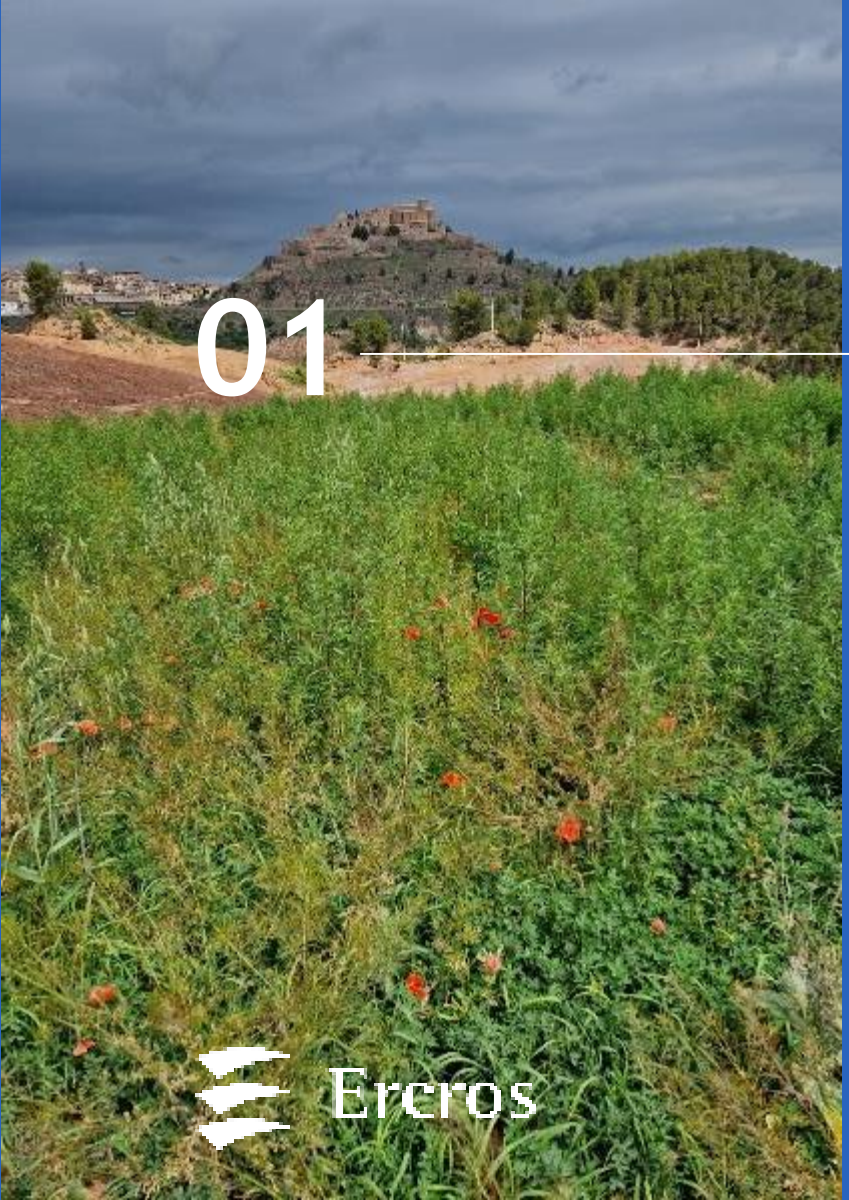
Situation of the Cardona landfills

October, 2024

Ercros

Index



01

Ercros and the Cardona Saline Valley

Key dates

Context
Terrera Nova
Terrera Vella

1930
Start of underground mining activity in the Saline Valley of Cardona.

1990
End of underground mining activity in Cardona.

1990
Ercros begins to exploit the Terrera Nova to obtain salt.

1998
Ercros signs an agreement with the City Council of Cardona (owner of the Terrera Vella) by which it cedes the right of exploitation. In 1999, the Generalitat classified it as a mining resource under section B) of the Mining Law.

2003
Ercros presents the restoration project of the Terrera Vella in the processing of the exploitation application.

2008
Ercros began to exploit the Terrera Vella, after receiving authorization in 2007.

2012
After extracting 10.6 million tonnes of salt, Ercros ceased activity at the Terrera Nova due to the depletion of salt stocks.

2013
The EU publishes the standard that requires the application of membrane technology in the production of chlorine within a maximum period of four years.

2015
The restoration project of the Terrera Nova proposed by Ercros and the universities of Barcelona (UB) and Polytechnic University of Catalonia (UPC) is approved. The cost of the restoration is almost 3 million euros and extends until 2027.

2017
After the extraction of 2.3 million tonnes of salt, Ercros suspended the activity in the Terrera Vella as the salt did not have the quality required in the membrane technology.

2018
Ercros produces all its chlorine with membrane technology, the most efficient and least polluting that exists. This process forces to do without the salt of the Terrera Vella. Instead, it consumes a purer salt that comes mostly from Súria.

2022
The Directorate of Industry of the Generalitat declares the mining authorisation of 2007 expired. Ercros renounces its rights to the Terrera Vella to allow other operators to continue exploiting it.

The Saline Valley of Cardona

The Cardona Saline Valley is a geological formation that extends through the subsoil of the central Catalan depression. It is formed by salts precipitated during the Eocene period (37M-58M years ago) because of the evaporation of the shallow sea, which at that time covered the Ebro depression, to the Bages region. Currently, the Saline Valley is included in the Plan of Areas of Natural Interest (PEIN) of Catalonia.

The composition of the Saline Valley is varied and rich in saline compounds and minerals, such as potassium chloride and sodium chloride.

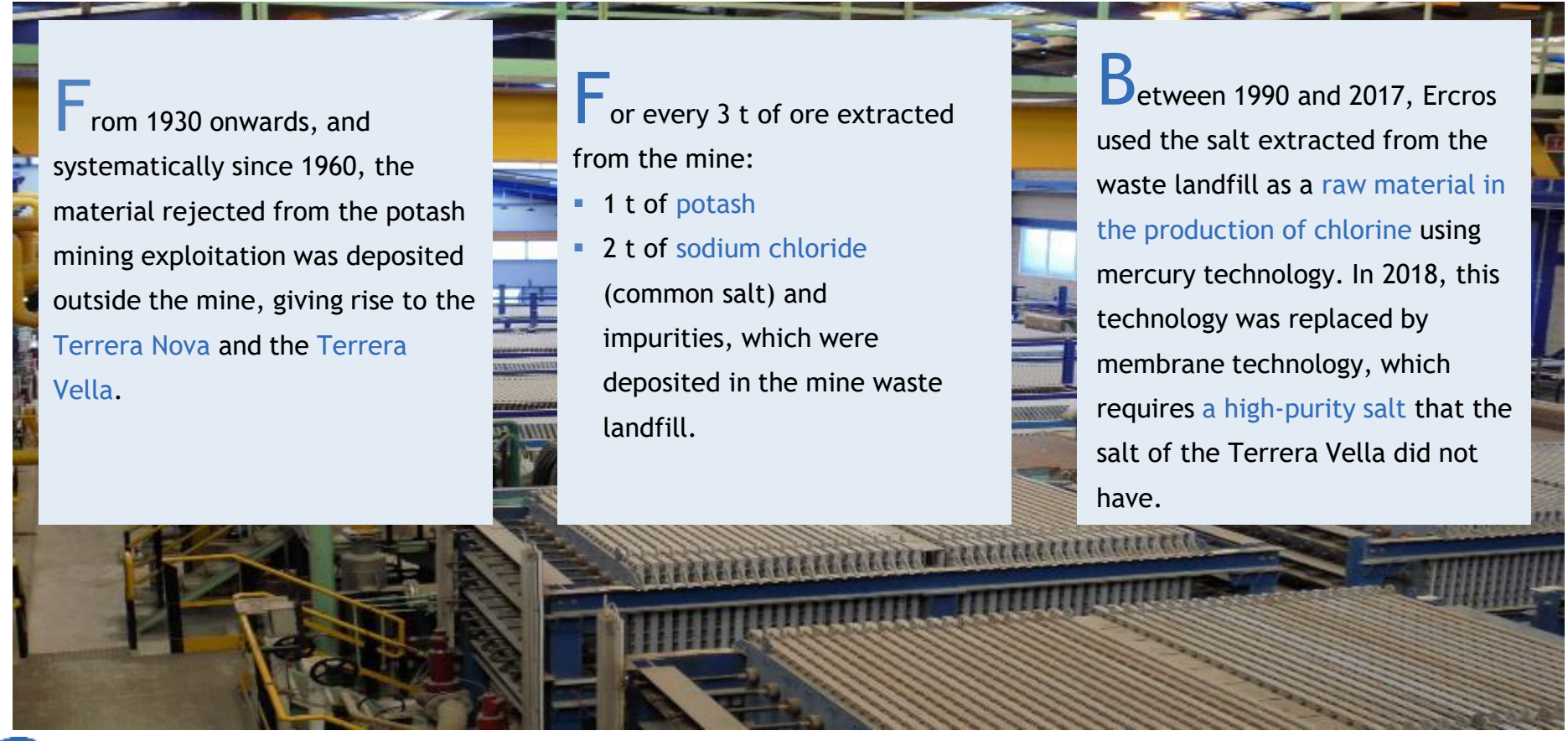
In 1930, mining activity began in the Salt Valley with the commercial exploitation of potash. This activity involves the appearance of waste landfills on the surface formed by the reject material extracted from the mine, including sodium chloride.

The Cardona mine was closed in 1990 after extracting 37 million tonnes of ore. This same year and for 28 years, Ercros will use the salt from the waste landfills as raw material in its chlorine production plants. With the elimination of the waste landfills, it reduces the saline hydrological impact and restores the landscape.

02

The value of the mine waste landfills

Raw material in chlorine processing



From 1930 onwards, and systematically since 1960, the material rejected from the potash mining exploitation was deposited outside the mine, giving rise to the Terrera Nova and the Terrera Vella.

For every 3 t of ore extracted from the mine:

- 1 t of potash
- 2 t of sodium chloride (common salt) and impurities, which were deposited in the mine waste landfill.

Between 1990 and 2017, Ercros used the salt extracted from the waste landfill as a raw material in the production of chlorine using mercury technology. In 2018, this technology was replaced by membrane technology, which requires a high-purity salt that the salt of the Terrera Vella did not have.

Terrera Nova and Terrera Vella

Terrera Nova

Origin: Mining until 1990
Surface: 20 ha
Salt extracted: 10.6 million tonnes
Ercros' years of activity: 1990 - 2012
Landowner: Ercros

Terrera Vella

Origin: Mining until ‘50
Surface: 9 ha
Salt extracted: 2.3 million tonnes
Ercros' years of activity: 2008 - 2017
Landowner: Cardona City Council

Reduction of waste landfills

Terrera Nova

A. Image of the land before 1990, the year in which Ercros began its activity.

B. Image in October 2024.

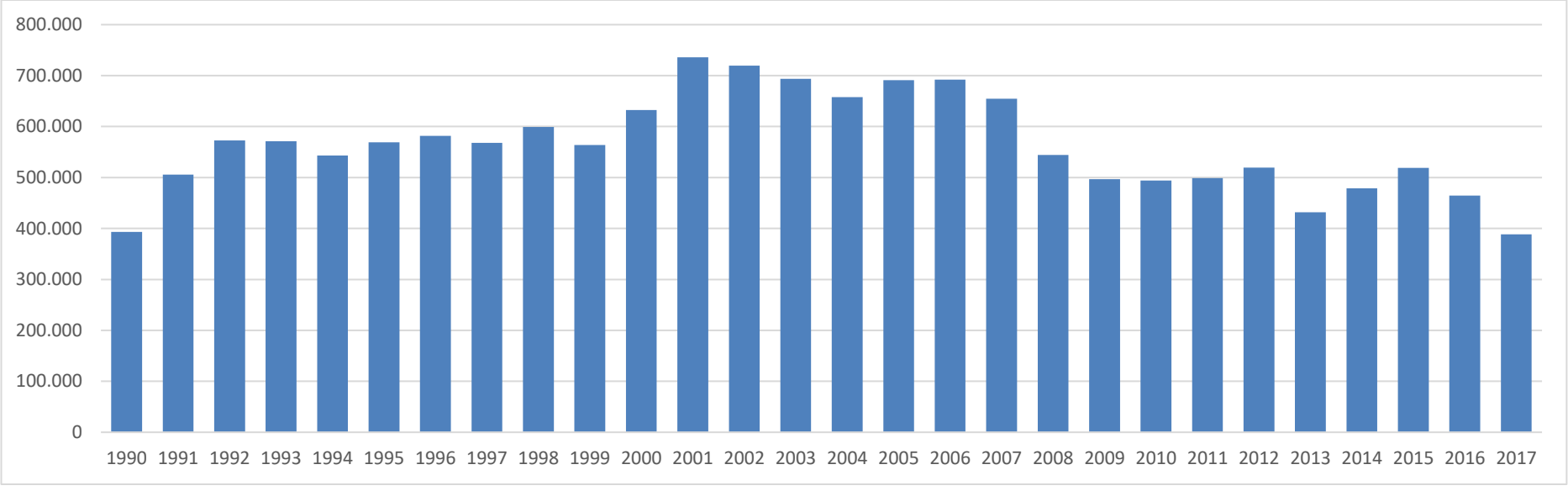
Terrera Vella

A. Image of the land before 2008, the year in which Ercros began its activity.

B. Image in October 2024.

Salt consumed from the Bages waste landfills

Tons of raw salt from the waste landfills in the Bages region that Ercros has consumed each year.



13 Mt Raw salt consumed by Ercros from the waste landfills of Cardona

3 Mt Raw salt consumed by Ercros from Súria and Sallent to mix with the salt of the Terrera Vella to compensate for its poor quality

Sinkhole filling

Ercros has taken advantage of the mud from the purification of the salt from the mine waste landfills to fill the sinkholes of the Saline Valley in order to prevent land subsidence.

What are sinkholes?

Sinkholes are the cavities that form when rainwater and underground currents seep into the interior of a mountain of salt and dissolve the salt. The cavities thus formed within the mountain are transformed into large holes in the surface when the ground gives way.

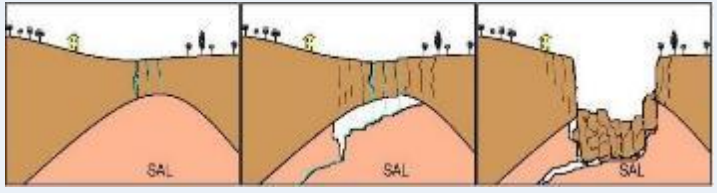
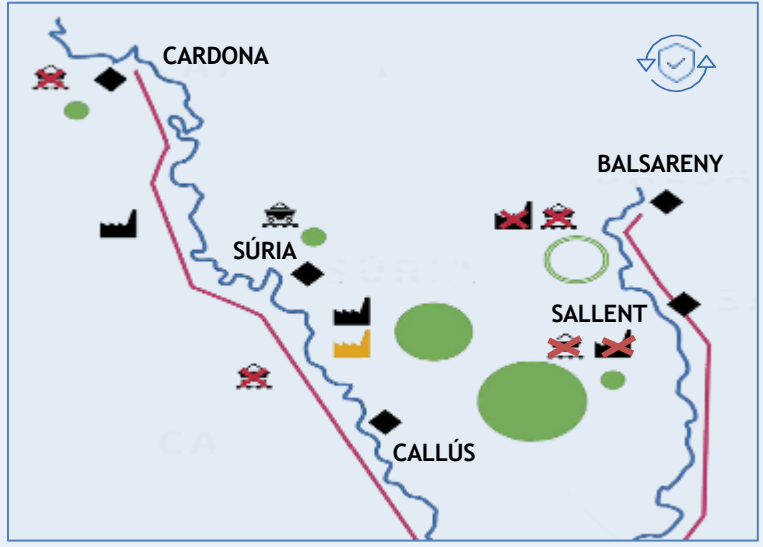


Image taken from the publication La Vall Salina de Cardona.

Salt consumption, today

Currently, Ercros consumes a little bit more than 300,000 tons of salt annually. Its main supplier is located in Súria. In fact, although it has other suppliers to meet its needs, it consumes all the salt that this plant can provide. As a result, it continues its environmental efforts to reduce the waste landfills in the Bages region.

- Closed mine
- Operational mine
- Closed flotation plant
- Flotation plant (separates the potash from the salt)
- Salt crystallization plant
- Salt waste landfill
- Sealed waste landfill
- Town
- River
- Collector



03

Terrera Nova restoration

The restoration process

In 2012, Ercros ended the exploitation of the Terrera Nova when the recoverable saline resource it contained was exhausted. With the disappearance of the mountain of waste, a soil of 20 hectares is freed up with extreme conditions: saline contamination in the soil, salt crusts on the surface and high risk of erosion.

Ercros undertakes the cleaning of the land by carrying out preliminary studies and tests and, based on these, drawing up a restoration project, in order to:

01

Recover the original relief

02

Reduce salinity

03

Rehab the landscape

Previous test

Before starting the restoration project, Ercros has carried out tests to evaluate the water dynamics and the presence of salts in the soil.

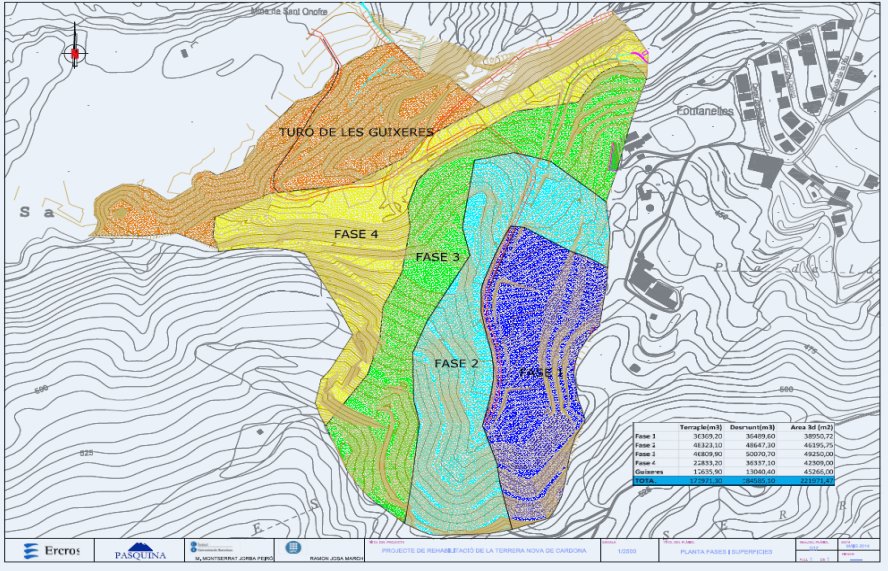
Revegetation testing

Species that absorb salt from the soil and expel it out or accumulate it, such as limonium, tamarix and atriplex, are tested, and the feasibility of planting species tested in the laboratory is tested in situ.

Restoration project

In 2015, the General Manager of Energy and Mines of the Generalitat de Catalunya approved the Terrera Nova restoration project prepared by Ercros with the technical advice of the University of Barcelona (UB), the Polytechnic University of Catalonia (UPC) and the construction company Pasquina. Subsequently, the environmental consultancy Minuartia joined the project.

The project includes restoration and maintenance actions until 2027 with a budget of 2,994,057 euros and proposes six actions to be carried out in five phases, which coincide with as many areas of the Terrera Nova.



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PASQUINA

minuartia

Detail of the actions

01

Decompaction of salt residues.

Washing salts from the soil to facilitate revegetation.

02

Construction of access roads.

Form paths to facilitate earthmoving and the construction of the new relief.

03

Construction of terraces.

Reshape the topography to reproduce the original landscape.

04

Conduction of rainwater to drainage areas.

Control, channel and collect surface water and runoff water to avoid contamination of the environment.

05

Sowing for revegetation and phytoremediation.

Restore the necessary conditions to allow the implantation of vegetation, with external contribution of soil.

06

Maintenance.

Maintain coherence with the environment, restore previous characteristics and accelerate revegetation.

The relief has taken the original shape

The level of the mountain has been lowered to what it was before

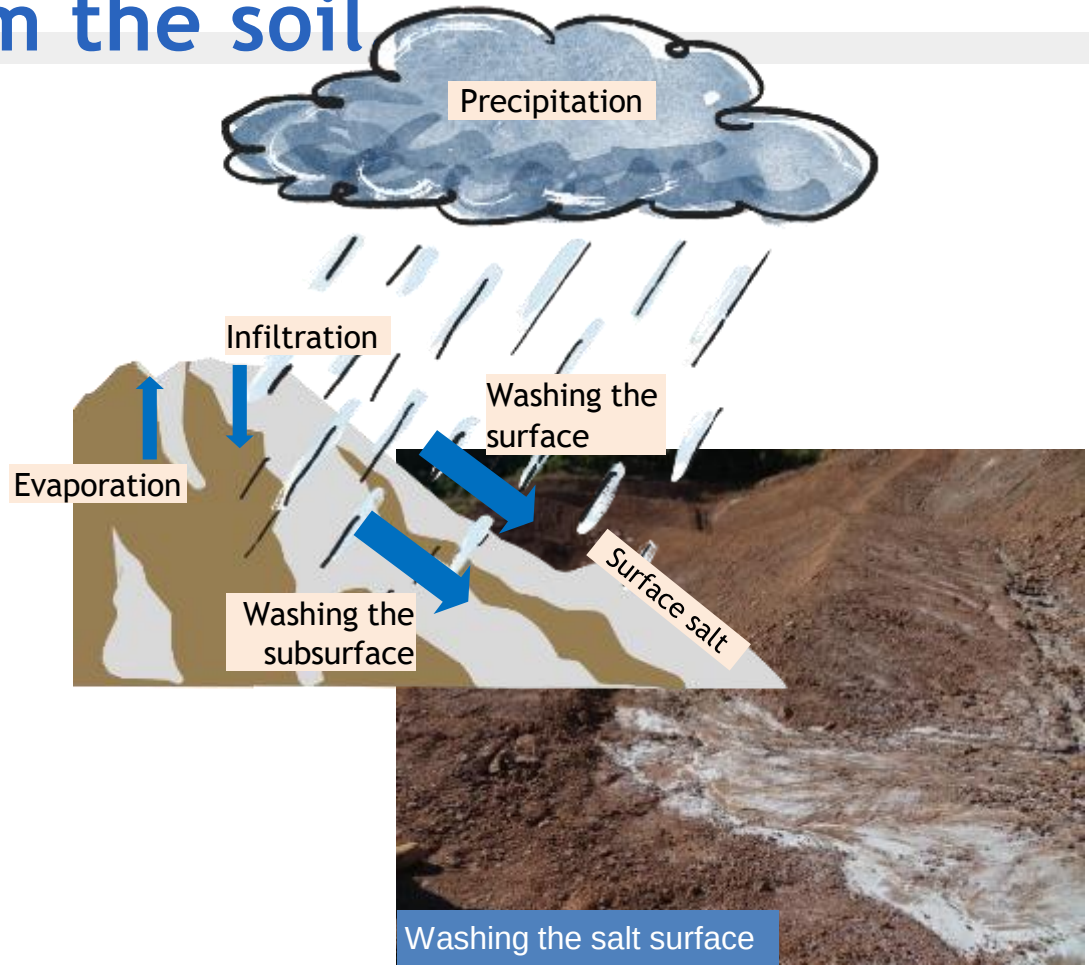
The relief reproduces ancient agricultural terraces

The surplus topsoil of the new Cardona industrial estate is valued to shape the land

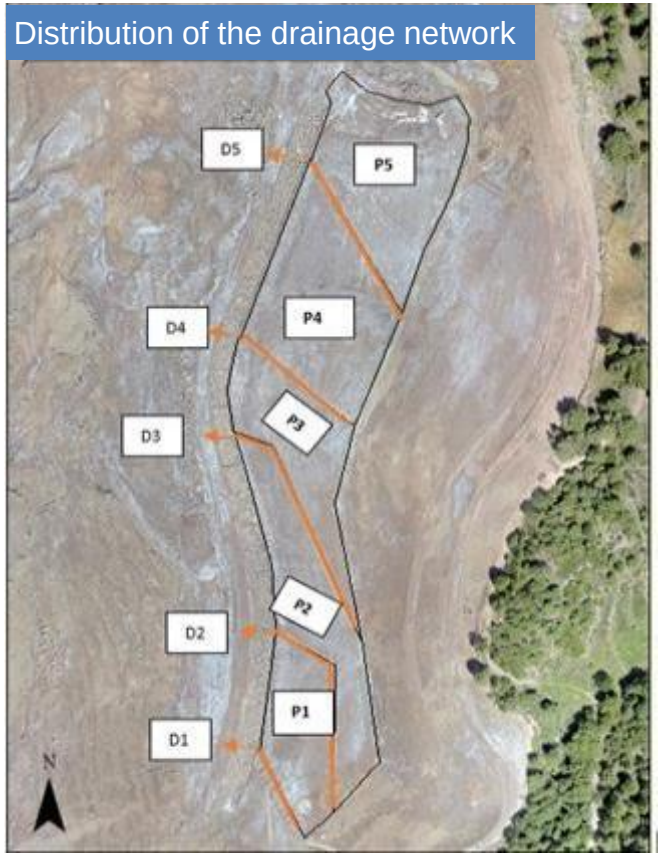
The morphology is adapted to each area

Salt is removed from the soil

Salt crust removal



...and drainage prevents environment salinization

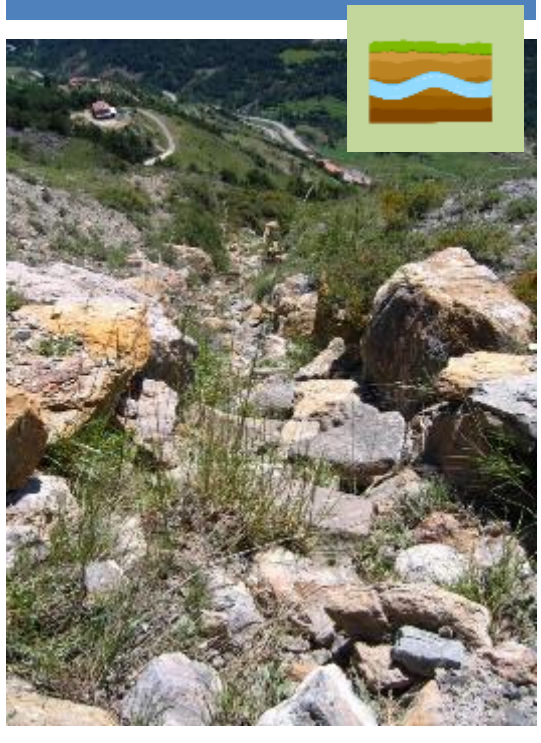


Erceros

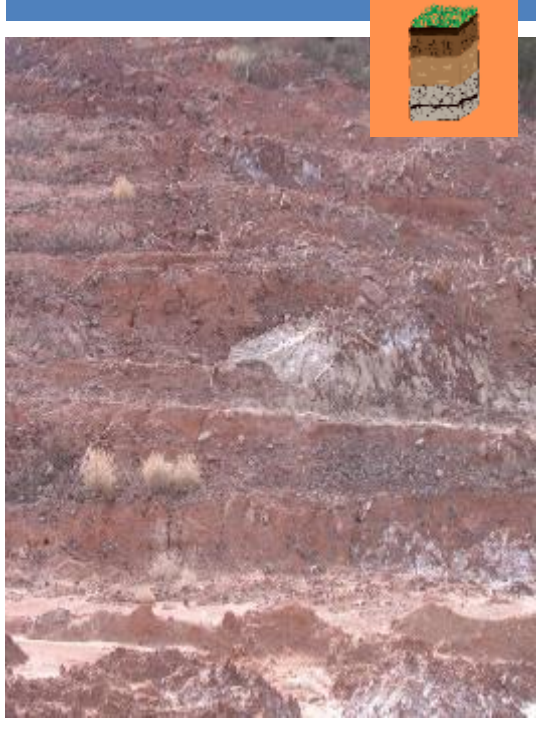
The first green shoots are here!

Periodic control of the actions

Erosion and drainage network: biannual



Soil salinity: annual



Revegetation: biannual

Highlights and relevant figures

Strengths of Ercros' environmental management in Terrera Nova

1. With the exploitation of the salt contained in the Terrera Nova, Ercros has **valued this resource while eliminating the waste landfill**.
2. With the elimination of salt and the construction of drains, **it has slowed down the salinisation of rivers and aquifers** from the area.
3. By revegetating the soils with native species, it **prevents erosion and harmonizes the landscape**.
4. With the movement of earth, it has **remodelled the morphology** to assimilate it to its origin.

11Mt	2015-2027	3 M€	20 ha	185,000 t
Salt extracted	Running the restoration	Restoration budget	Ground surface	Lands moved

04

Terrera Vella situation

Evolution of the Terrera Vella

2007

2009

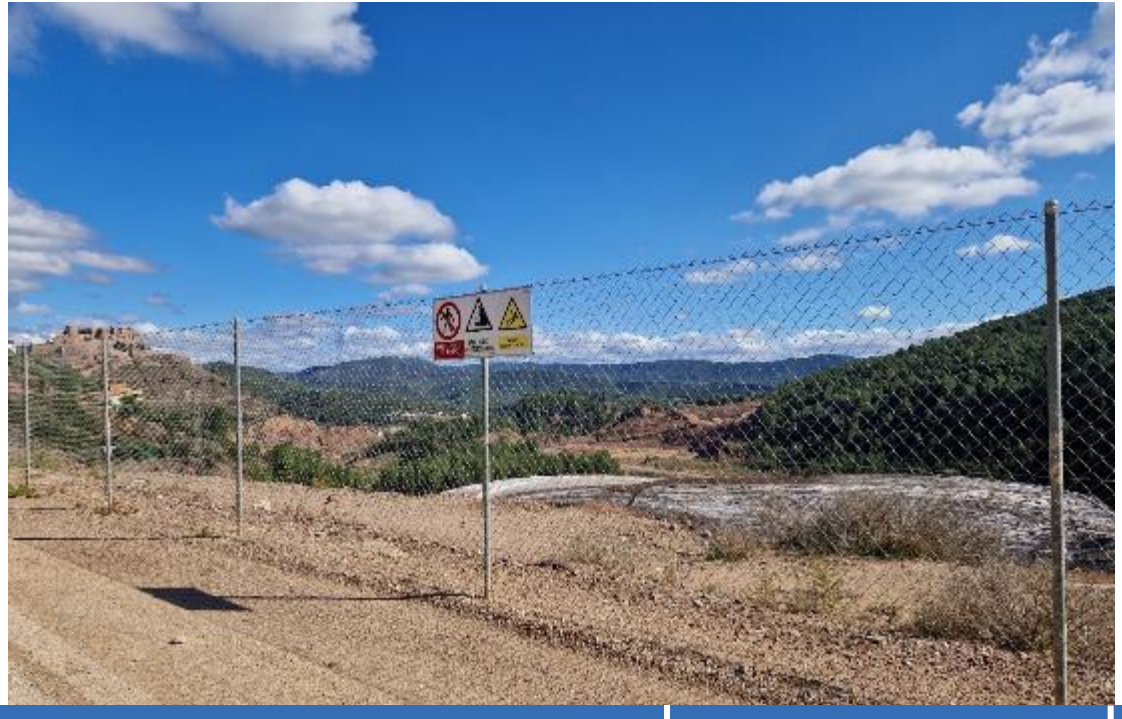
2011

2013

2015

2017

Terrera Vella, today



In 2017, in view of the fact that it does not have the necessary quality for the new technology implemented in the production of chlorine, Ercros decides to suspend the extraction of salt from the Terrera Vella.

In 2022, the Generalitat declared the mining authorisation expired. On this date, Ercros had completed the actions foreseen in the project approved in 2003.

The company has left the Terrera Vella in good safety conditions for people and property (certified by the accredited inspection and control entity Bureau Veritas) and has definitively ceased its activity to allow other operators to continue operating it.

9 ha	2008-2017	2.3 Mt
Ground surface	Period of exploitation	**Raw salt extracted**

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