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ENVIRONMENTAL REVIEW

Town Planning Scheme 5, Amendment 22 (West End) – Town of Port Hedland

EPA Assessment No. 1806

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Invitation to Make a Submission

The Town of Port Hedland invites people to make a submission on this scheme amendment. The environmental impact assessment process is designed to be transparent and accountable, and includes specific points for public involvement, including opportunities for public review of environmental review documents. In releasing this document for public comment, the Environmental Protection Authority (EPA) advises that no decisions have been made to allow this scheme amendment to be implemented.

The EPA has identified one environmental factor relevant to the Town of Port Hedland Town Planning Scheme (TPS) No 5 Amendment No 22 which is required to be addressed in the Environmental Review (ER) document. This factor is protection from dust generated at nearby port facilities, to which a robust and implementable planning response is required.

In accordance with the *Environmental Protection Act 1986*, an ER has been prepared by the Town of Port Hedland which describes this scheme amendment and its likely effects on the environment in accordance with the EPA's scope for this ER.

The purpose of proposed Amendment No 22, known as the "West End" rezoning, is to protect from unacceptable dust exposure by:

- Establishing appropriate zoning in which residential dwellings are designed and constructed in such a way as to be unsuitable for occupation by families with children or elderly persons.
- Ensure dwellings will be designed and developed to mitigate exposure to dust.

In this context the primary purpose of this ER is to determine the dwelling types, residential densities and design criteria that will enable future dwellings in the amendment area to meet air quality standards. The key recommendations will be incorporated into the TPS Amendment No. 22 Scheme Provisions, which is a statutory mechanism to ensure compliance with recommendations and commitments.

The ER is available for a public review period of 6 weeks from [date] closing on [date].

Comments from government agencies and from the public will help the EPA to prepare an assessment report from which it will make recommendations to government.

Why write a submission?

A submission is a way to provide information, express your opinion and put forward your suggested course of action - including any alternative approach. It is useful if you indicate any suggestions you have to improve the proposal. All submissions received by the EPA will be acknowledged.

Submissions will be treated as public documents unless provided and received in confidence, subject to the requirements of the *Freedom of Information Act 1992* (FOI Act), and may be quoted in full or in part in the EPA's report.

Why not join a group?

If you prefer not to write your own comments, it may be worthwhile joining a group interested in making a submission on similar issues. Joint submissions may help to reduce the workload for an individual or group, as well as increase the pool of ideas and information. If you form a small group (up to 10 people) please indicate all the names of the participants. If your group is larger, please indicate how many people your submission represents.

Developing a submission

You may agree or disagree with, or comment on, the general issues discussed in the Environmental Review or the specific proposal. It helps if you give reasons for your conclusions, supported by relevant data. You may make an important contribution by suggesting ways to make the proposal more environmentally acceptable.

When making comments on specific elements of the Environmental Review:

- Clearly state your point of view.
- Indicate the source of your information or argument if this is applicable.
- Suggest recommendations, safeguards or alternatives.

Points to keep in mind

By keeping the following points in mind, you will make it easier for your submission to be analysed:

- Attempt to list points so that issues raised are clear. A summary of your submission is helpful.
- Refer each point to the appropriate section, chapter or recommendation in the ER.
- If you discuss different sections of the ER, keep them distinct and separate, so there is no confusion as to which section you are considering.
- Attach any factual information you may wish to provide and give details of the source. Make sure your information is accurate.

Remember to include:

- Your name
- Address

- Date
- Whether and the reason why you want your submission to be confidential

The closing date for submissions is: [date].

Submissions should be mailed to

Town of Port Hedland
PO BOX 41
PORT HEDLAND WA 6721

ATTENTION: Leonard Long

Or alternatively emailed to: mgrpl@porthedland.wa.gov.au

EXECUTIVE SUMMARY

Town of Port Hedland TPS Amendment No. 22 (West End) Environmental Review

The TPS Amendment has been initiated to rezone land situated in the West End of Port Hedland, specifically:

1. Rezoning the land bounded by Anderson, Withnell, Sutherland and Taplin Streets, and The Esplanade, Port Hedland currently zoned "Residential" to "West End Residential" with an applied density code of "Minimum R30".
2. Rezoning the land bounded by Withnell, McKay and Anderson Streets, and the Esplanade Port Hedland from "Residential" to "Town Centre".

Figure 1 outlines the proposed TPS Amendment No. 22 land area.

Purpose of the ER Document

The primary objective of the ER is to:

Determine the dwelling types, residential densities and design criteria that will enable future dwellings in the amendment area to meet the air quality standards specified in the Taskforce Report (EPA, 2009).

Previous EPA Advice and the Port Hedland Dust Taskforce

In the Environmental Protection Bulletin No. 2 – Port Hedland Dust and Noise (EPA, 2009) the EPA expressed concern at current dust levels, emerging health research and current land use planning controls in the vicinity of port ore loading operations. In response, the State Government established the Port Hedland Dust Management Taskforce in May 2009 to review existing reports, and develop a comprehensive management plan and implementation strategy for ongoing dust and noise reduction and air quality management in Port Hedland.

The Dust Taskforce reviewed proposed TPS Amendment No. 22 having regard to potential building design considerations, and also potential population statistics (growth) in the amendment area. The following recommendations were made in relation to TPS Amendment No. 22 with the objective of strengthening local planning policy:

- Building design and performance standards as identified in the CA & MJ Lommers report (identifies measures to mitigate dust exposure), be incorporated into the Scheme Amendment.
- The amendment be modified to include a residential density cap of R80, subject to closer scrutiny of potential bedroom population yield associated with adopting this cap.

- Planning provisions be reviewed as new health and environmental information arises to ensure that the planning response remains appropriate for the environmental conditions of the day.
- Ownership and management structures that encourage common ownership, management and maintenance of building air filtration systems and external fixtures designed to minimise dust ingress.

Environmental Review Scope and Content

The Environmental Protection Authority (EPA) advised the single environmental factor relevant to the Scheme Amendment was dust, which is required to be addressed in the ER document.

The EPA instructions for the scope of work for the ER included:

1. Determine suitable land uses within the area the subject of Amendment 22 to meet dust levels recommended by the Taskforce.
2. Determine which land uses could be permitted within the area the subject of Amendment 22 that would not be adversely impacted by elevated dust levels.
3. Provide an analysis of the potential total population permitted by the proposed amendment compared with the total population permitted by the current zoning. This is required to determine if there is potential that the amendment will lead to a greater number of residents being exposed to elevated dust levels.
4. Determine the most appropriate residential density, dwelling type and design criteria that will enable future dwellings in the amendment area to meet the recommended air quality levels in the Port Hedland Dust Taskforce Management Report”.
5. Determine the most appropriate dwelling type (e.g. residential, group or apartment) in the amendment area that can be designed to meet the recommended air quality criteria specified in the Port Hedland Dust Taskforce management Report.
6. Demonstrate that the proposed Residential Planning Code density (R Code), Building Codes of Australia and scheme provisions prescribed in Amendment 22 will ensure that dwellings will be designed and developed that meet the air quality standards recommended in the Port Hedland Dust Management Report.
7. Provide specific detail on proposed building and infrastructure design that will assist in effective mitigation of elevated dust levels on an on-going basis. It is recommended that dwellings are designed to minimise exposure to fugitive dust. These should include, but not be restricted to:
 - a. Dwelling types and design that would achieve air quality standards.

- b. Filtering air conditioning plants that has the required filtering capability required to handle dust particles of fraction size PM 10.
- c. Air tight window seals (hermetically sealed).
- d. Closed eaves.
- e. High pitched rooves to encourage dust run-off.

Potential Impacts and Proposed Management

High concentrations of dust in Port Hedland, and especially in the town's West End, present a potential impact upon residents health particularly children and elderly as well as the visual amenity of the area.

TPS Amendment No. 22 provides a co-ordinated framework for the management of dust exposure in the "West End" of Port Hedland, whilst supporting appropriate development consistent with the Dust Taskforce. The potential impacts of development at the site have been defined with reference to the dust environmental factor identified by the EPA. The design and management initiatives proposed to provide an environmentally responsive outcome for the Amendment area include:

- Development density will increase to a minimum R30¹ density with a maximum of a R80, minimum lot size of 600m² to be endorsed by Council.
- A limit on the floor area of grouped and multiple dwellings of 110m² (two bedrooms).
- The ability for Council to consider and approve shops and markets in this area;
- New "Aged or Dependent Persons," "Ancillary Accommodation" and "Single House" prohibited.
- "Holiday Accommodation," "Hotel" and "Motel" permitted as development only permitted with Council planning approval after due advertising/ notification.
- "Child Care Service," "Nursing Home" and "Place of Public Meeting, Assembly or Worship" prohibited.
- "Grouped Dwelling" and "Multiple Dwelling" listed as development only permitted with Council planning approval, with additional size and bedroom number constraints imposed. The following requirements on dwellings which will be included as Scheme Provisions:
 - Maximum two rooms capable of use as Bedrooms.

¹ R coding refers to the minimum lot size, i.e. R20 represents 20 lots per hectare or 500m².

- Filtered air-conditioning / mechanical ventilation.
 - Sealed windows, skylights, etc.
 - Building design and orientation to minimise dust ingress, limited outdoor living areas and colours and textures to minimise visual dust impact.
- Whilst the development of permanent residential dwellings will not be prohibited by the scheme amendment. A review of the dust impact will be reassessed after a five year period, to ascertain if any additional measures need to be implemented in the West End Residential area.

Further detail of the proposed management actions and initiatives relevant to each factor is provided in Table A.

Following review of the factors, Scheme Provisions and proposed management, it is concluded that the EPA's objectives in relation to protection from unacceptable dust exposure can be met.

Table A: Summary Table of Environmental Impacts and Management

Factor	EPA Objective	Potential Impacts	EPA Scope of Works	Proposed Management
Pollution Management				
Dust	To ensure that air emissions do not adversely affect environmental values or the health, welfare and amenity of people and land uses by meeting statutory and acceptable standards (EPA, 2004)	<ul style="list-style-type: none"> Elevated dust levels within the amendment area have the potential to impact resident's health, particularly children and elderly, and visual amenity. 	<ul style="list-style-type: none"> Determine suitable land uses within the area the subject of Amendment 22 to meet dust levels recommended by the Taskforce. 	<ul style="list-style-type: none"> No land uses are permitted which may contribute to elevated dust levels within the amendment area.
			<ul style="list-style-type: none"> Determine which land uses could be permitted within the area the subject of Amendment 22 that would not be adversely impacted by elevated dust levels. 	<ul style="list-style-type: none"> Land uses which encourage "at risk" individuals from residing permanently in the amendment area or that are for sole/predominant use by "at risk" individuals are prohibited including: <ul style="list-style-type: none"> Aged or dependent persons dwellings; Nursing homes; Ancillary Accommodation; Child Care Services; Place of Public Meeting, Assembly or Worship Medical Centre; Hospital The inclusion of a Residential Density Cap of R80 to encourage short-stay accommodation over permanent residential accommodation. All forms of short-stay accommodation being 'AA' uses in the West End Residential zone excluding "Holiday Home". A provision in the West End Residential zone relating to management and use of any short-stay accommodation facility. The provision require the following: All developments approved to provide a type of short-stay accommodation shall be subject to a management statement addresses but should not be limited to the on-going use, reception, security, maintenance, caretaking, refurbishment,

Factor	EPA Objective	Potential Impacts	EPA Scope of Works	Proposed Management
				marketing and other services required for the development to operate as a short-stay accommodation facility. The management statement shall be approved by the relevant local government prior to occupation of the development.
			<ul style="list-style-type: none"> ▪ Provide an analysis of the potential total population permitted by the proposed amendment compared with the total population permitted by the current zoning. This is required to determine if there is potential that the amendment will lead to a greater number of residents being exposed to elevated dust levels. 	<ul style="list-style-type: none"> ▪ Single Houses are not prohibited in the West End Residential zone, however, "at risk" individuals are encouraged not to reside in the amendment area. ▪ To limit on-going proliferation of permanent residential development without review of the on-going research into the potential impacts on the populations, a time-limit on development of permanent residential development in the West End Residential zone is required. The provision should require the following: Permanent residential uses shall be reconsidered after 1 July 2016 in the West End Residential zone, being subject to further investigations on the impact of iron-oxide rich dust at elevated levels on the general population."
			<ul style="list-style-type: none"> ▪ Determine the most appropriate residential density, dwelling type and design criteria that will enable future dwellings in the amendment area to meet the recommended air quality levels in the Port Hedland Dust Taskforce Management Report". 	<ul style="list-style-type: none"> ▪ Dwelling type, density and design are designed to deter occupation of the amendment area by "at risk" members of the population. This will include: <ul style="list-style-type: none"> – All dwellings shall be restricted to a maximum floor area of 110m². – All dwellings being restricted number of bedrooms or rooms that may be possible for use as a bedroom to a maximum of two.
			<ul style="list-style-type: none"> ▪ Determine the most appropriate dwelling type (e.g. residential, group or apartment) in the amendment area that can be designed to meet the recommended air quality criteria specified in the Port Hedland Dust Taskforce Management Report. 	<ul style="list-style-type: none"> ▪ A preference should be made for higher density developments as they are more likely to reduce direct air-flow into the building. Amendment 22. This will require: <ul style="list-style-type: none"> – Multiple Dwellings being encouraged over Grouped Dwellings by assigning a maximum Residential Density cap or R80.
			<ul style="list-style-type: none"> ▪ Demonstrate that the proposed Residential Planning Code density (R Code), Building Codes of Australia and scheme provisions prescribed in Amendment 22 will ensure that dwellings will be designed and developed that meet the air quality standards 	<ul style="list-style-type: none"> ▪ All developments are required to include appropriate design solutions to address elevated levels of dust. Amendment 22 shall include a provision which requires the following: <ul style="list-style-type: none"> – All development within the West End Residential zone shall require planning approval. – All applications for planning approval in the "West End"

Factor	EPA Objective	Potential Impacts	EPA Scope of Works	Proposed Management
			<p>recommended in the Port Hedland Dust Management Report.</p>	<p>Residential zone excluding those for minor additions including patios and outbuildings shall be accompanied by a certification from a suitably qualified consultant that the building has been designed limit exposure of users of the building to dust levels which exceed 70ug/m³.</p> <ul style="list-style-type: none"> - Prior to occupation, the Town of Port Hedland shall be require to approve a common management agreement between owners or the owners collectively, and a common facility manager/operator to provide for common on-site management of all units within the development.
			<ul style="list-style-type: none"> ▪ Provide specific detail on proposed building and infrastructure design that will assist in effective mitigation of elevated dust levels on an on-going basis. It is recommended that dwellings are designed to minimise exposure to fugitive dust. These should include, but not be restricted to: <ul style="list-style-type: none"> - Dwelling types and design that would achieve air quality standards. - Filtering air conditioning plants that has the required filtering capability required to handle dust particles of fraction size PM 10 - Air tight window seals (hermetically sealed) - Closed eaves - High pitched rooves to encourage dust run-off. 	<ul style="list-style-type: none"> ▪ The recommendations of the C.A. & M.J. Lommers Pty Ltd have been endorsed as appropriate ways to limit exposure to elevated dust levels. Amendment 22 shall include provisions prepared in conjunction with C.A. & M.J. Lommers Pty Ltd to ensure all developments are designed to incorporate appropriate dust mitigation measures. ▪ Amendment 22 shall also require that all developments

TABLE OF CONTENTS

Page

Invitation to Make a Submission i

EXECUTIVE SUMMARY iv

1.0 INTRODUCTION 1

1.1 Responsible Authority 1

 1.1.1 Proponent Details 1

1.2 TPS Amendment No. 22 Context 1

 1.2.1 Port Hedland Dust Taskforce..... 2

 1.2.2 EPA Assessment of TPS Amendment No. 22..... 3

2.0 SUMMARY OF AMENDMENT 4

2.1 TPS Amendment No. 22 Purpose 4

2.2 TPS Amendment No. 22 Scheme Provisions 4

3.0 ENVIRONMENTAL FACTORS RELEVANT TO THE SCHEME..... 6

3.1 Dust..... 6

 3.1.1 EPA Objective 6

 3.1.2 EPA Scope of Work..... 6

 3.1.3 Current Situation..... 7

 3.1.4 Town of Port Hedland Residential Demand..... 8

 3.1.5 Relevant Policies and Studies 8

3.2 Port Hedland Air Quality and Noise Management Plan..... 9

 3.2.1 Health Risk Assessment and Analysis..... 9

 3.2.2 Environmental Management Controls..... 10

 3.2.3 Land Use Planning..... 10

 3.2.4 TPS Amendment No. 22..... 11

 3.2.5 Port Hedland Development Plan..... 11

 3.2.6 Industry Initiatives..... 12

 3.2.7 Governance..... 12

4.0 IMPLICATIONS FOR THE ASSESSMENT OF TPS AMENDMENT NO. 22..... 13

4.1 Potential Impact 13

4.2 Proposed Management 14

4.2.1 Determine suitable land uses within the area the subject of TPS Amendment No. 22 to meet the dust levels recommended by the taskforce..... 14

4.2.2 Determine which land uses could be permitted within the area subject of TPS Amendment No. 22 that would not be adversely impacted by elevated dust levels..... 14

4.2.3 Provide an analysis of the potential total population permitted by the proposed amendment compared with the total population permitted by the current zoning. This is required to determine if there is potential that the proposed amendment will lead to a greater number of residents being exposed to elevated dust levels..... 17

4.2.4 Determine the most appropriate residential density, dwelling type and design criteria that will enable future dwellings in the amendment area to meet the recommended air quality levels in the Port Hedland Dust Taskforce Management Report 22

4.2.5 Determine the most appropriate dwelling type (e.g. single residential, group dwelling or apartment) in the amendment area that can be designed to meet the recommended air quality criteria specified in the Port Hedland Dust Taskforce Management Report..... 25

4.2.6 Demonstrate that the proposed Residential Planning Code density (R Code), Building Codes of Australia and scheme provisions prescribed in TPS Amendment No. 22 will ensure that dwellings will be designed and developed that meet air quality standards recommended in the Port Hedland Dust Management Report..... 26

4.2.6.1 Provide specific detail on proposed building and infrastructure design that will assist in effective mitigation of elevated dust levels on an on-going basis. It is recommended that dwellings are designed to minimise exposure to fugitive dust..... 27

5.0 SUMMARY OF MANAGEMENT RESPONSE 29

6.0 REFERENCES 34

TABLES

(contained within report text)

	Page
Table 1: Potential Population Total Analysis between the Existing and Proposed Zone.....	19
Table 2: Dwelling Type and Household Composition.....	22
Table 3: Residential Density Analysis.....	23
Table 4: Average Persons per Household for Grouped and Multiple Dwellings with 3 or More Bedrooms and 2 or Less Bedrooms in Port Hedland	24
Table 5: Average Rental Prices in Port Hedland for Single Bedroom and Two Bedroom Dwellings.....	24
Table 6: Summary Table of Environmental Impacts and Management.....	30

FIGURES

(compiled at rear of report)

Figure 1:	Town of Port Hedland Town Planning Scheme No. 5 Amendment No. 22 - Amendment Area
Figure 2:	Town of Port Hedland Town Planning Scheme No. 5 West End Land Use Zoning.

APPENDICES

APPENDIX 1:	EPA Environmental Factors
APPENDIX 2:	Detailed Assessment of Potential Population Under Existing and Proposed Zoning
APPENDIX 3:	C.A. & M.J. Lommers Pty Ltd Report

1.0 INTRODUCTION

1.1 Responsible Authority

The Town of Port Hedland is the Responsible Authority for the TPS Amendment No. 22.

The proponents' contact details are given in 1.1.1.

1.1.1 Proponent Details

Town of Port Hedland

Contact Person: Mr Leonard Long
Position: Manager Planning
Office Address: Civic Centre
McGregor Street
Port Hedland WA 6721

Phone: 08 6436 2200

Web address: www.porthedland.wa.gov.au

1.2 TPS Amendment No. 22 Context

TPS Amendment No. 22 was initiated by the Town of Port Hedland to implement a recommendation of the Port Hedland Land Use Master Plan (LUMP) (2007). The LUMP identified that a new "West End Residential" zone was required to discourage the habitation or regular use of the residential areas west of Taplin Street by families with children and elderly, to avoid unacceptable dust exposure. TPS Amendment No. 22 specifies certain uses that are not allowed within the "West End Residential" area including schools, child care and aged care facilities.

Figure 1 outlines the proposed TPS Amendment No. 22 land area.

The deliberative land use control in the "West End" of Port Hedland is advocated in response to the EPA Environmental Protection Bulletin (EPP) No. 2 - Port Hedland Noise and Dust (2009) and Department of Health advice.

The EPP bulletin highlighted that dust and noise in Port Hedland have historically been above acceptable levels. Although a number of incremental measures have been implemented to improve the situation, the EPA expressed the view that a long term integrated land use and management plan is required to ensure that acceptable air quality and noise levels are achieved into the future.

The Bulletin subsequently recommended that:

“...that a coordinated government and industry approach to the development and execution of an integrated government and industry strategy (with explicit emission reduction strategies and explicit exposure reduction strategies) is required with strong and inclusive governance arrangements.”

In response to these air quality issues the State Government established the Port Hedland Dust Management Taskforce in May 2009 to review existing reports and develop a comprehensive management plan and implementation strategy for ongoing dust and noise reduction in Port Hedland.

1.2.1 Port Hedland Dust Taskforce

The Port Hedland Dust Taskforce was subsequently established at the request of the Premier to review the existing reports relating to the impact of dust in Port Hedland. The objective of the Taskforce was to develop an integrated dust management plan that considered all available evidence. The Port Hedland Air Quality and Noise Management Plan (DSD, 2010) was published in March, 2010. The report considered a number of previously published reports (which are referenced in that document) including:

- Pilbara Air Quality Study Summary Report (DEC, 2004);
- Literature Review and Report on Potential Health Impacts of Exposure to Crustal Material in Port Hedland (Department of Health, 2006);
- Port Hedland Cumulative Impact Study (Department of Industry and Resources 2007);
- Respiratory Hospitalisations in Port Hedland 1993 – 2004: An Explanatory Study on the Toxicology of Port Hedland Dust Particulates (Department of Health 2006);
- A Cell Culture Study on the Toxicology of Port Hedland Dust Particulates (DEC, undated);
- Port Hedland Land Use Master Plan (Town of Port Hedland, 2008);
- Port Hedland Outer Harbour Concept (fatal flaw analysis) (Port Hedland Port Authority, 2009).
- Port Hedland NO_x and SO₂ Investigations and Monitoring (in progress).

The DSD report includes a summary of the issues associated with noise and dust in Port Hedland. It identifies the areas west of Taplin Street (i.e. the “West End”) are

particularly vulnerable to elevated dust levels above those recommended in the National Environmental Protection (Ambient Air Quality) Measure.

The Port Hedland Air Quality and Noise Management Plan can be viewed at the following link: <http://www.dsd.wa.gov.au/documents/000991a.denise.lazenby.pdf>.

Consistent with EPP No. 2, TPS Amendment No. 2 seeks to facilitate appropriate development through zoning changes, and in doing so mitigate potential impacts to public amenity and human health arising from current and future dust loadings in ambient air in the Town of Port Hedland.

1.2.2 EPA Assessment of TPS Amendment No. 22

The Town of Port Hedland referred TPS Amendment No. 22 to the EPA in August, 2009. On the 7th September, 2009 the EPA advised the Town of Port Hedland of its decision to formally assess this amendment.

This Environmental Review document has been prepared in accordance with Section 48A of the *Environmental Protection Act 1986* to provide further detail in support of Town of Port Hedland TPS No. 5 Amendment No. 22. Appendix I includes the EPA Relevant Environment Factors and Scope of Work to Amendment 22.

1.2.2.1 Purpose of the ER Document

The primary objective of the ER is to:

Determine the dwelling types, residential densities and design criteria that will enable future dwellings in the amendment area to meet the air quality standards specified in the Taskforce Report (EPA, 2009).

2.0 SUMMARY OF AMENDMENT

2.1 TPS Amendment No. 22 Purpose

The primary purpose of the amendment is to implement the recommendations outlined in Section 3.6 of the Port Hedland Land Use Master Plan (Town of Port Hedland, 2007). This Section recommends that land use controls are required in the West End to meet the following objectives to reduce the potential for human exposure to dust:

- Discourage permanent occupation of the West End area by very young and very old people;
- Add vibrancy to the area by encouraging tourism, entertainment and retail experiences;
- Maximise opportunity for the area to be occupied by working-aged people;
- Ensure that all land owners and land occupiers that use the area are aware of the noise, dust and air quality issues and associated risks (Town of Port Hedland, 2008).

2.2 TPS Amendment No. 22 Scheme Provisions

TPS Amendment No. 22 aims to establish a predominantly “residential” zone in which dwellings are designed and constructed in such a way for it to deter permanent occupation by families with children or by elderly persons. This is consistent with the recommendations of the Land Use Master Plan and advice from the Department of Health.

TPS Amendment No. 22 proposes the following:

- Rezoning the land bounded by Anderson, Withnell, Sutherland and Taplin Streets and The Esplanade which is currently zoned “Residential” to “West End Residential”.
- Rezoning the land bounded by Withnell, McKay and Anderson Streets and The Esplanade from “Residential” to “Town Centre”.

The “West End Residential” zone includes a number of specific provisions and land use controls which would apply. In summary, these provisions include:

- Dwellings having a maximum floor area of 110m² and no more than 2 bedrooms or rooms which can be used as bedrooms.

- The requirement to inform all landowners and potential purchasers of the potential noise and dust risks.
- A minimum residential density coding of R30 being applicable and no maximum residential density.
- Subdivision of land that will only support the development of grouped dwellings.
- The following land uses being able to be approved subject at the discretion of the Council and subject to public comment:
 - Caretaker's Dwelling
 - Grouped Dwelling
 - Holiday Accommodation
 - Home Occupation
 - Hotel
 - Motel
 - Multiple Dwelling
 - Residential Building
 - Transient Workforce Accommodation
 - Arts and Crafts Centre
 - Industry – Cottage
 - Infrastructure
 - Display Home Centre
 - Market
 - Office
 - Restaurant (includes cafe)
 - Carpark
 - Community Use*
 - Education Establishment*
 - Public Utility
 - Private Recreation*
 - Public Recreation*.

Note: Uses marked with an "*" are not permitted to be solely for use either exclusively or primarily by children or elderly persons.

3.0 ENVIRONMENTAL FACTORS RELEVANT TO THE SCHEME

The EPA assessment of the scheme specified dust emissions and ambient air quality as the single environmental factor relevant to the amendment area.

3.1 Dust

The area affected by TPS Amendment No. 22 is located in the "West End" of Port Hedland and is currently zoned to support predominantly permanent residential development. The review of relevant literature by the Port Hedland Dust Taskforce established that areas west of Taplin Street (i.e. the "West End") is more vulnerable to elevated dust levels which regularly exceed the fine dust or PM10 (particulates less than 10 microns in size) standards set in the National Environmental Protection (Ambient Air Quality) Measure.

3.1.1 EPA Objective

To ensure that air emissions do not adversely affect environmental values or the health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standard (EPA, 2008).

3.1.2 EPA Scope of Work

3.1.2.1 Site Specific Factor

The EPA identified the following site specific factor:

- Elevated dust levels within the amendment area.

3.1.2.2 The Scope of Work

The scope of work required for the ER include:

- Determine suitable land uses within the area subject of TPS Amendment No. 22 to meet the dust levels recommended by the taskforce.
- Determine which land uses could be permitted within the area the subject of TPS Amendment No. 22 that would not be adversely impacted by elevated dust levels.
- Provide an analysis of the potential total population permitted by the proposed amendment compared with the total population permitted by the current zoning. This is required to determine if there is a potential that the proposed amendment will lead to a greater number of residents being exposed to elevated dust levels.

- Determine the most appropriate residential density, dwelling type and design criteria that will enable future dwellings in the amendment area to meet the recommended air quality levels in the Port Hedland Dust Taskforce Management Report.
- Determine the most appropriate dwelling type (e.g. single residential, grouped dwelling or apartment) in the amendment area that can be designed to meet the recommended air quality criteria in the Port Hedland Dust Taskforce Management Report.
- Demonstrate that the proposed Residential Planning Code density (R-Codes, Building Codes of Australia) and scheme provisions prescribed in TPS Amendment No. 22 will ensure that dwellings will be designed and developed that meet the air quality standards recommended in the Port Hedland Dust Management Report.
- Provide Specific Detail on proposed building and infrastructure design that will assist in effective mitigation of elevated dust levels on an on-going basis. It is recommended that dwellings are designed to minimise exposure to fugitive dust. These should include, but not be restricted to:
 - Dwelling type and design that would achieve air quality standards
 - Filtering air conditioning plant that has the required filtering capability required to handle dust particles of fraction size PM_{10}
 - Air tight window seals (hermetically sealed)
 - Closed eaves
 - High pitched rooves to encourage dust run-off.

3.1.3 Current Situation

The area subject to TPS Amendment No. 22 is located in close proximity to the adjacent Port Hedland Port Facility. Dust levels in this area exceed national standards outlined in the National Environmental Protection (Ambient Air Quality) Measure every third day on average. Given the planned growth of the port and increased exports, it is anticipated that ambient dust levels will continue to rise in the town site simply as a function of increased freight volume (DSD 2010).

The area subject to TPS Amendment No. 22 currently is zoned Residential R12.5 / 30 and Residential 12.5 / 50 in the Town of Port Hedland Town Planning Scheme No. 5 (TPS No. 5) (Figure 2). TPS No. 5 does not include any statutory provisions which require residential development to be designed to mitigate the potential impacts of elevated dust levels in the West End. The zone also permits a number of land uses which support primary use by children or elderly including:

- Primary schools
- Child care centres

- Aged or dependent persons dwellings
- Nursing homes
- Family houses.

The Council's current practice regarding dust issue includes the requirement as a condition of planning approval for developments located in the amendment area to include Section 70A Notifications on all Certificates of Titles advising residents and future purchasers of the potential health risks relating to current air quality.

3.1.4 Town of Port Hedland Residential Demand

Demand for residential development in the Town of Port Hedland has risen significantly in the preceding three to four years. Between 2002 and 2004, the average building approvals issued for dwellings in the Port Hedland Local Government Area was 27, rising approximately 380% to an average of 103 approvals between 2005 and 2008 (ABS 2010).

Redevelopment in the West End amendment area has increased in line with the growth rate exemplified in the ABS Building Approval statistics for the whole local government area. Redevelopment is however, focused in the area west of Howe Street. This is the result of "Residential" zoned land between Howe Street and Taplin Street not being serviced by reticulated sewer and therefore limiting the capability to redevelop at higher residential densities. The provision of reticulated sewer to this area would facilitate redevelopment within the Amendment area under the current Scheme Provisions.

In summary, there is a recognised shortage of residential housing and residential zoned land in the Port Hedland area. The current and planned expansion of the Port Hedland Port and associated workforce increase will further exacerbate the Port Hedland housing crisis. This outcome is likely to further intensify the current land use conflicts between the Port Operation and the commercial and residential areas of the Town. This is likely to potentially expose a greater number of residents to the potential risks associated with elevated dust levels (DSD, 2010).

3.1.5 Relevant Policies and Studies

The policy most relevant to the assessment of TPS Amendment No. 22 is the Port Hedland Air Quality and Noise Management Plan .The Taskforce Report considered all relevant policies, studies and reports with respect to air quality in Port Hedland in concluding the final recommendations which provide clear direction for future development in the Town area.

3.2 Port Hedland Air Quality and Noise Management Plan

The report concluded there were five categories where there must be clear direction for action. These include:

- Health risk assessment and analysis.
- Environmental management controls.
- Land use planning.
- Industry initiatives.
- Governance.

The recommendations relating to Health and Risk and Land Use Planning are most relevant in assessing whether TPS Amendment No. 22 addresses the EPA Objective. The key actions are discussed in detail below.

3.2.1 Health Risk Assessment and Analysis

The Dust Taskforce determined that although there is a clear link between the increased risks to health and high levels of particulate matter from vehicle emissions and other combustion sources in urban environments, there is limited information to suggest any direct adverse affects resulting from mineral rich dust (Port Hedland dust comprises 93% iron-oxide). The Dust Taskforce concluded that further research was required to investigate whether there is a discernible link between increased respiratory disorders and iron-oxide rich dust.

The Department of Health recommended to the Dust Taskforce that as an interim measure (while dust research is being undertaken), that a risk management approach should be implemented to protect the whole population from potential risks.

1. The Department of health advises that "at risk"* individuals should not reside permanently in the West End of Port Hedland as they are at greatest risk of developing both short term (symptoms increase significantly over a matter of days) and long term (symptoms develop gradually over a number of years) health effects.
2. As the potential health risk to permanent residents is unclear, and in order to prevent possible long term health risks, reducing long term dust exposure for all residents is a priority. Mitigation strategies may include short term occupancies, such as fly-in, fly-out accommodation and commercial premises, or high-end developments such as hotels or holiday apartments. Local planning requirements must ensure these developments employ smart building design and construction and that premises are maintained to the standard needed to limit dust penetration.

* Note: "At Risk" is described as those individuals with clinical respiratory and cardiovascular disease, the elderly, babies and young children.

3.2.2 Environmental Management Controls

In light of the need for further research the Dust Taskforce recommended a revised air quality standard suitable for Port Hedland as an interim measure of air quality. The recommended standard is a variation to the National Environmental Protection (Ambient Air Quality) Measure, however is based on short term guidelines implemented by the EPA with respect to BHP Billiton Iron Ore's operations through Ministerial Statement 740.

The recommended revised air quality standard for Port Hedland in the interim is PM10 of 70 ug/m³ (24 hour average) with ten recorded exceedences per year. This will be an interim measure incorporated into a local air quality management plan for a period of five years whilst further research is undertaken. The measure will subsequently be reviewed at this stage to determine if it should be extended, replaced or revised.

The Dust Taskforce acknowledges the new target is achievable in areas east of Taplin Street, based on air dispersion modelling undertaken which presumes full development of the inner harbour and the implementation of current best practice dust management measures.

The modelling also highlights that exceedences of the 70 ug/m³ target substantially increases in areas west of McKay Street, and that stricter land use controls may be required in this area to reduce exposure in the future. However, it should be noted that this land is not located in TPS Amendment No. 22 boundary.

3.2.3 Land Use Planning

The Dust Taskforce considered the future land use planning of Port Hedland having regard to a number of key issues:

- The health and well-being of residents.
- Improvements to amenity to make Port Hedland more attractive to workers or permanent residents.
- The significance of the continuing operations and planned expansions of industry to the town and the State.
- A need to ensure the co-existence of industrial and commercial operations and residential land use in a responsible way (DSD 2010).

After considering these elements and the current situation, the Dust Taskforce made the recommendations on three elements pertaining to land use in Port Hedland, two of which have strategic implications with respect to long-term land use planning.

3.2.4 TPS Amendment No. 22

The Dust Taskforce reviewed TPS Amendment No. 22 having regard to potential building design considerations and also potential population statistics in the amendment area. The following recommendations were made in relation to TPS Amendment No. 22 which is expected to strengthen local planning policy:

- Building design and performance standards as identified in the CA & MJ Lommers report be incorporated into the Scheme Amendment.
- The amendment be modified to include a residential density cap of R80, subject to closer scrutiny of potential bedroom yield associated with adopting this cap.
- Planning provisions be reviewed as new health and environmental information arises to ensure that the planning response remains appropriate for the environmental conditions of the day.
- Ownership and management structures that encourage common ownership, management and maintenance of building air filtration systems and external fixtures designed to minimise dust ingress.

3.2.5 Port Hedland Development Plan

The Dust Taskforce considered the EPA's preference for a long term plan which focuses future residential growth away from the West End given the concerns associated with the potential health risks to the population residing in the West End.

The Dust Taskforce therefore recommended a Development Plan for the whole of Port Hedland be progressed which aims to:

- Identify sites for proposed new development within the entirety of Port Hedland.
- Promote a predominance of future residential development opportunity in the more eastern areas of Port Hedland.
- Identify appropriate locations in the West End of Port Hedland for the redevelopment of properties for the purpose of additional commercial premises, entertainment complexes and short stay accommodation facilities.
- Provide greater detail regarding residential density, dwelling types and building design for all areas of Port Hedland.
- Prescribe additional planning controls that assist in addressing amenity issues associated with residing in those areas that have elevated noise and dust levels.

3.2.6 Industry Initiatives

The Dust Taskforce noted that the continued growth of the port will include the continued improvements to the management and handling of resources through the implementation of best practice measures. The Dust Taskforce fully supported the creation of the Port Hedland Industries Council to act as a conjugate between government and industry. This will further assist in the ongoing management of the impact of the port operations on the population.

3.2.7 Governance

The Dust Taskforce recommended a comprehensive governance structure where appropriate authorities have been delegated the responsibility for the implementation of various elements of the overall Air Quality and Noise Management Plan. Specifically, the Department of Environment and Conservation (DEC) will be responsible for all environmental management controls, and the Western Australian Planning Commission (WAPC) responsible for land use planning.

The Dust Taskforce finally advised that the key to the overall improvement to air quality in Port Hedland requires the co-ordinated implementation of all elements of the Air Quality and Noise Management Plan.

4.0 IMPLICATIONS FOR THE ASSESSMENT OF TPS AMENDMENT NO. 22

The Port Hedland Air Quality and Noise Management Plan provide a number of key principles which require consideration in the assessment of TPS Amendment No. 22 against EPA Objectives and the Scope of Work.

1. The provisions proposed through TPS Amendment No. 22 must be considered holistically with respect to achieving recommended air quality standards in the West End. This includes:
 - The preparation of a long term development plan for Port Hedland.
 - The environmental management controls and revised air quality standards to be implemented.
 - The on-going research into the impact of iron-oxide rich dust on the human population.
 - Industry initiatives.
 - Governance and implementation.
2. The recommended changes to TPS Amendment No. 22 made by the Dust Taskforce being considered in the assessment.
3. The land use controls and building design controls associated with the areas west of McKay Street (i.e. Port Area Town Centre Zone) noting the Management Plan identifies this area will be subject to substantially more frequent exposure to elevated dust levels.
4. The risk management approach to land use planning in the West End has been recommended by the Department of Health.

4.1 Potential Impact

The current situation with respect to the proposed amendment area in which there is the potential for the compounding of existing land use conflicts between industry and residential areas. If no action is taken it is likely that, notwithstanding the other initiatives to be implemented in the Air Quality and Noise Management Plan, there would be:

- An increased potential for "at risk" members of the population to be subject to elevated levels of dust levels.

- An on-going risk to the remaining population through residing in the amendment area.

TPS Amendment No. 22 proposes a solution through a number of land use restrictions and development provisions which intend to minimise the potential impact to permanent residents resulting from increased exposure to elevated dust levels.

The potential impacts resulting from the amendment include:

- The extent to which the health and amenity of “at risk” members of the population and the general population will be exposed to elevated levels of dust.
- The possibility of exposing a greater number of permanent residents to elevated dust levels in the West End.

4.2 Proposed Management

TPS Amendment No. 22 proposes to implement a number of land use management measures to address the potential risks currently associated with elevated dust levels in the West End.

The EPA defined the “Scope of Work” for TPS Amendment No. 22 to assess the potential dust impacts on the health, welfare and amenity on the additional “West End” residents facilitated under TPS Amendment No 22. The EPA work requirements are considered below with regard to TPS Amendment No. 22 and the Port Hedland Air Quality and Noise Management Plan.

4.2.1 Determine suitable land uses within the area the subject of TPS Amendment No. 22 to meet the dust levels recommended by the taskforce

The restriction of any land use likely to contribute to elevated dust levels in the “West End” will assist in meeting the Taskforce’s recommended interim air quality standard. TPS Amendment No. 22 does not permit any heavy or general industrial land uses. The land uses proposed are predominantly residential in nature therefore will not have a significant dust contribution.

4.2.2 Determine which land uses could be permitted within the area subject of TPS Amendment No. 22 that would not be adversely impacted by elevated dust levels

The link to human health effects and iron-oxide rich fine dust is unclear but is considered to be most likely less harmful than those from combustion sources found in urbanised areas (DSD 2010). Further studies are required to clearly establish any potential impact which is expected to take approximately five years to complete.

There is a strong historical connection and on-going preference to facilitate increased residential development in the “West End” of Port Hedland in order to support increased tourism and commercial development in the Port Area (ToPH, 2008). The community preference is that residential development remains in this area on the basis a health risk assessment of the air quality concurs with residential / commercial land use.

The consideration of appropriate residential densities and dwelling types that are appropriate in the “West End” is considered further below consistent with the EPA Scope of Work.

Whilst the appropriate research being into air quality is being undertaken, a risk management approach should be employed with respect to land use permissibility consistent with the recommendations and upon the advice of the Department of Health. To determine appropriate and inappropriate land uses within the amendment area the below mitigation measures must be considered.

4.2.2.1 Prevent the permanent habitation of / or long term visitation to the amendment area by “at risk” members of the population.

Specific residential land uses designed to provide permanent accommodation for “at risk” members of the population should be prohibited which is consistent with the Department of Health’s recommendations. TPS Amendment No. 22 will restrict the ability to develop uses that cater for the “at risk” demographics in the “West End” residential zone including:

- Aged or dependent persons dwellings.
- Nursing homes.
- Ancillary Accommodation.

The uses would still however be permitted in the area bound by Sutherland Street, McKay Street and Anderson Street which is proposed to be rezoned “Town Centre” zone.

Other land uses that specifically encourage the frequent visitation to the amendment area by the “at risk” members of the population should also be discouraged or prevented in order to further mitigate any potential impact on the health and welfare of the population. Such other uses as child care facilities, primary schools and high schools or community facilities with a focus on youth or elderly are prohibited uses in the Amendment area.

TPS Amendment No. 22 restricts such uses where appropriate, either by including it in the zoning table as a use not permitted or through an additional notation to the zoning table highlighting the following:

“Notwithstanding anything contained in Appendix 1 – Definitions, no land use shall be approved within the West End Residential Zone that is intended for use either exclusively or primarily by children or elderly persons.”

The area proposed to be rezoned to “Town Centre” zone in the amendment area does allow for Council to approve all uses otherwise proposed to be prohibited in the “West End Residential” zone in addition to a number of other uses such as “Hospital”. TPS Amendment No. 22 report acknowledges this area will be excluded from any specific provisions relating to land use or building design which will be imposed through the West End Residential zone. It highlights that:

“It is considered Council’s current approach to assessing residential development in the West End Town Centre will continue to be sufficient pending either a subsequent amendment or more comprehensive scheme review.” (Town of Port Hedland, 2009)

TPS Amendment No. 22 does contain land use provisions which actively discourages the permanent population or frequent visitation of the amendment area by “at risk” people consistent with the Department of Health advice, the recommendations of the Air Quality and Noise Management Plan and the Land Use Master Plan.

It does however, retain the possibility of a number of land uses within the area bound by Sutherland, Withnell and McKay Streets which would accommodate permanent occupation or frequent visitation by “at risk” members of the population. This should be reviewed in the context of overall intent of the TPS Amendment No. 22 and the recommendations of the Dust Taskforce.

4.2.2.2 Encourage alternative forms of accommodation over permanent residency including transient workforce accommodation and holiday accommodation.

The intent of encouraging accommodation other than permanent accommodation in the amendment area is to reduce the general population’s long term exposure to elevated dust levels (DSD 2010).

TPS Amendment No. 22 allows for the approval of a number of short-term accommodation facilities within the whole amendment area including:

- Transient Workforce Accommodation.
- Hotel.
- Motel.
- Holiday Accommodation.

TPS Amendment No. 22 allows for the Council to grant approval for these uses in the amendment area. It does not specifically encourage their development over permanent residential dwellings but does recognise the merit of such accommodation in achieving the objectives of the Dust Taskforce.

Land uses that provide short stay accommodation are not currently subject to the density provisions of the Residential Design Codes of Western Australia (R-Codes). If residential density in the amendment area was capped rather than “unlimited” as proposed, the overall yield of a site could be potentially greater if it was developed as a short-stay accommodation land use rather than permanent residential subject to an appropriate site design. This may act to encourage short-stay development in the “West End” over permanent accommodation.

The long-term management and regulation of developments that are approved for short-term requires consideration in the context of the amendment. Without appropriate management measures in force, there is a recorded potential for short-stay developments to be ultimately used as “defacto permanent” residential accommodation (Tourism Taskforce Report 2006). If this were to occur, the intent of promoting short-stay accommodation in order to limit long-term exposure would not be achieved. It could rather have the potential to increase long-term exposure to the general population given the opportunity for additional rooms / units within a short-stay accommodation facility compared to permanent dwellings.

The Tourism Taskforce Report (2006) identifies methods to ensure the on-going use and management of tourism or short-stay accommodation. Although these recommendations relate to the protection of important tourism zoned land, similar principles may be effective in this instance in ensuring that over time, the population does not transition from short-term to permanent in the amendment area.

4.2.3 Provide an analysis of the potential total population permitted by the proposed amendment compared with the total population permitted by the current zoning. This is required to determine if there is potential that the proposed amendment will lead to a greater number of residents being exposed to elevated dust levels.

4.2.3.1 Method

To undertake the analysis requested by the EPA, the following must be considered:

- Individual maximum residential dwelling yield under the existing and proposed zone.
- The anticipated occupancy of the predominant dwelling type and size under the existing and proposed zone.

4.2.3.2 Maximum Residential Dwelling Yield

To determine the maximum potential dwelling yield under the existing and proposed dwelling, each landholding in the amendment area was individually tested. The dwelling yield for the existing zones was based on the maximum residential densities applicable to the landholdings in the amendment area, being R30 and R50 respectively.

A residential density cap of R80 was assumed under TPS Amendment No. 22 based on the recommendations of the Dust Taskforce.

4.2.3.3 Maximum Population

To determine the maximum potential population under the existing and proposed density, a review of the ABS 2006 census data was undertaken having regard to the likely dwelling type and size that would be delivered under each zone.

The existing zones (R30 – R50) are defined as medium densities in the R-Codes of Western Australia. The typical dwelling type delivered in medium density developments is semi-detached dwellings. In the Town of Port Hedland, 55% of semi-detached dwellings are three bedrooms (ABS 2006). For the purpose of this analysis it is therefore presumed the typical dwelling size for a medium density development is three bedrooms. The average occupancy of three bedroom semi-detached dwellings in the Town of Port Hedland is 2.8 residents (ABS 2006). Accordingly, the maximum population for each lot in the amendment area has been determined by multiplying the maximum dwelling yield by 2.8.

The capped R80 density is defined as high density in the Residential Density Code of Western Australia. The dwelling type delivered at high densities is multiple dwellings or apartments. TPS Amendment No. 22 proposes to restrict dwelling size to two bedrooms. For the purpose of this assessment, it is therefore anticipated the likely dwelling type and size proposed to be delivered under the proposed zoning is two-bedroom apartments. The average occupancy of a two bedroom apartment in the Town of Port Hedland as of the last census is 2.2 residents (ABS 2006). Accordingly, the maximum population for each lot in the amendment area has been determined by multiplying the maximum dwelling yield by 2.2.

Table I summarises the findings of the analysis. A detailed summary of potential dwelling yield and population is provided in **Appendix 2**.

Table 1: Potential Population Total Analysis between the Existing and Proposed Zone

Current Zoning			Proposed Zoning		
Zone	Total Dwelling Yield	Maximum Population	Zone	Total Dwelling Yield	Maximum Short Stay Population
R30 (i.e. east of Hospital)	254.0	711.2	R80 (east of the Hospital)	649.0	1427.8
R50	585	1638.0	R80 & Town Centre Zone* (west of the Hospital)	861.0	1894.2
Total	839.0	2,349.2	Total	1,510.0	3,322.0

* Note: The Residential Density in the Town Centre zone is restricted to a maximum of R50 under TPS No. 5.

The analysis highlights that the proposed amendment may provide the opportunity for the overall short stay population base to increase in the amendment area. The above projected population figures must be reviewed in the context of a five year period and the extent of redevelopment likely to occur in this time-frame. This is particularly relevant as the Dust Taskforce has explicitly recommended the proposed amendment provisions be reviewed at the completion of the detailed research program. This will occur through the implementation of a local air quality management plan required by the DEC (DSD 2010).

The following factors must therefore be considered in the context of the proposed amendment and its capability to contribute to a higher permanent population density in the amendment area:

4.2.3.4 Infrastructure

The portion of the amendment area east of Acton Street (consisting of 71 Lots) is not serviced by reticulated sewer. Redevelopment of these lots without reticulated sewer is unlikely to be supported as it is contrary to the WA Country Sewerage Policy (Ref). While all the relevant planning for the reticulated sewer has been completed, funding remains an obstacle.

Currently, there is no established time-frame for the delivery of reticulated sewer to this area in the future. Therefore, it can be reasonably assumed the proposed amendment would have no impact on the potential population in this area within the time-frame set for the five year review, notwithstanding the existing and proposed densities.

4.2.3.5 Existing Redevelopment

A substantial amount of redevelopment has already occurred within the amendment area west of Howe Street within the preceding several years. A site visit to the amendment area established that of the 129 lots in this area approximately:

- 21 sites appeared to have been developed to a density similar to the current maximum permitted.
- 6 sites were in the process of redevelopment at the time of writing the report.
- 13 sites appeared to be used for non-residential purposes.

Redevelopment of these properties in the next five years would be unlikely given the investment to undertake a development at the current density code or their current use as non-residential/community purposes (i.e. Heritage Listed, Hospital Use, Offices). These existing developments further reduce the potential to achieve the maximum potential population yield contemplated by the initial analysis within the next five years.

4.2.3.6 Alternative Forms of Accommodation

TPS Amendment No. 22 proposes to encourage other forms of accommodation over permanent residential accommodation as discussed in Section 4.2.5 of this document.

It is difficult to accurately predict a proposed percentage of sites that would be developed to an alternative form of accommodation, the capability for the delivery of these short term accommodation uses prior to permanent residential must be considered in the figure proposed through the initial analysis.

4.2.3.7 Development and Design Requirements

It is anticipated development will be deterred in the amendment area based on the following:

- The implementation of the various land use, building and design restriction will be imposed in conjunction with the increase in residential density making the redevelopment process in this area more difficult and costly compared to other areas in the Town of Port Hedland (MacroPlan 2009); and
- The uncertainty arising from a requirement to review the amendment provisions in the next five years may result in landowners waiting to develop until a final decision is made on land use planning controls in the amendment area.

This will further limit the extent of development that will occur in the amendment area until a more conclusive assessment can be provided on the potential impacts of iron-oxide rich dust.

4.2.3.8 Summary

TPS Amendment No 22 has the potential, to increase short-stay residency but with less “at risk” persons in the amendment area. The amendment however must be considered in the context of a five year review at which time TPS provisions will be considered, refined or change entirely to reflect the findings of the DEC local air quality management plan. This approach is entirely consistent with the Dust Taskforce recommendations. Accordingly, the actual implications of the amendment in this time-frame are considered to be minimal due to the following:

- There being no current or planned provision of reticulated sewer to the amendment area east of the hospital in the foreseeable future.
- The extent to which redevelopment has already occurred at the existing density coding in the amendment area.
- The encouragement to landowners to provide short stay forms of accommodation over permanent residential.
- The potential for redevelopment to be deterred or delayed due to costly additional development and design constraints along with the prohibition of “at risk” demographic groups.

The potential for the permanent population to increase over time does highlight the importance of the amendment provisions being reviewed within a reasonable time-frame. This will ensure infill does not continue into the medium to long-term without consideration of the potential impacts on the health, welfare and amenity of persons residing in the amendment area. An appropriate mechanism is the inclusion of a “sunset clause” which prohibits permanent residential development continuing past an appropriate five year time-frame that would facilitate:

- The finalisation of research through the local air quality plan.
- A review of the findings in the context of the current amendment Scheme Provisions.
- An amendment to the TPS to occur.

4.2.4 Determine the most appropriate residential density, dwelling type and design criteria that will enable future dwellings in the amendment area to meet the recommended air quality levels in the Port Hedland Dust Taskforce Management Report.

The most appropriate residential density, dwelling type and design criteria is to be considered in the context of the Department of Health’s recommended risk mitigation strategies. In relation to development’s design for permanent residential accommodation, the density, dwelling type and form must therefore be designed to discourage or prevent “at risk” member of the population from residing in the amendment area.

4.2.4.1 Children

The National Housing Supply Council reviewed 2008 data to determine the link between dwelling type and household composition. The findings with respect to family households (including single parents) with children is summarised in Table 2 below:

Table 2: Dwelling Type and Household Composition

Dwelling Type	Percentage of housing stock occupied by households with children
Separate House	48.6%
Detached, row or terrace house, town-house etc.	27.7%
Flat, unit or apartment	15.6%
Other dwelling	10.8%

Table 2 clarifies a general rule of preference for families with children to live in separate houses (i.e. Single House) as compared to semi-detached (grouped dwellings) and apartments (multiple dwellings), but also dependent upon availability. Although it must be acknowledged that local factors and the issue of availability can skew this and as such the actual number of families in less traditional forms of housing may be higher than stated above.

In order to discourage the permanent residency of the amendment area by children, it is therefore appropriate to restrict the provision of dwelling types to grouped and multiple dwellings, with a preference for multiple dwellings where possible.

4.2.4.2 Elderly

The Australian Housing and Urban Research Institute recently published a review of the relationship between older people and housing in Australia (Judd *et al* 2010). The research established through an analysis of ABS census data that approximately 80% live in single houses, 76% of which have three or more bedrooms. This is a legacy of home owners remaining in their properties once their children have left. There is no specific data as to the number of dwellings this factor applies to in Port Hedland. Historical data

would indicate that the elderly tend not to live in Port Hedland. This data is supported given the premium rents offered for such dwellings, there is a strong disincentive to remain in such housing stock.

To further prevent the elderly from potential risks, the provision of desirable and purpose built age care facilities outside the amendment area should be promoted. Specifically designed aged care facilities should be precluded from the amendment area.

4.2.4.3 Dwelling Size and Type

The available data suggests that "at risk" members of the population are less likely to choose to reside in grouped dwellings or multiple dwellings compared to single houses. Multiple dwellings should be encouraged over grouped dwellings, noting the data suggests a lesser likelihood for families with children, including single parent families to live in apartments. Single Houses should be prohibited in the amendment area.

Medium density residential densities (i.e. R30 – R60) generally encourage grouped dwellings over multiple dwellings whilst high density residential density codes (R80+) encourage multiple dwellings over grouped dwellings, highlighted in Table 3.

Table 3: Residential Density Analysis

Residential Density	Grouped Dwellings (average area of land required per dwelling) m ²	Multiple Dwellings (average area of land required per dwelling) m ²
R30	300	333
R50	180	200
R80	180	125

To encourage multiple dwelling developments over grouped dwellings, an appropriate development incentive, through an achievable higher dwelling yield, is considered appropriate.

TPS Amendment No. 22 in its current form achieves this development incentive as there is no density cap proposed. However, the review has established the appropriateness of a cap in order to:

- Provide a further incentive for short-stay accommodation over permanent, and the preference to limit any permanent population.
- Prevent the unfettered permanent population growth in the amendment area.

A maximum residential density of R80 would encourage multiple dwellings over grouped dwellings whilst providing sufficient control over the potential growth in the permanent population. This is consistent with the findings of the Dust Taskforce.

4.2.4.4 Design Criteria

TPS Amendment No. 22 includes specific design criteria on dwelling size to 110m² in plot ratio area and the number of bedrooms to 2 per dwelling. Table 4 provides an analysis of the average persons per household for grouped and multiple dwellings with 3 or more bedrooms and 2 or less bedrooms in Port Hedland based on ABS census data (ABS 2006)

Table 4: Average Persons per Household for Grouped and Multiple Dwellings with 3 or More Bedrooms and 2 or Less Bedrooms in Port Hedland

Bedrooms	Grouped Dwellings	Multiple Dwellings	Overall Average
3 or more	3.6	3.3	3.45
2 or less	2.4	2.2	2.3

By restricting the number of bedrooms to a maximum of two through the potential for an increased permanent population is further limited.

The MacroPlan (2009) peer review of TPS Amendment No. 22 recommended that further consideration be given to reducing the dwelling size in the amendment area to 60m². This would typically only allow for the provision of one bedroom dwellings. Whilst there is a need to protect the health and welfare of residents in the amendment area, the amenity of residents also requires consideration under the EPA objective.

During the March 2010 quarter, average rental prices in Port Hedland for single bedroom and two bedroom dwellings is presented in table 5.

Table 5: Average Rental Prices in Port Hedland for Single Bedroom and Two Bedroom Dwellings

Rent	Single bedroom	Two bedrooms
Per Week	\$1,000	\$1,299

Source: Pilbara Development Commission 2010

The provision of two bedroom dwellings in the amendment area will assist in delivering more affordable accommodation for single people and workers as it provides the opportunity to share accommodation, reducing overall living costs compared with the delivery of single bedroom dwellings only. As such, a restriction on dwelling size to 60m² would impose undue financial hardship based on the current rental market although a greater availability of single person dwellings could improve the affordability of such accommodation into the future.

A floor space restriction of 110m² is considered appropriate as it allows for two bedroom dwellings to be provided with larger living areas promoting indoor use, whilst restricting the overall ability for a dwelling to be converted to incorporate additional rooms that could later be used as bedrooms.

4.2.4.5 Summary of Residential Density, Dwelling Type and Design Criteria

The appropriate dwelling type, density and dwelling design must consider the most appropriate way to:

- Prevent permanent residency of the amendment area by “at risk” members of the population.
- Minimise the overall increase in population numbers of the amendment area in the short term.

The review of available data highlights the following:

- Single Houses should be prohibited in the amendment area.
- Multiple Dwellings should be encouraged over Grouped Dwellings².
- A restriction on the number of bedrooms per dwelling to a maximum of two reduces the potential for increases in permanent population in the amendment area.
- An over restriction on allowable floor space (60 m²) will have a detrimental impact on the affordability and therefore amenity of future residents in the amendment area, thus a need to cap at 110 m².

TPS Amendment No. 22 will deliver therefore appropriate dwelling type, density and design requirements to achieve the above through the existing provisions proposed and subject to a maximum residential density cap of R80 being imposed so as to encourage multiple dwellings whilst restricting large scale population increases in the short term.

4.2.5 Determine the most appropriate dwelling type (e.g. single residential, group dwelling or apartment) in the amendment area that can be designed to meet the recommended air quality criteria specified in the Port Hedland Dust Taskforce Management Report.

The consideration of the most appropriate dwelling type needs to account for the recommended air quality criteria specified in the Dust Taskforce report, and must exclude the consideration of single houses.

² Grouped dwellings are town house or grouped housing sites (ABS refers to them general as semi-detached, row or terrace house, townhouse etc). Multiple Dwellings are apartments and flats (ABS - flat, unit or apartment)

Single dwellings will not be permitted on lots within the reclassified “West End Residential” zone in order to ensure discouragement of dwelling forms conducive to habitation by longer term residents, and in particular “at risk” members of the community. As such, group dwellings such as units, apartments and townhouses will be permitted. Single detached dwellings are typically larger and more “family oriented” as a general rule and as such will be prohibited from being developed or improved (existing stock) in the “West End”.

In addition to the higher density residential developments, appropriate areas in the “West End” of town should be considered for the redevelopment for other land uses such as commercial premises, entertainment complexes and short stay accommodation facilities (e.g. serviced apartments).

4.2.6 Demonstrate that the proposed Residential Planning Code density (R Code), Building Codes of Australia and scheme provisions prescribed in TPS Amendment No. 22 will ensure that dwellings will be designed and developed that meet air quality standards recommended in the Port Hedland Dust Management Report.

MacroPlan (2009) identified that TPS Amendment No. 22 lacked specific detail with respect to building design requirements for developments in the amendment area. Additional building design measures were subsequently explored by the Dust Taskforce. The advice and recommendations of C.A. & M.J. Lommers Pty Ltd has subsequently endorsed by the Dust Taskforce as the most appropriate dust mitigation measures. However concerns were raised regarding the on-going maintenance of air-conditioner filters. The report notes this could be addressed through ownership and management structures which encourage common ownership and maintenance of building air filtration systems (DSD 2010).

TPS Amendment No. 22 relies on the implementation of the Town of Port Hedland's local planning policy to ensure developments are designed to meet air quality standards. The amendment report highlights the policy would be required to address detailed matters relevant to air quality including the use of hermetically sealing building openings and appropriate air filtering for air conditioners.

A specific West End local planning policy has yet to be developed by the Town of Port Hedland. In the absence of a local planning policy TPS Amendment No. 22 will incorporate specific scheme provisions which address the advice and recommendations outlined by C.A. & M.J. Lommers Pty Ltd consistent with the recommendations of the Dust Taskforce (DSD 2010).

Specific design and orientation of building still requires further detailed consideration in the context of all development (short-stay and non-residential). The requirement to submit an accompanying building development report with any application for a building licence, prepared by an independent expert which certifies that the proposed design mitigates exposure to dust including specifications on air-conditioning units and filtration devices.

To ensure the ongoing maintenance of air-conditioning units and filtration systems, it may be also be prudent to impose requirements that all developments shall be subject to a common management agreement between owners or the owners collectively, and a common facility manager / operator to provide for common on-site management of all units within the development. This could be facilitated through specific scheme provisions or standard conditions of planning approval.

The Town of Port Hedland will consider all planning and building applications and they will only be approved on the basis they comply with the relevant codes and specific requirements detailed in this TPS Amendment. A suitably qualified building consultant should be engaged for any proposed development and a report provided as to the adequacy of the dust mitigation measures before a building licence is approved.

4.2.6.1 Provide specific detail on proposed building and infrastructure design that will assist in effective mitigation of elevated dust levels on an on-going basis. It is recommended that dwellings are designed to minimise exposure to fugitive dust.

The Town of Port Hedland has recognised the need to implement innovative and clear building guidelines and specific building codes for dust mitigation in new dwellings in the “West End Residential” zone. Building consultants C.A. & M.J. Lommers Pty Ltd provided detailed information (Appendix 3) relating to building design for the minimisation of dust ingress to compliment the findings of the Taskforce and assess the effectiveness and practicability of the suggested minimisation options presented herewith.

Suggested methods and minimisation options to be implemented as building code requirements on new dwellings in the “West End” of Port Hedland are as follows:

Residential density – already identified as the major mitigation measure and provides the basis of TPS Amendment No. 22.

Hermetically sealed / positively pressurised buildings – high level sealing and/or positive pressure on all building seals is a complementary measure to minimise dust ingress in conjunction with other measures.

Window and door orientation – orienting openings in dwellings such that the effects of prevailing winds is minimised on the exposed side and so limit the ingress of airborne dust. Protection of openings through the use of protective screens or louvers may reduce the direct impact of winds depositing dust onto the windows; similarly the use of eaves at roof level may provide the same level of protection.

Ensure buildings are of a high pitch to mitigate the build-up of dust on the roof and that all eaves are boxed to prevent internal deposition. Roof construction should be relatively airtight and that any vents are positioned in a manner which prevents the ingress of dust. This includes the use of one way baffles or positive powered exhausts.

Any private open space (i.e. courtyards) associated with development should be sited with minimal exposure to prevailing dust sources and that consideration be given to the installation of fine water misting systems to provide both cooling and removal of airborne dust particles.

Filtered air conditioning – utilising bag filters on household air conditioning is a viable active method of reducing dust loading and circulation with households, however issues such as ongoing maintenance, cleaning and replacement of filter media is required to ensure adequate performance.

The use of a combination of these building design methods is essential to achieving effective dust minimisation and ingress in to households within the proposed “West End residential zones.”

It should be recognised that active dust mitigation measures such as filtering can best be achieved on larger scale developments with a central unit rather than multiple units, which may not be subject to the same level of maintenance.

5.0 SUMMARY OF MANAGEMENT RESPONSE

TPS Amendment No. 22 provides appropriate statutory provisions to ensure limit the extent of exposure of the “at risk” population and the broader population to elevated dust levels in the amendment area. A number of areas have been identified to strengthen the amendment to better achieve the EPA objective. The final provisions are outlined in the table below:

Table 6: Summary Table of Environmental Impacts and Management

Factor	EPA Objective	Potential Impacts	EPA Scope of Works	Proposed Management
POLLUTION MANAGEMENT				
Dust	To ensure that air emissions do not adversely affect environmental values or the health, welfare and amenity of people and land uses by meeting statutory and acceptable standards (EPA, 2004)	<ul style="list-style-type: none"> Elevated dust levels within the amendment area has the potential to impact upon resident's health particularly children and elderly) and amenity. 	<ul style="list-style-type: none"> Determine suitable land uses within the area the subject of Amendment 22 to meet dust levels recommended by the Taskforce. 	<ul style="list-style-type: none"> No land uses are permitted which may contribute to elevated dust levels within the amendment area.
			<ul style="list-style-type: none"> Determine which land uses could be permitted within the area the subject of Amendment 22 that would not be adversely impacted by elevated dust levels. 	<ul style="list-style-type: none"> Land uses which encourage "at risk" individuals from residing permanently in the amendment area or that are for sole/predominant use by "at risk" individuals are prohibited including: <ul style="list-style-type: none"> Aged or dependent persons dwellings; Nursing homes; Ancillary Accommodation; Child Care Services; Place of Public Meeting, Assembly or Worship Medical Centre; Hospital The inclusion of a Residential Density Cap of R80 to encourage short-stay accommodation over permanent residential accommodation. All forms of short-stay accommodation being 'SA' uses in the West End Residential zone excluding "Holiday Home". A provision in the West End Residential zone relating to management and use of any short-stay accommodation facility. The provision require the following:

Factor	EPA Objective	Potential Impacts	EPA Scope of Works	Proposed Management
				<p>All developments approved to provide a type of short-stay accommodation shall be subject to a management statement addresses but should not be limited to the on-going use, reception, security, maintenance, caretaking, refurbishment, marketing and other services required for the development to operate as a short-stay accommodation facility. The management statement shall be approved by the relevant local government prior to occupation of the development.</p>
			<ul style="list-style-type: none"> ▪ Provide an analysis of the potential total population permitted by the proposed amendment compared with the total population permitted by the current zoning. This is required to determine if there is potential that the amendment will lead to a greater number or residents being exposed to elevated dust levels. 	<ul style="list-style-type: none"> ▪ Single Houses are prohibited in the West End Residential zone to deter "at risk" individuals from residing in the amendment area. ▪ To limit on-going proliferation of permanent residential development without review of the on-going research into the potential impacts on the populations, a time-limit on development of permanent residential development in the West End Residential zone is required. The provision should require the following: <p>"Grouped and Multiple Dwellings shall not be permitted after 1 July 2016 in the West End Residential zone unless a further amendment is undertaken in light of further findings on the impact of iron-oxide rich dust at elevated levels on the general population."</p>
			<ul style="list-style-type: none"> ▪ Determine the most appropriate residential density, dwelling type and design criteria that will enable future dwellings in the amendment area to meet the recommended air quality levels in the Port Hedland Dust Taskforce Management Report". 	<ul style="list-style-type: none"> ▪ Dwelling type, density and design are designed to deter or prevent permanent occupation of the amendment area by "at risk" members of the population. This will include: <ul style="list-style-type: none"> – A Single House being a prohibited use in the "West End Residential" zone. – Grouped and Multiple Dwellings are to be "AA" uses in the "West End Residential" zone. – All dwellings shall be restricted to a maximum plot ratio area of 110m². – All dwellings being restricted number of bedrooms or rooms that may be possible for use as a bedroom to a maximum of two.

Factor	EPA Objective	Potential Impacts	EPA Scope of Works	Proposed Management
			<ul style="list-style-type: none"> ▪ Determine the most appropriate dwelling type (e.g. residential, group or apartment) in the amendment area that can be designed to meet the recommended air quality criteria specified in the Port Hedland Dust Taskforce Management Report. 	<ul style="list-style-type: none"> ▪ A preference should be made for higher density developments as they are more likely to reduce direct air-flow into the building. Amendment 22. This will require: <ul style="list-style-type: none"> – Multiple Dwellings being encouraged over Grouped Dwellings by assigning a maximum Residential Density cap or R80.
			<ul style="list-style-type: none"> ▪ Demonstrate that the proposed Residential Planning Code density (R Code), Building Codes of Australia and scheme provisions prescribed in Amendment 22 will ensure that dwellings will be designed and developed that meet the air quality standards recommended in the Port Hedland Dust Management Report. 	<ul style="list-style-type: none"> ▪ All developments are required to include appropriate design solutions to address elevated levels of dust. Amendment 22 shall include a provision which requires the following: <ul style="list-style-type: none"> – All development within the "West End Residential" zone shall require planning approval. – All applications for planning approval in the "West End Residential" zone excluding those for minor additions including patios and outbuildings shall be accompanied by a certification from a suitably qualified consultant that the building has been designed limit exposure of users of the building to dust levels which exceed 70ug/m³. – Prior to occupation, the Town of Port Hedland shall be require to approve a common management agreement between owners or the owners collectively, and a common facility manager/operator to provide for common on-site management of all units within the development.
			<ul style="list-style-type: none"> ▪ Provide specific detail on proposed building and infrastructure design that will assist in effective mitigation of elevated dust levels on an on-going basis. It is recommended that dwellings are designed to minimise exposure to fugitive dust. These should include, but not be restricted to: <ul style="list-style-type: none"> – Dwelling types and design that would achieve air quality standards. 	<ul style="list-style-type: none"> ▪ The recommendations of the C.A. & M.J. Lommers Pty Ltd have been endorsed as appropriate ways to limit exposure to elevated dust levels. Amendment 22 shall include provisions prepared in conjunction with C.A. & M.J. Lommers Pty Ltd to ensure all developments are designed to incorporate appropriate dust mitigation measures. ▪ Amendment 22 shall also require that also developments

Factor	EPA Objective	Potential Impacts	EPA Scope of Works	Proposed Management
			<ul style="list-style-type: none"> - Filtering air conditioning plants that has the required filtering capability required to handle dust particles of fraction size PM 10 - Air tight window seals (hermetically sealed) - Closed eaves - High pitched rooves to encourage dust run-off. 	

6.0 REFERENCES

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FIGURES

RPS

APPENDIX I

EPA Environmental Factors

APPENDIX 2

Detailed Assessment of Potential Population Under Existing and Proposed Zoning

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APPENDIX 3

C.A. & M.J. Lommers Pty Ltd
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