

Environmental Initial State Analyses Report



FUTUR
COLLISIONNEUR
CIRCULAIRE
Étude de faisabilité

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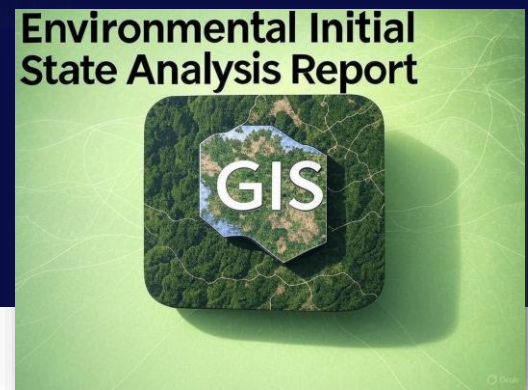
FUTURE
CIRCULAR
COLLIDER



Objectives and structure



Studies and results



Challenges and next steps



About EISA Objectives Structure and presentation

Environmental Initial State Analysis

- **A reference situation** (also called **baseline condition, initial state, or state zero**) used in environmental assessment and natural resource management.
- **Describes a specific area** (landscape, habitat, etc.) at **a defined point in time**.
- Serves as **baseline for evaluating future environmental changes** - both quantitatively and geographically.

It is a comprehensive assessment that evaluates the current environmental conditions before any new activities, changes, or improvements are implemented.



Objectives

The FCC scenario developed with early consideration of territorial and environmental constraints across the Geneva canton and Ain and Haute-Savoie departments, using a sensitivity grid.

EISA's key objectives:

- Provide **as complete and accurate description as possible** of the current situation, including the environmental, social, and economic characteristics of the territory concerned.
- **Assess the environmental initial state** of eight surface sites to support feasibility in a transnational context.
- Established a **baseline reference** for assessing impacts and proposing mitigation measures.
- **Guide site optimization** toward layouts that minimize environmental impacts (principle of avoidance).
- Laid the **groundwork for future regulatory impact evaluation**.



Methodology overview

Goal: Create a structured environmental initial state analysis report for the Future Circular Collider (FCC) feasibility study, integrating a transboundary environmental assessment aspect in France and Switzerland.

Approach:

- **Regulatory Alignment:** Incorporates French (Code de l'environnement, Articles L.122-1, R.122-1) and Swiss (LPE Articles 10a-10d, OEIE) environmental regulations.
- **Best Practices:** Draws from French (Cerema 2020) and Swiss (OFEV 2009) guidelines, and case studies like **Grand Paris Metro**, **CERN's LEP/LHC**, **Iter** and other.
- **Taxonomy Integration:** Uses FCC environmental taxonomy to organize themes (e.g., air, water, biodiversity) and address differences (e.g., hydrobiological aspects in the natural environment theme (CH) vs physical environment (FR)) to ensure compliance.



Scope of the EISA Report

1: Presentation:

- the general context,
- the origin of the project,
- the constraints,
- the regulatory framework,
- the methodology.

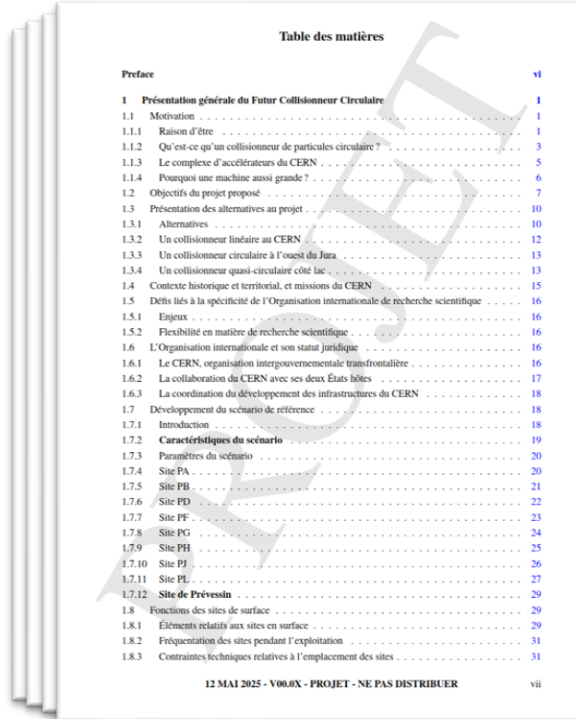
2: Detailed description of the environmental initial state, covering:

- the physical environment (geology, hydrology, climate, air quality),
- the natural environments (biodiversity, natural habitats, ecological continuities),

- the human environment (demography, urban planning, mobility, heritage, economy, health),
- economic and agricultural dynamics,
- elements related to natural and technological risks.

3: Future evolution

- description of the likely evolution of the territory in the absence of implementation of the FCC,
- constraints and opportunities related to other projects.



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Innovative Documentation Solutions

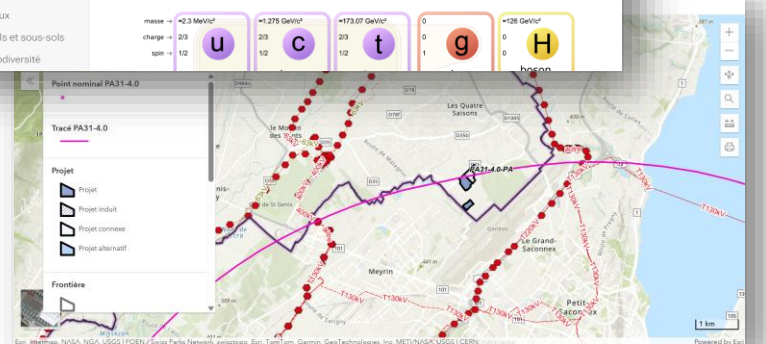
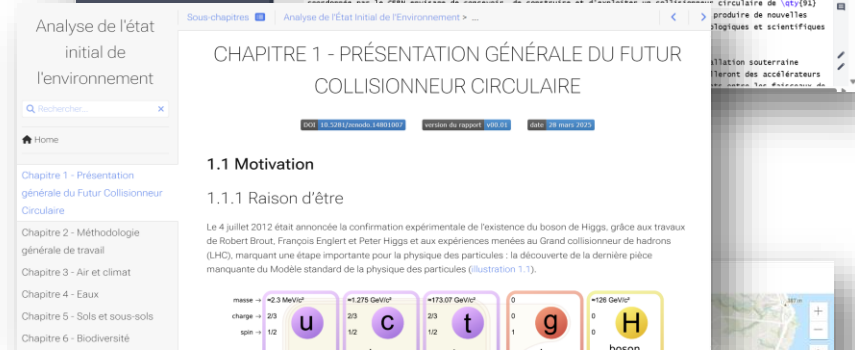
Challenge: Manage complex, voluminous data for a binational audience.

Proposed Solutions:

- **Classic Report:** Traditional paper-based, robust but cumbersome for updates and navigation.
- **Interactive Report:** Web-based platform with GIS integration, enabling thematic and spatial data searches, suited for final dissemination.
- **Document Composition System:** Hybrid approach using LaTeX/Overleaf, separating content into modular “bricks” for flexible PDF/web outputs, adaptable to French/Swiss formats.

Tools: Overleaf, ArcGIS, plasTeX for HTML conversion.

Advantages: Enhances accessibility, supports multilingual editing, and ensures regulatory compliance.





EISA studies Results

Methodology for FCC Environmental Studies

Consortium & Governance

- Interdisciplinary Franco-Swiss team led by **SEM (SETEC, ECOTEC Environnement SA, MARCELEON)** with external experts in acoustics, biodiversity, agriculture, drone recordings.
- Shared commitment to a transparent approach to conducting the initial state analysis.

Project contractor



European Organization for Nuclear Research
Organisation européenne pour la recherche nucléaire

Lead Firm



Partners



Subcontractors



setec
international

Thierry Valleix

Jean-Francois Vian

other

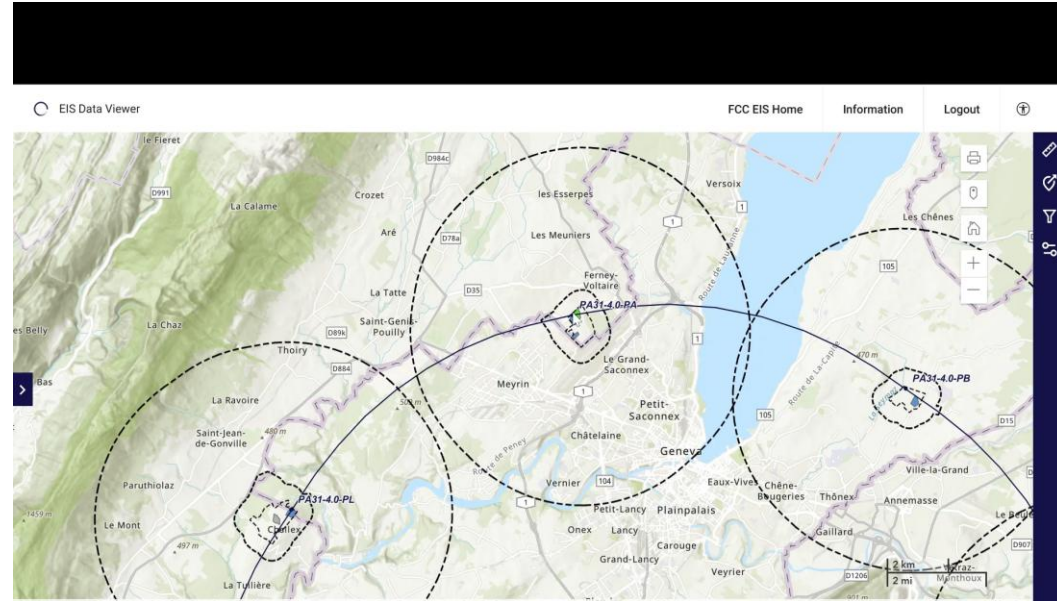


Territorial Coverage

Focus on areas earmarked for the eight surface sites (permanent land-use changes).

Study Areas, tailored by theme (e.g., larger for water, patrimony, smaller for noise, air quality, light pollution):

- **ZIP:** Surface sites boundaries for detailed data collection.
- **ZEI (16–100 ha):** Immediate surroundings for a subsequent assessment of the direct impact on the local environment.
- **ZER (500m–1km):** Transition zone for diffuse impacts (e.g., ecological flows) and for more appropriate design integration to minimize potential effects.
- **ZEE (+/- 5km):** Broader territory to assess the long-term effects and changes caused by global environmental dynamics (e.g., changing climatic conditions or availability of natural resources)



Data Collection:

- Bibliographic: regulatory texts, institutional databases (e.g., Biodiv’AURA, INPN), urban plans, GIS mapping, EISA of other projects.
- Fieldwork: air quality, soil, noise, biodiversity inventories (Feb 2023–Aug 2024, 2025 ongoing).
- Stakeholder: local authorities, local associations.

Tableau 0.2 – Sources bibliographiques

| T | Thématique | Source française | Source suisse |
|----------|---|---|---|
| A | Air et climat | Infoclimat, RéseauClimatAction, WeatherSpark, OMS, CITEPA, AASQA, PCAET | Office fédéral de météorologie et de climatologie, MétéoSuisse, WeatherSpark, OMS |
| | Eaux | Atlasanté, Géorisques, Agence de l’Eau, EauFrance, BNPE | Office Fédéral de l’Environnement, Système d’information du territoire à Genève (SITG), SIG l’Eau de Genève |
| | Sols et sous-sols | Infoterre, Google Earth, Banque du Sous-Sol du BRGM, Géoportail, GIS Sol | Google Earth, SITG |
| B | Biodiversité | Centre National de la Propriété Forestière (CNPF), Institut national de l’information géographique et forestière (IGN), Inventaire national du patrimoine naturel (INPN), Observatoire de la Biodiversité en Auvergne-Rhône-Alpes (Biodiv’AURA), OpenObs, Réseau Partenarial des Données sur les Zones Humides – (RPDZH) | Faune Genève, InfoSpecies, Office Fédéral de l’Environnement (OFEV), SITG |
| Fon d | Fonctionnalités des milieux naturels | Géoportail de l’Urbanisme, IGN, Plan Local d’Urbanisme (PLU) | SITG |
| U am d | Urbanisme et aménagements du territoire | IGN, Géoportail de l’Urbanisme | SITG |
| N de | Mobilités et déplacements | Institut national de la statistique et des études économiques (INSEE), IGN, General Transit Feed Specification, Open Street Map, Geovelo, Google Traffic, Données de la Société Nationale des Chemins de fer Français (SNCF) | Office cantonal de la statistique (OCSTAT), SITG, General Transit Feed Specification, Open Street Map, Geovelo, Office Fédéral de la Statistique, Master Plan 2040 du CERN, Google Traffic, Données de Transports Publics Genevois (TPG), Données des Chemins de Fer Fédéraux Suisses (CFF) |
| hu ag st | Activités humaines (hors agriculture et sylviculture) | INSEE, dont base SIRENE, PLU, Divers sites internet institutionnels dont Office de Tourisme | SITG, Répertoire des entreprises du Canton de Genève, Plan Directeur Cantonal 2030 |
| A | Agriculture | Géoportail, PLU, Règlement National d’Urbanisme (RNU), Schéma de cohérence territoriale (SCoT), Agreste | Plan directeur communal (PDCoM), Plan directeur cantonal (PDCa), Office fédéral de la statistique, Agroscope, SITG |
| S | Sylviculture | CNPF, IGN, PLU, Sites internet des Départements de l’Ain et de la Haute-Savoie | SITG |
| i arc a | Patrimoine culturel, architectural et archéologie | IGN | SITG |
| | Paysage | IGN | SITG |
| | Bruit | Carte de bruit stratégique (CBS), Plan d’exposition au bruit (PEB) | SITG |
| | Vibrations | Géorisques, Infoterre, Métorage | SITG, Métorage |
| | Pollution lumineuse | Association d’Astronomie du Vexin (AVEX) | Association d’Astronomie du Vexin (AVEX), SITG |
| Ra | Rayonnements | Institut de Radioprotection et de Sécurité Nucléaire (IRSN), Autorité de Sécurité Nucléaire (ASN), Agence internationale de l’énergie atomique (IAEA) | SITG, Division de Radioprotection |
| | Risques et sécurité | Géorisques, Infoterre, IGN, PLU, Plans de Prévention des Risques, Document d’information communal sur les risques majeurs (DICRIM), Atlas des Zones Inondables, Territoires à Risques Importants d’Inondation, Service de l’Ecologie et de l’Eau, IRSN, Base de Données des Failles potentiellement Actives, Carte de Localisation des Phénomènes d’Avalanche, INERIS, Base de données BASIAS, BASOL et SIS | SITG |
| Au d me | Autres projets d’aménagements existants | Sites internet des communes traversées par le projet, Missions régionales d’autorité environnementale (MRAe) | Site internet du canton de Genève, Site internet du Grand Genève, SITG |

Environmental stake analysis

Based on several perspectives:

- physical and technical constraints of the surface site area,
- preservation and enhancement of environmental elements,
- compliance with regulatory and strategic frameworks, including sustainability and climate goals.

Stakes Prioritization: based on regulatory protection, environmental indicators, territorial context, and expert input, using standardized criticality scales

Tableau 0.3 – Échelle de hiérarchisation des enjeux

| | | | | | |
|-----------|-------------------|--------------|-------------|------------|-----------------|
| Enjeu nul | Enjeu très faible | Enjeu faible | Enjeu moyen | Enjeu fort | Enjeu très fort |
|-----------|-------------------|--------------|-------------|------------|-----------------|

Tableau 0.4 – Méthode d'évaluation des enjeux pour la faune et flore en France selon le niveau de protection et le niveau de menace (Listes rouges de France et d'Auvergne-Rhône-Alpes)

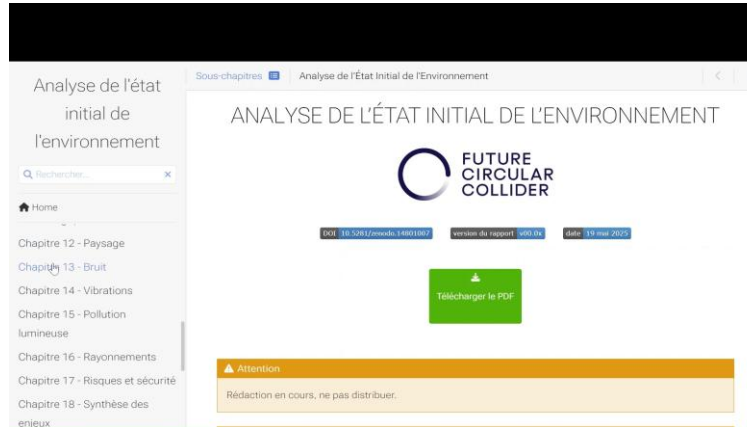
| | Espèce non protégée | Espèce non protégée dans la directive | Espèce protégée | Espèce protégée dans la directive |
|--|---------------------|---------------------------------------|-------------------|-----------------------------------|
| Espèce menacée (CR, EN) à l'échelle régionale ou nationale | Enjeu fort | Enjeu très fort | Enjeu très fort | Enjeu très fort |
| Espèce vulnérable (VU) à l'échelle régionale ou nationale | Enjeu moyen | Enjeu fort | Enjeu fort | Enjeu très fort |
| Espèce quasi-menacée (NT) à l'échelle régionale ou nationale | Enjeu faible | Enjeu moyen | Enjeu moyen | Enjeu fort |
| Espèce non menacée, étant assez abondante à l'échelle nationale et régionale (LC) | Enjeu très faible | Enjeu faible | Enjeu faible | Enjeu moyen |
| Espèce sans statut à l'échelle nationale ou régionale (DD, NE, NA, ou aucune indication) | Enjeu non évalué | Enjeu très faible | Enjeu très faible | Enjeu faible |

Tableau 0.5 – Méthode d'évaluation des enjeux pour la faune et la flore en Suisse selon le niveau de protection et le niveau de menace (Listes rouges de Suisse et de Genève)

| | Espèce non protégée (CH/GE) | Espèce partiellement protégée ou protégée (CH/GE) |
|--|-----------------------------|---|
| Espèce menacée (CR, EN) à l'échelle régionale ou nationale | Enjeu fort | Enjeu très fort |
| Espèce vulnérable (VU) à l'échelle régionale ou nationale | Enjeu moyen | Enjeu fort |
| Espèce quasi-menacée (NT) à l'échelle régionale ou nationale | Enjeu faible | Enjeu moyen |
| Espèce non menacée, étant assez abondante à l'échelle nationale et régionale (LC) | Enjeu très faible | Enjeu faible |
| Espèce sans statut à l'échelle nationale ou régionale (DD, NE, NA, ou aucune indication) | Enjeu non évalué | Enjeu très faible |

Environmental study coverage

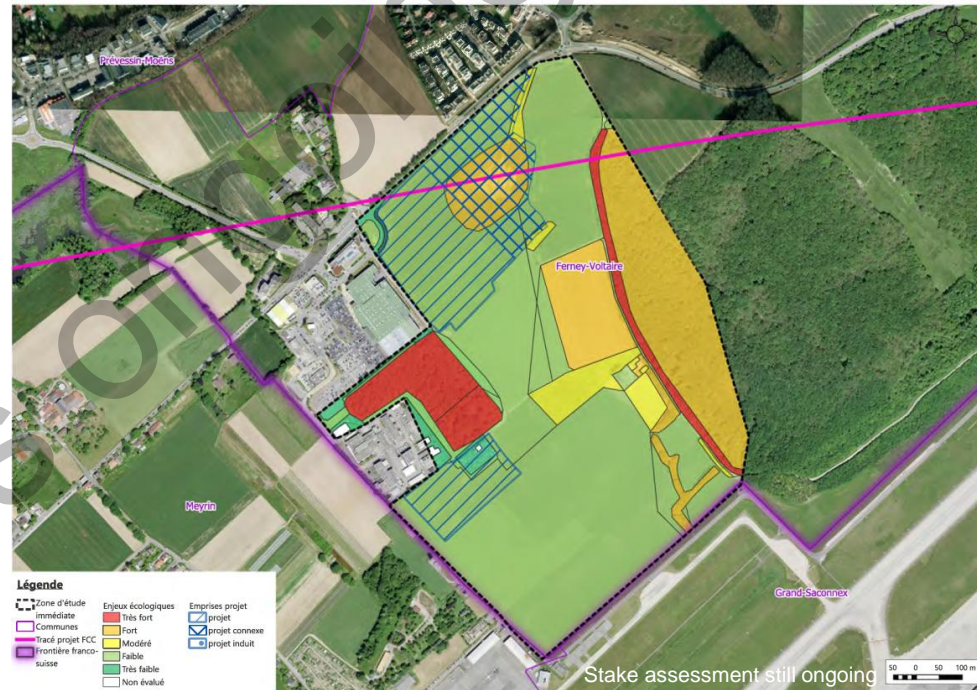
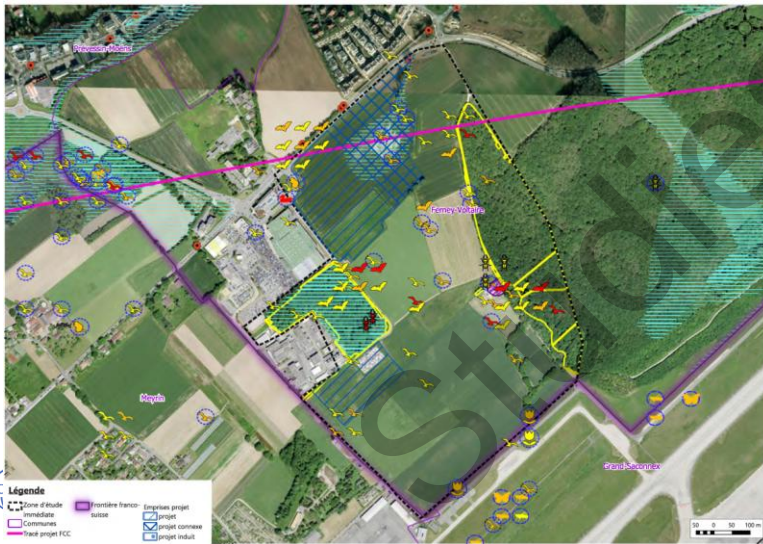
- Soil
- Landscape
- Forest and agriculture
- Background noise with mp3 recordings
- Air quality (2 campaigns)
- Traffic study
- Wetlands
- Biodiversity (habitats, fauna and flora, other)
- Aerial imaging
- Economy and social topics
- Other ongoing studies to be completed in 2025



Surface site PA - Ferney-Voltaire, France

Ecological Value: ZIP on a low-value agricultural land but near sensitive habitats (high-value wetland and forest).

Other stakes: agricultural land, car traffic more intense during rush hour.



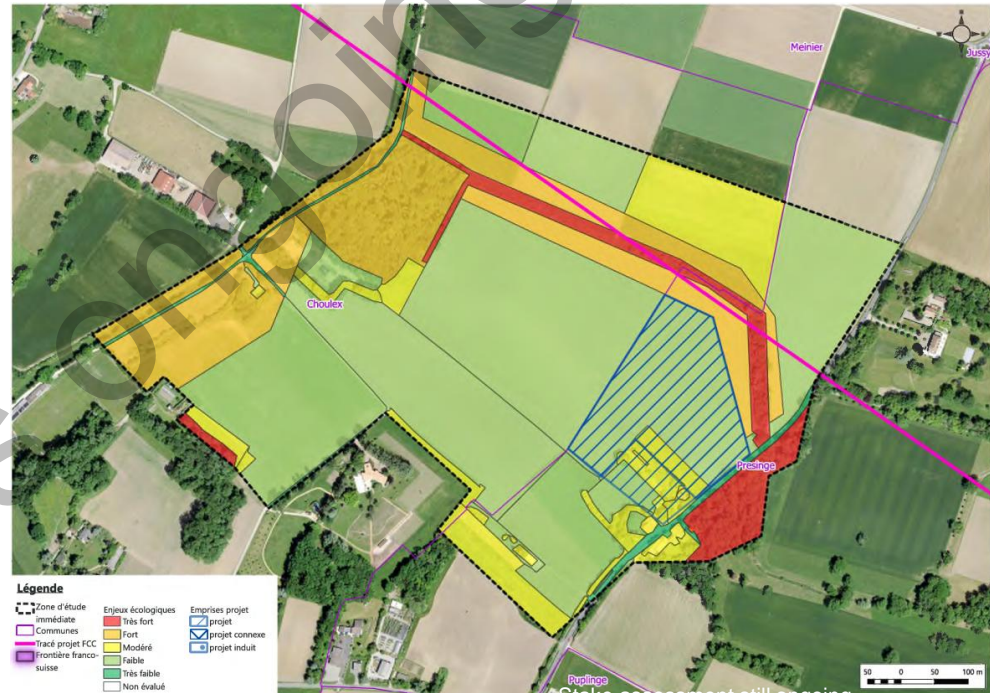
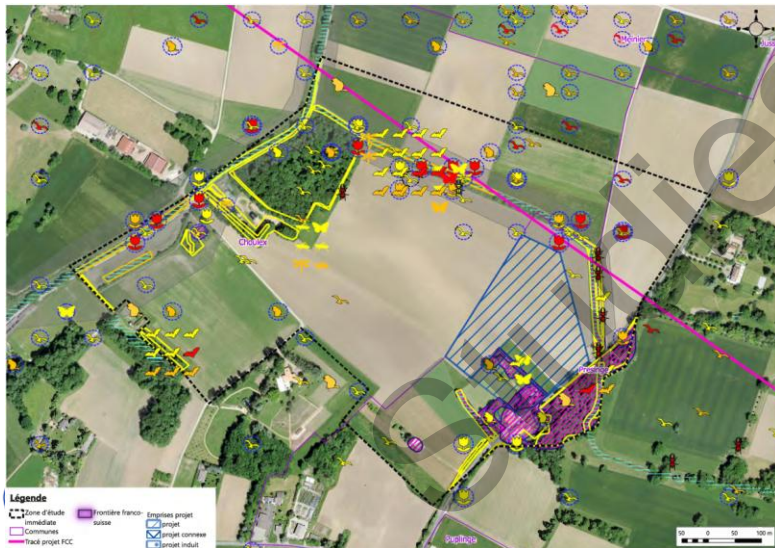
Attention point: wetland for birds' migratory stopovers and forest edges with bats and insect species presence → focus on improvement.

traffic constraints and low light pollution in south.

Surface site PB - Presinge, Switzerland

Ecological Value: ZIP mainly on a low-value agricultural land but near high-value hedgerows and stream; ZEI includes potential presence of bat.

Other stakes: protected agricultural land, agricultural landscape of the area.



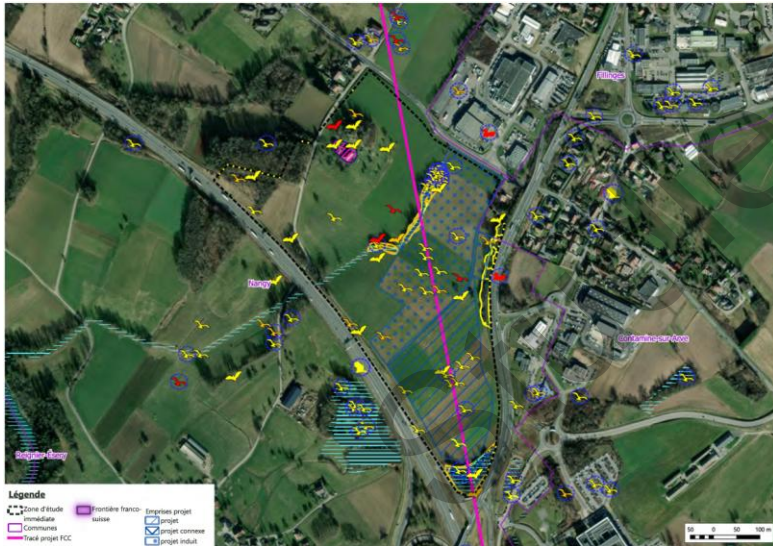
Attention point: hedgerows and stream used by small fauna, important insects; assess the presence of bat roosts

Low light pollution and landscape integration.

Surface site PD - Nangy, France

Ecological Value: ZIP on a low-value agricultural land. Diverse hedgerows, old orchard, isolated trees and small wetlands in ZEI.

Other stakes: major roads with heavy traffic, agricultural land.

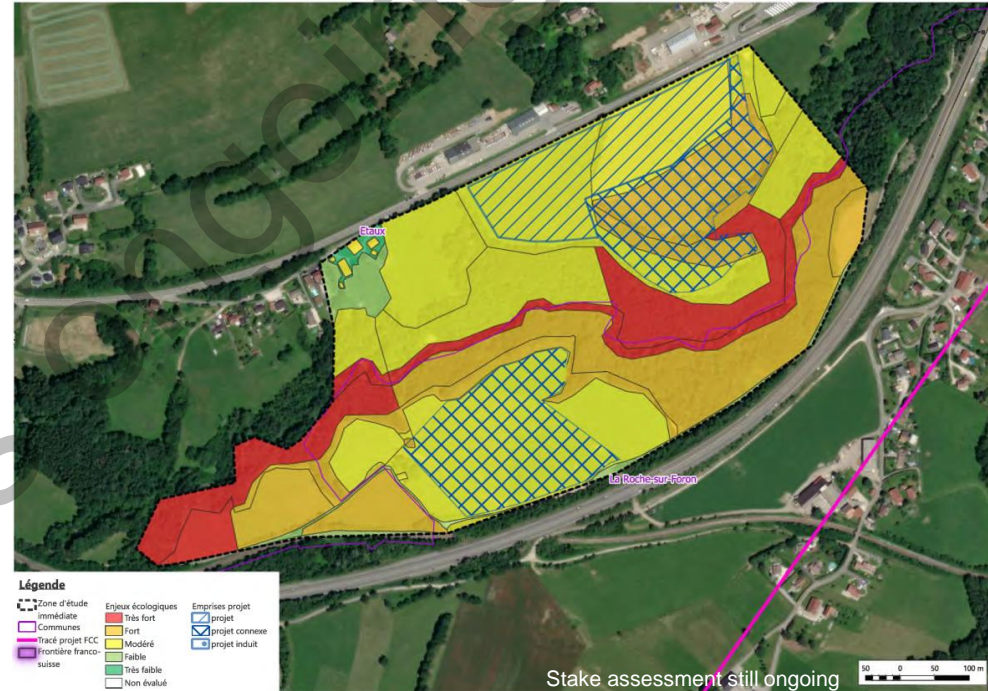
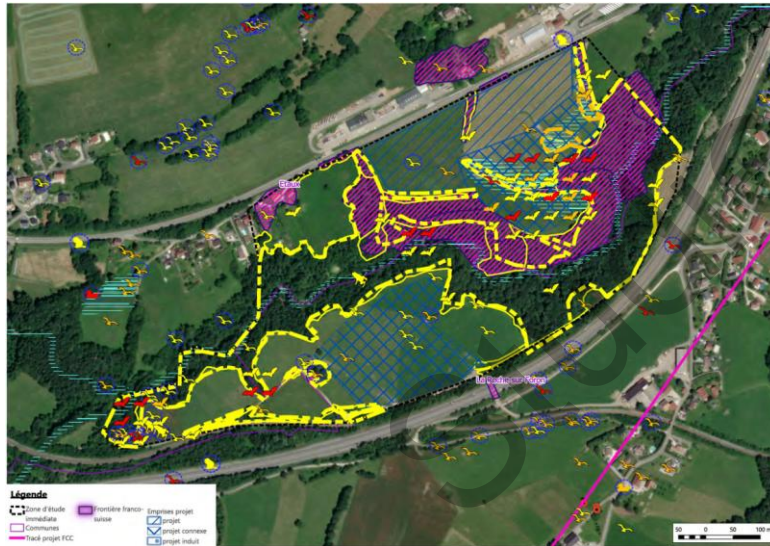


Attention point: traffic, hedgerows, bird populations hunting in the area.

Surface site PF - Éteaux, France

Ecological Value: ZIP on moderate-value prairie/hedge; ZEI includes high-value forest and Vuaz stream, wetland area near the ZIP (based on the pedological surveys). Ecological corridor.

Other stakes: slope toward the forest. Area with medium risk of clay shrinkage and swelling.



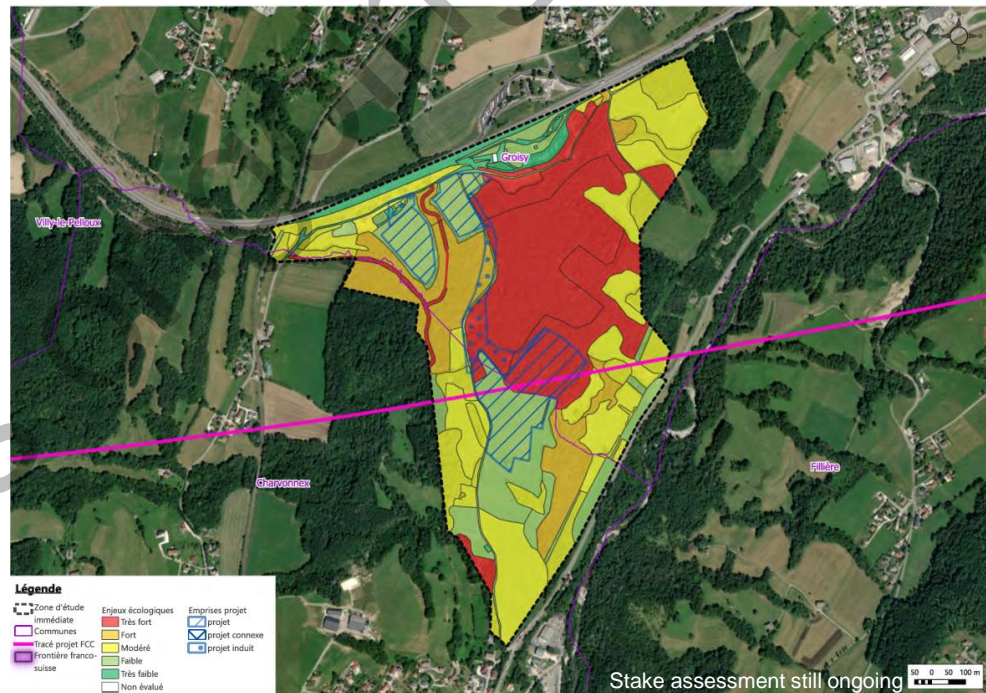
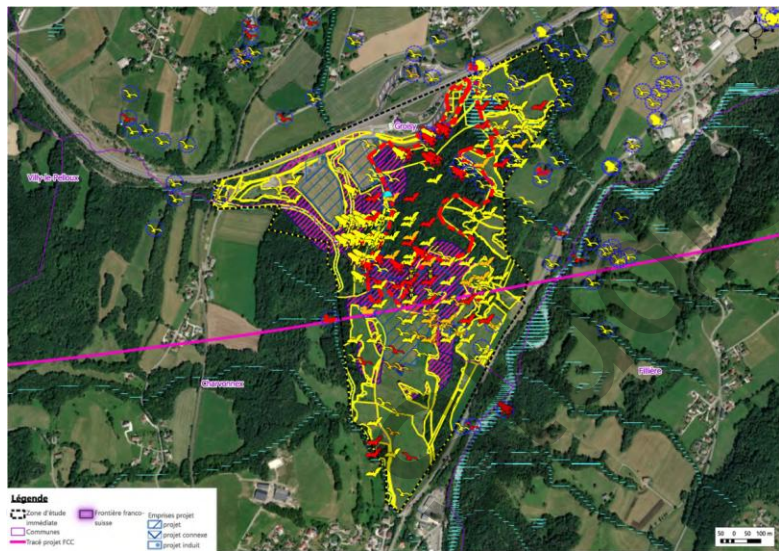
Attention point: Vuaz stream and wetland area; assess the functionality of the ecological corridor → possibility of improvement

Light pollution, slopping area.

Surface site PG - Charvonnex - Groisy, France

Ecological Value: ZIP partly on high-value forest edge; ZEI important for amphibians, bats and birds. Patrimony flora species inventoried in the centre of ZEI.

Other stakes: steep slope towards the south.



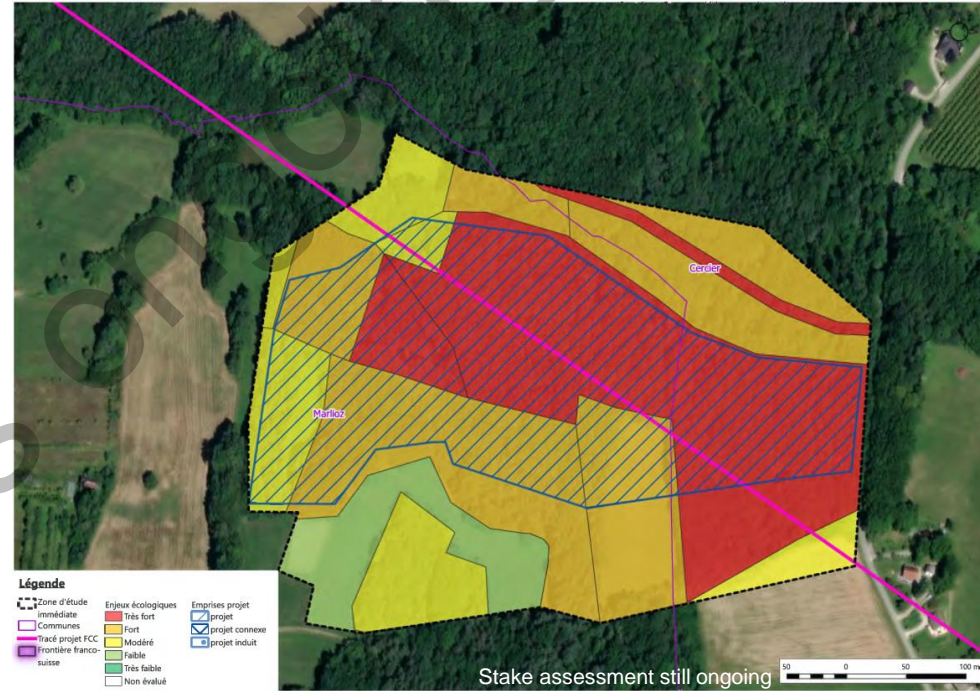
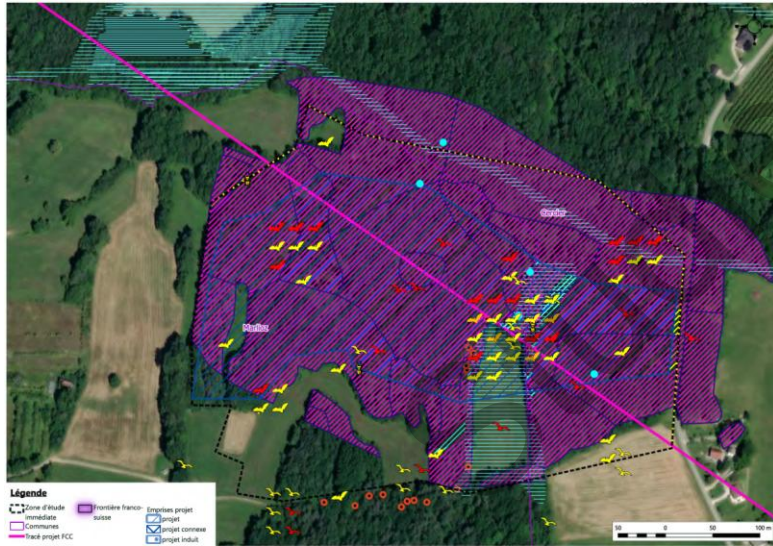
Attention point: forest important for amphibians, bats and birds' populations. Attention to light pollution.

Steep slope in south → landscape integration opportunity

Surface site PH - Cercier - Marlioz, France

Ecological Value: forest with presence of important bats and birds' species; wetland in ZIP (pedological surveys) and stream in ZEI; moderate-value open areas in ZEI.

Other stakes: very steep slopes of between 12 and 15%, forested landscape and natural zone.



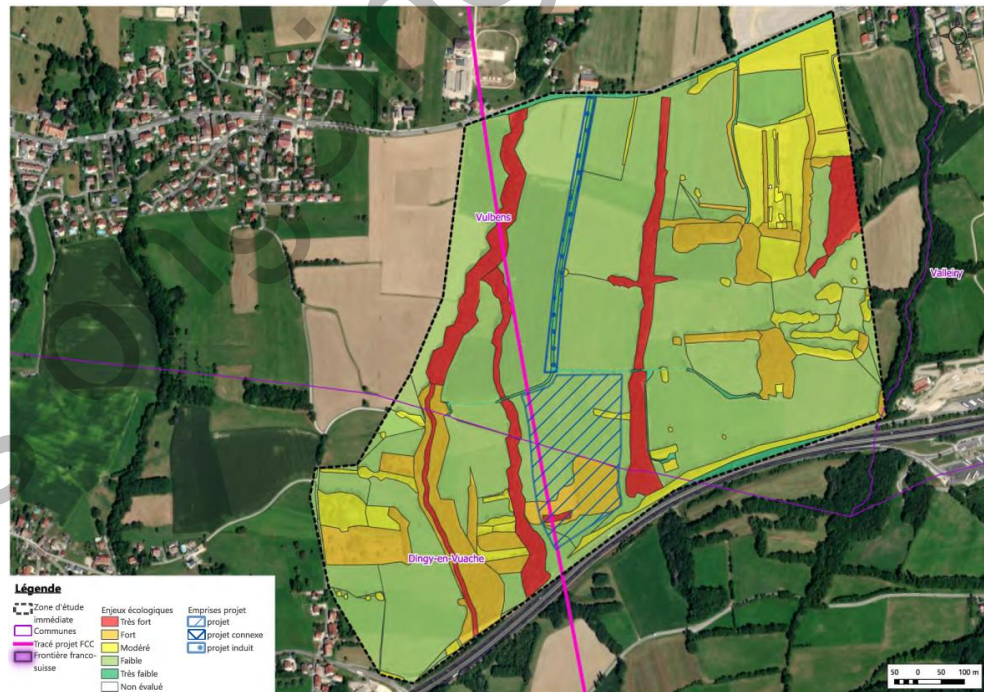
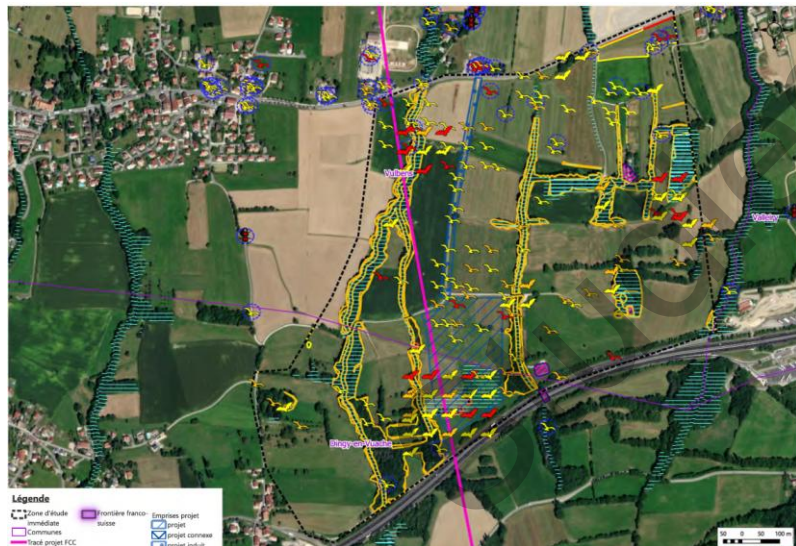
Attention point: Forest with important species and inventoried wetland. Asses potential areas for improvements.

Low noise area with no light pollution.

Surface site PJ - Dingy-en-Vuache-Vulbens, France

Ecological Value: ZIP on low-value pasture but includes high-value wetland/hedges with important bats species; wetland in ZIP (pedological surveys). Ecological corridor in ZEI.

Other stakes: moderate slope towards the north, low air quality, protected agricultural land.



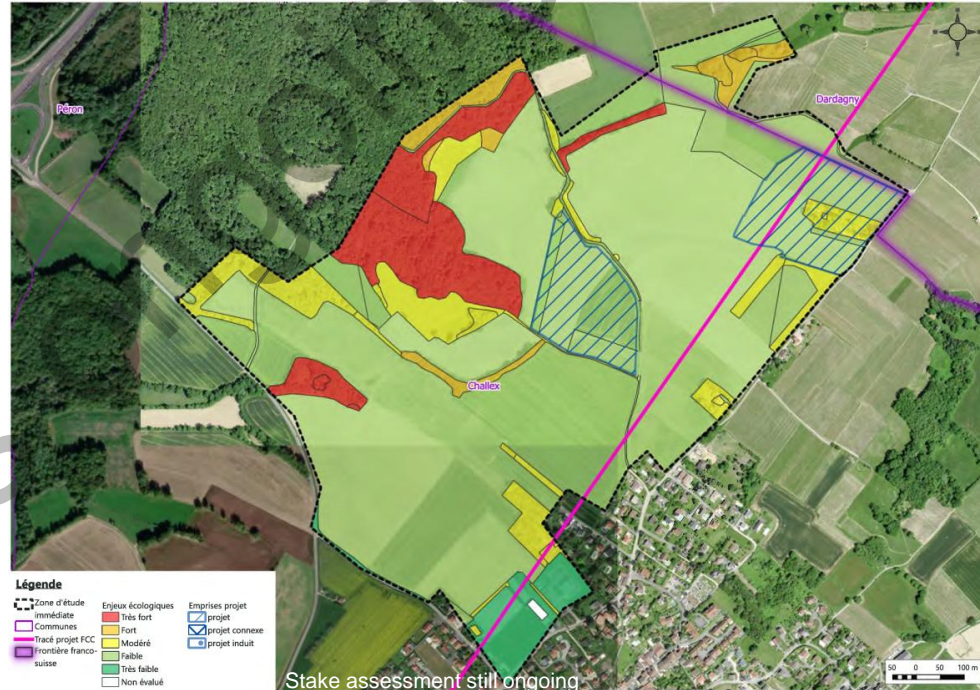
Attention point: hedgerows, and stream, assess wetland and ecological corridor functionality; search for bats' roosts.

Agricultural landscape but low visibility of the site.

Surface site PL - Challex, France

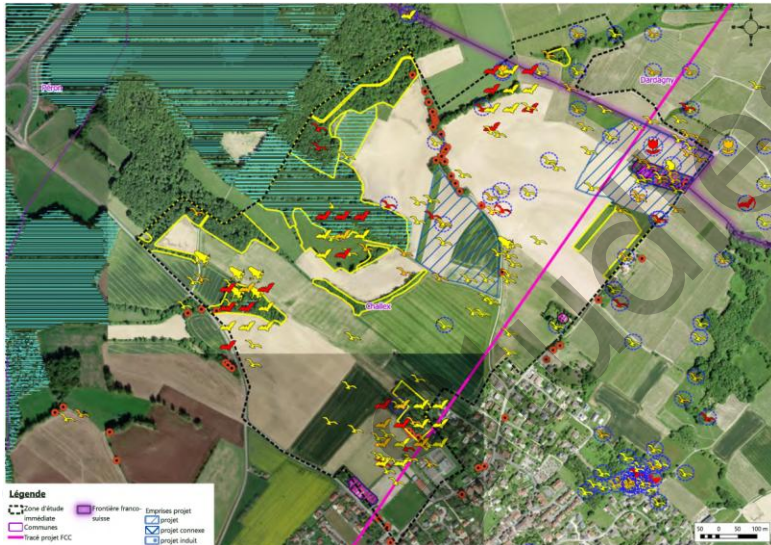
Ecological Value: ZIP on low-value agricultural land with hedges of low to moderate stake (birds, bats, potential impotent flora species). High-value ZEI forest (birds, bats, amphibians).

Other stakes: agricultural land, rural landscape, very little noise disturbance, car traffic in rush hours.



Attention point: hedgerows and bats' roosts. Low noise pollution and rural landscape.

Car traffic.





Challenges
Summary
Next steps

Challenges

- Environment to be understood in the “largest sense” (**ecological stakes are one of the aspects**)
- **Large area (~600 ha)** to be investigated
- **Large scope** of detailed studies
- **Seasonal and weather** constraints
- Iterative surface site optimization based on the results
- **Harmonized and coherent presentation** of information in the report
- **Process that integrates the environment in the project design and planning from the early reflection phase on.**



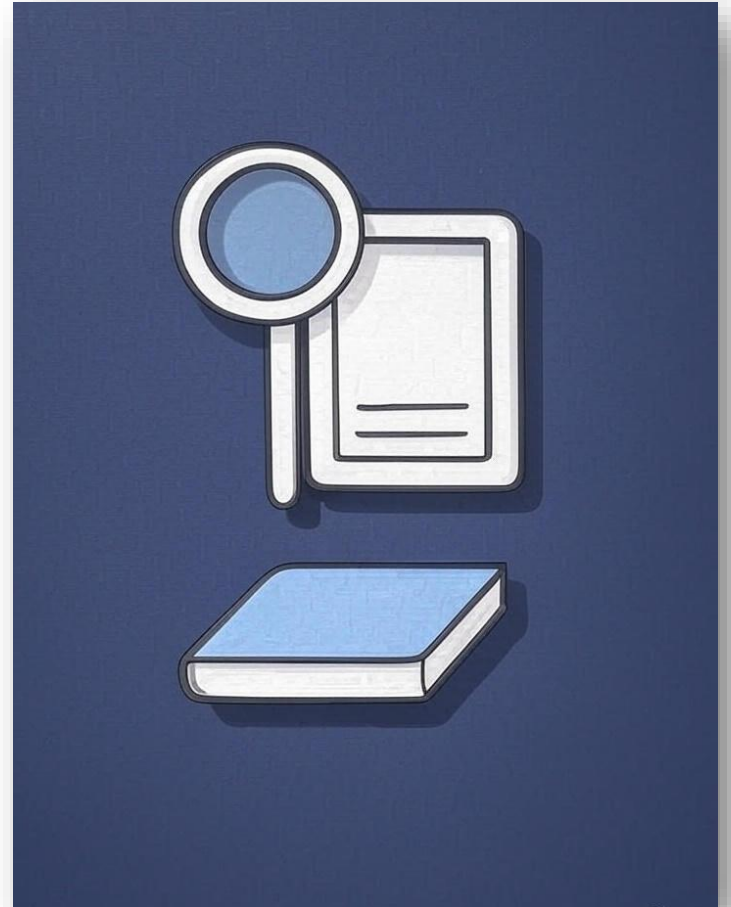
Summary

- Content of the report harmonized with the Swiss and French regulatory requirements
- Interactive report that goes beyond the standard pdf file
- Field studies carried out since 2023 and a few ongoing
- Large area investigated, results lead to surface site layout changes
- Stakes assessed for each surface site
- Baseline reference for the further impact study
- Additional surface site optimization to be conducted in selected areas



Next steps for EISA

- **Complete the ongoing studies**
- Consolidate the EISA report
- Create interactive WebMaps
- Share information with the stakeholders
- Work with CE on the surface site optimization
- Prepare for the environmental impact assessment





**Thank you
for your attention**