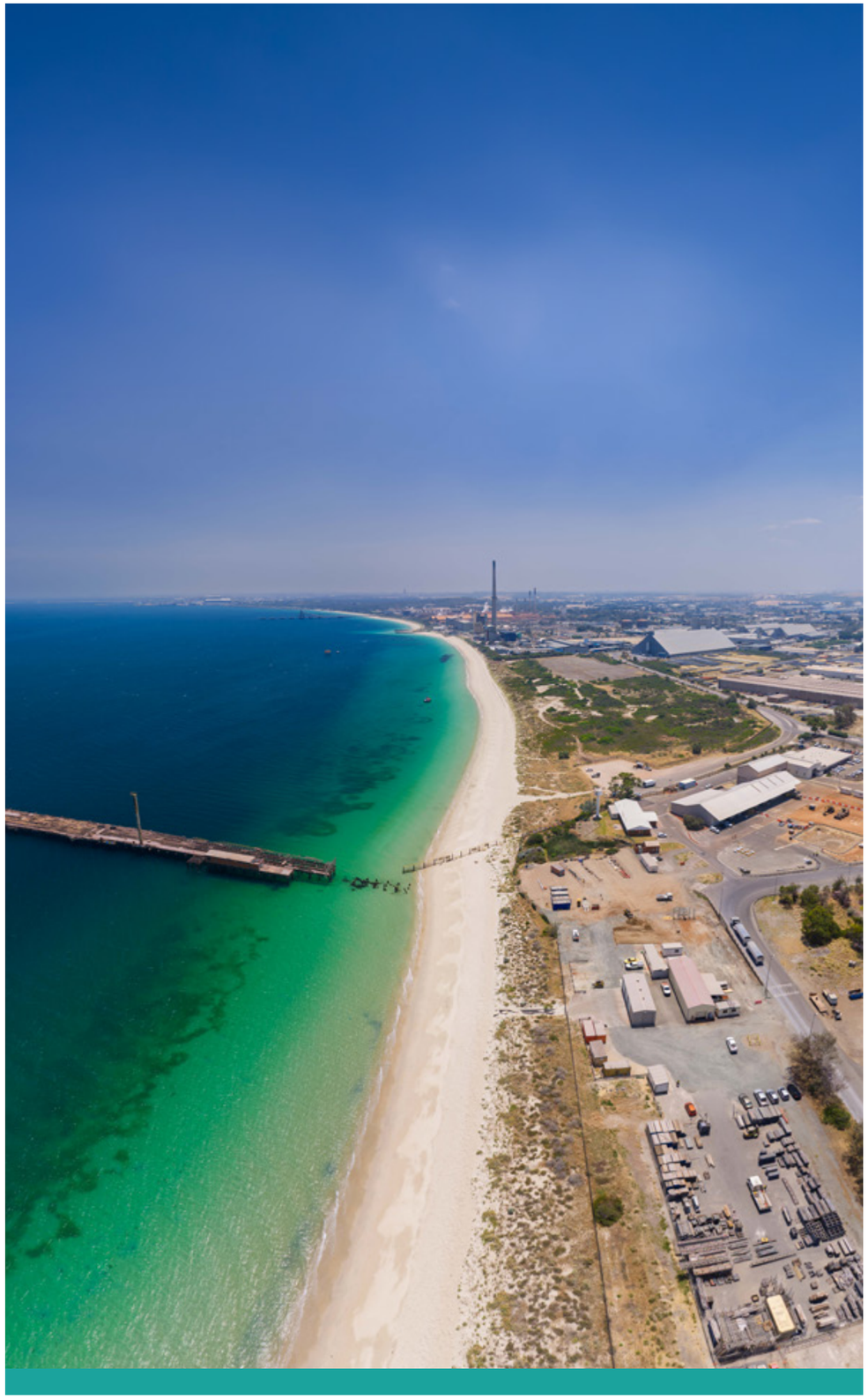
INDEPENDENT REVIEW

Westport's approach to Working with Nature

NTRO NATIONAL TRANSPORT RESEARCH ORGANISATION

WESTPORT



Foreword

Westport is the Western Australian Government's long-term program to deliver essential economic infrastructure needed to support the State's future container trade. With Fremantle Port constrained by surrounding urban development, a new container terminal and supporting road and rail freight network are critical to ensure Western Australia can continue to move goods efficiently and competitively. Planning is underway now to ensure this infrastructure is in place when it is needed, not after capacity constraints begin to limit growth.

The program will relocate container trade from a highly urbanised area to Kwinana—Western Australia's premier heavy industrial precinct, where transport, logistics and industry are already co-located. While Cockburn Sound is a long-standing working marine environment that has experienced significant change, Westport has anchored its approach in supporting the long-term resilience and function of the marine environment alongside economic and operational needs.

As the largest infrastructure program ever planned in Western Australia, Westport represents a once-in-a-generation opportunity to rethink how major maritime infrastructure is planned, designed and delivered. The scale of the program brings with it a commensurate opportunity to apply Working with Nature principles systematically, using science-led, transparent decision-making to achieve enduring environmental, community and economic outcomes.

Our review has shown that Westport has steadily and consistently embedded 'Working with Nature' principles into its project methodology, planning and design evolution. The program has clearly integrated world-leading marine science, continuous stakeholder engagement, advanced design optioneering and adaptive management - and has clearly demonstrated a robust (and continuous) commitment to 'nature-positive' outcomes.

As the Program moves into Stage 4 (Definition and Delivery), the focus shifts from strategic intent to practical implementation. The forward recommendations in consultation with the Westport Office outline how governance, design 'adaptation', and long-term monitoring can ensure the implementation of Working with Nature outcomes.

Through continuing this trajectory, Westport can set a new national benchmark for port development, delivering infrastructure that strengthens ecological values and supports community aspirations - whilst providing enduring economic value for Western Australia and continued access to world markets.

National Transport Research Organisation Representatives:

Jason Sprott
Executive Director (Ports & Airports), National Transport Research Organisation (NTRO), Australian Representative – PIANC 'Working with Nature' Technical Committee

Georgia O'Connor
Senior Environmental Engineer National Transport Research Organisation (NTRO)

> Westport commissioned NTRO to provide an independent review of Stage 1 to 3 of the Westport Program and test it against recognised Working with Nature (WwN) principles. This review acts as a checkpoint to confirm whether the direction aligns with best-practice thinking and to identify opportunities for improvement before decisions are progressed.

What is Working with Nature (WwN)?

Working with Nature (WwN) is an integrative design philosophy developed by the World Association for Waterborne Transport Infrastructure (PIANC) that seeks to plan and deliver navigation and maritime infrastructure with natural processes, rather than imposing solutions on them.
It prioritises long-term ecosystem health, resilience and function alongside economic and operational needs, and is applied as a way of making informed decisions across planning, design and delivery, not as a single project, environmental offset or mitigation measure. This approach contrasts with traditional approaches that rely mainly on avoiding or mitigating impacts.

Key characteristics:

Promotes a design concept which works **'with'** rather than **'on'** nature.

Requires a deep understanding of existing environmental values.

Encourages proactive integration of natural systems from the outset.

Requires deep consultation with an array of stakeholders and traditional knowledge custodians.

Focuses on ecosystem enhancement, climate resilience and social value.

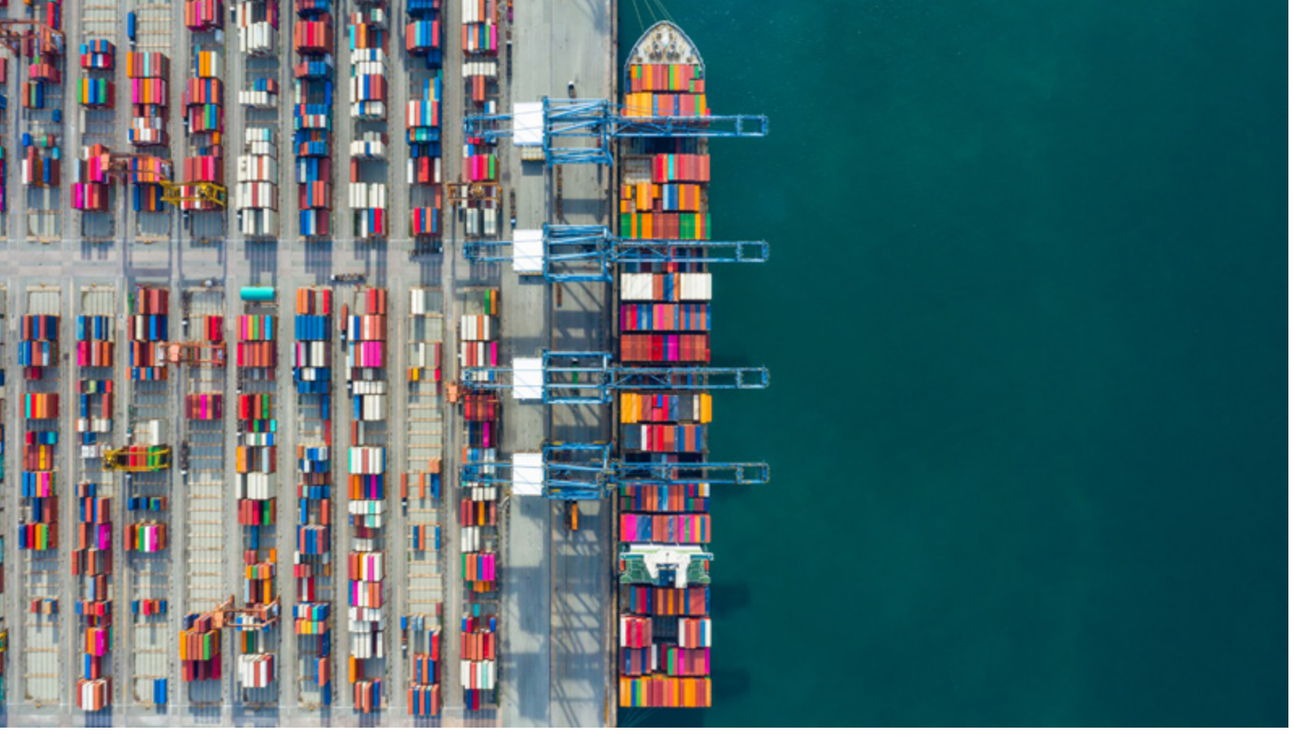
Includes a 6 step framework, covering:

01	02	03	04	05	06
Establishing needs of project	Understanding the environment	Stakeholder engagement	Nature-based design	Implementation	Adaptive management

NTRO Review: Summary of Work Completed during Stages 1 to 3

STAGE 1 – STRATEGIC FOUNDATION

- **Westport committed to the PIANC WwN framework** from the outset, introducing its principles during Stage 1 and identifying opportunities for nature-positive planning and design.
- **Stage 1 set environmental goals,** such as minimising seagrass loss, avoiding dredging impacts, and protecting Cockburn Sound, which were integrated into strategic planning and site selection.
- **Sustainability and WwN principles were embedded into Stage 1 through problem definition,** 'Basis of Design' documents, and Measures and Targets review to ensure environmental and social values informed early decision-making.
- **Extensive community & stakeholder engagement** during Stage 1 helped inform option selection and identify opportunities aligned with WwN principles.
- **Stage 1 laid the foundation for future WwN** initiatives through commitments to marine science investment, cumulative impact modelling, and environmental data curation.
- **Identified key environmental and cultural values** and opportunities.
- **Strategic site selections** (South Kwinana Shelf, Anketell Road) aimed to minimise ecological and cultural impacts through primary avoidance.



STAGE 2 – CONCEPT DEVELOPMENT

- **WwN principles were formally embedded into Supply Chain Integrated Design (SCID) planning** and governance structures to guide nature-positive decision making.
- **Westport committed $13.5 million to Western Australian Marine Science Institution (WAMSI) marine science program in Cockburn Sound** to support the environmental impact assessment and long-term ecological management.
- A **cumulative impact prediction tool** and **curated environmental data repository** were scoped to improve transparency and planning.
- **Continued stakeholder engagements/ workshops** identified key environmental and social values, which were mapped and used to shape design priorities.
- **Cultural and Spiritual Values Mapping** project completed with Noongar knowledge holders, identifying marine and terrestrial sites of significance.
- Early design concepts such as **nature-inclusive design, green terminals** and **beneficial sediment reuse** were developed for future refinement.
- **Planning aligned with international and state sustainability and climate frameworks,** including the United Nations Sustainable Development Goals (SDGs), Paris Agreement, and Western Australian climate policy.

STAGE 3 – DESIGN INTEGRATION

- **WwN principles were embedded into the Supply Chain Integrated Design (SCID) design**, with environmental, economic and social objectives integrated into the MCA framework and 'Basis of Design' documents.
- **Environmental criteria were given high weightings in the MCA, directly influencing layout selection and reinforcing nature-positive decision making.**
- **Community values from the University of Western Australia (UWA) Social Values Survey were incorporated** into the MCA scoring, ensuring recreational, heritage and cultural priorities were reflected in design outcomes.
- **Several WwN initiatives were identified for consideration,** including nature-inclusive design, habitat creation zones and green infrastructure for terminals and transport corridors.
- **Design Option G was selected for its low ecological impact, particularly on benthic habitats, snapper larvae interaction and circulation patterns.**
- Breakwater and revetment designs incorporated recycled materials and ecological features, supporting **habitat enhancement** and **sediment reuse.**
- **Construction planning scoped nature-positive practices, including seasonal dredging windows, low-impact methods, electric equipment and emergency environmental response protocols.**
- **Monitoring frameworks** were scoped for key ecological indicators, including seagrass, pink snapper, dolphins and flushing regimes.

- **Smart particle modelling was proposed** to simulate ecological behaviour under future climate conditions, supporting adaptive design.
- **Climate and resilience risks were assessed,** with embedded treatments for sea level rise, storm events and acidification.
- **The Marine Mitigation Working Group (MMWG) and a Terrestrial Mitigation Working Group (TMWG) were established** to guide environmental and social stakeholder informed mitigation strategies.
- A **Cockburn Sound-wide WwN governance structure was recommended** to support cumulative impact management and long-term collaborative stewardship.
- **WAMSI projects were designed to support long-term ecological monitoring, water quality assessment and species health tracking.**
- **Planning aligned with broader sustainability frameworks, including Westport's net zero principles, ESG Strategy, UN SDGs and adaptive management commitments.**

NTRO CONCLUSION REGARDING THE WESTPORT ACHIEVEMENTS IN STAGES 1 TO 3:

- **Across all 3 stages, Westport has demonstrated a robust and continuous commitment to WwN objectives.**
- Westport has demonstrated consistent integration of WwN in strategy, environmental impact assessment, engagement and early design.
- **Stage 1** of the Program laid a strong and strategic foundation for WwN objectives.
- **Stage 2** marked a transition from strategic alignment to concept development, with a clear intent to embed WwN principles into design and delivery.
- **Stage 3** progressed from concept development to detailed design advancement, with WwN principles actively embedded into the WAMSI Westport Marine Science Program, SCID Phase 3 design, MCA framework and Basis of Design documents.
- Several WwN initiatives were identified, including nature-inclusive design, habitat creation zones and green infrastructure.
- Continued focus on nature-positive outcomes, collaborative governance and adaptive management was identified as being critical for long-term success.
- Westport has clearly demonstrated deep engagement with a range of community, industry, government and Noongar stakeholders.

WESTPORT'S STRATEGIC WWN ACTIVITIES DEMONSTRATED TO NTRO

Monitoring & Adaptation
Ongoing governance & adaptive management commitments (Stage 4+)

Restoration & Offsets
Detailed consideration of targeted environmental restoration projects & commitments

Environmental Assessments
Rigorous and transparent regulatory assessments at both state & Commonwealth levels

Adaptive Design & Planning
Marine Mitigation Working Group, mitigation hierarchy alternative design 'optioneering', strong use of Multi-Criteria Analysis to inform design changes & outcomes

Strategic Commitment
ESG Strategy & Action Plan, consideration of UN SDG framework, net zero commitment, nature positive commitment

Science-Based Approach
Foundation $13.5m+ Marine Science Program (150 scientists and researchers working across 33 projects)

Stakeholder Engagement
Continuous inclusion of a broad range of stakeholder interests & engagement throughout Program

Technical Environmental Investigations
Significant marine & terrestrial-based scientific work & analysis, robust consideration of cultural values

Westport commitments & consistency with WwN Framework

Recommendations for Program Stage 4

From this point, NTRO has made a series of recommendations (some of which are already underway) to ensure the continued success of the program:

Governance & organisational structure: Formalise WwN integration by embedding WwN in core decision pathways.

Monitoring & adaptive management: Develop processes to support proactive, evidence-based adaptation.

Capacity building: Deliver WwN training and develop practical guidance materials to build consistent understanding and capability across teams.

Design & technical integration: Ensure WwN principles are consistently applied across design elements and technical processes.

Stakeholder engagement enhancements: Robust documentation to clearly show how stakeholder input informs and shapes design decisions.

Long-term governance: Establish robust and transparent governance systems to support coordinated management and long-term ecological stewardship.

Nature-based solutions: Progress priority Nature-based solutions initiatives to strengthen ecological outcomes.

SUSTAINABLE DEVELOPMENT GOALS

What benefits does WwN offer for Westport?

The benefits of WwN to Westport include its positive influence on site selection, design optimisation, stakeholder support and ecological outcomes.

Key benefits include:

ENVIRONMENTAL BENEFITS

Reduced ecological impacts, including avoiding seagrass loss, minimising dredging and protecting Cockburn Sound.

Strengthening of ecological values and systems through the consideration of nature-based design features such as nature-inclusive design, habitat creation zones and dredged material reuse.

Strong alignment with Westport's aspiration to deliver Australia's first nature-postitive port.

SCIENTIFIC AND TECHNICAL BENEFITS

Program elevated environmental values understanding via the $13.5m WAMSI marine science program, enabling world-leading hydrodynamic, ecological and cumulative impact understanding and predictive modelling.

DESIGN AND OPERATIONAL BENEFITS

Through the use of adaptive design and multi-criteria analysis decision making; minimising and avoiding impact on ecological footprint, encouraging better hydrodynamic circulation, and improving operational outcomes to reduce the risk to marine species.

SOCIAL AND STAKEHOLDER BENEFITS

Increased trust and transparency through better-informed decision-making that considers cumulative and long-term impacts, supported by continued engagement, independent review and the use of peer-reviewed science.

GOVERNANCE AND LONG-TERM RESILIENCE

Facilitated the development of a 'Cockburn Sound–Wide' governance concept, encouraging ongoing shared stewardship and adaptive management.

National Transport Research Organisation (NTRO)
80a Turner St, Port Melbourne, VIC, Australia 3207
www.ntro.org.au | info@ntro.org.au