

15 INTERACTIONS, CUMULATIVE AND COMBINED EFFECTS

15.1 INTRODUCTION

This chapter of the remedial Environmental Impact Assessment Report (rEIAR) has been prepared by WSP Ireland Consulting Ltd (WSP) for the Shillelagh Quarries Limited (SQL) Substitute Consent application to An Bord Pleanála (ABP). The application for Substitute Consent application is for quarrying activities (the Development) at an existing quarry located in the townland of Hempstown Commons, Co. Kildare, (the Site), and is located within the administrative boundary of Kildare County Council (KCC).

This chapter of the rEIAR describes interactions/inter-relationships between environmental effects in the area surrounding the Development.

15.2 TECHNICAL SCOPE

The EIA Directive (Directive 2011/92/EU, as amended by Directive 2014/52/EU, together the 'EIA Directive') requires that an environmental impact assessment identifies, describes and assesses in an appropriate manner the significant effects of a project and the significant interaction and in-combination effects of the project. This requires the careful consideration of environmental factors and pathways (direct and indirect) that can magnify effects through the interaction or accumulation of effects.

Environmental factors are inter-related to some degree, and these interactions can exist on many levels. This chapter summarises the primary interactions between the environmental topics and provides a matrix to coherently display them.

The overall objective of the assessment in this chapter is to identify whether remedial measures are required that would not otherwise have been identified in the individual study areas for these interacting effects.

The overall rEIAR Project Team contributed to the compilation of this chapter.

15.3 METHODOLOGY

The temporal scope of the assessment is 29 December 2019 to present. The baseline date of 29 December is derived from the expiry date of the KCC Planning Reg. 07/443; ABP Ref. PL09.233338 (see section 2.4 and section 2.6 of Chapter 2 (Project Description) for further detail). This assessment period equates to approximately five years and is identified as 'short-term' duration (those lasting one to seven years) (EPA 2022).

The assessment directly covers the physical extent of the rEIAR study boundary as shown in Figure 15-1, and the assessment area has been extended as appropriate to identify the relevant interacting effects surrounding the Development.

15.4 DEVELOPMENT DESCRIPTION

The lands, the subject of this rEIAR (i.e. lands within the Application Boundary) extend to approximately 10.05 ha and are located within the EIA boundary for the rEIAR (approximately 18.45 ha). The existing quarry void extends to approximately 5 ha and is located entirely within the EIA boundary and the application boundary.



Figure 15-1 - Substitute Consent application area and the lands the subject of the EIAR.

It is noted that quarry works carried out at the Application Site following the expiry of the KCC Planning Reg. 07/443; ABP Ref. PL09.233338 occurred within the application boundary (also referred to as the substitute consent boundary) and is considered within this assessment. Full details of works and development carried out within the application boundary over the assessment period are provided in Chapter 2 (Project Description) and, in summary, comprise:

- Continued extraction and processing of blast rock;
- Continued use of stockpiling in the stockpile areas;
- Continued export of aggregate offsite;
- Installation of a primary soakaway and overflow soakaway, and used of pump to transport collected waters from the quarry floor to the soakaway(s); and,
- Upgrade of the closed system wheelwash through the addition of dry grate and the installation of a higher capacity concrete-lined tank.

It is noted that extraction has remained within an approximately 5 ha area during the assessment period and therefore only minor soil stripping has taken place on the Site during that time.

Phased restoration works of the lands under the control of the Applicant (SQL) outside of the application boundary, and located with the EIA Boundary, were carried out in line with Condition 6A of KCC PPRN. 07/443 and the direction of the High Court settlement terms (see Chapter 2 (Project Description) and, on this basis, have been scoped out of this assessment.

The extension of the carpark area during the assessment period was carried out on third-party lands by the owner of those land and has therefore been scoped out of this assessment.

See Chapter 2 (Project Description) of this rEIAR for details of the proposed restoration plan for the lands within the Application Boundary.

15.5 METHODOLOGY

This assessment has been made with reference to the 'Guidelines on the information to be contained in environmental impact assessment reports', published by the EPA in May 2022 (EPA, 2022 Guidelines). These guidelines were issued by the EPA to facilitate compliance with the EIA Directive.

The descriptive terminology used follows a 'matrix approach' to environmental assessment which is based on the characteristics of the impact (magnitude and nature) and the value (sensitivity) of the receptor. The terminology and method have been summarised in Chapter 1 (Introduction, Scope and Methodology) of this rEIAR.

The methodology for assessment of cumulative and in combination effects is set out at the beginning of Section 15.7 for ease of reference to the reader.

15.6 INTERACTIONS

For the assessment of interacting effects, a matrix has been provided in Table 15-1 identifying through professional judgment the specific topics within the rEIAR where the effects potentially interact/inter-relate with each other.

Table 15-1 – SQL Substitute Consent Environmental Interactions, (X = No Interaction; ✓ = Potential Interaction).

Interaction	Population & Human Health	Ecology and Biodiversity	Land, Soils & Geology	Water	Air Quality	Climate	Noise and Vibration	Cultural Heritage	Landscape & Visual	Traffic & Transport	Material Assets	Major Accidents & Disasters
Population & Human Health		X	X	✓	✓	X	✓	X	✓	✓	✓	✓
Ecology and Biodiversity.			✓	✓	✓	X	✓	X	✓	X	X	X
Land, Soils & Geology				✓	X	X	X	✓	✓	X	X	X
Water					X	X	X	X	X	X	X	X
Air Quality						X	X	✓	X	X	X	X
Climate							X	X	X	X	X	X
Noise and Vibration								X	X	X	X	X
Cultural Heritage									✓	X	X	X
Landscape & Visual										X	X	X
Traffic & Transport											X	X
Material Assets												X
Major Accidents & Disasters												

15.6.1 POPULATION AND HUMAN HEALTH

During the assessment period of December 2019 to present, quarry activity effects on population and human health had potential to interact with water, air quality, noise, traffic and transport, landscape and visual, material assets, and major accidents and disasters.

Potential effects to the human environment from Site activities may have potentially included impacts on water which may have affected groundwater quality in local wells. Potential impacts to human health may have arisen from dust generating activities on the Site and increases in concentrations of airborne particles and nitrogen dioxide due to plant emissions. Impacts to human health from excess noise and vibration on site may have potentially resulted in direct effects to site workers and also annoyance and effects on mental health in the surrounding residential receptors.

Visual impact during the assessment period may have potentially related to the effect of the Development on specific views and on the general visual amenity experienced by people.

Site activities during the assessment period may have had the potential to impact or cause disruption to local services or utilities.

Major accidents and disasters which have the potential to occur on site may have impacted employees on site and people in the site surrounds, including residential receptors.

These interactions have been considered in the relevant chapters of this rEIAR: Chapter 3 Population and Human Health, Chapter 6 – Water, Chapter 7 – Air Quality, Chapter 9 – Noise and Vibration, Chapter 11 – Landscape and Visual, Chapter 12 – Traffic and Transport, Chapter 13 – Material Assets, and Chapter 14 – Major Accidents and Disasters.

In summary, these assessments have identified that such interacting effects with the human environment are **not significant**.

15.6.2 ECOLOGY AND BIODIVERSITY

During the assessment period there was potential for interacting effects between ecology and biodiversity and land, soils and geology, water, air quality, noise and vibration and landscape and visual.

Adverse impacts to the soil, water and air environment would have had the potential to deteriorate habitat quality both on and off-site.

Similar to human receptors, impacts from excess noise and vibration on Site may have potentially resulted in stress to some species and effects on biodiversity and habitats surrounding the Site.

Elements of the Development have altered landscape features permanently including areas where nesting birds may have been present, and as such there has been the potential to cause stress to these species.

These interactions have been considered in the relevant chapters of this rEIAR: Chapter 4 – Ecology and Biodiversity, Chapter 5 Land, Soils and Geology, Chapter 6 – Water, Chapter 7 – Air Quality, Chapter 9 – Noise and Vibration and Chapter 11 – Landscape and Visual.

In summary, these assessments have identified that such interacting effects with the surrounding ecology and biodiversity are **not significant**.

15.6.3 LAND, SOILS AND GEOLOGY

During the assessment period there was potential for interacting effects between soil and geology, water, cultural heritage, and landscape and visual.

Excavated materials have arisen as a result of the stripping of soils and the removal of gravel in the progression of the Development during the assessment period. The excavation of rock took place in the existing void at previously developed rock faces. Activities on the overall Site had the potential to cause changes in the underlying water environment and in the areas where soil was stripped had potential to damage undiscovered cultural heritage features.

The Site is located within a county geological site designated because of historically quarrying at the site and resultant bedrock exposures. Activities in the quarry had the potential to cause changes to exposed quarry faces, albeit changes would have been caused by continued extraction so bedrock exposure would have remained available.

These interactions have been considered in the rEIAR in Chapter 5 – Land, Soils and Geology, Chapter 6 – Water, Chapter 10 – Cultural Heritage, and Chapter 11 – Landscape and Visual.

In summary, these assessments have identified that the interacting effects with land, soils and geology and water and cultural heritage are **not significant**.

15.6.4 CULTURAL HERITAGE

During the assessment period there was potential for interacting effects between cultural heritage and air quality, and landscape and visual impacts.

Stripping of soils and extraction activities which generated dust could have holistically affected the setting of cultural heritage assets within the wider study area. Also, alterations in the landscape and visual amenity of the Site had the potential to impact the value of recorded monuments, county geoheritage site, and also unrecorded features.

No potential vibration interaction with cultural heritage assets has been identified.

These interactions have been considered in Chapter 5 – Land, Soils and Geology, Chapter 7 – Air Quality, and Chapter 9 – Cultural Heritage.

In summary, this assessment in the rEIAR has identified the above interacting effects as **not significant**.

15.6.5 CONCLUSION

It has been concluded that there were **no significant interactions** between any of the various environmental topic areas as a result of previous operations within the Development lands, and surrounding study area.

15.7 CUMULATIVE AND COMBINED EFFECTS

This section of the rEIAR describes the environmental effects of the Proposed Development in combination with other relevant committed development within 2 km of the Site during the assessment period (29 December 2019 to present). Cumulative effects are defined as the addition of many non-significant or significant effects, including the effects of other projects, to create larger, more significant effects. Singular activities may have a non-significant effect in isolation, however when combined with other effects these can be collectively significant.

This assessment has been made with reference to the 'Guidelines on the information to be contained in environmental impact assessment reports' (EPA 2022).

Sources for the search of planning applications included:

- Planning Enquiry System – Kildare County Council;
- Planning Enquiry System – Wicklow County Council;
- Department of Housing, Local Government and Heritage EIA Portal;
- Kildare County Development Plans covering the periods 2017-2023 and 2023-2029 respectively; and
- Wicklow County Development Plans covering the periods 2018-2022 and 2022-2028 respectively.

Table 15-2 identifies the relevant schemes considered in this cumulative assessment. These schemes were selected based on their size, scale and proximity to the Proposed Development. Each development site has been considered by the EIA team's respective discipline leads and this section summarises the results of their expert opinion on the cumulative effects assessment.

Table 15-2 – Third party development

Reference	Location	Description	Status / Decision date
22973: (Simon Phibbs)	Ca. 600 m southeast of site. Hempstown Commons, Blessington, Co. Kildare.	New detached bungalow type dwelling house, new vehicular recessed entrance off privately owned existing laneway, new on-site domestic wastewater treatment system, landscaping and all associated site development works on lands	Granted with conditions. 18/11/2022
20145: (Thomas Phibbs)	Ca. 1 km southeast of site. Hempstown, Blessington, Co. Wicklow	Extend the appropriate period of a permission - 14/1536 - demolition of existing family home building of replacement private dwelling on footprint of existing family home with roof pitch to match that on existing dwelling together with all ancillary works	Granted without conditions. 07/08/2020
22405: (Simon and Kate Dick)	Ca. 1.5 km southwest of site. Shango, Redbog, Rathmore	The removal of single storey conservatory to the rear, minor modifications to the internal layout and to the front and rear facades,	Granted with conditions. 26/07/22

Reference	Location	Description	Status / Decision date
		construction of new single storey extensions to front and rear at ground floor level, provision of 2 No. new dormer windows to the rear at ground floor level, provision of 2 No. new dormer windows to the rear at attic level, all associated ancillary, landscaping and site development works.	
211718: (Sarah O'Mahony)	Ca. 2 km southwest of the site. Wolfestown, Rathmore, Co. Kildare.	Alterations and extension to existing single storey dwelling. The application will include the following: Removal of existing corrugated shed building; Refurbishment of the existing single storey cottage to provide 3 No. bedrooms; Construction of a new single storey extension to provide new living room, bathroom, utility room and kitchen/dining/living space all to the rear of the existing cottage; Alterations to the existing vehicle entrance to provide a recessed vehicle entrance; Provision of a new wastewater treatment system, along with all associated site development and facilitating works including site landscaping	Granted with conditions. 21/03/22
20297 (John Trant and Elaine Doyle)	Ca. 2 km southwest of the site. Punchestown Lower, Rathmore, Naas, Co. Kildare.	Construction of a milking parlour, dairy, drafting and handling facilities, and waiting yard. Construction of an agricultural cubicle shed. Construction of silage pit. Construction of	Granted with conditions. 10/11/20

Reference	Location	Description	Status / Decision date
		geomembrane lined slurry lagoon. Modifications of existing entrance to improve sightlines and installation of access passageway. Erection of an external milk storage tank, meal bin, water tank and all associated site works. Revised by Significant Further Information which consists of construction of a new agricultural entrance.	
191035 (Nuala Boylan)	Ca. 1.5 km southwest of the site. Pipers Hall, Crosschapel, Co. Kildare.	Construction of a two-bedroom storey and a half dwelling, effluent treatment system, new site entrance and all associated site works.	Granted with conditions. 02/04/2020
20276 (Anna Sargent and Emmet Ralph)	Ca. 2 km to the southwest of the site. Wolfestown, Rathmore, Naas, Co. Kildare.	A dormer bungalow, detached garage, recessed entrance, well, septic tank, percolation area and associated landscaping	Granted with conditions. 17/09/20
22288 (Siobhan Eustace)	Ca. 1.7 km to the south of the site. Evergreen House, Crosschapel, Blessington, Co. Wicklow. W91 H3C2	Development of an existing 16.8 sqm single story conservatory extension to existing dwelling and an existing single storey 31.32 sqm detached garage to the rear of the existing dwelling and all associated site development works	Granted with conditions. 14/06/2022
22680 (Declan Cullen)	Ca. 100 m to the north of the site. Slatequarries, Rathmore, Naas, Co. Kildare.	To construct a single storey bungalow type dwelling which will incorporate a family flat to be occupied by a man, who requires supervised independent living accommodation. A secondary sewage treatment system with	Granted with conditions. 30/11/2022

Reference	Location	Description	Status / Decision date
		percolation area. A bored well. All associated ancillary ground works. This site will be accessed from the public road via an existing driveway under an agreed right of way arrangement.	
2460445 (Patrick Slattery)	Ca. 900 m to the south of the site. Pipershall, Blessington, Co Kildare	For a detached dormer dwelling, detached domestic garage / car store, on site effluent treatment system & percolation area, surface water to soakaways, recessed entrance and all associated site works	Granted with conditions. 18/09/2024
2460333 (Father Richard Behan)	Ca. 1.5 km to the south of the site. Parochial House, Crosschapel, Blessington, Co Kildare	For a new vehicular entrance and all associate site works	Granted with conditions. 22/07/2024
191412 (David Cleaver-Darling)	Ca. 500 m to the southeast of the site. Hempstown, Blessington, Co. Kildare.	For construction of a dormer style dwelling with Oakstown treatment plant and soil polishing filter along with a new entrance and all associated site works.	Granted with conditions. 14/09/2020
201387 (Gerry Phibbs)	Ca. 600 m to the southeast of the site. Hempstown Commons, Blessington, Co. Kildare	A single storey dwelling and detached domestic garage, new effluent treatment system and soil percolation system, the construction of approximately 40 linear metres of an access lane from an existing private lane and all ancillary site works.	Granted with conditions. 06/09/2021
22973 (Simon Phibbs)	Ca. 600 m to the southeast of the site. Hempstown Commons, Blessington, Co. Kildare.	A new detached bungalow type dwelling house, new vehicular recessed entrance off privately owned existing	Granted with conditions. 18/11/2022

Reference	Location	Description	Status / Decision date
		laneway, new on-site domestic wastewater treatment system, landscaping and all associated site development works on lands.	

15.7.1 POPULATION AND HUMAN HEALTH

Sand and gravel quarrying activities currently take place in an adjacent quarry to the north of the site. A precast manufacturer is located to the southeast of the site. It is considered that the substitute consent development has had beneficial impacts on both direct and indirect employment and economies surrounding the site.

Cumulative impacts of these surrounding quarrying activities and industrial activities during the assessment period in relation to water, air quality, and noise and vibration are considered in the respective chapters of this rEIAR. With the maintenance of on-site mitigation measures there were, and are, considered to be **no significant** negative cumulative impacts to population and human health during the assessment period.

The continuation of the existing operation since 29 December 2019 in combination with the surrounding developments has not had a significant impact on population trends, amenity public health or public safety within the surrounding area. There are no other industrial operations in the vicinity of the site that would have generated a cumulative impact upon human beings over the substitute consent period.

With regards to development identified in Table 15-2, assuming other developments in the area have incorporated widely adopted good design, practice and mitigation measures it is considered that there have been **no significant** cumulative effects of the Application Development with other significant developments in the locality.

The impacts identified during the assessment period were mitigated by design or good practice. Effects from the Site in isolation have been considered to be, in all instances to be **Not Significant**.

15.7.2 ECOLOGY

With regards to development identified in Table 15-2, assuming other developments in the area have incorporated widely adopted good design, practice and mitigation measures it is considered that there have been **no cumulative effects** of the Application Development with other developments in the locality. Further relevant detail is provided in sections 15.7.2.1 to 15.7.2.5 below.

15.7.2.1 Groundwater

Considering the lack of groundwater connectivity between the Application Site and Red Bog SAC/pNHA as described in this rEIAR, it is considered that there is **no potential for any impacts** to have occurred during the assessment period. Groundwater cumulative effects are therefore screened out from further assessment.

15.7.2.2 Noise

As discussed in **Chapter 9** (Noise and Vibration) of this rEiAR, noise levels that exceed the 55 dB threshold at which significant impacts are expected are not likely to have occurred as a result of activities associated with the Application Site during the assessment period. Noise cumulative effects are therefore **scoped out** from further assessment.

15.7.2.3 Habitat Loss

The loss of grassland as a resource for foraging birds was found to be insignificant in isolation, but it may contribute to large-scale habitat loss in the wider environment. In relation to ground-nesting birds, the loss of this habitat was considered significant (in isolation). However, suitable habitat has recently been restored on the lands adjacent within the wider EIA boundary, and as such cumulative assessment of this impact has been **scoped out**.

The loss of scrub habitat and trees as a resource for nesting and foraging birds has been found to be significant in isolation. As such, cumulative assessment of this impact has been **scoped out**, as appropriate compensation and enhancement have already been proposed (see Chapter 4, Ecology).

The loss of a small amount of scrub habitat within the Application Site which would have provided suitable refuge habitat for reptiles was not considered significant due to the increased availability of this habitat type on Site since 2019. Furthermore, replacement habitat has been recommended in this rEiAR (see Chapter 4, Ecology). As such, cumulative assessment of this impact has been **scoped out**.

15.7.2.4 Badgers

The impact of the Application Site activities on badgers (potential disturbance, destruction of potential setts and/or direct kills) has been considered significant in isolation¹. Therefore, cumulative assessment of impacts affecting badger have been **scoped out** given that appropriate compensation and enhancement have already been proposed.

15.7.2.5 Bats

While the impact of the Application Site activities on bats (potential disturbance of roosting bats, loss of low suitability roosting trees) was not found to have a significant impact on bats in isolation, the cumulative effect when combined with nearby developments may be of significance. As such, cumulative assessment for bats has been **scoped out** on the basis that the loss of woody vegetation will be compensated.

15.7.3 LAND, SOILS AND GEOLOGY

Assuming other developments in the area have incorporated widely adopted good design, practice and mitigation measures it is considered that there have been no significant cumulative effects of the Development with other similar developments in the locality during the assessment period.

¹ It should be noted that badgers have not been recorded onsite.

Cumulatively, the potential impacts of quarrying at the Site on the Slate Quarries County Geological Site are considered to be at most '*Imperceptable*' on the basis of the rationale set out in section 5.7.5 in Chapter 5 (land Soils and Geology), and therefore cumulative effects are considered to be **not significant**.

There are no other cumulative impacts on the land, soils and geology envisaged in terms of the activities at the Site over the reporting period.

15.7.4 WATER

There was potential that the dewatering within the pit could have caused a cumulative impact with regards to groundwater quantity in the area. However, as there are no residual effects on surrounding water bodies or underlying groundwater aquifers envisaged, there is **no potential for cumulative impacts on surface water or groundwater** to occur.

There was the potential that the release of arsenic from the bedrock groundwater to the soakaway ponds may have added to the already naturally elevated (see Section 6.4.7.4 in Chapter 6 (Water)) concentrations of arsenic in the bedrock groundwater beneath the Site, the gravel and sands or the Goldenhill River. However, arsenic is not currently sampled for in the rivers and there is not a monitoring point installed into the gravel and sands down gradient from the Site. Therefore, assessment of current arsenic levels vs the baseline levels at these receptors cannot be made. Monitoring is available in the bedrock groundwater down gradient of the soakaway ponds in GW5. Monitoring of GW5 currently shows no increase in arsenic (in response to increases at SW01), indicating limited impact on the groundwater in the bedrock, with likely short pathways. See Figure 6C-1 in Chapter 6 (Water) for changes in arsenic concentrations across the monitored locations.

15.7.5 AIR QUALITY

The boundary dust deposition monitoring undertaken on the site provides an inherent measure of cumulative dust levels as the samples collected will include airborne material generated due to the operation of the Proposed Development as well as emissions from the neighbouring precast concrete manufacturing plant to the southwest, nearby sources (within 800m) and (to a lesser extent) downwind sources of mineral dust and PM₁₀ (carried on the wind).

The measures outlined in Section 7.8 in Chapter 7 provide sufficient mitigation against significant effects. It is assumed that the nearby sources also employ appropriate and proportionate mitigation measures as good practice, and therefore it is expected that any cumulative impact would be sufficiently minimised and **not result in a significant effect**.

15.7.6 CLIMATE

The impacts identified during the assessment period were mitigated by design or good practice. Effects from the Site in isolation have been considered in all instances to be **not significant**.

Assuming other developments in the area have incorporated widely adopted good design, practice and mitigation measures it is considered that there has been no significant cumulative effects of the Application Development with other developments in the locality.

15.7.7 NOISE AND VIBRATION

15.7.7.1 Noise

Measured noise levels from compliance monitoring and predicted levels indicate that noise from the quarry is not a significant contributor to overall noise levels. During monitoring, noise from road traffic and the stone cutters often dominated the noise environment at NSRs. Predicted levels at NSR1, NSR2 and NSR3 were more than 10 dB below the daytime target limit and below measured levels at the corresponding monitoring positions.

Potentially cumulative noise effects have therefore been assessed as **not significant**.

15.7.7.2 Vibration

There are no known blasting activities being carried out at any existing industrial development within the study area. It is understood that there is infrequent blasting taking place at a site in proximity to the study area, but no details are known regarding this. Cumulative vibration impacts on the local environment are considered '*negligible*' due to blasting activities not taking place concurrently.

Potentially cumulative vibration effects have therefore been assessed as **not significant**.

15.7.8 ARCHAEOLOGY AND CULTURAL HERITAGE

The Application Development has had no effects on any archaeological, architectural or cultural heritage and therefore the application is **not considered to have any cumulative effects** on cultural heritage.

15.7.9 LANDSCAPE AND VISUAL

As there are no material changes to the landscape and visual effects of the quarry across the substitute consent period, there is also no change to its contribution to any cumulative effects. Potentially cumulative effects have therefore been assessed as **not significant**.

15.7.10 TRAFFIC AND TRANSPORT

Cumulative effects have been considered in the assessment as part of background traffic measured and as part of the AADT for the assessment period. Potentially cumulative effects have therefore been assessed as **not significant**. See Chapter 12 (Traffic and Transport) for discussion.

15.7.11 MATERIAL ASSETS

Assuming other developments in the area have incorporated widely adopted good design, practice and mitigation measures it is considered that there have been **no significant** cumulative effects of the Application Development with other similar developments in the locality.

15.7.12 MAJOR ACCIDENTS AND DISASTERS

Assuming other developments in the area have incorporated widely adopted good design, practice and mitigation measures it is considered that there have been **no significant** cumulative effects of the Application Development with other similar developments in the locality.

15.8 CONCLUSIONS

No significant cumulative or combined effects have been identified.

15.9 REFERENCES

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