

Hydrogen Guideline

March 2023



Guidance for hydrogen development



Acknowledgement of Country

The Department of Planning, Housing and Infrastructure acknowledges that it stands on Aboriginal land. We acknowledge the Traditional Custodians of the land, and we show our respect for Elders past, present and emerging through thoughtful and collaborative approaches to our work, seeking to demonstrate our ongoing commitment to providing places in which Aboriginal people are included socially, culturally and economically.

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Glossary

Term	Explanation
Applicant	The applicant for development consent or any person who may be carrying out development pursuant to a consent granted under Part 4 of the <i>EP&A Act</i>
Approval	Approval granted by a determining authority under Part 5 of the <i>EP&A Act</i>
Characterisation	The identification of various components of a development for the purposes of determining permissibility
Consent	Development consent granted under Part 4 of the <i>EP&A Act</i>
Consent authority	The consent authority for a development application
Department	The NSW Department of Planning and Environment
Development application	An application for consent under Part 4 of the <i>EP&A Act</i> to carry out a development (excluding an application for a complying development certificate)
Proponent	The person proposing to carry out an activity under Part 5 of the <i>EP&A Act</i>
Regionally significant development	Development that is declared to be Regionally significant development in accordance with section 2.19 and schedule 6 of the State Environmental Planning Policy (Planning Systems) 2021.
State significant development	Development that is declared to be State significant development in accordance with section 4.36 of the <i>EP&A Act</i> and Part 2.3 of the State Environmental Planning Policy (Planning Systems) 2021.
State significant infrastructure	Development that is declared to be State significant infrastructure in accordance with section 5.12 of the <i>EP&A Act</i> and Part 2.3 of the State Environmental Planning Policy (Planning Systems) 2021.
Three ports	Port Botany, Port of Newcastle and Port Kembla

Abbreviations

Term	Explanation
ADG Code	Australian Dangerous Goods Code for the Transport of Dangerous Goods by Road and Rail approved by the National Transport Commission
CIV	Capital investment value
CSSI	Critical state significant infrastructure
EP&A Act	Environmental Planning and Assessment Act 1979
EP&A Regulation	Environmental Planning and Assessment Regulation 2021
EIS	Environmental impact statement
EPI	Environmental planning instrument
LEP	Local environmental plan
M	Million
PHA	Preliminary hazard analysis
RSD	Regionally significant development
SAP	Special activation precinct
SEE	Statement of environmental effects
SEPP	State environmental planning policy
SSD	State significant development
SSI	State significant infrastructure
Standard Instrument	Standard Instrument – Principal Local Environmental Plan 2006
Transport and Infrastructure SEPP	State Environmental Planning Policy (Transport and Infrastructure) 2021

1

Introduction



The transformation of the global energy sector presents a huge opportunity for Australia. Hydrogen is emerging as a viable green renewable fuel, industrial feedstock and energy source with the potential to become a significant growth industry in NSW.

The development of hydrogen will create economic growth and jobs and help NSW transition from fossil fuels. It will increase our resilience in the face of climate change by providing more options for renewable energy alternatives. Consequently, it will support the NSW Government's Net Zero Plan and commitment to achieve net zero emissions by 2050.

In October 2021, the NSW Government released the NSW Hydrogen Strategy. The strategy aims to support investment and lower hydrogen production costs to enable the rapid expansion of a new hydrogen industry. This guideline has been prepared to support the implementation of the strategy (see Action 21).

1.1 Purpose and objectives

The purpose of this guideline is to assist industry, regulators, and the community in understanding hydrogen development and related supply chain activities under the NSW planning framework.

Hydrogen development is not explicitly defined under the NSW planning system. However, it can be categorised under existing land uses.

This guideline will help applicants and consent authorities identify:

- how hydrogen development could be characterised
- whether a proposed development is permissible
- what planning pathways are available.

It also contains broad guidance on site selection, cumulative impacts and key assessment issues to consider when preparing a development application under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) or an application to carry out an activity under Part 5 of the Act.

The Department of Planning and Environment (the department) is undertaking additional work to identify how the planning framework can be improved to support the safe and efficient development of the hydrogen industry. This guideline will be updated as this work progresses and the industry matures.

While the guideline aims to provide certainty about the planning system and the characterisation of hydrogen development and activities, each development application or application to carry out an activity is unique and individual circumstances may vary.

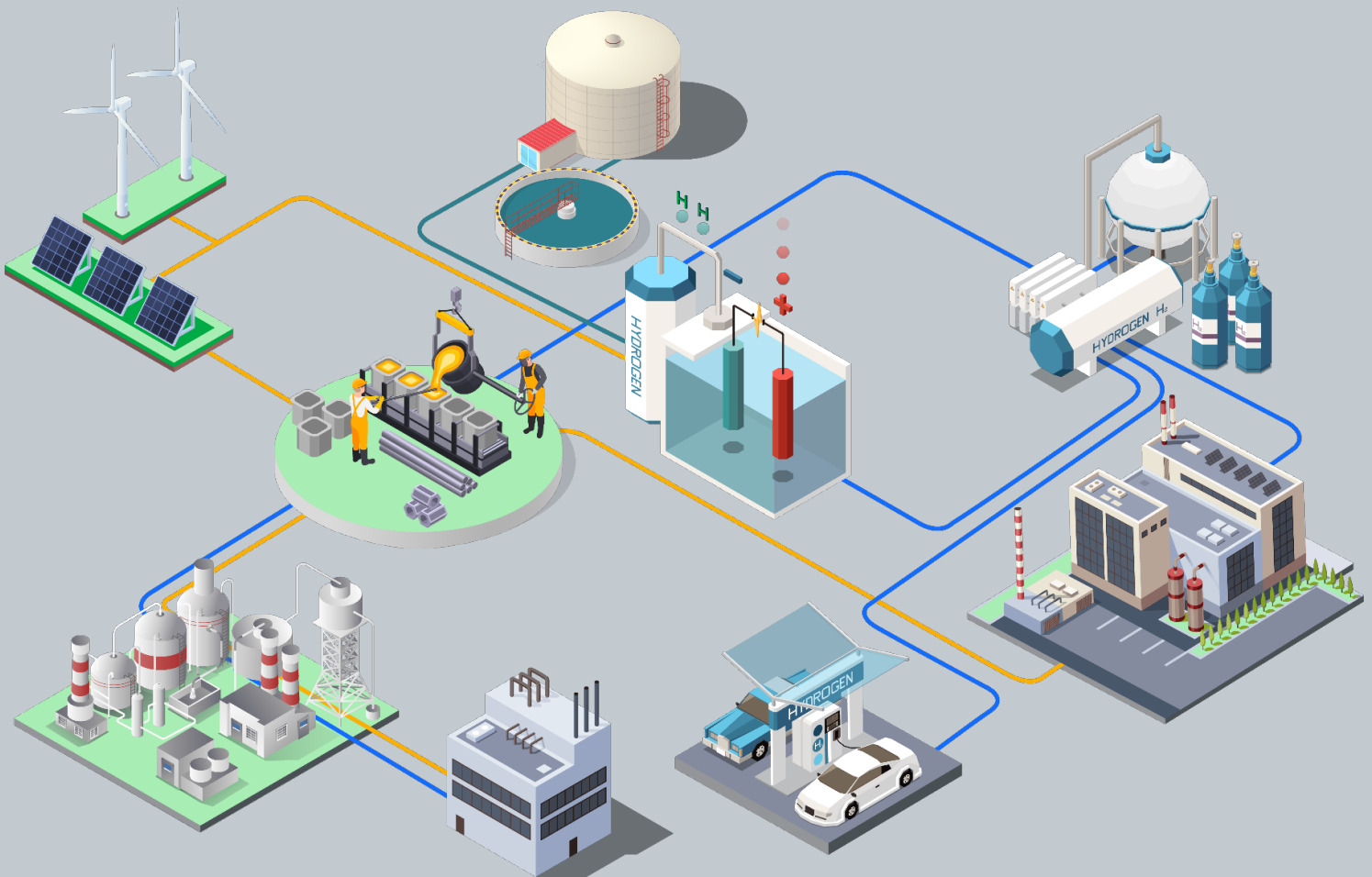
Consequently, this guideline should not be relied upon as a substitute for legal advice, and applicants and proponents are encouraged to seek their own legal and planning advice in relation to proposed hydrogen projects.

1.2 Application of the guideline

This guideline applies to:

- hydrogen produced by electrolysis
- the storage of hydrogen (except underground storage in natural, geological features)
- the distribution of hydrogen by pipeline, road, rail or ship
- hydrogen refuelling stations and
- the end use of hydrogen in electricity generation and as an industrial feedstock.

These elements of the hydrogen supply chain are explained in detail in section 2.1. This guideline does not apply to forms of hydrogen production other than electrolysis.



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About hydrogen



2.1 How hydrogen is used

Hydrogen is very versatile and can be used in many ways and across various applications. The supply chain is outlined in Figure 1 and described below. It can be broadly separated into four main components: production, storage, distribution and end-use. Hydrogen development may include one or many parts of this supply chain.

Hydrogen production

Hydrogen gas can be produced through electrolysis, which uses an electric current to split water into pure hydrogen and oxygen. The production process is generally powered by renewable energy sources, including wind and solar.

Storage

Once produced, hydrogen can be stored as a compressed or liquified gas for later distribution or use. There are hazards associated with the storage of compressed and liquified hydrogen gas, just as with other gases, including the risk of fire and explosion. Hydrogen must also be cooled to very low temperatures (around minus 253 degrees Celsius) to be stored as a liquified gas.

Distribution

Hydrogen can be blended with natural gas (approximately 10% hydrogen) and distributed through the existing gas network. Alternatively, it may be distributed through a dedicated and purpose-built pipeline.

Compressed and liquified hydrogen can be transported by road, rail or ship and distributed to domestic or international markets. Liquified hydrogen is generally preferred for longer distances as a much greater mass of hydrogen can be transported in this way.

Hydrogen refuelling stations can be used to distribute and transfer hydrogen into freight and private vehicles.

End use

Like fossil fuels, hydrogen can be used to generate electricity, combusted for industrial and residential heating, and used for transport applications. Unlike fossil fuels, hydrogen does not produce greenhouse gas emissions when burned. Therefore, it can help supplement other renewable energy sources when they are low or intermittent.

Hydrogen can also be used as an industrial feedstock to produce materials and chemicals such as ammonia, which is used in fertiliser production, and to replace coking coal in steel manufacturing.

Products made using hydrogen, including ammonia or liquid organic hydrocarbons, can be used to store and transport energy over long distances, including overseas. Once exported, products such as ammonia can be converted back to hydrogen and used in other ways.

New hydrogen fuel cell technology also allows hydrogen to be used to decarbonise the freight industry and power public transport and private vehicles.

2.2 Hydrogen hubs, ports and special activation precincts

The NSW Hydrogen Strategy identifies hydrogen hubs and strategic areas for future hydrogen development. These areas aim to create economies of scale by attracting private investment and reducing production costs.

The strategy identifies Port Kembla and the Port of Newcastle as prospective hydrogen hubs. Both ports have existing infrastructure, transportation links and export capabilities to facilitate the development of the hydrogen industry. The ports also support a range of land uses including ammonia storage or processing and steel production, which will benefit from nearby hydrogen production and storage.

The NSW Hydrogen Strategy also identifies special activation precincts (SAPs) as suitable locations to support the hydrogen hub model. SAPs are strategically planned areas in regional NSW that will help drive investment in services and economic activity for regional communities.

2.3 Hazards and risks of hydrogen development

As with all fuels, there are hazards and risks associated with the production and use of hydrogen. It is classified as a Class 2.1 flammable gas under the Australian Dangerous Goods Code (ADG Code) and burns with a nearly invisible flame.

This means that hydrogen development will require controls to enable its safe use, including adequate ventilation and systems to detect leaks and flames. Nevertheless, some of hydrogen's properties make it safer than other fuels. For example, it is non-toxic, much lighter than air and dissipates rapidly when released or in the event of a leak.

The overall risk of hydrogen development will largely depend on how it is stored and handled, the quantities stored on site, and its location relative to other land uses, particularly if they are sensitive to or have the potential to increase the risks and hazards posed by hydrogen.

The hazards and risks of hydrogen are a key component in selecting a site for development and in the assessment process. Section 4 provides more guidance on these issues.

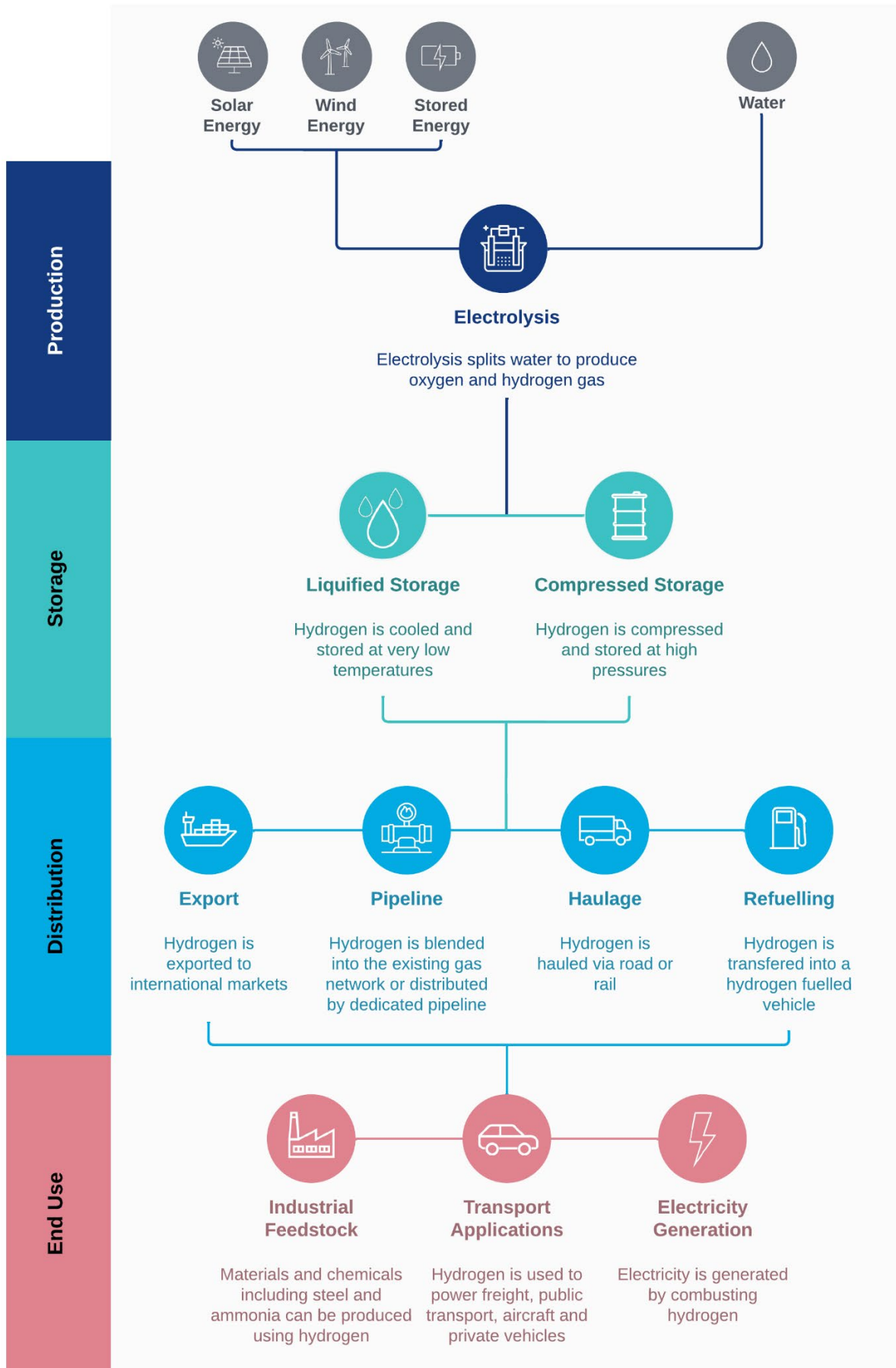


Figure 1 : Hydrogen supply chain

3

NSW planning framework



The NSW planning framework consists of the:

- *Environmental Planning and Assessment Act 1979* (EP&A Act)
- *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation)
- environmental planning instruments (including local environmental plans (LEPs) and state environmental planning policies (SEPPs)), guidelines and development standards.

A key function of the NSW planning framework is to manage how we use land to avoid and minimise conflicting uses and environmental impacts. The planning system does this by designating where certain types of development may be carried out (for example, with or without consent) and setting out an assessment process that is proportionate to the scale, importance, risk and impact of that development.

Some minor development does not need approval at all (exempt development), while other development that would have minimal environmental impact does not need an environmental assessment if it meets specific development standards (complying development certificate). For example, some development in special activation precincts is eligible for complying development planning pathways relevant standards are met (see section 3.3).

Developments permitted with consent require a range of planning assessment and approvals dependent on the scale of the development and its likely environmental impact. These developments are regulated by Part 4 of the EP&A Act. Local development is the most common, requiring a development application be submitted to and decided by the relevant local council. Regionally significant development (RSD) is for development that has a higher capital investment value and is of importance to the region. Regional planning panels provide an elevated and separated development consent process for RSD.

State significant development (SSD) is a pathway reserved for development that is of the highest capital investment value and potentially high environmental impacts. SSD is assessed by the department and is decided either by the Minister (or departmental delegate) or the Independent Planning Commission (where certain thresholds are met).

Developments permissible without consent (typically development or maintenance of critical infrastructure by government agencies) do not require approval from a consent authority and can be self-determined following an environmental assessment. Should this type of development be of a large enough scale, it can become State significant infrastructure (SSI) or Critical SSI and the Minister for Planning becomes the determining authority. This type of development is regulated by Part 5 of the EP&A Act.

Further information on these planning pathways can be found on the department’s website and in the department’s Community Guide to Planning. To determine if hydrogen development is permissible and which planning pathway applies, applicants and planning authorities need to consider:

- how the development is characterised, considering definitions in environmental planning instruments (EPIs) (for example, general industry, heavy industry, chemical industry, gas manufacturing and electricity generation)
- the dominant purpose or principal use of the development
- if the development is permitted with or without consent or is prohibited on the subject land under the applicable EPIs
- the type and scale of the project (for example capital investment value (CIV) and storage quantities).

The sections below give guidance on each of these steps.

Development in NSW ports

With future hydrogen development anticipated in NSW ports, it is important to recognise that the development of port facilities is treated differently in the planning system depending on where it occurs. Development within the declared Lease Areas of Port Botany, the Port of Newcastle and Port Kembla (the three ports), is regulated differently from areas outside the Lease Areas, or in other ports as outlined in the State Environmental Planning Policy (Transport and Infrastructure) 2021 (Transport and Infrastructure SEPP).



3.1 Characterising development

Characterising development involves the process of determining the purpose for which the development is carried out to understand if it is a permissible land use. Development is characterised based on its dominant or principal purpose. That is, the reason the development is being undertaken or the end to which the development serves.

Development must be characterised according to land use terms defined in EPIs. Given that hydrogen development is not explicitly defined in any legislation under the NSW planning system, the most relevant land use terms should be used.

Table 1 provides a guide to how different parts of the hydrogen supply chain could be characterised under the Standard Instrument – Principal Local Environmental Plan 2006 (Standard Instrument) and relevant SEPPs. The definitions of each land use term are provided in full in Appendix A..

Development may involve many aspects of the hydrogen supply chain including production and distribution. If the dominant purpose can be identified as just one of these uses, and the remaining uses are ancillary, then the whole development can be taken to be for that dominant purpose. An ancillary use is generally a use that is subordinate or subservient to the dominant purpose.

If a development involves one or more uses that serve their own purpose and are not closely related or integrated, they are likely to be independent uses (depending on the facts and circumstances of each case which will need to be individually assessed). In such circumstances, the development may be considered mixed-use development and each independent use must be permissible.

Box 1 gives examples of a range of scenarios.

The department's planning circular PS 21-008: Planning Circular – How to Characterise Developments gives more information and outlines some general matters to consider when characterising development.

Table 1. Characterising hydrogen development

Hydrogen supply chain	Purpose of the development	Land use term
Production	Production of hydrogen using electrolysis	<i>Heavy industry</i> (includes <i>hazardous industry</i>)
Storage	Bulk storage of hydrogen as: <ul style="list-style-type: none"> • gas or compressed gas • liquified gas 	<i>Heavy industrial storage establishment</i> (includes <i>hazardous storage establishment</i>) <i>Port facilities</i> (outside Lease Area) <i>Port facilities</i> (in Lease Area)
Distribution - refuelling	The transfer of hydrogen as a fuel source from a storage tank into a hydrogen-fuelled vehicle	<i>Service station</i> <i>Highway service centre</i> <i>Port facilities</i> (outside Lease Area) <i>Port facilities</i> (in Lease Area) <i>Wharf or boating facilities</i>
Distribution - other	The distribution of hydrogen by pipe, road, rail, air or sea for domestic use or export to international markets	<i>Freight transport facility</i> <i>Port facilities</i> (outside Lease Area) <i>Port facilities</i> (in Lease Area) <i>Wharf or boating facilities</i> <i>Rail infrastructure facilities</i>
End Use - electricity	The use of hydrogen fuel for the generation of electricity	<i>Electricity generating works</i>
End Use – industrial feedstock	The use of hydrogen in industrial processes such as ammonia and steel production	<i>Heavy industry</i>

Box 1 | Characterisation examples

The following examples are provided as a guide only and are not intended as to be a definitive or exhaustive characterisation of hydrogen development.

Dominant purpose

A development is proposed that will include an electrolysis plant to produce hydrogen, and bulk hydrogen storage and loading facilities to allow offsite distribution. The dominant purpose for this development would be the hydrogen production facility, as the storage and distribution would likely be ancillary to and support hydrogen production on site.

Dominant purpose

A development is proposed that will include an electrolysis plant to produce hydrogen, and a hydrogen refuelling station that will use the hydrogen produced on site to refuel vehicles. The dominant purpose for this development would likely be the hydrogen production facility, as the refuelling station would be ancillary to and support hydrogen production on site.

Ancillary use

A development is proposed that will include a hydrogen production facility with a battery storage system which will store green energy from the transmission network. As the battery storage would only be used to power the electrolysis plant and not for commercial storage or supply of energy to the grid, it could be considered an ancillary use subservient to the dominant purpose of hydrogen production.

Mixed use

A development is proposed that will include a hydrogen electrolysis plant and a solar farm that will export energy to the grid but also power on-site hydrogen production. In this instance, the solar farm and the hydrogen production could both serve their own purposes and be considered independent uses. As such, the development could be considered mixed use. Therefore, both the solar farm and hydrogen production facility would need to be permissible with consent on the land under the relevant EPI¹.

¹ Development consent may be granted for an SSD project even if the development is partly prohibited (section 4.38(3) of the *Environmental Planning and Assessment Act 1979*)

3.2 Permissibility

Once a development has been characterised, the relevant EPIs should be used to determine if the proposed development is permissible and if planning consent or approval is required. Table 2 summarises permissible uses for different zones under the Standard Instrument and relevant SEPPs including the Transport and Infrastructure SEPP and the State Environmental Planning Policy (Industry and Employment) 2021.

All LEPs must be prepared in accordance with the Standard Instrument. However, an LEP may afford additional permissibility in some circumstances and consequently vary from the summary in Table 2. Consequently, applicants should check the applicable LEP and other applicable SEPPs on the [NSW Legislation website](#) for any variations from the Standard Instrument.

Table 2. Permissibility of hydrogen development

Characterisation	Permissibility
Heavy industries (Includes <i>hazardous industry</i>)	Permissible with consent in: <ul style="list-style-type: none"> E5 and IN3 zones under the Standard Instrument² IN3 and SP1 zones under the Transport and Infrastructure SEPP³
Heavy industrial storage establishment (Includes <i>hazardous storage establishments</i>)	Permissible with consent in: <ul style="list-style-type: none"> E5 and IN3 zones under the Standard Instrument² SP1 zone under the Transport and Infrastructure SEPP³
Freight transport facilities	Permissible with consent in: <ul style="list-style-type: none"> E4, E5, IN1 and IN3 zones under the Standard Instrument² IN1, IN3 and SP1 zones under the Transport and Infrastructure SEPP³
Port facilities – located in port Lease Areas	Permissible with consent in: <ul style="list-style-type: none"> IN3 and SP1 zones under the Transport and Infrastructure SEPP³ IN1, IN3, SP1 or RE1 zones if carried out by or on behalf of a public authority and has a CIV of \$100 million (M) or less⁴ Permissible without consent in IN1, IN3, SP1 or RE1 zones if carried out by or on behalf of a public authority and has a CIV of more than \$100 M ⁵

² Land Use Table, Part 2 of the Standard Instrument (Local Environmental Plans) Order 2006

³ Land Use Table, Part 5.2, of the State Environmental Planning Policy (Transport and Infrastructure) 2021

⁴ Section 5.16 of the State Environmental Planning Policy (Transport and Infrastructure) 2021

⁵ Section 5.16 of the State Environmental Planning Policy (Transport and Infrastructure) 2021

Characterisation	Permissibility
<p>Port facilities – located outside port Lease Areas</p>	<p>Permissible with consent in:</p> <ul style="list-style-type: none"> W3 zone under the Standard Instrument² unzoned land or in a prescribed zone (B4, B8, IN1, IN3, IN4, SP1, SP2, SP3, RE1, W2, W3) by any person if it's the erection or use of a structure within an existing port facility not directly related to the operation of the port⁶ IN3 and SP1 zones within the three ports under the Transport and Infrastructure SEPP³ <p>Permissible without consent under the Transport and Infrastructure SEPP if:</p> <ul style="list-style-type: none"> carried out by or on behalf of the Newcastle Port Corporation or Transport for NSW in a prescribed zone (B4, B8, IN1, IN3, IN4, SP1, SP2, SP3, RE1, W2, W3)⁷ or on any land providing the development is directly related to an existing port facility⁷ by or on behalf of any other public authority in a prescribed zone (B4, B8, IN1, IN3, IN4, SP1, SP2, SP3, RE1, W2, W3)⁷
<p>Wharf or boating facilities</p>	<p>Permissible with consent in:</p> <ul style="list-style-type: none"> W3 zone under the Standard Instrument² SP1 zone under the Transport and Infrastructure SEPP³ IN1, IN3, SP1 or RE1 zones if carried out by or on behalf of a public authority and has a CIV of \$100M or less⁴ <p>Permissible without consent:</p> <ul style="list-style-type: none"> in IN1, IN3, SP1 or RE1 zones if carried out by or on behalf of a public authority and has a CIV of more than \$100M⁵ on any land (not including land reserved under the <i>National Parks and Wildlife Act 1974</i> unless by exception) if by or on behalf of a public authority under the Transport and Infrastructure SEPP⁸
<p>Rail infrastructure facilities</p>	<p>Permissible with consent by any person in a prescribed zone (E4, E5, IN1, IN2, IN3, SP1 and SP2) under the Transport and Infrastructure SEPP if a rail freight terminal, siding or intermodal facility⁹</p> <p>Permissible without consent on any land (not including land reserved under the <i>National Parks and Wildlife Act 1974</i> unless by exception) if carried out by or on behalf of a public authority¹⁰</p>

⁶ Section 2.78 and 2.81, Division 13, of the State Environmental Planning Policy (Transport and Infrastructure) 2021

⁷ Section 2.78 and 2.80, Division 13, of the State Environmental Planning Policy (Transport and Infrastructure) 2021

⁸ Section 2.80, Division 13, of the State Environmental Planning Policy (Transport and Infrastructure) 2021

⁹ Section 2.94, Division 13, of the State Environmental Planning Policy (Transport and Infrastructure) 2021

¹⁰ Section 2.92, Division 13, of the State Environmental Planning Policy (Transport and Infrastructure) 2021

Characterisation	Permissibility
<i>Service station</i>	<p>Permissible with consent in:</p> <ul style="list-style-type: none"> • E1, E3 and B2 zones under the Standard Instrument² • SP1 zone under the Transport and Infrastructure SEPP³ • IN1 zone for land to which the State Environmental Planning Policy (Industry and Employment) 2021 applies¹¹ • Enterprise, Agribusiness and Mixed Use zones in the Western Sydney Aerotropolis¹²
<i>Highway service centre</i>	<p>Permissible with consent in a road corridor for a freeway, main road or tollway under the Transport and Infrastructure SEPP¹³</p> <p>Enterprise and Agribusiness zones in the Western Sydney Aerotropolis¹²</p>
<i>Electricity generating works</i>	<p>Permissible with consent in:</p> <ul style="list-style-type: none"> • on any land for electricity generation using waves, tides or aquatic thermals as a relevant fuel source¹⁴ • prescribed non-residential use zone (RU1, RU2, RU3, RU4, E4, E5, IN1, IN2, IN3, IN4, SP1, SP2 and W4) in the Transport and Infrastructure SEPP¹⁴ • SP1 zones in the three ports under the Transport and Infrastructure SEPP³

3.3 Planning pathways

Once a development has been characterised and its permissibility established, it can then be regulated by and assessed through one of several planning pathways within the NSW planning framework. Tables 3 to 10 outline the relevant planning pathways for the classifications established in section 3.2. These tables focus on hydrogen development and do not specifically address the thresholds and triggers for other derivatives such as ammonia, methanol or steel production.

¹¹ Section 2.10, Chapter 2, of the State Environmental Planning Policy (Industry and Employment) 2021

¹² Land Use Table, Chapter 4, of the State Environmental Planning Policy (Western Parkland City) 2021

¹³ Section 2.117, Subdivision 2, Division 17, of the State Environmental Planning Policy (Transport and Infrastructure) 2021

¹⁴ Section 2.36, Division 4, of the State Environmental Planning Policy (Transport and Infrastructure) 2021

Table 3. Planning pathways for hydrogen development that is a heavy industry

Heavy industry pathway	Trigger or threshold
Local development	If permissible with consent and none of the below
RSD	More than \$30M CIV ¹⁵
SSD	<p>More than \$30M CIV fuel, gas or inorganic fertiliser manufacturing¹⁶</p> <p>More than 50 tonnes hydrogen present (major hazard facility)¹⁶</p> <p>If carried out on land in Lease Area or unzoned land in three ports that is permissible with consent and has either a CIV greater than \$100m or is designated development¹⁷</p> <p>More than \$30M CIV in the Western Sydney Aerotropolis¹⁸</p>
SSI or Critical SSI	<p>Development that would be an activity for which the proponent would be the determining authority and would require an EIS¹⁹</p> <p>If the activity is, or is on land, declared SSI or CSSI under a SEPP</p>

Table 4. Planning pathways for hydrogen development that is a hazardous storage establishment

Hazardous storage establishment pathway	Trigger or threshold
Local development	If permissible with consent and none of the below
RSD	More than \$30M CIV ¹⁵
SSD	<p>More than \$30M CIV with gas storage or chemical storage¹⁶</p> <p>More than 50 tonnes hydrogen present (major hazards facility)¹⁶</p> <p>If carried out on land in Lease Area or unzoned land in three ports that is permissible with consent and has either a CIV greater than \$100m or is designated development (except for rail freight terminals and shipping facilities)¹⁷</p> <p>More than \$30M CIV in the Western Sydney Aerotropolis¹⁸</p>
SSI or Critical SSI	<p>Development that would be an activity for which the proponent would be the determining authority and would require an EIS¹⁹</p> <p>If the activity is, or is on land, declared SSI or CSSI under a SEPP</p>

¹⁵ Section 2, Schedule 6 of the State Environmental Planning Policy (Planning Systems) 2021

¹⁶ Section 10, Schedule 1 of the State Environmental Planning Policy (Planning Systems) 2021 and Schedule 15 of the Work Health and Safety Regulation 2017

¹⁷ Section 5.27, Chapter 5 of the State Environmental Planning Policy (Transport and Infrastructure) 2021

¹⁸ Section 29, Schedule 1 of the State Environmental Planning Policy (Planning Systems) 2021

¹⁹ Section 1, Schedule 3 of the State Environmental Planning Policy (Planning Systems) 2021

Table 5. Planning pathways for hydrogen development that is a freight transport facility

Freight transport facility pathway	Trigger or threshold
Local development	If permissible with consent and none of the below
RSD	More than \$30M CIV ¹⁵
SSD	More than 50 tonnes hydrogen present (major hazards facility) ¹⁶ More than \$30M CIV in the Western Sydney Aerotropolis ¹⁸

Table 6. Planning pathways for hydrogen development that is an electricity generating work

Electricity generating works pathway	Trigger or threshold
Local development	If permissible with consent and none of the below
RSD	More than \$5M CIV ²⁰
SSD	More than \$30M CIV for electricity generation or heat ²¹ More than \$10M if environmentally sensitive area of State significance ²¹ More than \$30M CIV in the Western Sydney Aerotropolis ¹⁸
SSI or Critical SSI	Development that would be an activity for which the proponent would be the determining authority and would require an EIS ¹⁹ If the activity is, or is on land, declared SSI or CSSI under a SEPP



²⁰ Section 5, Schedule 6 of the State Environmental Planning Policy (Planning Systems) 2021

²¹ Section 20, Schedule 1 of the State Environmental Planning Policy (Planning Systems) 2021

Table 7. Planning pathways for hydrogen development a service station or highway service centre

Service station and highway service centre pathway	Trigger or threshold
Local development	If permissible with consent and none of the below
RSD	More than \$30M CIV ¹⁵
SSD	More than \$30M gas or chemical storage ¹⁶ More than 50 tonnes hydrogen present (major hazards facility) ¹⁶ If carried out on land in Lease Area or unzoned land in three ports that is permissible with consent and has either a CIV greater than \$100M or is designated development ¹⁷ More than \$30M CIV in the Western Sydney Aerotropolis ¹⁸
SSI or Critical SSI	Development that would be an activity for which the proponent would be the determining authority and would require an EIS ¹⁹ If the activity is, or is on land, declared SSI or CSSI under a SEPP

Table 8. Planning pathways for hydrogen development that is a wharf or boating facilities

Wharf or boating facility pathway	Trigger or threshold
Local development	If permissible with consent and none of the below
RSD	More than \$5M CIV ²⁰
SSD	More than \$30m CIV (port facilities and wharf or boating facilities) ²² More than 50 tonnes hydrogen present (major hazards facility) ¹⁶ If carried out on land in Lease Area or unzoned land in three ports that is permissible with consent and has either a CIV greater than \$100M or is designated development (except for rail freight terminals and shipping facilities) ¹⁷
SSI or Critical SSI	If carried out on land in Lease Area or unzoned land in three ports that is permissible without consent and is undertaken by or on behalf of a public authority with a CIV greater than \$100M ²³ More than \$30M CIV and carried out by or on behalf of a public authority (does not apply in Lease Areas or unzoned land in three ports) ²⁴

²² Section 18, Schedule 1 of the State Environmental Planning Policy (Planning Systems) 2021

²³ Section 5.28, Chapter 5 of the State Environmental Planning Policy (Transport and Infrastructure) 2021

²⁴ Section 2, Schedule 3 of the State Environmental Planning Policy (Planning Systems) 2021

Table 9. Planning pathways for hydrogen development that is a port facility

Port facility pathway	Trigger or threshold
Local development	If permissible with consent and none of the below
Exempt development	Change of use in three ports Lease Areas where standards are met ²⁵
RSD	More than \$5M CIV ²⁰
SSD	<p>More than \$30M CIV (port facilities and wharf or boating facilities)²²</p> <p>More than 50 tonnes hydrogen present (major hazards facility)¹⁶</p> <p>If carried out on land in Lease Area or unzoned land in three ports that is permissible with consent and has either a CIV greater than \$100m or is designated development (except for rail freight terminals and shipping facilities)¹⁷</p>
SSI or Critical SSI	<p>If carried out on land in Lease Area or unzoned land in three ports that is permissible without consent and is undertaken by or on behalf of a public authority with a CIV greater than \$100M²³</p> <p>More than \$30M CIV and carried out by or on behalf of a public authority (does not apply in Lease Areas or unzoned land in three ports)²⁴</p> <p>Development for which the proponent would be the determining authority and would require an EIS</p> <p>If declared SSI or CSSI under a SEPP</p>



²⁵ Section 21, Schedule 10, of the State Environmental Planning Policy (Transport and Infrastructure) 2021

Table 10. Planning pathways for hydrogen development that is a rail infrastructure facility

Rail infrastructure facility pathway	Trigger or threshold
Local development	If permissible with consent and none of the below
Exempt development	Construction/installation of railway tracks and associated infrastructure within the three ports ²⁶
Complying development	Erection of rail terminal facilities if it will not include handling of dangerous goods ²⁷ .
RSD	More than \$30M CIV ¹⁵
SSD	More than \$30M railway freight terminal, sidings, and intermodal facilities ²⁸
	More than 50 tonnes hydrogen present (major hazards facility) ¹⁶
	More than \$30M CIV in the Western Sydney Aerotropolis ¹⁸
SSI or Critical SSI	More than \$50M for rail infrastructure carried out by or on behalf of ARTC ²⁹
	Development for which the proponent would be the determining authority and would require an EIS
	If declared SSI or CSSI under a SEPP

Ports

Certain development is complying development in NSW ports if it will have minimal environmental impact and meets the criteria outlined in section 2.83 of the Transport and Infrastructure SEPP, or in the case of the three ports, Part 5.3 and Schedule 11 of the SEPP.

However, for most hydrogen development, it is likely that only minor works such as pipelines, electricity transmission, or access roads will be considered complying development. If these works are ancillary to a hydrogen development that requires consent, they should generally be included in the development application and not undertaken as complying development.

Special activation precincts

Many industrial and employment uses of land that usually require a development consent under the current planning framework can be undertaken as complying development within SAPs.

²⁶ Section 22, Schedule 10, of the State Environmental Planning Policy (Transport and Infrastructure) 2021

²⁷ Section 17A, Schedule 11, of the State Environmental Planning Policy (Transport and Infrastructure) 2021

²⁸ Section 19, Schedule 1 of the State Environmental Planning Policy (Planning Systems) 2021

²⁹ Section 3, Schedule 3 of the State Environmental Planning Policy (Planning Systems) 2021

SAPs including those in Wagga Wagga, Moree and Parkes have masterplans and delivery plans that guide the location of industrial development and other land uses. While some hydrogen development may be eligible for a streamlined planning process (complying development) in the future, this will depend on the relevant standards set under the State Environmental Planning Policy (Precincts – Regional) 2021 and the scope and scale of the proposed development.

An activation precinct certificate must be obtained from the Regional Growth Development Corporation before a complying development certificate is issued. The requirement for an activation precinct certificate is regulated under the EP&A Regulation. The activation precinct certificate provides an assurance that a proposal is consistent with the relevant land-use table, master plan and delivery plan.

For potentially hazardous development (see section 4.1), a preliminary hazards analysis (PHA) must accompany the application for an activation precinct certificate. The Regional Growth Development Corporation will engage with the Department of Planning, Housing and Infrastructure to identify if the development poses a low, medium or high risk.

If a proposed development is high risk, it will not qualify for complying development. In these cases, consent must be obtained from the consent authority under Part 4 of the EP&A Act. Additionally, major hazards facilities cannot be carried out as complying development.

Given the inherit risks associated with hydrogen, and the infancy of the industry, applicants are encouraged to discuss their proposal with the department early to identify if it is likely to trigger a high risk and consequently whether the complying development pathway is likely to be appropriate.

More information about development in SAPs is available on the department's [special activation precincts webpage](#).

3.4 Environmental impact assessment

Consent authorities must consider the likely impacts of a development on the natural and built environments, and social and economic impacts in a locality when considering whether to grant consent to a development³⁰. Consequently, development that requires consent will generally need to be accompanied by an environmental assessment in the form of either a statement of environmental effects (SEE) or an EIS.

³⁰ Section 4.15 of the Environmental Planning and Assessment Act 1979

An SEE must accompany all development applications unless the development is either designated development or SSD, in which case an EIS is required. Designated development refers to developments that are high-impact or located in or near an environmentally sensitive area. The thresholds for designated development are listed in Schedule 3 of the EP&A Regulation. Hydrogen should be considered a chemical for the purposes of applying these thresholds.

An EIS must be prepared to support an application for SSI and CSSI.

The requirements for an SEE are outlined in the department's Application Requirements. The requirements for an EIS are outlined in section 190 of the EP&A Regulation and in the department's State Significant Development Guidelines – Preparing an EIS and State Significant Infrastructure Guidelines – Preparing an EIS.

Applicants of designated development and SSD and proponents of SSI or CSSI must contact the department to request the Planning Secretary's Environmental Assessment Requirements. These will outline the matters that must be addressed in the EIS.

Designated development in SAPs

Certain development within the Regional Enterprise Zone in the Parkes, Wagga Wagga or Moree SAPs (such as chemical industrial facilities and works and chemical storage facilities) are not considered designated development despite meeting the thresholds prescribed in the EP&A Regulation³¹.



³¹ Section 50, Schedule 3 of the Environmental Planning and Assessment Regulation 2021

4

Key assessment issues



This section outlines some of the key assessment issues that may arise for hydrogen development and activities. Importantly, this is a guide and not intended to be an exhaustive list. Any assessment must address the requirements of the relevant planning and or consent authority and be proportionate to the scale and impacts of the individual development.

4.1 Hazards and risks

As hydrogen is a Class 2.1 flammable gas under the ADG Code, hydrogen development may potentially be a “hazardous industry” for the purpose of the State Environmental Planning Policy (Resilience and Hazards) 2021 (Resilience and Hazards SEPP). If it does constitute a “potentially hazardous industry” a preliminary hazard analysis (PHA) must be prepared and submitted with a development application for hydrogen production, storage and use.

The Resilience and Hazards SEPP incorporates the provisions of the repealed State Environmental Planning Policy No. 33 Hazardous and Offensive Development also known as SEPP 33. SEPP 33 guidelines dated January 2011 ([Applying SEPP 33 Guidelines](#)) continue to apply to potentially hazardous or offensive industries identified under the Resilience and Hazards SEPP. These guidelines set out the process and thresholds for determining if a PHA is required. For Class 2.1 Flammable Gases, including hydrogen, the requirement for a PHA generally depends on:

- the amount of gas being stored or handled
- the state in which it is stored
- its location from other land uses.

The requirement for a PHA starts in the following circumstances:

- 0.1 tonnes of pressurised gas would be located 15 metres from sensitive land uses (residential or other more sensitive uses), or 10 metres from other land uses (commercial or industrial)
- 0.5 tonnes of liquified pressurised gas would be located 20 metres from sensitive land uses or 10 metres for other land uses.

Figures 6 and 7 within Appendix 4 of [Applying SEPP 33 Guidelines](#) should be used to determine whether hydrogen development is potentially hazardous. Notwithstanding the Hazards and Resilience SEPP may still apply in circumstances where the quantity of hydrogen or other dangerous goods is below the risk screening thresholds in Appendix 4.

For example, this may be the case if the proposal includes storage of two incompatible materials which would elevate the toxic or explosive risk of a proposal. Consequently, Appendix 3 of the [Applying SEPP 33 Guidelines](#) should be used to determine if the proposal is considered a potentially hazardous industry and activity even if the screening thresholds are met.

If a PHA is required, it must be prepared in accordance with the [Hazardous Industry Planning Advisory Paper No 4 – Risk Criteria for Land Use Planning](#).

More information about the hazards assessment framework in NSW can be found in the [Planning guidelines for hazardous development](#).

4.2 Site selection

Good site selection provides an opportunity to avoid and minimise negative impacts and risks of development at the outset. A good site may result in a greater social licence to operate and minimal impacts on the environment, surrounding land uses and the community.

As hydrogen development may be potentially hazardous, good site selection is imperative to help avoid and minimise hazards and risks. There are many technical and commercial factors that need to be considered when selecting a site for hydrogen development. These include:

- proximity to sensitive land uses, including residential
- the potential to sterilise the development potential of surrounding or adjacent land (for example future residential development, expansion of port areas or uses)
- proximity to transport infrastructure
- development restrictions, including land use zoning

Applicants should carefully assess the suitability of the site in their development application and outline how these considerations have been factored into site selection and design of the project.

4.3 Cumulative impacts

Cumulative impacts are the incremental impacts of the project, combined with impacts from other developments. These impacts can be environmental, economic and social in nature.

When hydrogen activities are proposed in concentrated industrial areas, such as hydrogen hubs or major ports, cumulative impacts can increase the risk profile of the development and the impacts that may be experienced off-site. In these cases, the cumulative hazard and risk profiles of the surrounding area must be fully quantified and understood.

The potential for and consequence of cumulative impacts must be incorporated into a PHA (if required) and must consider other operating, approved and proposed industries and activities within

the locality. These might include other hydrogen-related development, fuel storage, chemical manufacturing or other potentially hazardous development.

In the case of State significant development, applicants must assess the likely cumulative impacts of the project at a strategic level and site-based level in accordance with the department's [Cumulative Impact Assessment Guidelines for State Significant Projects \(PDF 1,393 KB\)](#).

4.4 Other assessment issues

Other issues that may need to be assessed will depend on the scale and type of development being proposed. These may include, but are not limited to:

- **Water management** – where water take is associated with the development, demonstration that there is sufficient water available for the proposed operation, including identification of the source(s) of water.
- **Biodiversity** – if the development would impact native vegetation, habitat of threatened species or ecological communities an assessment must be undertaken in accordance with the *Biodiversity Conservation Act 2016*.
- **Air quality and noise** – an assessment of any air quality or noise impacts including details of how impacts associated with construction and operation would be minimised and managed.
- **Heritage** – an assessment of potential impacts on Aboriginal cultural heritage and non-aboriginal heritage.
- **Traffic and transport** – consideration of impacts to the local and classified road network during construction and operation and details of road upgrades and infrastructure works, if necessary.
- **Waste** – details and classification of any waste streams that would be generated (including brine water as a by-product of hydrogen production) and details of storage, handling and disposal.
- **Contamination** – a site contamination assessment in accordance with the Managing Land Contamination Planning Guidelines: SEPP 55 – Remediation of Land (DUAP, 1998), including characterisation of the nature and extent of any contamination on the site and surrounding area.
- **Community and stakeholder engagement** – for State significant development an engagement strategy consistent with the department's Undertaking Engagement Guidelines for State Significant Projects.

Appendix

A

Land use definitions



Development	Definition
<p><i>Heavy industry</i> Standard Instrument</p>	<p>A building or place used to carry out an industrial activity that requires separation from other development because of the nature of the processes involved, or the materials used, stored or produced, and includes —</p> <ul style="list-style-type: none"> a) hazardous industry, or b) offensive industry. <p>It may also involve the use of a hazardous storage establishment or offensive storage establishment.</p>
<p><i>Hazardous industry</i> Standard Instrument</p>	<p>A building or place used to carry out an industrial activity that would, when carried out and when all measures proposed to reduce or minimise its impact on the locality have been employed (including, for example, measures to isolate the activity from existing or likely future development on other land in the locality), pose a significant risk in the locality —</p> <ul style="list-style-type: none"> a) to human health, life or property, or b) to the biophysical environment.
<p><i>Heavy industrial storage establishment</i> Standard Instrument</p>	<p>A building or place used for the storage of goods, materials, plant or machinery for commercial purposes and that requires separation from other development because of the nature of the processes involved, or the goods, materials, plant or machinery stored, and includes any of the following —</p> <ul style="list-style-type: none"> a) a hazardous storage establishment, b) a liquid fuel depot, c) an offensive storage establishment
<p><i>Hazardous storage establishment</i> Standard Instrument</p>	<p>A building or place that is used for the storage of goods, materials or products and that would, when in operation and when all measures proposed to reduce or minimise its impact on the locality have been employed (including, for example, measures to isolate the building or place from existing or likely future development on other land in the locality), pose a significant risk in the locality —</p> <ul style="list-style-type: none"> a) to human health, life or property, or b) to the biophysical environment.
<p><i>Freight transport facility</i> Standard Instrument</p>	<p>A facility used principally for the bulk handling of goods for transport by road, rail, air or sea, including any facility for the loading and unloading of vehicles, aircraft, vessels or containers used to transport those goods and for the parking, holding, servicing or repair of those vehicles, aircraft or vessels or for the engines or carriages involved.</p>

Development	Definition
<p><i>Port facilities</i></p> <p>Chapter 5, Transport and Infrastructure SEPP</p>	<p>Facilities on land in the Lease Area, or the Intertrade Industrial Park, used in connection with the carrying of freight and persons by water from one port to another for business or commercial purposes, and includes any of the following –</p> <ul style="list-style-type: none"> a) facilities for the embarkation or disembarkation of passengers onto or from any vessels, including public ferry wharves, b) facilities for the loading or unloading of freight onto or from vessels and freight receipt, processing, land transport and storage facilities, c) wharves for commercial fishing operations, d) refuelling, launching, berthing, mooring, storage or maintenance facilities for any vessel, e) sea walls or training walls, f) administration and port operations buildings and facilities, g) communication, security and safety facilities, h) utilities and services, road and rail infrastructure, pipelines and car parks.
<p><i>Port facilities</i></p> <p>Division 13, Transport and Infrastructure SEPP Standard Instrument</p>	<p>Any of the following facilities at or in the vicinity of a designated port within the meaning of section 47 of the <i>Ports and Maritime Administration Act 1995</i> –</p> <ul style="list-style-type: none"> a) facilities for the embarkation or disembarkation of passengers onto or from any vessels, including public ferry wharves, b) facilities for the loading or unloading of freight onto or from vessels and associated receipt, land transport and storage facilities, c) wharves for commercial fishing operations, d) refuelling, launching, berthing, mooring, storage or maintenance facilities for any vessel, e) sea walls or training walls, f) administration buildings, communication, security and power supply facilities, roads, rail lines, pipelines, fencing, lightning or car parks.
<p><i>Service station</i></p> <p>Standard Instrument</p>	<p>A building or place used for the sale by retail of fuels and lubricants for motor vehicles, whether or not the building or place is also used for any one or more of the following –</p> <ul style="list-style-type: none"> a) the ancillary sale by retail of spare parts and accessories for motor vehicles, b) the cleaning of motor vehicles, c) installation of accessories, d) inspecting, repairing and servicing of motor vehicles (other than body building, panel beating, spray painting, or chassis restoration), e) the ancillary retail selling or hiring of general merchandise or services or both.

Development	Definition
<p><i>Highway service centre</i></p> <p>Standard Instrument</p>	<p>A building or place used to provide refreshments and vehicle services to highway users. It may include any one or more of the following –</p> <ul style="list-style-type: none"> a) a restaurant or cafe, b) take away food and drink premises, c) service stations and facilities for emergency vehicle towing and repairs, d) parking for vehicles, e) rest areas and public amenities.
<p><i>Electricity generating works</i></p> <p>Standard Instrument</p>	<p>A building or place used for the purpose of making or generating electricity or electricity storage.</p>
<p><i>Wharf or boating facilities</i></p> <p>Standard Instrument</p>	<p>A wharf or any of the following facilities associated with a wharf or boating that are not port facilities –</p> <ul style="list-style-type: none"> (a) facilities for the embarkation or disembarkation of passengers onto or from any vessels, including public ferry wharves, (b) facilities for the loading or unloading of freight onto or from vessels and associated receipt, land transport and storage facilities, (c) wharves for commercial fishing operations, (d) refuelling, launching, berthing, mooring, storage or maintenance facilities for any vessel, (e) sea walls or training walls, (f) administration buildings, communication, security and power supply facilities, roads, rail lines, pipelines, fencing, lighting or car parks.

Development	Definition
<p><i>Rail infrastructure facilities</i></p> <p>Division 15, Transport and Infrastructure SEPP</p>	<p>Includes —</p> <ul style="list-style-type: none"> (a) railway tracks, associated track structures, cuttings, drainage systems, fences, tunnels, ventilation shafts, emergency accessways, bridges, embankments, level crossings and roads, pedestrian and cycleway facilities, and (b) signalling, train control, communication and security systems, and (c) power supply (including overhead power supply) systems, and (d) railway stations, station platforms and areas in a station complex that commuters use to get access to the platforms, and (e) public amenities for commuters, and (f) associated public transport facilities for railway stations, and (g) facilities for the assembly, maintenance and stabling of rolling stock, and (h) facilities for the dismantling and stabling of rolling stock taken out of service, and (i) refuelling depots, garages, maintenance facilities and storage facilities that are for the purposes of a railway, and (j) railway workers' facilities, and (k) rail freight terminals, sidings and freight intermodal facilities, and (l) buildings for or related to railway purposes, <p>but do not include buildings or works that are for residential, retail or business purposes and unrelated to railway purposes.</p>