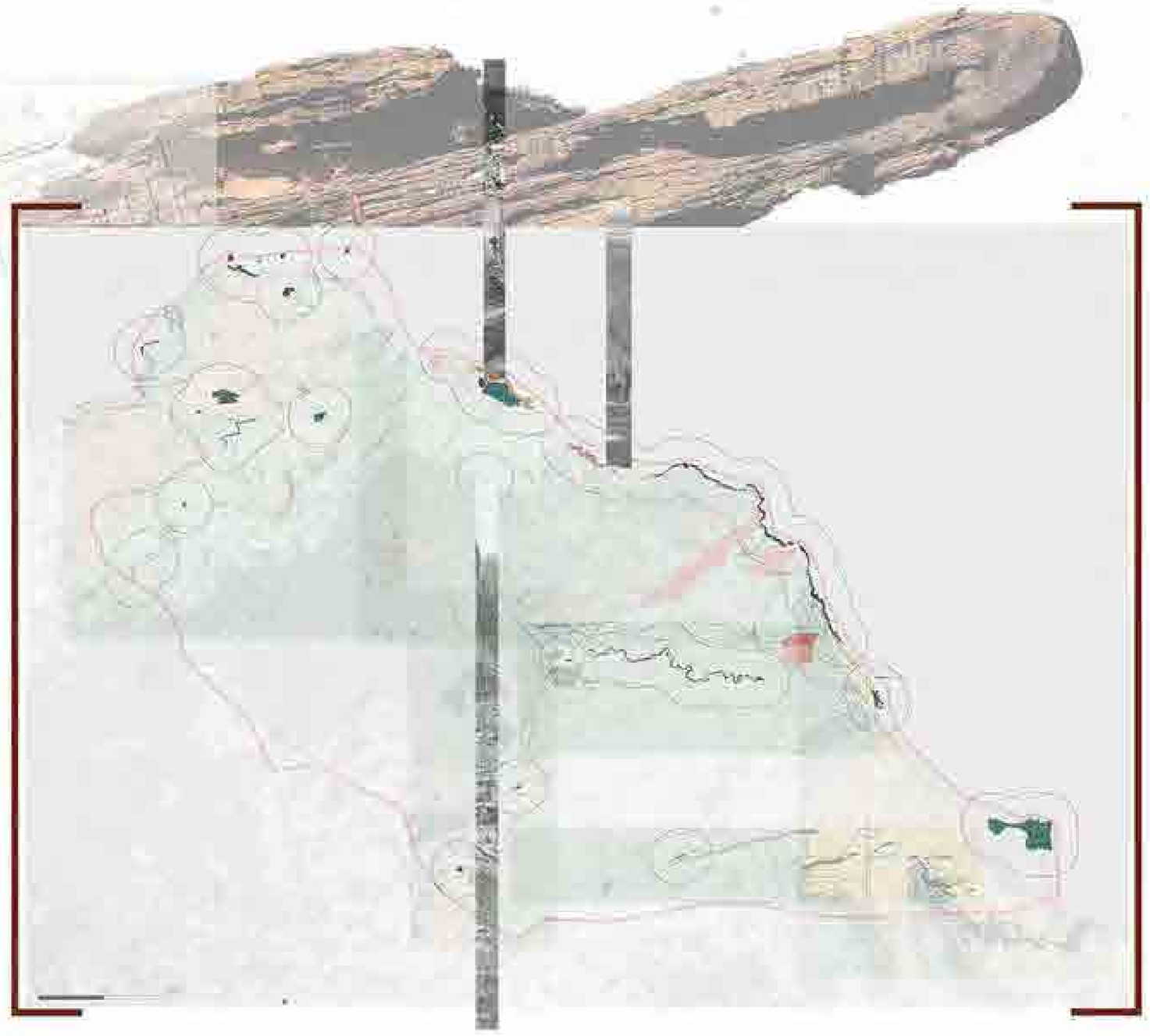


PETRA NOSTOS

Scotland's Geopoetic Geopark

Petra Nostos is located in south east Scotland, a geopark that merges scientific exploration of the Earth's geological history with artistic and poetic interpretation, offering a deeply immersive experience of the landscape.

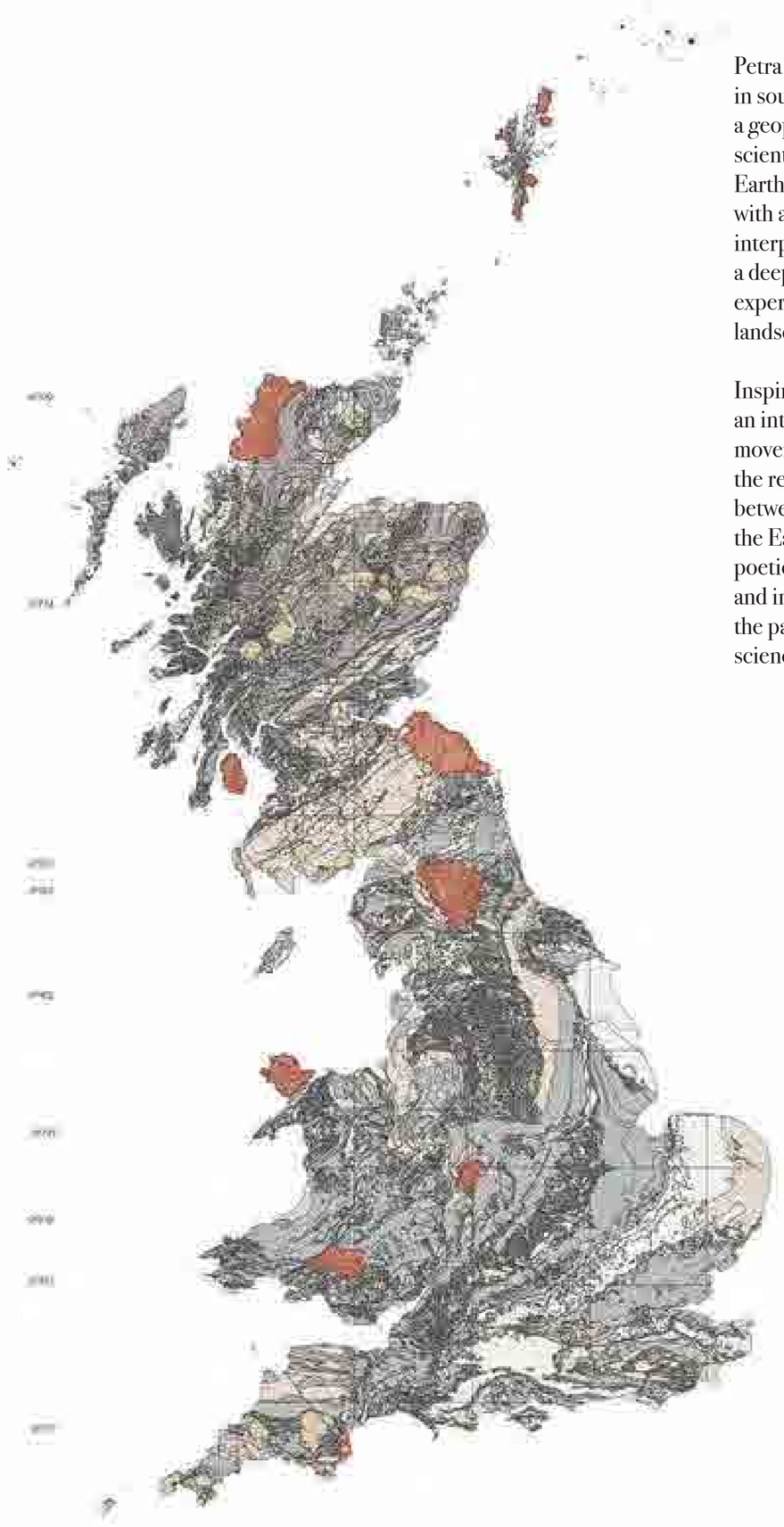
Inspired by geopoetics, an interdisciplinary movement that explores the relationship between humans and the Earth through poetic, imaginative, and intellectual means, the park bridges art, science, and philosophy.

Rooted in engagement with the natural world, it seeks geological and ecological realities entangled with human experience. Therefore, fostering a renewed sense of planetary belonging. Petra Nostos encourages emotional and intellectual connections with powerful geological features. The design operates at two interconnected scales: a strategic scale represented by Petra Nostos, and a detailed scale, Stellae Scriptorium, a site of reflective engagement with the human and more-than-human. Located within Dunbar Quarry, Stellae Scriptorium acknowledges humans as geomorphic agents.

Together, these layers create a journey through deep time, sensory experience, and creative interpretation.

This project is by:

Lily Gavin
MA Portfolio 2025
University of Edinburgh



Above: *Siccar Point*

AN OPPORTUNITY TO REDEFINE THE GEOPARK

At a strategic scale, this proposal presents Petra Nostos, a new geopark in southeast Scotland that merges the scientific exploration of Earth's geological history with artistic and poetic interpretation, offering visitors a deeply immersive and multidimensional experience of the landscape. Drawing from the movement of geopoetics, the park encourages creative engagement with landforms, inviting individuals to connect emotionally and intellectually with the Earth's dynamic processes.

The name Petra Nostos comes from the Greek words petra, meaning "stone," and nostos, meaning "homecoming." It captures the essence of a return to the land, a rediscovery of nature's vast temporal scales and raw beauty through both geological knowledge and artistic expression.

As I initially researched existing geoparks in the UK, I noticed that many were designed primarily for geologists, making them largely inaccessible and uninviting to the general public. My vision for Petra Nostos is to redefine what a geopark can be, transforming it into a poetic, immersive experience where visitors engage with the more-than-human world and encounter moments of the sublime.

I want to create a space that is open and engaging for everyone, not just experts. This means designing easy to navigate facilities, clear wayfinding, and enhanced accessibility, features many current geoparks lack. More importantly, I want to move beyond presenting geology as a sterile, scientific subject. Instead, Petra Nostos invites visitors to connect emotionally and creatively with the landscape, experiencing its awe and power through geopoetics.

This geopark will encourage a deep, personal connection with nature, one that sparks wonder, creativity, and a renewed sense of belonging to the Earth.

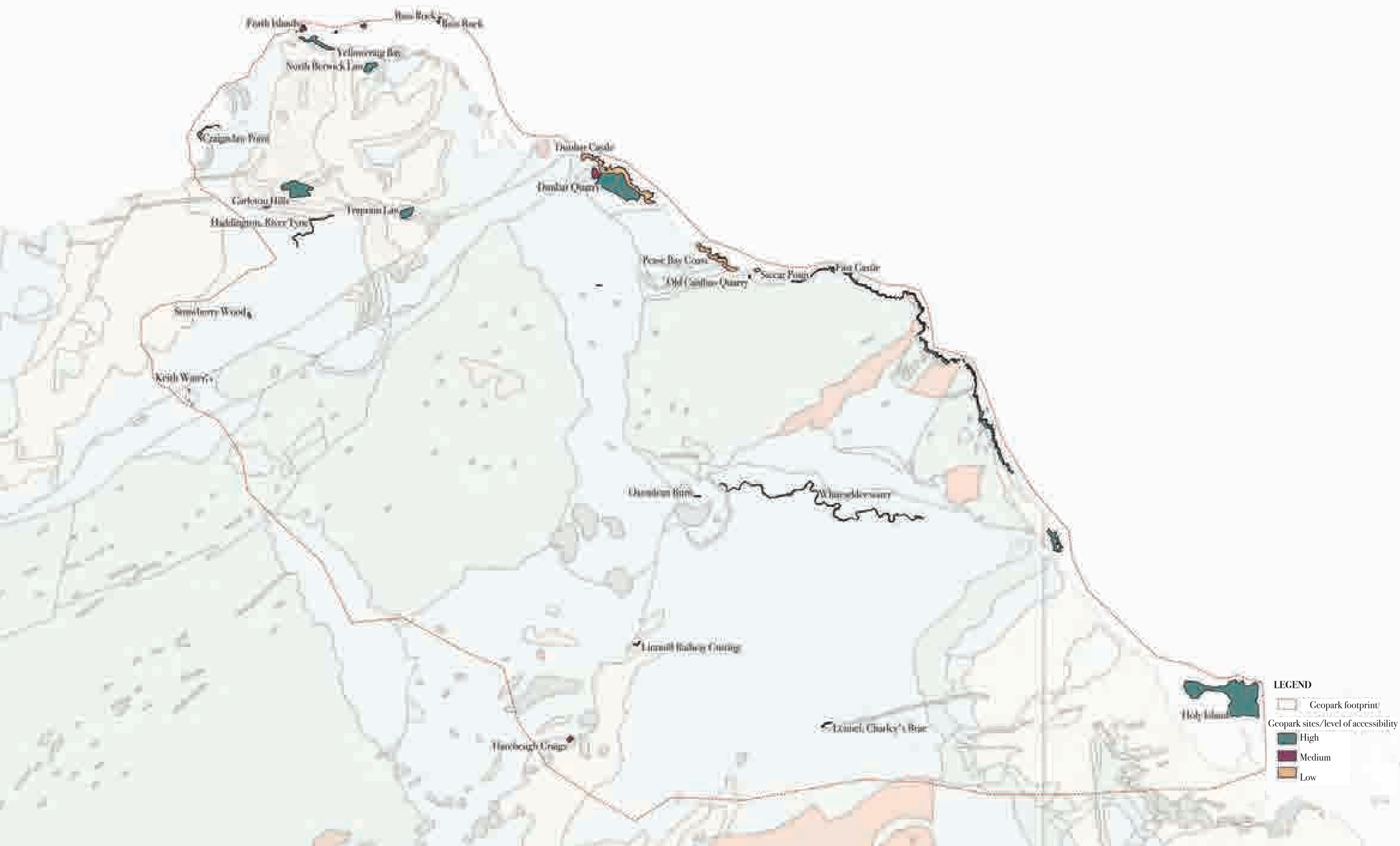
The proposed geopark spans a geologically diverse region, marked by fossil-rich Carboniferous limestones, ancient Devonian Old Red Sandstone, volcanic intrusions, glacial features, and dramatic coastal exposures. Together, these formations reflect a long and complex history shaped by tropical seas, tectonic upheavals, erosion, and human intervention through quarrying and land use. These overlapping stories of natural process and cultural practice provide fertile ground for interpretation through both scientific and creative lenses.

Among the many notable sites within the proposed boundary is Siccar Point, internationally recognised as the place where James Hutton observed the unconformity that helped him formulate the concept of deep geological time. It adds value as an iconic site alongside others in the region, reinforcing southeast Scotland's historical importance to the development of geological science.

Petra Nostos also responds to a clear geographic gap in the UK's geopark network. Existing UNESCO Global Geoparks such as the Northwest Highlands, Shetland, GeoMôn, Fforest Fawr and the English Riviera are scattered across the country. However, southeast Scotland remains underrepresented, and Petra Nostos would strengthen the national framework by extending coverage into a geologically rich but currently overlooked area.

Its proximity to Edinburgh, the Scottish capital, offers major advantages in terms of accessibility, infrastructure, and outreach. This opens doors for partnerships with universities, schools, cultural institutions, and tourism networks, helping the park function as a vibrant platform for public education and interdisciplinary collaboration.

Below: *Petra Nostos Geopark*



Above: *Dunbar limestone quarrying through time and space*

EXPOSING DEEP TIME

At a detailed scale, this project focuses on the Stellae Scriptorium site, an active quarry located within Petra Nostos and situated in the larger Dunbar region. Quarrying in this area has a long history, with evidence of continuous limestone extraction dating back nearly two centuries. This enduring industrial activity is deeply embedded in the landscape and its cultural heritage.

Rather than following the common practice of backfilling and restoring quarry voids, my design proposes to keep the Stellae Scriptorium quarry open and accessible. This approach reimagines the role of waste rock, typically viewed as a byproduct to be discarded, as a valuable resource to expose and celebrate the quarry's deep time history. By utilizing waste rock to reshape the terrain, I aim to reveal the layers of industrial activity and geological transformation that define the site.

"This approach reimagines the role of waste rock, typically viewed as a byproduct to be discarded, as a valuable resource to expose and celebrate the quarry's deep-time history."

The Dunbar Cement Works quarry continues to generate significant amounts of waste rock after decades of extraction. Usually, this rock is returned to the quarry void as part of restoration efforts, as seen in nearby sites. For example, the North West Quarry, now called Whitesands Quarry, was backfilled and restored through a pioneering agreement with RSPB Scotland, and it now serves as a growing wildlife and bird reserve.

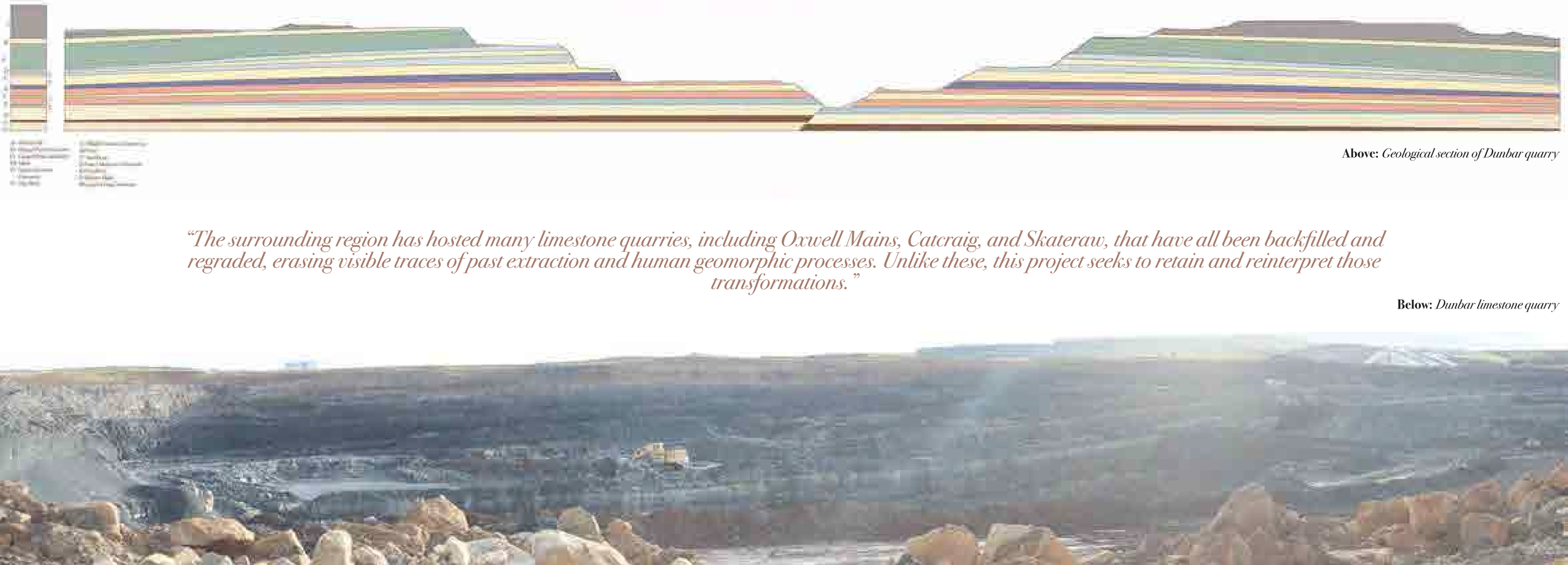
In contrast, the North East Quarry, where Stellae Scriptorium is located, remains active and forms the core of my project. Here, instead of backfilling, I propose to keep the quarry open by creating new landforms such as earth mounds, narrowing the quarry neck, and building long term landmarks. Keeping the quarry open exposes the deep-time layers within the rock strata, revealing the site's geological history.These new features will integrate with the wider industrial landscape, including Torness Nuclear Power Station, the Dunbar Cement Works buildings, the coastal landfill, and Barns Ness Lighthouse.

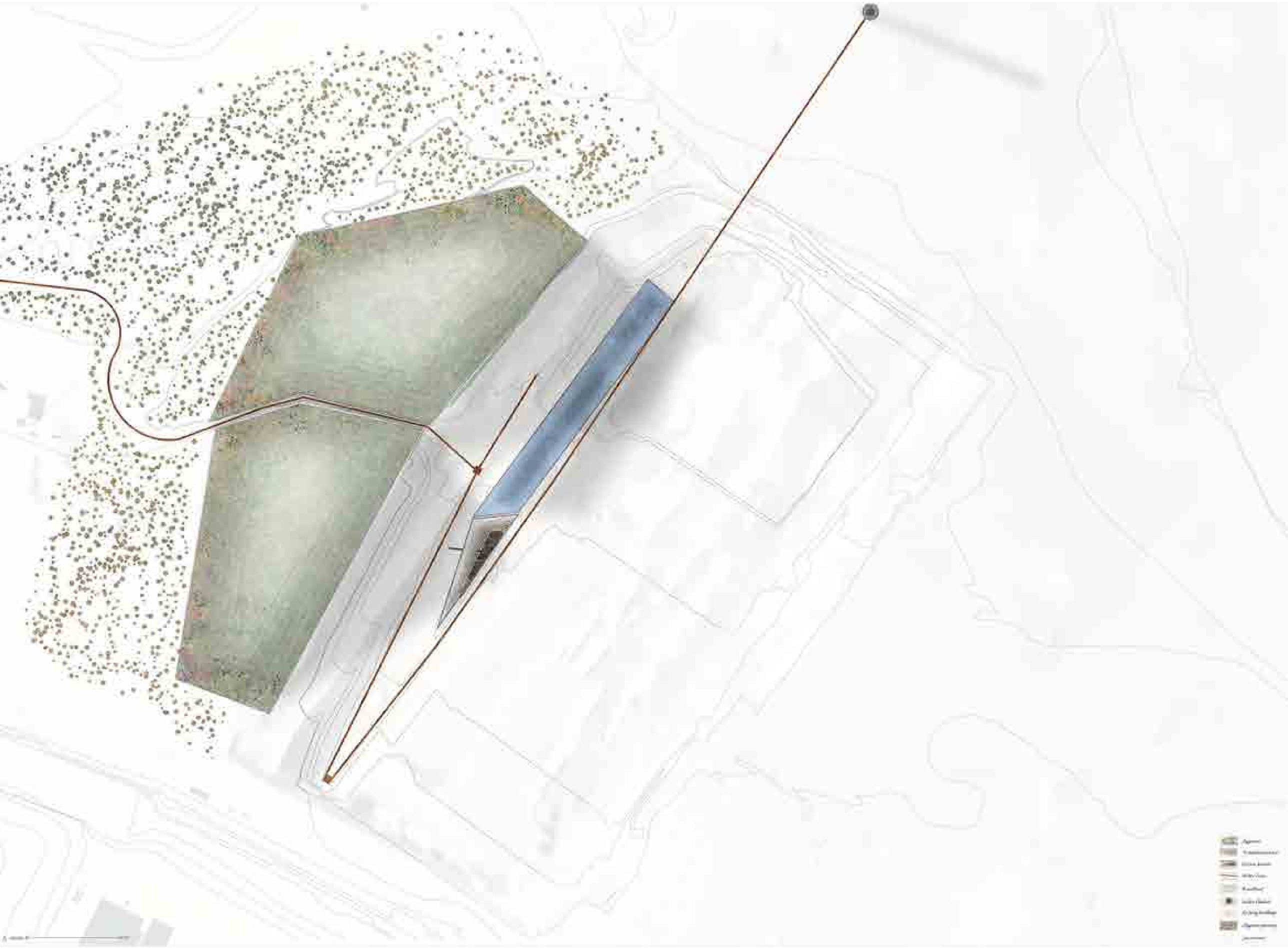
The surrounding region has hosted many limestone quarries, including Oxwell Mains, Catcraig, and Skateraw, that have all been backfilled and regraded, erasing visible traces of past extraction and human geomorphic processes. Unlike these, this project seeks to retain and reinterpret those transformations. Waste rock stockpiled on site, which I observed during my first semester field trips, will become the raw material for a new landscape typology, one that reveals and honors the industrial legacy rather than concealing it

Above: *Geological section of Dunbar quarry*

"The surrounding region has hosted many limestone quarries, including Oxwell Mains, Catcraig, and Skateraw, that have all been backfilled and regraded, erasing visible traces of past extraction and human geomorphic processes. Unlike these, this project seeks to retain and reinterpret those transformations."

Below: *Dunbar limestone quarry*





Above: *Stellae Scriptorium*

SCRIPTING THE SUBLIME

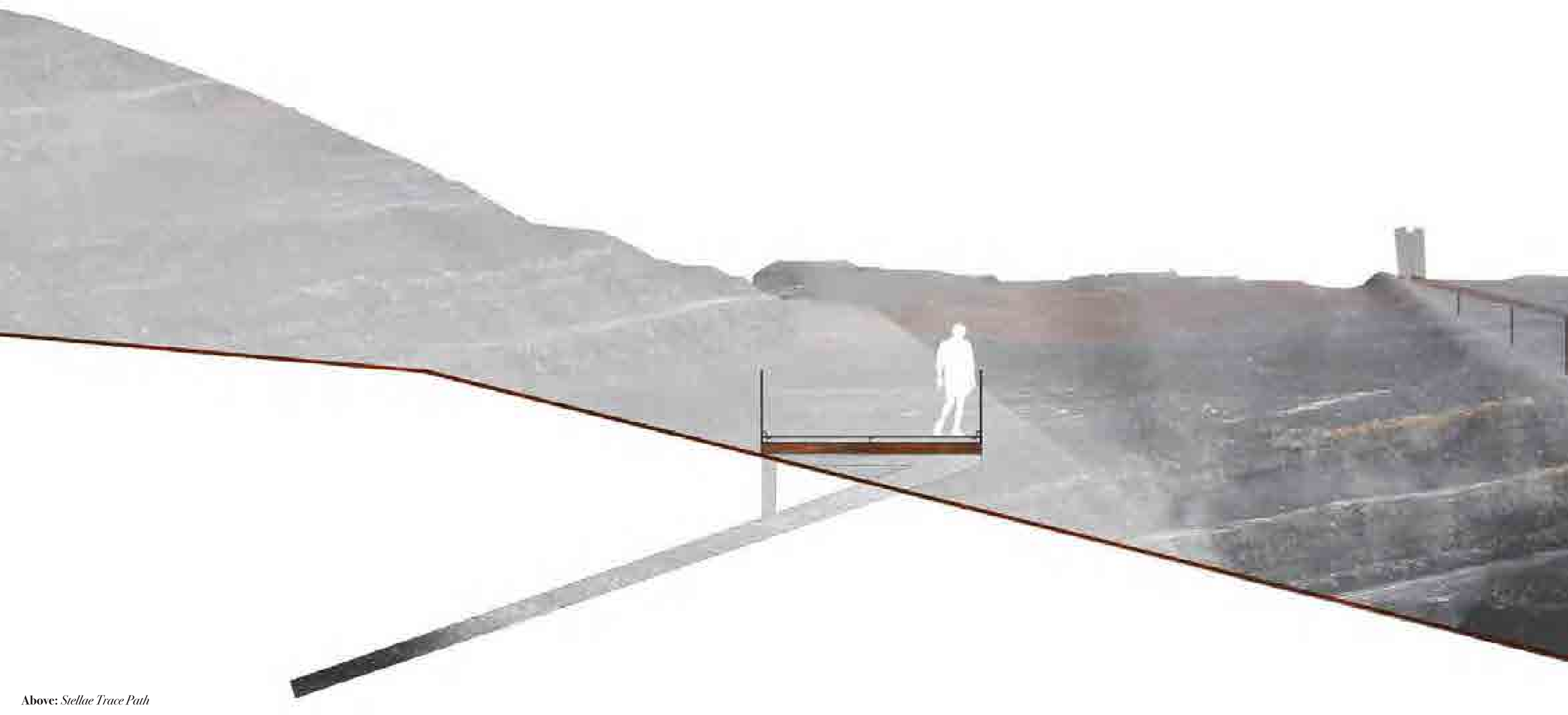
This plan presents the Stellae Scriptorium site within the Petra Nostos Geopark as it stands in the year 2033, a pivotal moment when visitors first encounter the unfolding transformation of the active quarry. Set within Dunbar's North East Quarry, the design retains the quarry as an open and evolving landscape, revealing nearly 330 million years of geological history embedded in its exposed rock strata.

Key spatial features define the site: the water-holding Nymphaeum Core, the network of guiding paths known as the Stellae Trace, the terraced Ziggurats constructed from repurposed quarry waste rock, the towering Stellae Obelisk, and the subterranean Cavum Astrum. Each element is designed with a focus on human scale while also aiming to evoke a profound more than human experience.

"This deliberate juxtaposition of clean human-made lines with fractured natural edges reflects the broader metaphor at the heart of Petra Nostos, the tension and interplay between human intervention and the deep time of the Earth."

The overall composition uses bold geometric forms to create a powerful contrast with the raw, jagged contours of the quarry. This deliberate juxtaposition of clean human-made lines with fractured natural edges reflects the broader metaphor at the heart of Petra Nostos, the tension and interplay between human intervention and the deep time of the Earth.

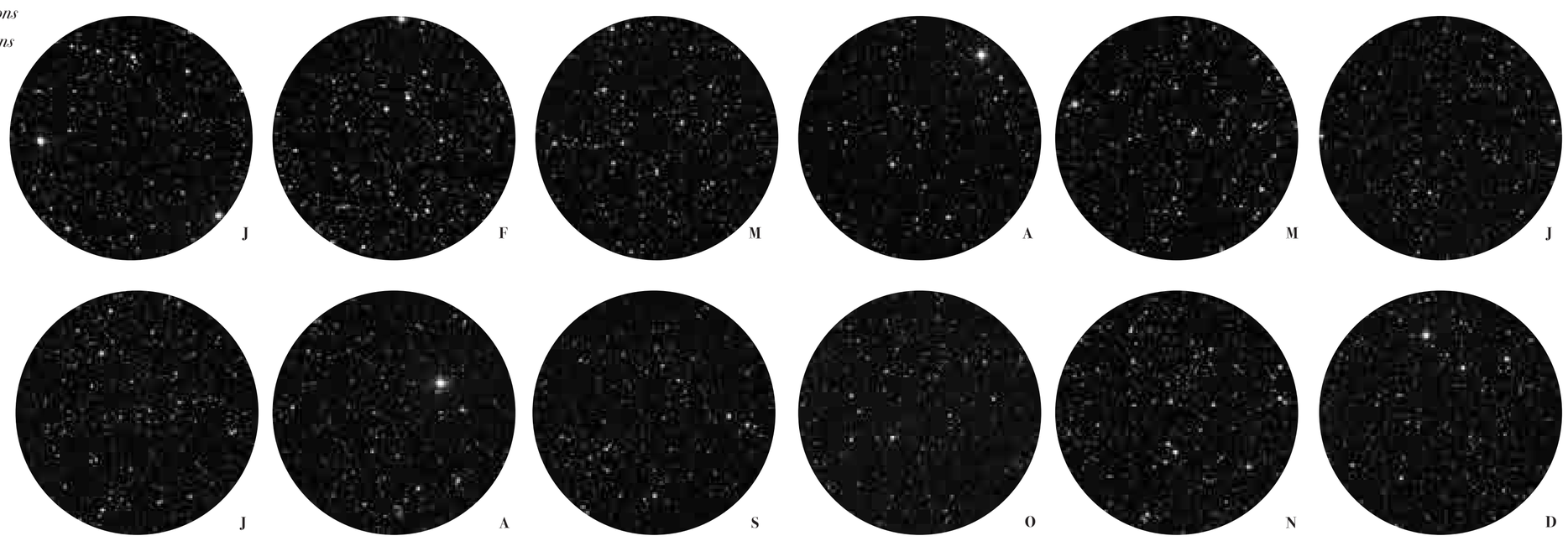
The intention is to create a sublime experience, one that evokes both unease and wonder. Visitors are immersed in a landscape that stretches perception and invites emotional and intellectual connection to geological time, planetary processes, and the poetic potential of place.



Above: *Stellae Trace Path*

Above: *Stellae Scriptorium constellations*

Right: *Stellae Scriptorium constellations through time (monthly)*



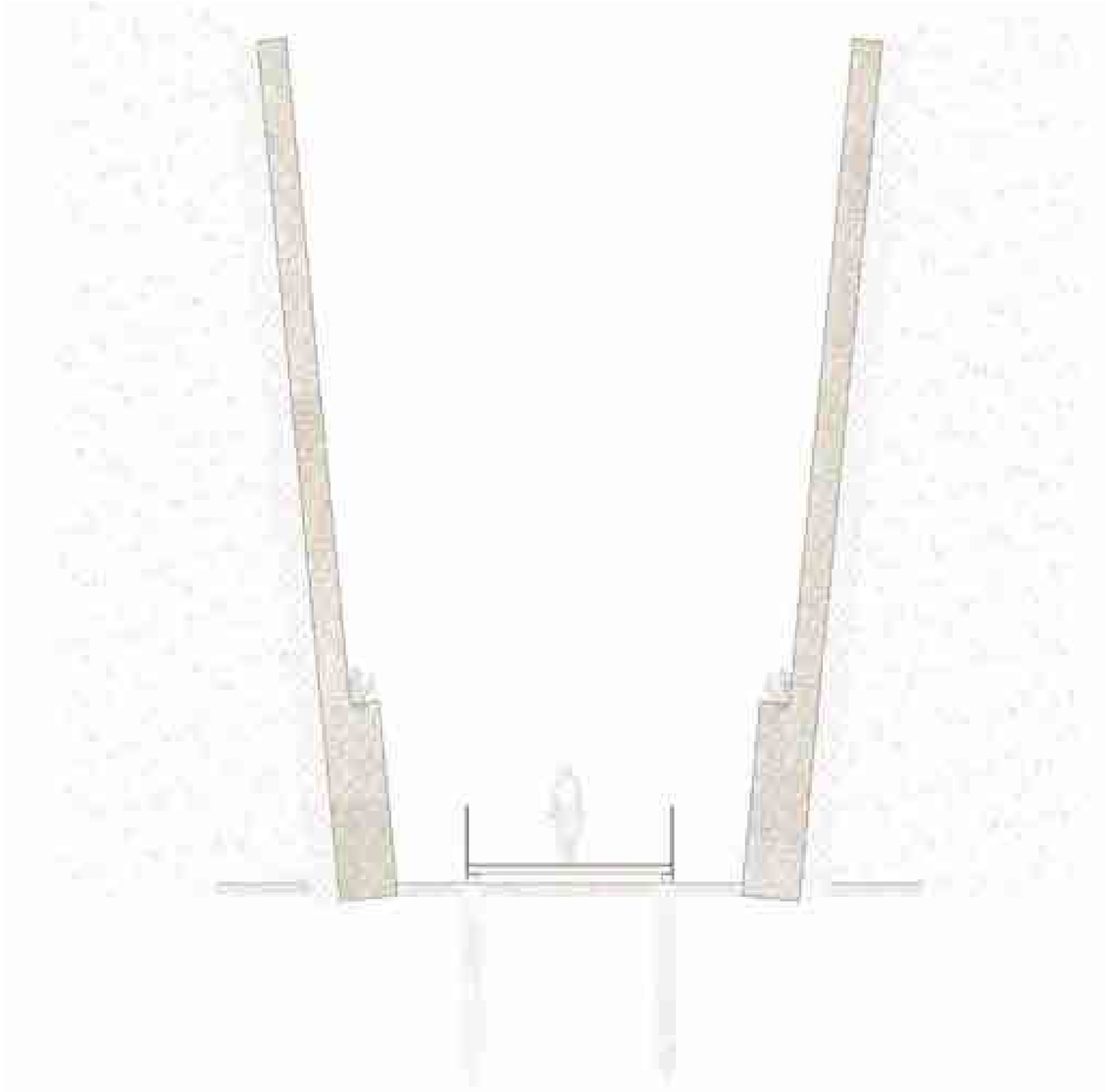
STELLAE SCRIPTORIUM

Geopoetics seeks to reveal the more than human, encouraging a way of seeing that transcends the human scale. In thinking about geology through this lens, I began to expand the definition beyond Earth, considering how geological processes and rock formations exist not only on our planet but across the universe. This includes extraterrestrial features such as lunar basalt plains, Martian sedimentary layers, asteroid surfaces scattered with regolith, and icy crusts on moons like Europa.

To express this connection, I used site-specific star mapping to guide the placement of key features within the design. Constellations informed the geometry of paths, forms, and alignments, embedding cosmic references into the structure of the landscape. In doing so, the project invites visitors to make a profound connection between the geology beneath their feet and the geology above their heads, encouraging them to look up, reflect, and experience the more than human.

This constellation concept became a central driver for the project's name, Stellae Scriptorium—Latin for "a place where the stars are written." The name reflects both the astronomical inspiration behind the design and the poetic invitation for visitors to interpret their own meaning within the space. The connection is implicit and open-ended, encouraging a deeply personal experience. Rather than prescribing a single narrative, the landscape becomes a canvas for reflection, allowing each visitor to form their own sense of wonder, belonging, and connection to the cosmos.

Below: *Stellae Scriptorium experiential features*



Above: *Stellae Trace path/gabion wall*

Above: *Stellae Trace path location*

CONSTRUCTING THE SUBLIME EXPERIENCE

One of the central challenges in designing Petra Nostos was negotiating the tension between the vast, more than human scales of poetics, deep time, constellations, and geology, and the intimate, embodied scale of human experience. The Stellae Trace path exemplifies how this tension is addressed spatially. Beginning at the entrance with a car park and basic facilities, it leads visitors through a woodland walk before descending into the quarry and arriving at the Stellae Obelisk. This carefully sequenced route invites a gradual transition from the familiar and accessible to an immersive landscape of sublime encounter.

The design navigates between practical, human scale interventions and the overwhelming vastness of geological time and space. This balance is physically expressed through a raised, narrow walkway that lifts visitors off the soft forest floor and carries them between two towering 15 metre gabion walls filled with limestone. Overhead planting sits just beyond eye level, prompting a sense of curiosity and bodily disorientation. The path resists clarity, and its ambiguity provokes questioning. Where does it lead? Why are these rocks caged? The experience is intended to unground the visitor, offering a spatial and psychological pause before the descent into the Stellae Scriptorium quarry.

"One of the central challenges in designing Petra Nostos was negotiating the tension between the vast, more than human scales of poetics, deep time, constellations, and geology, and the intimate, embodied scale of human experience."

This threshold marks a shift from the rooted intimacy of woodland flora into an amplified, more than human space, one that stretches the imagination as much as the body. To make these experiences real, I used detailed technical drawings at scales ranging from 1:5 to 1:50, translating abstract ideas of the sublime into buildable design interventions. These grounded strategies ensure that poetic and emotional responses are supported by practical forms, bridging the human and the cosmic in ways that are both deeply felt and physically achievable.

The ziggurat earth mounds are shaped directly from the ongoing accumulation of waste rock produced by active quarrying. For over 26 years, the Dunbar Cement Works quarry has generated approximately 2.1 million tonnes of waste rock annually. By 2025, this will total an estimated 54.6 million tonnes, forming a vast, dynamic material surplus that offers both a logistical challenge and a powerful opportunity for landscape transformation.

This surplus becomes the foundation for a phased earthwork strategy, where the landscape evolves gradually through time, shaped by both material processes and intentional design. The proposal introduces stepped ziggurat mounds, each reaching 17.5 metres in height, constructed incrementally between 2025 and 2033. With a terraced profile defined by a 2.5 metre rise and 5 metre run, the mounds form stable, walkable ledges. Waste rock is compacted in 0.5 metre lifts and reinforced with steel grids, geogrids, and structural mats to ensure long-term stability. Drainage and erosion control layers are embedded between lifts, while the uppermost 300 to 500 millimetres supports a layered planting strategy.

"For over 26 years, the Dunbar Cement Works quarry has generated approximately 2.1 million tonnes of waste rock annually. By 2025, this will total an estimated 54.6 million tonnes, forming a vast, dynamic material surplus that offers both a logistical challenge and a powerful opportunity for landscape transformation."

On the western slopes, sedum mats and meadow vegetation encourage biodiversity and help the mounds blend visually into the broader landscape. In contrast, the eastern faces are left raw and unplanted, exposing the industrial geology and maintaining a sense of material honesty.

Rather than appearing as isolated features, the ziggurats are positioned in conversation with their wider context, including the Torness Nuclear Power Station, Dunbar Cement Works, the coastal landfill, and Barns Ness Lighthouse. Together, they form part of a reimagined industrial topography.

Above: *Dunbar Cement Works*

Above: *Ziggurat/Stellae Trace earth works*