

# Critique of the Environmental Impact Study: Moncubo Wind Farm Project

## Summary

This document presents a critical analysis of the Environmental Impact Study (EIS) for the proposed Moncubo wind farm project. The project site is situated on 9.5 square kilometers of upland limestone karst, a complex and vulnerable ecosystem. Our analysis reveals significant shortcomings in the assessment's consideration of the three-dimensional karst environment, particularly its underground network of fissures, caves, and water systems. We argue that the proposed location is fundamentally unsuitable for wind farm development due to the irreparable damage that would be inflicted on this delicate Cantabrian karst ecosystem.

## Resources

The [publication notice](#) in the BOC

The EIS can be downloaded from [here](#) or from the [Matienzo Caves Project website](#).

## Introduction

The Environmental Impact Study for the Moncubo wind farm project, consisting of three wind turbines, spans 1,052 pages including annexes. Despite its length, the document fails to adequately address the unique characteristics and vulnerabilities of the limestone karst ecosystem that defines the proposed site. The karst environment is mentioned merely eight times throughout the entire assessment, demonstrating a concerning lack of focus on this critical aspect of the local geology.

## Critical Deficiencies in the Environmental Impact Study

### 1. Inadequate Consideration of the Karst Environment

The EIS's list of environmental factors (pp. 19-20) notably omits any specific consideration of the limestone karst with its underground environment of fissures, conduits, and streams. All factors considered focus exclusively on surface conditions, ignoring the three-dimensional nature of karst ecosystems. This omission suggests that the environmental sensitivity tool developed by the Ministerio para la Transición Ecológica y el Reto Demográfico (MITERD) is fundamentally flawed and incomplete.

The document's reliance on the Base Topográfica Nacional (BTN) for cave identification is woefully inadequate, as it identifies only one cave (Cueva de la Garma) within the 5km study area. Local speleological surveys indicate numerous additional caves and karst features in the vicinity that would be directly affected by the project.

### 2. Reliance on Regional Rather Than Local Data

Throughout the assessment, environmental factors appear to have been extracted from regional sources rather than thorough local studies. The wind farm represents a localized intrusion and should be evaluated based on site-specific geology, geomorphology, hydrology, slope instability, etc. The bat study is one aspect that has been thoroughly and locally researched.

The hydrology assessment relies on a single water level station at Beranga, providing no meaningful insights into the local hydrology of Monte Llusa. Figure 28 on page 109 is entirely irrelevant to understanding the local hydrological conditions of the project area.

### 3. Inadequate Assessment of Underground Water Systems

While the document acknowledges 54 water abstraction points within a 10km radius and 25 within 5km, it fails to map these points or include them in the project's shapefile data. This omission prevents a proper analysis of how the project might impact these water sources.



Several springs documented by the Matienzo Caves Project (see page 13) are located around the Monte Llusa hillsides and to the south:

- Fuente de Villanueva (#5023), Villanueva, Ribamontán al Monte
- Water source (#5191), Villanueva, Ribamontán al Monte
- Fuente del Real (#4893), El Rincón, Hazas de Cesto
- Resurgence (#4894), El Rincón, Hazas de Cesto
- Wet weather spring (#4892), El Rincón, Hazas de Cesto
- Wet weather spring (#4867), El Rincón, Hazas de Cesto
- Wet weather spring (#5187), Hazas de Cesto
- Resurgence (#3959), Solórzano
- Cueva del Arroyo de Canastrillas (#4046), Solórzano
- "Bombeo de Anero", public water supply (#5184), Ribamontán al Monte
- Flood resurgence (#5192), Ribamontán al Monte
- Resurgence (#5185), Ribamontán al Monte

These springs require comprehensive monitoring for flow changes and pollution throughout all phases of the wind farm's lifecycle, yet the EIS lacks adequate provisions for such monitoring. Details of these springs are shown in annex 1, and positions on the map are shown on figure 1, below.

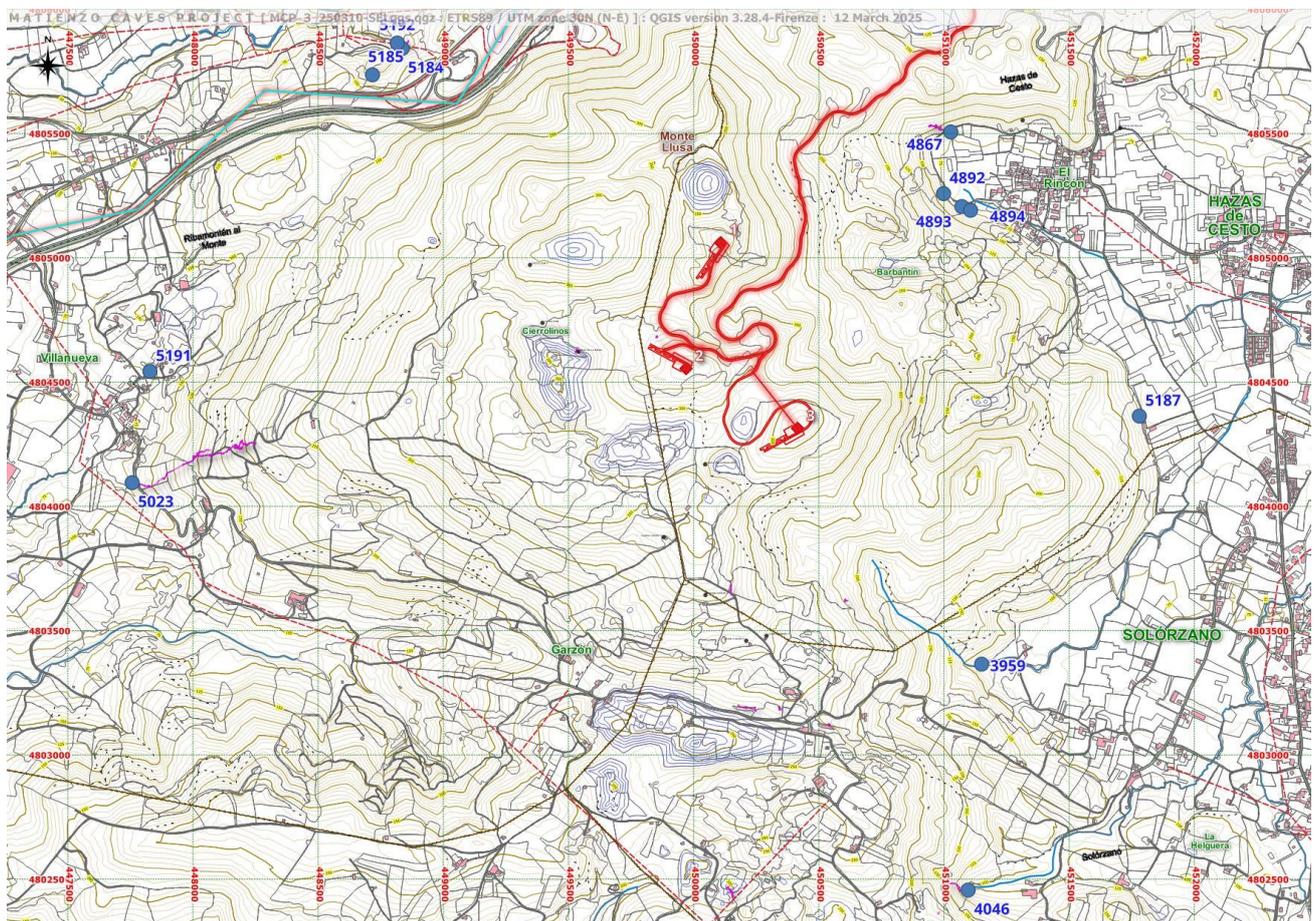


Figure 1 500m grid. **Springs at risk.** Note the cave passage extent (purple line) at Villanueva (#5023)

#### 4. Insufficient Surface Surveys

Due to thick vegetation and difficult terrain, a significant part of the project area has not been thoroughly surveyed for cave entrances. There is a high probability that unexplored caves containing wildlife, natural drainage patterns, and archaeological deposits exist within the proposed wind farm site. The archaeological survey itself acknowledges this

limitation, noting that the investigation "could not be developed as planned due to the existence in some places of a powerful plant mass composed of scrubland and Cantabrian holm oak, developed on a rugged karst topography of aged karren type" (p. 27 of the archaeology annex).

The platform and generator 2 are placed directly over a fenced pond and a fenced deep and wide shaft (#4870). Has this point actually been visited by the proposer, or is the shapefile mapping wrong?

In addition, a number of caves and shafts will be destroyed as new roads for Alternative 1 are built. These "at risk" sites are shown on Figure 2, below.

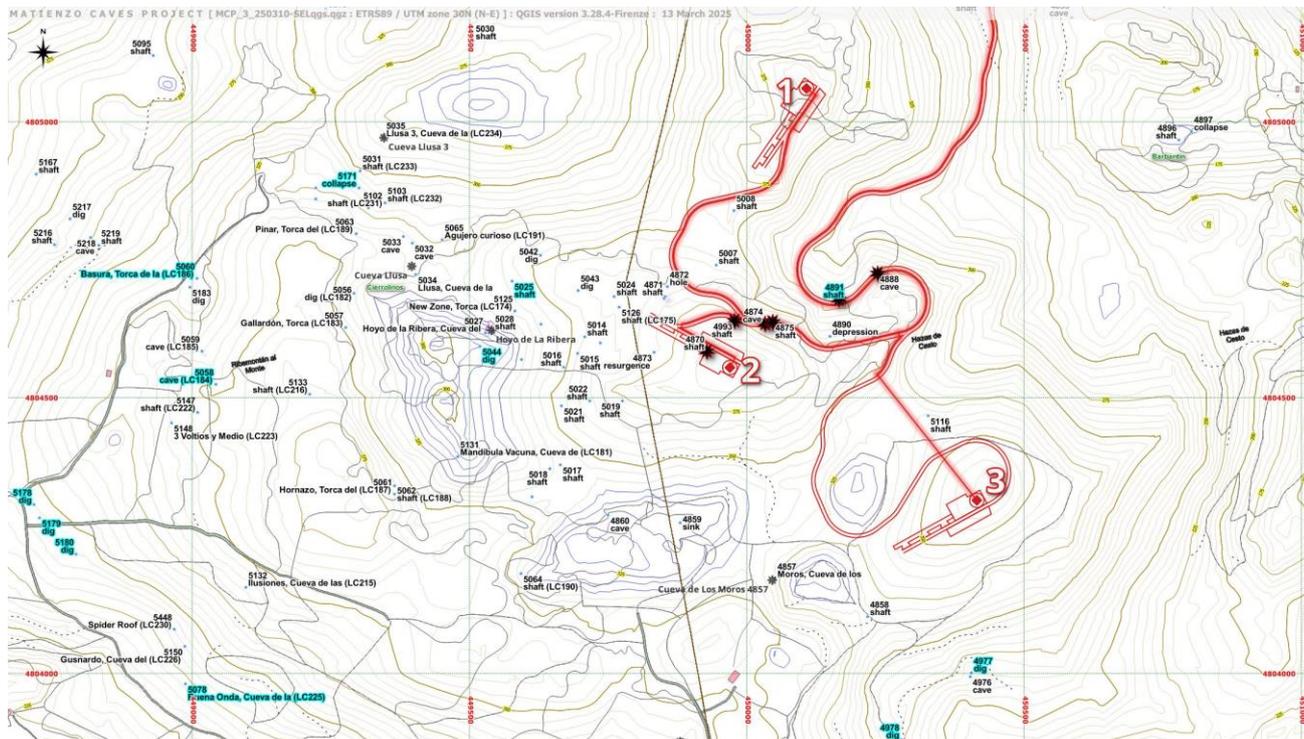


Figure 2 500m grid. Six features due to be destroyed by Alternative 1. Platform 2 is apparently being built over a pond and a wide and deep shaft.

## 5. Disruption of Natural Drainage Patterns

The construction of access roads (6m wide with 60m radius on bends) and their associated drainage systems will significantly alter the area's natural hydrology. Drainage from the project—including roads, generator foundations, and work areas—will be directed into depressions with underground connections, thereby disrupting natural drainage patterns. This critical issue is minimized in the "Alteración del drenaje, caudal y escorrentía superficial" section (pp. 195-196).

The EIS fails to address whether the concrete foundations will be removed during the decommissioning phase, raising concerns about permanent alterations to the karst environment.

## 6. Neglected Underground Biodiversity

The EIS completely overlooks underground wildlife, including the cave-dwelling isopod crustacean *Cantabroniscus*, which is endemic to this region. This species has been documented multiple times in caves around Matienzo, including in at least six photographed instances. (More details and photos of this crustacean can be found in annex 5.)

This omission exemplifies the document's surface-focused approach that fails to consider the full ecological complexity of karst environments. Table 51 (page 195) lists environmental factors potentially affected by the project but mentions only surface features, neglecting the underground fissures and caves that define karst systems.

## 7. Inadequate Environmental Monitoring Plan

Annex XII (Plan de Vigilancia y Seguimiento Ambiental, pp. 7-8 and p. 11) outlines monitoring of "the most representative waterways or those that could potentially be most affected." However, it remains unclear whether this will include all potentially affected springs or merely surface sample points. Critically, the contents of all drainage channels, including sediments, will inevitably enter the hidden underground network of fissures and streams, potentially causing far-reaching and irreversible damage.

## 8. Irreversible Environmental Damage

The EIS's claims regarding decommissioning are unrealistic. There is no feasible way to return the area to its original state once limestone outcrops have been altered or removed, and fissures and shafts have been filled with sediments from the drainage network or concrete. Furthermore, the document fails to address the likelihood of component replacement to extend the wind farm's operational life indefinitely.

## Alternative Zero: The Appropriate Course of Action

The "Alternativa Cero" (no-action alternative) described on pages 66-67 and dismissed by the proposer represents the most appropriate course of action. Spain possesses numerous large areas better suited for wind farm development that would not entail the destruction of sensitive karst ecosystems. The environmental and ecological cost of developing this particular site far outweighs any potential benefits.

## Conclusion

The Environmental Impact Study for the Moncubo wind farm project fails to adequately consider the complex and vulnerable nature of the limestone karst ecosystem at the proposed site. The document relies heavily on regional rather than local data, ignores the three-dimensional character of karst environments, and understates the potential for irreversible environmental damage.

The images on the cover and within the document (e.g. pp. 122, 125, and 126) depict the wilderness landscape and typical views that would be destroyed, but they cannot show the intricate underground network of fissures and caves that characterize limestone karst—a network that would be irrevocably altered by this development.

Given these critical deficiencies, and considering that Spain has many more suitable locations for wind farm development, we strongly advocate for the adoption of "Alternativa Cero"—rejecting the proposed project and preserving this unique Cantabrian karst ecosystem for future generations.

Juan Corrin (NIE Y5528443-Q)  
on behalf of the  
[Matienzo Caves Project](#)  
13/3/2025

Annexes follow ...



## Annex 1 - List of affected Karst features (caves, shafts, resurgences) due to Alternative 1

| Alternative | Phase         | code | name       | area                  | Ayuntamiento   | East   | North   | Altitude | Feature                                  | Summary  | Consequences                           | web details   |
|-------------|---------------|------|------------|-----------------------|----------------|--------|---------|----------|--|--|--|---|
| 1           | construction  | 4874 | cave       | Monte Llusa           | Hazas de Cesto | 450033 | 4804634 | 367      | cave                                     | Length 2m; Depth 1m<br>Tiny cave.  | <b>Destroyed / blocked</b>             | <a href="https://matienzocaves.org.uk/descrip/4874.htm">https://matienzocaves.org.uk/descrip/4874.htm</a> |
| 1           | construction  | 4888 | cave       | Monte Llusa           | Hazas de Cesto | 450236 | 4804725 | 329      | undercut + scar                          | Length 3m<br>Undercut and scar.  | <b>Destroyed / blocked</b>             | <a href="https://matienzocaves.org.uk/descrip/4888.htm">https://matienzocaves.org.uk/descrip/4888.htm</a> |
| 1           | construction  | 4891 | shaft      | Monte Llusa           | Hazas de Cesto | 450166 | 4804678 | 320      | shaft                                    | Length 4m; Depth 2m<br>Small draughting shaft on footpath.   | <b>Destroyed / blocked</b>             | <a href="https://matienzocaves.org.uk/descrip/4891.htm">https://matienzocaves.org.uk/descrip/4891.htm</a> |
| 1           | construction  | 4875 | shaft      | Monte Llusa           | Hazas de Cesto | 450047 | 4804637 | 365      | shaft                                    | Length 10m; Depth 4m<br>Short pitch onto crawl.  | <b>Destroyed / blocked</b>             | <a href="https://matienzocaves.org.uk/descrip/4875.htm">https://matienzocaves.org.uk/descrip/4875.htm</a> |
| 1           | construction  | 4993 | shaft      | Monte Llusa           | Hazas de Cesto | 449978 | 4804639 | 377      | shaft                                    | Length m; Depth 2m<br>Small shaft.   | <b>Destroyed / blocked</b>             | <a href="https://matienzocaves.org.uk/descrip/4993.htm">https://matienzocaves.org.uk/descrip/4993.htm</a> |
| 1           | construction  | 4870 | shaft      | Monte Llusa           | Hazas de Cesto | 449928 | 4804584 | 383      | shaft + passages                         | Length 50m; Depth 22m<br>Roomy shaft and chambers. See online sketch. Nearby pond also to be built over. | <b>Destroyed / blocked</b>             | <a href="https://matienzocaves.org.uk/descrip/4870.htm">https://matienzocaves.org.uk/descrip/4870.htm</a> |
| 1, 2, 3     | whole project | 4867 | resurgence | El Rincón             | Hazas de Cesto | 451027 | 4805506 | 81       | resurgence with explored cave passage(s) | Length 155m; Height 15m<br>Well-decorated passage ends at sumps. This is a wet-weather resurgence.       | <b>Altered water flows + pollution</b> | <a href="https://matienzocaves.org.uk/descrip/4867.htm">https://matienzocaves.org.uk/descrip/4867.htm</a> |
| 1, 2, 3     | whole project | 5187 | resurgence | Hazas de Cesto (west) | Hazas de Cesto | 451780 | 4804363 | 75       | resurgence with explored cave passage(s) | Length 10m; Depth 4m<br>Wet weather resurgence.  | <b>Altered water flows + pollution</b> | <a href="https://matienzocaves.org.uk/descrip/5187.htm">https://matienzocaves.org.uk/descrip/5187.htm</a> |

| Alternative | Phase         | code | name               | area               | Ayuntamiento        | East   | North   | Altitude | Feature                                  | Summary  | Consequences                    | web details   |
|-------------|---------------|------|--------------------|--------------------|---------------------|--------|---------|----------|--|--|---------------------------------|---|
| 1, 2, 3     | whole project | 4894 | resurgence         | El Rincón          | Hazas de Cesto      | 451106 | 4805191 | 70       | resurgence                               | A wet weather resurgence. The farmer says that a lot of water came out during flood conditions .   | Altered water flows + pollution | <a href="https://matienzocaves.org.uk/descrip/4894.htm">https://matienzocaves.org.uk/descrip/4894.htm</a> |
| 1, 2, 3     | whole project | 4893 | Real, Fuente de la | El Rincón          | Hazas de Cesto      | 451071 | 4805206 | 70       | resurgence with explored cave passage(s) | Continually flowing, built-over, spring. The main source of the Río Chico. Passages behind this resurgence are likely to act as a conduit for at least some of the water sinking in the area of Alternative 1. | Altered water flows + pollution | <a href="https://matienzocaves.org.uk/descrip/4893.htm">https://matienzocaves.org.uk/descrip/4893.htm</a> |
| 1, 2, 3     | whole project | 4892 | resurgence         | El Rincón          | Hazas de Cesto      | 450998 | 4805258 | 75       | resurgence                               | Length 13m; Depth 6m<br>A boulder-filled rift which, the farmer says, emits copious quantities of water in flood conditions.   | Altered water flows + pollution | <a href="https://matienzocaves.org.uk/descrip/4892.htm">https://matienzocaves.org.uk/descrip/4892.htm</a> |
| 1, 2, 3     | whole project | 5184 | resurgence         | La Estrada (Anero) | Ribamontán al Monte | 448835 | 4805842 | 53       | resurgence, public water supply          | Public water supply. It's possible that at least some of the water comes from the Monte Llusa area.  | Altered water flows + pollution | <a href="https://matienzocaves.org.uk/descrip/5184.htm">https://matienzocaves.org.uk/descrip/5184.htm</a> |
| 1, 2, 3     | whole project | 5185 | cave               | La Estrada (Anero) | Ribamontán al Monte | 448717 | 4805736 | 81       | resurgence with explored cave passage(s) | Length 20m; Depth 3m<br>A cave perched above a small resurgence.   | Altered water flows + pollution | <a href="https://matienzocaves.org.uk/descrip/5185.htm">https://matienzocaves.org.uk/descrip/5185.htm</a> |
| 1, 2, 3     | whole project | 5192 | cave               | La Estrada (Anero) | Ribamontán al Monte | 448816 | 4805864 | 54       | resurgence with explored cave passage(s) | Length 88m; Depth 3m<br>Wet weather resurgence with passages ending too tight.   | Altered water flows + pollution | <a href="https://matienzocaves.org.uk/descrip/5192.htm">https://matienzocaves.org.uk/descrip/5192.htm</a> |

| Alternative | Phase         | code | name                              | area        | Ayuntamiento        | East   | North   | Altitude | Feature                                  | Summary  | Consequences                    | web details   |
|-------------|---------------|------|-----------------------------------|-------------|---------------------|--------|---------|----------|--|--|---------------------------------|---|
| 1, 2, 3     | whole project | 5191 | cave                              | Villanueva  | Ribamontán al Monte | 447828 | 4804543 | 75       | resurgence with explored cave passage(s) | Length 5m; Depth m<br>Small resurgence.  | Altered water flows + pollution | <a href="https://matienzocaves.org.uk/descrip/5191.htm">https://matienzocaves.org.uk/descrip/5191.htm</a> |
| 1, 2, 3     | whole project | 5023 | Villanueva, Fuente de             | Villanueva  | Ribamontán al Monte | 447757 | 4804095 | 81       | resurgence with explored cave passage(s) | Length 915m; Height 18m<br>A major resurgence at the head of a gully in Villanueva. Passages, with 7 sumps, total nearly 1km in length. The passages head towards Alternative 1 and are likely to act as a conduit for at least some of the water sinking in that area.  | Altered water flows + pollution | <a href="https://matienzocaves.org.uk/descrip/5023.htm">https://matienzocaves.org.uk/descrip/5023.htm</a> |
| 1, 2, 3     | whole project | 4046 | Arroyo de Canastrillas, Cueva del | La Helguera | Solórzano           | 451096 | 4802456 | 105      | resurgence with explored cave passage(s) | Length 136m<br>In the mid-July 2014 "lots of water" was seen to flow down the Arroyo de Canastrillas. The cave features a 100m high-level passage leading to a diveable sump, while from the entrance, water can be followed upstream about 40m through two ducks until it intersects the high level. Two sumps have been dived. | Altered water flows + pollution | <a href="https://matienzocaves.org.uk/descrip/4046.htm">https://matienzocaves.org.uk/descrip/4046.htm</a> |
| 1, 2, 3     | whole project | 3959 | resurgence                        | Solórzano   | Solórzano           | 451150 | 4803365 | 85       | resurgence                               | Small resurgence.  | Altered water flows + pollution | <a href="https://matienzocaves.org.uk/descrip/3959.htm">https://matienzocaves.org.uk/descrip/3959.htm</a> |

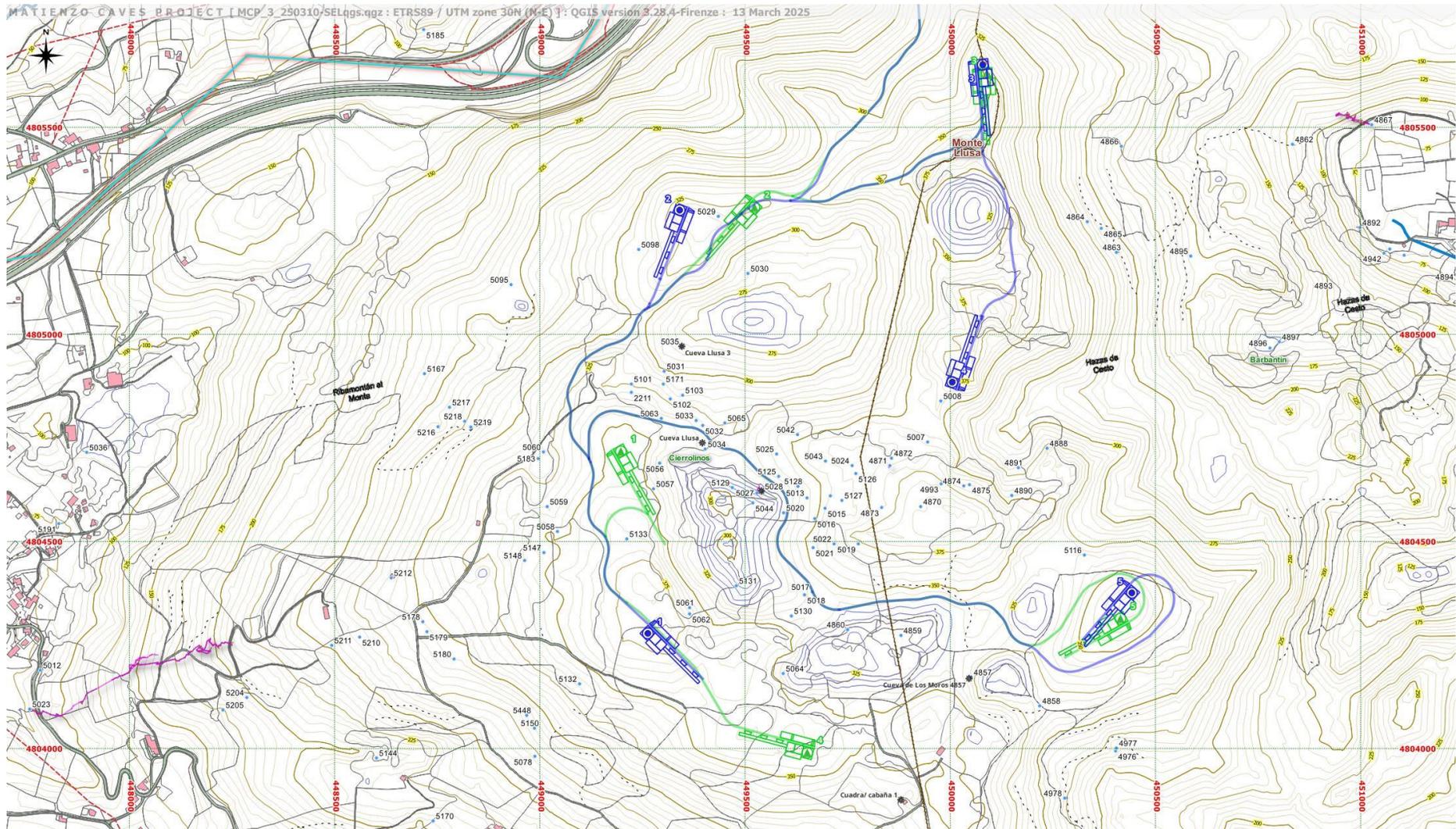
## Annex 2 - List of affected Karst features (caves, shafts, resurgences) due to Alternatives 2 and 3

| Alternative | Phase         | code | name               | area                  | Ayuntamiento        | East   | North   | Altitude | Feature                                  | Summary  | Consequences                    | web details   |
|-------------|---------------|------|--------------------|-----------------------|---------------------|--------|---------|----------|--|--|---------------------------------|---|
| 1, 2, 3     | whole project | 4867 | resurgence         | El Rincón             | Hazas de Cesto      | 451027 | 4805506 | 81       | resurgence with explored cave passage(s) | Length 155m; Depth -15m<br>Well-decorated passage ends at sumps. This is a wet-weather resurgence.   | Altered water flows + pollution | <a href="https://matienzocaves.org.uk/descrip/4867.htm">https://matienzocaves.org.uk/descrip/4867.htm</a> |
| 1, 2, 3     | whole project | 5187 | resurgence         | Hazas de Cesto (west) | Hazas de Cesto      | 451780 | 4804363 | 75       | resurgence with explored cave passage(s) | Length 10m; Depth 4m<br>Wet weather resurgence.  | Altered water flows + pollution | <a href="https://matienzocaves.org.uk/descrip/5187.htm">https://matienzocaves.org.uk/descrip/5187.htm</a> |
| 1, 2, 3     | whole project | 4894 | resurgence         | El Rincón             | Hazas de Cesto      | 451106 | 4805191 | 70       | resurgence                               | A wet weather resurgence. The farmer says that a lot of water came out during flood conditions .   | Altered water flows + pollution | <a href="https://matienzocaves.org.uk/descrip/4894.htm">https://matienzocaves.org.uk/descrip/4894.htm</a> |
| 1, 2, 3     | whole project | 4893 | Real, Fuente de la | El Rincón             | Hazas de Cesto      | 451071 | 4805206 | 70       | resurgence with explored cave passage(s) | Continually flowing, built-over, spring. The main source of the Río Chico. Passages behind this resurgence are likely to act as a conduit for at least some of the water sinking in the area of Alternative 1. | Altered water flows + pollution | <a href="https://matienzocaves.org.uk/descrip/4893.htm">https://matienzocaves.org.uk/descrip/4893.htm</a> |
| 1, 2, 3     | whole project | 4892 | resurgence         | El Rincón             | Hazas de Cesto      | 450998 | 4805258 | 75       | resurgence                               | Length 13m; Depth 6m<br>A boulder-filled rift which, the farmer says, emits copious quantities of water in flood conditions.   | Altered water flows + pollution | <a href="https://matienzocaves.org.uk/descrip/4892.htm">https://matienzocaves.org.uk/descrip/4892.htm</a> |
| 1, 2, 3     | whole project | 5184 | resurgence         | La Estrada (Anero)    | Ribamontán al Monte | 448835 | 4805842 | 53       | resurgence, public water supply          | Public water supply. It's possible that at least some of   | Altered water flows + pollution | <a href="https://matienzocaves.org.uk/descrip/5184.htm">https://matienzocaves.org.uk/descrip/5184.htm</a> |

| Alternative | Phase         | code | name                              | area               | Ayuntamiento        | East   | North   | Altitude | Feature                                  | Summary  | Consequences                    | web details   |
|-------------|---------------|------|-----------------------------------|--------------------|---------------------|--------|---------|----------|--|--|---------------------------------|---|
|             |               |      |                                   |                    |                     |        |         |          |  | the water comes from the Monte Llusa area.   |                                 |   |
| 1, 2, 3     | whole project | 5185 | cave                              | La Estrada (Anero) | Ribamontán al Monte | 448717 | 4805736 | 81       | resurgence with explored cave passage(s) | Length 20m; Depth 3m - A cave perched above a small resurgence.  | Altered water flows + pollution | <a href="https://matienzocaves.org.uk/descrip/5185.htm">https://matienzocaves.org.uk/descrip/5185.htm</a> |
| 1, 2, 3     | whole project | 5192 | cave                              | La Estrada (Anero) | Ribamontán al Monte | 448816 | 4805864 | 54       | resurgence with explored cave passage(s) | Length 88m; Depth 3m Wet weather resurgence with passages ending too tight.  | Altered water flows + pollution | <a href="https://matienzocaves.org.uk/descrip/5192.htm">https://matienzocaves.org.uk/descrip/5192.htm</a> |
| 1, 2, 3     | whole project | 5191 | cave                              | Villanueva         | Ribamontán al Monte | 447828 | 4804543 | 75       | resurgence with explored cave passage(s) | Length 5m Small resurgence.  | Altered water flows + pollution | <a href="https://matienzocaves.org.uk/descrip/5191.htm">https://matienzocaves.org.uk/descrip/5191.htm</a> |
| 1, 2, 3     | whole project | 5023 | Villanueva, Fuente de             | Villanueva         | Ribamontán al Monte | 447757 | 4804095 | 81       | resurgence with explored cave passage(s) | Length 915m; Height 18m A major resurgence at the head of a gully in Villanueva. Passages, with 7 sumps, total nearly 1km in length. The passages head towards Alternative 1 and are likely to act as a conduit for at least some of the water sinking in that area. | Altered water flows + pollution | <a href="https://matienzocaves.org.uk/descrip/5023.htm">https://matienzocaves.org.uk/descrip/5023.htm</a> |
| 1, 2, 3     | whole project | 4046 | Arroyo de Canastrillas, Cueva del | La Helguera        | Solórzano           | 451096 | 4802456 | 105      | resurgence with explored cave passage(s) | Length 136m In the mid-July 2014 "lots of water" was seen to flow down the Arroyo de Canastrillas. The cave features a 100m high-level passage leading to a diveable sump, while from the entrance, water can be followed upstream about                             | Altered water flows + pollution | <a href="https://matienzocaves.org.uk/descrip/4046.htm">https://matienzocaves.org.uk/descrip/4046.htm</a> |

| Alternative | Phase         | code | name                         | area        | Ayuntamiento        | East   | North   | Altitude | Feature             | Summary  | Consequences  | web details   |
|-------------|---------------|------|------------------------------|-------------|---------------------|--------|---------|----------|---------------------|--|---|---|
|             |               |      |                              |             |                     |        |         |          |                     | 40m through two ducks until it intersects the high level. Two sumps have been dived. |   |   |
| 1, 2, 3     | whole project | 3959 | resurgence                   | Solórzano   | Solórzano           | 451150 | 4803365 | 85       | resurgence          | Small resurgence.  | Altered water flows + pollution                             | <a href="https://matienzocaves.org.uk/descrip/3959.htm">https://matienzocaves.org.uk/descrip/3959.htm</a> |
| 2, 3        | construction  | 5020 | shaft                        | Cierrolinos | Ribamontán al Monte | 449594 | 4804569 | 328      | shaft               | A possible shaft in a deep depression.   | At risk   | <a href="https://matienzocaves.org.uk/descrip/5020.htm">https://matienzocaves.org.uk/descrip/5020.htm</a> |
| 2, 3        | whole project | 5027 | Hoyo de la Ribera, Cueva del | Cierrolinos | Ribamontán al Monte | 449529 | 4804617 | 317      | archaeological cave | Length 22m<br>A small entrance to 22m of walking-size passage heading north.         | At risk; nearby heavy traffic. Needs further investigation. | <a href="https://matienzocaves.org.uk/descrip/5027.htm">https://matienzocaves.org.uk/descrip/5027.htm</a> |
| 2, 3        | construction  | 5029 | cave                         | Monte Llusa | Ribamontán al Monte | 449435 | 4805285 | 332      | cave?               | Unexplored cave well hidden in jungle.   | At risk   | <a href="https://matienzocaves.org.uk/descrip/5029.htm">https://matienzocaves.org.uk/descrip/5029.htm</a> |
| 2, 3        | construction  | 5032 | cave                         | Cierrolinos | Ribamontán al Monte | 449397 | 4804780 | 332      | cave shelter        | Length 8m<br>A low, 8m wide, rock shelter.   | At risk; nearby heavy traffic. Needs further investigation. | <a href="https://matienzocaves.org.uk/descrip/5032.htm">https://matienzocaves.org.uk/descrip/5032.htm</a> |
| 2, 3        | whole project | 5034 | Llusa, Cueva de la           | Cierrolinos | Ribamontán al Monte | 449403 | 4804723 | 332      | archaeological cave | Length 50m<br>A 50m long cave with archaeological interest.                          | At risk; nearby heavy traffic. Needs further investigation. | <a href="https://matienzocaves.org.uk/descrip/5034.htm">https://matienzocaves.org.uk/descrip/5034.htm</a> |
| 2, 3        | construction  | 5063 | Pinar, Torca del (LC189)     | Cierrolinos | Ribamontán al Monte | 449296 | 4804797 | 339      | shaft               | Length 14m; Depth 14m<br>Choked shaft.   | At risk   | <a href="https://matienzocaves.org.uk/descrip/5063.htm">https://matienzocaves.org.uk/descrip/5063.htm</a> |
| 2, 3        | construction  | 5017 | shaft                        | Cierrolinos | Ribamontán al Monte | 449664 | 4804378 | 342      | shaft               | Undescended shaft.   | Destroyed / blocked   | <a href="https://matienzocaves.org.uk/descrip/5017.htm">https://matienzocaves.org.uk/descrip/5017.htm</a> |

### Annex 3 – Map showing Alternatives 2 (blue) and 3 (green)



## Annex 4 – Cantabroniscus

### ***A request for information to AI Claude about this crustacean came back with the information below***

*Cantabroniscus primitivus* is a fascinating cave-dwelling isopod crustacean endemic to the Cantabrian Mountains in northern Spain.

#### **Biology and Classification**

- It belongs to the family Trichoniscidae within the suborder Oniscidea (terrestrial isopods or woodlice)
- It's considered a relict species with primitive characteristics, reflected in its species name "primitivus"
- It's the only species in its genus (*Cantabroniscus*)

#### **Habitat and Distribution**

- Found exclusively in limestone caves of the Cantabrian Mountains in northern Spain
- Inhabits subterranean aquatic environments, particularly in karst systems
- Restricted to a very limited geographical range, making it extremely endemic

#### **Adaptations**

- Like many cave organisms, it displays troglomorphic adaptations including:
  - Lack of pigmentation (typically appearing whitish or translucent)
  - Reduced or absent eyes
  - Elongated appendages for sensing its environment
  - Slow metabolism adapted to the resource-limited cave environment

#### **Conservation Status**

- Due to its extremely limited range and specialized habitat requirements, it's considered vulnerable to environmental changes
- Threats include groundwater pollution, disturbance of cave systems, and climate change impacts on the karst hydrology

This species represents an important example of specialized evolution in subterranean environments and is of significant interest to biospeleologists.

*Cantabroniscus* has been photographed at least 6 times in different caves in and around Matienzo.



*Above: Cantabroniscus in Orillonzuco (#1162) Photo: Juan Corrin*

*Below: Cantabroniscus in Cueva de Fresnedo 2 (#0841) Photo: Simon Cornhill*



# El Proyecto de Cuevas de Matienzo

El [Proyecto de Cuevas de Matienzo](#) es una iniciativa de larga trayectoria dedicada a explorar, documentar y preservar los extensos sistemas de cuevas en y alrededor de la depresión de Matienzo en el norte de España desde la década de 1960. Operando con permisos oficiales del Gobierno de Cantabria, el proyecto realiza expediciones sistemáticas que han documentado miles de cuevas, creando un archivo digital y físico integral de topografías, fotografías, descripciones de cuevas y datos geológicos.

El proyecto sirve como un centro de colaboración internacional donde espeleólogos experimentados y novatos trabajan juntos para ampliar el conocimiento de estas formaciones kársticas únicas, promoviendo la conservación de cuevas y apoyando la investigación científica en campos como la arqueología, hidrología, biología y cambio climático.

A través de su sitio web interactivo, el Proyecto de Cuevas de Matienzo hace sus hallazgos accesibles al público, permitiendo a investigadores y entusiastas de todo el mundo beneficiarse de sus sesenta y cinco años de exploración espeleológica, mientras crea conciencia sobre la importancia de proteger estos frágiles ecosistemas subterráneos.

## The Matienzo Caves Project

The [Matienzo Caves Project](#) is a long-standing initiative dedicated to exploring, documenting, and preserving the extensive cave systems in and around the Matienzo depression of northern Spain since the 1960s. Operating with official permits from the Cantabrian Government, the project conducts systematic expeditions that have documented thousands of caves, creating a comprehensive digital and physical archive of surveys, photographs, cave descriptions and geological data.

The project serves as an international collaborative hub where experienced and novice cavers work together to expand knowledge of these unique karst formations while promoting cave conservation and supporting scientific research in fields such as archaeology, hydrology, biology and climate change.

Through its interactive website, the Matienzo Caves Project makes its findings publicly accessible, allowing researchers and enthusiasts worldwide to benefit from its sixty-five years of speleological exploration while raising awareness about the importance of protecting these fragile underground ecosystems.

