

# NEWSLETTER



Nº 2 | February 2021

## Highlights

Peñalén's first phase of restoration

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## GREAT MILESTONE OF THE LIFE RIBERMINE PROJECT COMPLETED THE FIRST PHASE OF RESTORATION OF PEÑALÉN (SPAIN)

On October 10th, LIFE RIBERMINE has completed the 2020 phase of land mass displacements (topographic refurbishment and preparation of edaphic substrates) in the heaps of Santa Engracia Mine (Peñalén, Spain) and in front of the road to Poveda.

The work began in July and aimed to reconfigure the landform, create landscapes similar to natural ones, remodel stable surfaces in the surroundings and, thus, reduce erosion produced mainly by surface runoff.

On November 17, the revegetation work ended, successfully completing the first phase of restoration of this area!





## First Phase of Restoration Completed in Santa Engracia Mine (Peñalén)

The first phase of execution of LIFE RIBERMINE in Peñalén (Mina Santa Engracia), developed during the summer and autumn of 2020, has concluded all the restoration works on the two exterior heaps on the front of the Tagus River runway, in three main actions, by the following order:

1. **Topographic remodelling** of the heaps, transforming platform-slope-type configurations into “natural” reliefs, similar to those of the surrounding landscape, with fluvial networks and scalloped slopes, with convex-concave longitudinal profiles. For this, the *GeoFluv-Natural Regrade™* method was used. As a novelty, in this area, gravel was spread on the bottom of the reconstructed river channels, simulating the bottom loading of natural riverbeds.

2. **Spreading of edaphic substrates** on these topographic configurations. Colluvial-type surface formations were extended, which will serve as edaphic substrates for the development of the vegetation.

3. **Revegetation** (with two types of works):

- a) **Mulching.** On steeper slopes, an organic amendment was made with local sheep manure, which was buried a few centimetres deep. On that substrate, a straw mulch collected from mown meadows from the surrounding fields (and therefore with local seed), was spread. The whole set was covered with a biodegradable mesh and anchored to the ground.

- b) **Seed.** The remaining areas were seeded with species adapted to germinate in autumn (such as local varieties of wheat). The objective was to make an initial vegetation cover, in autumn, so that it exerts an initial protection of the soil just when it is most vulnerable. That is, when it is bare of vegetation.

Finally, the entire restored area has been fenced, to prevent the impact of ungulates on the initial vegetation cover.

The success of these tasks has been indisputable, and the results are in sight!



## Subsoil Area of the Future Pilot Project of Lousal Mine, Prospected by Electrical Resistivity Tomography— ERT

February 11<sup>th</sup>, 2020



Technical team responsible for the work of Electrical Tomography performed in Lousal.

One of the preparing tasks to the future implementation of a Pilot Project in Lousal, aiming to correct the Acid Mine Drainage (AMD), within the scope of action A2.3., was the exploration of the subsoil of this area. The works carried out by a professional team (ANÁLISIS Y GESTIÓN DEL SUBSUELO, S.L.), intended to investigate the relationships between the coating materials and the rocky substrate, to identify and locate the contact zones between lithologies, and to delimitate possible underground water flows and their trajectories. For that, it was used the Electrical Resistivity Tomography, which is based on the contrast of the electrical resistivities ( $\Omega m$ ) from different materials. Given that the lower the resistivity, the greater the electrical conductivity, the non-metallic rock beds present high values, the opposite being true for metallic materials (such as pyrite or acidic waters contaminated with metallic residues).

## Santa Engracia Mine: Conclusion of the First Stage of the Exterior Heaps Revegetation

November 17<sup>th</sup>, 2020



Detail of organic blanket installation (Photo: UAH-UZ revegetation team).

The LIFE RIBERMINE Project accomplished the first phase of revegetation tasks in the outside heaps of Santa Engracia mine (Peñalén). The aim of these measures was to begin the process of plant colonization in the substrate by sowing seeds of herbaceous species typical from the region, complemented with the application of organic blankets for soil protection in the areas most vulnerable to water erosion due to their steep inclination. The tasks of revegetation will continue in the next phases, with plantation of tree species and new sowings, as the geomorphological remodelling of the Santa Engracia mine is completed.

Watch the Video:

## REGEVETACIÓN DE LA CANTERA DE PEÑALÉN PROYECTO LIFE RIBERMINE



[HTTPS://YOUTU.BE/MSI36M2Hy1Y](https://youtu.be/MSI36M2Hy1Y)







## Presentation of LIFE RIBERMINE Project in Peñalén (Guadalajara, Spain)

September 15<sup>th</sup>, 2020

The LIFE RIBERMINE project was officially presented on September 3<sup>rd</sup>, 2020, in Peñalén (Guadalajara, Spain). It was not possible to perform on the previously scheduled date due to the pandemic situation of COVID-19.



***LIFE RIBERMINE recognized among the best regional practices in terms of energy and climate action by the European Green Deal!***

[A European Green Deal | European Commission \(europa.eu\)](https://european-council.europa.eu/media/en/press-articles/2020/07/14/p122222.pdf)

## LIFE RIBERMINE at the Celebration of Governing Board of Alto Tajo Natural Park

June 29<sup>th</sup>, 2020



parque natural

**Alto Tajo**

José Francisco Martín Duque (Complutense University of Madrid), representing the LIFE RIBERMINE Team, presented the Project in Peñalén (Guadalajara) during the celebration of the PNAPT Governing Board. This body is composed of municipalities, agricultural, sports, tourist and business associations throughout the region. The LIFE RIBERMINE Project is led by the "Dirección General de Transición Energética de Castilla La Mancha-Gov.", with the participation of GEACAM. José Luis Escudero Palomo ("Consejero de Desarrollo Sostenible de Castilla – La Mancha Gov.") and Fernando Marchán Morales ("Viceconsejero de Medio Ambiente"), represented the Coordination at this event. The Director of PNAT, José Antonio Lozano, is also part of the Project Team, so the involvement of this regional administration is absolute on several fronts, highlighting its enormous relevance.

## Visit of the Tagus Hydrographic Confederation to the Works of LIFE RIBERMINE Project

October 9<sup>th</sup>, 2020

On September 29<sup>th</sup>, 2020, the president of the Confederación Hidrográfica del Tajo, Antonio Yáñez, the commissioner of the waters, Javier Díaz-Regañón and technical staff of the aforementioned Confederation, visited the work of the LIFE RIBERMINE project, accompanied by the project partners. The event was also attended by the Vice-Minister of Sustainable Development, Fernando Marchán, who had the opportunity to visit the sites of actions and monitor the progress of the project. Similarly, it is worth mentioning the presence of the Governing Board of the Parque Natural del Alto Tajo (Alto Tejo Natural Park), José Antonio Lozano. Given that one of the fundamental objectives of the LIFE RIBERMINE project is to reduce the hydromorphological pressure of the former mining activity in the upper section of the Tagus River, receiving a visit from representatives of the Tagus Hydrographic Confederation is fundamental for its role as a collaborator necessary in this project, and there was the opportunity to know all the implications that the LIFE RIBERMINE project will have in this environment of high ecological value.



Visit of CHT with the Vice President of Desarrollo Sostenible and some of LIFE RIBERMINE's partners. The entourage included Antonio Yáñez (President de la CHT), Javier Díaz-Regañón, Comisario de aguas, Fernando Marchán (Viceconsejero Desarrollo Sostenible), Javier de la Villa, José Antonio Lozano and Francisco Delgado (JCCM), Lázaro Sánchez (CAOBAR S.A.) and José Francisco Martín (UCM).





# MEETINGS



*Constitution of the External Advisory Council (CAE).*

*March 5<sup>th</sup>, 2020*

First Meeting of the Project with the European Union Monitor

*May 25<sup>th</sup>, 2020*

Second Meeting of the Monitoring Committee

*June 9<sup>th</sup>, 2020*

Constitution of the External Advisory Council

*December 2<sup>nd</sup>, 2020*

Third Meeting of the Monitoring Committee

*December 18<sup>th</sup>, 2020*

Second Meeting of the External Advisory Council

# ATTENDANCES

*July 27<sup>th</sup>, 2020*

LIFE RIBERMINE takes part in the Technical-Scientific Day of the Alto Tajo Natural Park 20th Anniversary.

*August 1<sup>st</sup>, 2020*

LIFE RIBERMINE participates in the "Ciência Viva no Verão em Rede" action, Mina de Ciência, Lousal.

*September 23<sup>rd</sup> and 24<sup>th</sup>, 2020*

LIFE RIBERMINE participates in the LIFE BIODISCOVERIES Project Final Conference.

*November 24<sup>th</sup> to 27<sup>th</sup>, 2020*

LIFE RIBERMINE takes part in the Online Course "Restauración Canteras Tecmine II".

*November 25<sup>th</sup>, 2020*

LIFE RIBERMINE integrates the Master's Curriculum at the University of Castilla-La Mancha.



*Fieldtrip to the intervention areas in Peñalén, following the first meeting with the external MONITOR of NEEMO-EASME and the LIFE RIBERMINE project representatives of all partner.*



# LIFE RIBERMINE IN THE FIRST PERSON

## JOSÉ F. MARTÍN DUQUE

PROFESSOR, COMPLUTENSE UNIVERSITY OF MADRID, UCM

LEADER OF GEOMORPHOLOGICAL RESTORATION GROUP - GRM

"The geomorphological remodelling work, including the spreading of edaphic substrates, was carried out successfully. The result was just excellent. The entire staff

from CAOBAR y Excavaciones Félix Moya showed an impeccable professionalism. This gives us security and guarantees for the following works."

## JORGE M.R.S. RELVAS

PROFESSOR, FACULTY OF SCIENCES OF THE UNIVERSITY OF LISBON

PRESIDENT, ASSOCIATION LOUSAL CIÊNCIA VIVA CENTER

**LIFE RIBERMINE in Lousal: projecting future in a mine with a past**

"The ancient Lousal mine exploited pyrite for sulphur production during the 20th century, and presently hosts an integrated environmental, social and heritage rehabilitation program that assumes a perspective of education for science and citizenship and meets the best environmental practices and ethical and inclusive concerns. The sources of contamination in the mining perimeter were identified and a variety of combined interventions were previously implemented, including neutralization reactions promoted by the addition of alkaline agents, and phytoremediation using metal hyperaccumulator plants. As part of the LIFE RIBERMINE Project, a pilot experiment camp will be installed in Lousal, in an area of 1.5 ha, with a view to reduce hydromorphological pressures and chemical pollution and restoring ecosystem services by ecological restoration based on the best available geomorphological and revegetation techniques. One of the main positive impacts of the project is the extrapolation of the performed methodologies for other areas affected by DAM associated with the exploitation of sulphides. "

## JOSÉ M. NICOLAU IBARRA

PROFESSOR, ECOLOGIA, ZARAGOZA UNIVERSITY

LIFE-RIBERMINE REVEGETATION COORDINATOR (SPAIN)

"The revegetation tasks started in autumn 2020, with the planting of a community of herbaceous plants to protect the soil from winter erosion. The work was carried out by the company

Albar Forestal, which incorporated in the work team, several inhabitants of Peñalén. Despite the complexity of the activities - which included soil preparation, addition of organic soil amendments, extension of mulch, hand sowing and installation of organic blankets - the work was carried out successfully and within the established time, and the plants germinated and covered the soil, as expected."

## NETWORK

TEC  MINE

INNOVATIVE TECHNIQUES FOR MINE RESTORATION

LIFE16 ENV/ES/000159

 **Biodiscoveries**  
Mata da Machada e Sapal do Rio Coima

LIFE13 BIO/PT/000386

 **LIFE MONTADO-ADAPT**  
MONTADO & CLIMATE, A NEED TO ADAPT

LIFE15 CCA/PT/000043

 **ECOREST CLAY**

LIFE12 BIO/ES/00926

 **SelPiBioLife**

LIFE13 BIO/IT/000282

 **PINASSA**  
PINEGRAL  
PINUS NIGRA

LIFE13 NAT/000724



## LOUSAL RESTORATION PLAN

Completion and delivery of the Lousal Restoration Plan.

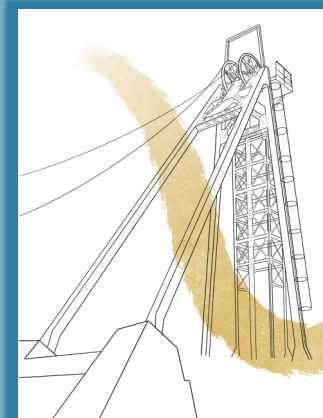
## CONCLUSION OF GEOMORPHOLOGICAL RECOVERY IN SANTA ENGRACIA

Completion of the geomorphological intervention phase in the Santa Engracia Mine.

## GEOMORPHOLOGICAL RECONFIGURATION, EDAPHIC CORRECTION AND REVEGETATION OF LOUSAL PILOT AREA

Start and completion of geomorphological intervention in the pilot area of Lousal, substrate correction (generation of "soil layers" and pH rise) and revegetation through sowing of native species from the region.

## CURIOSITIES



### Malacate (Head frame)

Several drawings were made for graphic and merchandising purposes highlight the lines of themes related to the LIFE RIBERMINE project, such as aspects of the intervention fronts, characteristic landmarks on the ground or biodiversity.

*Malacate* (head frame) is a word originated in the mines of the Iberian Pyrite Belt, attributed to the structure, shaped like a tower, that rests on the wells of the mines, which supported the collar pulleys by which steel cables that have a suspended cage were pulled. This cage, commonly called *jaula*, was a metal cabin, with one or two floors, that slides along the well. It transported personnel, ore or materials, or even animals, which were used in the traction of the trolleys inside the mines.



Coordinator



Castilla-La Mancha

Consejería de Desarrollo Sostenible

Partners



Centro  
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do Lousal  
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