02 July 2020

Kathleen Shackleton
Service Manager
Lancelin South Water
PO Box 60
Lancelin WA 6044

Our ref: 6137219

Your ref:

Dear Kathleen

Review of Lancelin South Drinking Water Source Protection Plan

1 Introduction

A drinking Water Source Protection Plan (WSPP) was developed for the Lancelin South Development by RPS on behalf of Aquasol Pty Ltd in November 2012.

This letter provides a review of the 2012 WSPP as recommended.

2 Parties Involved

Aquasol Pty Ltd originally obtained a Water Services Licence from the Economic Regulation Authority (ERA), built and operated the drinking water treatment plant and provided water to the residents of Lancelin South.

Water Corporation obtained a licenced allocation of 470,000 kL/annum of groundwater from the then Department of Water to supply the Lancelin South Development. The licence was transferred to Aquasol.

In 2017 Lancelin South Pty Ltd was granted Water Services Licence WL47 from the ERA. In 2019, the Department of Water and Environmental Regulation (DWER) transferred the Licence to Take Water to Lancelin South Pty Ltd. Lancelin South Water (LSW), a trading name of Lancelin South Pty Ltd, commenced operation of the water supply and wastewater disposal systems servicing the Lancelin South development in October 2017.

3 Infrastructure

Approximately 50 of the ultimate 1,000 lots in Lancelin South have been developed. Each lot is serviced with potable water, non potable water and sewerage connections.

The originally developed production and monitoring bores, as detailed in the 2012 WSPP, are still in use.

The water treatment plant designed and installed by Aquasol was decommissioned and removed in November 2019. A replacement water treatment plant was installed at the same time. The water treatment process has not changed substantially from that discussed in the 2012 WSPP. A P1 Wellhead Protection Zone has been proclaimed over the area of the WTP which is enclosed within a locked, chain mesh fenced compound.

Both non-potable and potable water are reticulated to each lot in Lancelin South.

4 Water Quality Monitoring

LSW regularly monitors the water in accordance with monitoring plans complying with the requirements of the Department of Health (DoH) and the DWER. Samples are taken from the following:

- Monitoring bores;
- Production bore (Source Sampling Point);
- Treated Water Tank (Treated Water Sampling Point);
- Sample tap in the residential area (Consumer Sample Point)

Drinking water quality is reported quarterly to DoH and a summary of results are provided on the LSW web site. An Annual Water Quality Summary report has been requested by DoH and will be provided (and added to web site) on an annual basis from September 2020.

Groundwater quality and abstraction is reported to DWER on an annual basis by LSW.

5 Land Use and Environment

There have not been and there are no proposed changes to the use of land surrounding the production bore or WTP.

The land surrounding the production bore and WTP remains natural bush land.

6 Other items

LSW maintains regular surveillance of the WTP and surrounds.

LSW has developed an Emergency Response Plan.

7 Conclusions

The 2012 WSPP remains relevant to the current groundwater abstraction and water supply system to Lancelin South.

All references to and responsibilities assigned to ‘Aquasol’ within the 2012 WSPP should be considered as transferred to LSW.

Sincerely
GHD Pty Ltd

Claire Murray

Process Scientist

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LANCELIN SOUTH WATER RESERVE DRINKING WATER SOURCE PROTECTION PLAN

Lancelin South Town Water Supply

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SUMMARY

The Lancelin South development is located approximately 130 km north of Perth and 2.2 km south of the town of Lancelin, in the Shire of Gingin. The development will result in the creation of approximately 1,000 residential lots and associated community infrastructure, with the potential for the future creation of a further 3,000 residential lots (subject to planning approvals). The establishment of a new potable water supply scheme is in progress, and an application for a water service provider licence has been submitted to the Economic Regulation Authority by Aquasol Pty Ltd for operation of the proposed scheme.

Hydrogeological investigations have previously been undertaken by URS to establish the suitability of the Leederville aquifer as a supply source for the proposed scheme. A production bore (3/09) has been constructed and a H3 level hydrogeological investigation has been conducted and reported on (URS 2010b). The production bore is located within the proposed Lancelin South Water Reserve, located approximately 250 m east of the Lancelin South development, and approximately 100 m north of Lancelin Road. A Drinking Water Source Protection Plan (DWSPP) is required for the source by the Department of Health as part of their Memorandum of Understanding with the licenced water service provider.

Current and proposed land uses in the area include grazing, natural bushland, lime sand mining, semi-rural development and urban residential development. The surrounding land uses pose minimal risk to the water supply due to the confined nature of the source aquifer system, provided bore construction is in accordance with *Minimum Construction Requirements for Water Bores in Australia (3rd Edition)* (National Water Commission 2012).

This DWSPP has been prepared by RPS to provide an assessment of the risks to water quality within the proposed Lancelin South drinking water source area, and to make recommendations in regards to management practices available to minimise or manage the identified risks. The water quality protection measures to be implemented include:

- the proclamation of the boundary of the proposed Lancelin South Water Reserve under the *Country Areas Water Supply Act 1947*. The private land in this water reserve (compound) will be managed for priority 1 (P1) water source protection

- recognition of the Priority 1 reserve area within the Shire of Gingin's local planning scheme and other applicable schemes and strategies

- implementation of Best Management Practices including appropriate bore construction in accordance with *Minimum Construction Requirements for Water Bores in Australia (3rd Edition)* (National Water Commission 2012), and the use of appropriate signage.

The DWSPP has been prepared to satisfy a requirement of DoW in line with the Department's commitment to protecting drinking water sources to meet public health requirements and ensure the supply of a reliable, safe, good quality drinking water to consumers.

This DWSPP is consistent with the National Water Quality Management Strategy: Australian Drinking Water Guidelines (ADWG) (NRMMC 2011) recommendation for a preventative risk-based and multi-barrier approach to protection of public drinking water sources which includes catchment protection as the first barrier to water source protection (with subsequent protection through barriers applied to contamination of storage, treatment and distribution functions of the water supply system).

In developing a catchment protection strategy the water source catchment has been assessed to identify the potential risks to drinking water quality. Subsequently, controls and strategies to mitigate these risks have been developed in an effort to ensure the safest possible water supply to consumers.

This DWSPP details the location and boundary of the proposed Lancelin South potable water source and discusses existing and future use of the water source. It is noted that this source is protected from threats associated with surface land uses because the water is abstracted at significant depth from within a confined aquifer. However, potential threats to the source may be presented if new or existing production bores (or bores related to other land uses) in the vicinity of the supply are not properly constructed and maintained. To facilitate ongoing management of the water source and reflect the importance of the water supply to the ongoing development of the Lancelin area, it is recommended that water reserves are identified in the Shire of Gingin local planning scheme, consistent with Western Australian Planning Commission's Statement of planning policy No. 2.7: Public drinking water source policy (2003).

GLOSSARY

Abstraction	The removal of water from a water body (typically an aquifer).
Aesthetic guideline	A criteria within the *Australian Drinking Water Guidelines* (NHMRC & NRMMC 2004) which defines the acceptable levels of odour, taste and appearance of water.
Allocation	The volume of water to which a licenced water user is permitted to abstract on an annual basis.
Aquifer	A geological formation capable of storing, receiving and releasing usable quantities of water.
Bore	An excavation created in an aquifer for the purpose of accessing groundwater (also known as a well).
Catchment	The spatial extent of land surface contributing a water store or conveyance feature.
Confined Aquifer	An aquifer that has a confining (impermeable) layer between it and the land surface.
Effluent	The fluid product of a process.
Hydrogeology	The study of the distribution and movement of groundwater.
Pollution	The introduction of contaminants into the natural environment.
Public Drinking Water Source Area (PDWSA)	The introduction of contaminants into the natural environment.
Recharge	Addition of water to an aquifer.
Recharge area	The area from which recharge water is sourced.
Supply scheme	The arrangement of infrastructure processes and management by which water is delivered to users.
Superficial aquifer	The unconfined aquifer exposed at the land surface.
Treatment	The application of processes intended to improve the usability of water for beneficial uses.
Unconfined aquifer	An aquifer with direct hydraulic connection to the land surface.
Water quality	Physical, chemical and biological characteristics of water.
Water reserve	An area proclaimed under the *Country Areas Water Supply Act 1947* or the *Metropolitan Water Supply Sewerage and Drainage Act 1909* for the purpose of protecting drinking water supplies.
Wellhead	The infrastructure located at the land surface above a groundwater bore/well.
Wellhead protection zone (WHPZ)	A designated area surrounding a bore/well for the purpose of water quality protection.

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1.0 DRINKING WATER SOURCE OVERVIEW

1.1 Proposed Water Supply System

A potable water supply scheme is required to service the residential development under construction at Lot 1, 5243, 9504 and 9505 Lancelin and Old Ledge Point Roads, Lancelin (hereon referred to as "the development", Figure 1).

The development currently covers an area of approximately 176 ha and includes the construction of approximately 1,000 residential lots. The structure plan for the initial 1,000 lot development comprises residential densities ranging from R2.5 to R20/40, as well as a 54 ha Mixed Business/Light Industrial zone of approximately 118 lots, a 3.6 ha Village Centre commercial area, and five Local Centres (small retail hubs intended to service the daily needs of residents) totalling 1.58 ha.

A scheme amendment to cater for development of an additional 3,000 residential lots and associated community infrastructure is in progress and will comprise a similar structure plan breakdown (pro-rata).

Aquasol Pty Ltd (Aquasol) has applied to the Economic Regulation Authority (ERA) for a Water Service Provider's (WSP) licence to operate the required potable water supply scheme. The proposed raw water used by Aquasol in operation of the scheme will be sourced from the confined Leederville aquifer. Abstraction will initially utilise a single production bore (referred to as production bore 3/09), with abstraction under a 5C licence granted by DoW and supported by a H3 hydrogeological investigation (URS 2010a, Appendix 1) and District Water Management Strategy (URS 2010b, Appendix 2). Figure 1 indicates the location and depth of production bore 3/09, and associated monitoring bores, and bore coordinates and depths are provided in Table 1.

Table 1: Monitoring and Abstraction Bore Details

Bore Reference	Type	Easting (m, MGA50)	Northing (m, MGA50)	Top of Casing Elevation (m AHD)	Depth (m)
3/09	Production	344779	6563873	39.43	213
1/09	Monitoring	344451	6564068	28.02	139
2/09	Monitoring	344453	6564064	27.63	42

1.2 Water Treatment

Water quality treatment and disinfection measures are essential in ensuring the supply of safe and amenable water to consumers. However source protection, achieved through appropriate catchment and aquifer management, is the first step in ensuring a good-quality water supply, as endorsed by NRMMC (2011).

Water quality analyses were conducted during the H3 investigation as reported in URS (2010). The results indicated that the source water quality meets all ADWG requirements with the exception of iron. The water quality results are provided as Appendix 2.

Power for the water abstraction, treatment and distribution requirements will be supplied via connection to the existing Western Power energy distribution network.

1.2.1 Treatment of Potable Water Supply

The proposed treatment system will see raw water pumped from the deep aquifer bore through a first filtration system discharging in a holding/irrigation tank located at the proposed treatment plant (Figure 3). Water for supply via the reticulated potable supply scheme will be taken from the holding tank before passing through a secondary filtration system including UV sterilisation, reverse osmosis filtration and chlorination before delivery to consumers. The bore, storage tanks and water treatment facilities are all contained within a secured treatment plant site. The quality of the drinking water supply for the proposed development will be in accordance with the Australian Drinking Water Guidelines (NHMRC & NRMMC 2004a).

The filtration system will require regular back-flushing to remove iron precipitate. During this process water is pumped and circulated in a reverse direction through the filter media and out into a primary backwash tank. Filtered particulates will settle in the primary backwash tank, and clean water will overflow into a secondary backwash tank before being to redirected back into the system. The primary backwash tank will be periodically drained to remove excess of impurities gradually deposited.

1.3 Catchment Details

1.3.1 Physiography

Lancelin South is situated on the Swan Coastal Plain, and within the Quindalup Dune System which is characterised by a complex pattern of parabolic dunes. The Quindalup Dunes are the geomorphic expression of the Safety Bay Sand geological unit, comprising of medium grained calcareous sand. The majority of the area is characterised as having irregular dunes with high relief and slopes of up to 20% (Geological Survey of Western Australia, 1978). A small portion of the site, located towards the southern boundary, is characterised as being undulating with shallow calcareous sands and along the eastern boundary the surface geology is characterised as dunes or remnants with low relief. Topographically the site falls from approximately 30 m AHD in the east to 5 m AHD in the west.

1.3.2 Climate

The Lancelin area has a Mediterranean climate with warm dry summers and mild wet winters. Rainfall is highest from April to October and makes up approximately 90% of the annual total, with monthly rainfall often exceeding 100 mm. From December to March the area receives lower rainfall, higher temperatures and higher evaporation rates.

The average annual rainfall for Lancelin is approximately 609.4 mm (1966 to 2010, Lancelin Station 009114). In 1999 a maximum rainfall of 853.8 mm was recorded and in 2006 the minimum rainfall of 428.0 mm was recorded.

Average annual pan evaporation is 2044 mm/yr which is approximately three times greater than average annual total rainfall with monthly rainfall only greater than monthly evaporation from May to August.

1.3.3 Hydrogeology

The site is located in the Perth Basin within the Dandaragan Trough. The hydrogeology of the site at increasing depths consists of the Superficial, Lancelin Formation, Leederville and Yarragadee Aquifers as discussed below. Further discussion of the hydrogeology of the water supply scheme is provided in URS (2010a) (Appendix 1).

1.3.3.1 Superficial Formation

The Superficial Aquifer in the Lancelin Area is generally greater than 20 m below surface level. At the site the depth to the Superficial Aquifer ranges from less than 5 m in the west to over 30 m in the east (URS 2010a, Appendix 1).

The aquifer has a saturated thickness of approximately 25 m, is recharged by direct rainfall infiltration and the Moore River (URS 2010a, Appendix 1). On a regional scale, groundwater within the Superficial Aquifer flows in a south-westerly direction before discharging to the ocean (URS 2010a, Appendix 1).

1.3.3.2 Lancelin Formation

The Lancelin Formation is a confining bed which underlies the Superficial Formation. Around the study area the Lancelin Formation consists of the Lancelin Formation and the Gingin Chalk (URS 2010a, Appendix 1). Around the Guilderton and Lancelin area the Lancelin Formation comprises approximately 50 m of weakly to moderately consolidated sandy mudstone and siltstone, often consisting of a white to greenish-brown, glauconitic marl above the Gingin Chalk and forms a regional low permeable and confining bed (Moncrieff 1989, Davidson and Yu 2008).

1.3.3.3 Leederville Formation

The Leederville Formation underlies the Lancelin Formation in the proposed water supply area. The Leederville Formation is a confined aquifer made up of approximately 50% weakly to moderately consolidated sandstone with some conglomerate (URS 2010a, Appendix 1). These sandstone beds may be up to 40 m thick, but are generally less than 10 m thick (URS 2010a, Appendix 1). The sandstone generally has a silty or clayey texture and is grey in colour (URS 2010a, Appendix 1).

In addition to sandstone the Leederville Formation is inter-bedded with weakly to well-consolidated siltstone, claystone and shale which are medium grey or brownish grey to black in colour (URS 2010a, Appendix 1).

The Leederville Formation is recharged mainly from the Superficial Formations (URS 2010a, Appendix 1). Groundwater flow in the Leederville formation is in a westerly direction towards the coast (URS 2010a, Appendix 1).

1.3.3.4 Yarragadee Formation

Around the study area the Yarragadee Formation is generally overlain by the Warnbro Group (URS 2010a, Appendix 1). The Yarragadee Formation consists predominantly of weakly consolidated, light grey sandstone together with minor amounts of conglomerate, shale, siltstone, and claystone, with minor thin coal horizons and filaments of black carbonaceous material (URS 2010a, Appendix 1). The Yarragadee aquifer is generally confined either by the South Perth Shale or by the Otorowiri Member of the Parmelia Formation (URS 2010a, Appendix 1). Recharge generally occurs by downward leakage. Although the Yarragadee aquifer is a major regional aquifer, it was not included in the Lancelin South water supply options largely due to its significant depth below surface level (URS 2010a, Appendix 1).

1.4 Future Water Supply Requirements

The proposed water supply scheme has been designed to service approximately 1,000 residential lots. A scheme amendment is being prepared to support construction of an additional 3,000 residential lots and associated community infrastructure, and a review of existing H3 hydrogeological investigations (URS 2010a, Appendix 1) will be undertaken to assess the ability of the current water resource to service this additional requirement.

1.5 Drinking Water Source Protection

The proposed potable water supply scheme for which this DWSPP has been prepared is not yet operational. As such, there are no existing drinking water source protection measures in place. URS (2010a) notes that the drinking water source benefits from a high degree of natural protection as provided by the confined nature of the aquifer and limited hydraulic connectivity to the overlying superficial formations (Appendix 1).

The abstraction bore will be constructed in accordance with the National Water Commission's *Minimum Construction Requirements for Water Bores in Australia* (2012). As the drinking water is supplied from a confined aquifer, the risks to the water source are considered low or negligible as long as the bore is constructed in accordance with the National Water Commission's Minimum Construction Requirements for Water Bores in Australia (2012).

1.6 Department of Water Management

1.6.1 Current Licenced Allocation

DoW is responsible for administration of water resource use in Western Australia under the *Rights in Water and Irrigation* Act (RIW*I) 1914*. This Act vests the right to use and control surface water and groundwater resources with the Crown, and requires licensing of all groundwater abstraction within RIWI proclaimed groundwater management areas and from artesian bores within Western Australia.

The proposed potable supply scheme falls within the Gingin Groundwater Area, proclaimed under the RIWI Act. An application for a licensed allocation of 470,000 kL/yr from the Leederville Aquifer for supply via the proposed potable water supply scheme was recently issued by the DoW to the Water Corporation for the Lancelin South development (licence number GWL 172832). However, as the Water Corporation will not be the water service provider a Form 4T application will be lodged with the DoW to transfer this licence from the Water Corporation to Aquasol Pty Ltd. A licence for additional allocation will be applied for should the scheme amendment to allow construction of an additional 3,000 lots be successful.

1.6.2 Gingin Allocation Plan

An allocation plan for the Gingin area is being prepared by DoW and is scheduled for release in 2012. The plan was not available at the time of preparing this DWSPP.

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2.0 WATER QUALITY MONITORING AND CONTAMINATION RISKS

Water quality is susceptible to adverse impact from a wide range of chemical, physical and microbiological factors. These factors have the potential to result in supply of water that is aesthetically acceptable to consumers, safe for consumption and which is of a suitable quality for typical end uses.

Aquasol will monitor water quality of the raw water supply on a quarterly basis in order to assess the health-related and aesthetic characteristics of the raw (untreated) supply water, in accordance with the Australian Drinking Water Guidelines (NHMRC & NRMMC 2004a). Results of this monitoring will be assessed against ADWG and will allow adaptive management of the water supply system through the adaptation of the water treatment processes in response to changes in raw water quality.

The Australian drinking water guidelines provide the health and aesthetic guidelines to protect human health, manage aesthetics and maintain water supply infrastructure. Aquasol will regularly monitor the quality of raw water from the Lancelin South Water Reserve for microbiological, health-related and aesthetic (non-health-related) characteristics. This data will show the quality of water in the water reserve. An assessment of the drinking water quality once treated will also be made against the ADWG. This assessment will be made by an intergovernmental committee called the Advisory Committee for the Purity of Water that is chaired by the Department of Health. A water quality summary for the Lancelin South Water Reserve from water quality samples collected on 1 December 2009 is provided as Appendix 2.

Water quality testing of potable water (i.e. treated water) supplied via the proposed water supply scheme will also be monitored. Assessment will be made by an inter-governmental committee (the Advisory Committee for the Purity of Water, chaired by the Department of Health (WA)).

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3.0 LAND USE ASSESSMENT

3.1 Potential Water Quality Risks

The use of water sourced from a confined aquifer results in a water source that is protected by a natural degree of isolation of the source from potential pollutants resulting from the surrounding land uses. However, protection of the water supply from the risk of contaminants through controls on the construction and maintenance of any existing or new bores in proximity to the water supply bore(s) is still required to prevent bores from acting as a conduit for contaminants associated with surface activities to enter the water resource. To this end (and as a matter of good practice), all bores should be constructed in accordance with *Minimum Construction Requirements for Water Bores in Australia (3rd Edition)* (National Water Commission 2012).

3.2 Existing Land Uses and Activities

Production bore 3/09 is located within natural bushland (zoned Rural under the Shire of Gingin's Town Planning Scheme), outside and to the east (i.e. up-gradient with respect to groundwater flow) of the proposed development area. This location will minimise potential risks associated with residential land use. Upon approval of the water supply scheme by ERA and DoW, the water treatment infrastructure would be constructed at the current location of production bore 3/09.

The land on which the water abstraction bore (and water treatment facility) are (will) be located is owned by the Lancelin South land development project proponent (Mr Joe Matthews), and will be leased to Aquasol on an indefinite/ongoing basis and at no cost.

A Drinking Water Source Protection Assessment (DWSPA) was conducted during preparation of the District Water Management Strategy (DWMS) (URS 2010b). The DWSPA concluded that bore 3/09 did not require the establishment of a Wellhead Protection Zone (WPZ) because there was negligible risk of contamination from land use or other contamination sources. These conclusions were based on:

- geological conditions – the significant depth at which the Leederville aquifer exists, and separation of the aquifer from the superficial formations by low-permeability strata

- hydrogeological conditions – the upward head that exists in the Leederville aquifer relative to the overlying superficial formations. these conditions would retard or prevent leakage of contaminants to the Leederville aquifer

- the bore has been constructed in accordance with relevant sections of National Water Commission's *Minimum Construction Requirements for Water Bores in Australia* (2012) – which includes measures such as cement grouting to prevent vertical leakage through the preferential pathway that a bore casing may otherwise present

- pump tests – which indicate a lack of hydraulic connectivity between the Leederville aquifer and overlying superficial formations

- groundwater modelling – which predicts a lack of impacts on the superficial formations by pumping within the Leederville aquifer

- monitoring bores – which have been installed to allow monitoring of the water quality in both the Leederville and overlying superficial aquifers.

A compound (of approximately 30 × 20 m) around production bore 3/09 will be provided to protect the bore and associated infrastructure. This compound will be proclaimed as the Lancelin South Water Reserve under the *Country Areas Water Supply Act 1947*.

3.3 Proposed Land Uses and Activities

The proposed drinking water reserve is not expected to be subject to impact as a result of existing and/or future land-use activities due to the confined nature of the Leederville aquifer and the depth below ground level at which abstraction will occur. In the unlikely event that herbicide use is required in or around the compound, herbicide will be used in accordance with the Department of Water Statewide Policy 2 *Pesticide use in PDWSAs* and the Department of Health PSC88 *Use of herbicides in water catchment areas*.

4.0 CATCHMENT PROTECTION STRATEGY

4.1 Proposed Proclamation of Lancelin South Water Reserve

One site (at the location of production bore 3/09) is to be proclaimed under the *Country Areas Water Supply Act 1947*. This site is to be proclaimed to formally acknowledge the locations of a public drinking water supply source, and to trigger special control areas in the local planning scheme and related documents. This DWSPP recommends proclaiming the proposed compound area of production bore 3/09 (an area of approximately 30 m × 20 m) for the Lancelin South development under the *Country Areas Water Supply Act 1947* (Figure 2). This compound should be proclaimed as the Lancelin South Water Reserve. The proclamation process should be initiated by the Department of Water in consultation with Aquasol.

4.2 Priority Areas

The protection of PDWSAs relies on statutory and non-statutory measures for water resource management and land-use planning. The Department of Water's policy for the protection of PDWSAs includes a system that defines three specific priority areas:

- Priority 1 (P1) areas have the fundamental water quality objective of risk avoidance (e.g. state forest and other Crown land).
- Priority 2 (P2) areas have the fundamental water quality objective of risk minimisation (e.g. land that is zoned rural).
- Priority 3 (P3) areas have the fundamental water quality objective of risk management (e.g. areas zoned urban, industrial or commercial).

The determination of priority areas is based on the strategic importance of the land or water source including risks to water quality and quantity, the local planning-scheme zoning, the form of land tenure and existing approved land uses or activities. For further detail, please refer to our WQPN no. 25: Land use compatibility in public drinking water source areas.

A Priority 1 area for the Lancelin South Water Reserve (comprising the bore and treatment plant compound) has been determined in accordance with current Department of Water policy (Figure 2). The Department of Water's *WQPN no.25: Land use compatibility in public drinking water source areas* (DoW 2004) outlines activities that are "acceptable", "compatible with conditions" or "incompatible" within a P1 priority area.

A Priority 1 (P1) reserve classification will be assigned to the proclaimed reserve in accordance with *Statement of Planning Policy No. 2.7 – Public Drinking Water Source Policy* (Western Australian Planning Commission (WAPC) 2003).

4.3 Land Use Planning

The State Planning Policy 2.7 – Public Drinking Water Source Policy (WAPC 1997) recognises the need for establishment of appropriate mechanisms within the statutory land use planning process in order to secure the long-term protection of public drinking water sources. In accordance with this policy, it is appropriate that the Lancelin South Water Reserve (P1 area) be recognised as a special control area in the Shire of Gingin Local Planning Scheme No. 8 (2011).

4.4 Best Management Practices

Water quality can be protected through the careful consideration of design and management practices. A wide range of guidelines exist for many land uses, including industry codes of practice, environmental guidelines and water quality protection notes. These guidance tools have been developed in consultation with industry groups, government agencies, practitioners and technical advisors. *Minimum Construction Requirements for Water Bores in Australia (3rd Edition)* (National Water Commission 2012) is an example of such a guidance tool, which provides guidance for suitable bore construction methods to protect water resources and has been developed by industry practitioners and technical experts.

Other key mechanisms for protecting water quality include education and awareness initiatives (e.g. public signage and promotions). These can be particularly important for visitors to the area who are unfamiliar with the presence of water reserves (e.g. tourists using the Indian Ocean Drive tourist route). Prominent signage will be prepared and placed on Lancelin Road in the vicinity of the drinking water reserve area to convey information regarding the presence of the reserve and appropriate protection measures (including provision of the water service provider's contact details for use in response to emergencies).

Specific Best Management Practices to be employed include:

- fencing (including secure gate) to bore compound
- signing of compound (showing name of Water Reserve and Water Service Provider, and emergency contact phone number)
- bore construction to National Water Commission's *Minimum Construction Requirements for Water Bores in Australia (3rd Edition)* (National Water Commission 2012).

4.5 Surveillance and By-law Enforcement

The *Country Areas Water Supply Act (1947)* provides protection of water quality within PDWSAs in country areas. The proclamation of the Lancelin South water reserve will allow existing and future by-laws to protect water quality.

By-law enforcement, through surveillance of land-use activities in PDWSAs is an important mechanism to protect water quality.

Appropriate signage will be erected on the boundaries of this water reserve to educate and advise the public about activities that are prohibited or regulated.

4.6 Responding to Emergencies

Water contamination may occur as a result of unforeseen incidents and the use of chemicals during emergency response scenarios.

The Shire of Gingin's Local Emergency Management Committee should be familiar with the location and purpose of the Lancelin South Water Reserve. The fire and rescue services headquarters should be provided with a locality plan and this should be made available to the Hazardous Materials Emergency Advisory Team (or equivalent). Aquasol should have an advisory role to any Hazardous Materials incidents in, or near to, the Lancelin South Water Reserve.

A map of the Lancelin South Water Reserve should be made available to any personnel who deal with hazardous material incidents in the area, and these personnel should be aware of the potential impact of hazardous materials on the water resource.

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5.0 RECOMMENDATIONS

The following recommendations are made with regards to the Lancelin South drinking water reserve. The relevant stakeholder in terms of implementation is indicated in brackets at the end of each recommendation.

1. Proclaim the abstraction bore compound of bore 3/09 as the Lancelin South Water Reserve under the *Country Areas Water Supply Act 1947*. (Department of Water and Aquasol).

2. Reflect the Lancelin South Water Reserve in the Shire of Gingin's Local planning scheme in accordance with the WAPC's State Planning Policy no. 2.7 Public Drinking Water Source Policy 2003 (Shire of Gingin and Aquasol).

3. Implement the water source protection strategies identified in this Drinking Water Source Protection Plan (Aquasol).

4. Any new land uses not complying with WAPC's State Planning Policy No. 2.7: Public drinking water source policy (2003) and the Department of Water's Water Quality Protection Note 25 Land use compatibility in Public Drinking Water Source Area in proclaimed areas should be referred to the Department of Water for assessment. (Department of Water).

5. Any bores proposed to be installed to use the confined aquifer, in close proximity to the Lancelin South Water Reserve should be assessed to determine their contamination risk to this drinking water source, through the Department of Water's groundwater licence application process. (Aquasol and Department of Water).

6. Incidents covered under the Western Australian Plan for Hazardous Materials (FESA, 2010) in the Lancelin South Water Reserve should be addressed by ensuring that:

   – The Shire of Gingin Emergency Management Committee is made aware of the location and purpose of the Water Reserve.

   – The locality plan for the water reserve is provided to the fire and rescue headquarters for the Hazardous Materials Emergency Advisory Team.

   – Aquasol and Department of Water provide an advisory role during incidents in the Lancelin South Water Reserve.

   – Personnel dealing with the Western Australian Plan for Hazardous Materials Incidents in the area have ready access to a locality map of the Lancelin South Water Reserve and information to assist them in recognising the potential effects of spills on drinking water quality (Aquasol, Department of Water).

7. Fence, provide secured gate, and erect signs on the boundary of the Lancelin South Water Reserve (Aquasol).

8. All bores must be constructed in accordance with the National Water Commission's Minimum Construction Requirements for Water Bores in Australia (2012). The head-work to be adequately designed and sealed to prevent potential contamination of the drinking water source (bore owner and Aquasol).

9. Provide all residents with information about the water system from the licensed water service provider, at the time of lot purchase or through the developer's water customer agreement (Aquasol).

10. An electronic version of the Lancelin South Water Reserve Drinking Water Source Protection Plan to be provided on the water service provider's website, and a link be made available to the Department of Water (Aquasol).

11. Review of the Lancelin South Drinking Water Source Protection Plan after five years, or earlier if required. (Aquasol and Department of Water).

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FIGURES

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APPENDIX I

H3 Hydrogeological Investigation

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APPENDIX 2

Water Quality Results

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APPENDIX 3

Lancelin South District Water Management Strategy

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