



F72 – Fig trees

Figure 36: Landscape subunit - Farming areas.

6.2 ADWR CULTURAL VALUES

6.2.1 LANDSCAPE PATTERN (THE DOMINANCE OF VINES ALTERNATING WITH MEDITERRANEAN SCRUB)

The combined work of nature and man is reflected in the landscape of the ADWR, resulting from the balance achieved between the steep slopes, the scarcity of water and the shale soils with the crops selected and adapted to the medium, over centuries (Application of the Alto Douro Wine Region to World Heritage, 2000). The pattern of the landscape in the ADWR is marked by the permanent crops of vineyards, olive groves and almond, side by side with extensive patches of Mediterranean bushes, villages and Quintas, by the water plan created by the Douro River and its main affluents and associated riparian galleries.

The vineyards located up to the 600 m are traditionally used for the production of Port wine, while the remaining vineyards, present at higher rates (between 600 and 700 m) are for the production of other Douro wines (Cancela d’Abreu et al., 2004).

The terraces, supported by stone walls extracted from the shale slope itself for the plantation of the vineyard, are located on slopes where once dominated bushes. There are, however, some slopes or hillside parts where the landscape of traditional terraces (pre- and post-phyllloxeric terraces) has been altered in recent decades (Cancela d’Abreu et al., 2004).

The need for mechanization to monetize production combined with labour shortages, caused different planting and cultivation systems to be started. Thus, currently, traditional terraces are still dominant, in terms of area, but it is already common to observe also vineyards planted on landings, vineyards planted vertically

and vineyards planted without plot of land.

In addition to the vineyard as dominant crop, it is common to observe in its limits, or in the alignment of agricultural paths, olive trees plantations that also mark the landscape, by its volume and colour.

On the other hand, there are some terraces that are abandoned, covered with forest, or that were used for the planting of olive trees or other culture, which are almost always traces of the attack of *phylloxera* at the end of the last century, which led to the destruction of the existing vineyard and the consequent abandonment of wine production by some owners. The terraces abandoned at that time and consequently covered with forest have the designation of "mortuary" and also contribute to the diversification of the landscape and biodiversity refuge.

Also, in areas of very steep slope, where the construction of terraces was not feasible, the forest settlements of hardwoods and resinous and Mediterranean-like bushes occupy the territory.

At the highest and not so suitable for the cultivation of the vineyard appear other crops such as olive or almond, Mediterranean scrub areas, often with the presence of tree species such as the stock, holm oak or juniper, in a more or less sparse way, and forest areas.

Thus, from altitudes above 700 m (which are no longer favourable to the vine culture), north of the Douro, the vineyard is substituted by forest settlements (of hardwoods and resinous), while south of the Douro, consists mainly in areas of uncultivated, bushy and pastures. These result from frequent fires that do not allow these areas to reach more mature stages of plant development, and also from abandoned agricultural fields and areas without vegetation cover.

In the quarry area, the landscape pattern is characterized by the presence of the Poio quarries surrounded by scrubland, pastures and agricultural areas dominated by olive and almond trees.

Around the villages and farms that dot the landscape, there are vegetable gardens and mixed orchards of pome fruit, prune fruit, citrus fruit and fig trees that grow on levels due to the rugged terrain.

This landscape pattern is cut out by the Côa River and its associated watercourses, its enclaves, meanders and valleys with more or less continuous riparian galleries.

6.2.2 SETTLEMENTS AND QUINTAS

The villages are a very important element in the context of Douro's heritage. The “Aldeias Vinhateiras” stand out, designated by the "Vineyard Villages", program under the Integrated Action of The Douro Territorial Base. “Aldeias Vinhateiras” contain a history intrinsically linked to wine culture, and are a product more related to the small-scale local economy. There are 6 villages that can be found by roads that wind through valleys, between terraces, landings and vineyards, namely: Provesende (Sabrosa), Barcos (Tabuaço), Favaio (Alijó),

Ucanha (Tarouca), Salzedas (Tarouca) and Trevões (S. João da Pesqueira).

“Aldeias Vinhateiras”, so-called since 2001, in recent years have been subject of strong investments that have allowed all of them to have, nowadays, rehabilitated public spaces, hence triggered, a qualifying and inducing process of rehabilitation of private buildings and installation, although still incipient, of new activities, including local products trading, restaurants and lodging (Ramos C. e Fonseca G., 2014).

Toponymic analysis near the Quarry area n.º 6637 “Vale de Videiro II” highlights the relevance and proximity of the toponyms: Canada do Inferno, Poio and Quinta do Rego da Vide. Located further away from the project's area of influence, the Videiro Valey toponym stands out. The meaning of most of the toponyms highlights the geomorphological characteristics and the agricultural and industrial activity (Poio quarries) of the surrounding area. “Canada do Inferno” and “Vale de Videiro”, with altimetry ranging from around 400 m to 150 m close to the waters of the River Côa, reveal the altimetric asymmetries and the difficulties that these elevations and the watercourses represent for movement in this territory.

The designations given to the toponyms “Canada”, “Vale” and “Rego” reflect the importance of geomorphology for the toponymy of the surrounding region, considering the obstacles represented by the high/steep cliffs and the water lines. This analysis also curiously highlights the importance of quarrying activities, expressed in the place name “Poio Qaurries”. This record documents the antiquity of quarrying and its importance to the region's economy.

Figure 37 presents aerial photograph with an indication of the location of all “Aldeias Vinhateiras”. The “Aldeias Vinhateiras” nearest to the Quarry n.º 6637 “Vale de Videiro II” are Trevões (about 25 km away) and the settlements of Barcos and Favaio (about 40 km away). From these villages it is not possible to see the quarry under study due to the distance.



Figure 37: Aerial photograph indicating the location of the Aldeias Vinhateiras. The red line indicates the location of the Project under study.

Surrounding the Quarry n.º 6637 “Vale de Videiro II” the number of settlements is low, and they are mostly small and scattered, with the exception of the population cluster corresponding to the town of Vila Nova de Foz Côa . Table 8 and Figure 38 present villages located close to the project area (up to about 6 km away).

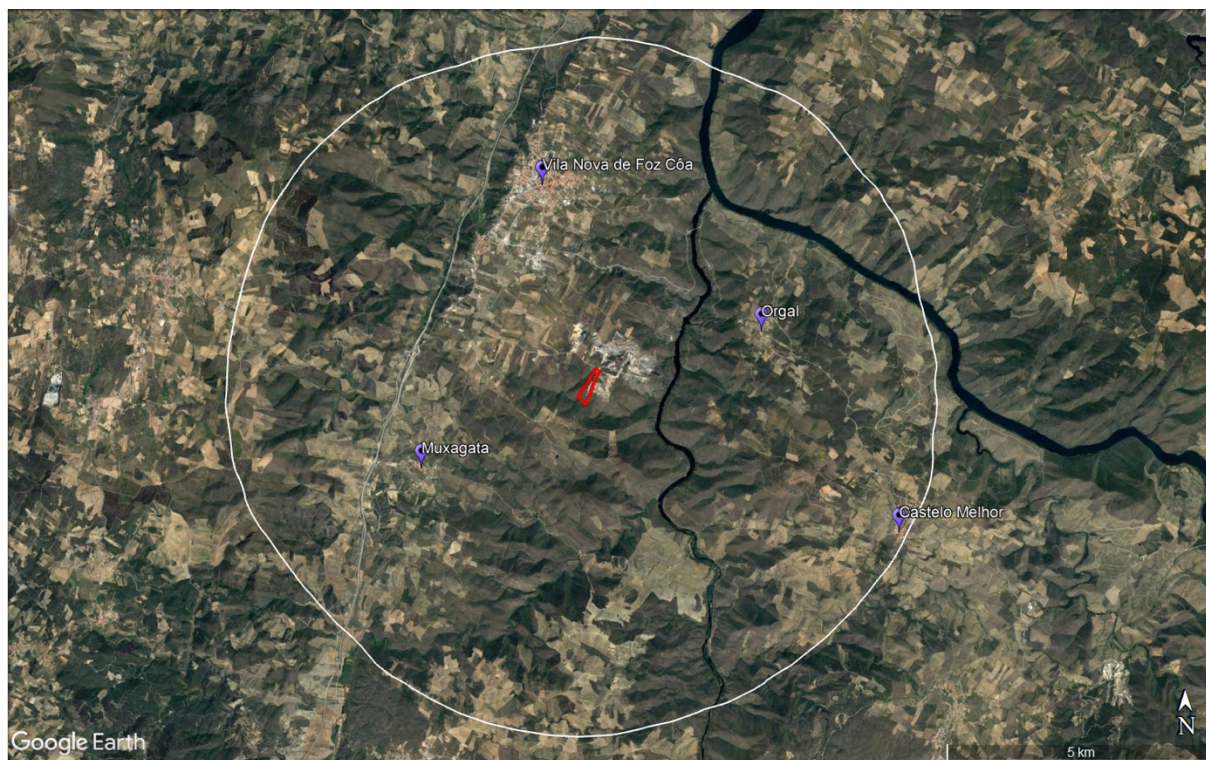


Figure 38: Aerial photograph indicating the location of the villages closest to the Project area. The red line indicates the location of the Project under study and the white line a buffer of 6 km relative to the project area.

Table 8: Villages within a 6 km radius of the Quarry n.º 6637 “Vale de Videiro II.

Settlements	Approximate distance to project area (straight measurement)	Visibility to the Quarry n.º 6637 “Vale de Videiro II
Vila Nova de Foz Côa	2 400	No
Orgal	2 900	Very low
Castelo Melhor	6 000	No
Muxagata	2 800	No

Even if there is a possibility that the quarry n.º 6637 “Vale de Videiro II” may be visible from the town of Castelo Melhor, its visibility may be conditioned by the vegetation and tree cover, the buildings in the population areas and, above all, by the topography of the region. For the same reasons mentioned above, and because it is located in an area with steep slopes, terrain with a lot of folding, well-marked slopes and banks, and limited by shrub and tree cover, the quarry's visibility from most of the towns within a 6 km radius is null or very low. In order to assess actual visibility, taking land use into account, the vantage points of the visual basin in which the project area is located were identified, taking into account the spatial position of towns, roads and reservoirs, and an on-site assessment was carried out (fieldwork), *vide* Figure 39.





Figure 39: Identification of the observation points from which the photographs of the Viewpoints (PV) for the quarry were taken and the spatial orientation of the images taken. The red polygon delimits the quarry n.º 6637 “Vale de Videiro II”.

At observation points PV1 and PV2, temporary observation points where passage is made at moderate to low speeds and of medium frequency associated with industrial or agricultural activity, located on the access road to the project under study, with altimetries of around 420 m, it is possible to see the quarry n.º 6637 “Vale de Videiro II” exploration area, heaps, accumulation of finished product and paths, and their visibility is considered to be high.



Figure 40: Observation point PV1 (access road to the quarry n.º 6637 “Vale de Videiro II”, to the northwest). The red polygon identifies the project area.



Figure 41: Observation point PV2 (access road to the quarry n.º 6637 “Vale de Videiro II”, to the northwest). The red polygon identifies the project area.

From PV3, with an altimetry of around 440 m, to the northwest, the visibility of Quarry n.º 6637 “Vale de Videiro II” decreases, mainly due to the increase in distance and the positioning and direction of the farm. This is a temporary observation point, with passages made at moderate to low speeds and low frequency associated with agricultural activity, and visibility of the quarry is considered low.



Figure 42: Observation point PV3 (access road to agricultural areas, northwest of Quarry n.º 6637 “Vale de Videiro II”). The red polygon identifies the project area.

Observation points PV4, PV5, PV6 and PV7, with altimetry between 400 and 430 m, to the west (PV4 and PV5), southwest (PV6) and south (PV7) of the study area, are located on a rural path that leads to agricultural areas. These are temporary observation points, where passage is made at low speeds and with a low frequency associated with agricultural activity. Visibility to Quarry n.º 6637 “Vale de Videiro II” due to the distance and orogeny of the terrain is low from point PV4, moderate from PV5 and high from points PV6 and PV7, with the exploration area, slopes and heaps visible.



Figure 43: Observation point PV4 (rural road, west of Quarry n.º 6637 "Vale de Videiro II"). The red polygon identifies the project area.



Figure 44: Observation point PV5 (rural road, west of Quarry n.º 6637 "Vale de Videiro II"). The red polygon identifies the project area.



Figure 45: Observation point PV6 (rural road, southwest of Quarry n.º 6637 "Vale de Videiro II"). The red polygon identifies the project area.



Figure 46: Observation point PV7 (rural road, south of Quarry n.º 6637 "Vale de Videiro II"). The red polygon identifies the project area.

From points PV9 and PV10, located to the south of the study area and at altimeters of around 270 and 310 m, respectively, the exploration area and the heap located further south are easily visible. Both sites are temporary observation points, located on rural accesses used mainly as access to agricultural fields, where passage is made at low speeds and low frequency.



Figure 47: Observation point PV9 (rural road, south of Quarry n.º 6637 "Vale de Videiro II"). The red polygon identifies the project area.



Figure 48: Observation point PV10 (rural road, south of Quarry n.º 6637 "Vale de Videiro II"). The red polygon identifies the project area.

From point PV8, as it is at a lower altitude than Quarry n.º 6637 "Vale de Videiro II", it is not possible to see the project.



Figure 49: Observation point PV8 (rural road, southeast of the quarry n.º 6637 “Vale de Videiro II”).

With regard to observation points PV11, PV12, PV13, PV14 and PV15, located to the east and northeast of Quarry n.º 6637 "Vale de Videiro II", visibility for the project is null. However, although it is not visible, some of the neighboring quarries can be seen, i.e. the Poio Quarry Core in which the study area is integrated can be identified. With the exception of PV11, where visibility to the Poio Quarry Core is high, visibility is reduced at the other sites, largely due to the distance and the rough morphology of the terrain.

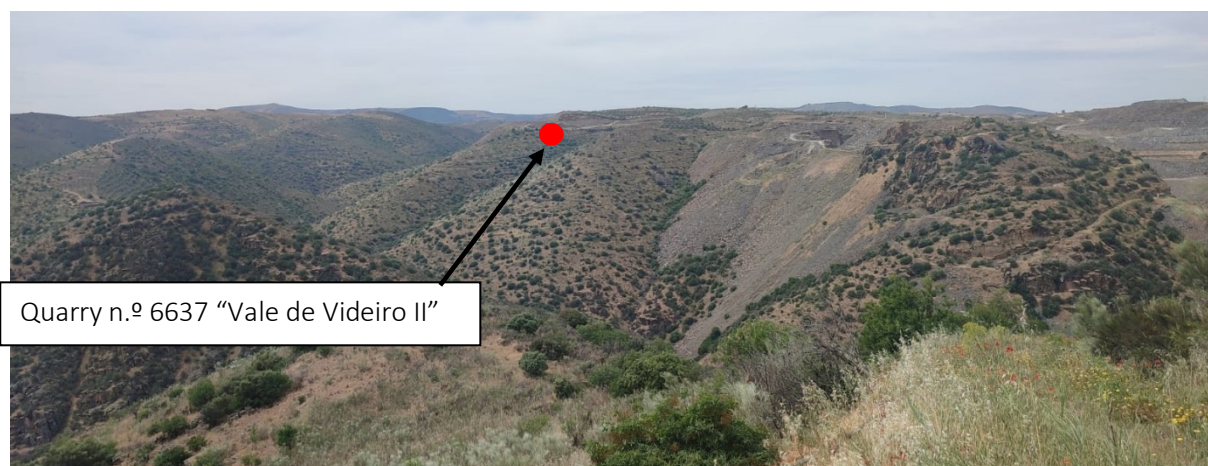


Figure 50: Observation point PV11 - Poio Quarry nucleus (rural road, east of quarry n.º 6637 “Vale de Videiro II”).



Figure 51: Observation point PV12 - Poio Quarry nucleus (rural road, northeast of Quarry n.º 6637 "Vale de Videiro II").
The red polygon identifies the project area.

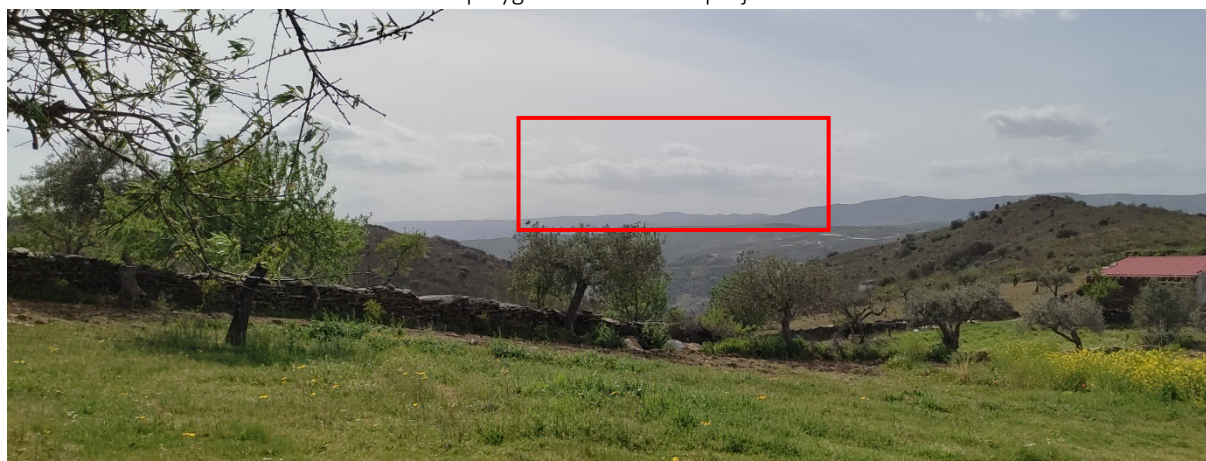


Figure 52: Observation point PV13 - Poio quarry core (rural road, northeast of Quarry n.º 6637 "Vale de Videiro II"). The
red polygon identifies the project area.



Figure 53: Observation point PV14 - Poio quarry core (rural road, northeast of Quarry n.º 6637 "Vale de Videiro II"). The red polygon identifies the project area.



Figure 54: Observation point PV15 - Poio quarry nucleus (rural road, northeast of Quarry n.º 6637 "Vale de Videiro II"). The red polygon identifies the project area.

With regard to the visibility of Quarry n.º 6637 "Vale de Videiro II" from the town of Vila Nova de Foz Côa, we can see that this is null, as exemplified by observation points PV16 and PV17, located at a higher altimetry than the quarry. The same applies to PV18, in the town of Muxagata, where the project under study cannot be seen. The fact that the quarry is located on a hillside opposite the town of Vila Nova de Foz Côa and the distance and morphology of the terrain between the project and the town of Muxagata, protect the population from a humanized and industrialized landscape, altered by shale exploitation.



Figure 55: Observation point PV16 (Vila Nova de Foz Côa industrial park, northwest of Quarry n.º 6637 "Vale de Videiro II").



Figure 56: Observation point PV17 (residential area of Vila Nova de Foz Côa, northwest of Quarry n.º 6637 "Vale de Videiro II").



Figure 57: Observation point PV18 (town of Muxagata, southwest of Quarry n.º 6637 "Vale de Videiro II").
In the ADWR, in addition to the villages, the Douro properties dot the landscape. The light-colored residential buildings are surrounded by agricultural support buildings, mainly for wine-growing.

Around the villages and the properties, there are vegetable gardens and mixed orchards of pome fruit, prune fruit, citrus fruit and fig trees that grow on levels due to the rugged terrain. However, these orchards lose importance as you go up in altitude. In addition to the population clusters, farms, vegetable gardens and orchards, there is the vineyard as the dominant crop, with olive trees planted on its borders or on the alignment of the agricultural paths, which also mark the landscape with their volume and colour. In areas with very steep slopes, where the construction of terraces was not feasible, stands of hardwood and coniferous forests and Mediterranean scrub occupy the territory. From altitudes above 700 m (which are no longer favourable for growing vines), to the north of the Douro, the vineyard gives way to forest stands (of hardwoods and conifers) while to the south of the Douro, it gives way mainly to areas of uncultivated land, scrubland and pastures. These uncultivated areas are the result of frequent fires that do not allow these areas to reach more mature stages of plant development. They are also the result of abandoned agricultural fields and areas without vegetation cover.

In the area surrounding Quarry n.º 6637 “Vale de Videiro II”, there are no relevant farms in terms of heritage. In the wider area, there are four farms, the nearest of which is Quinta da Saudade, about 3.2 km away. Figure 58 and Table 9 show the location of the farms referenced by CIMDOURO and existing wine production farms in the vicinity of Quarry n.º 6637 “Vale de Videiro II”, within a buffer of 6 km (according to the information provided by CIMDOURO <https://www.cimdouro.pt/> and farms referenced on the Google Maps platform).

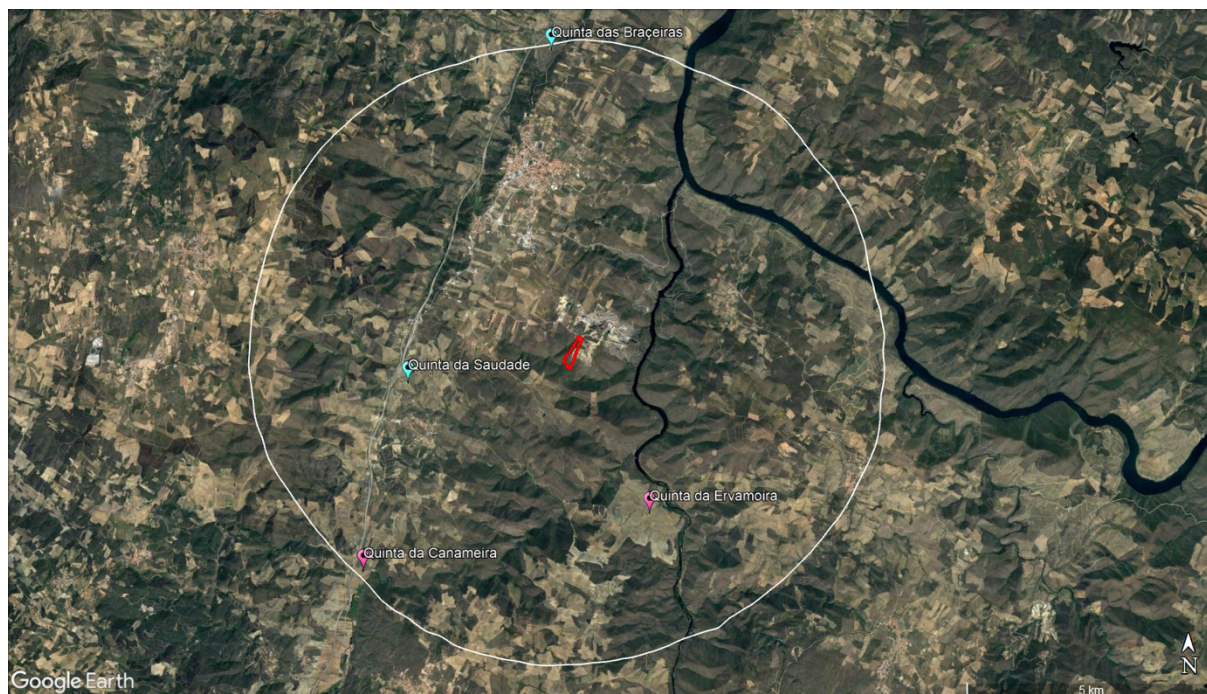


Figure 58: Aerial photograph showing the existing farms in the vicinity of Quarry n.º 6637 “Vale de Videiro II”. Pink markers - farms indicated by CIMDOURO (source: <https://www.cimdouro.pt/>); Blue markers - wine producing farms (source: Google Maps). The white line indicates a 6 km buffer.

Table 9: Existing farms in the vicinity of Quarry n.º 6637 "Vale de Videiro II", buffer 6 km. Source: <https://www.cimdouro.pt/> e Google Maps.

Farm	Address	Zip code	Municipality	Source
Quinta da Canameira	Quinta da Canameira	5150-000	Vila Nova de Foz Côa	CIMDOURO
Quinta da Ervamoira	Quinta da Ervamoira – Muxagata	5150-338		
Quinta das Braçeras	-	-		Google Maps
Quinta da Saudade	Quinta da Saudade	5150-333		

6.2.3 THE SACRED

The Cistercian monks influenced the construction of the landscape through the countless assets they held between Lamego and the outfall of Varosa River (on the border with Régua), being a vast and scattered religious heritage in the landscape, but modest.

In Alto Douro there are no large churches or shrines, however, the landscape is punctuated by small chapels located in the highest points (much closer to the gods) or near the houses and Quintas, because the river is a "source of disease" and in the face of the adversities of sailing in the Douro, the populations devoted their faith to obtain protection.

Some of these places are very old and many, because they are located in higher areas, are observation points of the exceptional landscape over the valley of Douro River and its slopes.

In the study area (*buffer* of 6 km around the area to be licensed from the Quarry n.º 6637 “Vale de Videiro II”), the chapels and churches shown in Figure 59 and Table 10, of which the Mother Church of Vila Nova de Foz Côa and the Chapel of Nossa Senhora da Conceição are listed as Classified Heritage by CIMDOURO. Although the sacred sites indicated are within the study area, they do not allow the quarry to be seen.

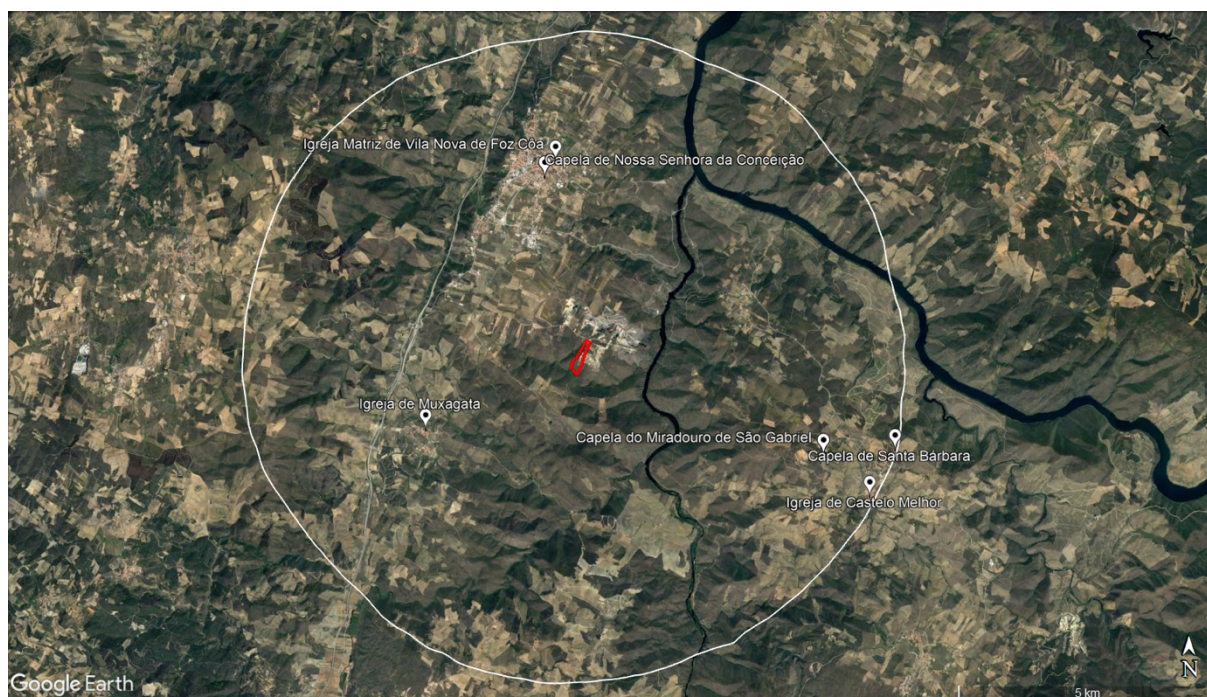


Figure 59: Aerial photograph showing the sacred sites in the vicinity of Quarry n.º 6637 "Vale de Videiro II". The white line indicates a 6 km buffer.

Table 10: Sacred sites in the surroundings of Quarry n.º 6637 "Vale de Videiro II", buffer 6 km.

Sacred Place	Locality	Municipality	Classified Heritage
Igreja Matriz de Vila Nova de Foz Côa	Vila Nova de Foz Côa	Vila Nova de Foz Côa	Sim
Capela de Nossa Senhora da Conceição	Vila Nova de Foz Côa		Sim
Igreja de Muxagata	Muxagata		Não
Capela do Miradouro de São Gabriel	Castelo Melhor		Não
Capela de Sata Bárbara	Castelo Melhor		Não
Igreja de Castelo Melhor	Castelo Melhor		Não

6.2.4 ACCESSIBILITY – THE NAVIGABILITY OF DOURO RIVER, THE RAILROAD AND THE ROADS

For centuries the Douro River was the main communication route of the Alto Douro. The paths along its affluents allowed people and properties to reach from highest points to the river. The railroad was built around 1870 on the margins of Douro River and only in the twentieth century it was extended along its affluents. Access to the region has recently been improved, in particular through the new road network.

“Since immemorial times, the Douro River has been an important route of communication and transportation for the region's products, and until the end of the last century it was the only access route. (...) The rabelo boat

was designed with characteristics suited to this river and especially for the transportation of wine barrels, and there are references to its existence in documents from the 10th century. (...) Although essentially based on the transportation of granite, commercial navigation generates significant added value for the region by making the exploitation of quarries economically viable and by creating jobs in depressed areas. (...) There are around 186 boats operating on the Douro, offering a wide variety of touristic options, ranging from a simple, short trip (a tour of the Porto and Gaia bridges or the World Heritage Site) to a weekly Porto - Barca d'Alva cruise on a luxury hotel boat. (...) There has been a growing trend in the number of river tourists and the fleet of boats available for tourist cruises. Along the river, the municipalities and APDL have been improving and building touristic river quays with infrastructures suitable for high-quality tourism. (...) Alongside tourist and commercial navigation, sports navigation has been increasing very significantly.” (APLD Douro <https://douro.apdl.pt/via-navegavel-douro/promocao/>)

According to APDL Douro, the Douro waterway in Portugal is 208 km long, from the Atlantic Ocean to the Spanish border at Barca D'Alva, with a gradient of 125 m overcome by 5 navigation locks (from 13 to 35 m), *vide* Figure 60. Considered a waterway with international and modern characteristics, it is open throughout its length to vessels of all types, with the exception of sailboats with masts over 7.20m. The maximum dimensions of vessels allowed in the locks: length 83 m; beam 11.4 m; draft 3.8 m; air draft 7.5 m. Restrictions upstream of Pinhão, due to the bottleneck in the canal: length 83 m; draft 2 m. The navigation channel is marked with river markings in the regulatory colors and there are around 60 river quays along the route (APLD Douro <https://douro.apdl.pt/via-navegavel-douro/canal-de-navegacao/>).

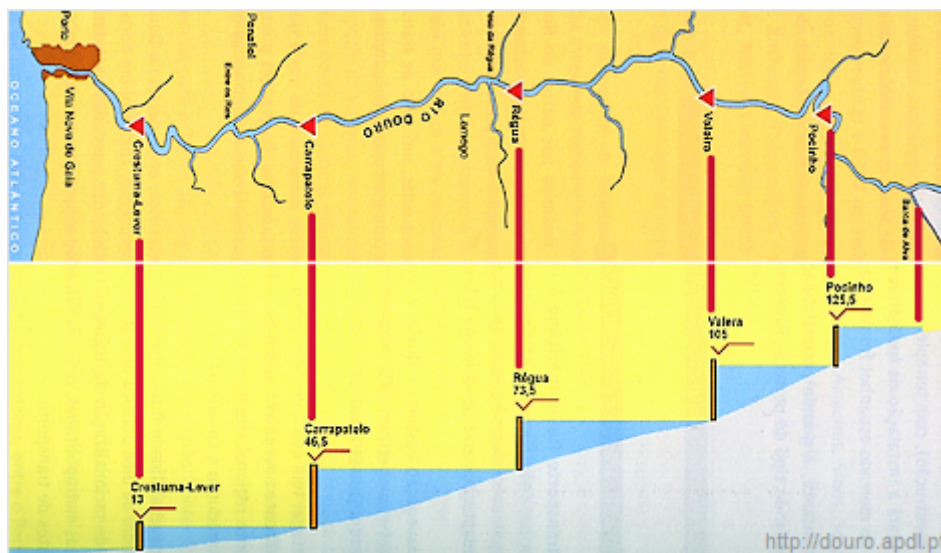


Figure 60: Location and height of the existing locks on Douro River.

There is currently a wide range of maritime tourism. Maritime tourist navigation is distributed among the following segments:

- Cruises longer than one day (hotel ships);
- One-day cruises (using locks), almost all of which are divided into the following routes: Porto/Régua/Porto, Régua/Pinhão/Régua and Régua/Barca D'Alva/Régua;
- Cruises on the same reservoir, which are concentrated in the Porto/Gaia, Entre-os-Rios, Régua, Pinhão, Foz do Sabor and Pocinho areas.

6.2.5 THE TERRACES AND WALLS IN SHALE AND THE DIFFERENT TYPES OF PLANTING OF THE VINEYARD

Shale soils and relief feature determine remarkable forms of landscape transformation. To cultivate the vineyard on the steep and stony slopes of the Douro and its affluents, where the bushes once dominated, it was necessary to produce soil and build landings (terraces) traditionally supported by shale walls (extracted from the shale slope itself) and that combine themselves, nowadays, with new forms of vineyard frame (Application of the Alto Douro Wine Region to World Heritage, 2000).

The older terraces feature low walls and narrow and irregular “geios” (planting land between two steps or walls), which accompany the level curves and rocky outcrops, sometimes having only a squeeze of vines – pre-phyloxeric terraces. These terraces were mostly built before the phylloxera attack in the last third of the 19th century, which led to the destruction of the existing vineyard and the consequent abandonment of wine production by some owners, leaving many of these abandoned terraces (“mortórios”), covered with spontaneous vegetation and bushes. Other terraces have been recovered for replanting vineyards or for planting olive trees or other crops. Associated with some pre-phyloxeric terraces, it is also possible to observe traces of even older traditional techniques, such as that of the pikes, in which the vines were planted on the walls themselves, leaving the “geios” free for other crops.

The post-phyloxeric terraces mostly built between the end of the 19th century and the 1930s, during the reconstruction period of the regional vineyard, have solid, tall and rectilinear walls, supporting wide “geios”, with four, five or more row of vineyards (Application of the Alto Douro Wine Region to World Heritage, 2000). The need for mechanization to monetize production combined with the scarcity of labor, led to the implementation of different planting and cultivation systems, also leading to changes in landscape of traditional terraces (pre- and post-phyloxeric terraces) (Cancela d’Abreu *et al.*, 2004), and it is already common to observe vineyards planted on landings, vineyards planted vertically and vineyards planted without plot of land.

6.2.6 CULTURAL, ARCHAEOLOGICAL, ARCHITECTURAL AND ETHNOLOGICAL HERITAGE

6.2.6.1 Archaeological and ethnographic heritage

Inscribed on the UNESCO World Heritage List in 1998, the Côa Valley is considered "the most important open-air Paleolithic rock art site". The archaeological site is divided into two main river axes: 30 kilometers along the Côa River - Faia, Penascosa, Quinta da Barca, Ribeira de Piscos, Canada do Inferno - and 15 kilometers along the banks of the Douro River - Fonte Fireira, Broeira, Foz do Côa, Vermelhosa, Vale de José Esteves, Vale de Cabrões. Like an immense open-air gallery, the Côa Valley has more than a thousand rocks with rock art, identified at more than 70 different sites, the predominant ones being Palaeolithic engravings made around 25,000 years ago.

In the database of the Direcção Geral do Património Cultural (DGPC), 276 archaeological sites are registered for the municipality of Vila Nova de Foz Côa, 62 of which are located in the parish of Vila Nova de Foz Côa (*vide* Table 11). Figure 61 shows the positioning of the archaeological sites in the vicinity of Quarry n.º 6637 "Vale de Videiro II", with geographic location available and referenced by the DGPC, in a buffer of 6 km (according to the information available at <https://arqueologia.patrimoniocultural.pt/index.php?sid=sitios&p=1>).

Table 11: Archaeological sites recorded in the DGPC database for the parish of Vila Nova de Foz Côa. (Source: Archaeological Portal – DGPC)

Designation	Nº CNS	Type	Classification/ Chronology	Coordinates (WGS84)
Alto das Malhadas	22886	Village	Regular / Iron Age	-
Azinhate	41517	Rupestrian Art	- / -	-
Bairro Flor da Rosa 4	33210	Occupancy	- / Roman	Latitude: 41,080483 Longitude: -7,156757
Bairro Flor da Rosa 5	33211	Occupancy	- / Roman	Latitude: 41,078191 Longitude: -7,158326
Bairro Flor da Rosa 6	32781	Habitat	- / Roman	Latitude: 41,074869 Longitude: -7,159494
Cachão	41524	Rupestrian Art	Regular / Upper Paleolithic	-
Calçada da Vermelhosa	41504	Calada	- / Modern	-
Campanas	11026	Village	- / Chalcolithic	Latitude: 41,117826 Longitude: -7,182970
Canada da Moreira	41492	Rupestrian Art	- / Upper Paleolithic, Iron Age and Modern	-
Canada do Arrobão	41493	Rupestrian Art	Regular / Upper Paleolithic, Iron Age and Modern	-

Designation	Nº CNS	Type	Classification/ Chronology	Coordinates (WGS84)
Castelo Velho do Monte de Meão (ou Castelo Velho 5)	11029	Fortified Village	- / Iron Age, Roman, Bronze Age - Late	Latitude: 41,143220 Longitude: -7,151040
Crelgo	41506	Grave	Regular / Middle Age	-
Eira	17502	Diverse traces	- / Undetermined and Roman	Latitude: 41,133947 Longitude: -7,130218
Foz do Côa - Rocha 112	29919	Rupestrian Art	- / Paleolithic and Iron Age	Latitude: 41,077354 Longitude: -7,109516
Foz do Côa - Rocha 113	29920	Rupestrian Art	Regular / Iron Age and Modern	-
Lameira Longa	41490	Sepultura	Good / Middle Age	-
Minas do Cabeço Vermelho	39030	Mine	Regular / Undetermined	Latitude: 41,148238 Longitude: -7,121879
Moinhos de Cima - Rocha 17	29912	Rupestrian Art	Regular / -	-
Moinhos de Cima - Rocha 18	29913	Rupestrian Art	Bad / Undetermined	-
Moinhos de Cima - Rocha 22	29914	Rupestrian Art	Good / Iron Age	-
Moinhos de Cima - Rocha 23	29915	Rupestrian Art	- / Paleolithic	Latitude: 41,073355 Longitude: -7,112470
Moinhos de Cima - Rocha 4	29908	Rupestrian Art	- / Iron Age	Latitude: 41,070632 Longitude: -7,109038
Moinhos de Cima - Rocha 5	29910	Rupestrian Art	Regular / -	-
Moinhos de Cima - Rocha 6	29909	Rupestrian Art	- / Iron Age	Latitude: 41,072245 Longitude: -7,110191
Moinhos de Cima - Rocha 7	29911	Rupestrian Art	- / Iron Age	Lisboa DGPC Latitude: 41,071731 Longitude: -7,110127
Monte Meão I	41507	Village	Regular / Neo-Chalcolithic and Bronze Age	-
Monte Meão III	41561	Occupancy	Regular / Neo-Chalcolithic	-
Monte Meão IV	41577	Rupestrian Art	Regular / Neo-Chalcolithic and Roman	-
Monte Meão V	41585	Rupestrian Art	Regular / Modern	-
Monte Meão VI	41578	Occupancy	Regular / Neo-Neo-Chalcolithic and Roman	-
Monte Meão VII	41579	Occupancy	Regular / Neo-Chalcolithic	-
Núcleo de Arte Rupestre da Foz do Côa	8456	Rupestrian Art	- / Iron Age, Upper Paleolithic and Contemporary	Latitude: 41,080248 Longitude: -7,108375
Núcleo de Arte Rupestre da Vermelhosa	11168	Rupestrian Art	- / Iron Age and Upper Paleolithic	Latitude: 41,086721 Longitude: -7,107195

Designation	Nº CNS	Type	Classification/ Chronology	Coordinates (WGS84)
Núcleo de Arte Rupestre de Vale de Cabrões	8455	Rupestrian Art	- / Upper Paleolithic, Iron Age and Neo-Chalcolithic	Latitude: 41,091065 Longitude: -7,117891
Núcleo de Arte Rupestre de Vale do Forno	11174	Rupestrian Art	- / Iron Age	Latitude: 41,068587 Longitude: -7,115982
Núcleo de Arte Rupestre da Bulha	41509	Rupestrian Art	- / Upper Paleolithic, Iron Age and Modern	-
Paço	11044	Diverse traces	- / Roman	Latitude: 41,084992 Longitude: -7,133461
Pedreira do Poio	39266	Village	Destroyed / Chalcolithic	Latitude: 41,050790 Longitude: -7,119303
Poio	41580	Rupestrian Art	Regular / Upper Paleolithic	-
Quita da Barca IV	41491	Rupestrian Art	Regular / Modern	-
Quinta do Vale de Meio	11144	Outdoor Station	Lower Paleolithic	Latitude: 41,154242 Longitude: -7,124071
Raposeira I	41540	Rupestrian Art	Regular / Iron Age	-
Raposeira II	41541	Rupestrian Art	Regular / Iron Age	-
Reguengo / Nossa Senhora da Veiga	41576	Town	Regular / Roman	-
Texugo	39723	Village	Regular / Chalcolithic	Latitude: 41,044037 Longitude: -7,119261
Tudão	41513	Rupestrian Art	- / Upper Paleolithic and Iron Age	-
Vale Escuro I	41515	Rupestrian Art	- / -	-
Vale Videiro	8467	Rupestrian Art	- / Upper Paleolithic	Latitude: 41,038889 Longitude: -7,112752
Vale da Casa (ou Vale da Cerva)	1703	Rupestrian Art	- / Bronze Age and Iron Age	Latitude: 41,108780 Longitude: -7,102684
Vale da Casa II	41554	Rupestrian Art	Endangered / Upper Paleolithic Neo-Chalcolithic and Modern	-
Vale de Cabrões II	41494	Rupestrian Art	Regular / Upper Paleolithic, Iron Age and Modern	-
Vale de Canivães	41552	Rupestrian Art	Regular / -	-
Vale de José Esteves II	41570	Rupestrian Art	- / Upper Paleolithic and Iron Age	-
Vale de José Esteves III	41571	Rupestrian Art	- / Upper Paleolithic and Iron Age	-
Vale de José Esteves IV	41584	Rupestrian Art	- / Upper Paleolithic, Iron Age and Modern	-
Vale de Moinhos - Rocha 10	29905	Rupestrian Art	- / Modern	Latitude: 41,068365

Designation	Nº CNS	Type	Classification/ Chronology	Coordinates (WGS84)
				Longitude: -7,124551
Vale de Moinhos - Rocha 11	29906	Rupestrian Art	- / Iron Age	Latitude: 41,068489 Longitude: -7,119220
Vale de Moinhos - Rocha 12	29907	Rupestrian Art	- / Upper Paleolithic	Latitude: 41,066258 Longitude: -7,118373
Vale de Moinhos - Rocha 7	11312	Rupestrian Art	- / Iron Age	Latitude: 41,068726 Longitude: -7,121560
Vale do Forno - Rocha 19	29918	Rupestrian Art	- / Paleolithic	Latitude: 41,076001 Longitude: -7,110311
Vale do Forno - Rocha 5	29916	Rupestrian Art	Regular / Iron Age	-
Vale do Forno - Rocha 6	29917	Rupestrian Art	- / Iron Age	Latitude: 41,076001 Longitude: -7,110311

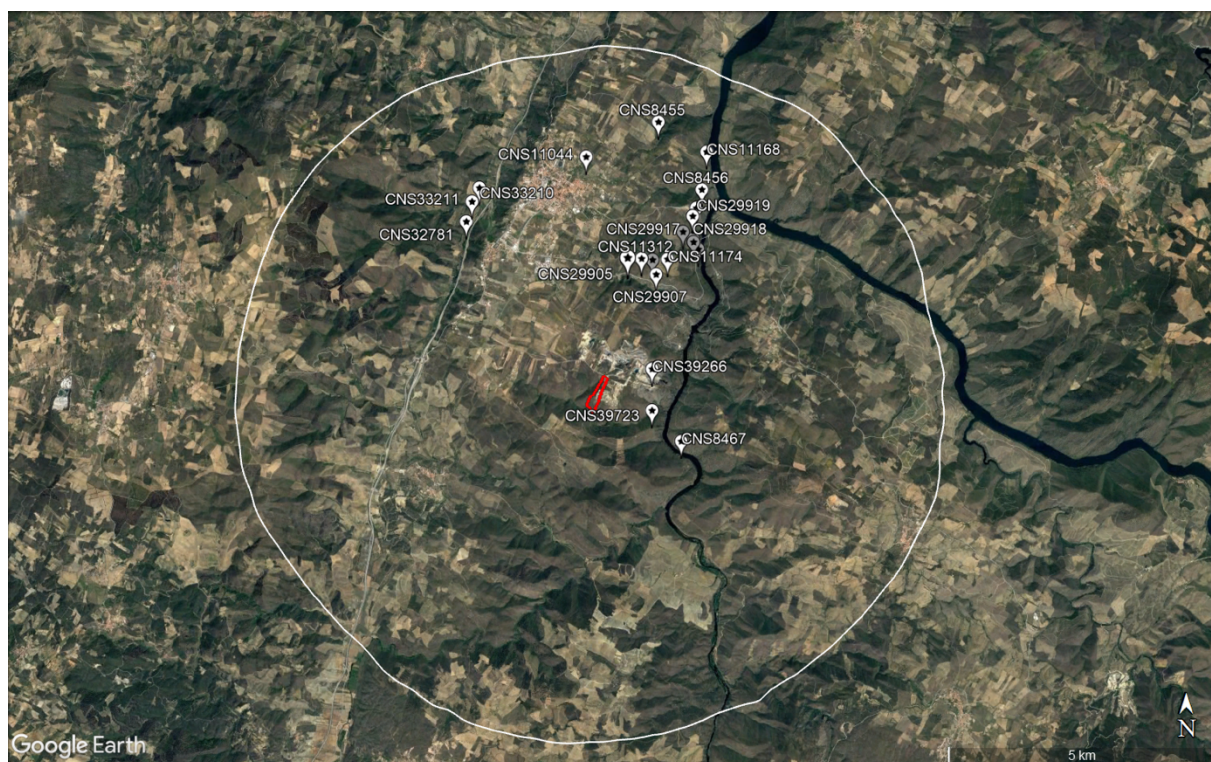


Figure 61: Aerial photograph marking the archaeological sites geographically identified and referenced by the DGPC in the vicinity of the project. The red polygon identifies Quarry n.º 6637 "Vale de Videiro II".

As part of the Environmental Impact Assessment, a study was carried out on the "Architectural, Archaeological and Ethnographic Heritage", presented as a technical annex to the EIA. The archaeological prospection work resulted in the identification of one (1) site of architectural interest, one (1) site of ethnographic interest and

one (1) site with potential, with no archaeological evidence, located outside the affected area, but situated in the surrounding area (*vide* Table 12, Figure 63 and Figure 64).

Table 12: Characteristics of the archaeological, ethnographic and potential sites identified around the area to be licensed for archaeological prospecting.

Archaeological site	
Terraced walls	Several terraced walls have been marked all over the southern slope of the development, arranged in an east/west direction, transversal to the slope. These are earth retaining walls to create small artificial terraces on the slope, about 10 to 15 m apart. There are also walls in the north/south direction, parallel to the slope line, which delimit the properties. These walls were built using a construction technique based on small slabs of schist, of medium or large size, arranged transversely to the face, with the smaller side facing outwards, which block others that are placed parallel to them. These masonry elements, placed on the walls, don't seem to have been previously built, but were simply taken from the ground and reused. Some walls have a well-marked face and can be around 1.5 m high, while others are poorly built, with less care taken to define the face, and are not well preserved because they have collapsed. There were frequent shale fragments with small grooves or traces engraved on the surface, with little depth, some with a different color from the facial color of the stone, which would be more recent, but there were others with deeper grooves and with a darker and older patina, denoting some antiquity. These pieces of schist with traces are very specific examples that recur in almost every wall, where we found at least one or two stones with these traces. These pieces could possibly be ancient panels of prehistoric rock art, broken up and reused on the walls, or else just marks of use, caused by chopping the stone or plowing into the ground, where they were originally found (Figure 63)
Ethnographic site	
Earth slope and shale chips	Identified on the edge of the southern slope of the development, next to the stream. It's not a clear occurrence and it's not easy to describe. It corresponds to a slope of earth and schist chips about 2.5 m thick, arranged in a north/south direction, transversal to the watercourse, which is interrupted and destroyed to the south, next to the stream. The construction begins just 10 m away (to the north) and disappears along the watercourse, without extending to the other side. For this reason, there is some difficulty in classifying this construction as the wall of a water dam used to convey water to a mill, a dwelling or just for irrigation. It is an artificial and man-made structure, probably not very old, and is a testimony to the primitive agricultural activity in this Videiro Valley. This structure has probably been destroyed over time by erosion and some river flooding, and has not been preserved. It is in an advanced state of ruin, partially covered in scrubland (Figure 64)
Site with potential, no archaeological evidence	
Large outcrop of shale	When surveying the valley that forms the southern boundary of the development, at the level of the Vale de Videiro stream, where there could be schist panels with engravings, a large schist outcrop was identified, which could contain engravings. The crag is 3 m high and 4 m wide, but on close observation of the faces of the schist surface, no signs of artistic representations from prehistoric times were identified (Figure 64)



Figure 62: Location of the occurrences identified within the boundaries of the study area.

The terraced walls on this slope appear to be mere solutions for retaining land and creating artificial platforms for agricultural cultivation and planting of olive trees, since they do not present a coherence and planning proper to the vineyards, but rather punctual solutions and according to specific needs, at the whim of the slopes and topographical irregularity. They are walls of short length, interrupted and not parallel. There are even walls of greater extension, perpendicular to the land, of mere division of property.



Figure 63: Terraced walls made of schist slabs on the southern slope.

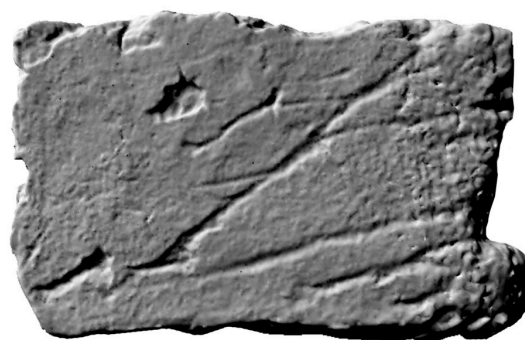




Figure 64: Stones with engraved features, schist cliff and earth and stone slope in the waterline valley.

6.2.6.2 Classified heritage or in the process of being classified

On DGPC database (<http://www.patrimoniocultural.pt/pt/patrimonio/patrimonio-imovel/pesquisa-do-patrimonio/classificado-ou-em-vias-de-classificacao/geral/>), for the municipality of Vila Nova de Foz Côa, out of a total of 21 records, 20 heritage elements are classified and 1 has been closed/archived without legal protection (vide Table 13). Table 13 and Figure 65 show the location of the sites considered to be Classified Heritage in the municipality of Vila Nova de Foz Côa in the area surrounding Quarry n.º 6637 "Vale de Videiro II". The Muxagata Pillory is the closest Classified Heritage site to Quarry n.º 6637 "Vale de Videiro II", some 3.1 km away.

Table 13: Classified heritage or heritage without legal protection registered in the DGPC database for the municipality of Vila Nova de Foz Côa.

Designation	Current Status	Protection Category	Category / typology
Igreja matriz de Vila Nova de Foz Côa	Classified	Classified as MN - National Monument	Religious Architecture / Church
Castelo de Numão	Classified	Classified as MN - National Monument	Military Architecture / Castle
Pelourinho de Foz Côa	Classified	Classified as MN - National Monument	Civil Architecture / Pelourinho
Capela de Nossa Senhora da Conceição	Classified	Classified as IM - Municipal Interest	Religious Architecture / Chapel
Casa dos Caldeira	Procedure closed / archived -	Not applicable	Civil Architecture / House

Designation	Current Status	Protection Category	Category / typology
	no legal protection		
Solar dos Donas Botto Pinto, também designado Casa de João Marçal	Classified	Classified as MIP - Monument of Public Interest	Civil Architecture / Set
Pelourinho de Touça	Classified	Classified as IIP - Property of Public Interest	Civil Architecture / Pelourinho
Pelourinho de Muxagata	Classified	Classified as IIP - Property of Public Interest	Civil Architecture / Pelourinho
Pelourinho de Horta	Classified	Classified as IIP - Property of Public Interest	Civil Architecture / Pelourinho
Casa de Almendra	Classified	Classified as IIP - Property of Public Interest	Civil Architecture / Solar
Igreja Matriz de Almendra	Classified	Classified as IIP - Property of Public Interest	Religious Architecture / Church
Pelourinho de Almendra	Classified	Classified as IIP - Property of Public Interest	Civil Architecture / Pelourinho
Ponte sobre a ribeira de Teja	Classified	Classified as IIP - Property of Public Interest	Civil Architecture / Bridge
Casa Grande de Freixo de Numão	Classified	Classified as IIP - Property of Public Interest	Civil Architecture / House
Pelourinho de Freixo de Numão	Classified	Classified as IIP - Property of Public Interest	Civil Architecture / Pelourinho
Castelo de Castelo Melhor	Classified	Classified as IIP - Property of Public Interest	Military Architecture / Castle
Casa de Nossa Senhora da Conceição	Classified	Classified as IIP - Property of Public Interest	Civil Architecture / House
Pelourinho de Cedovim	Classified	Classified as IIP - Property of Public Interest	Civil Architecture / Pelourinho
Castelo Velho de Freixo de Numão	Classified	Classified as SIP - Site of Public Interest	Archaeology / Castle
Casa Vermelha	Classified	Classified as IM - Municipal Interest	Civil Architecture / House
Sítio arqueológico Castanheiro do Vento	Classified	Classified as SIP - Site of Public Interest	Archaeology / Archaeological site

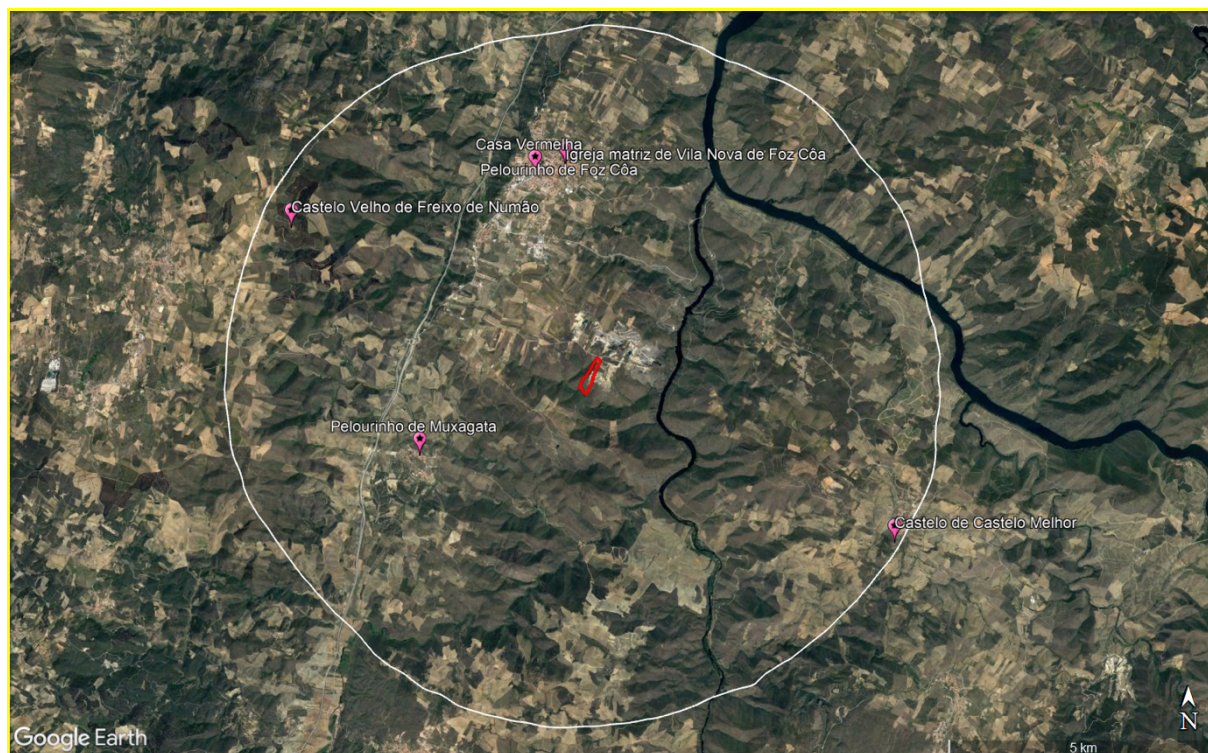


Figure 65: Aerial photograph showing the sites listed as Classified Heritage in the municipality of Vila Nova de Foz Côa, in the vicinity of Quarry n.º 6637 "Vale de Videiro II". The white line indicates a 6 km buffer.

The Set of Archaeological Sites in the Côa River Valley is made up of 12 cores, *vide* Table 14.

Table 14: Set of Archaeological Sites in Côa River Valley.

Archaeological Sites in the Côa River Valley	
Núcleo de Arte Rupestre da Faia/Vale Afonsoinho	Estação arqueológica da Quinta de Santa Maria da Ervamoira
Núcleo de Arte Rupestre da Faia	Núcleo de Arte Rupestre da Ribeira de Piscos/Quinta dos Poios
Núcleo de Arte Rupestre da Ribeirinha	Núcleo Arqueológico de Habitat Paleolítico do Salto do Boi/Cardina
Núcleo de Arte Rupestre da Penascosa	Núcleo de Arte Rupestre do Alto da Bulha
Núcleo de Arte Rupestre da Broeira	Núcleo de Arte Rupestre da Canada do Inferno/Rego da Vide
Núcleo de Arte Rupestre da Canada do Amendoal	Núcleo de Arte Rupestre da Foz do Côa
Núcleo de Arte Rupestre da Canada da Moreira	Núcleo de Arte Rupestre do Vale de Cabrões
Núcleo de Arte Rupestre da Fonte Frieira	Núcleo de Arte Rupestre do Vale da Figueira/Teixugo
Núcleo de Arte Rupestre de Meijapão	Núcleo de Arte Rupestre do Vale de José Esteves
Núcleo de Arte Rupestre do Vale do Forno	Núcleo de Arte Rupestre do Vale de Moinhos
Núcleo de Arte Rupestre do Vale das Namoradas	Núcleo de Arte Rupestre da Vermelhosa
Núcleo de Arte Rupestre da Quinta da Barca	Núcleo de Arte Rupestre da Quinta do Fariseu

The project area does not have any Classified Heritage or in the process of being classified, but it is very close

to to the Núcleo de Arte Rupestre da Canada do Inferno/Rego da Vide, the Canada do Inferno and Vale do Videiro archaeological sites, as mentioned above.

6.2.7 VIEWPOINTS AND SCENIC ROUTES

The panoramic roads over the ZEP-ADWR have a high cultural and tourist value because they allow you to enjoy the Duriense landscape. From the viewpoint of S. Leonardo, the writer Miguel Torga describes the Douro as an "excess of Nature", "Diário XII" (S. Leonardo de Galafura, April 8, 1977):

«The Doiro sublimated. The prodigy of a landscape that ceases to be by forcing itself out of proportion. It's not a panorama that the eye can contemplate: it's an excess of nature. Terraces that are passed by titanic men climbing the slopes, volumes, colors and modulations that no sculptor has painted or musician can translate, horizons expanded beyond the plausible thresholds of vision. A virginal universe, as if it had just been born, and already eternal in its harmony, its serenity, its silence that not even the river dares to break, sometimes furtively disappearing behind the hills, sometimes stunned at the bottom reflecting its own amazement. A geological poem. Absolute beauty».

Along the banks of the River Douro there are several viewpoints over the river and the vineyard landscape. Figure 66 and Table 15 present the location of the viewpoints in the municipality of Vila Nova de Foz Côa. From none of these viewpoints is it possible to see the quarry.

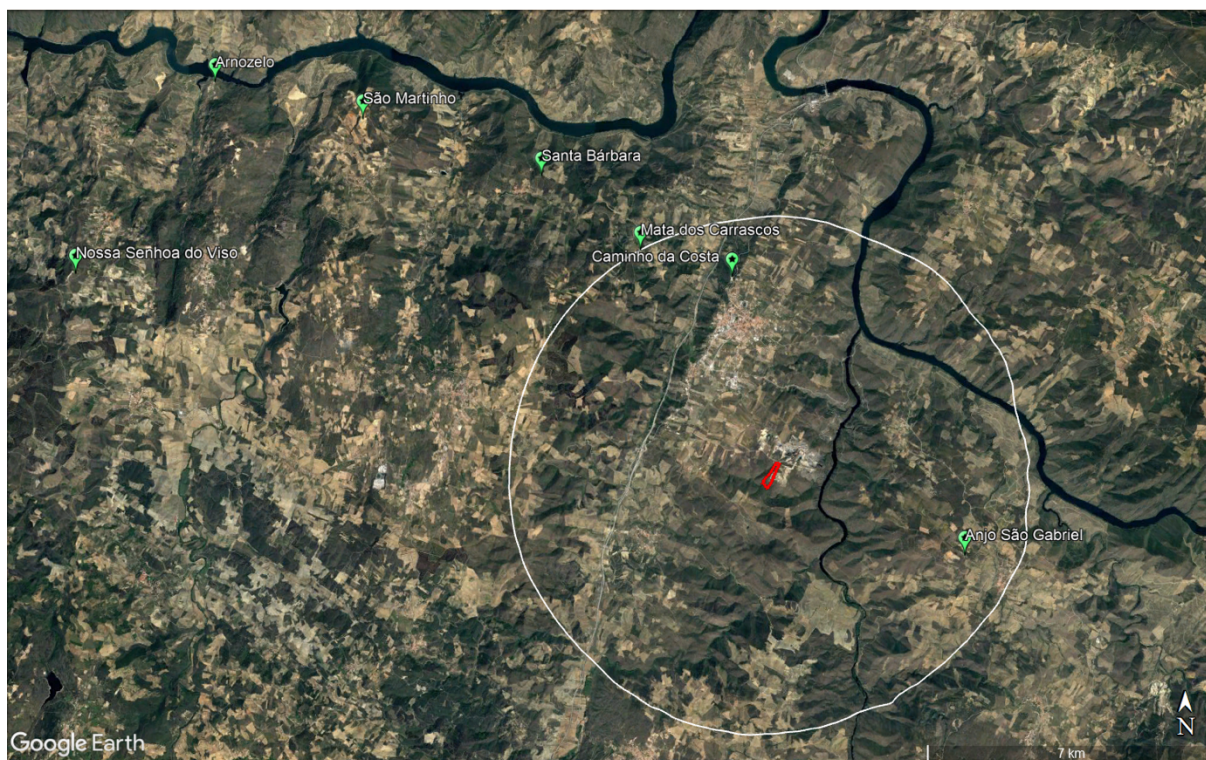


Figure 66: Aerial photograph showing the location of the viewpoints in the municipality of Vila Nova de Foz Côa. The red line indicates the location of the project under study and the white line a buffer of 6 km from the project area.

Table 15: Location of viewpoints in the municipality of Vila Nova de Foz Côa.

Designation	Parish	Coordinates (WGS84)	Visibility to Quarry n.º 6637 “Vale de Videiro II”
Anjo São Gabriel	Castelo Melhor	41.0326881, -7.0768738	No
Arnozelo	Numão	41.136359, -7.293891	No
Caminho da Costa	Caminho da Costa	41.0928775, -7.1424645	No
Mata dos Carrascos	Santo Amaro	41.0983473, -7.1689916	No
Nossa Senhora do Viso	Custóias	41.0925986, -7.327199	No
Santa Bárbara	Mós	41.1146104, -7.1974551	No
São Martinho	Seixas	41.1260975, -7.247768	No

The panoramic roads over the ZEP-ADWR have a high cultural and tourist value because they allow you to enjoy the Duriense landscape. The valorisation of panoramic roads (road-railway) of high tourist value was one of the strategic objectives defined in the Douro Valley Touristic Development Plan 2007-2013 (Magalhães R. et al., 2008).

The panoramic roads are composed mainly of classified national and municipal roads whose layout is sinuous due to the topography of the territory and whose network is denser on the right bank than on the left bank of the Douro River and by the railway of the Linha do Douro on the right bank of the Douro River.

On the section of the Côa River between Castelo Melhor and the mouth of the Côa with the Douro River, the main scenic routes are the N102, N222 and IP2. However, taking into account the location of Quarry n.º 6637 “Vale de Videiro II”, the existence of vegetation and the topography of the area surrounding it, it is not visible from any of these accesses.

6.3 ADWR NATURAL ATTRIBUTES

6.3.1 COMPLEX GEOMORPHOLOGY AND RELEVANT RIDGES

The landscape of this region is characterized by a mountainous terrain, physiographically jagged, alternating between hills with very steep slopes, deep valleys and the wide valley of the Côa River and the Douro River. Quarry n.º 6637 “Vale de Videiro II” does not overlap with ridges considered relevant. The ridges that stand out in their surroundings are evidently due to the very orographic diversity of the region, which is characterized by an undulated and particularly sinuous relief.

6.3.2 CLIMATE, REDUCED RAINFALL AND WATER SCARCITY

The Douro River and its tributaries meander more or less tightly, depending on the degree of hardness of the shale and granite through which they flow.

Despite the reservoirs associated with the Douro River and its tributaries, water scarcity is one of the characteristics of this region, where the nature of the bedrock and the steep slopes make it difficult for water to seep into the ground.

Although rainfall is low, the Mediterranean climate helps to optimize the conditions for wine production. It is characterized by a climate of extremes, with very hot summers and very cold winters, and it is said in the region that there are “nine months of winter and three months of hell”» (Candidatura do Alto Douro Vinhateiro a Património Mundial, 2000).

6.3.3 THE DIVERSITY OF NATURAL HABITATS

Land use in this region is generally organized according to a clear altimetric zoning, with scrubland and forest (woodland) dominating the higher elevations and, when cultivated, olive trees, followed by vineyards halfway up the slopes, while the valley bottoms are essentially occupied by citrus groves and vegetable gardens.

Despite the strong human influence in this region and the dominance of Mediterranean vineyards and olive groves, it is possible to observe various habitats and species of conservation interest here. In fact, the entire Alto Douro Vinhateiro region is surrounded by a number of sites included in the Rede Natura 2000, including the Vale do Côa Special Protection Area (SPA), where the project is located.

For this region, there are several natural habitats that deserve attention, such as stretches of watercourses with natural and semi-natural dynamics and their associated riparian galleries. The riparian vegetation along the watercourses is also characterized by the presence of Mediterranean species, such as *Fraxinus angustifolia* (ash), *Alnus glutinosa* (alder) and willows (*Salix* sp.).

Along the Douro and the confluence with its tributaries there are still well-developed and well-preserved forests with *Celtis australis*, *Juniperus oxycedrus*, *Quercus suber*, *Phyllirea angustifolia*, *Acer monspessulanum*, among others.

In the higher areas, the vegetation is typically Mediterranean, with patches of diverse pre-forest scrub, characterized by the presence of *Lavandula stoechas* (rosemary), *Cytisus multiflorus* (broom) or *Retama sphaerocarpa* (piorno), with the presence of holm oak, juniper or cork oak (in certain areas with still significant densities), showing the presence of natural habitats at different stages of ecological succession, but which are also of exceptional importance as areas of refuge for biodiversity and soil formation and retention, and may be home to a great floristic diversity as well as species with high conservation value. There are also forest stands here, mainly of maritime pine, which sometimes give rise to more structured mixed habitats due to the natural regeneration of cork oaks or holm oaks.

The project area is part of a very important region for birdlife, reflecting its proximity to two Important Bird Areas, namely the Douro International and Águeda Valley Special Protection Area (PTZPE0038) and the Côa Valley SPA (PTZPE0039).



Figure 67: Aerial photograph of the area of Quarry n.º 6637 "Vale de Videiro II", delimited by the red line, bordering the Côa Valley SPA (PTZPE0039) (area in white) and indicating the Douro International and Águeda Valley SPA (PTZPE0038) (area in purple).

The Côa Valley SPA (PTZPE0039) is an area of mountainous terrain that follows the basin of the terminal section of the Côa River and is characterized by the presence of rocky and steep slopes that extend along the Côa and Massueime rivers.

This region is characterized by the presence of rupicolous habitats made up of river escarpments and rocky outcrops, where there is a varied mosaic of agricultural habitats with natural formations. Despite being an area mostly devoid of natural vegetation, there are still several enclaves of diverse pre-forest scrubland, as well as cork oaks, holm oaks and juniper trees. In terms of land use and being an imminently rural area, the main sectors of activity are pastoralism and the cultivation of olive groves, almond trees and vines, in decreasing order of importance (<http://www.icnf.pt/portal/pn/biodiversidade/rn2000/resource/doc/zpe-cont/vcoa>).

The landscape dichotomy between "cliffs" and plateaus, with the alternation between areas with particularly favourable conditions for refuge and nesting and areas where agricultural activity dominates, providing important trophic resources, is the most decisive aspect in the richness of bird habitats and species in this area.

This SPA is therefore an important area for rupicolous birdlife, where Mediterranean scrubland birds and birds from pseudo-steppe habitats stand out.

Among the bird species that occur in this SPA, we should highlight the nesting population of the redshank (*Neophron percnopterus*), which corresponds to one of the most significant nuclei in our country, as well as the black wheatear (*Oenanthe leucura*), which is frequent in the more arid areas of this SPA. The area is also important for forest birds of prey such as the kite (*Milvus milvus*), booted eagle (*Hieraaetus pennatus*) and short-toed eagle (*Circaetus gallicus*), as well as the golden eagle (*Aquila chrysaetos*), griffon vulture (*Gyps fulvus*) and Bonelli's eagle (*Hieraaetus fasciatus*). The large expanse of scrubland provides a certain abundance of various passerines, such as the lime warbler (*Sylvia conspicillata*), the Subalpine warbler (*Sylvia cantillans*), the valley warbler (*Sylvia melanocephala*) and the golden warbler (*Sylvia hortensis*) (<http://www.icnf.pt/portal/pn/biodiversidade/rn2000/resource/doc/zpe-cont/vcoa>).

The diversity of birds recorded in the study area is relatively high. In terms of species richness and relative abundance, the area around the quarry is more diverse, especially due to the presence of agricultural biotopes with pastures and natural spaces and scattered hardwood and coniferous forests that provide places to feed and take refuge.

In floristic terms, the scrubland dominated by pyrenean broom and the presence of holm oak (in certain areas with still significant densities) show the presence of natural habitats at different stages of ecological succession, but which are also of exceptional importance as areas of refuge for biodiversity and soil formation and retention, and may be home to a great floristic diversity as well as species with high conservation value. It should be noted that inside the quarry there are occasional areas with run-off water, which is temporary and depends on the quarry's own mining plan, as a result of the accumulation of water on the extraction levels.

6.3.4 MEDITERRANEAN CULTURES: THE VINEYARD, THE OLIVE TREE AND THE ALMOND TREE

The Douro landscape is inseparable from the remarkable use of natural resources, particularly the soil and climate, which are very advantageous for growing vines, and it is in the Douro Vinhateiro region that this character manifests itself most strongly.

The crop that best defines the character of the Douro landscape is the vine, but there are also other crops such as olive groves, almond groves, orange groves and vegetables near the houses.

In the area where the quarry is located, which is higher up and further away from the Douro River valley, the drier climate and soil conditions mean that areas of scrubland dominate. As for agricultural crops, there are often areas of semi-natural pasture, olive groves, almond groves and small vineyards.

The riparian vegetation, where it occurs, is also characterized by the presence of Mediterranean species, such as ash, alder and willow.

6.3.5 GEOLOGICAL HERITAGE

The geological features of the ADWR are fundamental in shaping the landscape. The shale and granite intrusions, the rocky escarpments and the steep-sided valleys all characterize the landscape.

The municipality of Vila Nova de Foz Côa has 2 sites of geological or geomorphological interest, according to the database available on the "Geological Heritage of Portugal - Inventory of geosites of national importance" website." (<https://geossitios.progeo.pt/geosites>) (vide Tabela 16). As already mentioned, the project is located in and integrates the Poio Shale Quarries (vide Figure 68).

Tabela 16: Sites of geological or geomorphological interest, registered in the database "Geological Heritage of Portugal - Inventory of geosites of national relevance" (<https://geossitios.progeo.pt/geosites>), relating to the municipality of Vila Nova de Foz Côa.

Designation	Thematic Category	Justification of Scientific Value
Poio Shale Quarries	Transverse to the varisco shear zone in Portugal	Good example of deep flysch sedimentation associated with the lower Paleozoic of the autochthonous Central Iberian zone (https://geossitios.progeo.pt/geosites/pedreiras-dos-xistos-do-poio).
Quinta do Vale Meão	Neotectonics in mainland Portugal	The only accessible outcrop where quaternary sediments affected by the FMVB can be seen, constituting evidence of neotectonic activity in this structure, an outcrop at the southern end of the Vilarica tectonic basin where there is a fault contact between highly sheared granites to the west and a fluvial terrace deposit of the Douro River to the east (https://geossitios.progeo.pt/geosites/quinta-do-vale-meao).



Figure 68: Aerial photograph of the area of Quarry n.º 6637 "Vale de Videiro II", delimited by the red line, and approximate indication of the 2 sites of geological or geomorphological interest in the municipality of Vila Nova de Foz Côa.

6.3.6 THE DOURO RIVER AND ITS TRIBUTARIES

The Douro River and its tributaries, the dam reservoirs and the immense water mirrors they create are striking features of the ADWR landscape, contributing to the fragmentation and enrichment of the region's landscape mosaic.

The project is located about 4 km southwest of the Douro River and is part of the ADWR SPA. The closest tributaries of the Douro River to the project is the Côa River (located about 1.3 km to the east), which runs in a S-N direction, under the influence of the Douro River, where it flows to.

6.3.7 THE EPHEMERAL OF THE LANDSCAPE: LIGHT AND COLOUR, SOUND AND SILENCE, AND SMELLS

The chromatic contrast between the shale soils and the green of the vegetation, the almond trees in blossom, the leaves of the vineyards in autumn, the light over the watercourses, the sound, the silence and the smells are all elements that characterize and immortalize this landscape of singular beauty.

The entire landscape that characterizes the Alto Douro Wine Region is highly valued for its sensory richness, where the chromaticism associated with the agricultural areas and the water surface of the Douro stands out. Throughout the day there are transformations that depend heavily on climatic variations, such as morning

mist over the river, which in the course of the morning lets the first rays of intense sunshine through. Throughout the year, other mutations occur associated with the vegetative cycles, where the different duration and intensity of the light and the chromatic alternation of the crops are felt, particularly the vines - *from the leafless winter in which the colours of the schist soils stand out, to the spring and summer in which green dominates, to the autumn in which it acquires impressive warm and golden tones, where red, brown and orange tones stand out - and the almond trees (with their admirable flowering in early spring)* (Cancela d’Abreu *et al.*, 2004).

Despite the almost absolute dominance of the vineyard, the landscape of the Douro Wine Region has a clear chromatic diversity, created by the contrast of the green slopes with the water mirror and with the scrubs and forests of the higher areas, and by the confrontation of the vineyard with the stone walls or the white speckle of the houses in the middle of the cultivated spaces.

Another essential sensory feature of these landscapes is the silence (Bianchi de Aguiar *et al.*, 2000).

6.4 IMPACT ASSESSMENT

The impact assessment was carried out by quantifying the physical impact of the Cultural and Natural attributes that confer VUE to the ADWR affected by the implementation of the project. Figure 69 and Figure 70, respectively, display the land uses and identify the cultural attributes in the Project's surroundings.

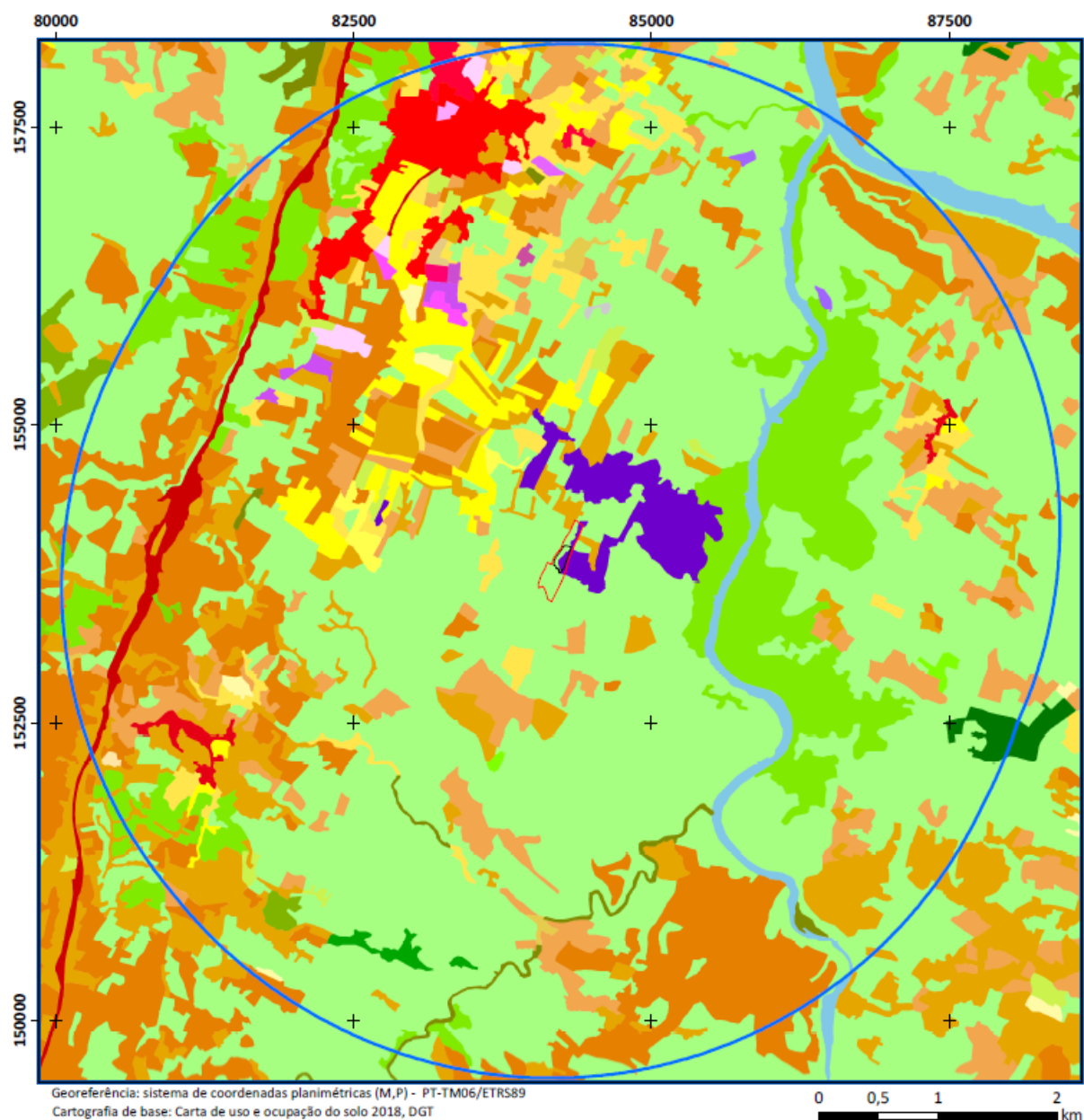




Figure 69: Extract from the COS 2018 Land Use map of the quarry area and its surroundings.

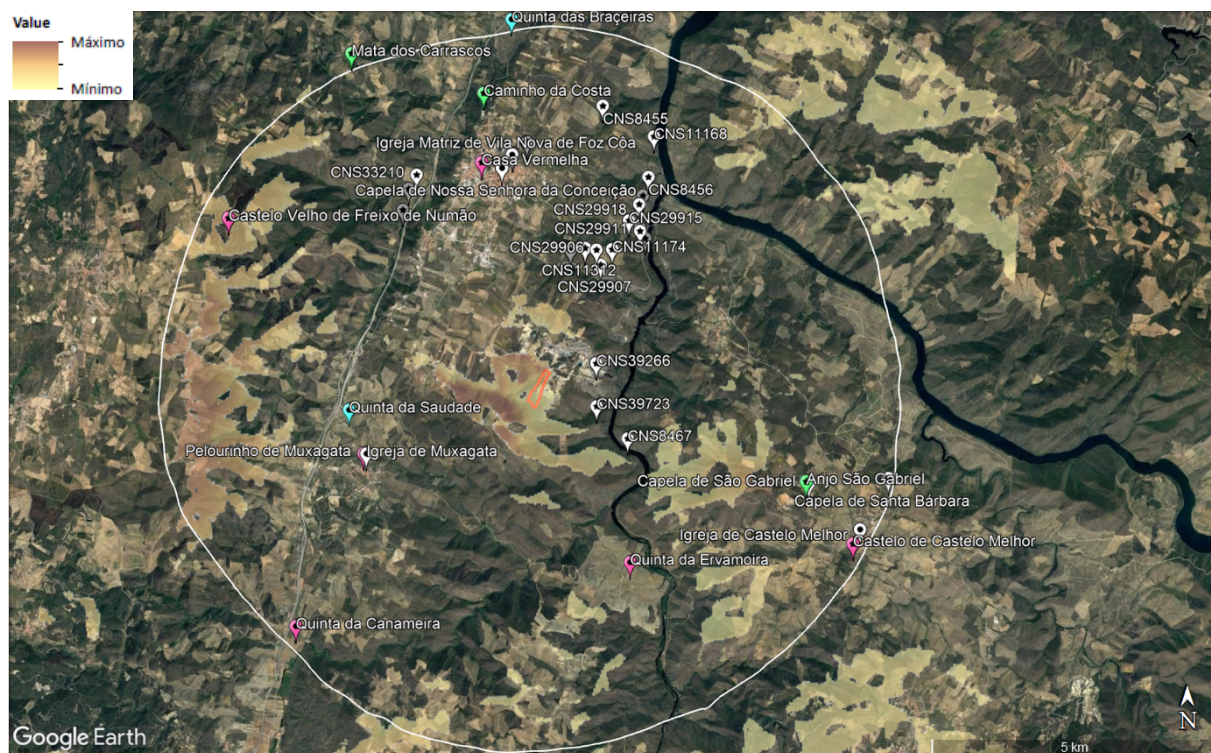
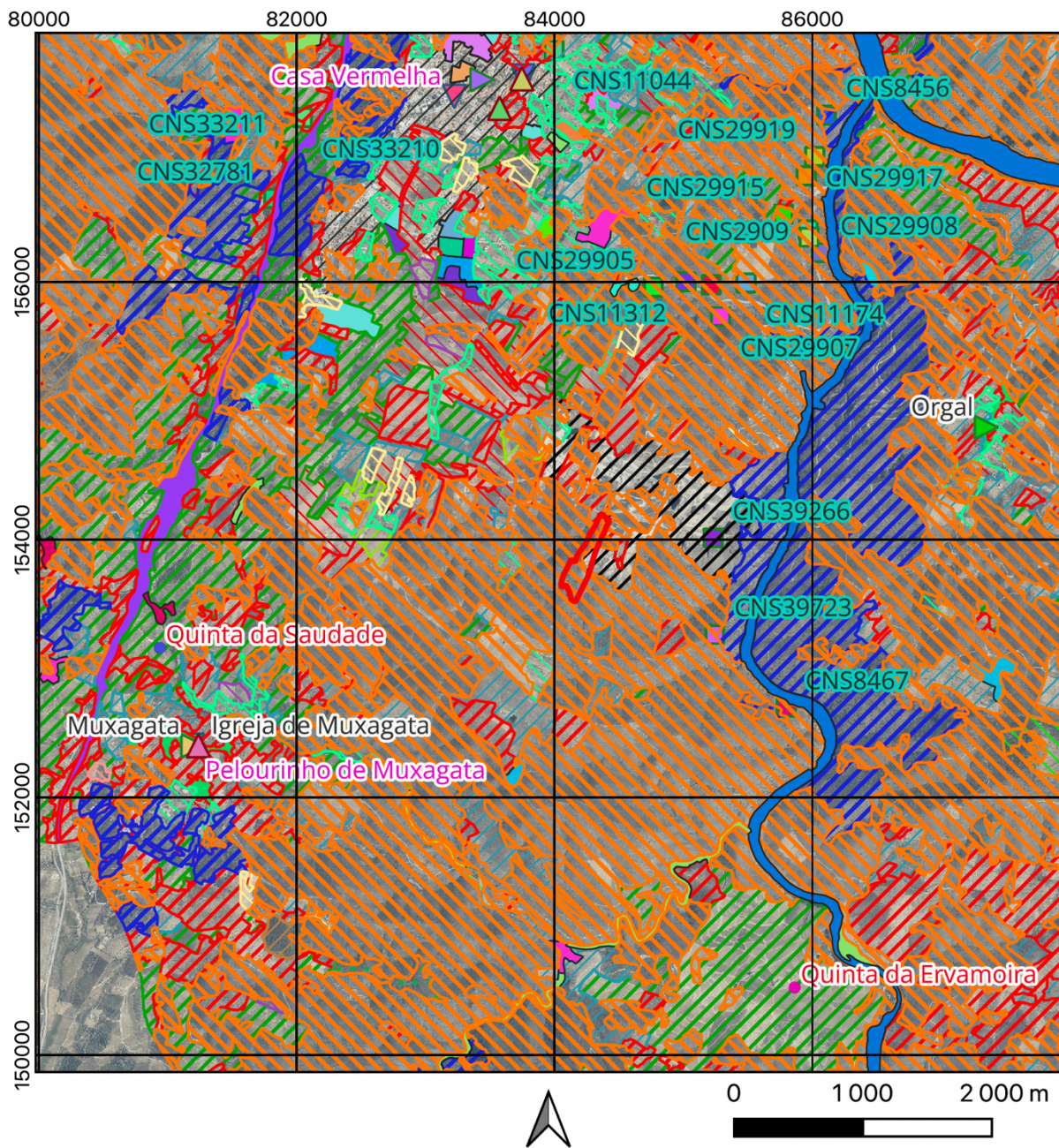
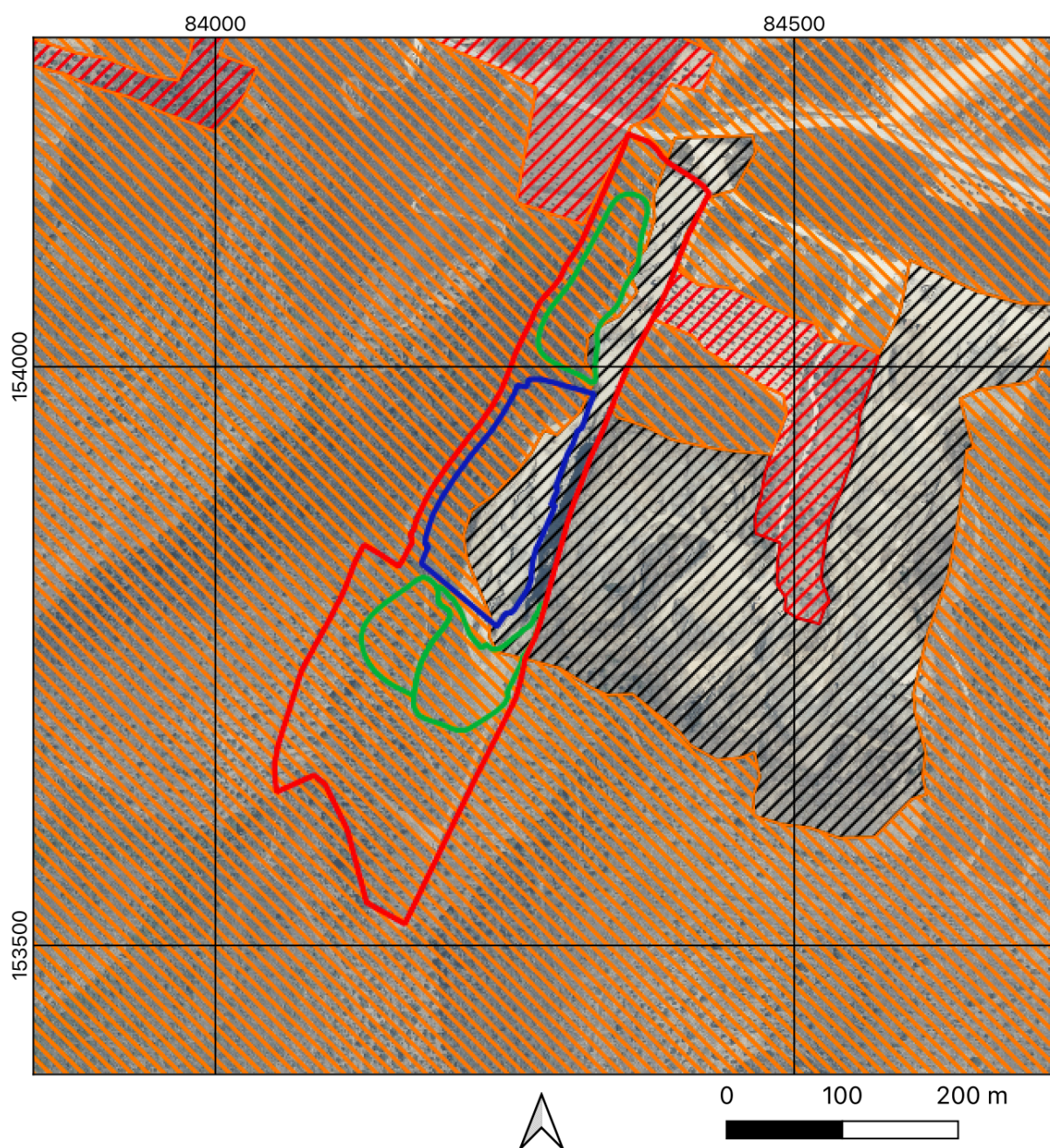


Figure 70: Identification of the cultural attributes surrounding the project.

An orthophotomap is presented with identification of the natural and cultural elements that give VUE to the ADV existing in the surrounding area and in the quarry to be licensed. The area to be licensed affects patches occupied by bushes, not affecting other natural or cultural elements that confer VUE to the ADV.





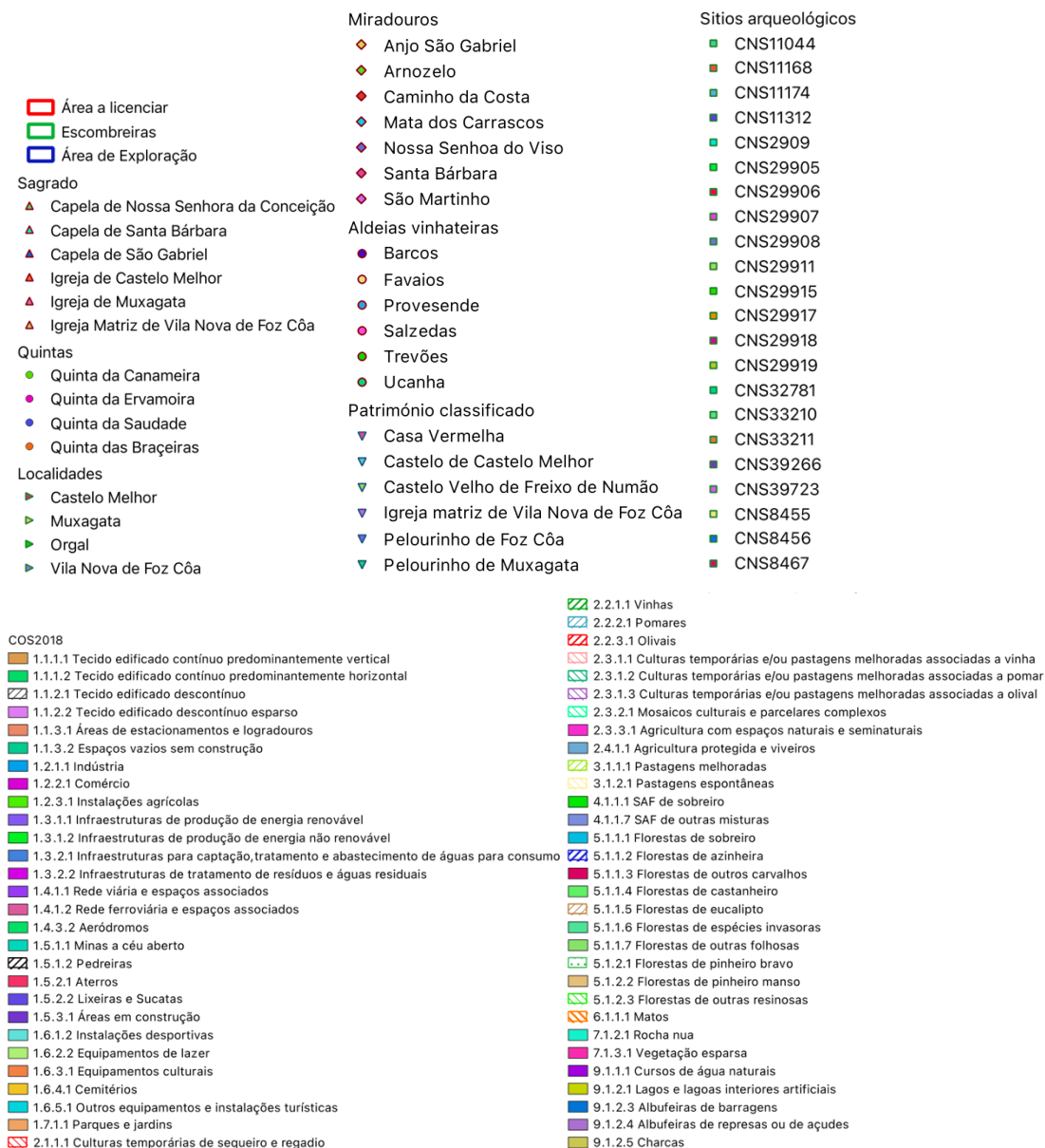


Figure 71: Orthophotomap with identification of the natural and cultural elements that give VUE to the ADV existing in the area surrounding Quarry N.º. 6637 "Vale de Videiro II".

Table 13 presents the quantification of the Cultural and Natural attributes that confer VUE to the ADWR affected by the implementation of the project.

Table 13: Quantification of the Cultural and Natural attributes that confer VUE to the ADWR affected by the implementation of the project.

Values	Cultural	
Attributes that confer VUE	The landscape pattern (the dominance of vineyards)	Not affected

Values	Cultural	
	alternating with Mediterranean scrubland)	
	Villages and Quintas	Visible from the settlement of Orgal
	The sacred	Not affected
	Accessibility	Not affected
	The terraces, the schist walls and the different types of vineyard planting	Not affected
Other asset components or attributes	Cultural, archaeological, architectural and ethnological heritage	Not affected
	Viewpoints and scenic routes	Not affected
Values	Natural	
Attributes that confer VUE	The complex geomorphology, the scarcity of fertile soil and relevant ridges	- Affects the geomorphology of the area to be licensed - Is potentially visible from relevant ridges
	The diversity of natural habitats, particularly scrubland, woodland and riparian galleries	Affects small patches of scrubland
	Mediterranean crops: vines, olives and almonds	Affects area with scattered almond trees
	Climate, low rainfall and water scarcity	Not quantifiable
	The Douro River and its tributaries	Not affected
	The ephemeral landscape: light and color, sound and silence and smells	Not quantifiable
	Special Protection Zones – Rede Natura 2000	Inserted in the Côa Valley SPA
Other asset components or attributes	Geological heritage - geosites	Inserted in the Poio Shale Quarries geosite

6.4.1 IMPACT ASSESSMENT ON CULTURAL VALUES

Table 14 the expected impacts of the project on the various cultural attributes that confer VUE on the ADWR are presented.

Table 14: Impacts of the project on the various cultural attributes that confer VUE on the ADWR.

Values	Cultural	Project phase	Nature of the impact (beneficial or adverse)	Magnitude and severity of the impact/change	Significance of the effect of the change
Attributes that confer VUE	The pattern of the landscape (the dominance of vineyards alternating with Mediterranean scrubland)	Preparation and operation phases	Neutral	No change	Neutral
		After deactivation	Positive	Minor change	Moderately beneficial
	Villages and Quintas	Preparation and operation phases	Negative	Negligible change	Slightly adverse
		After deactivation	Positive	Minor change	Moderately beneficial
	The sacred	Preparation and operation phases	Negative	Negligible change	Slightly adverse
		After deactivation	Positive	Minor change	Moderately beneficial
	Accessibility	Preparation and operation phases	Neutral	No change	Neutral
		After deactivation	Neutral	No change	Neutral
	The terraces, the schist walls and the different types of vineyard planting	Preparation and operation phases	Positive	Minor change	Moderately beneficial
		After deactivation	Neutral	No change	Neutral
Other asset components or attributes	Cultural, archaeological, architectural and ethnological heritage	Preparation and operation phases	Neutral	No change	Neutral
		After deactivation	Positive	Minor change	Moderately beneficial
	Viewpoints and scenic routes	Preparation and operation phases	Negative	Negligible change	Slightly adverse
		After deactivation	Positive	Moderate change	Moderately beneficial

6.4.1.1 Landscape pattern (the dominance of vineyards alternating with Mediterranean scrubland)

The pattern of the landscape in the ADV is marked by permanent crops of vines, olive groves and almond trees, side by side with extensive patches of Mediterranean scrubland and occasionally some orchards with citrus and fig trees.

In the area surrounding Quarry n.º 6637 “Vale de Videiro II”, the landscape pattern includes areas of scrubland, semi-natural areas with pastures and fallow agricultural areas, with natural regeneration of low scrubland and annual herbaceous plants and with olive groves, vineyards and almond groves.

This landscape pattern is cut out by the Côa River and its associated watercourses, its enclaves, meanders and more or less steep-sided valleys.

The physical presence of the quarry has a negative visual impact on those who are located in the agricultural areas, or access roads to them, from which it is possible to see the quarry area. The impact is considered to be insignificant, because due to the location of the quarry, the topography of the land and the existence of vegetation cover around the quarry, there are few areas from which it can be seen.

The PARP foresees that recovery will take place throughout the quarry's useful life, but it is possible to specify the following phases:

- Phase 1 (3 years). Olive tree plantation on the edge of the farm.
- Phase 2 and 3 (4 to 9 years). Recovering, by sowing, the area corresponding to the recovery of the defense zone with the neighboring rustic building and planting olive trees.
- Phase 4 (10 to 21 years). Sowing of the landfill area to the south, which will no longer be used.
- Last Phase (22 to 40 years). This involves the final shaping of the land, with the recovery of the farm slopes, the spreading of topsoil and seeding of the identified areas (farm and landfill areas) and the planting of almond trees (*vide* Figure 72).

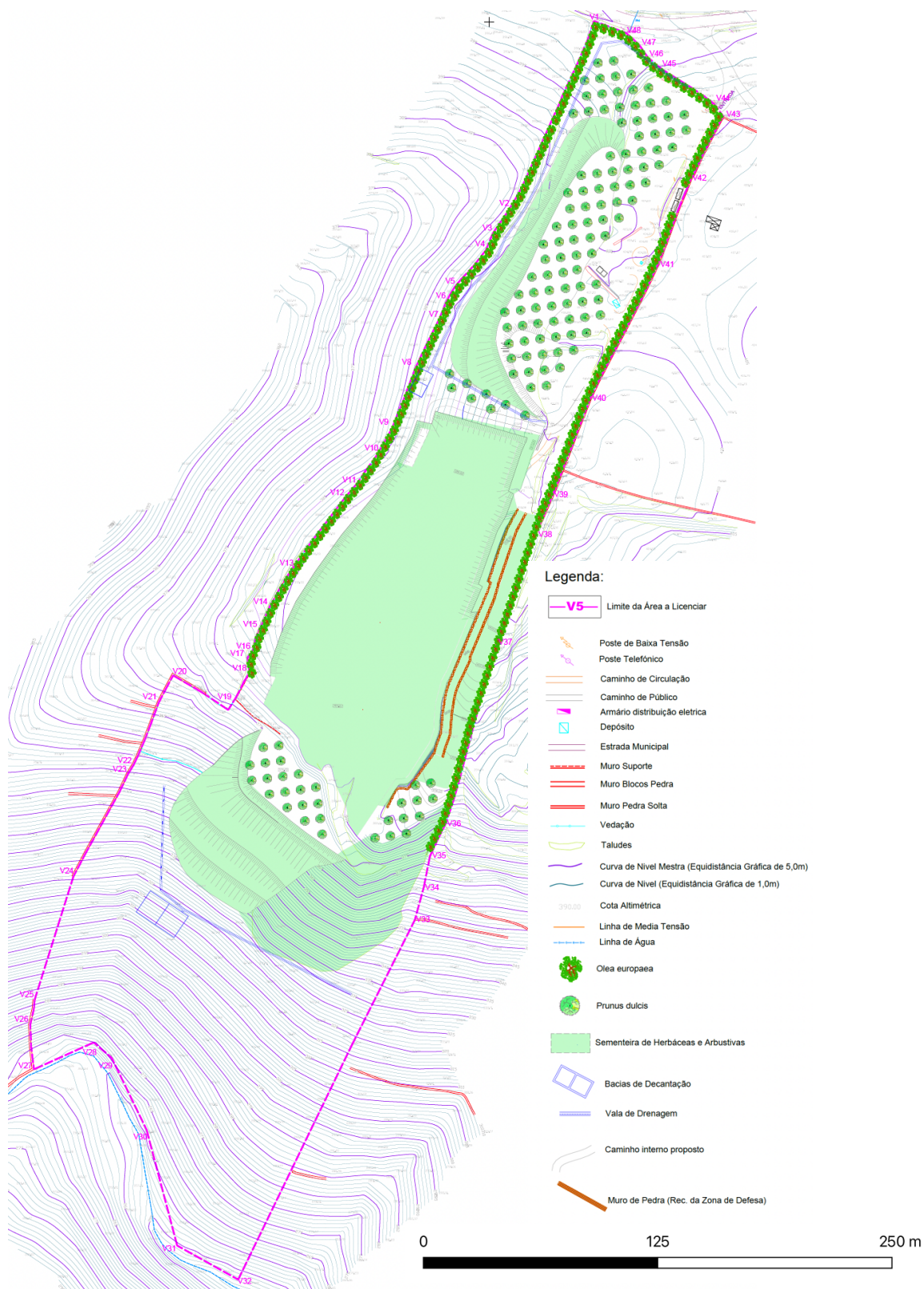


Figure 72: PARP - Planting/Sowing Final stage (40 years).

6.4.1.2 Settlements and Quintas

There are no Aldeias Vinhateiras in the immediate vicinity of Quarry n.º 6637 "Vale de Videiro II", the nearest being around 25 km away, in the town of Trevões (vide Figure 37), from which it is not possible to see the quarry n.º 6637 “Vale de Videiro II”.

In the area surrounding Quarry n.º 6637 "Vale de Videiro II", the number of settlements is small. Considering a buffer of 6 km from the quarry, there are 4 settlements (vide Figure 38).

Quarry n.º 6637 "Vale de Videiro II" is only potentially visible from the town of Orgal. Its visibility may be conditioned by the vegetation and tree cover, the buildings in the population areas and, above all, by the topography of the region. For the same reasons mentioned above, and because it is located in an area with steep slopes, terrain with a lot of folding, with well-marked troughs and slopes, visibility of the quarry from most of the towns within a radius of 6 km is null or very low.

In the area surrounding Quarry n.º 6637 "Vale de Videiro II", there are no relevant quintas in terms of heritage, the nearest being Quinta da Saudade, about 3.2 km to the west. In a wider area, considering a buffer of 6 km, there are 4 quintas (vide Table 9 and Figure 58). Due to the location of the farms (close to the river Douro), the topography of the land and the existing vegetation cover around the quarry, it is not possible to see Quarry N.º 6637 "Vale de Videiro II" from any of the identified Quintas. Figure 73 shows the visibility map overlaid with the location of the farms identified in a 6 km radius around the quarry.

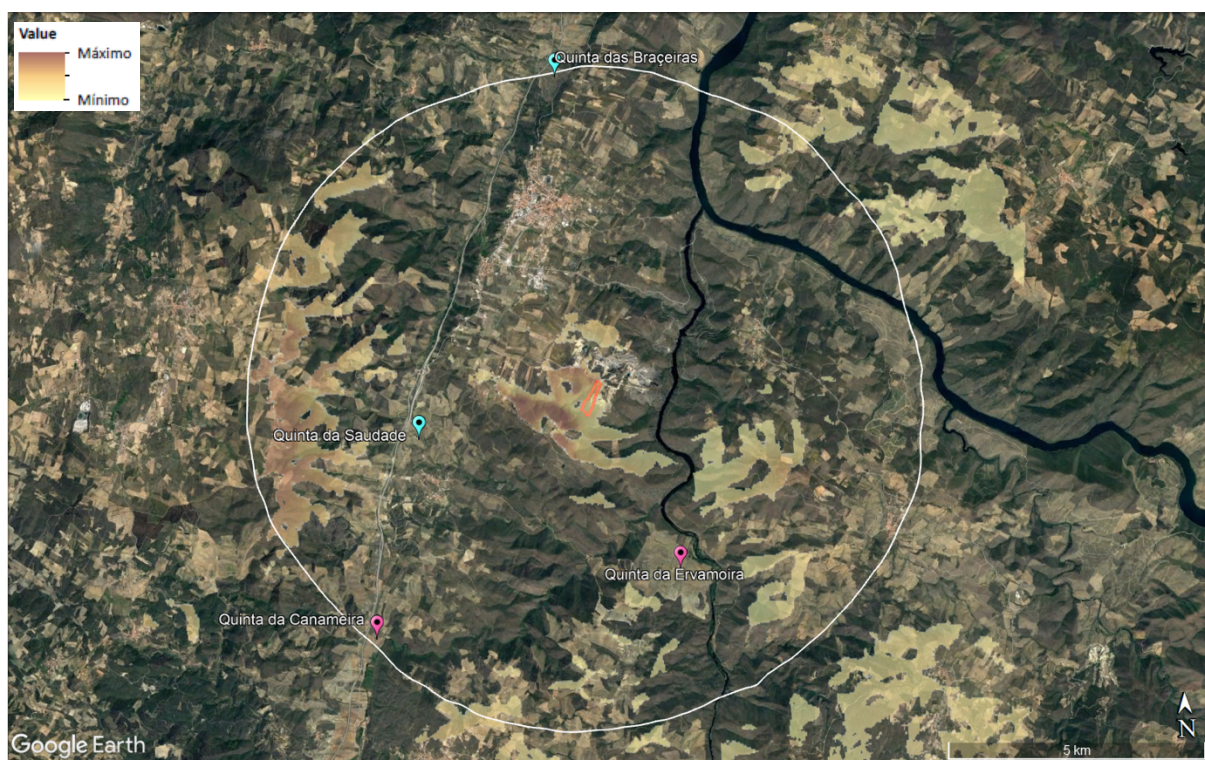


Figure 73: Visibility from the Quintas, located in the surrounding area, to Quarry n.º 6637 “Vale de Videiro II”.

6.4.1.3 The Sacred

Some of the religious sites are very old and many, because they are located in higher areas, are exceptional vantage points for observing the landscape. In the study area (area of the quarry to be licensed and a 6km buffer in the surrounding area), the main church of Vila Nova de Foz Côa and the Chapel of Nossa Senhora da Conceição stand out because they are listed as Classified Heritage by CIMDOURO. None of these chapels or churches are visible from the quarry area, vide Figure 74.

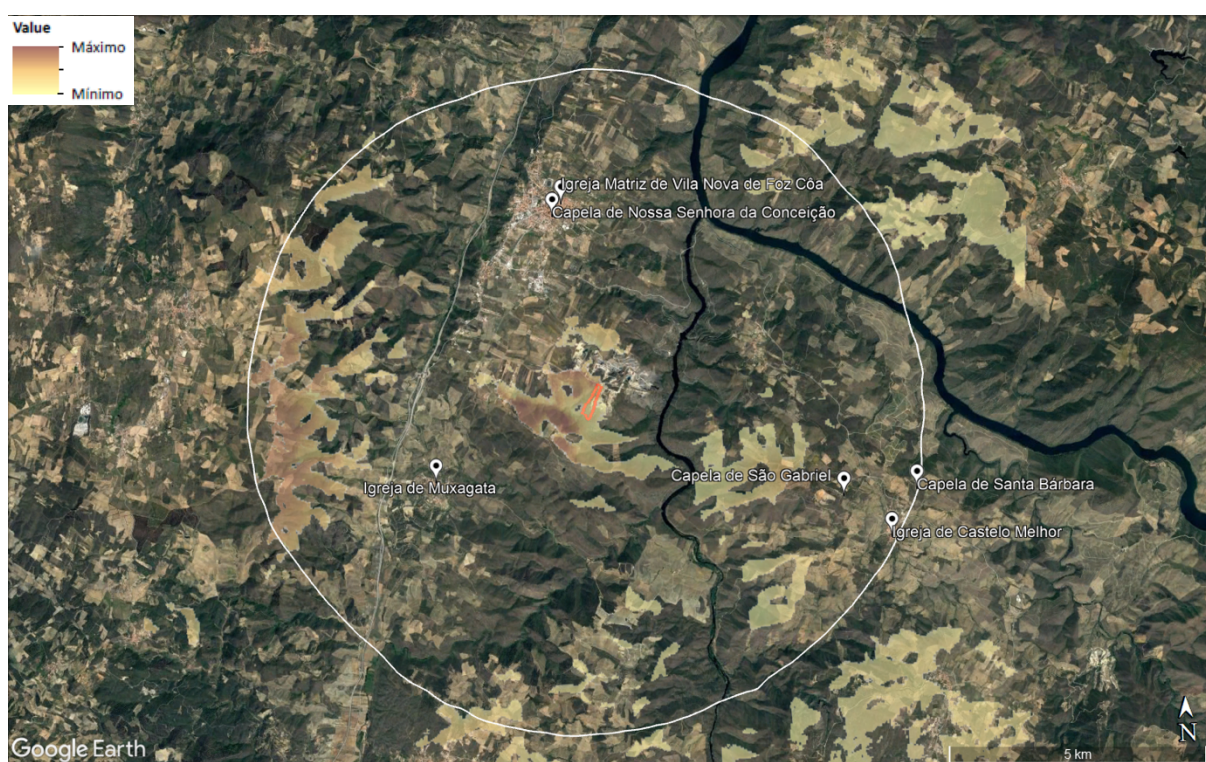


Figure 74: Visibility from the Chapels and Churches located in the surrounding area to Quarry n.º 6637 “Vale de Videiro II.

6.4.1.4 Accessibility - the navigability of the Douro River, the railway and the roads

No changes are planned to the navigability of the Douro or the railway line. As for the road network, while on the one hand it is possible to see degradation due to overuse, particularly by vehicles transporting products resulting from mining activities, on the other hand it is also important to note that it is economic activities that

often drive the improvement and even construction of new access roads. In this sense, no significant changes are expected in this attribute.

6.4.1.5 The shale terraces and walls and the different types of vine planting

In the study area, particularly on the slopes closest to the Douro River, to the north of the area to be licensed for Quarry n.º 6637 "Vale de Videiro II", terraces supported by shale walls are still very much present, especially in the division of land, in some mortories and in vineyard areas with a terraced land system.

However, the physical presence of the Poio Quarry Core, which includes the quarry under study, has a negative visual impact for those located in some of the region's vineyards, from which it is possible to see the Poio Quarry Core. Even so, this impact is considered to be negligible because, due to the location of the quarry, the topography of the land and the existence of tree cover in its surroundings, there are few areas from which it is possible to see the quarry.

6.4.1.6 Cultural Heritage, Archaeological, Architectural and Ethnological Heritage

As mentioned, there is no Cultural Heritage, Archaeological, Architectural or Ethnological Heritage located within the project's area of influence. In the municipality of Vila Nova de Foz Côa, according to the geographical information available in the DGPC database, there are 20 classified heritage elements. The Pelourinho de Muxagata is the closest Classified Heritage site to Quarry n.º 6637 "Vale de Videiro II", some 3.1 km away, from which there is no visibility of the quarry under study, vide Figure 75.

As for the archaeological sites already known, Quarry n.º 6637 "Vale de Videiro II" is close to the sites known as Pedreira do Poio (CNS 39266) and Texugo (CNS 39723), one on each side of the Vale de Videiro stream, close to its mouth.

Despite the characteristics of the landscape in the area to be licensed for Quarry n.º 6637 "Vale de Videiro II", due to its distance from known archaeological sites, it is considered that the visual impact of the presence of the quarry represents low or even zero significance for the known Archaeological Heritage.

The potential effects of seismic activity from explosives on the heritage sites identified, CNS 8466 (rock no. 41) and CNS 8467 (rock no. 2), is a factor studied by the Geophysics Center of the University of Lisbon in partnership with the Côa Valley Archaeological Park. The results of the monitoring study were published in the proceedings of the 3rd Archaeology Congress of Trás-os-Montes, Alto Douro and Beira Interior (2006). The article "Monitorização Sísmica do Território do Parque Arqueológico do Vale do Côa (PAVC)" (Veludo I.; Matias L.; Costa P.T., 2006) concludes that the explosions and activities carried out at the Poio quarries do not

endanger the rock supporting the rock engravings.

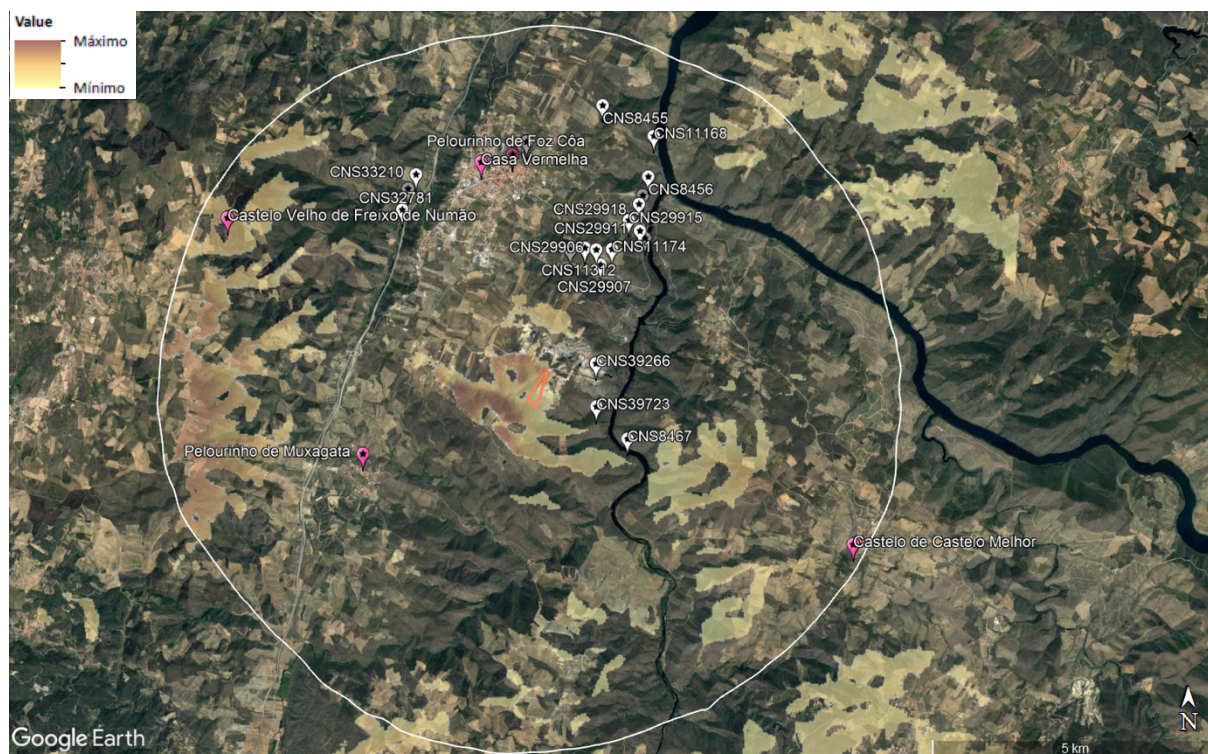


Figure 75: Visibility from elements of Cultural Heritage, Archaeological, Architectural and Ethnological Heritage, located in the surrounding area, to Quarry n.º 6637 “Vale de Videiro II”.

Therefore, the impacts of Quarry n.º 6637 "Vale de Videiro II" on Cultural Heritage, Archaeological Heritage, Architectural and Ethnological Heritage are considered to be null, with no impact on these attributes of the landscape.

6.4.1.7 Viewpoints and scenic routes

Along the banks of the Douro River there are several viewpoints over the Douro River and the vineyard landscape. Three viewpoints have been identified that are closest to the project area (a buffer of 6 km from the project area), vide Table 15 and Figure 76. From none of these viewpoints is it possible to see the quarry.

The impact of the existence of Quarry n.º 6637 "Vale de Videiro II" is considered to be insignificant in relation to this value, since none of the nearest viewpoints can be seen from Quarry n.º 6637 "Vale de Videiro II", due

to their location and the topography of the land. Figure 76 shows the visibility map overlaid with the location of the viewpoints identified around the quarry.

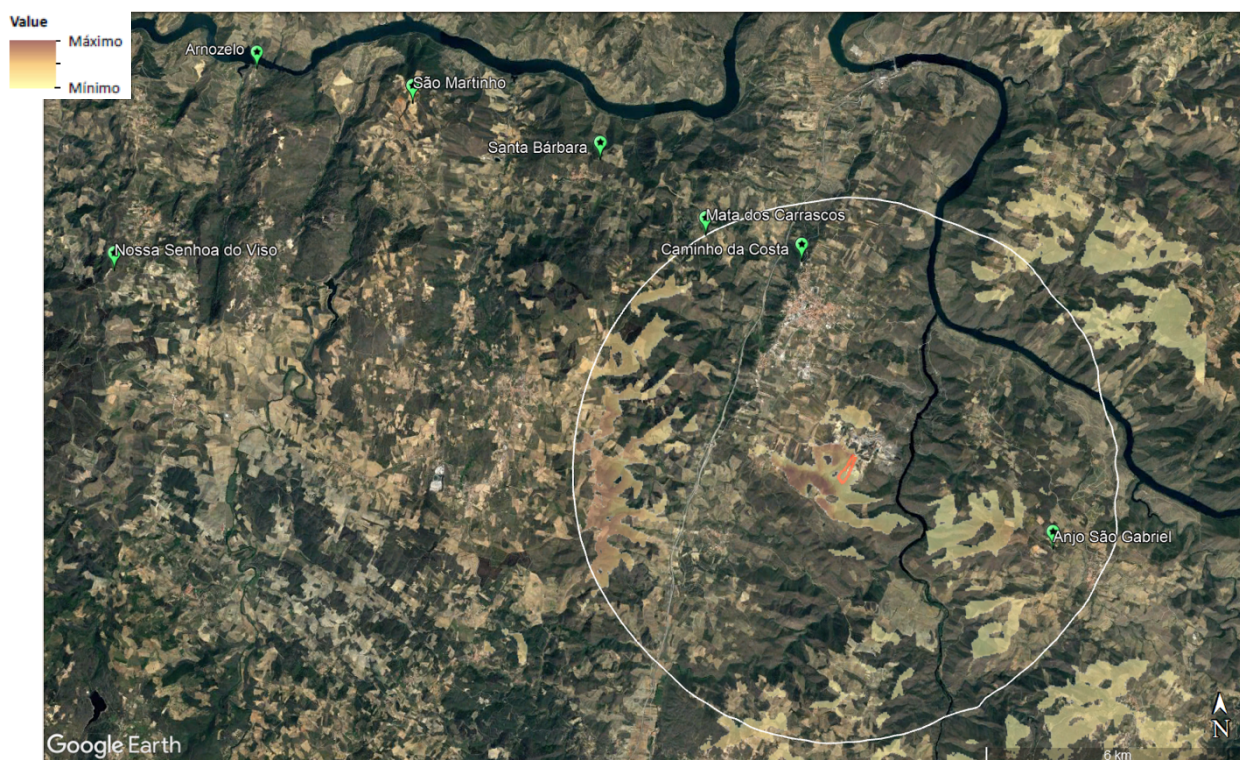


Figure 76: Visibility from the viewpoints located in the surrounding area to Quarry n.º 6637 "Vale de Videiro II".

The panoramic routes over the ADWR SPA have a high cultural and touristic value, as they make it possible to enjoy the Douro landscape. The enhancement of panoramic roads (road-rail) of high touristic value was one of the strategic objectives defined in the Douro Valley Tourism Development Plan (PDTVD) 2007-2013 (Magalhães R. *et al.*, 2008).

The scenic routes are essentially made up of classified national and municipal roads, whose layout is winding due to the topography of the territory and whose network is denser on the right bank than on the left bank of the Douro River, and the Douro Line railroad on the right bank of the Douro River.

On the stretch of the Côa River between Castelo Melhor and the mouth of the Côa with the Douro River, the main scenic routes are the N102, N222 and the IP2. However, taking into account the location of Quarry n.º 6637 "Vale de Videiro II", the existence of vegetation and the topography of the area surrounding it, it is not visible from any of these accesses.

Thus, the impact of the existence of Quarry n.º 6637 "Vale de Videiro II" is considered to be null in relation to this value.

6.4.2 IMPACT ASSESSMENT ON NATURAL VALUES

Table 17 presents the expected impacts of the project on the various natural attributes that confer VUE on the ADWR.

Table 17: Impacts of the project on the various natural attributes that confer VUE on the ADWR.

Values	Natural	Project phase	Nature of the impact (beneficial or adverse)	Magnitude and severity of the impact/change	Significance of the effect of the change
Attributes that confer VUE	The complex geomorphology, the scarcity of fertile soil and relevant ridges	Preparation and operation phases	Negative	Minor change	Moderately adverse
		After deactivation	Positive	Relevant change	Very beneficial
	The diversity of natural habitats, particularly scrubland, woodland and riparian galleries	Preparation and operation phases	Negative	Negligible change	Slightly adverse
		After deactivation	Positive	Relevant change	Very beneficial
	Mediterranean crops: vines, olives and almonds	Preparation and operation phases	Neutral	No change	Slightly adverse
		After deactivation	Neutral	No change	Moderately beneficial
	Climate, low rainfall and water scarcity	Preparation and operation phases	Negative	Minor change	Moderately adverse
		After deactivation	Positive	Moderate change	Moderately beneficial
	The Douro River and its tributaries	Preparation and operation phases	Neutral	No change	Neutral
		After deactivation	Neutral	No change	Neutral
	The ephemeral landscape: light and color, sound and silence and smells	Preparation and operation phases	Negative	Minor change	Moderately adverse
		After deactivation	Positive	Moderate change	Very beneficial
	Special Protection Zones – Rede Natura 2000	Preparation and operation phases	Negative	Minor change	Moderately adverse
		After deactivation	Positive	Moderate change	Moderately beneficial
Other asset components or attributes	Geological heritage - geosites	Preparation and operation phases	Neutral	No change	Neutral
		After deactivation	Neutral	No change	Neutral

6.4.2.1 Complex geomorphology and relevant ridges

The presence of quarries has a negative impact on the visual and aesthetic quality of the landscape in which they are located, inducing changes in the topography of the land (changes in the shape of the land, depressions in cut areas, the presence of heaps, deposits of blocks and structures and machinery used in the extractive activity) and altering the geomorphology of the place where it is implemented.

When preparing the exploration area, the land is cleared and stripped in order to create free fronts for blasting, as well as the construction of temporary and/or permanent accesses, which lead to the removal and compaction of soils and the creation of heaps.

Any of these processes leads to very significant, local, certain, direct, but minimizable and reversible negative impacts on geomorphology.

These impacts condition the stability of processes related to the morphological aspects of the terrain, in particular the alteration of the natural flow of surface water and the infiltration capacity of the soil.

Bearing in mind that the quarry is already in operation, the geomorphology in the area where the project will be implemented is already quite altered, so the impacts on this attribute during the operation phase will be similar to those that already exist, and are not expected to worsen significantly.

These impacts can be minimized with the implementation of appropriate land modelling measures to be applied after the project is decommissioned, which will improve the current situation, namely the storage of removed soil in pargas for later reuse and the use of tailings from the extractive activity in land modelling operations.

Thus, in the preparation and exploitation phases that are envisaged with the licensing of the quarry, the impacts on geomorphology are moderately adverse, because although they induce relevant changes, these will only have repercussions in the area affected by the project, and will not differ significantly from those that currently occur. In the phase after decommissioning, the landscape recovery measures to be implemented will help to reverse these changes and improve the current situation, which will be very beneficial.

This impact on geomorphology is restricted to the project area and does not extend to its surroundings. Given the small size of the project, it is considered that the changes to this attribute will not jeopardize the complex geomorphology that characterizes the ADWR.

Since Quarry n.º 6637 “Vale de Videiro II” does not overlap with ridges considered relevant, the direct impact of the project on this attribute is considered to be null. This attribute will also not be significantly affected in an indirect and negative way, although there may be a slight impact, since there is a possibility that the quarry area will be seen from some relevant ridges belonging to the ADWR SPA, which stand out in the surroundings of the project as a result of the very orographic diversity of the region, however, since the quarry already exists

on the site, the significance of the impact will be slight.

6.4.2.2 The diversity of natural habitats: scrub and woodland and riparian galleries

The region in which the study area is located is characterized by a varied mosaic of natural and semi-natural habitats, dominated by a variety of pre-forest scrublands; small woodlands with cork oak groves; typically Mediterranean agricultural crops such as olive groves and vineyards; and agricultural areas with natural spaces. The riparian vegetation along the region's waterways is also characterized by the presence of Mediterranean species such as ash (*Fraxinus angustifolia*), alder (*Alnus glutinosa*) and various species of willow (*Salix spp.*).

Of the biotopes identified in the area to be licensed for Quarry n.º 6637 "Vale de Videiro II", it can be seen that the patches occupied by almond trees should not be affected by the project as the area is already heavily intervened.

Most of the impacts on the local flora will be negative, but localized and insignificant (since the biotopes are very homogeneous, the quarry is small and the area to be exploited has already been intervened) and can be minimized, with moderately adverse changes compared to the current situation during the preparation and exploitation phases.

The main impacts associated with the preparation and operation phases of the quarry on biotopes and flora are as follows:

- The removal of soil and shrub and tree cover, which could lead to changes in biotope structure and plant species diversity;
- Soil tillage that could contribute to the colonization of the area by invasive plants;
- A criação de zonas de aterro com materiais oriundos das necessárias mobilizações de solo e de rejeitados da exploração que poderão soterrar alguns núcleos de vegetação natural;
- Disturbance (trampling) caused by the movement of people and machinery involved in the preparation and operation of the quarry;
- Degradation of vegetation due to the increase in dust.

It should be noted that within the area to be licensed, no natural or semi-natural habitats have been identified that attribute VUE to the region, namely scrubland, woodland and riparian galleries .

It is also important to note that biotopes and flora, in general, could benefit from the licensing of the quarry, since the actions to be promoted in the environmental and landscape recovery of the area will help to reverse the current situation, in which, in addition to the extraction of shale in the exploration area, there is a decline in the presence of Mediterranean forests and crops in its surroundings as a result of habitat degradation, forest

fires and agro-forestry abandonment.

Thus, for the operation phase (since the PARP will begin to be implemented during this phase) and the decommissioning phase, positive impacts are expected, with relevant and very beneficial changes, namely: an increase in the floristic and structural diversity of the biotopes present with the implementation of borders with native forest species characteristic of Mediterranean forests and scrubland and the creation of semi-natural spaces with herbaceous and sub-shrub crops.

6.4.2.3 Mediterranean crops: vines, olives and almonds

The vine and the olive tree, and in some areas also the almond, fig and orange trees, are symbols of Mediterranean culture and have a very distinctive representation in the ADWR (Alto Douro Wine Region World Heritage Site, 2000).

In a large area of the ADV, vines are the dominant crop, although olive and almond groves are also highly representative. In fact, in the vicinity of the quarry, near the towns of Vila Nova de Foz Côa, Orgal and Muxagata, the slopes are mostly occupied by vines and orchards.

However, the area to be affected by Quarry n.º 6637 “Vale de Videiro II” has no vineyards, olive groves or almond orchards or other fruit trees, so this attribute will not be affected by the project during the preparation and operation phase.

6.4.2.4 Climate, low rainfall and water scarcity

Water scarcity is one of the characteristics of this region, where the nature of the bedrock and the steep slopes make it difficult for water to infiltrate the soil.

According to climate models, the Vila Nova de Foz Côa region is expected to experience an increase in extreme high temperatures and heat waves, and a decrease in rainfall days, as a result of global climate change.

At the project level, topographical changes, earthmoving and deforestation are factors that can cause changes in the quantity and quality of water in the areas closest to the project. These factors have an influence on the natural surface drainage of surface water bodies and rainwater, since the absence of vegetation reduces infiltration and leads to an increase in the process of natural surface runoff, so it is necessary to ensure that rainwater runoff takes place naturally and properly.

However, the quarry area has already been worked on, so the existing impacts will not be increased; on the contrary, more effective planning of the existing drainage network should minimize these impacts.

In addition to emitting suspended particles, extraction activities make soils more vulnerable to erosion, especially during periods of high rainfall. During these periods, the dragging, transportation and deposition of materials into surface water bodies can lead to siltation and a reduction in their quality with an increase in

suspended solids, increased turbidity and reduced plant activity. However, a clean rainwater drainage network is planned, consisting of perimeter ditches that will allow drainage of the surrounding land. The drainage of potentially contaminated rainwater means that it will only be returned to the existing water line in the area surrounding the project after passing through a settling basin. Discharge from the settling basin, if it occurs, will only take place after the discharge point has been licensed.

As for the water needed for the production process, consumption will remain unchanged from the current situation, which in terms of consumption is negligible, since water is only needed for the social facilities, sprinkling access roads and the shale cutting machine.

The rehabilitation and shaping of the soil, the planting of tree species and the implementation of the drainage system will subsequently have a positive and direct influence on infiltration levels and natural surface drainage. It should also be noted that the proposed PARP has taken into account the vulnerability of the actions to be implemented in the face of climatic conditions and water scarcity, opting for solutions that are more suited to the region's soil and climate characteristics, recognizing that the land shaping, afforestation, reafforestation, sowing and other measures to be carried out, should promote the productive enhancement of wild spaces, the recovery of degraded ecosystems and the prevention and minimization of adverse environmental situations in the region in which it is located, contributing to the enhancement and conservation of natural resources, diversification of the landscape, increased biodiversity and regional framework.

The changes in this attribute will be minor, and although slightly adverse in the preparation and operation phase, after decommissioning and landscape restoration, moderately beneficial changes are expected.

6.4.2.5 The Douro River and its tributaries

The project is located about 4 kilometers from the Douro River and relatively close to relevant ridges belonging to the ZEP-ADV, which stand out in the project's surroundings as a result of the region's own orographic diversity.

The direct impact of the project on the River Douro is null, as this attribute does not overlap with the area to be licensed for Quarry n.º 6637 "Vale de Videiro II". Indirectly, given the null visibility from the entire Douro river valley to the quarry, no significant landscape impacts are expected.

Although shale extraction activities are associated with impacts such as the emission of suspended particles, increased vulnerability of soils to erosive phenomena, especially during periods of high rainfall, which can lead to the dragging, transport and deposition of materials into surface water bodies, which can even lead to siltation and a reduction in their quality with an increase in suspended solids, increased turbidity and reduced plant activity, it is considered that these impacts will be null on the Douro River and its tributaries.

As mentioned above, a clean rainwater drainage network is planned, consisting of perimeter ditches that will

allow drainage of the surrounding land. The drainage of potentially contaminated rainwater means that it will only be returned to the watercourses in the area surrounding the project after passing through a settling basin. Discharge from the settling basin, if it occurs, will only take place after the discharge point has been licensed. It is therefore not expected that the quality of surface water will be altered by the dragging and transportation of materials from the quarry works, and we do not foresee any impact on the Douro River and its tributaries.

6.4.2.6 The ephemeral landscape: light and color, sound and silence and smells

O contraste cromático criado pelo mosaico de habitats, a luz, o ambiente sonoro e os odores caracterizadores da paisagem não terão alterações relevantes face à situação atual.

Apesar do projeto contribuir para as emissões de poluentes atmosféricos, principalmente de partículas e para a produção de ruído, uma vez que a situação futura será similar à situação atual prevê-se que os impactos, embora negativos e diretos, sejam temporários e reversíveis (pois terminarão após o tempo de vida do projeto) induzindo alterações negligenciáveis e pouco adversas.

However, there may be episodes of particle pollution associated with adverse weather conditions, such as strong winds and long periods without precipitation, which promote the suspension of a large quantity of particles, and especially the emission and re-suspension of particles with the movement of heavy vehicles on the road near sensitive receptors. These impacts could be minimized, in particular by sprinkling/watering paths and operating areas.

The implementation of the PARP is expected to improve air quality and also the scenic value of the landscape as a result of the implementation of tree curtains at the edge of the area to be licensed and the bordering of paths, which are still in the exploration phase. After exploration ceases, as a result of terrain shaping and habitat rehabilitation actions that will contribute to increasing color contrasts, textures and even odors, as a result of the diversification of vegetation to be implemented, by reducing the area exposed to the action of the wind on the ground and by ending the noise sources inherent to exploration.

6.4.2.7 Geological heritage - geosites

Quarry n.º 6637 "Vale de Videiro II" will be exploited in an area that has mostly already been intervened upon. Significant changes to the geology are expected due to the extraction of shale, which leads to the irreversible loss of a geological resource that is non-renewable on a human scale. The exploitation of the resource will be limited to the area defined in the mining plan.

Quarry n.º 6637 "Vale de Videiro II" is located on a geosite. The site is called Poio Shale Quarries, which, according to the database available on the website "Geological Heritage of Portugal - Inventory of geosites of national importance" (<https://geossitios.progeo.pt/geosites>), whose scientific value comes from being an

example of deep flysch sedimentation associated with the lower Paleozoic of the autochthonous Central Iberian zone with geological or geomorphological interest.

Quarry n.º 6637 “Vale de Videiro II” will operate in an area that has already been partially intervened and is expected to have a significant impact on the Geological Heritage due to the extraction of shale.

6.4.3 CUMULATIVE IMPACTS

Every possible effort should be made to avoid, eliminate or minimize adverse impacts on the attributes that give the Alto Douro Wine Region's Evolving and Living Cultural Landscape its VUE. However, in the case of World Heritage properties, it is essential to ensure a balance between the public, economic, social and even environmental benefits of the proposed changes to the landscape and the impacts that a given project will introduce.

The cumulative impacts on the attributes that confer VUE on the ADWR are assessed globally. The cumulative impact is essentially visual, i.e. on the visual or scenic value, but a broad approach is needed, as the impacts take many forms - they can be direct or indirect, cumulative, temporary or permanent, reversible or irreversible, visual, physical, social, cultural and even economic.

In the municipality of Vila Nova de Foz Côa, taking into consideration the information available on the DGEG geoportal at <https://www.dgeg.gov.pt/pt/servicos-online/informacao-geografica/>, 10 quarries have been identified (*vide* Table 18), including Quarry n.º 6637 “Vale de Videiro II”.

Table 18: Characteristics of quarries around the project (geoportal of the DGEG).

Regis- tration n.º	Designation	Holder	Sub- stance	Class	Current status	Approximate distance to the project (m)	Approxi- mate to- tal area (ha)
6632	Vale de Videiro 1	MARIA PIEDADE FERNAN- DES, UNIPESSOAL, LDA	Orna- mental shale	2	Quarry with de- posit	Contiguous	4,1
4995 +5002	Pedreiras de Xisto n.º 4995 “Rego da Vide” e n.º 5002 “Fraga do Poio n.º 20”	SOLICEL - SOCIEDADE DO CENTRO INDUSTRIAL DE ESTEIOS DE LOUSA, LDA	Orna- mental shale	1	Quarry with de- posit	200	32,3
4999	Alto da Companhia	ANTÓNIO AUGUSTO PAIS, LDA	Orna- mental shale	2	Quarry with de- posit	500	3,0

Regis- tration n.º	Designation	Holder	Sub- stance	Class	Current status	Approximate distance to the project (m)	Approxi- mate to- tal area (ha)
2434	Fraga do Poio N7	SOLICEL - SOCIEDADE DO CENTRO INDUSTRIAL DE ESTEIOS DE LOUSA, LDA	Orna- mental shale	3	Quarry without a deposit	470	4,7
4998	Jardim N4	CUPA PEDRAS, LDA	Orna- mental shale	1	Quarry without a deposit	50	42,1
6827	Vale da Mó N1	XISTOPOR - INDÚSTRIA EXTRATIVA, LDA	Orna- mental shale	2	Quarry without a deposit	480	6,1
5717	Alto da Touça	CONSTRUTORA MEDENSE, LDA	Granito industrial	2	Quarry with de- posit	9 200	14,6
6778	Alcadaria	CUBIGRANI - EXPLORA- ÇÃO E EXTRAÇÃO DE GRANITOS, UNIPessoal LDA	Mixed granodio- rite	2	Quarry with de- posit	8740	6,8
6521	Quinta das Casas	CASSIANO MANUEL SOA- RES CONSCIÊNCIA	Orna- mental shale	3	Quarry with de- posit	12 400	4,4

As mentioned above, Quarry n.º 6637 "Vale de Videiro II" is part of the Poio Quarry Core and is close to other industrial units: Quarry n.º 4998 "Jardim n.º 4", Quarry n.º 6632 "Vale Videiro I", Quarry n.º 6827 "Vale da Mó n.º 1", Quarry n.º 4999 "Alto da Companhia", Shale Quarries n.º 4995 "Rego da Vide" and n.º 5002 "Fraga do Poio n.º 20". This enhances the cumulative impact that has occurred over the years, resulting in a significant increase in "Artificialized Land" (shale exploitation areas) to the detriment of areas of scrubland, olive groves, almond groves and pastures.

There is thus a cumulative impact on the natural attributes that give the ADWR a VUE, namely: agricultural crops - almond groves; agricultural crops - olive groves; agricultural crops - olive groves and almond groves and scattered holm oak, juniper, maritime pine, almond and/or olive groves.

It should also be noted that in addition to direct employment, the activity of the Poio Quarries creates wealth in the municipality of Vila Nova de Foz Côa indirectly by boosting economic activities associated with suppliers, service providers and customers, as well as by increasing the municipality's reputation as a supplier of high

quality products, also affecting other economic sectors such as tourism, which benefited from the operation of the quarries, contributing to the vitality of the local economy.

The Poio Quarries area has been an area of shale exploitation for many decades and has the potential to be considered an EUV in accordance with criterion (iii) used for UNESCO's evaluation of EUVs, as it "bears exceptional witness to a living or vanished cultural tradition or civilization". It should also be noted that one of the main products produced by the Poio Quarries is precisely the vineyard supports that are used in the ADV's vineyards. As such, the Poio Quarries do not jeopardize the property's inscription on the World Heritage list. As the licensing procedure is associated with a PARP, it is expected that the scenic quality will increase, and the final visual impact will be very positive, especially as the proposed PARP includes the planting of native vegetation that enhances the entire landscape of the region.

6.4.4 GLOBAL ASSESSMENT

6.4.4.1 Effect on the authenticity of the ADWR

The most relevant values and attributes are not those usually associated with monuments and heritage in the most traditional sense.

The technical guidelines for how the authenticity of a property should be assessed are referred to in paragraphs 79 to 86 of the Guide "Operational Guidelines for the Implementation of the World Heritage Convention" (UNESCO, 2021). The satisfaction of the conditions of authenticity in relation to the properties on the World Heritage List shall apply essentially to cultural values as referred to in paragraph 82:

82. Depending on the type of cultural heritage, and its cultural context, properties may be understood to meet the conditions of authenticity if their cultural values (as recognized in the nomination criteria proposed) are truthfully and credibly expressed through a variety of attributes including: form and design; materials and substance; use and function; traditions, techniques and management systems; location and setting; language, and other forms of intangible heritage; spirit and feeling; and other internal and external factors (UNESCO, 2021).

"In the ADWR, the villages, the farm buildings, the patios and religious buildings, do not have the "grandeur" corresponding to the opulence of the landscape. The most representative vernacular heritage is found in the steep, terraced areas (plateaus supported by dry stone walls in shale), in the arable soil built by man, in the network of paths and accesses, in the biological and typological variety of the vineyards and in the pattern of landscape" (Ramos C. and Fonseca G., 2014).

The construction and presence of the project does not compromise the conditions of authenticity that were recognized to the ADWR, to the extent that they are not directly and significantly affected terraces (levels

supported by dry stone walls in shale), arable soil built by man, network of paths and accesses, biological and typological variety of vineyards and other cultural values, materials and imaterial, which constitute attributes that confer OUV to the ADWR.

The visual impact of the project's presence, due to the reasons pointed out throughout the present study and in the EIA, particularly due to its size and location, does not significantly affect the authenticity of the cultural attributes or the landscape pattern of the ADWR.

It should be noted that the current landscape is similar to the future landscape, in the exploration phase, and that the Environmental and Landscape Recovery will soon improve the landscape integration of the current exploration area.

6.4.4.2 Effect on the integrity of Property

The technical guidelines on how the integrity of a property should be assessed are referred to in paragraphs 87 to 95 of the Guide "Operational Guidelines for the Implementation of the World Heritage Convention" (UNESCO, 2021). In paragraph 89, the guidelines for the assessment of the integrity of the property which is inscribed according to criteria (i) to (vi), which were the criteria with which the registration of the ADWR was supported.

89. For properties nominated under criteria (i) to (vi), the physical fabric of the property and/or its significant features should be in good condition, and the impact of deterioration processes controlled. A significant proportion of the elements necessary to convey the totality of the value conveyed by the property should be included. Relationships and dynamic functions present in cultural landscapes, historic towns or other living properties essential to their distinctive character should also be maintained.

ADWR has all the values and attributes that express its OUV. They are present in the entire area, keeping the character intact, with the dimension that allows the complete representation of the characteristics and processes that transmit their importance as a wine region and unique technological landscape. The land use, the typologies of the implantation of the vineyards, the pattern of the landscape, the villages, the Quintas, the shale walls, the accessibility network and the complex morphology of the ADWR are manifested in its limits with the most representative and preserved expression of the Douro Demarcated Region, reflecting well the relationships and dynamic functions of the living evolutionary cultural landscape. The physical tissue of the ADWR and its significant characteristics are in property condition, and the processes that can generate Adverse effects are controlled, thus mirroring the conditions of integrity of the property (Ramos C. and Fonseca G., 2014).

The construction and presence of the Project (visual impact) due to the reasons pointed out throughout this report and in the EIA, namely due to its size, location, immediate implementation of the PARP, does not

compromise the conditions that guarantee the integrity of the ADWR.

7 MINIMIZATION MEASURES

The visual sensitivity of a landscape reflects the degree of susceptibility, in relation to the implementation of human activities, or to possible changes in land use. Thus, a landscape that has a high degree of sensitivity can easily suffer a significant reduction in visual quality in the face of the implementation of impactful activities.

In general, high-quality landscapes are at the same time high sensitivity, i.e., they are easily negatively affected by actions to change land use and their management systems. On the other hand, in landscapes that present high sensitivity, landscape valuation actions are more likely to generate significant visual impacts.

Therefore, taking into account that the area of Quarry Project n.º 6637 "Vale de Videiro II" has a high sensitivity, the application of minimization measures in the environmental and landscape recovery of the area will contribute to increasing the quality of the landscape.

The main minimization measure proposed is the phased application of the PARP and reinforcing the tree curtain on the quarry boundaries from the start of the project's implementation. Table 16 lists other complementary minimization measures.

Table 16: Proposed minimization measures.

Minimization and compensation measure
Comply with the Quarry Plan. Follow the indications of the Mining Plan, Waste Management Plan and Environmental and Landscape Recovery Plan.
Strengthen training for workers on property practices to be carried out during the work, by listing the set of minimization measures to be implemented and their importance.
Limit the movement of machinery and human resources to the strictly necessary areas.
Limit the cutting of vegetation to areas actually to be explored and their access, so that areas with vegetation can continue to be an habitat for certain species of fauna (e.g. birds, invertebrates, reptiles, etc.) adaptable to the presence of this type of project.
Cut the existing vegetation in a phased manner as the work front progresses. Preserve, whenever possible, all native tree and shrub specimens near the perimeter of the exploration area, which do not disturb the activity, signalling them when close to the intervened areas.
The topsoil resulting from the clearing of the expansion area and the areas directly affected must be removed and stored in a suitable place for later covering of the slopes, platforms and affected areas. This topsoil should be replenished as work progresses, and measures should be implemented to prevent erosion.
If any archaeological artefact appears during excavations, archaeological work will be necessary to assess the importance of them.
Natural drainage systems and built-up drainage systems shall be maintained in such a way as to allow the flow of surface run-offs to the surrounding land.
If any archaeological artefact appears during excavations, archaeological work will be necessary to assess the importance of them.
Natural drainage systems and built-up drainage systems shall be maintained in such a way as to allow the flow of surface run-offs to the surrounding land.

8 CONCLUSIONS

Considering that it is an existing project, the Quarry n.º 6637 "Vale de Videiro II" Project does not affect the authenticity or integrity of the ADWR Property, nor is it considered that the changes to be introduced are likely to affect the local, national or international perception of the Property.

As such, the project does not jeopardize the inscription of the Property on the World Heritage List.

9 REFERENCES

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10 APPENDIX