Proposal Content Document

Table 1: General proposal content description

Proposal title	H2Perth
Proponent name	Woodside Energy Technologies Pty Ltd ("**Woodside**")
Short description	The Amended Proposal involves the development of a liquid hydrogen (LH_2) production facility within the Rockingham Industrial Zone (RIZ) in Kwinana, Western Australia (WA). The facility is proposed to produce up to approximately 30,000 tonnes per annum (tpa) of LH_2, primarily for export markets, with potential future supply to domestic markets. Gaseous hydrogen (H_2) is proposed to be produced via natural gas reforming, with a minimum of 85% of associated CO_2 from the reforming process proposed to be captured for transport to third-party carbon sequestration and/or carbon utilisation facilities. The gaseous H_2 would be liquefied, stored in tanks of up to approximately 50,000 m^3 capacity, and transferred via a new LH_2 export pipeline corridor to the Kwinana Bulk Jetty (KBJ) for loading. Key supporting infrastructure would include utility systems, natural gas supply pipeline, power supply (either onsite Combined Cycle Gas Turbine (CCGT) generation or electricity import from the South West Interconnected System (SWIS)), water supply connections to the Kwinana Water Reclamation Plant and East Rockingham Water Resource Recovery Facility, wastewater discharge via the Sepia Depression Ocean Outlet Landline (SDOOL) and the KBJ. Construction and commissioning is anticipated to take a period of approximately three to four years, targeted to commence from around 2027, with operations targeted from 2031, and a maximum expected operational life of 40 years.

Table 2: Proposal content elements

Proposal element	Location / description	Hydrogen and Ammonia Production Facility - Existing proposal extent, capacity or range	Liquid Hydrogen Production Facility - Proposed Amendment	Combined extent, capacity or range
Physical elements				
Production Plant Area	Refer to Figure 1.	H_2 and ammonia (NH_3) production facility including gaseous H_2 production via natural gas reforming and electrolysis, liquid NH_3 production via NH_3 synthesis, NH_3	LH_2 production facility including gaseous H_2 production via natural gas reforming and H_2 liquefaction to produce up to ~30,000 tpa of LH_2; plant spans East and West Site (total ~120 ha Development Envelope, see	LH_2 production facility only with Plant Area Development Envelope up to ~120 ha (reduced from existing proposal), with up to 6 ha clearing of native and non-native vegetation

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		storage and rundown and export pipelines • Phase 1 - up to ~1 megatonnes per annum (Mtpa) NH_3 • Phase 2 – up to ~1.45 Mtpa NH_3 • Phase 3 - up to 3.25 Mtpa total NH_3 Clearing of up to approximately 0.66 hectares (ha) of vegetation within the approximately 148 ha (total) Plant Area Development Envelope[1].	Figure 1), with up to 6 ha clearing, excluding any clearing which Woodside understands the Western Australian Land Authority trading as DevelopmentWA is authorised to undertake within the Derived Proposal 5 approved boundary[2]. Proposal includes initial phase of development; potential for future expansion phase(s) to be referred under separate proposal(s).	(increase from existing proposal). Proposal does not include a phased development. Any potential future phases to be referred under separate proposal(s).
Product Storage	N/A	NH_3 storage tanks. Capacity to store up to 120,000 tonnes of liquid NH_3.	NH_3 storage no longer part of Amended Proposal. LH_2 storage on the West Site (see Figure 1).	LH_2 storage tanks up to ~50,000 m^3 storage capacity (~3,500 tonnes of LH_2).
Rundown Pipeline	N/A	NH_3 rundown pipelines.	NH_3 rundown pipelines no longer part of Amended Proposal. Gaseous H_2 rundown pipeline routed from the East Site to the West Site.	Gaseous H_2 rundown pipeline routed from the East Site to the West Site.
Export Pipeline	N/A	NH_3 export pipelines.	NH_3 export pipelines no longer part of Amended Proposal. LH_2 export pipelines and vapour/off-spec return	LH_2 export pipelines and vapour/ off-spec return pipelines.

[1] At the time of submission of the existing Proposal, the majority of the Plant Area Development Envelope (approximately 95%, 140 ha) was located within the RIZ Strategic Environmental Assessment area, and clearing of vegetation within the RIZ SEA was expected to be undertaken by DevelopmentWA. Under the existing Proposal, Woodside was seeking approval to clear vegetated areas outside of the RIZ SEA extent (being, up to approximately 0.66 ha).

[2] The clearing area specified here for the Amended Proposal has been determined with reference to the Derived Proposal 5 approved boundary. The accompanying *H2Perth Project Section 43A Supporting Document* (Woodside, 2025) made reference to the RIZ Strategic Environmental Assessment (SEA) extent instead of the Derived Proposal 5 approved boundary when describing the proposed clearing of native and non-native vegetation. Accordingly, the clearing area described in the Amended Proposal Supporting Document (~4.6 ha) is superseded for the purposes of the Amended Proposal and has been updated in this document to reflect the revised clearing area (6 ha).

Proposal element	Location / description	Hydrogen and Ammonia Production Facility - Existing proposal extent, capacity or range	Liquid Hydrogen Production Facility - Proposed Amendment	Combined extent, capacity or range
			pipelines from the West site to KBJ.	
CO_2 Offloading Infrastructure	N/A	Carbon dioxide (CO_2) offloading pipeline (piggybacked) for cool down and vapour return.	Connection points for the proposed offtake of CO_2 from the facility for trucking or rail transport options by third-parties.	CO_2 infrastructure including offloading pipeline.
Construction elements				
Road and Rail Crossings	As required.	Crossings for pipelines and connections between the plant area and the NH_3 storage facility included: • Tunnelling and/or Horizontal Directional Drilling (HDD). • Culverts. • Bridges and/or overhead pipe racks.	Crossings for gaseous H_2 rundown pipeline and interconnecting utilities/services (East Site to West Site) may include: • Tunnelling and/or HDD. • Culverts. • Bridges and/or overhead pipe racks.	Road/rail crossings for gaseous H_2 pipeline and interconnecting utilities/services within Kwinana Beach Service Corridor (KBSC) using tunnelling and/or HDD; culverts; bridges and/or overhead pipe racks.
Export Pipelines	Refer to Figure 1.	Potential tie-in and use of an existing NH_3 pipeline on the existing KBJ and potential construction of an NH_3 export pipeline with a small bore line return (piggybacked) on a potential future KBJ Expansion[3,4]. In addition to a potential liquid CO_2 offloading pipeline with a small bore line (piggybacked) for cooldown and vapour return.	NH_3 and liquid CO_2 export pipelines no longer part of Amended Proposal. Instead, LH_2 Export Pipeline(s), H_2 vapour return pipeline, and off-spec return pipeline are proposed between the West Site and KBJ.	LH_2 Export Pipeline(s), H_2 vapour return pipeline, off-spec return pipeline.

[3] References to KBJ Expansion should not be assumed to refer to a funded approved project. Fremantle Port Authority (FPA) is currently at the early stages of developing a business case for the KBJ Expansion and, any investment would require FPA Board and Ministerial Approval which Woodside understands have not been obtained at this time.
[4] KBJ's capacity to support new trade is subject to FPA's operational capacity and trade optimisation review.

Proposal element	Location / description	Hydrogen and Ammonia Production Facility - Existing proposal extent, capacity or range	Liquid Hydrogen Production Facility - Proposed Amendment	Combined extent, capacity or range
Construction Power Supply	N/A	For the construction of Phase 1, power was proposed to be sourced through connection to existing local infrastructure adjacent to the Proposal, local third-party renewable electricity supply and/or the use of on-site diesel generators. For the construction of Phases 2 and 3, the power already available on-site was proposed to be used for construction purposes.	Power from local grid and/or temporary onsite generators.	Grid electricity or generator supply.
Construction Water Supply and Disposal	N/A	Construction water of a suitable quality for dust suppression and pre-commissioning activities were proposed to be sourced externally from an appropriate third-party operator. Clean hydrotesting water was proposed to be discharged via infiltration onsite or trucked offsite to a suitably licenced facility. Once the plant was operational, hydrotest water re-use was proposed to be investigated.	Construction water for dust suppression and pre-commissioning activities still proposed to be sourced externally from an appropriate third-party operator. Short-term localised dewatering may be required (e.g. at Patterson Road crossing). Hydrotest water still proposed to be discharged via infiltration/offsite; re-use once operational under investigation.	Third-party water supply; Hydrotest water proposed to be discharged onsite/offsite; Potential re-use once operational; dewatering may be required.
Operational elements				
Hydrogen production from electrolysis	N/A	Electrolyser production capacity was proposed to be expanded over three phases: Phase 1: approximately 250 MW total capacity.	Not included.	N/A

Proposal element	Location / description	Hydrogen and Ammonia Production Facility - Existing proposal extent, capacity or range	Liquid Hydrogen Production Facility - Proposed Amendment	Combined extent, capacity or range
		Phase 2: approximately 1000 MW total capacity. Phase 3: up to 3250 MW total capacity.		
Processing electricity	N/A	Phase 1: approximately 150 MW total. Phase 2: approximately 250 MW total. Phase 3: approximately 450 MW total.	The Amended Proposal includes three alternative power supply cases as defined below: 1. *CCGT without Post Combustion Carbon Capture (PCCC)*. This case assumes on-site power generation from a CCGT gas power plant, with no connection to the SWIS. PCCC is excluded. 2. *CCGT with PCCC*. This case assumes on-site power generation from CCGT gas power plant, with no connection to the SWIS (95% assumed capture rate from CCGT). 3. *Grid electricity.* This case assumes the use of electricity from the SWIS and has no on-site CCGT power generation.	Estimated facility power demand ~50–65 MW. Supply via onsite CCGT (up to ~11 Terajoules per day (TJ/day) natural gas feedstock) or import from SWIS.
Hydrogen production via Autothermal Reforming (ATR) of natural gas	N/A	ATR produces H_2 via a natural gas feedstock of ~65 TJ/day during all phases of the Proposal. H_2 production via ATR proposed to cease by 2050.	H_2 (gaseous) production proposed solely via natural gas reforming (~16 TJ/day natural gas feedstock).	H_2 (gaseous) production proposed via natural gas reforming (~16 TJ/day natural gas feedstock) for reforming.
Hydrogen liquefaction	N/A	Not included.	H_2 liquefaction.	LH_2 production up to ~30,000 tpa.

Proposal element	Location / description	Hydrogen and Ammonia Production Facility - Existing proposal extent, capacity or range	Liquid Hydrogen Production Facility - Proposed Amendment	Combined extent, capacity or range
Ammonia production	N/A	Capacity to convert up to approximately 1625 tonnes per day H_2 to NH_3 over three phases Phase 1: up to ~1 Mtpa NH_3. Phase 2: up to ~1.45 Mtpa NH_3. Phase 3: up to 3.25 Mtpa total NH_3.	No NH_3 production in the Amended Proposal.	N/A
Product storage	N/A	Capacity to store up to 120,000 tonnes of liquid NH_3.	NH_3 storage no longer part of Amended Proposal. LH_2 storage on the West Site (see Figure 1).	LH_2 storage tanks up to ~50,000 m^3 storage capacity (~3,500 tonnes of LH_2).
Water supply	N/A	Process water for the Proposal was proposed to be sourced from the Kwinana Water Recycling Plant (KWRP): Phase 1: approximately 2.8 Megalitres per day (ML/day). Phase 2: approximately 7.1 ML/day. Phase 3: approximately 20.2 ML/day. Cooling water was proposed to be sourced from the East Rockingham Water Resource Recovery Facility (ER WRRF) or directly via the SDOOL: Phase 1 – approximately 16 ML/day.	Process water from KWRP (via KBSC pipeline corridor), ~1.1-2.0 ML/day. Tie-in location within the Amended Proposal Plant Area Development Envelope along the site boundary. Cooling water from East Rockingham WRRF at ~3.5-8.5 ML/day. Tie-in location contained within the Amended Proposal Plant Area Development Envelope along existing road reserves and Water Corporation Service Corridor. Potable water from local mains supply, ~0.02 ML/day. Tie-in location within the Amended Proposal Plant Area Development Envelope along the site boundary.	Process water: ~1.1-2.0 ML/day. Cooling water: ~3.5-8.5 ML/day. Potable water: ~0.02 ML/day.

Proposal element	Location / description	Hydrogen and Ammonia Production Facility - Existing proposal extent, capacity or range	Liquid Hydrogen Production Facility - Proposed Amendment	Combined extent, capacity or range
		Phase 2 – approximately 31.2 ML/day. Phase 3 – approximately 71.4 ML/day. Potable water was proposed to be sourced from local mains supply.		
Stormwater	N/A	Stormwater management design was proposed to be incorporated as each phase of the Proposal was developed.	Stormwater during operations proposed to be managed by check basin and infiltration pond/basin.	Check basin and infiltration pond/basin.
Wastewater	N/A	Process and cooling water effluent was proposed to be disposed of via the SDOOL under an Effluent Service Agreement with Water Corporation. Phase 1: approximately 3.8 ML/day. Phase 2: approximately 6.5 ML/day. Phase 3: up to 16.2 ML/day.	Process and cooling water effluent proposed to be disposed of via the SDOOL under an Effluent Service Agreement with Water Corporation, up to ~2.9 ML/day. Temporary storage pond capacity up to ~8.7 ML. Sewage discharge to municipal sewer (East & West Site boundaries) or via suitable onsite effluent treatment system	Up to ~2.9 ML/day discharge to SDOOL; Up to ~8.7 ML temporary storage pond capacity.
Proposal elements with greenhouse gas emissions				
Construction elements:				
Installation and construction	Due to the early design stage, Scope 3 Greenhouse Gas Emissions (GHG) estimates for constructing the Proposal were very high level; however, construction emissions were expected to be lower than operational emissions. Construction of the Proposal's three phases was estimated to result in less than 25 kilo tonnes (kt) of CO_2-e overall. The embodied carbon associated with the construction was		Scope 3 GHG emissions from construction of the Amended Proposal have not yet been estimated but are not expected to exceed the construction emissions as referred due to the reduced scale of the facility.	

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	expected to be higher, estimated around 410 kt across the three phases.			
Operation elements:				
Scope 1 GHG emissions (estimated)	**Phase 1** 1.1 million tonnes of CO_2 equivalent per annum (Mt CO_2-e/annum). Net zero[5] via use of carbon credits[6]. **Phase 2** 1.1 Mt CO_2-e/annum. **Phase 3** 1.1 Mt CO_2-e/annum up to 2050. Zero Mt CO_2-e/annum after 2050.		Case 1: Avg. 0.2 Mtpa CO_2-e. Peak 0.2 Mtpa CO_2-e; Gross lifetime ~9.1 Mt CO_2-e (net zero after offsets[6]). Case 2: Avg. 0.09 Mtpa CO_2-e; Peak 0.09 Mtpa CO_2-e; Gross lifetime ~3.4 Mt CO_2-e (net zero after offsets[6]). Case 3: Avg. 0.06 Mtpa CO_2-e; Peak 0.06 Mtpa CO_2-e; Gross lifetime ~2.4 Mt CO_2-e (net zero after offsets[6]).	Net zero Scope 1 GHG emissions in all cases (proposed through ≥85% CO_2 from the reforming process captured; residual emissions fully offset[6]).
Scope 2 GHG emissions (estimated)	**Phase 1** Up to 0.5 Mt CO_2-e/annum (assuming electrolysis was powered by 80% renewable electricity). **Phase 2** Peak of 1.0 Mt CO_2-e/annum (assuming additional electricity was 90% renewable). **Phase 3** Peak of 1.0 Mt CO_2-e/annum in 2033 (assuming additional electricity was 100% renewable). Transitioning to 0 Mt CO_2-e/annum from 2040 (assuming all electricity was 100% renewable).		Case 1: Zero Scope 2 GHG emissions. Case 2: Zero Scope 2 GHG emissions. Case 3: Avg. 0.04 Mtpa CO_2-e; Peak 0.07 Mtpa CO_2-e; Gross lifetime 1.4 Mt CO_2-e (net zero after offsets[6]).	Net zero Scope 2 GHG emissions in all cases, after offsets[6].

[5] Net zero emissions are achieved when anthropogenic emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period. Where multiple greenhouse gases are involved, the quantification of net zero emissions depends on the climate metric chosen to compare emissions of different gases (such as global warming potential, global temperature change potential, and others, as well as the chosen time horizon). See Glossary in Woodside's 2025 Annual Report for further information.

[6] Woodside intends to fully offset residual Scope 1 GHG emissions and Scope 2 GHG emissions through the use of carbon credits and environmental products. Environmental products refers to the adoption of renewable energy certificates, renewable gas guarantee of origin certificates and/or other such market mechanisms.

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Total Scope 1 GHG emissions and Scope 2 GHG emissions (estimated)	Estimated gross lifetime Scope 1 GHG emissions and Scope 2 GHG emissions of 19.3 Mt CO_2-e. Net zero total Scope 1 GHG emissions and Scope 2 GHG emissions.		Gross Lifetime: Case 1: ~9.1 Mt CO_2-e Case 2: ~3.4 Mt CO_2-e Case 3: ~3.8 Mt CO_2-e	Net zero total Scope 1 GHG emissions and Scope 2 GHG emissions after offsets[6].
Rehabilitation				
Refer to Decommissioning below.				
Commissioning				
Commissioning activities (expected over the course of approximately four to eight months) included connection of services (electricity, gas and water). Commissioning may include multiple plant shutdowns and start-ups and associated increased flaring to enable safe start-up of the plant.			No change	Commissioning duration expected to be ~4–8 months; includes service connections, plant shutdowns/start-ups, and flaring during start-up.
Decommissioning				
At the end of the Proposal life, all physical infrastructure associated with H_2 and NH_3 production for the Proposal was anticipated to be removed. Certain infrastructure components, such as roads or culverts may remain in place, depending on future land use requirements. A Closure Management Plan (CMP) was proposed to be prepared a minimum of five years prior to the last planned H_2 or NH_3 production activity at the Proposal site. Traditional Owners and relevant regulatory bodies were proposed to be consulted during the preparation of decommissioning plans and provided opportunities to participate in rehabilitation management activities.			No change.	All infrastructure expected to be removed at end of project (except if retained for land use). CMP to be prepared ≥5 years before closure, in consultation with Traditional Owners and regulators.
Other elements which affect extent of effects on the environment				
Proposal time*				
Operational life of project	The Proposal had an expected operational life of 90 years.		Change to expected operational life of 40 years.	Expected 40 years operational life.

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Construction Phase	Construction period expected ~2-3 years prior to the commencement of operation. Phase 1: targeted commencement of operation in late 2027. Phase 2: targeted commencement of operation in 2030. Phase 3: targeted commencement of operation in 2033.		Construction targeted from ~2027 for ~3–4 years for initial phase of development. Operations targeted to commence from ~2031.	Construction targeted from ~2027 for ~3–4 years for initial phase of development. Operations targeted to commence from ~2031.
Operations Phase	Operations included H_2 production via ATR targeted for approximately 2027 to 2050 and via electrolysis targeted from 2030 to 2050. NH_3 production throughout operational life.		Operations include H_2 production via natural gas reforming and H_2 liquefaction, targeted to commence from ~2031 and continuing through project lifetime.	Operations targeted to commence from ~2031.
Decommission -ing Phase	Decommissioning of ATR components targeted for approximately 2050 to 2052. Decommissioning of remaining Proposal components targeted from approximately 2117 – 2120.		Staged decommissioning of reforming components removed from proposal. All infrastructure to be decommissioned at end of project life (anticipated to occur after ~2070). Closure Management Plan (CMP) to be prepared ≥5 years before closure.	Decommissioning anticipated to occur after ~2070 (full project lifetime). CMP required.

** Proponents should only provide realistic timeframes to avoid unnecessary change to proposal applications at referral (section 38C), assessment (section 43A) or post assessment (section 45C).*

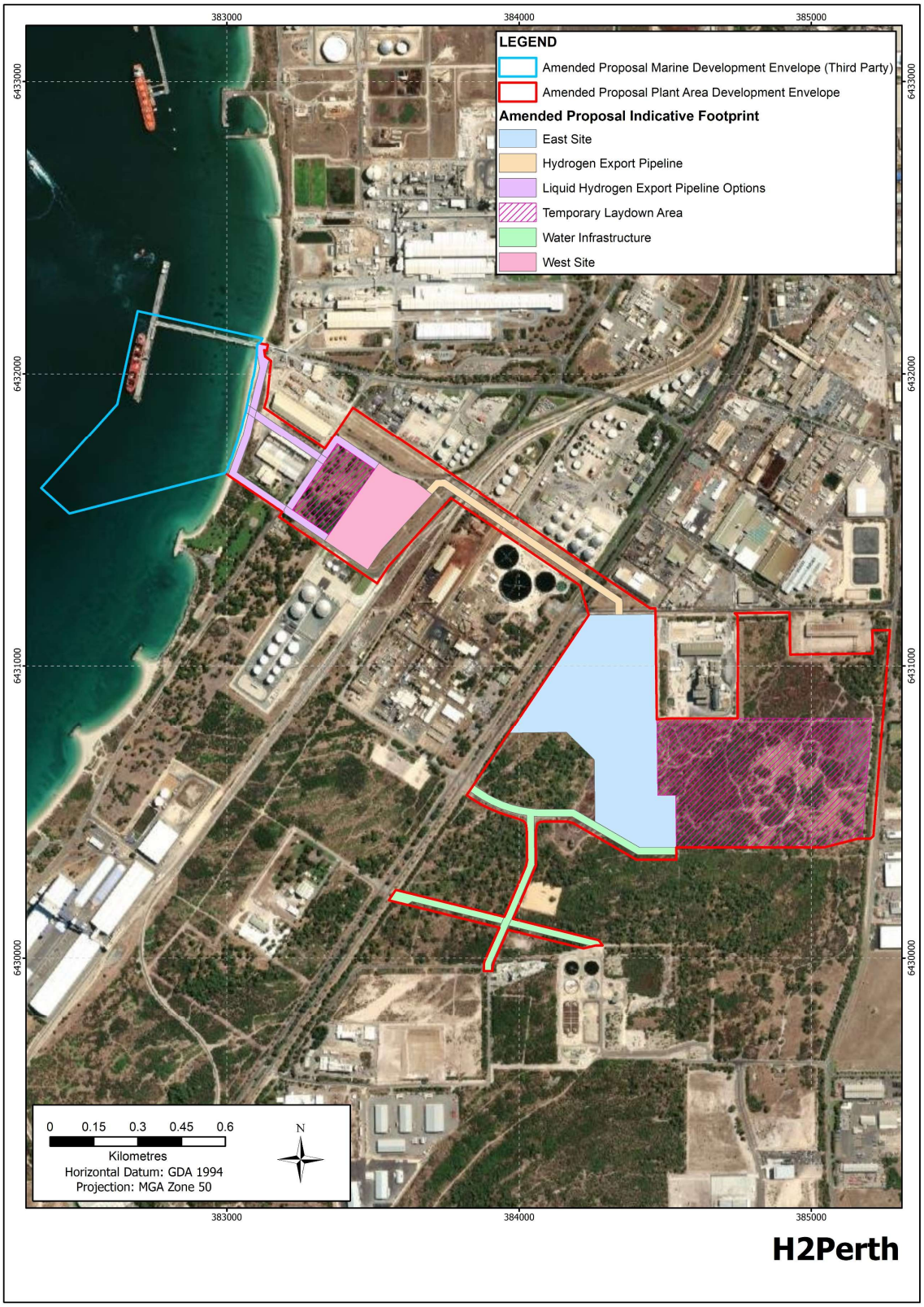

Figure 1: Amended Proposal Development Envelope and Indicative Footprint