Planning for the Proposed Peel Food Zone

2017
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3. Potential development within the proposed Peel Food Zone

3.1 Potential (or Future) land use

The determination of potential land use for the proposed PFZ was guided by the following features and principles:

- The preservation and protection of the environmental values of the area, including its wetlands, waterways and native vegetation
- Existing land use and infrastructure is the foundation for future agricultural industries
- Food production trends, for example, intensification of agriculture, are applied
- Land use options in the PFZ will be used to attract investment from individuals and organisations to the region.

In order to determine the suitability of land use scenarios for the PFZ, a systematic and transparent analysis tool using the GHD Infrastructure Development – Geospatial Information Systems (INDEGO) methodology was utilised. INDEGO combines Multi-Criteria Analysis (MCA) with desktop based Geographic Information Systems (GIS) analysis and so has the capacity to assess a range of land use scenarios for the PFZ taking into account both environmental and social imperatives.

This Chapter describes the method applied in the determination of the land use scenarios selected for this study.

3.2 INDEGO

INDEGO combines traditional MCA techniques with desktop-based GIS analysis to generate a site suitability surface using key criteria identified by project personnel. This software has been designed such that it integrates the constraints and opportunities that have been identified in the natural and built environment alongside the social and cultural heritage criteria relevant to the study area. Importantly, INDEGO methodology enabled the land suitability selection process to take a balanced, transparent and traceable approach where the environmental, social, physical, and infrastructure data sets were assessed as per their ‘constraint’ for the six agriculture scenarios.

3.2.1 Multiple Criteria Analysis (MCA)

Spatial datasets were accessed for the study area and determined by the following factors:

- Representativeness of the area in terms and constraints and opportunities
- A consistent level of coverage across the Study area
- Availability of data from local, state and federal government sources
- Accuracy.

These datasets were considered by way of an MCA workshop process and involved assessment of both performance ratings and criteria weightings, held with state government agency representatives. The attendees are listed in Appendix A. The workshop provided a structured and transparent approach to determine overall preferences among alternatives,
where participants identified, ranked and weighted the performance criteria guiding the alignment suitability modelling process.

The GHD facilitated workshop was held in Perth on the 23rd January 2017.

During the workshop, the following six broad agricultural land use categories were agreed for consideration:

- **Dryland pasture & grazing (Non-Irrigated)**
- **Soil-based irrigated horticulture (Annual)**
- **Soil-based irrigated horticulture (Perennial)**
- **Soil-based irrigated horticulture (Covered)**
- **Non Soil-based horticulture (Protected Horticulture) [Glasshouses]**
- **Closed loop livestock systems**

### 3.2.2 Performance rating and Criteria weighting

The performance rating workshop drew upon the knowledge of the attendees who were required to rate the attributes of each criterion in terms of their suitability for the proposed development. Each criterion was given a rating in terms of its level of opportunity or constraints that it would exhibit for this project, as per the descriptions shown in Table 2.

<table>
<thead>
<tr>
<th>Performance Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Opportunity</td>
</tr>
<tr>
<td>10</td>
<td>Neutral Value</td>
</tr>
<tr>
<td>20</td>
<td>Moderately Constrained</td>
</tr>
<tr>
<td>40</td>
<td>Highly Constrained</td>
</tr>
<tr>
<td>100</td>
<td>Unsuitable</td>
</tr>
<tr>
<td>999</td>
<td>Highly Unsuitable</td>
</tr>
</tbody>
</table>

In determining the performance ratings, the following were considered in the workshop:

- The criteria weighting process assessed each criterion in consideration of its relative importance in the decision making process.
- The value assigned to the criterion is independent of the criterion’s level of constraints; instead, the weight reflects a particular criterion’s importance or potential level of impact on the assessment process relative to another criterion. The criterion that was considered to be of more importance to the decision making process as compared to the other criterion was to be scored as a “1” and the relatively less important criterion in that instance was to be scored as a “0”.

The weightings assigned to each criterion are presented in Appendices B to G, with the respective land use scenario.

### 3.3 Site Suitability surfaces

The results of the workshops were combined with the desktop GIS to generate six Site Suitability surfaces representing the six land use scenarios. The Site Suitability modelling utilises an overlay approach that requires all data to be converted into cell-based grids.
The key issues collated and utilised in the constraints and opportunity mapping are shown in Table 3.

**Table 3 Relevant datasets used to developed the INDEGO site suitability surfaces**

<table>
<thead>
<tr>
<th>Values</th>
<th>Constraints</th>
<th>Constraints</th>
<th>Constraints</th>
<th>Constraints</th>
<th>Constraints</th>
<th>Constraints</th>
<th>Constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental</td>
<td>Proximity to receiving water bodies</td>
<td>Phosphorous export risk</td>
<td>Geomorphic wetlands</td>
<td>Contaminated sites</td>
<td>Nature reserves</td>
<td>Remnant vegetation</td>
<td>Other reserves</td>
</tr>
<tr>
<td>Social</td>
<td>Lot area</td>
<td>Proximity to sensitive human receptors</td>
<td>Crown land</td>
<td>Aboriginal Heritage sites</td>
<td>Town sites and urban areas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infrastructure</td>
<td>Proximity to 3 phase power lines</td>
<td>Proximity to Restricted Access Vehicle (RAV) 4 road network</td>
<td>Internet Access</td>
<td>Flood Risk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical</td>
<td>Flood risk (1 in 100 AEP Floodplain)</td>
<td>Depth to maximum Groundwater level</td>
<td>Groundwater availability</td>
<td>Land capability (Soil)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.4 **Land use scenarios**

Six land use scenarios were assessed for development and potential investment in the PFZ. The scenarios were determined in consultation with the DAFWA and take into account predicted trends in food production, consumer expectations, land capability and environmental constraints, water supply, infrastructure and labour market. These scenarios are described in Table 4 and shown as the nominated Figures in Appendices B to G. The scenarios were refined to minimise their potential impact to nearby waterways, wetlands and residences.

**Table 4 Land use Scenarios**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Features</th>
<th>Figure Number</th>
<th>Appendix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dryland pasture and grazing</td>
<td>Rainfall dependent land use for hay production and grazing.</td>
<td>B1 - B11</td>
<td>B</td>
</tr>
<tr>
<td>Soil based horticulture, annual</td>
<td>Irrigated soil based annual horticultural crops produced</td>
<td>C1 - C11</td>
<td>C</td>
</tr>
</tbody>
</table>
### Scenario Features

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Features</th>
<th>Figure Number</th>
<th>Appendix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil based horticulture, perennial</td>
<td>Irrigated perennial crops established in open paddocks</td>
<td>D1- D11</td>
<td>D</td>
</tr>
<tr>
<td>Soil - based horticulture (covered)</td>
<td>Irrigated horticultural crops, established in-ground, but covered to manage natural elements particularly temperature, rainfall and wind.</td>
<td>E1 - E11</td>
<td>E</td>
</tr>
<tr>
<td>Non Soil-based horticulture (Closed)</td>
<td>Engineered, glasshouse/enclosed production system that features water re-use, temperature and nutrient control (i.e. no nutrient export into the natural environment).</td>
<td>F1 - F10</td>
<td>F</td>
</tr>
<tr>
<td>Closed loop livestock</td>
<td>Engineered, feedlot and intensive livestock system designed to control water use and prevent nutrient loss into the natural environment.</td>
<td>G1 - G10</td>
<td>G</td>
</tr>
</tbody>
</table>

#### 3.4.1 Dryland pasture and grazing.

The site suitability map for this system is presented in Appendix B, Figure B11 and shows that the areas most suited to this system are predominately along the eastern edge of the PFZ and toward the centre in the southern half of the zone. Most of the PFZ has adequate lot sizes for grazing with smaller lots associated with special rural living and farmlet zones (Figure B1). Suitability for grazing is strongly influenced by land capability with higher fertility soils more common in the east of the PFZ on the Forrestfield and Pinjarra soil-landscape units. The major constraint in determining the sites most suitable for this land use system is the phosphorous (P) export risk (Figure B3).

On the Bassendean soil-landscape units in the western half of the PFZ, deep sandy, infertile soils with minimal capacity to retain soil phosphorus and being located close to the sensitive waterways and wetlands, means these areas have a high risk of phosphorus export. Research undertaken in the Peel region has provided evidence to show that grazing properties make relatively large contributions to elevated phosphorus, poor water quality, algal blooms and fish deaths in the Peel-Harvey waterways. As grazing is a permitted land use on rural land in the Peel-Harvey, there is no suggestion that grazing will be restricted on these soil types. However, in future pressure is expected to increase for landholders to change land management, via soil amendment and improved fertiliser management. There is also an opportunity to replace some areas used for grazing with closed loop systems, leading to a net decrease in nutrient export on these areas.
Reducing the volume of P exported to the waterways is an important environmental imperative for this region as has been expressed by state and local government and the broader community. Figure B10 presents a summary of the suitability of each of the criteria and the overall site suitability surface and it shows that flood risk, infrastructure and proximity to sensitive human receptors are unconstrained for this land use.

### 3.4.2 Soil based irrigated horticulture (annual)

This land use system is most suited close to the eastern edge of the PFZ, Appendix C, Figure C11. Land capability (Figure C2), water availability and runoff are the features of this irrigated system that has influenced the final site suitability surface. Groundwater availability is constrained along the eastern boundary of the PFZ and this is reflected in the final site suitability surface where land is identified as highly constrained or unsuitable for this land use. The risk of P export to waterways and wetlands (Figure C3) and proximity to receiving water bodies (Figure B6) has also constrained the land available for this land use system. The proximity to sensitive human receptors (residences) identifies land in the south of the PFZ (Figure C9) as highly unsuitable as residences must be separated from potential impacts including spray drift, light and noise that can be the result of soil based irrigated horticultural practices.

### 3.4.3 Soil based irrigated horticulture (perennial)

The site suitability surface map for this land use system is shown in Appendix D, Figure D11 and the summary maps are shown in Figure D10. The features influencing the suitability of this land use system are similar to those discussed for the soil-based irrigated annual horticultural system. Irrigated, perennial systems are most suited in the northeast corner of the PFZ and inland of the eastern boundary. Groundwater availability (Figure D5) identifies the eastern boundary as highly unsuitable.

The high to extreme risk of P export (Figure D3) and proximity to receiving water bodies (Figure D6) associated with Bassendean sands in the western half of the PFZ largely restricts suitability for this land use to eastern half of the PFZ.

Along the eastern boundary, groundwater availability (Figure D5) is unsuitable for irrigation due to lack of suitable aquifers on the footslopes of the Darling Scarp.

Residences within the southern section of the PFZ has constrained the suitability of the perennial horticultural system as residences must be separated from potential impacts such as spray drift, light and noise that may be the result of soil based perennial horticultural activities (Figure D9).

### 3.4.4 Soil-based irrigated horticulture (covered)

The site suitability for the land use system, soil-based horticulture (covered) highlights a larger area of the PFZ as being suitable (Appendix E, Figure E11). Generally, P export (Figure E3) and groundwater availability (Figure E5) show suitability trends similar to those presented for the soil-based irrigated horticultural system. Covering horticultural crops has reduced the risk of spray drift on residences and increases water use efficiency, thereby reducing potential runoff or infiltration of nutrients into the soil profile. These factors have influenced the increase suitable land area by decreasing the impact on receiving water bodies (Figure E6) and the potential impact on sensitive human receptors.

The factors that have influenced the increased suitable land area are the reduced risk of affecting watercourses (Figure D6) and the potential impact on sensitive human receptors (Figure 9). Land capability is a major influence of the sites most suitable for this land use system reflecting its inherent soil fertility and water holding capability.
3.4.5 Non Soil-based irrigated horticulture (closed)

The site suitability map for non-soil-based irrigated horticulture is shown in Appendix F, Figure F10. This map shows this system is suited to the majority of land within the PFZ and is highly suitable in areas proximate to existing infrastructure, specifically RAV4 vehicle networks (Figure F6), 3 phase power (Figure F5) and internet access, (Figure F8). The central corridor of the PFZ is highly suitable for this system reflecting the RAV4 network established in the PFZ. This closed loop system assumes that neither water nor nutrients are exported from the site hence the assessment of P export for this system was not required. Access to irrigation water remains a constraint hence this system is less suited to the eastern edge of the PFZ. Proximity to residences remains a hard constraint for this system due to potential amenity impacts caused by increased traffic, noise and light.

3.4.6 Closed-loop intensive livestock

The site suitability surface for this land use system is shown in Appendix G, Figure G10. Where the maximum groundwater depth model indicates an average depth between 0.5m and 2m, it is assumed that landfill will be used to increase the separation to the shallow water table (Figure G3). Designing a facility with at least a 2m separation distance considerably increases the area that potentially suits the PFZ. By managing the risk of groundwater separation using landfill, proximity to sensitive human receptors in the south of the zone is the major constraint, Figure G7. Proximity to established infrastructure, both the RAV4 vehicle network (Figure G6) and 3 phase power lines (Figure G5) has identified the central and northern section of the PFZ as the area most suited to this land use.

3.5 Constraints and opportunities

The constraints and opportunities for the proposed PFZ have been conceptually presented in Figure 5. In summary, the factors most influential in determining the areas within the PFZ most suited to each of the considered land use scenarios were:

- Urban and rural residential zonings
- Environmental assets
- Land capability
- Infrastructure.

The population centres within the PFZ are generally concentrated in the southern and northern sections of the PFZ. These areas will require attention to the distances (buffer) from agricultural activities where impacts from spray drift, light and noise emissions may occur. The environmental features of the PFZ are widely regarded as valuable assets that are to be protected and enhanced. The environmental assets in the PFZ are reflected by the illustration of the major waterways and established native remnant vegetation. Most of the environmental assets were listed as ‘Highly Unsuitable’ areas and therefore sites not suitable for food production industries. Land capability was an important determinant of the sites most suitable for the soil-based industries. The eastern half of the PFZ features the more inherently fertile soils as shown by the darker shading along the eastern and southern parts of the PFZ. Access to infrastructure, roads, power and telecommunications were the influencing determinants for the sites within the PFZ most suited to food production systems reliant on regular transport of product in and out of facilities, reliable power supplies, for lighting and pumps and efficient telecommunications to allow for the efficient marketing of products.

In general terms, soil based land use scenarios are better suited to land in the eastern sections of the PFZ, reflecting its higher land capability and lower P export risk. Along the eastern boundary of the PFZ, groundwater supplies are constrained. The closed systems are generally
suited to land that is close to established infrastructure, particularly the restricted access vehicle (RAV4) road network and three-phase power. These land use systems, assume that production requirements such as nutrients, water, light, temperature and pest control for both plants and animals, will be provided and not reliant on seasonal conditions.

The datasets used in this study have been used at a ‘gross’ scale and therefore provide indicative findings as to the suitability of each land use scenario within the PFZ. Potential investors looking to establish food-producing industries will be required to gain development approval. Due diligence will be required to confirm access to water, the site suitable for food production, i.e. not contaminated, and there are no caveats on the land for environmental and heritage purposes.

Regulators and the Peel community will expect that environmental conditions and standards will be maintained, particularly noting organisations such as the Peel Harvey Catchment Council. Where possible, investors to the region may be encouraged to invest in improving the environmental health of the PFZ with revegetation programs, state of the art nutrient management and monitoring practices and water quality management.

Opportunities may arise from interventions in the landscape, which alter land capability such as mining operations. These interventions may reduce the impact of constraints associated with nutrient retention and water availability.

A summary of the dominant themes (highly desirable criteria) for each of the land use systems is shown in Table 5. All data have been provided to DAFWA in an electronic form to enable future interrogation of the data.
<table>
<thead>
<tr>
<th>Scenario</th>
<th>Lot area</th>
<th>Flood Risk</th>
<th>Groundwater availability</th>
<th>Proximity to receiving water bodies</th>
<th>Proximity to 3 Phase powerlines</th>
<th>Proximity to RAV4 vehicle network</th>
<th>Proximity to sensitive human receptors</th>
<th>Depth to Groundwater (Separation distance)</th>
<th>Internet access</th>
<th>Phosphorous Export Risk</th>
<th>Land Capability</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dryland pasture and grazing</strong></td>
<td>Cadastral lot sizes &gt;40 ha</td>
<td>Flood risk – outside 1 in 100 (1%) AEP Floodplain</td>
<td>Groundwater available</td>
<td>Proximity to Serpentine and Murray Rivers &gt; 10km</td>
<td>Proximity to 3 Phase Power Lines – within 1km of distribution lines</td>
<td>Proximity to sealed roads (truck access) – within 1km of sealed roads</td>
<td>Distance from sensitive human receptors &gt;500m</td>
<td>Property adjacent to internet access lines</td>
<td>&lt;3-10% of the map unit has a high to extreme hazard</td>
<td>&gt;70% of the land has moderate to very high capability, &gt;70% of the land has high to very high capability</td>
<td></td>
</tr>
<tr>
<td><strong>Soil-based irrigated horticulture (Annual)</strong></td>
<td>Cadastral lot size greater than 20ha</td>
<td>Flood Risk – outside 1 in 100 (1%) AEP Floodplain</td>
<td>Groundwater available</td>
<td>Proximity to Serpentine and Murray Rivers &gt; 15km</td>
<td>Proximity to 3 Phase Power Lines – within 1km of distribution lines</td>
<td>Proximity to sealed roads (truck access) – within 1km of sealed roads</td>
<td>Distance from sensitive human receptors &gt;500m</td>
<td>&lt;3-10% of the map unit has a high to extreme hazard</td>
<td>&gt;70% of the land has moderate to very high capability, &gt;70% of the land has high to very high capability</td>
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<td></td>
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<tr>
<td><strong>Soil-based irrigated horticulture (Perennial)</strong></td>
<td>Cadastral lot size greater than 20ha</td>
<td>Flood Risk – outside 1 in 100 (1%) AEP Floodplain</td>
<td>Groundwater available</td>
<td>Proximity to Serpentine and Murray Rivers &gt; 15km</td>
<td>Proximity to 3 Phase Power Lines – within 1km of distribution lines</td>
<td>Proximity to sealed roads (truck access) – within 1km of sealed roads</td>
<td>Distance from sensitive human receptors &gt;500m</td>
<td>&lt;3-10% of the map unit has a high to extreme hazard</td>
<td>&gt;70% of the land has moderate to very high capability, &gt;70% of the land has high to very high capability, 50-70% of the land has moderate to very high capability</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Soil-based irrigated horticulture (Covered)</strong></td>
<td>Cadastral lot size greater than 20ha</td>
<td>Flood Risk – outside 1 in 100 (1%) AEP Floodplain</td>
<td>Groundwater water available for irrigation</td>
<td>Proximity to Serpentine and Murray Rivers &gt; 15km</td>
<td>Proximity to 3 Phase Power Lines – within 1km of distribution lines</td>
<td>Proximity to sealed roads (truck access) – within 1km of sealed roads</td>
<td>Distance from sensitive human receptors &gt;500m</td>
<td>&lt;3-10% of the map unit has a high to extreme hazard</td>
<td>&gt;70% of the land has moderate to very high capability, &gt;70% of the land has high to very high capability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scenario</td>
<td>Lot area</td>
<td>Flood Risk</td>
<td>Groundwater availability</td>
<td>Proximity to receiving water bodies</td>
<td>Proximity to 3 Phase powerlines</td>
<td>Proximity to RAV4 vehicle network</td>
<td>Proximity to sensitive human receptors</td>
<td>Depth to Groundwater (Separation distance)</td>
<td>Internet access</td>
<td>Phosphorous Export Risk</td>
<td>Land Capability</td>
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<tr>
<td>Non Soil-based horticulture (Protected Horticulture)</td>
<td>Cadastral lot size greater than 5ha</td>
<td>Flood Risk – outside 1 in 100 (1%) AEP Floodplain</td>
<td>Groundwater available for irrigation</td>
<td>Proximity to 3 Phase Power Lines less than 50m</td>
<td>Proximity to sealed roads (truck access) – within 1km of sealed roads</td>
<td>Distance from sensitive human receptors &gt;300m</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Closed loop livestock</td>
<td>Cadastral lot size greater than 20ha</td>
<td>Outside 1 in 100 (1%) annual exceedance probability (AEP) Floodplain</td>
<td>Groundwater available</td>
<td>Proximity to Serpentine and Murray Rivers &gt;2km</td>
<td>Proximity to 3 Phase Power Lines within 1km</td>
<td>Proximity to sealed roads (truck access) - within 1km of sealed roads</td>
<td>Distance from sensitive human receptors &gt;1.5km</td>
<td></td>
<td></td>
<td>Groundwater BGL at max level &gt;= 2m</td>
<td></td>
</tr>
</tbody>
</table>
3.6 Stakeholder Consultation workshop

A number of stakeholders with business, environmental and government interest in the PFZ were invited to a workshop held at the Keysbrook Community Hall on 5 April, 2017 to review each of the land use scenarios and provide feedback on each of the maps. The list of attendees and apologies is provided in Appendix H. This workshop had four objectives:

1. Provide an overview of the Peel Food Zone project
2. Provide an overview of the purpose and approach to this Project
3. Review and comment on each of the scenarios
4. Provide overall comments on the Project.

This section provides the responses for each of the scenarios and the Project.

3.6.1 General comments

Workshop attendees were generally of the view that their opinions and considerations were heard. There was an overall agreement that the audience was lacking in representation from current landholders. DAFWA advised that a number of landholders were invited but had declined the invitation. Presentations to landholders in the region will occur over the coming months.

This section summarises the overall discussion.

General Comments

There was general agreement that the northern boundary needed to be extended to include Rowe Rd.

Some attendees suggested it was important to explore why food zones have not been successful in other parts of Australia and overseas. Learning from their experiences is important. Similarly, understanding the perceived constraints for intensive food production industries is important. Attendees commented that establishing an area such as this without understanding investment constraints could be limiting and lead to unnecessary mistakes, lost time and loss of investors.

While developing land may bring growth and sustainability to the region, acknowledging those already living and working in this region is very important. Existing residents will need to be educated as to how intensive farming systems may impact their lives, both positively (upgrade to infrastructure and investment in environmental protection) and negatively (increased vehicle numbers and noise).

Environmental Features

There are some significant environmental constraints in the PFZ, particularly the wetlands and waterways. There are very few remaining substantial stands of native vegetation in the zone, with much of the landscape featuring isolated patches of bush. The intensification of agricultural and food production systems, if not managed well, may further degrade these remaining assets. The opportunity to incorporate environmental management conditions should occur as the PFZ area develops and investors bring ideas and technology to the region. The region, if managed well, could become the ‘Kings Park of the South’. Environmental considerations will need to be elevated into planning considerations and a planning language, common to the two Shires, may need to be established so that natural assets and residences receive the same protection as the investors. Some land may need to be purchased by government and permanently protected to ensure the environmental values of the area are not lost. Buffers are a good example as most landholders do not intentionally invest in environmental buffers.
As industries are developed in the PFZ, it will be essential that buffers and distances to sensitive human receptors are maintained.

**Industrial development**

Investment in the PFZ offers opportunities for eco-tourism, agri-tourism and eco-industrial opportunities. Bush food as well as mass-produced food, could potentially be developed in this region and so bring bus-loads of people through the area. Similarly, there is the opportunity to introduce niche animal processing (e.g. rabbit abattoir).

Infrastructure is key to industrial development. Upgrading the existing road networks may be required to attract investment.

**Natural resources**

The PFZ initiative provides an opportunity to add to existing data sets used to make planning and regulatory decisions with data provided by private companies and individuals. For example, the mineral sands mining company currently mining in the PFZ may provide water and soil quality monitoring data. There is also the opportunity for companies to provide technical advice on a range of land and water management practices that provide both production and environmental benefits to the region. Examples of potential data and management practices are:

- Water quality data
- Groundwater data
- Soil rehabilitation practices
- Native vegetation revegetation and rehabilitation
- Management of wetlands and waterways
- Managing soil acidification and inherently acidic soils
- Improving Carbon (C) content in the soil profile, particularly topsoil
- Adding imported organic matter to the profile to improve water and nutrient holding capacities
- Groundwater availability and other sources of supply. Water supplied to the agricultural industries is unlikely to be sourced outside the region, but supplied by groundwater, harvesting, recycling and managed aquifer recharge.

3.6.2 **Land use scenarios and stakeholder comments**

There was general support for the concept of the PFZ, although there was some concern that there was not enough representation of current landholders attending this workshop. DAFWA and PDC intend to undertake additional presentations in the region following the completion of this study.

Attendees were invited to review each of the land use scenarios. Maps for each scenario were placed on tables with a representative from DAFWA at each table recording comments. Table 5 provides a summary of the comments for each scenario.

Where possible, amendments recommended by attendees to maps were made to the final sets of maps provided in this Report. This included extending the northern boundary of the PFZ.

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2 Andy Ellet, Project Manager for the Peel Water Initiative provided a brief outline of this project and its links with the PFZ.
### Table 6 Stakeholder comments for each land use scenario

<table>
<thead>
<tr>
<th>Land use Scenario</th>
<th>Comments</th>
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</table>
| Dryland pasture and grazing               | – What support is to be provided to existing landholders  
– Engagement of existing landholders to change their management practices is needed  
– Different models of operating/leasing should be considered  
– Opportunities to improve degraded wetlands should be part of this Project  
– Pasture may be the answer. Carbon sinks would be established and pasture slows down water flow in the landscape thereby reducing nutrient runoff. They also provide a useful buffer  
– Move the boundary to the north  
– Environmental values very important to be protected ‘Kings Park’ status should be the focus  |
| Soil-based irrigated horticulture (annual)| – The northern boundary of the PFZ to be extended to Rowe Rd  
– Best practice nutrient management is required to reduce risk of nutrient loss from farming systems  
– Constraints of SPP 2.1 may limit opportunities  
– Government decision-makers may not take risks in decision-making in order to approve new industries  
– Should we be measuring outcomes rather than inputs or prescribing processes  
– Have we asked people who have not invested why they chose not to do so  
– Have all future zones in rural strategies been incorporated as no go areas or sensitive land uses  
– Bush fire risk should be a data set included in this work  
– Climate change and sea level rise need to be taken into account  |
| Soil-based irrigated horticulture (Perennial)| – Potential land use constraint in farmlet zone around North Dandalup  
– Eastern boundary has potential landscape implications depending on use  
– Contour implications for ‘useability’, refer Shire of Murray Hills Landscape Precinct Plan  
– Push boundary of the PFZ to the north  
– Remove ‘special zone’  |
| Soil-based irrigated horticulture (Covered)| – Most people are comfortable with this concept  
– Why restrict the area to <20ha  
– Opportunity to control nutrient losses from rainfall  
– Likely to be an economic option for producers on cheaper land (further east) without building glasshouses  
– Some tourism opportunities  
– Controlling what happens to rainfall is important and how will this be received by regulators  
– There is an issue with the planning framework and land use permissibility for intensive agriculture in the rural residential lots  
– There is an opportunity to harvest rainfall for other production systems  
– Visual amenity on the eastern boundary may be an issue  |
| Non soil-based irrigated horticulture (Closed)| – Biosecurity is an important aspect to manage  
– Any carbon-based products should be recycled  
– Clusters will enhance waste collection efficiency  
– Do we really need to build a trial farm if the systems are as attractive as marketed? Immediate investment will create immediate jobs  
– Why are buffer distances so important  
– Keeping up with technology changes is important  
– Investors will need certainty  |
| Closed loop intensive livestock             | – Always check with DoW for water availability and our knowledge of groundwater availability is generally limited in this region  
– What land uses in the Nambeelup are approved.  |
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<th>Land use Scenario</th>
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<tbody>
<tr>
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<td>– Make sure separation distances are correctly assessed</td>
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<tr>
<td>Current land use map</td>
<td>– Have all existing mining approved areas been captured</td>
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<td>– Mining company will be willing to share soil and water data to improve knowledge of the area</td>
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<td>– Airport is important to the PFZ</td>
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<td>– Support for a larger area and then reduce area if required</td>
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<tr>
<td></td>
<td>– Eco-industrial land and nature reserves should be incorporated into the PFZ to protect the environmental values</td>
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<tr>
<td></td>
<td>– If one of the critical success factors is ownership of the land then why don’t we focus on the community government owned land at Keralup for this initiative</td>
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<td>– Focusing on one parcel of land may provide the catalyst for other investors</td>
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