



WQPN 42, September 2009

Radiator repair and reconditioning

Purpose

Radiator repair and reconditioning are essential services for the maintenance of motor vehicles, stationary engines and cooling systems. Coolants (anti-freeze) mixed with water contain chemicals that assist in the transfer of heat, limit corrosion, scavenge oxygen and help lubricate moving components. Coolants may contain amines, borate, carboxylate, detergents, (ethylene or propylene) glycols, hydrazine, molybdate, nitrite, phosphoric acid and/or silicates. Once coolants are removed from service they may also contain contaminants resulting from engine wear such as lubricants and metals (aluminium, copper, cadmium, chromium, iron, lead, magnesium, nickel and zinc), organic compounds and acidic or alkaline cleanser residues.

Coolants can threaten the quality of water resources through poor storage practice for new and used chemicals as well as the discharge of wastewater containing harmful residues. Radiator repair may involve the use of large amounts of water to flush radiators during servicing. It is an unacceptable practice to discharge contaminated water into stormwater drains or on-site soak pits, as it poses a contamination risk to downstream water users. Chemical residues are likely to harm drinking water, irrigation waters and aquatic ecology (plants, fish and waterbirds).

These notes advise on environmental issues and make recommendations on best practice. Key supporting information is provided in appendices. This information includes the department's role, intended use of the note, sensitive water resources description, water resource buffers, relevant statutes and administering agencies, information for assessing development proposals and may include case studies, checklists and diagrams.

Scope

This note applies to new, upgraded and established premises for radiator repair and reconditioning throughout Western Australia.

This note is not intended to cover cooling systems that rely on gas compression and expansion for heat exchange, but may offer some useful guidance on potential risks to the environment and good practice.

Advice and recommendations

The note provides guidance on best environmental management practices, and may be used by other decision-making agencies evaluating the establishment or operation of radiator repair and reconditioning sites that may affect the quality of water resources.

Our aim is for proven best environmental management practices to be adopted for all industrial activities. Employing these practices should result in reduced production costs through more efficient use of resources, an enhanced image with customers and significant benefits to the local environment.

Location of premises

Within public drinking water source areas

- 1 Within designated *P1* or *P2* areas, *wellhead protection zones* and *reservoir protection zones* (prohibited zones), the establishment or expansion of automotive and industrial servicing facilities is incompatible with the management objectives for the water resource. This department will oppose their development in these areas and zones.
- 2 Within *P3* areas, radiator repair facilities are considered compatible with conditions. Best practice environmental management should be used. Guidance on current best practice environmental management is given in this note or in project-specific conditions set by regulatory agencies.
- 3 Operational areas (where compatible) should have a minimum vegetated separation buffer of 100 metres to the full supply level of reservoirs, their primary feeder streams and any production bores/wells used as a source of drinking water or food processing. For additional information, see our water quality protection note 6 *Vegetated buffers to sensitive water resources* ([Reference 4b](#)).
- 4 Despite being located in incompatible areas, existing authorised radiator servicing premises may remain operating. However, recommended best practice environmental management measures described in this note should be implemented.

Near waterways

- 5 If a development is located within a proclaimed waterways management area, prior written approval is required from this department. For online information on proclaimed waterway locations see < www.water.wa.gov.au > select *maps data and atlases* > *geographic data atlas* > *environment*. For information on regulation of these management areas use *contact us* for the department's nearest regional office.
- 6 Adequate separation distances should be maintained between operational areas where chemicals or wastewaters (treated or otherwise) could enter the environment and affect any natural waterway, to minimise the risk of degradation of water quality. These separation distances are determined on the basis of the waterway values, vulnerability and biophysical criteria ([References 4a and 4c](#)).

Swan River Trust management area

- 7 The Swan-Canning river system and abutting reserves are managed by the Swan River Trust using the *Swan and Canning Rivers Management Act 2006*. Written approval from the Swan River Trust is needed for any land or water based development that may have an effect on the estuary. For online information see < www.swanrivertrust.wa.gov.au > or phone (08) 9278 0900.

Near conservation wetlands

Wetlands are managed by the Department of Environment and Conservation (DEC). Many of these water bodies have been given conservation status under the Ramsar Convention, national wetlands programs or Western Australian environmental protection policy ([Appendix A](#)).

- 8 Proposals for radiator servicing where chemicals or wastewater (treated or untreated) could enter the environment and will be located within 500 metres of any wetland (including lakes, swamps, marshes and damp land) should be referred to a DEC regional office for assessment, with supporting information addressing the environmental risks. For information on protection of wetlands and their fringing vegetation see [Reference 2a](#).

Private water supply sources

Surface water bodies or groundwater used for water supplies need protection from physical, chemical and microbial contaminants. This protection is mainly provided by preventing discharge of potentially contaminating material to soils, drains and waterways and maintaining adequate separation buffers. Information on buffer dimensions is given in our water quality protection note 06 *Vegetated buffers to sensitive water resources* ([Reference 4b](#)).

- 9 For drinking water sources, the buffer should be a minimum of 100 metres from the external boundary of operational areas where chemicals or wastewater (treated or untreated) could enter the environment to the full supply level of surface water sources, their primary feeder streams, production bores or wells and aquaculture ponds (excluding tanks).
- 10 For all other water supply uses, the minimum buffer distance should be 50 metres.

Other location constraints

- 11 Radiator servicing facilities should not be located on flood-prone land. Filling of low-lying sites may be accepted provided that it does not interfere with land drainage or increase the extent of upstream floodwaters.
- 12 A minimum vertical separation distance of two metres from infrastructure to the maximum (wet season) groundwater table is recommended for free-draining soils. This avoids water-logging and allows for soil contaminant filtration/ aerobic microbial action.
- 13 Radiator servicing premises should be connected to deep sewerage, except where special exemptions apply under the *state government sewerage policy*. If sewerage connection is not available, alternative management strategies should be used to ensure effective protection of the quality of local water resources.

Construction

- 14 Radiator servicing should be carried out in weather-proof workshops with an impervious floor designed and graded to contain any spilt material or wash-down water.

- 15 The workshop area should be bunded, kerbed or graded to a collection sump to prevent the escape of spilt fluids into the environment. Chemical spills or radiator wastewater should drain to the fully contained collection sump. Flooring, drains and collection sumps should be sealed with protective coatings that resist seepage, damage or deterioration caused by contact with the stored materials.
- 16 Facilities should be constructed and managed so that coolant cannot escape into the environment during normal operations, due to equipment malfunctions or during emergencies such as storms, fires or vandalism.
- 17 Chemical containment compounds should have a storage capacity of 110 per cent of the capacity of the largest chemical container, plus 25 per cent of the capacity of all containers held within the compound. Any chemical containment compounds needing vehicle access should be protected by ramps that permit safe passage of personnel and vehicles, while maintaining effective containment capacity.
- 18 Stormwater run-off from roofs and external paved areas should be diverted away from the workshop, chemical and waste storage areas.
- 19 Any chemical bulk storage tanks with capacity exceeding 250 litres should follow the recommendations in our water quality protection note 56 *Tanks for above ground chemical storage* and note 61 *Tanks for ground level chemical storage*. Transfer of any chemicals from bulk tankers to storage should occur within chemical-resistant sealed and contained areas that permit recovery of any spills. Any underground tanks containing chemicals or wastes (where approved) should follow the recommendations in our note 62 *Tanks for underground chemical storage*.
- 20 Although coolant water has historically been released to drains or soakage, this practice poses a contamination threat to the quality of local water resources. Engine coolants and corrosion inhibitors are now prohibited under environmental protection regulations from discharge to the environment ([Appendix B](#)).
- 21 Wastewater containing coolant or corrosion inhibitor residues should ideally be treated for recycling on-site. Wastewater holding, treatment and coolant recovery units should be installed within the workshop. These units should be operated and maintained as recommended by the manufacturer. Solid residues should be transported off-site for reuse or disposal at an approved landfill.
- 22 Where reticulated sewerage is available, radiator wastewater may be discharged to sewer if approved by the service provider such as the Water Corporation. Wastewater should conform to an industrial waste permit. Early negotiations with the service provider should occur so adequate wastewater pre-treatment occurs prior to discharge.
- 23 Alternatively, radiator wastewater should be fully contained until transported off-site to a Schedule 1 category 61 liquid waste facility, licensed by the Department of Environment and Conservation in accordance with the *Environmental protection regulations 1987*.

24 Related recommendations on water source protection practices are provided in our water quality protection note 93 *Light industry – establishment and management* ([Reference 4b](#)).

Operation

Hazardous chemicals

25 Where practical, high pressure jetting and readily degradable cleansers should be used instead of hazardous chemicals to flush cooling systems. Where resilient or toxic solvents are used, they should be contained and stored securely to prevent any release to the environment prior to recycling or approved offsite disposal.

26 Bulk chemical and fuel storage should adhere to *Dangerous goods safety regulations 2007* ([Appendix B](#)) and the recommendations in our water quality protection note 65 *Toxic and hazardous substances – storage and use* ([Reference 4b](#)).

27 Coolant containers should be stored inside weatherproof and bunded areas, whether they contain chemicals or are nominally empty.

28 Coolant should be stored in robust chemical-resistant containers. Containers with a capacity less than 250 litres should be held in weather-proof buildings on reinforced concrete floors as previously described.

29 Coolant formulation, mixing, processing, container transfer and decanting should occur within the weather-proof buildings or an approved equivalent containment area.

Liquid waste management and disposal

30 Water and chemicals should be used efficiently. Water use should be minimised, low toxicity chemicals should be used (where practical) and environmentally sound recycling systems employed. This should be achieved by implementing best environmental management practice, material substitution, process changes and/ or recycling. The *centre of excellence in cleaner production* at the Curtin University conducts *Cleaner Production training programs* that can assist business and industry in reducing waste (see *useful contacts* [Appendix C](#)). The Swan River Trust's *Environmental management and cleaner production directory for small and medium business* (section 3.3) provides links to best practice documents ([Reference 6](#)).

31 Chemicals should not be stored near any floor drain that is connected to an on-site sewerage system such as septic tank and leach drains, or near any stormwater drains discharging to soakage or into surface waters.

32 Wastewater (treated or untreated) should not be allowed to enter stormwater drains leaving the premises (such as open drains, culverts or pipes).

33 Engine coolant, corrosion inhibitor or other chemical tainted discharge to the environment is prohibited by the *Environmental Protection (unauthorised discharges) Regulations 2004* ([Appendix B](#)). Significant penalties apply to any person who contravenes these regulations.

- 34 Occasionally wastewater that has been effectively treated to ensure protection of local water values may be approved for discharge to on-site soakage (if other options are impractical). This wastewater should be regularly monitored and meet the water quality criteria for the maintenance of receiving waters values. For water quality criteria see *national water quality management strategy* papers 4 and 6 ([Reference 1](#)).
- 35 On-site wastewater discharge (treated or untreated) is not acceptable within any PDWSA or within buffers to water bodies with recognised conservation values. Industrial wastewaters should not be discharged into on-site sewerage treatment (such as septic tank) systems.
- 36 Our water quality protection note *28 Mechanical servicing and workshop facilities* ([Reference 4b](#)), and the Environmental code of practice *automotive repair industry* ([Reference 2c](#)) are useful best environmental practice references.

Solid waste management and disposal

- 37 Solid wastes such as sludges, metals, plastics, paper and cardboard should be stored in separate bins or skips suited to the appropriate disposal method. Empty fluid containers should be recycled, while sludges (after any necessary de-watering to assist handling) may only be land-filled at secure Class IV sites. For further information on appropriate waste disposal, refer to *Landfill waste classifications and waste definitions* ([Reference 2b](#)).
- 38 Containers used for solvents, lubricants and other liquid wastes storage should be recycled or disposed off-site at approved locations.
- 39 Operators should recycle or sell the used metals parts or scrap to licensed vendors.

Mechanical servicing

- 40 All support activities associated with mechanical repairs, such as renewal of radiator cores and maintenance, should take place within the workshop area.
- 41 Any mechanical servicing facilities should be guided by our water quality protection note *28 Mechanical servicing and workshops* ([Reference 4b](#)). Any resultant liquid waste should be contained prior to disposal at a licensed facility.

Operator training

- 42 Employees should be effectively trained and reminded by signage of risks posed to the environment from chemical and wastewater discharge to local drains and soakage.

Spill incidents and emergency response

- 43 Absorbent materials should be used to clean-up chemical spills and leaks. Shop rags are commonly used to soak up spilt fluids. Chemical spills should be immediately responded to and contained, then recovered for both occupational health and safety reasons and to prevent contamination of the local environment (soils, drains, surface water and groundwater). For additional advice, see our water quality protection note *10 Contaminant spills - emergency response* ([Reference 4b](#)).

44 Spill kits should be located in easily accessible areas within workshops. They should include absorbent materials e.g. absorbent powders, sawdust, rags, or “kitty litter”, as well as mops, brooms, dustpans and appropriate protective clothing.

Monitoring and reporting

45 Where monitoring and reporting are required by regulatory authorities, see the section on *monitoring and reporting* in our water quality protection note 93 *Light industry*.

Development or expansion approvals

46 Plans for the development or expansion of an existing facility initially require approval from the relevant local government authority (council) ([Appendix B](#)).

47 The proponent should determine whether the development site may affect sensitive waters by contacting our local regional office (see < www.water.wa.gov.au > *Contact us*). Where facilities are planned for construction or upgrade near sensitive water resources, proponents should supply a notice of intent to this department, including the following data:

- a Name of site owner and activity operator, contact address and details.
- b A site plan showing the location of the planned facility.
- c Soil strata, land contours, local water features, vegetation cover, existing infrastructure and historical land usage that may be affected by the project.
- d Description of the type and scale of activities that will be carried out.
- e The nature and approximate quantity of materials stored or handled on site.
- f Storage and containment details for chemicals used commercially on-site.
- g The types and quantities of any waste generated at the facility.
- h Treatment details for all solid and liquid wastes generated on-site.
- i Disposal details for all wastes generated on-site.
- j Details of any relevant approvals/licences already provided by government agencies.

More information

We welcome your views on this note. All feedback is held on our file **15549**. To comment on this note or for more information, please contact our water source protection branch as shown below, citing the note topic and version.

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168 St Georges Terrace
Perth, Western Australia 6000

PO Box K822, Perth, Western Australia 6842

Telephone +61 8 6364 7600
Facsimile +61 8 6364 7601
Email waterquality@water.wa.gov.au

This note will be updated periodically as new information is received or industry/activity standards change. Updated versions are placed online at < www.water.wa.gov.au > select *water quality > publications > water quality protection notes*.

References and further reading

- 1 Australian Government - national water quality management strategy papers available online at < www.environment.gov.au > select *water > water quality > nwqms > nwqms guideline documents*
 - a *Australian and New Zealand guidelines for fresh and marine water quality 4, 2000*
 - b *Australian drinking water guidelines 6, 2004*
 - c *Australian guidelines for water quality monitoring and reporting 7, 2000*
 - d *Implementation guidelines 3, 1998*
 - e *Policies and principles – a reference document 2, 1994*
 - f *Water quality management – an outline of the policies 1, 1994.*
- 2 Department of Environment and Conservation (WA)
 - a Wetlands policy and guidelines available online at < www.dec.wa.gov.au > select *Management and protection > wetlands > publications*
 - Position statement: Wetlands, WRC 2001.
 - b Waste management see web page < www.dec.wa.gov.au >, select *Pollution prevention > waste management* or < www.zerowastewa.com.au >
 - *Landfill waste classification and waste definitions (1996 as amended).*
 - c Environmental code of practice: *Automotive repair industry*, Department of Environmental Protection, Perth, Western Australia, October 1997.
- 3 Department of Mines and Petroleum - dangerous goods codes, guidelines and licenses. For online publications see < www.dmp.wa.gov.au > select *resources safety > dangerous goods > storage and handling*.
- 4 Department of Water WA
 - a Policies available online at < www.water.wa.gov.au > select *policies*
 - Foreshore policy 1 *Identifying the foreshore area 2002*
 - State-wide policy 2 *Pesticide use in public drinking water source areas 2000*
 - b Water quality protection notes available online at < www.water.wa.gov.au > select *water quality > publications > water quality protection notes*:
 - WQPN 06 *Vegetated buffers to sensitive water resources*
 - WQPN 10 *Contaminant spills - emergency response*
 - WQPN 20 *Industry - general and heavy*
 - WQPN 22 *Irrigation with nutrient-rich wastewater*
 - WQPN 25 *Land use compatibility in public drinking water source areas*

- WQPN 28 *Mechanical servicing and workshops*
 - WQPN 49 *Service stations*
 - WQPN 56 *Tanks for above ground chemical storage*
 - WQPN 61 *Tanks for ground level chemical storage*
 - WQPN 62 *Tanks for underground chemical storage*
 - WQPN 65 *Toxic and hazardous substances - storage and use*
 - WQPN 68 *Wash down of mechanical equipment*
 - WQPN 93 *Light industry near sensitive waters.*
- c Waterways - water notes available online at < www.water.wa.gov.au > select *water quality* > *waterways* > *publications*:
- WN 11 *Identifying the riparian zone*
 - WN 23 *Determining foreshore reserves.*
- d Stormwater manual available online at < www.water.wa.gov.au > select *water quality* > > *stormwater and drainage* > *management manual*
Stormwater management manual for Western Australia.

5 Government of Western Australia publication see < www.public.health.wa.gov.au > select *policies and plans* > *policies* > *environmental health policies*.

Government sewerage policy – Perth metropolitan region 1981 (as amended).

6 Swan River Trust publications available from < www.swanrivertrust.wa.gov.au > select *resources and publications* > *Swan-Canning cleanup program*

Environmental management and cleaner production directory for small and medium business.

7 Western Australian Planning Commission policy available online at < www.wapc.wa.gov.au > select *publications* > *state planning policies*

SPP 4.1 State industrial buffer policy, 1997.

Appendix A - Key supporting information

The Department of Water is responsible for managing and protecting the state's water resources. It is also a lead agency for water conservation and reuse. This note offers:

- our views on minimising impacts of land use activities and facilities on water resources
- guidance on acceptable practices employed to protect the quality of water resources
- a basis for the development of a multi-agency environmental code or guidelines that considers the views of industry, government and the community, while sustaining a healthy environment.

The note provides a general guide on issues of environmental concern, and offers potential solutions based on professional judgement and precedent. Recommendations made in this note do not override any statutory obligation or government policy statement. Alternative practical environmental solutions suited to local conditions may be considered. This note shall not be used as this department's policy position on a specific matter, unless confirmed in writing. The note may be amended at our discretion, as new data becomes available.

Regulatory agencies should not use this note's recommendations in place of site-specific conditions based on a project's environmental risks. Any regulatory conditions should consider the values of the surrounding environment, the safeguards in place and take a precautionary approach.

Where a conflict arises between our recommendations and any proposed activity that may affect a sensitive water resource, this note may be used to assist negotiations with stakeholders. The negotiated outcome should not result in a greater risk to water quality than that which would apply if our recommended protection measures were used.

Sensitive water resources

Clean water resources used for drinking, sustaining aquatic and terrestrial ecology, industry, and aesthetic values, along with breathable air, rank as the most fundamental and important needs for viable communities.

Water resources should remain within specific quality limits to retain their values and therefore require stringent and conservative protection measures. Guidance on water quality parameters that are necessary to maintain water values are published in the Australian Government's *National water quality management strategy guidelines*, available online at <www.environment.gov.au> select *water* > *water quality* > *national water quality management strategy*.

The Department of Water strives to improve community awareness of catchment protection measures, for both surface water and groundwater, as part of a multi-barrier protection approach to water resource quality.

Human activity and many land uses pose a risk to water quality if contaminants are washed or leached into sensitive water resources in discernible quantities. These waters include estuaries, waterways, wetlands and unconfined groundwater accessed by water supply wells.

Sensitive water resources support one or more of the environmental values described below:

- 1 Public drinking water sources (i.e. water reserves, catchment areas or underground water pollution control areas) proclaimed or assigned under the *Metropolitan Water Supply, Sewerage and Drainage Act 1909*, the *Country Areas Water Supply Act 1947* or the *Health Act 1911*.
- 2 Private sources, used for the following water supplies:
 - a human or stock (animal) drinking water

- b commercial or industrial water (requiring specific qualities that support activities such as aquaculture, cooling, food or mineral processing or crop irrigation)
 - c urban irrigation (that could affect people's health or wellbeing).
- 3 Recognised ecological functions in groundwater aquifers such as soil or cave fauna.
- 4 Social values in natural waterways including aesthetic appeal, boating, fishing, tourism and swimming.
- 5 Ecological functions of waterways including:
- a those of high conservation significance described in the Environmental Protection Authority's guidance statement 33 *Environmental guidance for planning and development* (section B5.2.2), available online at <www.epa.wa.gov.au> select *EIA > guidance statements*
 - b waterways managed by the Department of Water under the *Waterways Conservation Act 1976*, including the Avon River, Peel-Harvey Inlet, Leschenault Inlet, Wilson Inlet and Albany waterways
 - c waterways managed by the Swan River Trust under the *Swan and Canning Rivers Management Act 2006*.

Engineered drains or constructed water features are excluded, because functional and operational factors may outweigh their water quality values.

- 6 Conservation values in wetlands (assigned or recognised, excluding those highly disturbed unless actively managed to restore specified environmental values), including:
- a Ramsar wetlands, described online at <www.ramsar.org>.
 - b High conservation significance wetlands as described in the Environmental Protection Authority's guidance statement 33 *Environmental guidance for planning and development* (section B4.2.2), available online at <www.epa.wa.gov.au> select *Environmental impact assessment > guidance statements*.
 - c Wetlands defined by the Australian Government in *A directory of important wetlands in Australia*, available online at <www.environment.gov.au> select *water > water for the environment > wetlands > wetlands publications, resources and links > books, reports directories*.
 - d Conservation valued and resource enhancement category wetlands identified in the *Geomorphic wetlands of the Swan coastal plain* dataset; all wetlands identified in the *South coast significant wetlands* dataset, and high value wetlands identified in the *Geomorphic wetlands Augusta to Walpole* dataset. The Augusta to Walpole wetland dataset awaits a detailed evaluation process. The Department of Environment and Conservation (DEC) is the custodian of wetland datasets and is responsible for maintaining and updating the information. The datasets can be viewed online at <www.dec.wa.gov.au> search *maps wetlands* or select *management and protection > wetlands > wetlands data*. Guidance on viewing the wetlands is provided on the same website at *water > wetlands > data* or by phoning DEC's nature conservation division for assistance on (08) 9334 0333.

Many aquifers, waterways and wetlands in this state still need a detailed scientific evaluation and their value remains to be classified. Unless proven otherwise, any natural waters that are largely undisturbed by human activity, should be considered to have sensitive values.

Community support for water values, the setting of practical management objectives, providing sustainable protection strategies and effective implementation are vital to protecting or restoring water resources for current needs and those of future generations.

Public drinking water source areas

Public drinking water source area (PDWSA) is the collective name given to any area proclaimed for the management and protection of a water source used for community drinking water supplies. PDWSA include *underground water pollution control areas*, *water reserves* and *catchment areas* administered under the provisions of the *Metropolitan Water Supply, Sewerage and Drainage Act 1909* or the *Country Areas Water Supply Act 1947*. For online information on the location of PDWSA see < www.water.wa.gov.au >select *tools and data* > *maps and atlases* >*geographic data atlas* > *environment* > *public drinking water source areas*.

For land planning and development purposes within any PDWSA, three protection areas (P1, P2 and P3) have been defined based on present land use, tenure and the vulnerability of the water body to harm. These areas are each managed in a different way to provide for effective protection of water resource quality.

Protection areas are assigned in specific *drinking water source protection plans* or *land use and water management strategies*. These are prepared in consultation with government agencies, landowners, industry and community.

P1 areas are defined to ensure that there is *no degradation* of the water source. These areas are declared over land where the provision of the high quality drinking water for public use is the prime beneficial land value. P1 areas would typically include land under public ownership. P1 areas are managed in accordance with the principle of *risk avoidance* and so most land development and activity is normally opposed.

P2 areas are defined to ensure that there is *no increased risk of pollution* to the water source once the source protection plan has been published. These areas are declared over land where low intensity development (such as rural) already exists. Protection of public water supply sources is a high priority in these areas.

P2 areas are managed in accordance with the principle of *risk minimisation*, and so restricted intensity development (with conditions) and activity with a low contamination risk is accepted.

P3 areas are defined to *manage the risk of pollution* to the water source. These areas are declared over land where public water supply sources must coexist with other land uses such as residential, commercial and light industrial development. Protection of P3 areas is achieved through management measures defined via *management guidelines* (such as these notes) or site-specific conditions that limit the contamination risk to water resources from the land use or activity. If however the water source becomes significantly contaminated, then water supplied from P3 areas may need to be treated or an alternative water source found.

Protection zones are defined close to the point where drinking water is harvested or stored. Additional constraints apply to activities in these zones to safeguard these most vulnerable water sources. These zones are described as *well-head protection zones* and *reservoir protection zones*.

Well-head protection zones are assigned within the immediate surrounds of water production wells and special restrictions apply. In these zones, groundwater moves rapidly towards wells. Any contamination leaching from the ground surface could rapidly migrate into scheme water supplies (before effective remedial action can occur). In porous soil catchments, well-head protection zones are usually circular, with 500 metres radius in P1 areas and 300 metres in P2 and P3 areas. These zones do not extend outside PDWSA boundaries.

Reservoir protection zones (RPZ) are defined within the immediate surrounds of public water supply reservoirs or pipe-heads, with special access and land use restrictions applied. The aim is to restrict the likelihood of contaminants being deposited or washing into water sources following rainfall. RPZ consist of a buffer area of up to two kilometres around the top water level of a reservoir and include the reservoir itself. For additional explanatory information on PDWSA, see our water quality protection note 25 *Land use compatibility in public drinking water source areas* and note 36 *Protecting public drinking water source areas*.

Buffers

Operational areas (where compatible) should have minimum vegetated separation distances to the full supply level of reservoirs, their primary feeder streams and production bores used as a source of drinking water. Buffers advice is provided in our water quality protection note 06 *Vegetated buffers to sensitive water resources*.

Clearing control catchments

There are special controls on vegetation clearing for salinity management purposes under part IIA of the *Country Areas Water Supply Act 1947*. These controls apply in *the Wellington Dam, Harris River Dam, Mundaring Weir and Denmark River* catchment areas and the *Kent River and Warren River* water reserves. Details on clearing controls may be obtained from our Swan-Avon, southwest and south coast regional offices.

Existing activities

We recognise that many land use activities were approved and established before publication of the source protection plan or strategy. We will negotiate with the operators of non-conforming activities to ensure that they progressively improve facilities and management practices to minimise the risk to water resources (while considering practical and economic constraints).

New or expanded activities

Any proposed new or expanded activities that may affect water resources should be referred to our nearest regional office for assessment and written response. The department may approve the proposal (with or without conditions), seek additional relevant information prior to taking a decision or reject the proposal due to inadequate protective measures to safeguard nearby environmental values.

In order to gain environmental approval, operators will need to demonstrate that under both normal and abnormal operating conditions that materials and processes used on site do not pose a significant risk to the local waters.

Waterways management areas

Five *waterways management areas* have been declared via the *Waterways Conservation Act 1976* to provide special protection to estuaries and their associated waterways that are considered especially vulnerable to degradation. These areas are the Albany Waterways, Avon River, Leschenault Inlet, Peel-Harvey Estuary, and Wilson Inlet.

Information on waterway values, the location of these management areas and development approval requirements can be obtained by contacting the local regional office (see online information at < www.water.wa.gov.au > select *Contact us*).

Appendix B -Statutory requirements and approvals relevant to this note include:

What's regulated?	Statute	Regulatory body/ agency
Land planning and zoning Subdivision of land Development approvals	<i>Planning and Development Act 2005</i>	Western Australian Planning Commission; Department of Planning www.planning.wa.gov.au Local government (council)
Impact of significant development proposals on the values and ecology of land or natural waters	<i>Environmental Protection Act 1986, Part IV</i> Environmental impact assessment	Minister for the Environment advised by the Environmental Protection Authority www.epa.wa.gov.au
Pollution control and regulation	<i>Environmental Protection Act 1986, Part V</i> <i>Environmental protection regulations 1987.</i> <i>Environmental Protection (Unauthorised discharges) Regulations 2004</i>	Department of Environment and Conservation - regional office www.dec.wa.gov.au
Licence to take surface water and groundwater	<i>Rights in Water and Irrigation Act 1914</i>	Department of Water - regional office www.water.wa.gov.au
Industrial sites in existing public drinking water source areas	<i>Metropolitan Water Supply, Sewerage and Drainage Act 1909</i> <i>Country Areas Water Supply Act 1947</i>	
Licence to discharge waters into managed waterways	<i>Waterways Conservation Act 1976</i>	
Discharges into the Swan-Canning Estuary	<i>Swan and Canning Rivers Management Act 2006</i>	Swan River Trust www.swanrivertrust.wa.gov.au
Storage of fuels, solvent, explosive and dangerous goods	<i>Dangerous Goods Safety Act 2004</i> and associated regulations 2007	Department of Mines and Petroleum www.dmp.wa.gov.au
Management of human wastes, community health	<i>Health Act 1911</i>	Department of Health www.health.wa.gov.au Local government (council)
Emergency response planning	<i>Fire and Emergency Services Authority of WA Act 1998</i>	Fire and Emergency Services Authority www.fesa.wa.gov.au
Discharge to sewer (industrial waste permit) or to main drain	<i>Metropolitan Water Supply, Sewerage and Drainage Act 1909</i> <i>Country Towns Sewerage Act 1948</i>	Water Corporation www.watercorporation.com.au Designated water services provider

Relevant statutes are available from the *State Law Publisher* at < www.slp.wa.gov.au >.

Appendix C - Useful contacts

- 1 Motor Trade Association of Western Australia
224 Balcatta Road Balcatta WA 6914, phone: (08) 9345 3466, fax: (08) 9345 3465;
web <www.mtawa.com.au> select *Environment* > *Green stamp program* >
Environmental Product and Services Directory and *Environmental Guidelines* > *coolant management*.
- 2 Curtin University - Centre for excellence in cleaner production:
Kent Street, Bentley WA 6102
Phone; (08) 9266 4519, fax: (08) 9226 4811
Web: < <http://cleanerproduction.curtin.edu.au> >.
- 3 Wynns automotive products (coolant recycling systems)
27 Oxleigh Drive Malaga WA,
Phone: (08) 9249 5333, fax: (08) 9249 5262
Web: < www.wynnswa.com.au > select *Workshop programs*
- 4 Licensed contractors taking coolants for disposal include:
 - Nationwide Oil Pty Ltd, 113 Ewing St. Welshpool, ph: (08) 9351 1300
 - Wren Oil, Lot 4/37 Harris Road Picton, Phone:1800 654 002 or fax: (08) 9725 4847
 - Total Waste Disposals Pty Ltd, 29 Kimmer Place Cannington
Phone: (08) 9356 2771.

The Department of Water does not endorse the use of specific products or services described above as meeting specific objectives. Potential users should obtain advice on their suitability for their particular needs and also seek competitive quotes from suppliers of similar products and services.