

WORLD HERITAGE LIST

Las Médulas (Spain)

No 803

Identification

<i>Nomination</i>	Las Médulas
<i>Location</i>	Province of León, Autonomous Region of Castilla y León
<i>State Party</i>	Spain
<i>Date</i>	19 July 1996

Justification by State Party

Las Médulas is a major work of human creative genius in the field of mining, and specifically the technology of *ruina montium*, the application of water power, and systems of gold mining on a scale, efficiency, and economic importance that were of decisive economic importance for the Roman Empire in the first two centuries AD.

Criterion i

It bears remarkable and unique witness to the creation of a cultural landscape, shaped by drastic human intervention and natural processes, with in addition the introduction of non-native flora, which has survived since the Roman period without change.

Criterion ii

It provides unique, or at least exceptional, evidence of a tradition of working and the technological and scientific exploitation of nature in a vanished civilization, which resulted in significant use of applied hydraulics.

Criterion iii

It is an unparalleled example of the blending of archaeology and landscape which illustrates a period that was of importance for humanity and for the Roman Empire of the 1st and 2nd centuries AD, to which it contributed a decisive economic force.

Criterion iv

Category of property

In terms of the categories of cultural property set out in Article 1 of the 1972 World Heritage Convention,

Las Médulas constitutes a *site*. It may also be considered to be a *cultural landscape* as defined in the *Operational Guidelines* (1997), paragraphs 35-41.

History and Description

History

The placer (alluvial) gold deposits of the Las Médulas region were being exploited on a small scale in the late Iron Age. Evidence for this is largely circumstantial, based on excavations of the defended sites (*castras*) of the region and the related cemeteries, with their wealth of golden objects.

The north-western part of the Iberian peninsula was the last to be conquered by the Romans, after the campaign of Augustus in 29-19 BC. The region remained under direct military control for at least a century after the conquest. The degree of romanization was less than in other parts of the Iberian peninsula. Some Roman urban centres were founded and a characteristic Roman road system built, but the indigenous population, though considerably reduced, continued to live on its tribal territories, around its typical defended hill-forts for a considerable period.

However, from the second half of the 1st century AD a new form of occupation becomes apparent. New settlements on the Roman model were set up, with the objective of exploiting the rich mineral resources (notably gold, but also iron) of the region. At the same time, new techniques of extracting the gold were put into practice, on an infinitely larger scale than in the pre-Roman period.

Under the Imperial Roman system, all mineral resources in Imperial provinces (as distinct from the older and more traditional Senatorial provinces) were vested directly in the Emperor, as part of his *patrimonium*, and was administered as part of the Imperial *fiscus*. The mining areas formed part of the province of Hispania Citerior, which included the north-western military regions of Asturia and Callæcia, and were declared to be Imperial estates. At first they were administered by the provincial governor, but following the reforms of Vespasian in the 70s of the 1st century AD, they were managed by an Imperial *procurator Asturiae et Callæciae*. Under him were the *procuratores metallorum*, responsible for individual operations or for groups of mines.

Contrary to general belief, and unlike the situation in other Imperial gold-mining areas (such as Wales), the workers in the mines were free men, not slaves. They continued the mining tradition established in the pre-Roman period in the region. Their settlements can be found all over the region, alongside yet clearly distinguishable from those which housed the Imperial officials and their staffs.

Engineering activities, such as the major hydraulic works of building dams and cutting channels and road construction, were the responsibility of the Roman army. This division of responsibilities and tasks can be seen in other Imperial estates, such as

the Weald of south-eastern England, which was a major producer of iron.

The military presence was also maintained in the mountainous and turbulent mining regions to keep the peace and to ensure the safety of Imperial officials and their deliveries of gold to provincial capitals and over the sea to Rome. The *Legio VII Gemina* (from whence the modern city derives its name) was permanently stationed at León, and auxiliary units garrisoned forts of varying sizes in and around the mining areas.

Sweeping changes took place in the Roman monetary system in the later 2nd century AD, when the gold *aureus* was devalued, with catastrophic results, not least for the Spanish mines. Caracalla (188-217) restored the *aureus* to its former place, and as a result the Spanish mines, which had been in crisis, reactivated their production. This may well also explain why Asturia and Callaecia were raised to the status of an independent province, Hispania Nova Citerior Antoniniana. However, both the new province and the resuscitation of the mines seem to have been short-lived, and the lack of later material in the archaeological record shows that gold production effectively came to an end in the opening decades of the 3rd century.

Description

The area proposed for inclusion on the World Heritage List, that of the Archaeological Zone of Las Médulas (ZAM), covers over 2000ha. It comprises the mines themselves and also large areas where the tailings resulting from the process were deposited. Within the area there are dams used to collect the vast amounts of water needed for the mining process and the intricate canals by means of which the water was conveyed to the mines.

Human settlement is represented by villages, of both the indigenous inhabitants and the Imperial administrative and support personnel (including army units). The area contains the route of one major Roman road and a large number of minor routes, used within the mining operations.

The procedure used in the Roman period for mining the gold-bearing ores made use of the immense power of large bodies of water, the process known to Pliny as *ruina montium*. Water from springs, rain, and melting snow was collected in large reservoirs, which led by a system of well built gravity canals to the mines themselves, over long distances. Galleries were cut into the sterile strata, many metres deep, that overlay the layers of auriferous conglomerate. When the sluices of the dams were opened, enormous quantities of water flowed into the galleries, which were closed at their ends. The pressure thus built up caused the rock to explode and to be washed away by the water flow, forming enormous areas of tailings, several kilometres in length. The process is vividly apparent on the working face at the main Las Médulas site, where the half-sections of the galleries used for the last operation there stand out against the sheer rock face.

When layers of the auriferous conglomerate were encountered, these were broken up in the same way, but the friable conglomerate was run through washing channels, the heavy gold particles being deposited on the bottoms of the channels. The non-metallic part was allowed to escape on to the layers of sterile tailings. It was also necessary to remove the large boulders resulting from this process. This was done by hand, as the neat heaps of them dotted around the landscape demonstrate.

The operating face of this spectacular form of mining slowly moved across the landscape. The main Las Médulas pit covers more than 10km² and the working face on the subsidiary La Frisga pit is more than 600m across. The system of water canals and conduits has been traced over large areas of the site, and measures at least 100km. Contours were used with great skill by the Roman mining surveyors, who maintained even gradients over long distances so as to provide a steady build-up of water when the sluices were opened. These channels can be seen in many parts of the site, and short sections have been cleared so as to demonstrate how they were constructed.

Non-excavational archaeological field survey over many years, both on the ground and using aerial observation and photography, has made it possible to identify a number of settlements within the area. A selected group of these has been partially excavated and demonstrates the essential differences in the way of life of the indigenous and incoming administrative communities.

Management and Protection

Legal status

The Archaeological Zone of Las Médulas (ZAM) was designated a Property of Cultural Interest (*Bien de Interés Cultural*) and included as No 349 on the List of Historical-Archaeological Monuments in June 1931 by decree, but this designation did not delineate any boundaries for the property. However, under the provisions of Law No 16/1985 on the Spanish Historical Heritage a precisely defined area has been registered as a protected monument.

The ZAM has also been protected as a Natural Area (*Espacio Natural*) since 1992. As a result of these two complementary statutory protection measures, all proposals for any form of development or intervention within the protected area must be submitted to the Junta de Castilla y León for approval.

The territory of the ZAM is a logical one, related to the area of Roman archaeological deposits pertaining to the mining operations and associated activities connected with hydraulic works and disposal of mine tailings. It excludes the present-day settlements of Carucedo, Salas e la Ribera, Quereño, and Puente de Domingo Flórez. The village of Las Médulas is included, but there are rigorous controls over any form of inappropriate development there.

There is no buffer zone specified in the documentation. However, this is superfluous in a region of rugged mountains with a declining population.

Management

Management as such is minimal. The ZAM is the responsibility of the Junta de Castilla y León, through its Dirección General del Patrimonio y Promoción Cultural, and the Municipalities of Borrenes, Carucedo, and Puente de Domingo Flórez have an overall supervisory function in respect of the privately owned properties within their territories.

The ZAM Project began in 1988, with the twin objectives of carrying out a scientific study of an entire Roman mining landscape and of creating an archaeological zone or park, as provided for in the Spanish heritage legislation. The scientific programme is well advanced, and work on the archaeological park is proceeding.

Conservation and Authenticity

Conservation history

The landscape of this area was formed by the extensive Roman mining operations. It was subsequently settled by small farming communities, whose market crops were dairy products and sweet chestnuts. This pattern endured until comparatively recently, when the area experienced the drift from the countryside to the towns that characterizes most of Europe. It has therefore conserved an organic landscape that has changed very little over many centuries.

With the initiation of the ZAM Project, there have been some conservation, restoration, and presentation interventions on the Roman mining sites, with the installation of simple viewing points and interpretation boards and clearance and minimal restoration of some technological features, such as water channels.

Authenticity

The authenticity of the property is absolute, since no changes have been made to the Roman installations and deposits since they went out of use in the early 3rd century AD.

Evaluation

Action by ICOMOS

An ICOMOS expert mission visited Las Médulas in November 1996. The views of a distinguished French archaeologist, the leading specialist on Roman mining, were also sought.

Qualities

The Roman gold-mining operations in the Las Médulas area were the most extensive in antiquity. The spectacular remains illustrate both the remarkable technology and the administration of this Imperial estate in every detail.

Comparative analysis

There are other major mining areas operated in classical times in the Graeco-Roman world - in Greece (Lavrión), Austria (around the Hüttenberg), France (the Montagne Noire), and especially on the Iberian peninsula (Rio Tinto, Sierra Morena). However, most of these were exploited for their ores in later periods, and as a result the traces of earlier workings have largely disappeared. North-eastern Spain is exceptional in that subsequent workings were limited or non-existent, as in the case of Las Médulas, which is unquestionably the best preserved and most representative of all the regions.

ICOMOS recommendations for future action

It is important that the further development of the Archaeological Zone should provide for the establishment of a small service of wardens or rangers, on the model of the US National Park Service, whose role would be two-fold: to patrol the area to monitor its condition and to provide visitors with basic information.

Every effort must be made to restrict vehicular access to the area. This can best be achieved by limiting the number of made-up roads and thereby the access of domestic cars and buses. To limit access by four-wheel-drive vehicles, it will also be necessary to introduce physical barriers at especially vulnerable points.

Some form of transport to key viewing points should also be provided for physically handicapped visitors and for senior citizens, since the areas to be covered are large and some of the tracks are difficult to negotiate on foot.

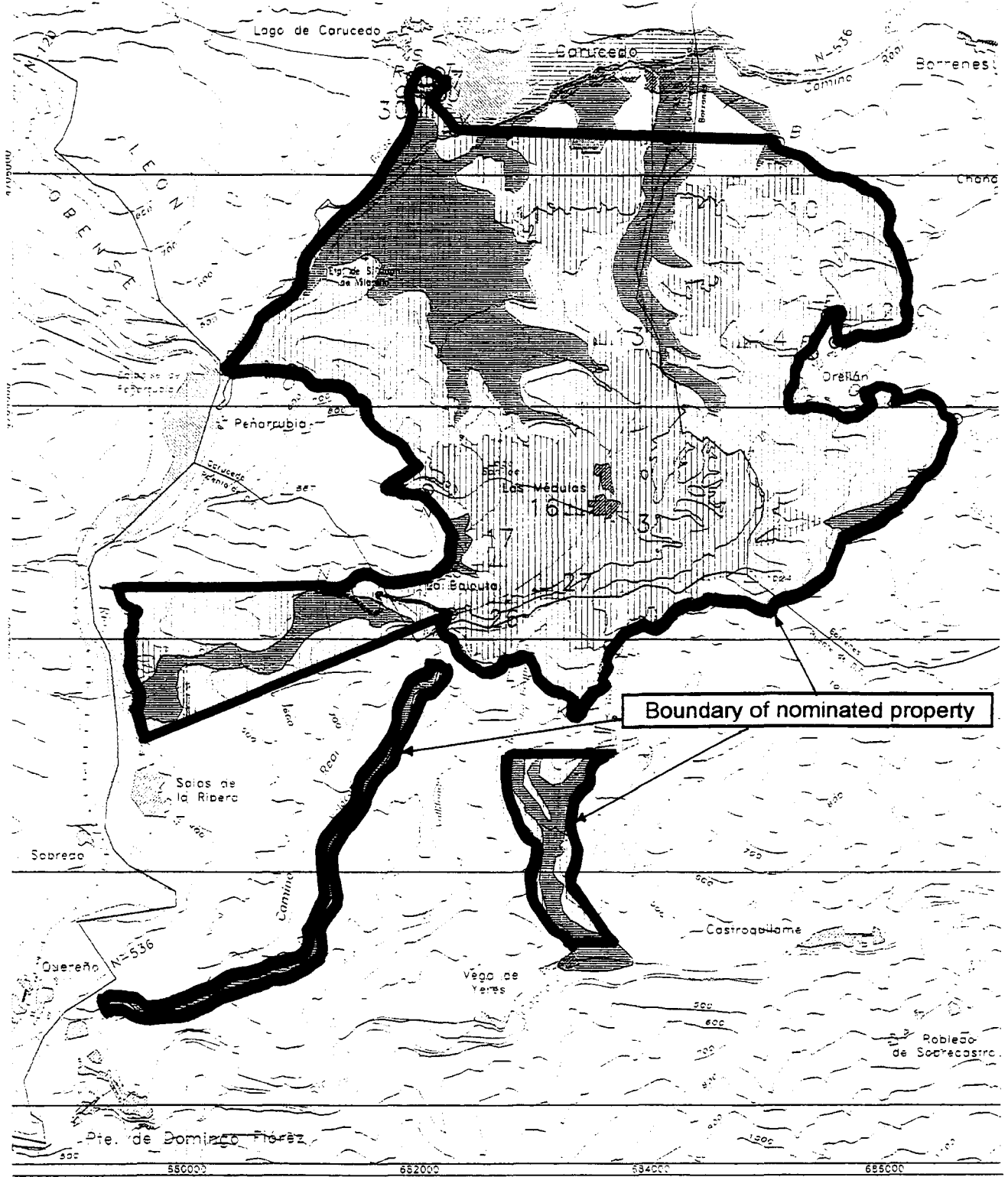
The reception and interpretation facilities for visitors should be improved at the two vehicular access points, including the installation of car parks, toilets, and interpretation centres offering guidebooks and other tourist materials.

Following the final meeting between the ICOMOS mission and representatives of the responsible authorities, an expanded version of the nomination dossier was provided, which contained information that satisfied ICOMOS that these points would be taken into consideration in developing the Archaeological Park.

Recommendation

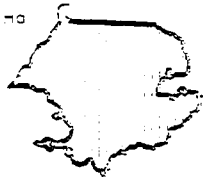
That this property should be inscribed on the World Heritage List on the basis of *criteria i, ii, iii, and iv*:

The Las Médulas gold-mining area is an outstanding example of innovative Roman technology, in which all the elements of the ancient landscape, both industrial and domestic, have survived to an exceptional degree.



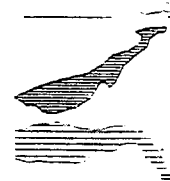
Límites de la zona principal de la mina de oro de Las Médulas

1.879,2 Ha



○ A-V

vértices de la delimitación



Mina de oro

Estériles

Depósitos postromanos

Yacimientos arqueológicos incluidos dentro de la zona principal de la mina de oro de Las Médulas

Límites de otros sectores de estériles

Baiourá

203,6 Ha

Valdebría

48,3 Ha

Otras minas de oro incluidas dentro de la delimitación de estériles

Escala: 1/50.000

0 500 1000 m

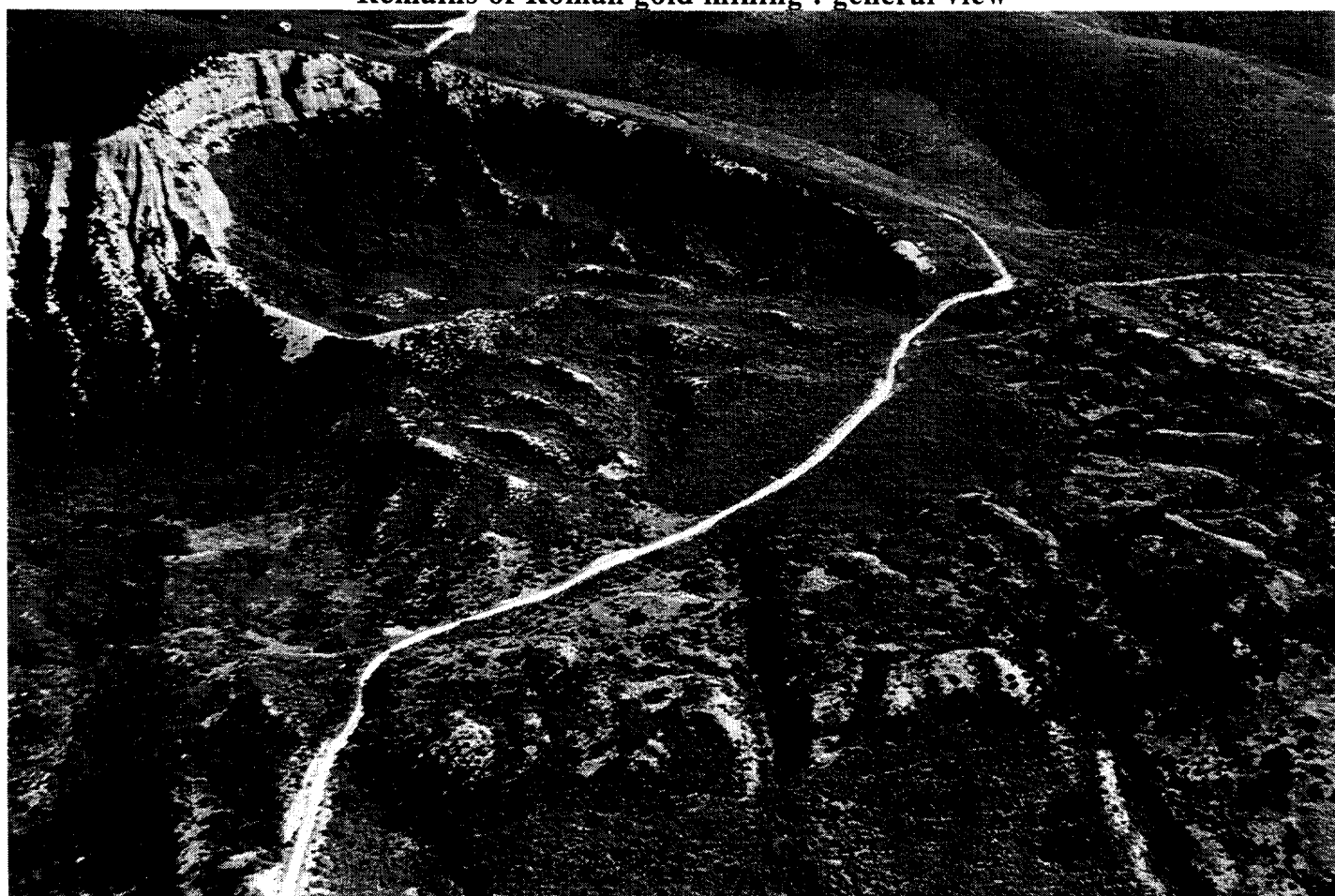
ZAV
Delimitación BIC

Equidistancia entre curvas 100 m.

Las Médulas :
Carte indiquant la zone proposée pour inscription /
Map showing nominated area



Las Medulas :
Vestiges de la mine d'or romaine : vue d'ensemble /
Remains of Roman gold mining : general view



Las Medulas :
Détail d'une mine d'or romaine /
Detail of Roman mine