ENVIRONMENT REIMAGINED

Digital IA

Enhanced environmentally integrated design enabled by digital advances

6th July 2023

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Who are Atkins

- Design, engineering and project management consultancy
- Serving the infrastructure, transportation and energy sectors
- Atkins was founded in 1938 in London , acquired by SNC-Lavalin Group in 2017
- 50,000 employees worldwide, with offices in over 50 countries & operations in over 160 countries
- Environment Business has c.650 people in the UK & India, Global Environment Practice of c.1,700

Better outcomes for communities & environment by putting them at the heart of decision making

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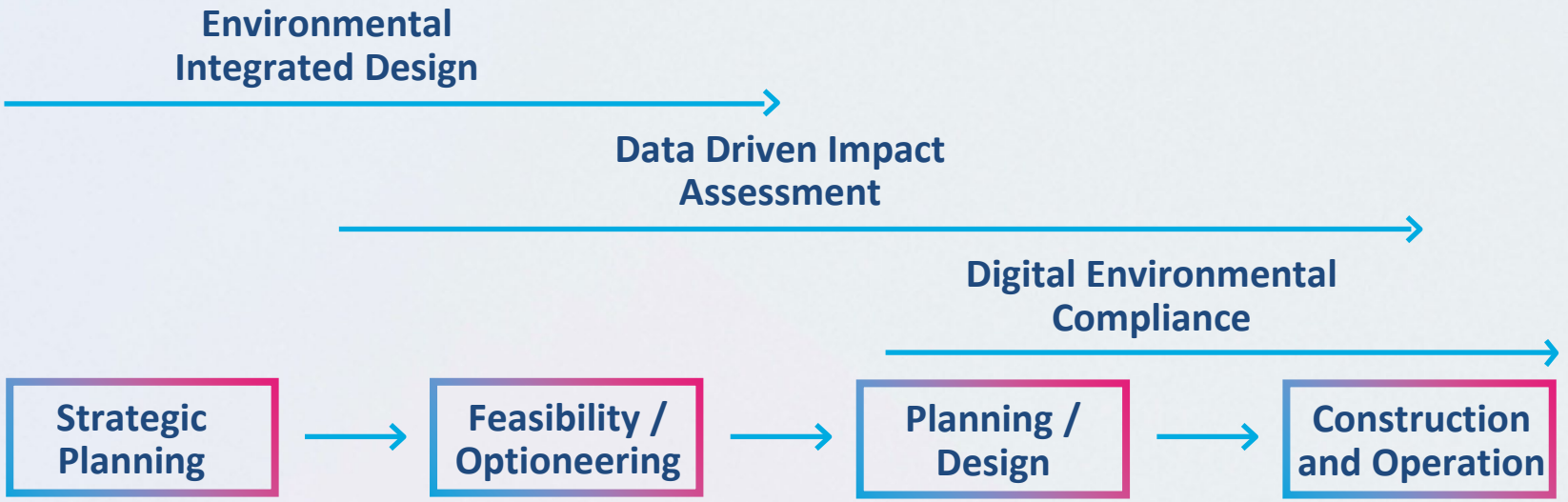
Presenting today

Paul Morgalla
Associate Director
UK Environment Digital lead

Dan Parsons
Associate Director
Environment Practice

Pietro Rescia
Associate Director
Environment Practice

Using digital to integrate the environment into the Asset Delivery Lifecycle



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Environmental Integrated Design

Paul Morgalla

The challenge

- 1.2 mi people killed
- 7,000+ disasters
- $3 trillion economic damage (UNDRR)

- Demanding environmental requirements
- Regulatory challenges
- Reputational damage

Under pressure to deliver more

- Climate resilient
- Low carbon
- People positive
- Nature positive

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People, Data, Technology

Digital is more than just a label. It's fundamental to our way of working. It has the power to transform outcomes, when combined with every element of the process: our people, our data insights and our technology

Adoption of digital is as much about adopting a digital mindset, as it is about data and technology

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Adopting a digital mindset

- Adopting a digital mindset is just as (if not more) important than the technology
- Much can be achieved using readily available open data tools (e.g. QGIS)
- Global, regional and national open data increasing available
- Upskill your team's digital and data capabilities

Our Environmental integrated design approach

- Better outcomes through earlier engagement
- Data-driven & digitally enhanced assessment
- Influence design decision making earlier
- Avoid & reduce environmental impacts and effects earlier
- Look for opportunities

Proactive engagement in design development

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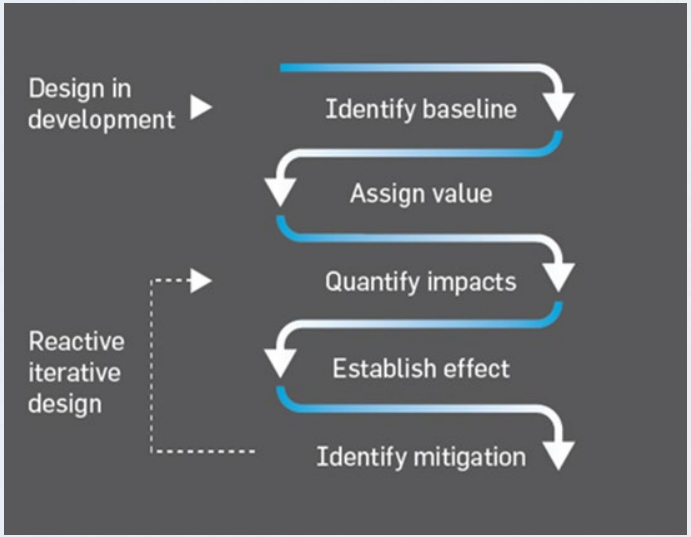
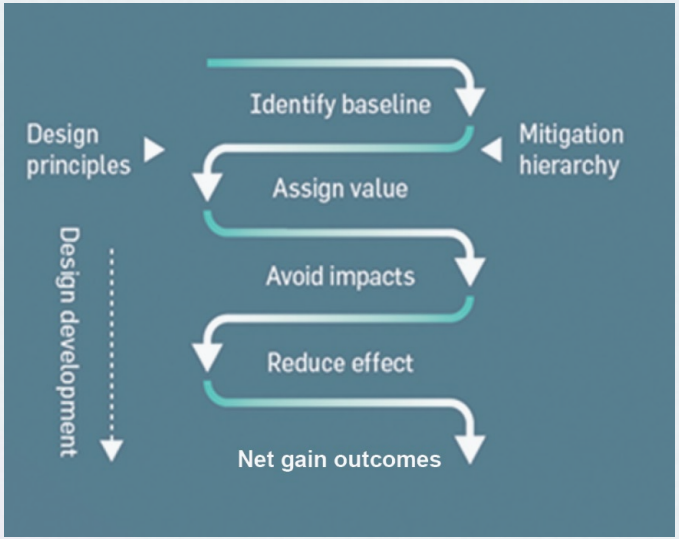
Left-shift in how the environment is considered in the design process

Traditional: reactive to design / brief



- Design development first
- Mitigate the worst environmental impacts
- Caught in a loop of late identification of issues & revisions

Environment Integrated Design:
proactive, outcome-based approach



- Set environmental principles early
- Identify environmental opportunities & avoid the worst
- Reduce the effects
- Improve overall project outcomes

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Environmental Integrated Design Example

Environmental Outcomes

- Biodiversity
- Cultural Heritage
- Landscape
- Air Quality
- Community
- Geology & Soils
- Water Resources
- Flood Risk

- Environmental Outcomes defined from the onset
- Rapid collation of environmental data, stored in our spatial Common Data Environment
- Establish environmental baseline

ESRI Award Analytical Insights 2020

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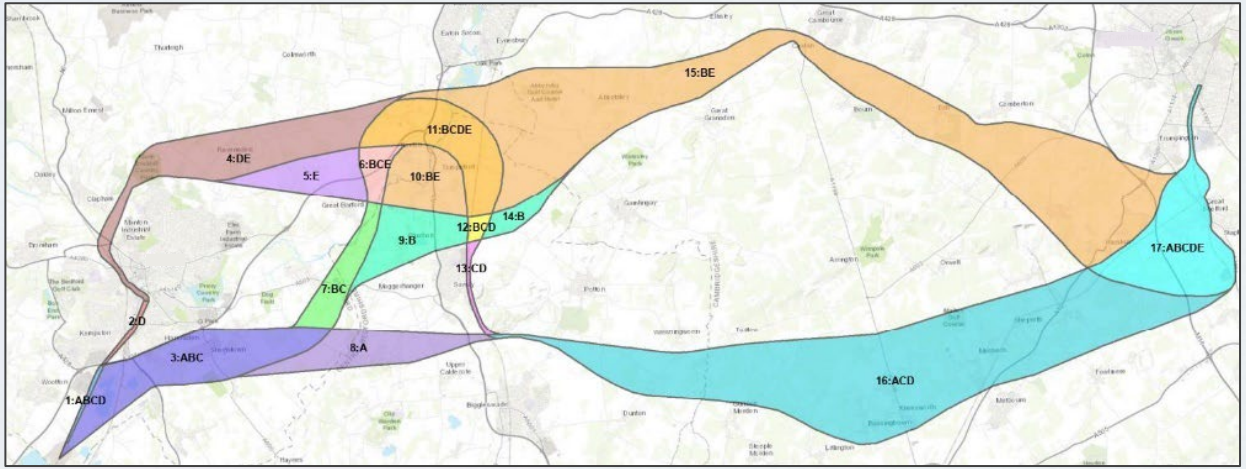

- Development of early route corridors

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Environmental Integrated Design Example

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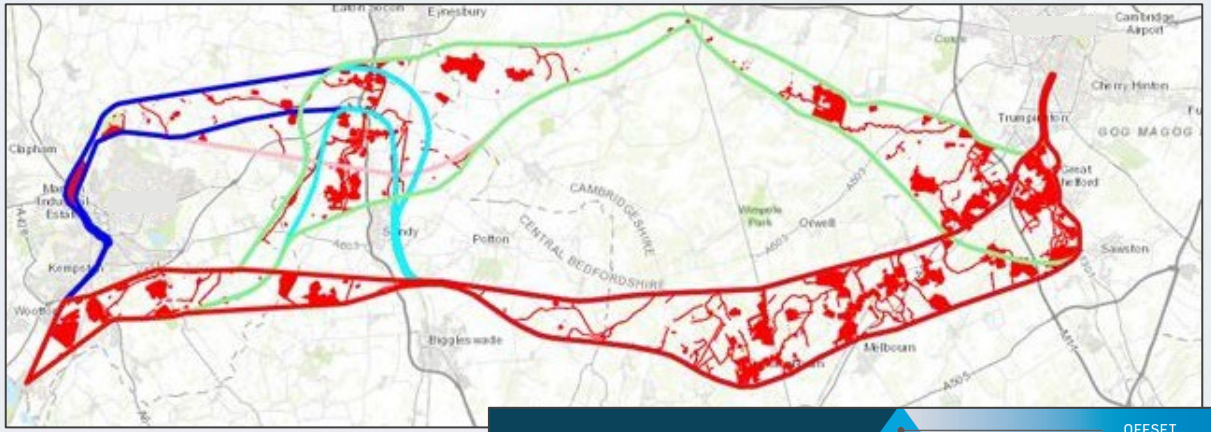
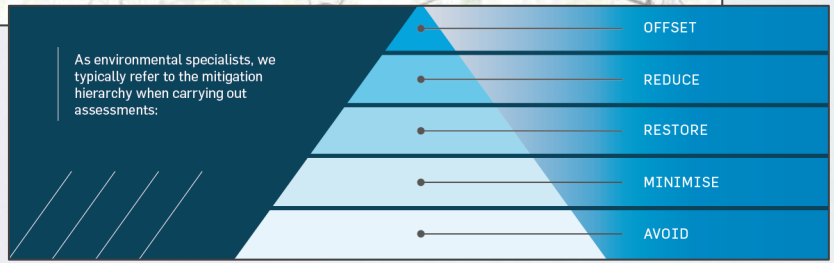


- Identify what we want to avoid



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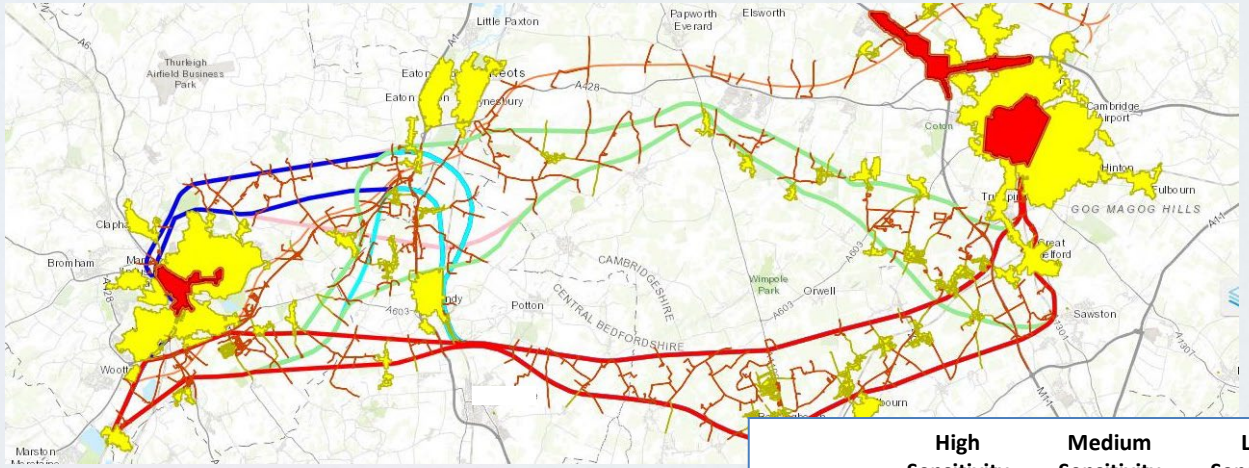

- Quantify potential level of mitigation
- Focus on early sight of constraints & opportunities

	High Sensitivity	Medium Sensitivity	Low Sensitivity
Direct Loss	Red	Red	Orange
Effects: access	Orange	Orange	Yellow
Effects: zone of influence	Yellow	Yellow	Yellow

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Environmental Integrated Design Example

Assessment Scale
Major Adverse
Moderate Adverse
Minor Adverse
Neutral / Nil
Minor Positive
Moderate Positive
Major Positive

Objective	Construction Score													
Subsections														
1: Biodiversity	---		--		--		---		---		---		---	
2: Cultural Heritage	--		--		-		---		--		---		---	
3: Landscape	---		-		-		-		--		--		--	
4: Air Quality	--		-		-		-		-		-		--	
5: Community	--		-		-		--		-		--		--	
6: Geology and soils	---	+	---		---		-		---	++	---	++	---	++
7: Water Resources	--		--		--		--		--		--		--	
8: Flood Risk	--		-		-		--		--		--		--	
Objective	**Operation and Maintenance Score**													
Subsections														
1: Biodiversity	--	+	-	+	-	+	--	+	--	+	--	+	--	+
2: Cultural Heritage														
3: Landscape	---		-	+	-	+	-	+	--	+	--	+	--	+
4: Air Quality	--	+	-	+	-	+	-	+	-	+	-	+	--	+
5: Community	--	+	-	+	-	+	-	+	-	+	--	+	-	+
6: Geology and soils	--		--		--		-		--		--		--	
7: Water Resources	--		--		--		--		--		--		--	
8: Flood Risk	--		-		-		--		--		--		--	

- Objective assessment against original outcomes
- Move the conversation on from the least worst option
- Unlock Opportunities

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Unlocking Opportunities

Our role is no longer to just mitigate the worst

Elevate our vision by working with nature and supporting communities to deliver opportunities and resilient infrastructure

'art of the possible' + business case benefits

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Summary

Environmental integrated design

- Better outcomes through earlier engagement - realize business case benefits earlier than traditional approach permits
- Data-driven & digitally enhanced environmental assessment hub

Proactive engagement in design development

- Influence design decision making earlier
- Avoid & reduce environmental impacts and effects early - lower mitigation costs
- Look to unlock opportunities - enhance the environment and community
- Carry through into the Planning / Design / Construction - robust approach

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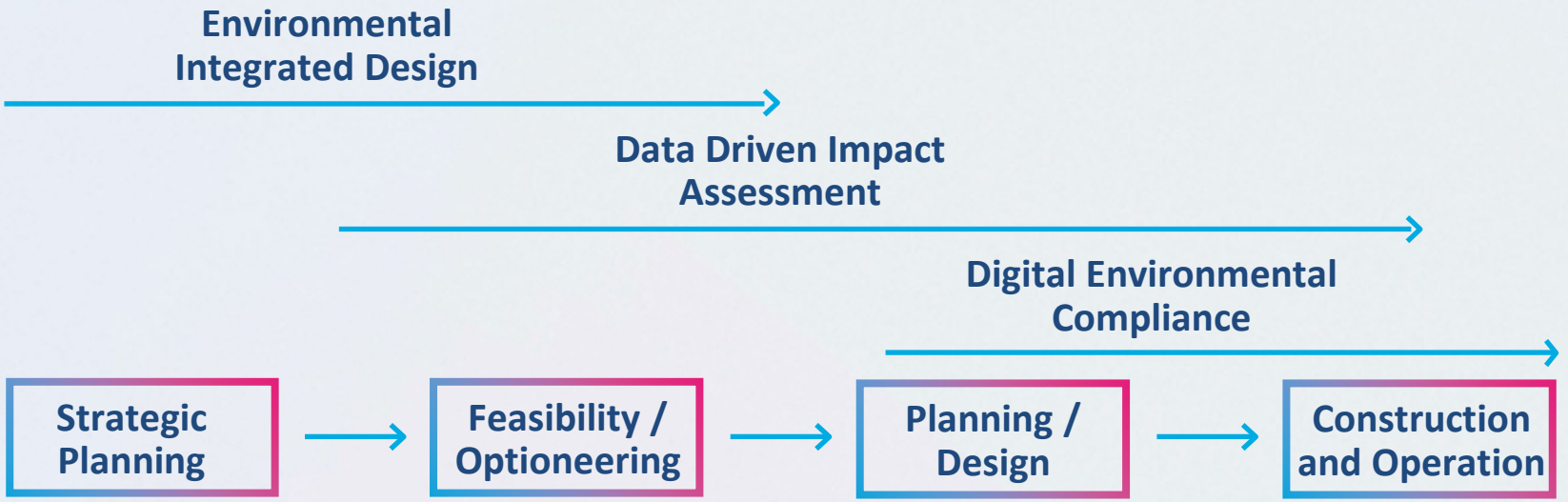
Data Driven Impact Assessment

Dan Parsons

Using digital to integrate the environment into the Asset Delivery Lifecycle



Why should we digitize EIA?

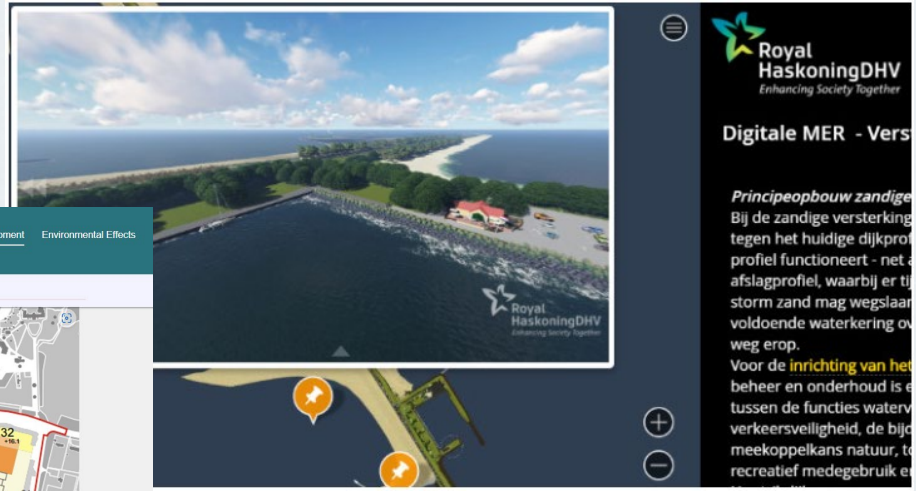
Solution to existing problems

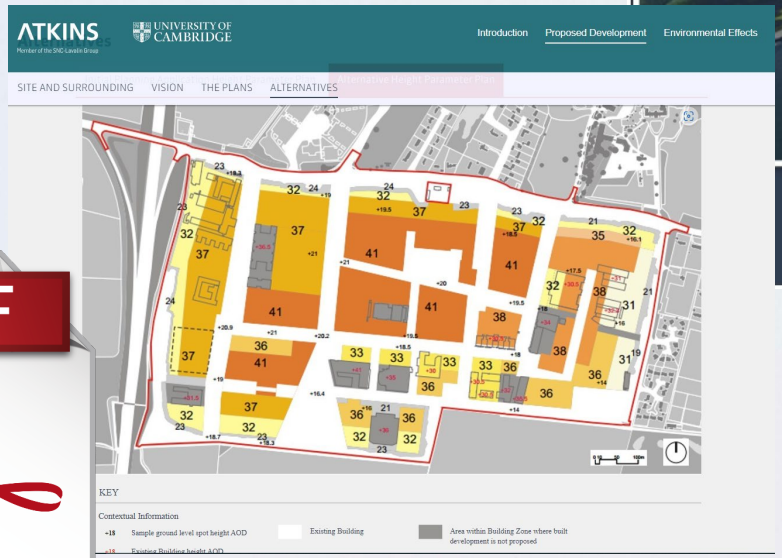
- Increasingly complex and impenetrable reports
- Increasingly expensive

Unlocking opportunities

- Integration of the EIA process with other project digital tools
- Earlier engagement with project designers and engineers
- Better environmental outcomes
- Cheaper and more efficient processes

Digital EIA – Efforts to date





- A few examples but no wide spread adoption of digital EIA
- Regulators don't currently accept digital submissions

Coming at the problem from a different direction

- Digital mindset
- Shifting focus from presentation to process
- EIA coordination becomes data management

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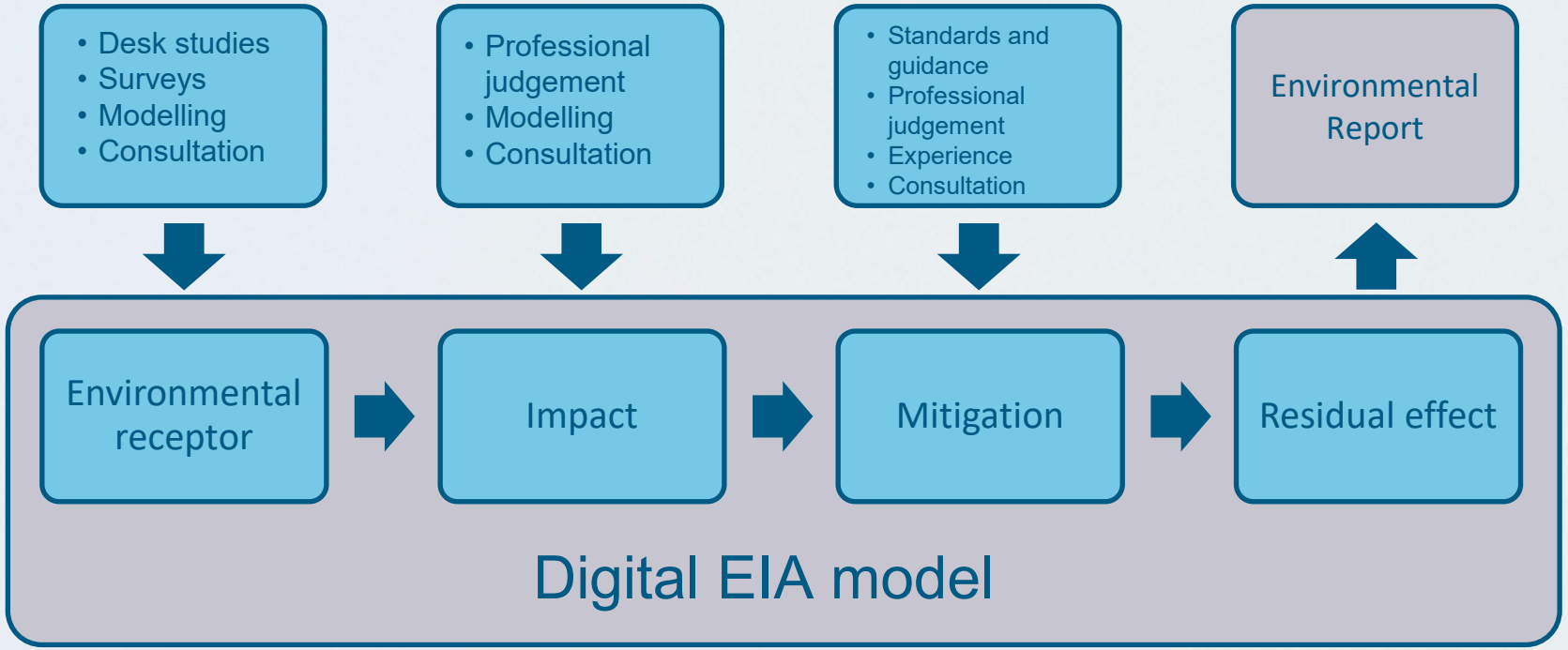
Back to basics – Conceptual EIA model



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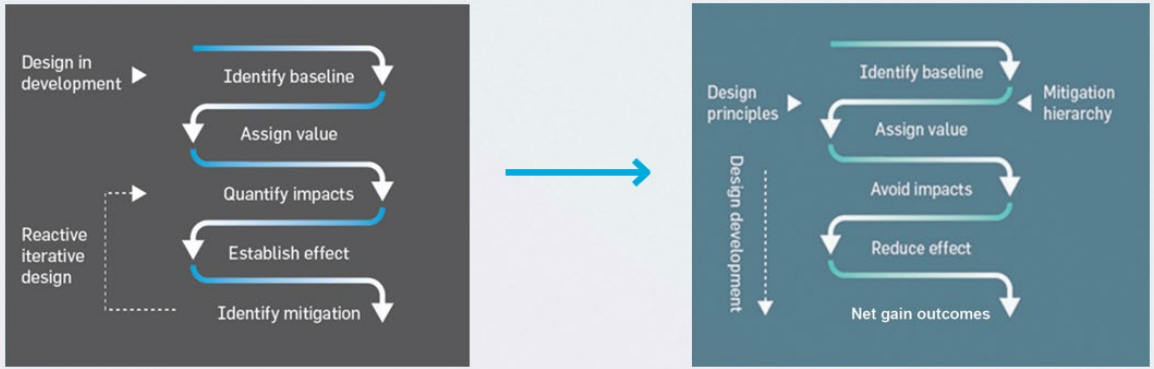
Building a truly digital EIA

- Data / information management and flows
- Use of common and familiar software e.g. MS Office applications
- Automation to improve quality and efficiency
- Improved collaboration
- Flexibility in reporting



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Digital IA model in action

- Exports Environmental Statement in a format that is acceptable to regulators
- Replicates the structure of the Conceptual EIA Model

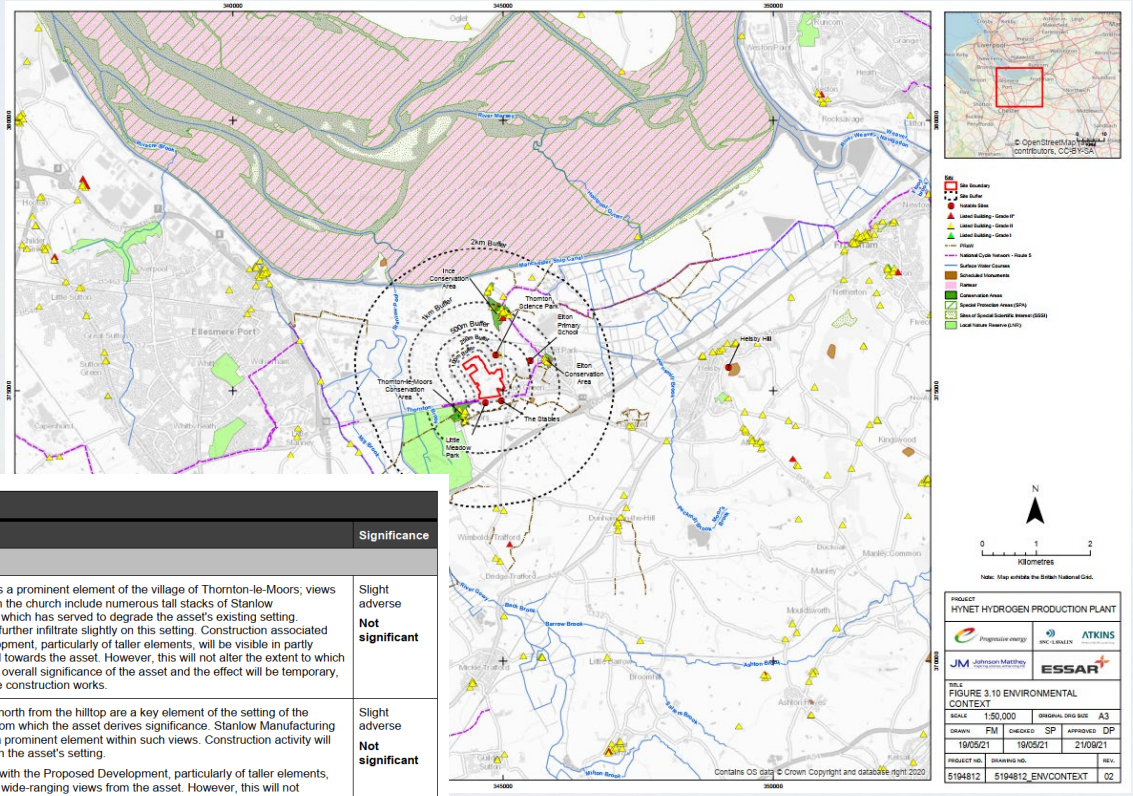

Table 8.4 Construction phase impact assessment

Baseline		Impact assessment				
Receptor	**Value**	**Impact**	**Mitigation**	**Magnitude**	**Residual effect**	**Significance**
Designated Heritage Assets						
Church of St Mary (Grade I Listed, NHLE 1330242)	High	Partly screened views of construction activity will have a temporary impact on the setting of the Listed Building.	No mitigation proposed	Negligible	The Listed Building forms a prominent element of the village of Thornton-le-Moors; views towards, across and from the church include numerous tall stacks of Stanlow Manufacturing Complex, which has served to degrade the asset's existing setting. Construction activity will further infiltrate slightly on this setting. Construction associated with the proposed development, particularly of taller elements, will be visible in partly screened views from and towards the asset. However, this will not alter the extent to which setting contributes to the overall significance of the asset and the effect will be temporary, lasting the duration of the construction works.	Slight adverse **Not significant**
Promontory Fort on Helsby Hill (Scheduled Monument, NHLE 1013292)	High	Distant views of construction activity will have a temporary effect on the setting of the Scheduled Monument.	No mitigation proposed	Negligible	The wide-ranging vistas north from the hilltop are a key element of the setting of the Scheduled Monument, from which the asset derives significance. Stanlow Manufacturing Complex already forms a prominent element within such views. Construction activity will further infiltrate slightly on the asset's setting. Construction associated with the Proposed Development, particularly of taller elements, will be distantly visible in wide-ranging views from the asset. However, this will not appreciably reduce the extent to which setting contributes to the overall significance of the asset and the effect will be temporary, lasting the duration of the construction works.	Slight adverse **Not significant**

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Digital Environmental Compliance

Pietro Rescia

Environmental Requirements

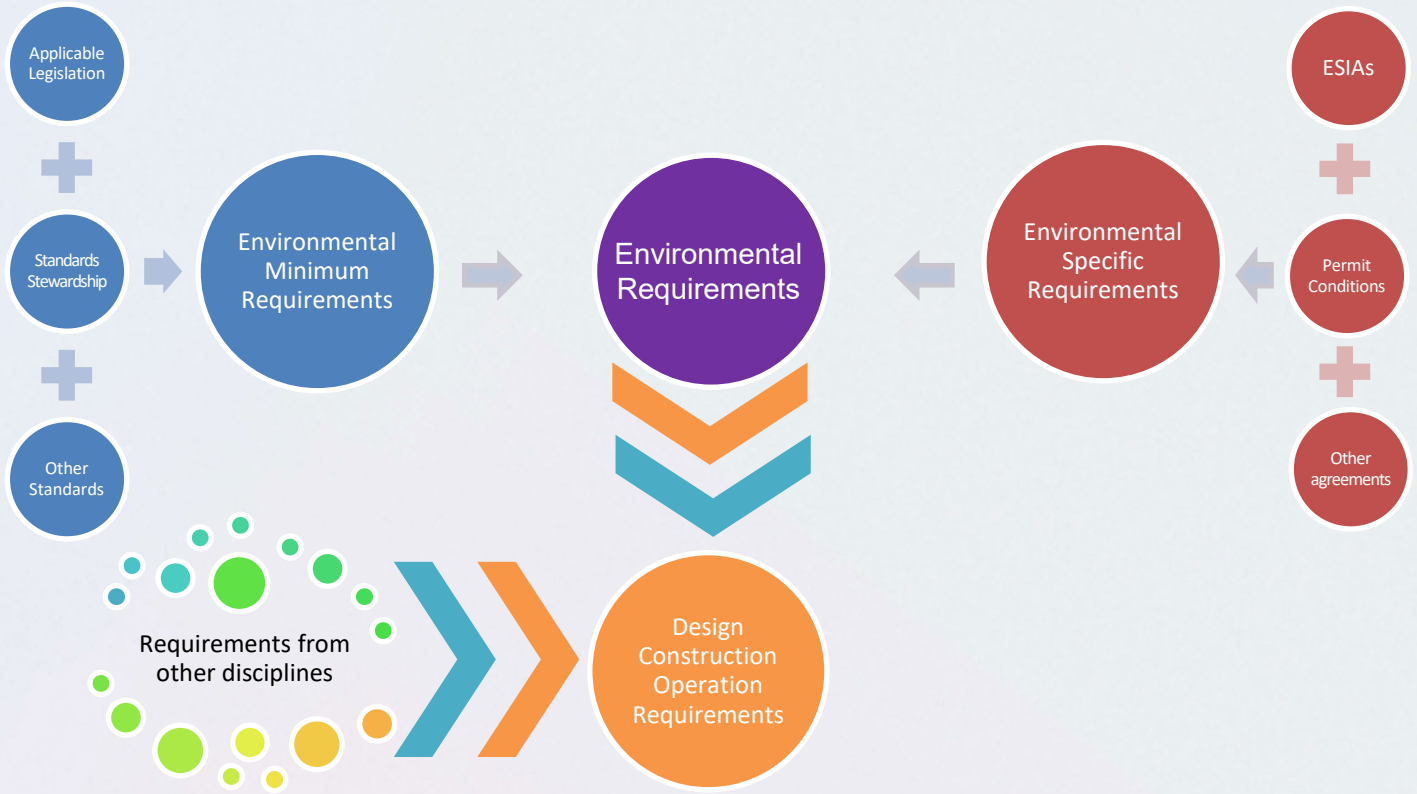
Minimum Requirements

- Requirements generated by the applicable environmental legislation
- Standards adopted voluntarily by the proponent
- Other standards e.g., required by investors

Specific Requirements

- Control and mitigation measures published in the EIAs and other official documents
- Permit, licence and planning conditions e.g., authorisations, decrees and consent conditions by regulators and public authorities.
- Specific agreements of the Organisation with third parties, including community groups, non-governmental organisations (NGOs).

General Workflow



The challenges of the Specific Requirements

- Many
- Dynamic nature
- Vague terms

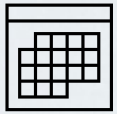
- Contractually relevant
- Regulatory links
- Subject to conditions

- Attribution to entities
- Management of interfaces
- Traceability of compliance

Conditions for Applicability

Spatial

- Jurisdictions
- Designations
- Receptors



Temporal

- Seasons
- Day and night
- Project phasing

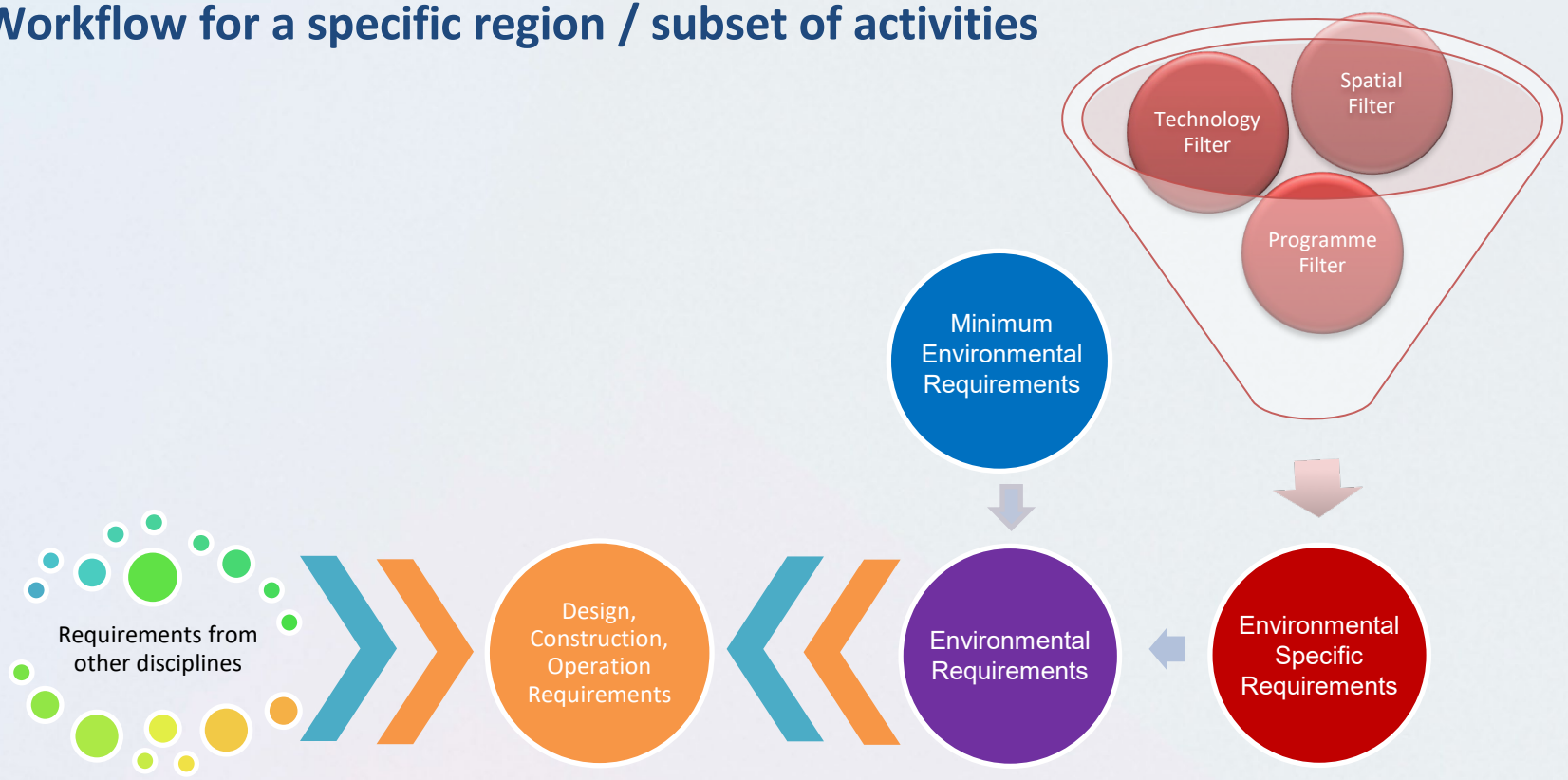
Technological

- Activities
- Plants and equipment
- Emissions

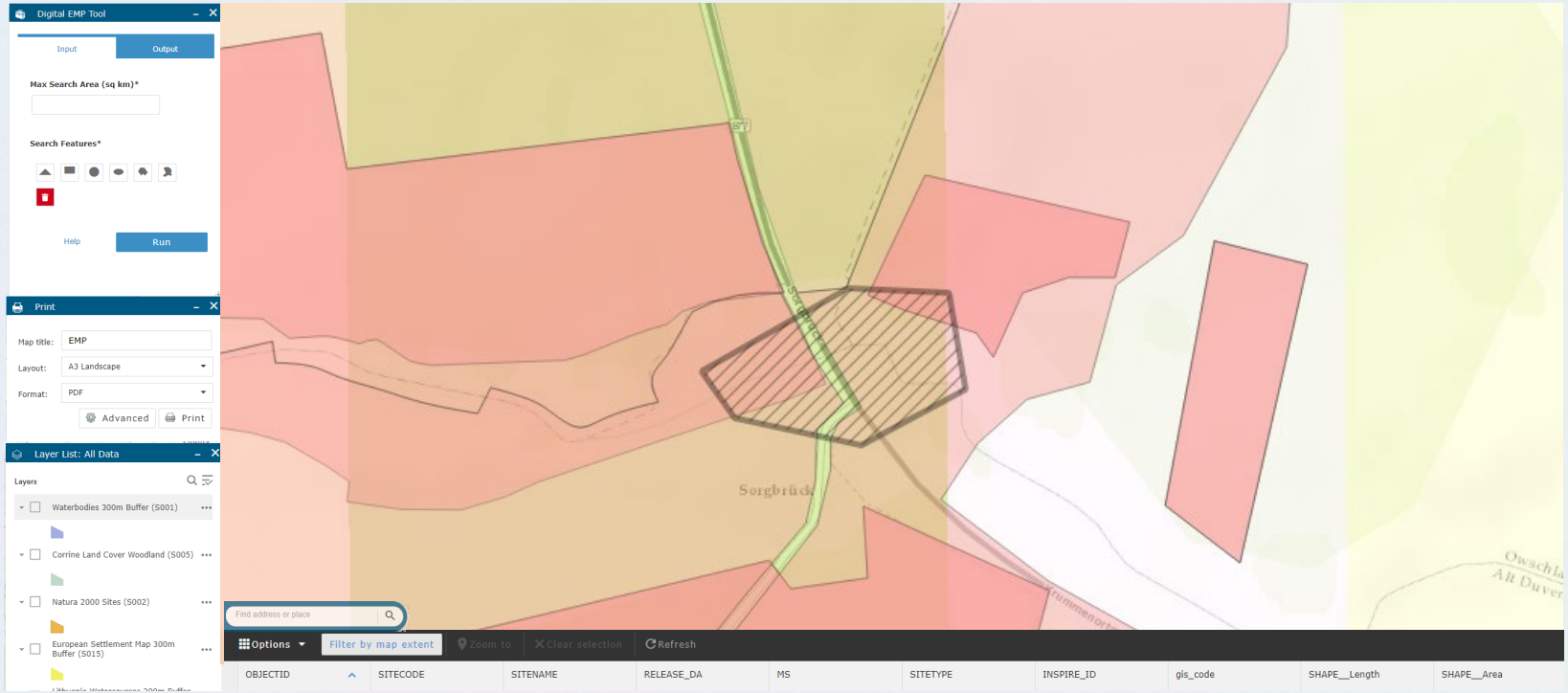
External

- Wind speed
- Temperature
- Water levels

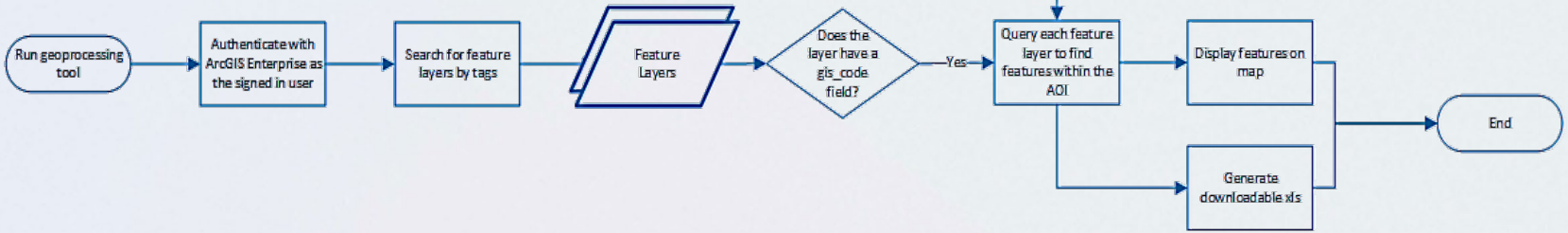
Workflow for a specific region / subset of activities



Spatial filter



Spatial Filter



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Technology and programme filter

Contract Number		
Contract Title		
Contractor		
Stage	All	
Jurisdiction	All	
Start / End Date of Works	01-Jan	31-Dec

Clear Submit

Question Code	Will Contract Activities Require/Originate:	Y/N
T001	The use of construction equipment or plants powered by internal combustion engines	Yes
T002	To clear the area where the activities will be carried out from vegetation, shrubs, trees	Yes
T003	The generation of traffic to transport construction materials to the site, dispose of waste, access of personeel	Yes
T004	The use of areas for setting up a construction compund outside the perimiter of the construction site	Yes
T005	The use of areas for storage e.g., of waste, construction materials, parking lots, refuelling of vehicles	Yes
T006	The removal of top soil in agricultural or natural or semi-natural areas	Yes
T007	Excavation of treanches, building of embankements, slopes, remodelling of surface, earth stockpiling earth movements in general	Yes
T008	The production of waste	Yes
T009	The production and discharge of wastewater, excluding liquid waste disposed of in tanks	Yes
T010	Construction of bridges, culverts	Yes
T011	Activities in the vicinity or intersecting waterbodies or their flood plain or embankements	Yes
T012	Maintenance activities during operation	Yes

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Advantages of digital environmental compliance

Managing digitally the Specific Requirements enable to:

- Focus on what is applicable to specific designers, contractors, operators
- Narrow the scope of reviews, audits, and inspections
- Control of risks and liabilities
- Optimise construction phasing
- Improve the quality of the design

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Summary

- Digital Impact Assessment can be applied across the asset lifecycle
- Digital mindset – Digital doesn't necessarily require expensive technology
- Left-shift – use of data to early environmental thinking - make the biggest impact
- Golden thread – data handshake at each stage
- Reduction of risk – ensure benefits are realised – positive environmental outcomes