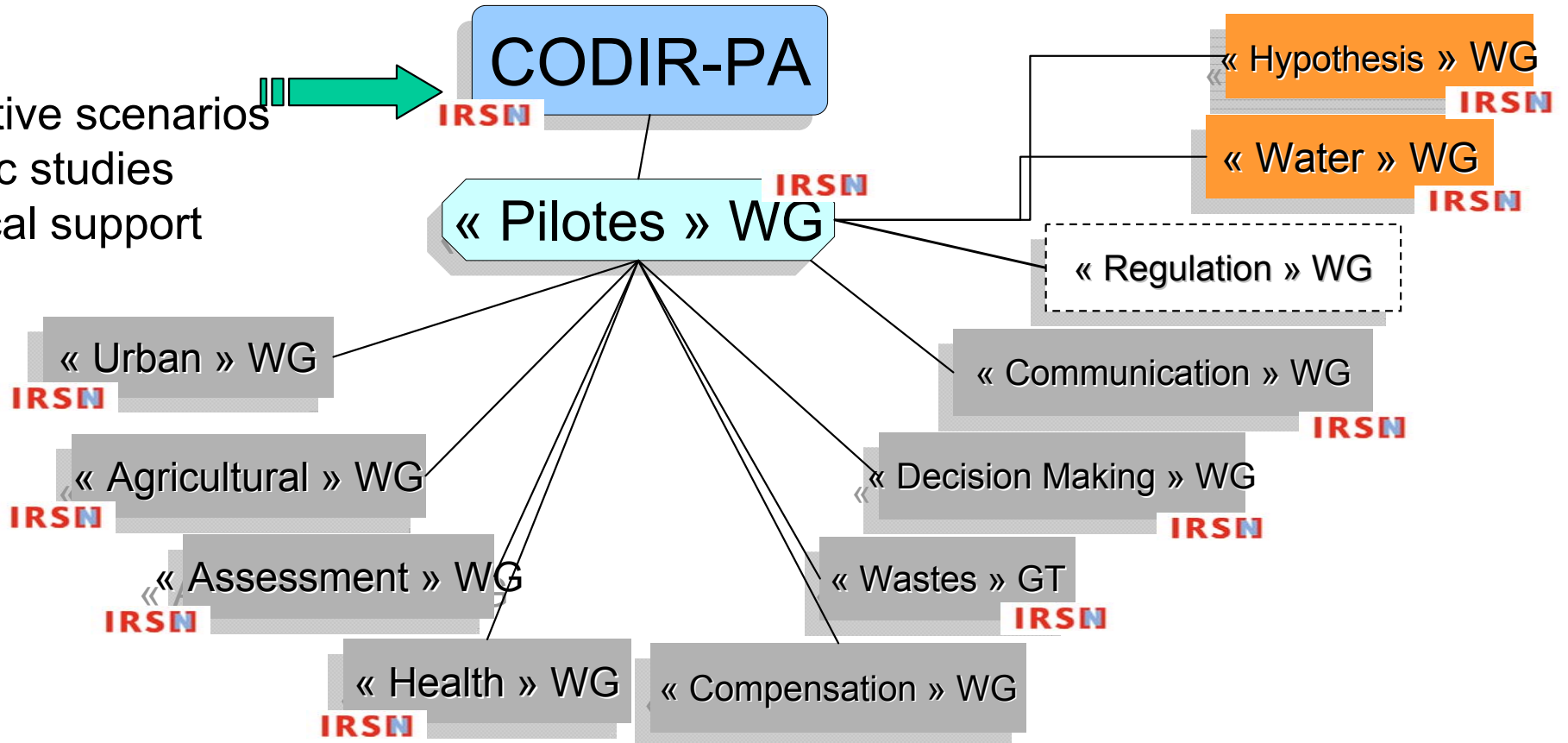
The French CODIR-PA

- From 2005 to 2010
- Working on the first year following a nuclear accident
- 120 persons
- Actors from various fields of competences
 - Gouvernement, local administration:
 - Experts (IRSN, INVS, AFSSA,..)
 - Associations
 - public representatives
 - Economical stakeholders

The French CODIR-PA

IRSN

- Illustrative scenarios
- Specific studies
- technical support

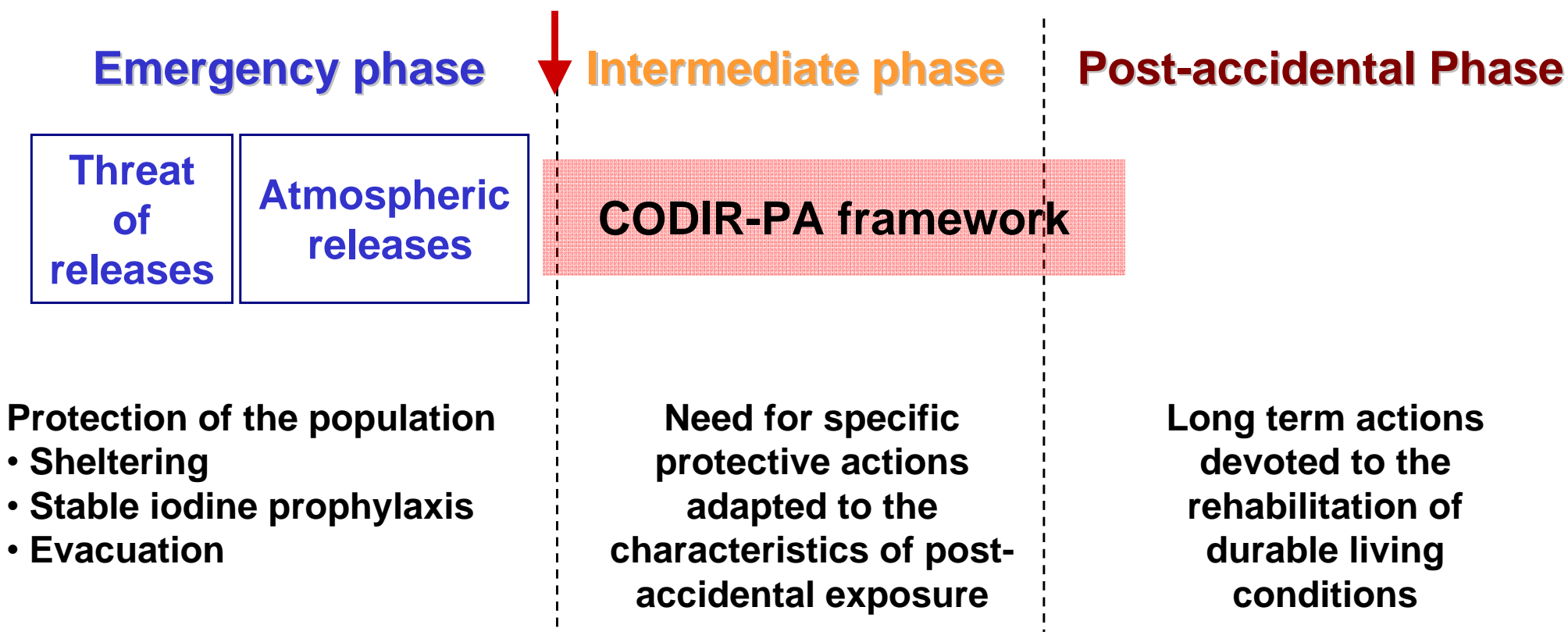


Example of field of investigation : Definition of strategies of protection of the population and relevant indicators

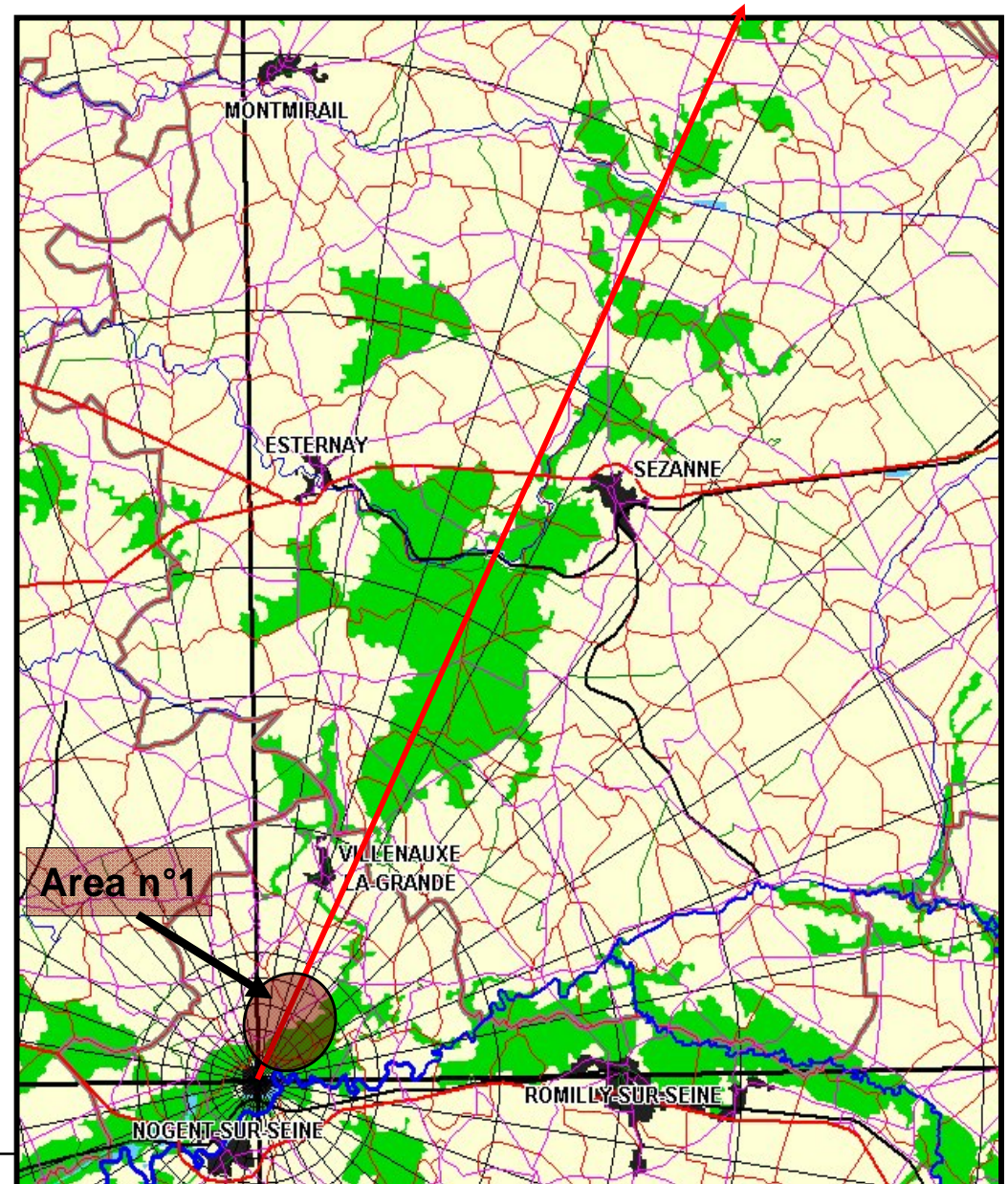
Strategies of protection of the population

- Along the different phases of a nuclear accident

**Decision on lifting
of emergency
counter-measures**



Areas for the protection of population to be defined by local public authorities, at the beginning of the intermediate phase



Area n°1 : Area where immediate relocating of local population is recommended to the authorities

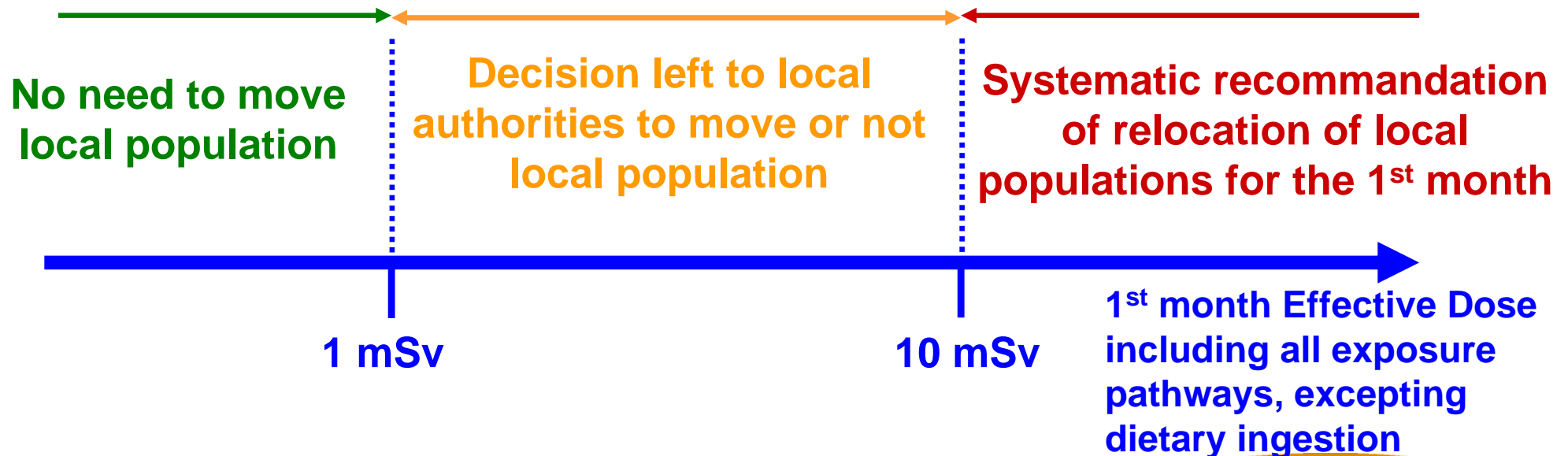
Guidance value based on a dose calculation including all exposure pathways except ingestion of contaminated foodstuff

Relocation area

- ➡ **Aim** : To decide whether or not the level of contamination require the relocation of population

⇒ The definition of this area doesn't take into account the possible counter-measures that would be apply in inhabited areas

- **Indicative criteria** : effective dose calculated on the 1st month after the accident for all exposure pathways excepting ingestion of locally produced foodstuff.
- **Indicative guidance values** :



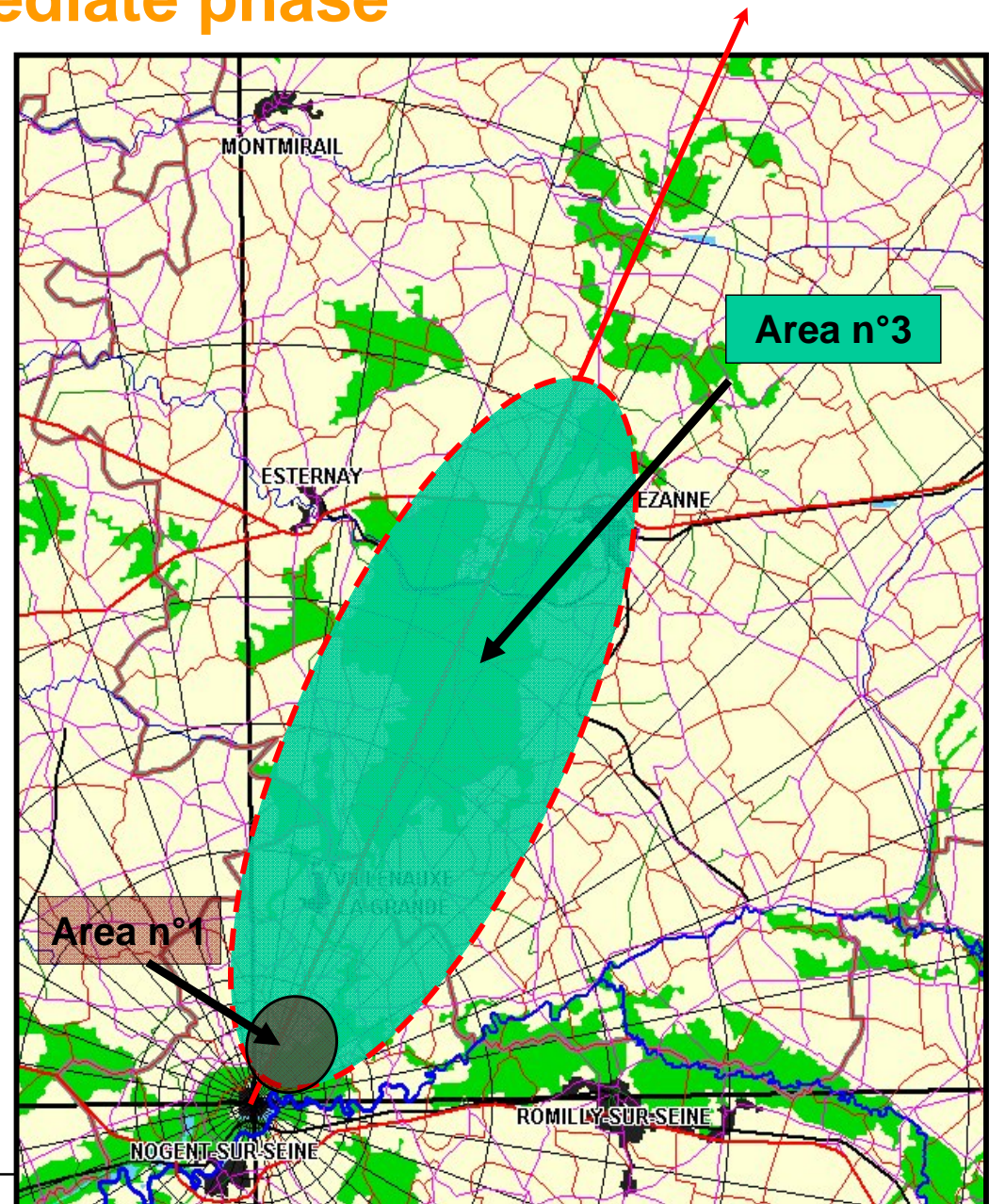
Areas for the protection of population to be defined by local public authorities, at the beginning of the intermediate phase

Area n°3 : MONITORING AREA
dedicated to the marketing survey of contaminated foodstuff

Guidance value : specific activity compared to ECFIL's

Area n°1 : Area where immediate relocating of local population is recommended to the authorities

Guidance value based on a dose calculation including all exposure pathways except ingestion of contaminated foodstuff



MONITORING AREA

- **Aim** : To organise a control of marketing of locally produced foodstuff regarding european or international regulation
 - ⇒- By establishment of food marketing prohibition [beginning of intermediate phase]
 - ⇒- By implementation of a systematic clearance monitoring of foodstuff organised by public authorities and stakeholders of food industries
- **Indicator** : specific activity of locally produced foodstuff
- **Intervention levels** : MPL's implemented in EC regulation following Chernobyl accident
- **Application** : At first, definition of the largest perimeter corresponding to the most sensitive product and then declinaison on specific areas for each category of foodstuff when monitoring systems have been set up.
- **Complementary actions** : dietary advices intended to local populations, particularly for those who are living in Monitoring area and consuming their own productions

Areas for the protection of population to be defined by local public authorities, at the beginning of the intermediate phase

Area n°3 : MONITORING AREA
dedicated to the marketing survey of contaminated foodstuff

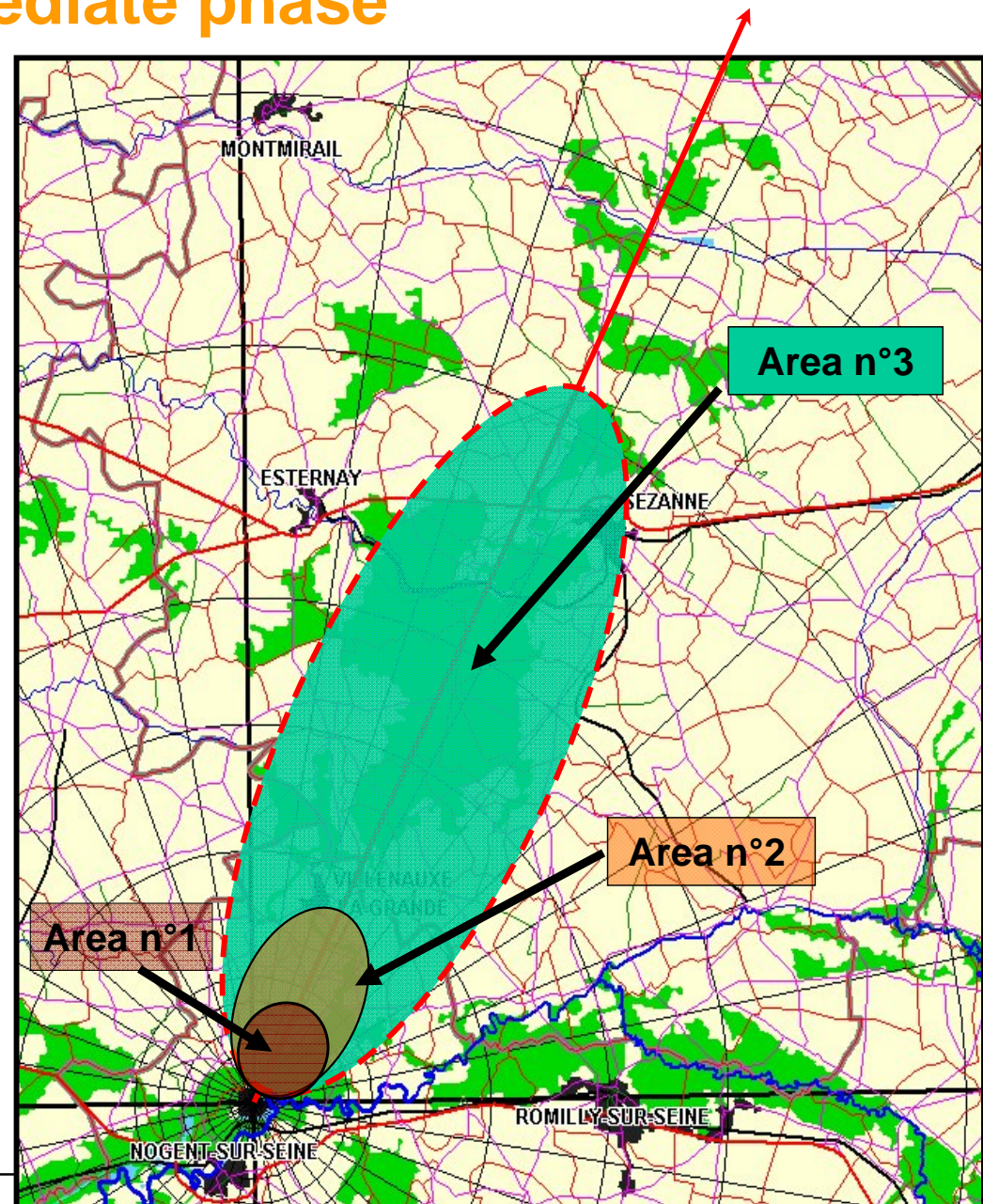
Guidance value : specific activity compared to ECFIL's

Area n°2 : FOOD PROHIBITION AREA where the consumption of locally produced foodstuff is forbidden

Guidance value based on a dose calculation including all exposure pathways

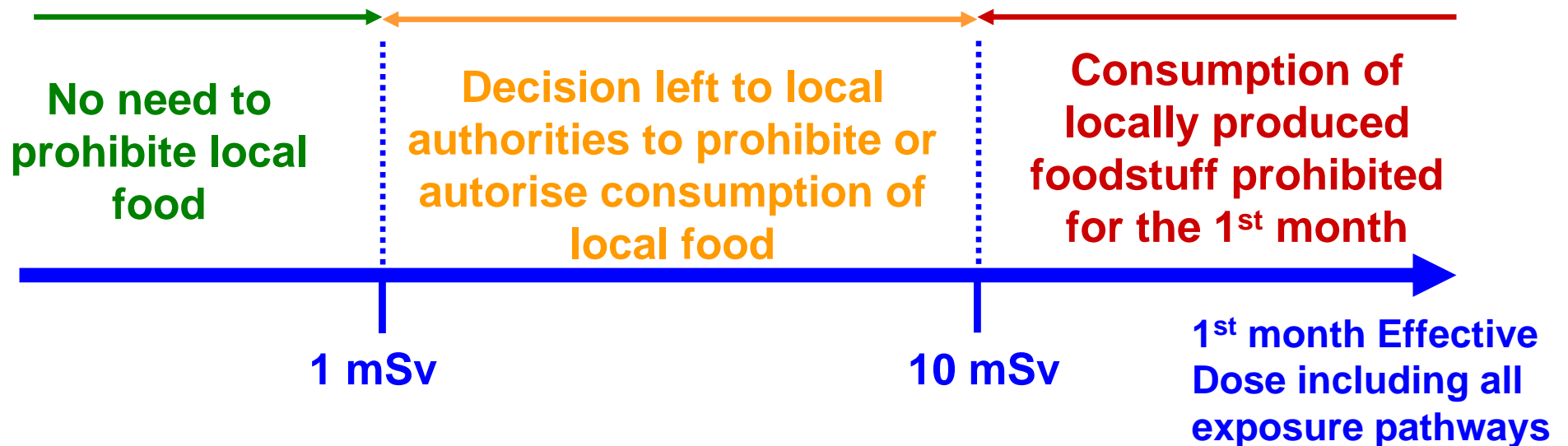
Area n°1 : Area where immediate relocating of local population is recommended to the authorities

Guidance value based on a dose calculation including all exposure pathways except ingestion of contaminated foodstuff



Food Prohibition Area

- ➡ **Aim** : To protect local population from consumption of locally produced foodstuff, marketed or not.
 - ⇒ **All** foodstuff produced in this area are declared unconsumable and unmarketable, whatever their contamination level
- **Indicative criteria** : effective dose calculated on the 1st month after the accident for all exposure pathways including ingestion of locally produced foodstuff.
- **Indicative guidance values** :



Present situation

- First elements of doctrine on protection of population in post-accident situations has been tested through 3 types of scenarios
 - Situations involving short atmospheric release (1h, 24h)
 - 2 on PWR, 1 concerning a release of α emitters (Pu)
- At national level, practice in crisis exercises
 - In 2008, first between radiation protection actors (IRSN, ASN)
 - Then with all stakeholders at national and local levels
- WGs with the services of the Departmental Administration in order to fit the first elements of doctrine to their needs in post-accident preparedness

Future prospects

- By the end of 2009, Handbook on decision making for the protection of the population at the end of the emergency phase or the early beginning of the intermediate phase
- Test of the doctrine with a severe accident scenario
 - Long atmospheric releases
 - Overlapping of emergency and post-accident phase
- Follow up of the work on the evolution of the protective areas
 - Combining the predictive approach adopted during the emergency phase and the early intermediate phase with a retrospective approach aiming at reconstructing the actual consequences of the accident