



Surface Water and Ground Water Environmental Management Plan

For Sydney's Desalination Plant

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SECTION 1 INTRODUCTION

1.1 PURPOSE

The purpose of this Surface Water and Groundwater Environmental Management Plan (SWGWMP) is to describe how Veolia Water Australia (Veolia) proposes to manage surface water and groundwater at Sydney's Desalination Plant during its operation and maintenance phase to minimise impacts on ecology and water quality in accordance with MCoA 4.6c.

The SWGWMP has been developed in accordance with applicable legislative responsibilities and specific Project Approvals and contractual requirements for the operation and maintenance of Sydney's Desalination Plant as defined in the Operate and Maintain (O&M) Contract and relevant Ministers Conditions of Approval (MCoA) and Statement of Commitments (SoC) as detailed in Table 3 Compliance Obligations.

1.2 SCOPE

This SWGWMP is applicable to all Veolia activities during the operation and maintenance phase of the Sydney Desalination Plant.

In particular, the SWGWMP has been prepared to address the compliance obligations set out in the MCoA and SoC for the Sydney Desalination Plant along with applicable legislation as detailed in Section 4.

This document includes details on:

- potential impacts to surface water and groundwater
- the management and mitigation measures relating to surface water and groundwater impacts
- erosion and sediment controls in the event of temporary construction works on site

It should be noted that the SWGWMP does not address the impacts and management of the discharge of seawater concentrate from the Sydney Desalination Plant. This issue is addressed in the Marine Water Quality and Ecosystem Environmental Management Plan (PL-KDP-4-809).

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1.3 REFERENCES

Table 1 References

Document reference	Operational Environmental Management Documentation	Document Number
TIER 1		
Operational EMS	Integrated Business Management System (IBMS) Manual	MN-KDP-1-806
TIER 2		
EMP	Environmental Management Plan	MN-KDP-1-806 Section 14
TIER 3		
MWQEMP	Marine Water Quality and Ecosystem Management Plan	PL-KDP-4-809
NEMP	Noise Environmental Management Plan	PL-KDP-4-810
CAMP	Conservation Area Management Plan	PL-KDP-4-4828
SWGEMP	Surface Water and Groundwater Environmental Management Plan	PL-KDP-4-811
WEMP	Waste Environmental Management Plan	PL-KDP-4-812
TIER 4		
EMPR	Environmental Monitoring Program	REG-KDP-4-920

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1.4 DEFINITIONS

Table 2 Definitions

Abbreviation	Definition
BWJV	Blue Water Joint Venture
DEWHA	Department of Environment, Water, Heritage and the Arts (Formerly DEH)
DoP	NSW Department of Planning (formerly Department of Infrastructure, Planning and Natural Resources)
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan (Section 14 of IBMS)
EMS	Environmental Management System (See IBMS)
EPA	Environment Protection Authority
EPL	Environment Protection Licence
EMSR	Environmental Management System Representative
IBMS	Veolia's Integrated Business Management System
I&I	Industry and Investment NSW (formerly DPI)
ISO	International Organisation for Standardisation
JSEA	Job Safety Environmental Analysis
MCoA	Ministers Conditions of Approval
NPWS	National Parks and Wildlife Service
O&M	Operate and Maintain
NSW	The State of New South Wales
RO	Reverse Osmosis
Schedule 5	Planning Approval Responsibilities Operate and Maintain Contract
SDP	Sydney Desalination Plant Pty Ltd
SEPP	State Environmental Planning Policy
SoC	Statement of Commitments
SSC	Sutherland Shire Council
SWC	Sydney Water Corporation
TS-09	Technical Schedule-09 Environmental Requirements – Operate and Maintain Contract

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**SECTION 2 OPERATIONAL ENVIRONMENTAL
MANAGEMENT DOCUMENTATION**

The Environmental Management System (EMS) for the operation and maintenance phase of the Sydney Desalination Plant is described in the Integrated Business Management System (IBMS) Manual MN-KDP-1-806 (Tier 1). The Environmental Management Plan (EMP) MN-KDP-1-806 Section 14 (Tier 2) describes the centralised mechanism and environmental requirements that apply during operation and maintenance of the Sydney Desalination Plant. This Surface Water and Groundwater Management Plan (SWGWMP) PL-KDP-4-811 (Tier 3) is part of the Veolia environmental management suite of documents required for the Sydney Desalination Plant as illustrated below.

This SWGWMP describes higher-level protocols, procedures and management measures that will be adopted to mitigate and minimise potential impacts on the community and environment during operation and maintenance activities.

Specific environmental management measures will be incorporated into the relevant procedures and work instructions developed to guide activities on site.

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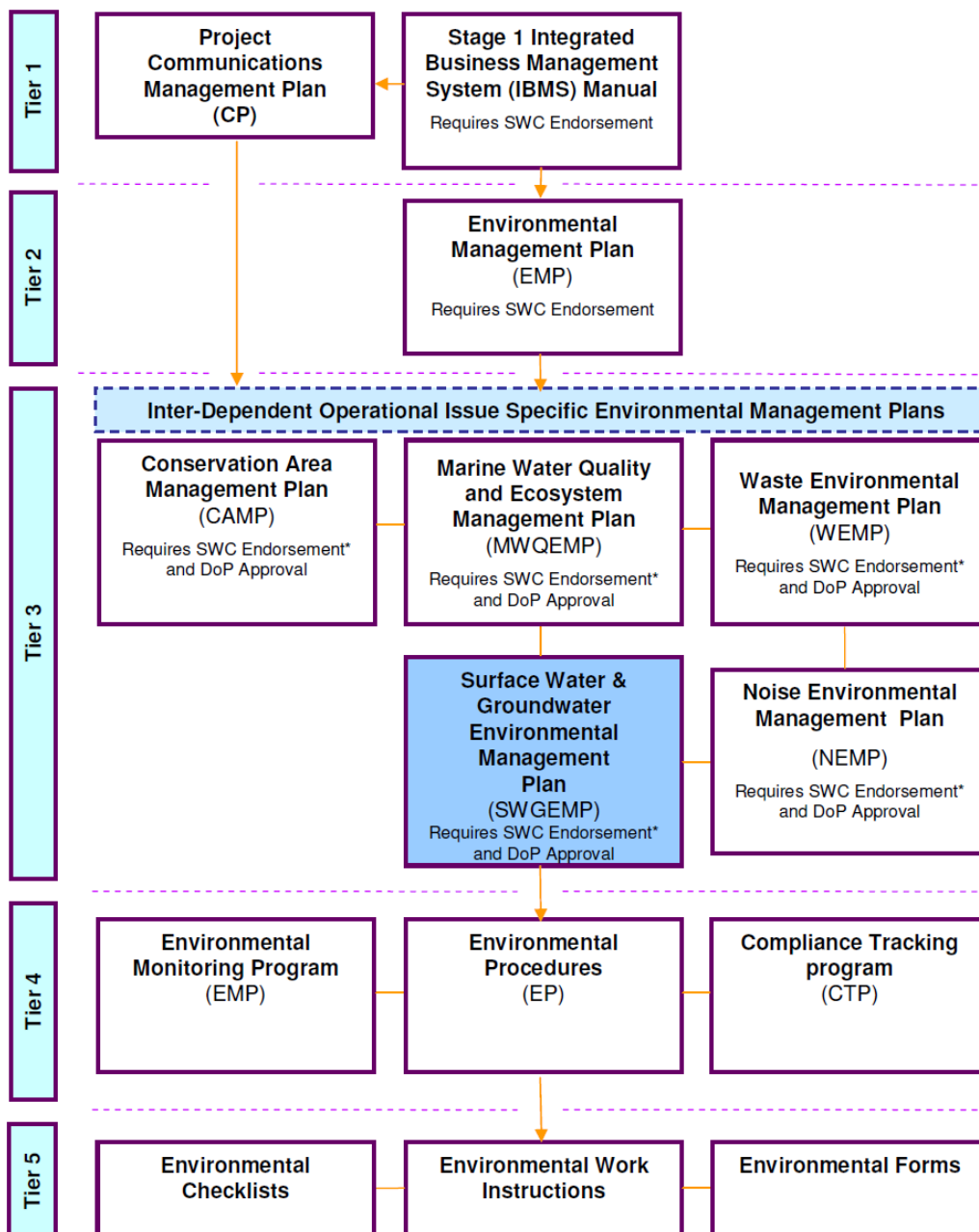


Figure 1 Environmental Documentation Flow Chart

2.1 DOCUMENT CONTROL

Control of all environmental management documents will be managed in accordance with section 12 of the IBMS Manual.

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SECTION 3 BACKGROUND

The Environmental Assessment (EA) (SWC, November 2005) for the proposed Sydney Desalination Plant identified that the potential exists for adverse environmental impacts, if left unmitigated, from operation of the plant that are associated with surface water runoff and changes to the groundwater hydrological regime. Further to the EA a Preferred Project Report (PPR) (SWC August, 2006) was prepared with subsequent amendments to the Statement of Commitments (SoC).

Other reports include:

- Annual Groundwater Monitoring Report (Coffey, October 2009)
- Annual Groundwater Monitoring Report (Coffey, October 2008)
- Groundwater and Surface Water Quality 2006-2007 (SWC, October 2007)
- Groundwater Modelling Study (Coffey, February 2007) Groundwater Investigation Report (Coffey, October 2006)
- Report for Desalination Plant, Flooding and Surface Water Management (Draft) (SWC, December 2006)

To address the requirement for baseline monitoring of groundwater (MCoA 4.6c and SoC 8c); monitoring was undertaken at 12 borehole locations across the site by Coffey for approximately four (4) weeks in July and August 2006. Between 21st December 2006 and 25 July 2007 SWC further monitored seven (7) of the 12 wells around the perimeter to give a representative sample of groundwater parameters on site. Level monitoring at these seven (7) locations was carried out by automatic piezometres (borehole data loggers). The monitoring provides a baseline record for Operations of existing groundwater levels, pre-development at the Project site. The results of this monitoring have been summarised in the Groundwater Monitoring Procedure PR-KDP-4-876 for interpretation of ongoing monitoring results.

3.1 PLAN APPROVAL PROCESS AND STAKEHOLDER CONSULTATION

This SWGWMP was submitted to SWC for approval prior to submission to Department of Planning (DoP) for approval. SWC endorsed the SWGWMP on 22nd December 2009 and in accordance with MCoA (Plant) 4.7 the Plan was first approved by the Department of Planning on 1st April 2010, prior to commencement of operation.

The initial revision of this Plan was prepared in consultation with NSW Department of Environment, Climate Change and Water and Industry and Investment NSW (I&I) in accordance with relevant Project Approvals.

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SECTION 4 LEGISLATIVE AND OTHER REQUIREMENTS

4.1 RELEVANT LEGISLATION

Veolia has developed this SWGWMP in accordance with the requirements of the following relevant NSW and federal legislation, with regard to changes made to the legislation on the 28th of April 2008.

4.1.1 ACTS

Protection of the Environment Operations Act 1997: The POEO Act enables the Government to set out explicit protection of the environment policies (PEPs) and adopt more innovative approaches to reducing pollution. PEPs are instruments for setting environmental standards, goals, protocols and guidelines. They provide both the framework for Government decisions that affect the environment, and are the means of adopting Australia-wide environment protection measures set by the National Environment Protection Council. Before a PEP can be made, the POEO Act requires public consultation on the draft PEP, and an analysis of the economic and social impact of the PEP.

Operation and maintenance activities at Sydney's Desalination Plant are required to be effectively managed to ensure Veolia complies with the water quality goals and criteria outlined in Section 120 of the *POEO Act 1997*.

Water Act 1912: The *Water Act 1912* came into force at the turn of the last century and represented a different era in water management in NSW. This Act is being progressively phased out and replaced by the *Water Management Act 2000*, but some provisions are still in force.

Any significant groundwater dewatering activities must comply with the statutory provisions of the *Water Act 1912*.

Water Management Act 2000: The objects of this Act are to provide for the sustainable and integrated management of the water sources of the State for the benefit of both present and future generations and, in particular:

- (a) to apply the principles of ecologically sustainable development, and
- (b) to protect, enhance and restore water sources, their associated ecosystems, ecological processes and biological diversity and their water quality, and
- (c) to recognise and foster the significant social and economic benefits to the State that result from the sustainable and efficient use of water, including:
 - (i) benefits to the environment, and
 - (ii) benefits to urban communities, agriculture, fisheries, industry and recreation, and
 - (iii) benefits to culture and heritage, and
 - (iv) benefits to the Aboriginal people in relation to their spiritual, social, customary and economic use of land and water,

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(d) to recognise the role of the community, as a partner with government, in resolving issues relating to the management of water sources,

(e) to provide for the orderly, efficient and equitable sharing of water from water sources,

(f) to integrate the management of water sources with the management of other aspects of the environment, including the land, its soil, its native vegetation and its native fauna,

(g) to encourage the sharing of responsibility for the sustainable and efficient use of water between the Government and water users,

(h) to encourage best practice in the management and use of water.

4.1.2 GUIDELINES

National Water Quality Management Strategy (NWQMS)

The National Water Quality Management Strategy (NWQMS) has been jointly developed since 1992 by the Australian Government in cooperation with state and territory governments, currently under the Natural Resource Management Ministerial Council. The NWQMS is part of the Council of Australian Governments' (COAG) Water Reform Framework and is acknowledged in the National Water Initiative. The NWQMS aims to achieve the sustainable use of Australia and New Zealand's water resources by protecting and enhancing their quality while maintaining economic and social development. The NWQMS is a strategy developed jointly by two ministerial councils: the Australian and New Zealand Environment and Conservation Council (ANZECC), and the Agriculture and Resources Management Council of Australia and New Zealand (ARMCANZ).

ANZECC (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality:

The Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC/ARMCANZ 2000) have been prepared as part of the NWQMS and provide government and the community – especially regulators, industry, consultants, community groups and catchment and water managers – with a framework for conserving ambient water quality in our rivers, lakes, estuaries and marine waters.

Managing Urban Stormwater: Soils and Construction, (Landcom 2004); also known as the “Blue Book”, provides guidelines to minimise land degradation and water pollution at development sites in NSW. The guidelines focus on minimising erosion and preventing sediment moving off site during the construction phase of development. These measures are, however, also applicable to operation and maintenance activities.

4.2 COMPLIANCE OBLIGATIONS

Sydney Water has developed Statement of Commitments (SoC). These commitments mainly outline safeguards and mitigation measures to avoid adverse impact on the environment and ensure legislative compliance. They also outline monitoring and

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reporting requirements. Commitments relevant to the management of the surface water and ground water are listed in Table 3 Compliance Obligations.

The Minister for Planning issued the Minister’s Conditions of Approval (MCoA) for the Desalination Plant project in November 2006 that impose requirements for management of surface water and ground water (Minister for Planning, 2006). This SWGWMP has been prepared as required under MCoA 4.6c. Relevant DoP Ministers Conditions of Approval (MCoA) and Statement of Commitments (SoC) are listed in Table 3 below with a cross reference to where the condition is addressed in this Plan and/or other project management documents.

Overall environmental compliance will be managed in accordance with section 16 of the IBMS Manual.

Table 3 Compliance Obligations

	No:	Requirement	Doc Ref:
MCoA Plant	4.6 (c)	A Surface Water and Groundwater Management Plan to detail how surface water and groundwater will be managed to minimise impacts on ecology and water quality. The Plan shall be developed in consultation with the DECC and DPI and shall include, but not necessarily limited to:	This Plan
		Surface Water	
		i) source control methods to reduce sediment load, and separate and divert water flows on the site;	Sections 6.1, 6.6
		ii) measures to avoid contaminated stormwater run-off from the site from entering Quibray Bay, such as directing all hardstand areas to a first-flush system and consideration of stormwater connection shut-off mechanisms;	Sections 6.6, 6.7
		iii) use of appropriately-sized structural mitigation measures such as artificial wetlands, sedimentation basins and gross pollutant traps;	Section 6.7
		iv) bunding of chemical storage areas;	Section 6.9
		Groundwater	
		v) provision for artificial recharge through stormwater retention and infiltration-based management, such as on site wetlands where appropriate;	Sections 6.3, 6.7
		vi) measures to provide for use of stormwater for irrigation on site where practicable;	Section 6.5
		vii) a groundwater monitoring program to establish baseline conditions (including groundwater levels, quality and flows);	Section 7.2
SoC	7	A Stormwater and Groundwater Management Plan will be prepared for the desalination plant site so that stormwater from the site does not pollute sensitive natural ecosystems during operations, including:	N/A (TS10)
		a) Source control methods to reduce sediment load, and separate and divert water streams on the site;	Sections 6.2 6.6
		b) Measures to avoid contaminated stormwater runoff from the site entering Quibray Bay such as directing all hardstand areas to a first	Sections 6.4

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	No:	Requirement	Doc Ref:
		flush system and considering measures to shut off the site stormwater connection;	6.6, 6.7
		c) Use of appropriately sized structural mitigation measures such as artificial wetlands, sedimentation basins or gross pollutant traps;	Section 6.7
		d) Bunding of chemical storages; and	Section 0
		e) Submission of the Plan to the Department of Planning.	N/A (TS10)
	8	A Stormwater and Groundwater Management Plan will be prepared for the desalination plant site. This will include strategies for groundwater recharge to minimise impacts on groundwater and protect sensitive groundwater dependent ecosystems, including:	N/A (TS10)
		a) Artificial recharge through stormwater retention and infiltration-based management such as on site wetland where site conditions permit;	Sections 6.3, 6.7
		b) Measures to provide for use of stormwater for irrigation on site if practicable;	Section 6.5
		c) Groundwater monitoring program to establish baseline conditions (ie groundwater level, quality and flows at the desalination plant site) and assess level and flows; and	N/A (TS10)
		d) Submission of the Plan to the Department of Planning.	N/A (TS10)
	59	Investigations of methods to optimise water conservation will be developed for implementation during operation of the desalination plant and infrastructure.	Section 6.5

4.3 ENVIRONMENT PROTECTION LICENCE REQUIREMENTS

As the operator of the Sydney Desalination Plant, Veolia will comply with all of the requirements outlined in the Environmental Protection Licence. Currently there is no EPL requirement with regard to surface water and groundwater management. The EPL for the operation and maintenance period addresses operational discharges from the marine outlet point as detailed in MWQEMP and the purge water from the delivery pipeline aspects of which are discussed in 6.8.3. This Plan will be updated should a revision to the EPL require it.

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SECTION 5 POTENTIAL SURFACE WATER AND GROUNDWATER IMPACTS

The aspects of the Sydney desalination plant that could impact on surface water and groundwater are listed in Table 4 Potential Impacts.

Table 4 Potential Impacts

Source	Potential Impact
Drainage and Groundwater	
Increased impermeable surfaces	Increased impermeable surfaces and altered site drainage which reduces groundwater recharge capacities and concentrates surface water runoff
Stormwater Retention Basins	Stormwater retention basins which alter the groundwater recharge regime
Reduced rainfall infiltration	Reduced rainfall infiltration to the soil and decreased or altered groundwater recharge
Surface Water Quality	
Increased Runoff Volume	Increased runoff volume from impermeable surfaces during regular rainfall events mobilising pollutant/contaminants and increasing potential pollutant loads to the receiving environment including Towra Point nature reserve and Quibray Bay
Increased impermeable surfaces	Increased impermeable surfaces increasing flow rates resulting in discharges that are potentially highly erosive to stream/drainage line beds and banks
Bisecting of existing drainage channels	Bisecting of existing drainage channels located in or close proximity of the site that may convey runoff of larger upstream catchment areas either through or past the site. A high rainfall event then has the potential for increased flood risk on site
Process Water	
Overflow During Operations	Overflow during operation due to pipe or valve failure
Tank Overflow	The overflow of storage tanks due to equipment or software malfunction
Fuel and Chemical Storage and Handling	
Spills	Fuel and Chemical spills during delivery
Leakage	Leakage of stored chemicals due to rupture of containers

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Leakage and Spills	Leakage and spills of fuels and chemicals due to poor storage and handling procedures
Use of Fertilisers, Herbicides and Pesticides	
Use of fertilisers	Use of fertilisers during revegetation and site landscaping programs.
Herbicides and Pesticides	The ongoing use of Herbicides and Pesticides during the operation and maintenance of the desalination plant grounds.
Oil, Grease and Effluent from operations	
Leakage and Spills	Accidental spills of diesel or leakage of hydraulic and lubricating oils from plant and equipment along with rinse water from plant or equipment washing all have the potential to enter drainage lines
Leakage	Leakage of poorly maintained plant equipment into stormwater system
Litter	
Litter Entering Waterways	The site generated litter entering natural waterways near the plant site
Incorrectly stored litter or waste	Incorrectly stored litter or waste affecting the groundwater system through leaching
Spoil Stockpile	
Spoil Stockpile erosion	Spoil Stockpile erosion affecting surface water systems
Surrounding Industry Contamination	
Contamination of Groundwater	Contamination of site groundwater systems from adjacent industry practices e.g. Caltex
Maintenance of Environmental Controls	
Sediment fences	Worn or damaged sediment fences
Drains, Pits and Culverts	Cracked or sediment filled drains pits or culverts becoming ineffective in stormwater management
Stormwater Retention basin	Sedimentation of stormwater retention basins

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SECTION 6 MANAGEMENT AND MITIGATION

6.1 WATER MANAGEMENT STRATEGY

Water management strategies during the operation and maintenance of the Sydney desalination plant include:

- Surface water management
- Groundwater management
- Erosion and sedimentation control
- Potential water reuse
- Sewage disposal.

Specific procedures for water management have been developed for Veolia's operation and maintenance of the plant.

6.2 SURFACE WATER MANAGEMENT AND QUALITY CONTROLS

During operation and maintenance of the Sydney desalination plant, significant impacts to surface water quality from erosion are not expected as the site will consist of impermeable surfaces, other hardstand areas (crushed rock), and established gardens and lawns. Impacts to water quality may still occur as a result of general operation or maintenance activities such as:

- repair or maintenance of existing structures
- construction of new structures
- landscape maintenance
- fuel, oil and chemical storage areas
- parking areas
- disturbed areas.

Water quality controls will be implemented as required. Water quality control measures have been designed such that they are as close to the potential source of contamination or sediment as possible. The Operations Manager will ensure that appropriate controls are in place and working effectively.

Water quality controls will include some or all of the following as required:

- Stormwater quality improvement devices (SQID) for site runoff to capture gross pollutants and provide oil and water separation, to prevent and minimise the potential for downstream pollution (HumeCeptor™ units have been fitted at the three inlets to the retention basins and the two outlets into the stormwater channel);
- Bunding of fuel, oil and chemical storage areas;

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- Minimising disturbance and bare areas, and where this is unavoidable, use of controls such as sediment fences and hay bale filters.

Additionally, rainwater tanks will provide limited benefits as source controls for water quality and the stormwater retention basins.

Drainage of the site is toward the stormwater retention basin and stormwater channel along Sir Joseph Banks Drive. Figure 2 shows the stormwater flow paths. Drainage channels on the site are trapezoidal concrete open drains, with box culverts to convey the water under the internal roads. Water entering the retention basins and the stormwater channel pass through SQIDs.

Surface water monitoring will be conducted in accordance with the Environmental Monitoring Program REG-KDP-4-920.

The undeveloped north-western section of the site (500ML/day plant footprint/catchment area) contains landscaped native vegetation and a redundant hardstand car park. Surface water from this area is directed toward a diversion channel designed for groundwater infiltration and to convey water flows from the offsite wetland across the site into the conservation area (Sydney Freshwater Wetland Vegetation community). The sheet-flow discharge design imitates what would have occurred in this area prior to the elevation of the site above the 1:100 year rainfall average recurrence interval (ARI).

6.3 GROUNDWATER MANAGEMENT

Stormwater from the hardstand areas on the site will be directed to the retention basins (described in section 6.7 below) to enable groundwater recharge. Permeable surfaces on the site such as crushed rock will also allow some groundwater infiltration and recharge at the source. Additionally, there will be no ongoing active-dewatering activities during operation.

A series of piezometres were installed pre-construction at the desalination plant site by SWC to monitor groundwater levels and quality. The SWC groundwater monitoring program will provide the guidelines for operational groundwater monitoring, and the specific monitoring detail will be in accordance with the Environmental Monitoring Program REG-KDP-4-920.

Monitored groundwater level and quality will be reviewed against background levels. If this monitoring, during operation, shows a significant reduction of the groundwater levels, then a program of groundwater recharge will be established if required (in addition to the retention basins), in order to achieve a suitable level for groundwater dependant ecosystems.

6.4 EROSION AND SEDIMENTATION CONTROL

During operation of the plant, significant impacts to surface water quality from erosion are not expected as the site consists of impermeable surfaces, hardstand areas (crushed rock), and established gardens and lawns.

Erosion and sedimentation will be controlled on site when required i.e. in the event of temporary works on site. Progressive erosion and sediment control plans will be implemented to mitigate erosion and sedimentation during such periods during operation of the Sydney desalination plant.

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6.5 WATER REUSE

Rainwater will be collected from the roofs of various buildings and structures (including but not limited to the RO and the Administration buildings, and the drinking water storage tank). Some of this water is collected in above-ground water tanks and reused on site for landscaping maintenance.

6.6 SEWAGE TREATMENT AND DISPOSAL

Site amenities will be connected directly to the sewerage system.

6.7 STORMWATER

Two permanent stormwater retention basins have been established to manage stormwater from the main site. The upper basin (floor RL 3.0) is an infiltration basin for groundwater recharge and the lower basin (floor RL 2.5) is merely a detention basin. These basins are hydraulically connected as shown in Figure 2. The banks of the basins are lined with fabric and overlain with rock to prevent erosion of the side embankments.

Runoff from the site is directed to either one of the three inlets to the upper basin or one of two inlets to the offsite stormwater channel. Each of these inlets is fitted with a stormwater quality improvement device (SQID) which removes hydrocarbons and suspended solids from the stormwater; preventing spills and minimising non-point source pollution entering downstream waterways. A third outlet to the stormwater exists from the 33kV bund which is fitted with an oil/water separator.

The stormwater basins have a retention capacity of 4900 m³ which is larger than the 4200m³ required to mitigate peak flow rates from a 1:100 year ARI storm event.

These volumes are based on:

- review and extrapolation of figures presented in Section 4.2 'Stormwater Flood Peak Analysis' of the Sydney Water Report for Desalination Plant, Flooding and Surface Water Management (GHD December 2006);
- desktop assessment of the required detention basin volume for the 250ML/day plant footprint/catchment area.

Most of the water volume in the basins will infiltrate into groundwater or be discharged into the Conservation Area (CA) through subsoil drainage lines. This assumption is based on the sand permeability of the existing underlying soils below the basins, obtained from the Coffey Groundwater Investigation Report, Proposed Desalination Plant Site, (Coffey 18 October 2006). When the groundwater table is high, the subsoil drainage lines may have a continuous flow of groundwater. During periods of high flow, it is possible for these basins to fill and subsequently overflow from the spillway discharge point that is located at the north-western end of the site. The discharged water would then run into the existing open channel in the CA (located immediately adjacent to the site) as shown in Figure 2. This runoff is then conveyed through the existing open channel under Captain Cook Drive which flows in to Quibray Bay, as shown in Figure 3.

The discharge point is also fitted with a baffle which acts as a secondary safe-guard preventing oil on the surface of the stormwater basin from entering the Conservation

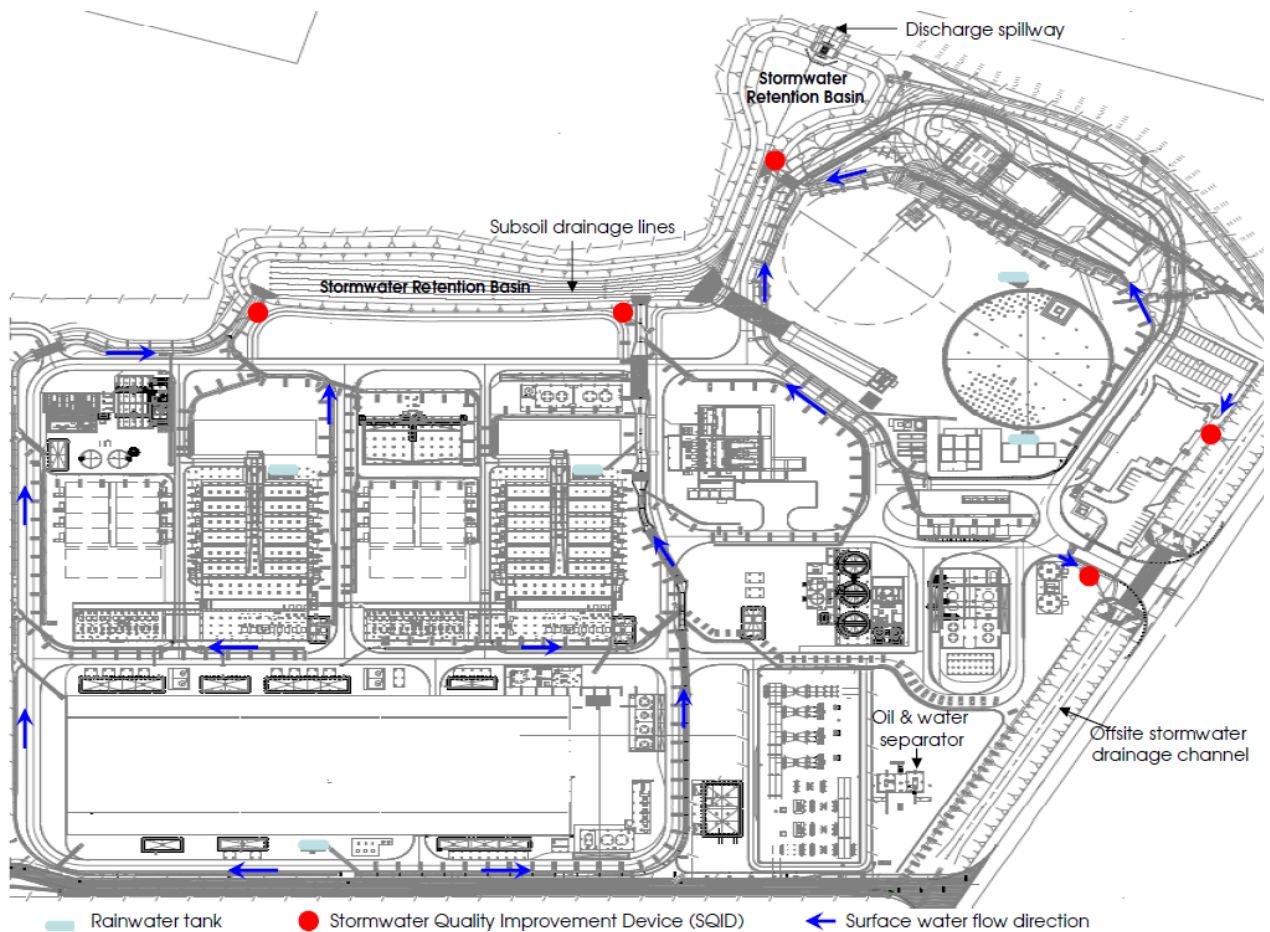
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Area. Erosion and scour protection including rip rap and a gabion mattress to disperse/calm flows is located immediately downstream of the discharge point.

Testing for oil and grease can be undertaken downstream of the SQID if required.

Figure 2: Storm Water Management



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Figure 3 Offsite Flows from Retention Basin



→ Offsite flow from retention basin (runs into an existing open channel in the Conservation Area, and is then conveyed through the existing open channel under Captain Cook Drive which connects into Quibray Bay).

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6.8 PROCESS WATERS

The following section describes contingencies for process waters to be redirected or released in the event of an emergency.

Even though the Sydney Desalination Plant was designed and constructed to contain process waters during the entire desalination process, there may be times when process equipment or its software malfunction or fail and cause an excess of water in one more stages of the plant. If this occurs, the following contingencies are in place to direct water as appropriate.

6.8.1 FILTERED WATER TANK

In the event that overflow from the filtered water tank occurs, this water will be directed to the plant's water intake, to be processed again.

6.8.2 WASTEWATER TANK

Should the wastewater tank overflow, this water will be directed to the plant's water intake to be processed again.

6.8.3 PURGE OF DELIVERY PIPELINE

The delivery pipeline under Botany Bay may at times require purging, e.g. if desalination water has not been required for an extended period of time. Pressure (head) from the Prospect Reservoir will be used to push the water back to the desalination plant and the water will be discharged to the ocean.

This will be managed in accordance with the specific conditions at the time, the volume of purge water and the goals of the purge (for example, decontamination of the pipeline may require high levels of chlorine to be added to the pipeline water and then removed prior to discharge to ocean). Due consideration will be taken for the ecological impact of any water on the ocean environment and Veolia will ensure it complies at all times with the requirements of the Environment Protection Licence.

6.8.4 FIRST PASS PERMEATE

In practice overflow should never occur. If it does occur the overflow is directed to the returns flow chamber and discharged or returned to the intake when there is no remaining hydraulic capacity in the concentrate line and outfall tunnel.

6.8.5 DRINKING WATER TANK (DWT)

Under normal operations drainage or overflow of the DWT will not occur, unless there is a failure of communication within and between the SWRO plant and drinking water pumping station. The pumping station design rate is 340ML/d which is greater than the

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plant's 266 ML/d maximum production and a high level in the drinking water tank will lead to a reduction in plant production. In practice overflow should never occur. If it does occur the overflow can be directed to the returns flow chamber (discharged or returned to the intake) which is the preference or to the sedimentation basin. All of these options would require the drinking water to be dechlorinated.

The overflow will be of drinking water quality in accordance with Table 1.1 of TS02, except that the water will not have been dosed with aqua ammonia. The chemical content of drinking water complies with lowland river ANZECC water quality trigger values; once dechlorinated as shown below. Drinking water will not contain any oils or grease, will not contain suspended solids, and will have an acceptable pH range and conductivity for stormwater discharge.

Table 5 Water Quality Parameters

Parameter	ANZECC Guidelines	Drinking Water
pH	6.5 –8.5	7.3-8.5
TSS (mg/L)	50	< 1
Conductivity (µScm-1)	<2200	< 200
Oil and Grease (mg/L)	No visible (<10)	none
Total Residual Chlorine (mg/L)	<0.1	0.25 – 1.5

6.9 CHEMICAL & FUEL STORAGE

The storage and handling of fuels and chemicals has the potential to pollute surface waters and contaminate soils.

Bulk storage areas for fuels, oils and chemicals are contained within purpose-built impervious bunds to retain any spills. These areas are fitted with sump pumps to transfer any spillage/wash down water contained in the chemical bund area for neutralisation and/or disposal. Depending on the hazardous nature of each chemical, sump pumps will be installed either permanently or on a temporary basis using a portable pump.

Storage will comply with EPA Guidelines "Bundling and Spill Management" and AS 1940-1993 – The Storage and Handling of Flammable and Combustible Liquids.

Large capacity spill kits have been provided at each storage area, with smaller kits contained within site vehicles and at areas of the worksite where handling and use of dangerous goods occur. Veolia staff have been provided with appropriate training in spill response. Any spillage will be immediately contained and absorbed with a suitable absorbent material as far as practicable.

Safety Data Sheets (SDS) for all chemicals stored on site are maintained by the Environmental Management System Representative (EMSR) and made available to site personnel, as well as located adjacent to the relevant chemical areas. Site

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personnel are informed of their location as a part of the induction process. SDSs are also available through the ChemAlert website.

Any activities on site that could result in a spillage of a chemical, fuel, or lubricant, is to be undertaken in accordance with the relevant work instruction and/or JSEA.

In the event water is polluted by chemicals and/or fire fighting materials (e.g. foams) the water will be collected, and disposed at an approved Liquid Waste Treatment Facility in accordance with EPA guidelines and provisions made in the Waste Environmental Management Plan (WEMP).

6.10 GENERAL

6.10.1 LITTER

Litter on the site has the potential to enter stormwater during rainfall events. Litter on the site is collected and appropriately disposed of on a regular basis in accordance with the WEMP.

The SQID located upstream of the basin and stormwater channel will capture gross pollutants from the site runoff.

6.10.2 FERTILISERS, HERBICIDES AND PESTICIDES

Use of fertilisers, herbicides and pesticides may enter the stormwater retention system and eventually enter the neighbouring conservation area where flora and fauna may be impacted.

A reputable contractor will be engaged to maintain the landscaped areas of the site. This contractor will only use Veolia approved chemicals and will use the minimum amount necessary.

Table 6 Water Management Measures, Responsibility and Timing

Water Management and Mitigation Measures	Responsibility	Timing
General Operation and Maintenance Activities – Water Management and Reuse		
Reduce water consumption through education of personnel, regular inspection of plumbing for leakages and damage; and installation of water saving devices where possible.	Environmental Management Systems Representative (EMSR) / Operations Manager	Ongoing training / Regular Inspection

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Water Management and Mitigation Measures	Responsibility	Timing
Rainwater will be collected in tanks and used for watering landscaped areas within the desalination plant site	Operations Supervisor/ Landscaping contractor	Ongoing
Surface Water Management and Quality Controls		
Stormwater drain system and retention basin to be monitored for sedimentation or blockages	Maintenance Supervisor	Ongoing
Landscaped areas within the desalination plant site to be maintained to limit erosion and sedimentation and surface water runoff	Maintenance Supervisor	Ongoing
Exposed soil due to temporary works carried out are to be covered and contained (i.e. watered) to minimise dust generation and sedimentation of stormwater system if required	Maintenance Supervisor	Ongoing
Groundwater Management		
Monitoring of the Stormwater Retention Basin for sedimentation or blockages that would limit the effective recharge of the groundwater system.	EMSR / Operations Manager	Ongoing
Monitoring of groundwater levels and quality as required	EMSR / Operations Manager	As required
Erosion and Sediment Control		
Exposed soil due to temporary works carried out are to be covered and contained (i.e. watered) to minimise dust generation and sedimentation of stormwater system if required	Maintenance Supervisor	Ongoing
Landscaped areas to be maintained	Maintenance Supervisor	Ongoing
Hardstand areas, concreted areas and crushed rock areas to kept clean and free of rubbish	Maintenance Supervisor	At all times
Stormwater Retention Basins		
To be visually inspected for obvious faults or deficiencies in the water holding capacity	EMSR	Ongoing
Drain systems upstream of the retention basin to be maintained and kept free of rubbish and excess sediment	Maintenance Supervisor	At all times
Process Water		
Individual process water sources to be correctly managed to limit the potential for overflow to the stormwater system	Operations Supervisor	Ongoing

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**SECTION 7 MONITORING, INSPECTION, AUDITING AND
REPORTING**

A regular auditing, monitoring and reporting program for soil and water management will be conducted in accordance with the Environmental Monitoring and Reporting Program REG-KDP-4-920.

7.1 SURFACE WATER QUALITY MONITORING

If deemed necessary, water quality monitoring will be used in the event of an uncontrolled sediment or chemical discharge to ensure compliance with regulations and also to assess the water quality discharged from the site to waterways, or retention basins for groundwater recharge. The monitoring will be focussed on assessing the quality and quantity of surface water.

7.2 GROUNDWATER MONITORING

A groundwater monitoring program will compare results of operational phase groundwater monitoring data with pre-construction baseline monitoring data (SWC Groundwater and Surface Water Quality 2006-2007 Final Report, October 2007). The groundwater monitoring program will determine any impact on groundwater conditions and give indication as to any potential requirement for artificial recharge. If artificial recharge is required, options will be developed, assessed and implemented.

7.3 AUDITING

Auditing is carried out in accordance with Veolia's corporate document PR-ANZ-1-475 Auditing Procedure.

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SECTION 8 PROJECT RESPONSIBILITIES AND TRAINING

8.1 ROLES AND RESPONSIBILITIES

In summary, the key responsibilities for surface water and groundwater management are detailed in the table below.

Table 7 Roles and Responsibilities

Role	Responsibility
Operations Manager:	Responsible for ensuring that surface water and groundwater management measures are implemented and maintained and, in the event of identified potential or actual breaches, to implement appropriate corrective or preventative actions to fulfil the requirements of this Plan.
Environmental Management Systems Representative (EMSR):	Responsible for ensuring this Plan is implemented by site staff. Undertake and assess data from inspections, monitoring and reporting and provide project-wide advice to ensure consistent approach and outcomes are achieved. Responsible for providing necessary training for Sydney Desalination Plant personnel to cover surface water and groundwater management issues.
Senior Process Engineer:	Responsible for providing assistance to the EMSR.
Operations Supervisor:	Responsible for providing assistance to the EMSR to fulfil the requirements of this Plan and for ensuring that appropriate surface water and groundwater management measures are implemented and maintained.
Maintenance Supervisor:	Responsible for providing assistance to the EMSR to fulfil the requirements of this Plan and for ensuring that appropriate surface water and groundwater management measures are implemented and maintained.