# Terra Phase 1 – Ecological Performance Unit (EPU)

Definition & Location-Based User Experience

Instruction Set for Emergent

## 1. Definition – Ecological Performance Unit (EPU)

An Ecological Performance Unit (EPU) is a fixed 1 km x 1 km grid cell that aggregates ecological state and restoration opportunity metrics.

An EPU is:
• Spatially fixed
• Uniform in size
• Independent of property boundaries
• Terra's core analytical unit

An EPU is NOT:
• A property boundary
• A cadastral boundary
• A regulatory zone
• A user-defined area

The EPU is Terra's foundational unit of ecological measurement.

## 2. Why 1 km?

• Ecologically meaningful at landscape scale
• Large enough to model connectivity
• Small enough to feel locally relevant
• Tiles cleanly across regions
• Scales internationally

Each EPU must have a unique identifier: EPU_ID.

## 3. Data Stored Within Each EPU (Phase 1 Minimum)

Structural Ecology:
• Dominant Regional Ecosystem (RE)
• Secondary REs (>20% area)
• Percentage remnant vegetation
• Total remnant hectares

Landscape Context (4.2 km radius):
• Neighbourhood remnant percentage
• Connectivity differential

Derived Metric:
• Nature Opportunity Rating (0–100)

Optional:
• Biodiversity overlay flag (0/1)

## 4. Nature Opportunity Rating (Phase 1 Model)

Score =
(1 - local_remnant_percent) * 0.4
+ (neighbourhood_remnant_percent - local_remnant_percent) * 0.4
+ biodiversity_overlay_flag * 0.2

Normalise to 0–100.

Weights are hardcoded for Phase 1 but must be modular for future adjustment.

## 5. Location-Based Mobile User Experience

On App Open:
1. Request location permission.
2. Retrieve GPS coordinates.
3. Drop a subtle marker at location.
4. Determine containing EPU and parcel (if available).
5. Highlight EPU and display bottom summary panel.

Bottom Panel Must Display:
• EPU_ID
• Dominant Ecosystem
• Remnant Percentage
• Nature Opportunity Rating

If permission denied:
• Show overview map
• Prompt user to enter address, draw boundary, or enter Lot/Plan number.

## 6. Property vs EPU Logic

If user inputs property boundary:
• Intersect property with EPUs.
• Calculate weighted Nature Opportunity Rating.
• Display how many EPUs the property spans.

This reinforces landscape logic while remaining property-friendly.

## 7. Non-Scope (Phase 1)

Do NOT build:
• Variable-sized EPUs
• Species modelling
• AI prediction layers
• Carbon calculations
• Time-series evolution
• Compliance scoring

Phase 1 EPU is a fixed, precomputed 1 km grid cell.

## 8. Performance Requirements

• All EPU metrics precomputed server-side.
• Stored in database.
• Frontend queries by EPU_ID only.
• No heavy client-side spatial computation.
• Map interaction must feel fast and responsive.

## 9. Success Criteria

Phase 1 is successful if:
• User sees themselves inside an EPU immediately.
• They understand their remnant percentage within 10 seconds.
• They ask how to improve their Nature Opportunity Rating.

Feedback from real users is the primary validation mechanism.