

# Victorian Desalination Project



Commissioning Environmental Sub-Plan  
 Attachment I.2.5 – Commissioning Control Measures Table  
 Draft

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Draft CESP Attachment I.2.5 – Commissioning Control Measures Tables

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### ATTACHMENT I.2.5: Commissioning Control Measures Table

#	Issue	PR #	Measure	Responsibility *	Project Phase	Evidence	Risk Register Reference
1	Marine flora and fauna entrainment	32202, 32205, 32206	<ul style="list-style-type: none"> <li>Intake structure grill sized at 50mm precludes marine mammals and other large marine organisms.</li> <li>SWLP system allows for flows of no greater than 0.15m/s (The equivalent intake flow rate of 200GL/year production) across the intake grilles.</li> <li>Monitoring of the screenings backwash differential pressure and frequency will be undertaken from the commencement of the Screening process.</li> <li>All screenings will be sent via the munchers to the Sludge System feed.</li> <li>The sludge system is capable of catering for a predicted worst case scenario of 100kg/day of screened material.</li> <li>Seawater intake is not sent to the Screen and feed until commencement of Pre-Treatment Commissioning.</li> </ul>	Area Environment Manager, Design Package Manager.	Design	Design Package Reports: <ul style="list-style-type: none"> <li>DP 1-0004 Hydraulic Model Intake System Design Package:</li> <li>DP 1 -0035 Marine Intake Structure and Risers Design Package:</li> <li>DP 1 -0003 Hydrodynamic Model Design Package.</li> <li>Commissioning Inspection and Test Records</li> </ul>	1
2	Discharge of off specification water to the marine environment. Initial potential discharge of seawater with high pH due to leaching of calcium from tunnel concrete lining.	33208	<ul style="list-style-type: none"> <li>During initial start-up, commission pumps in recirculation mode initially to ensure zero discharge. When pumps are operational, the seawater can be bypassed from intake directly to outfall via the bypass penstocks.</li> <li>When pumps are commissioned, run multiple pumps to achieve a high flow rate (equiv. to 100GL/a desalinated water flow) to ensure good dispersion of potential high pH water at the outlet structures. Discharge duration of potentially high pH water will be brief, as only the volume of water inside the intake tunnel and outlet tunnel are being discharged.</li> <li>No treatment or processing of the seawater is to occur during this process.</li> <li>Effective design of outlet diffuser structures to disperse the brine i.e. CFD modelling performed at worst case (rise of pH to 12) and simulated with the discharge flow mentioned above. The simulation demonstrated that the discharge water reaches ambient pH within a few meters of the discharge nozzle.</li> <li>Commissioning will be implemented as per the Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00).</li> </ul>	Commissioning Completions Manager	Commissioning	<ul style="list-style-type: none"> <li>Work Packs</li> <li>Monitoring and compliance records</li> <li>SCADA outputs from continuous In-plant monitoring</li> </ul> Design Package Reports: <ul style="list-style-type: none"> <li>DP 1-0003 Hydrodynamic Model Design Package.</li> <li>DP 1-0004 Hydraulic Model Intake System Design Package.</li> </ul>	2
3	Oil leaks from pumps discharged to the marine environment	33208	<ul style="list-style-type: none"> <li>Inspection of pump prior to installation to ensure no visible signs of oil leakage.</li> <li>Hard interlock of oil/water sensor within pump seal chamber which stops the pump and triggers an alarm (alarm triggers an operator response and corrective action procedures as per the Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006)).</li> <li>Limited quantity of oil in seal chamber of pump.</li> </ul>	Commissioning Completions Manager	Commissioning	<ul style="list-style-type: none"> <li>Work Packs</li> <li>Monitoring and compliance records</li> </ul>	3
4	High turbidity and pH water discharged to the marine environment.	33208, 33210	<ul style="list-style-type: none"> <li>Cleaning of tunnel prior to flooding.</li> <li>Final inspection and cleaning of pump station prior to flooding.</li> <li>Efficient pump start up and sequencing to maximise flow to outlet procedures as per the Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006).</li> </ul>	Commissioning Completions Manager	Commissioning	<ul style="list-style-type: none"> <li>Work Packs</li> <li>Monitoring and compliance records</li> </ul>	4
5	Noise: Protect neighbourhood amenity.	24158	<ul style="list-style-type: none"> <li>The design and selection of pumps (SWLPs) ensure that there is no airborne noise emitted during operation.</li> <li>Concrete cover over the seawater lift pump station reduces noise emission generated from water flowing over weirs etc.</li> <li>The equipment which may emit noise during operations is encapsulated in buildings or appropriate enclosures.</li> <li>Building ventilation systems incorporate noise attenuators to reduce noise emissions to the environment.</li> <li>The Desalination Plant is designed to meet EPA SEPP N1 and N3/89 (N3/89 will be complied with during day and evening. The State Environment Protection Policy N1 will be complied with at night-time for the Leased Area).</li> <li>A noise assessment will be performed to confirm design model as per the Commissioning Work Pack - Environmental Noise Assessment (COMM 051).</li> <li>Further details of noise monitoring are contained in the Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006).</li> </ul>	Design Package Manager/ Commissioning Environmental Representative/	Design and Commissioning	<ul style="list-style-type: none"> <li>Work Pack COMM-051</li> <li>WA Condition report 2.8.</li> <li>Monitoring and compliance records and reports.</li> </ul>	5, 38

#	Issue	PR #	Measure	Responsibility *	Project Phase	Evidence	Risk Register Reference
6	Underwater noise and vibration	37230, 38232, 38234	<ul style="list-style-type: none"> <li>Design and selection of pumps (SWLPs) ensures compliance with performance requirement for underwater noise.</li> <li>Assessment of underwater noise in accordance with the Commissioning Procedure for Underwater Environmental Noise Assessment (COMM 051).</li> </ul>	Commissioning Completions Manager	Commissioning	<ul style="list-style-type: none"> <li>Work Pack COMM-051</li> <li>Monitoring and compliance records</li> </ul>	6
7	Marine Flora and Fauna – Outlet Insufficient flow during commissioning to enable mixing in the marine environment	33208, 33210, 33211, 33212, 33213	<ul style="list-style-type: none"> <li>During commissioning, operate bypass at seawater lift pump station to ensure minimum flow to outlet tunnel equivalent to one stream of brine discharge. Commissioning will be implemented as per the Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00).</li> </ul>	Commissioning Completions Manager	Commissioning	<ul style="list-style-type: none"> <li>SCADA outputs from continuous In-plant monitoring</li> </ul>	7
8	Chemical and Hazardous Material unloading and storage / spills and leaks	12089, 19126, 19128, 19129	<ul style="list-style-type: none"> <li>All concentrated chemicals to be stored in dedicated chemical store buildings or bunded areas (In accordance with EPA Publication 347, Dec 1992) to reduce the risk of spills entering the storm water drainage system.</li> <li>Bund volume capacity will be equal to the capacity of the largest tank + 10% of another tank within the same bund).</li> <li>Unloading of bulk chemicals will be within designated bunded areas and follow Operating Procedures. Refer to preliminary list of operating procedures in the Commissioning Environmental Monitoring &amp; Control Procedure (TDV-2-EV-PRD-0006)</li> <li>Bulk chemical storage will be in designated tanks as per the Plant Wide Process Design (DP2-0001). Chemical identification will be on the relevant tank, buildings and unloading panels.</li> <li>Each chemical storage tank used on the plant is contained within a dedicated bunded area. Any spills or leaks from within the bund will be captured, assessed and disposed of in accordance with Operating Procedures.</li> <li>Limit the on-site storage and/or use of hazardous materials on a “just in time” basis during commissioning.</li> <li>Any spills or leaks within bunds will be captured, assessed and disposed of in accordance with Operating Procedures, the D&amp;C PGA Hazardous Materials Sub Plan (Att I2) and the D&amp;C PGA EIRP (Att K).</li> </ul>	Design Package Manager; and Commissioning Completions Manager	Design and Commissioning	Design Package Reports: <ul style="list-style-type: none"> <li>DP2-0001</li> <li>Monitoring and compliance records</li> <li>Site inspection records</li> <li>Work Packs</li> <li>D&amp;C EMP</li> </ul>	8, 10, 23, 25, 49, 50, 51, 52, 53
9	Unwanted chemical spills/leaks due to malfunction of components	12089, 19126, 19128	<ul style="list-style-type: none"> <li>All truck unloading areas are designed to capture any spills from truck unloading operations.</li> <li>Chemical storage tanks are located in designated bunded areas.</li> <li>Designated unloading and chemical storage areas will not occur within 30m of a designated waterways or wetlands.</li> <li>Chemical pipe works outside buildings are in culverts or double contained if direct buried.</li> <li>Tanks have level transmitter and high level switches to interlock feed system and prevent overfilling.</li> <li>Equipment and piping are designed to a rating higher than the operating requirement.</li> </ul>	Design Package Manager	Design	Design Package Reports: <ul style="list-style-type: none"> <li>DP2-0001</li> </ul>	8, 10, 20, 23, 25, 52
10	Unwanted chemical spills/leaks due to malfunction of dosing components	12089, 19126, 19128	<ul style="list-style-type: none"> <li>Pipes will be hydrostatically tested to ensure integral and eliminate the chance of leakage.</li> <li>Tested sequence to ensure that the likelihood of chemical spillage from malfunction of instrument is minimised.</li> <li>Systems and tested with water first to ensure correct interlock, control (sequence) and functionality. Systems are then dried with air prior to introduction of chemicals.</li> <li>Calibration and testing of chemical delivery system performed with water during the pre-commissioning process to minimise the risk of leaks.</li> <li>Pressure monitoring for loss of pressure due to major failure.</li> <li>Visual inspection of equipment as part of commissioning to detect any minor leaks.</li> <li>The above will be implemented as per the Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006). Spills will be managed as per the D&amp;C PGA Hazardous Materials Sub Plan (Attachment I2 to the D&amp;C PGA EMP) and the D&amp;C PGA EIRP (Control Measure #28)</li> </ul>	Commissioning Completions Manager	Commissioning	<ul style="list-style-type: none"> <li>Work Packs</li> <li>Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006)</li> <li>Construction Testing Procedures</li> <li>Monitoring and compliance records</li> <li>Site inspection records</li> </ul>	8, 9, 10, 11, 14, 18, 19, 20, 21, 22, 23, 24, 25, 26, 31, 32, 35, 36, 52
11	Incorrect chemical dosage due to malfunction of components	33208, 33210	<ul style="list-style-type: none"> <li>Dosing of chemicals is automatically controlled. Settings also have warning levels that trigger a system response, and alarms levels which trigger an operator response and corrective action procedures. Further details of the automated monitoring systems are detailed in the Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006).</li> <li>Control sequence is tested with water prior to introduction of chemicals.</li> </ul>	Commissioning Completions Manager	Commissioning	<ul style="list-style-type: none"> <li>Work Packs</li> <li>Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006)</li> </ul>	9, 11, 14, 18, 21, 22, 24, 29, 30, 31, 32, 33, 37

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			<ul style="list-style-type: none"> <li>Systems are tested with water first to ensure correct interlock, control and functionality. Systems are then dried with air prior to introduction of chemicals.</li> <li>Closed loop control of dosing equipment which reduces chemical use when set point is approached and stops chemical dose when control set point is breached.</li> <li>Continuous automated control of chemical dosage and real time monitoring to ensure no over dosing.</li> <li>Excess chemical flow will slow down the chemical feed pump automatically.</li> <li>Automatic shutdown of pump/dosing system if there is instrument or control failure.</li> <li>Calibration of instruments at intervals required by manufacturer.</li> </ul>			<ul style="list-style-type: none"> <li>SCADA outputs from continuous In-plant monitoring.</li> </ul>	
12	Training	-	<p>Commissioning team members will receive specific training relevant to the environmental risks of commissioning which will include, as minimum:</p> <ul style="list-style-type: none"> <li>Plant Environmental Site Induction (includes resource efficiency and waste management).</li> <li>Incident Management (through the Environmental Incident Response Plans).</li> </ul> <p>Subsequent training will be carried out based on specific work areas/activities, be commensurate with the associated risks, and may include, but not be limited to the following:</p> <ul style="list-style-type: none"> <li>Spill Response.</li> <li>Discharge Water Quality excursions.</li> <li>Unplanned discharge of water to waterways/marine.</li> <li>Training relating to the use of Hazardous goods.</li> </ul>	Project Director; Commissioning Director; Area Environment Manager and All employees	Commissioning	Training records	8, 10, 11, 12, 20, 23, 25, 28, 35, 36, 40, 41, 42, 47, 49, 50, 51, 52, 53, 54, 60.
13	Training (Induction)	20135	Promote the efficient use and conservation of resources as part of the training program for all personnel including contractors, subcontractors and operators. Include the waste management hierarchy in the induction with an emphasis on avoidance and minimisation. Include waste separation and segregation requirements in the induction.	Area Environment manager All employees	Construction and Commissioning	Training records	54.
14	Training – Environmental Incident Response Plan (EIRP)	19128	<p>Relevant staff trained in the appropriate management of unplanned discharges and response in accordance with the D&amp;C PGA and Utilities EIRPs as follows:</p> <ul style="list-style-type: none"> <li>For all spills, follow the Environmental Incident Response Plan (D&amp;C PGA EIRP and D&amp;C Utilities EIRP as appropriate; depending on the location of the incident at either the Plant site or along the Utilities corridor respectively).</li> <li>Notify the Environmental Team. Contain and absorb spill with sand, earth, inert material or vermiculite. Clean up all spills immediately. Place in a suitable, labelled container for waste disposal in accordance with relevant MSDS.</li> <li>Clean area and DO NOT discharge into sewer or waterways.</li> <li>Return clean up material to supplier for reuse/ recycling if possible. If reuse or recycling is not possible, the waste will be collected by an EPA certified waste disposal company and transporter.</li> </ul>	Site Manager  Construction Managers / Health and Safety Manager / Environment Manager	Commissioning	Daily logs	8, 10, 12, 20, 23, 25, 28, 35, 36, 40, 41, 42, 47, 49, 50, 51, 52, 53, 54, 60.
15	Chemical Awareness and Procedures	19126, 19128	<ul style="list-style-type: none"> <li>MSDS are readily available for all hazardous substances used or stored at the site during commissioning.</li> <li>All work involving the use of hazardous materials during commissioning shall be subject to the Job Safety and Environment Analysis (JSEA) process. The JSEA process will address the hazardous qualities of the material to be used. No work shall be undertaken without known risk to both environment and human health being understood and adequate control measures in place. Work shall only be conducted with a copy of the Material Safety Data Sheet (MSDS) attached to the JSEA.</li> </ul>	Site Safety Manager, HAZMAT Coordinator, Site Safety Officers	Commissioning	<ul style="list-style-type: none"> <li>MSDS Register</li> <li>JSEA records</li> </ul>	8, 9, 10, 23, 24, 25, 49, 51, 53.
17	Material identification	19126, 19128	<ul style="list-style-type: none"> <li>Identify and record the type, volume and concentration of hazardous materials that are used and stored during commissioning.</li> </ul>	HAZMAT Coordinator	Commissioning	Current HAZMAT materials records	10, 25, 46, 49, 50, 51, 52, 53.
18	Chemical Storage	19126, 19128	<ul style="list-style-type: none"> <li>During commissioning, appropriate segregation and separation of hazardous materials during storage will be established as required by the Dangerous Goods (Storage and Handling) Regulations 2000, the Occupational Health and Safety (Hazardous Substances) Regulations 1999 and the Code of Practice for the Storage and Handling of Dangerous Goods, No. 27, 2000.</li> </ul>	HAZMAT Coordinator and Safety Officers	Commissioning	Site inspection records	10, 25, 46, 49, 50, 51, 52, 53.
19	Chemical Storage	19126,	<ul style="list-style-type: none"> <li>Dangerous goods storage areas will be isolated from all sources of ignition and appropriate fire extinguisher coverage</li> </ul>	HAZMAT	Commissioning	Site plans and site inspection	10, 25, 46,



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		19128	provided during commissioning.	Coordinator and Safety Officers		records	49, 50, 51, 52, 53.
20	Chemical Storage	19126, 19128	<ul style="list-style-type: none"> <li>Dangerous goods storage areas will be posted with the relevant HAZCHEM signage and emergency response information at the entry to site.</li> </ul>	HAZMAT Coordinator and Safety Officers	Commissioning	Site inspection records	10, 25, 46, 49, 50, 51, 52, 53.
21	Chemical Storage	19126, 19128	<ul style="list-style-type: none"> <li>The storage area for bulk fuels will be at least 15 metres away from any buildings such as workshops, administration or amenities.</li> </ul>	HAZMAT Coordinator and Safety Officers	Construction and Commissioning	JSEAs and Site Environmental Plans	8, 10, 23, 25, 52.
22	Chemical Storage	19126, 19128	<ul style="list-style-type: none"> <li>Hazardous materials not in use are sealed and safely stored in a secure area.</li> </ul>	HAZMAT Coordinator and Safety Officers	Commissioning	JSEAs and Site Environmental Plans	8, 10, 25, 46, 49, 50, 51, 52, 53.
23	Chemical Storage	19126, 19128	<ul style="list-style-type: none"> <li>Hazardous materials storage/containment and disposal is in accordance with the MSDS (including personal protective equipment, ventilation, spill containment and precautions to avoid fire).</li> </ul>	HAZMAT Coordinator and Safety Officers	Commissioning	JSEAs and Site Environmental Plans	8,9, 10, 25, 46, 49, 50, 51, 52, 53.
24	Labelling and Signposting	19126, 19128	<ul style="list-style-type: none"> <li>All original containers are to be labelled to accurately identify the hazardous contents (product name and chemical name) and include appropriate risk and safety phrases, first aid and emergency procedures and the manufacturers or importers details (National Code of Practice for Labelling of Workplace Hazardous Substances NOHSC: 2012 (1994)).</li> </ul>	HAZMAT Coordinator and Safety Officers	Commissioning	JSEAs and Site Environmental Plans	10, 25, 46, 49, 50, 51, 52, 53.
25	Labelling and Signposting	19126, 19128	<ul style="list-style-type: none"> <li>Bulk storages of hazardous materials will be placarded during construction completion and easily viewable during commissioning.</li> </ul>	Site Manager	Construction	JSEAs and Site Environmental Plans	10, 25, 46, 49, 50, 51, 52, 53.
26	Spill risk reduction	19128	<ul style="list-style-type: none"> <li>During commissioning, ensure appropriate capacity spills kits are readily accessible to areas where hazardous materials and specifically hydrocarbons are stored.</li> <li>Develop chemical loading procedures and ensure that these measures are implemented on a day-to-day basis during commissioning.</li> </ul>	HAZMAT Coordinator	Construction Commissioning	<ul style="list-style-type: none"> <li>Chemical loading procedure,</li> <li>Site Inspection records</li> </ul>	10, 25, 46, 49, 50, 51, 52, 53.
28	Incident Management (Environmental Incident Response Plan (EIRP))	19128, 06244, 40252,	<ul style="list-style-type: none"> <li>All relevant personnel are to be trained in the Environmental Incident Response Plans (D&amp;C PGA and D&amp;C Utilities - Attachment K), Site Emergency Response Plan and the site's evacuation procedures.</li> <li>Emergency response training will be provided through incident simulations. Incident management (including spill control and clean-up measures) will be undertaken in accordance with the relevant MSDS and the Environmental Incident Response Plans.</li> <li>D&amp;C PGA EIRP and D&amp;C Utilities EIRP to be followed in emergency situations and for all incidents. The D&amp;C PGA EIRP will be implemented for plant site incidents and the D&amp;C Utilities EIRP for Utilities corridor incidents respectively. The primary responsibility for managing incidents lies with the CER or AEM depending on whether the incident occurred due to Commissioning or Construction Works respectively.</li> <li>A Commissioning alarm trigger breach (level 2) or breach or Water Quality Parameters (Confirmed by the In-Plant Water Quality Monitoring Program) will result in an immediate progressive shutdown (component, subsystem, system or plant) and implementation of the D&amp;C PGA EIRP.</li> </ul>	Construction Managers; Health and Safety Manager; Commissioning Environmental Representative; and Environment Managers	Construction and Commissioning	<ul style="list-style-type: none"> <li>Training records</li> <li>HSE Incident Reports</li> <li>Environmental Restart Permit (D&amp;C PGA EMP ATT K-3).</li> </ul>	3, 8, 9, 10, 12, 20, 23, 24, 25, 28, 35, 46, 48, 49, 50, 51, 52, 53, 55, 56, 57 & 59
29	Leaks from the dewatering screw or skip.	33208	<ul style="list-style-type: none"> <li>Dewatering screw and skip are located within a concrete hardstand which slopes toward a sump.</li> <li>Water collected in the sump is pumped back to the screen and feed diffuser.</li> <li>Staff trained in the appropriate management of unplanned discharges and response in accordance with the D&amp;C PGA and Utilities EIRPs as appropriate.</li> </ul>	Design Package Manager	Design	Design Package Reports: <ul style="list-style-type: none"> <li>DP2-0001</li> <li>Site Inspection records</li> </ul>	12
30	Odour: Protect Neighbourhood Amenity	24158	<p><u>Commissioning of Drum Screen and solid disposal via the dewatering screw:</u></p> <p>It is not planned to use the dewatering screw during commissioning, and the dewatering screw can be commissioned without the drum screen feed of potential solids.</p>	Commissioning Completions Manager; and Commissioning	Commissioning	<ul style="list-style-type: none"> <li>DP2-0001</li> <li>Monitoring and compliance records</li> </ul>	13, 15, 16, 17

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			<p>Other control measures enacted, in the event that solid disposal via the dewatering screw and skips occurs, are as per Odour Assessment Procedure (COMM 052):</p> <p><u>Commissioning of the Sludge System:</u></p> <ul style="list-style-type: none"> <li>Sludge is contained in covered skips and located within the sludge building to minimise fugitive emissions.</li> <li>Regular removal of the skips (once filled), to avoid stockpiling of waste, and appropriate disposal of the waste off site in accordance with EPA guidelines.</li> <li>Daily inspection of skip to ensure it is not overfilled or odorous.</li> </ul> <p><u>General:</u></p> <ul style="list-style-type: none"> <li>Trucks to use major roads where possible (not backstreets) and stick to a defined route.</li> <li>Management of wastes by design (screenings and sludge) as per Plant Wide Process (DP2-0001).</li> <li>An Odour assessment will be implemented as per the Commissioning Procedure for Odour Assessment (COMM 052).</li> </ul>	Environmental Representative		<ul style="list-style-type: none"> <li>Commissioning Procedure for Odour Assessment (COMM 052).</li> </ul>	
31	Commissioning of the Sludge System: Unwanted discharge into the marine environment	33210	<ul style="list-style-type: none"> <li>Chemical use to promote coagulation of suspended solids and is settled with the sediments.</li> <li>Dosing of chemicals into the Sludge Treatment system is automatically controlled to the required flow rate, the flow settings also have warning level that triggers a system response, and alarms levels which trigger an operator response and corrective action procedures. Further details of the automated monitoring systems are detailed in the Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00).</li> <li>Excess chemical flow will slow down the chemical feed pump automatically.</li> <li>Turbidity of the clarified water from the Densadeg is measured and controlled by regulating the injection of chemicals</li> <li>Calibration and testing of chemical delivery system performed with water during pre-commissioning process to minimise risk of leaks and ensure correct functionality prior to introduction of chemicals.</li> <li>Jar tests during commissioning to verify and optimise chemical dose rates.</li> <li>Water quality at outfall will be monitored with dual redundancy (primary and secondary monitoring instrument systems) including real time alarms. Monitoring system linked to plant through SCADA system to initiate change to process in event of excursion from design parameters.</li> <li>Commissioning will be implemented as per the Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00)</li> </ul>	Commissioning Completions Manager	Commissioning	<ul style="list-style-type: none"> <li>SCADA outputs from continuous In-plant monitoring</li> <li>Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006)</li> <li>Commissioning Phase Sludge Sampling and Classification procedure (PR-TDV-EN-2-N-000-0001)</li> <li>Monitoring and compliance records</li> </ul>	14
32	Sludge characterisation. <ul style="list-style-type: none"> <li>Wetter sludge produced during initial commissioning stage causing difficulty in management of solid waste (disposal from solid waste skips).</li> <li>Disposal of waste to the incorrect offsite facility.</li> </ul>	20130, 20132	<ul style="list-style-type: none"> <li>Extract sludge from a lower extraction point in the clarifier with higher solid content to ensure centrifuge feed has sufficient solids.</li> <li>Sludge Tank can be used to build up solids content in sludge prior to feed to centrifuge.</li> <li>Centrifuge has speed control and discharge weir control to retain and build up solids content (reduce wetness) to the required level prior to discharge.</li> <li>Sludge to be characterised at the initial period of commissioning prior to being sent off site for disposal. Characterisation to be in line with EPA IWRG 631 and IWRG701.</li> <li>Sludge to be characterised again when lime is added to the sludge system. Characterisation to be in line with EPA IWRG 631 and IWRG701.</li> <li>Sludge from the centrifuge is expected to be classified as non-hazardous. It will also be non-combustible and non-flammable</li> <li>Sludge classification will occur as per the Commissioning Phase Sludge Sampling and Classification procedure (PR-TDV-EN-2-N-000-0001).</li> <li>Disposal methodology (trucks) to be set in place contractually (note: inclusive of evacuation from sludge &amp; dewatering screw skip). High throughput (on average 1 skip per day initially to ~8 skips per day at full capacity).</li> <li>Ensure sufficient resources are available for waste pickup during commissioning (Note: Overall sludge production would be lower during commission than during operation due start/stop and low flow operating conditions).</li> </ul>	Commissioning Completions Manager	Commissioning	<ul style="list-style-type: none"> <li>Commissioning Phase Sludge Sampling and Classification procedure (PR-TDV-EN-2-N-000-0001)</li> <li>Monitoring and compliance records</li> <li>Waste disposal receipts, and Waste Contractor Reports</li> <li>Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006)</li> </ul>	15, 16
33	Waste Separation	20130, 20133,	Transport and handling of waste for commissioning will be managed as per the Resource Efficiency and Waste Management Sub Plan (Attachment I6 to the D&C PGA EMP).	Site Manager; Site Supervisors;	Construction and Commissioning	<ul style="list-style-type: none"> <li>Inspection and monitoring records</li> </ul>	13, 15, 16, 17, 25, 39,

#	Issue	PR #	Measure	Responsibility *	Project Phase	Evidence	Risk Register Reference
		20135	<ul style="list-style-type: none"> <li>Recyclable waste to be kept separate in a designated area for future treatment at the appropriate offsite recycling facility.</li> <li>All general inert and solid waste generated during commissioning shall be stored in appropriate waste containers.</li> <li>Prescribed wastes to be separated from non-prescribed waste at all times during commissioning. If small amounts of prescribed waste are mixed with non-prescribed waste the entire quantity of waste becomes prescribed.</li> <li>All storage containers and locations for the various waste streams shall be clearly labelled to ensure that mixing of wastes is avoided.</li> <li>Waste will not be stored adjacent to potentially sensitive areas such as natural vegetation, stormwater drains, residences or waterways during the commissioning process.</li> <li>Dedicated prescribed waste bins will be provided.</li> <li>Dedicated skips for process waste will be provided.</li> <li>Ensure spare waste storage receptacles on site for use as required during commissioning.</li> <li>Consult the CER on the nature or classification of a waste if it is unknown.</li> </ul>	Commissioning Environmental Representative; and All Employees		<ul style="list-style-type: none"> <li>Waste disposal receipts, EPA Waste Transport Certificates and Waste Contractor Reports</li> </ul>	54
34	Waste Disposal	20130	<ul style="list-style-type: none"> <li>Management of wastes by design (screenings and sludge) as per Plant Wide Process (DP2-0001).</li> <li>Characterisation of waste prior to off site disposal, as per EPA IWRG 631 and IWRG701</li> <li>Separate characterisation of waste during commissioning to reflect anticipated sludge characteristics</li> <li>Skips of sludge will be removed regularly (once filled) and disposed of off-site.</li> <li>All waste disposal to occur in accordance with EPA guidelines.</li> <li>Disposal methodology (trucks) to be set in place contractually (note: inclusive of evacuation from sludge &amp; dewatering screw skip).</li> <li>Ensure sufficient resources are available for waste pickup during commissioning. NB. Overall sludge production would be lower due start/stop and low flow operating conditions.</li> <li>Use of a EPA Licensed transporter and landfill for the disposal of all Industrial Waste</li> <li>Copies of EPA waste transport certificates to be retained and filed for the transport of Industrial Waste.</li> <li>Make use of covered skips, covered transport, waste transport certificates and receipts, as per D&amp;C EMP Commissioning Sub Plan At I2.5 Plan Commissioning, control measures table.</li> <li>Trucks to use major roads where possible (not backstreets) and stick to a defined route.</li> <li>Commissioning will be implemented as per the Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00)</li> </ul>	Commissioning Environmental Representative; and Site Supervisors	Construction and Commissioning	<ul style="list-style-type: none"> <li>Waste Transport Certificate copies</li> <li>Waste receipts/dockets</li> <li>Waste contractor reports</li> <li>Inspections and checklists</li> <li>Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00)</li> </ul>	15, 17, 25
35	Potential discharge into the marine environment of overdosed chemicals	33210	<ul style="list-style-type: none"> <li>Dosing of chemicals into the feedwater stream is automatically controlled to the required pH (~6.8).</li> <li>The pH and chemical flow control has warnings that triggers an automatic system response, and alarms which trigger an operator response and corrective action procedures.</li> <li>An event of Low pH will result in the system stopping dosing of chemicals. Chemical dosing will be automated and monitored in real time to ensure no over dosing.</li> <li>Additional monitoring at the outfall records water quality parameters and provides warnings and Level 1 and 2 triggers. Warnings and triggers will alert the operator of abnormal operation and initiate investigation of potential cause of excursion and implement appropriate action to bring conditions back to normal.</li> <li>Monitoring of water quality at the outfall of the Seawater lift pump station and alarm triggers from these monitoring instruments will initiate appropriate actions, e.g. check subsystem that is causing deviation and correct, check instrument calibration, check control function etc.</li> <li>Calibration and testing of chemical delivery system performed with water during pre-commissioning process to minimise risk of malfunction.</li> <li>Water quality will be confirmed through inline water quality monitoring with dual redundancy (primary and secondary instruments) including real time alarms.</li> <li>Spills will be managed in accordance with the D&amp;C PGA Hazardous Materials Sub Plan (Attachment I2 to the D&amp;C PGA</li> </ul>	Commissioning Completions Manager	Commissioning	<ul style="list-style-type: none"> <li>SCADA outputs from continuous In-plant monitoring</li> <li>Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006)</li> </ul>	18



#	Issue	PR #	Measure	Responsibility *	Project Phase	Evidence	Risk Register Reference
			<ul style="list-style-type: none"> <li>EMP).</li> <li>Commissioning will be implemented as per the Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00).</li> </ul>				
36	Discharge water quality to the marine environment	33210, 33211, 33212, 34222, 34219	<ul style="list-style-type: none"> <li>Monitoring of water quality through the online analysers at the outfall chamber and warnings and triggers from these monitoring instruments will initiate appropriate actions, e.g. check subsystem that is causing deviation and correct, check instrument calibration, check control function etc.</li> <li>Water quality will be confirmed through online water quality monitoring with dual redundancy (primary and secondary monitoring instrument systems) including real time warnings and alarms. Chemical dosing will be automated and in real time to ensure no over dosing. Further details of the automated monitoring systems are detailed in the Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006).</li> </ul>	Environmental Commissioning Representative	Commissioning	<ul style="list-style-type: none"> <li>SCADA outputs from continuous In-plant monitoring</li> <li>Monitoring data and reports</li> </ul>	2, 3, 4, 7, 11, 14, 18, 19, 21, 22, 26, 27, 29, 30, 31, 32, 33, 34, 36, 37, 43 & 59
37	Failure of inline monitoring system	33210, 33211, 33212, 34222, 34219	<ul style="list-style-type: none"> <li>Primary and secondary measurement instruments installed, smart instrument to provide status of instrument.</li> <li>Construction of equipment in accordance with Australian and International Standards.</li> <li>Manual grab samples for analysis on regular basis.</li> <li>Design includes a redundancy monitoring system and one monitoring system will be online at all times. Redundancy monitoring exists at critical control points, such as the sea water lift pump outlet and backwash effluent channel.</li> <li>Manual sampling will be conducted from the outfall and laboratory analysis will be conducted on water discharged from the outlet in accordance with the BMMP.</li> <li>Progressive component/subsystem/system/plant shutdown initiated in the event of monitoring failure (primary and secondary) as detailed in the Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006).</li> </ul>	Commissioning Completions Manager	Commissioning	<ul style="list-style-type: none"> <li>SCADA outputs from continuous In-plant monitoring</li> <li>Monitoring data and reports</li> <li>D&amp;C PGA EIRP and Environmental Plant Restart Permit</li> <li>Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006)</li> </ul>	2, 3, 4, 7, 11, 14, 18, 19, 21, 22, 26, 27, 29, 30, 31, 32, 33, 34, 36, 37, 43, 59
38	Discharge of off specification water to marine environment due to: - Overdosing of sodium hypochlorite at intake. - lack of neutralisation of sodium hypochlorite.	33210	<ul style="list-style-type: none"> <li>Interlock sodium hypochlorite injection with operation of seawater lift pumps (SWLPS) and therefore stops dosing when SWLPS are stopped.</li> <li>Sodium hypochlorite injection nozzles are within the intake structure.</li> <li>Automatic control of sodium hypochlorite dosing during the entire biofilm control process. Continuous monitoring and control of sodium hypochlorite in the seawater during the entire biofilm control process.</li> <li>Sodium hypochlorite is neutralised at the point of discharge from the process unit. This could be at DMPF Backwash Tank discharge channel, or at the Cartridge Filters depending on process requirements. Any un-neutralised sodium hypochlorite will be neutralised with sodium bisulphide at the outfall chamber of the seawater lift pump station.</li> <li>Continuous monitoring and dosing of sodium bisulphite (SBS) at the outfall, DMPF Backwash tank and Cartridge filter outlet. Automatic interlock to stop dosing of sodium hypochlorite should the SBS dosing system fail.</li> <li>Additional personnel will be assigned to monitor chlorine level at the critical locations, such as seawater launder, DMPF feed, Cartridge filter discharge and outfall during the biofilm control process.</li> <li>Commissioning will be implemented as per the Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00) and specific Standard Operating Procedures (being developed)</li> </ul>	Commissioning Completions Manager	Commissioning	<ul style="list-style-type: none"> <li>SCADA outputs from continuous In-plant monitoring</li> <li>Monitoring data and reports</li> <li>SOPs</li> </ul>	21, 22
39	Marine flora and fauna entrainment	32207, 32202	<ul style="list-style-type: none"> <li>Entrainment controlled through design of intake structures (e.g. controlled velocity, screen grill size)</li> <li>During commissioning, the possible effects of entrainment on marine biota including changes to recruitment and marine community structure, as well as confirmation of discharge within Water Quality Parameters, will be monitored in accordance with the BMMP and 30A Commissioning Approval Application.</li> </ul>	Area Environment Manager; and Commissioning Environmental Representative	Design and Commissioning	<ul style="list-style-type: none"> <li>Monitoring data and reports</li> <li>Design Packages</li> </ul>	All relating to Entrainment and discharge water quality
40	Commissioning of the DMPF system. Leakage of seawater or filtered seawater onto the surrounding ground	15103, 15106, 15108	<ul style="list-style-type: none"> <li>Design : Equipment and piping are designed to a rating higher than the operating requirements.</li> <li>Commissioning: Hydrostatic test of equipment and piping with fresh water during pre-commissioning prior to process commissioning of the filters. Leaks will be rectified during pre-commissioning.</li> <li>Pressure monitoring for loss of pressure due to major failure</li> <li>Visual inspection of equipment as part of commissioning to detect any minor leaks.</li> </ul>	Area Environment Manager; and Commissioning Environmental Representative	Design and Commissioning	<ul style="list-style-type: none"> <li>Monitoring data and reports</li> <li>Design Package Reports</li> </ul>	20

#	Issue	PR #	Measure	Responsibility *	Project Phase	Evidence	Risk Register Reference
	on site contaminating surface water.		<ul style="list-style-type: none"> <li>Staff trained in the appropriate management of unplanned discharges and response in accordance with the D&amp;C PGA and Utilities EIRPs as appropriate.</li> </ul>				
41	<p>Potential injection of dilute sodium hypochlorite for biofilm control of SWLP, DMPF, Cartridge filter systems prior to feed to RO.</p> <p>Overdosing of sodium hypochlorite at intake.</p> <p>- lack of neutralisation of sodium hypochlorite.</p> <p>Impact on marine environment</p>	33210, 33211, 33212, 34222,	<ul style="list-style-type: none"> <li>Design: Interlock sodium hypochlorite injection with operation of seawater lift pumps (SWLPS) and therefore stops dosing when SWLPS are stopped.</li> <li>Sodium hypochlorite injection nozzles are within the intake structure.</li> <li>Sodium hypochlorite injection only occurs when seawater lift pumps are operating.</li> <li>Automatic control of sodium hypochlorite dosing during the entire biofilm control process. Continuous monitoring and control of sodium hypochlorite in the seawater during the entire biofilm control process.</li> <li>Sodium hypochlorite is neutralised at the point of discharge from the process unit. This could be at DMPF Backwash Tank discharge channel, or at the Cartridge Filters depending on process requirements. Any un-neutralised sodium hypochlorite will be neutralised with sodium bisulphide at the outfall chamber of the seawater lift pump station.</li> <li>Continuous monitoring and dosing of sodium bisulphite (SBS) at the outfall, DMPF Backwash tank and Cartridge filter outlet. Automatic interlock to stop dosing of sodium hypochlorite should the SBS dosing system fail.</li> <li>Additional personnel will be assigned to monitor chlorine level at the critical locations, such as seawater launder, DMPF feed, Cartridge filter discharge and outfall during the biofilm control process.</li> <li>Commissioning will be implemented as per the Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00) and specific Standard Operating Procedures (being developed).</li> </ul>	<p>Commissioning Completions Manager</p> <p>Commissioning Environmental Representative</p>	Design and Commissioning	<ul style="list-style-type: none"> <li>Monitoring data and reports</li> <li>Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00)</li> </ul>	21
42	<p>Biofilm control of systems prior to feed to RO.</p> <p>Overdosing of sodium hypochlorite at intake.</p> <p>- lack of neutralisation of sodium hypochlorite.</p>	33210, 33211, 33213, 34222	<ul style="list-style-type: none"> <li>Design: Sodium hypochlorite will be neutralised with sodium bisulphide as it exits the process. This could be at DMPF Backwash Tank discharge channel, or at the Cartridge Filters depending on process requirements.</li> <li>Any un-neutralised sodium hypochlorite will be neutralised with sodium bisulphide at the outfall chamber of the seawater lift pump station.</li> <li>Interlock sodium hypochlorite inject with operation of seawater lift pumps and therefore stops dosing when SWLPS are stopped.</li> <li>Automatic control of sodium hypochlorite dosing during the entire biofilm control process. Continuous monitoring and control of sodium hypochlorite in the seawater during the entire biofilm control process.</li> <li>Sodium hypochlorite is neutralised at the point of discharge from the process unit. This could be at DMPF Backwash Tank discharge channel, or at the Cartridge Filters depending on process requirements. Any un-neutralised sodium hypochlorite will be neutralised with sodium bisulphide at the outfall chamber of the seawater lift pump station.</li> <li>Continuous monitoring and dosing of sodium bisulphite (SBS) at the outfall, DMPF Backwash tank and Cartridge filter outlet. Automatic interlock to stop dosing of sodium hypochlorite should the SBS dosing system fail.</li> <li>Follow appropriate procedures for the biofilm control process.</li> <li>The Marine monitoring programs that will be conducted during Commissioning are set out in the 30A Commissioning Approval Application and Commissioning MIRA Schedule (Attachment I.4). The 30A Commissioning Approval Application is informed by the Baseline Marine Monitoring Program.</li> <li>Commissioning will be implemented as per the Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00) and specific Standard Operating Procedures (being developed).</li> </ul>	<p>Commissioning Completions Manager</p> <p>Commissioning Environmental Representative</p>	Design and Commissioning	<ul style="list-style-type: none"> <li>Monitoring data and reports</li> <li>Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00)</li> </ul>	22
43	All discharges to the marine environment	33210, 33211, 33213, 34222	<ul style="list-style-type: none"> <li>Water will be discharged in accordance with Works Approval Report 2.2 and 2.3.</li> <li>Discharge will occur in accordance with EPA 30A Commissioning approval requirements.</li> <li>Regular monitoring data reports will be generated and reviewed to demonstrate compliance.</li> <li>The Marine monitoring programs that will be conducted during Commissioning are set out in the Section 30A Commissioning Approval Application.</li> </ul>	<p>Environmental Commissioning Representative ,</p> <p>Area Environment Manager</p>	Commissioning	Monitoring data and reports	<p>All discharges to the marine environment</p> <p>1, 2, 3, 4, 6, 11, 14, 18, 19, 21, 22, 26, 27, 29, 30, 31, 32, 33, 34, 36,</p>

#	Issue	PR #	Measure	Responsibility *	Project Phase	Evidence	Risk Register Reference
							37, 43 & 59
44	Construction Debris discharged to the marine environment Flushing of RO piping from Cartridge Filter to RO 1st & 2nd Pass	33210	<ul style="list-style-type: none"> <li>Pipes will be cleaned, to remove any construction debris, and hydrostatically tested. Contaminants will be small particulates e.g. dust.</li> <li>Flushing water will be directed to drains within the RO building where the contaminants can settle.</li> <li>The flushing water will then directed to the DMPF Backwash Effluent where the solids can be transferred to the sludge system for removal.</li> <li>No chemicals will be used during this stage of commissioning.</li> <li>Piping &amp; valving configuration prevents discharge to outfall at this process</li> <li>Commissioning will be implemented as per the Commissioning Environmental Monitoring &amp; Control Procedure (TDV-2-EV-PRD-0006).</li> </ul>	Commissioning Completions Manager	Commissioning	<ul style="list-style-type: none"> <li>Inspection records</li> <li>Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006)</li> </ul>	27
45	Contamination environment / surface water Flushing of RO piping from Cartridge Filter to RO 1st & 2nd Pass	15104, 15105, 15106, 15107, 15108	<ul style="list-style-type: none"> <li>Duty/assist pumps in the RO building pits to transfer water in the sumps to Backwash Effluent tank.</li> <li>Continuous monitoring and adjustment of flushing and draining valves to keep level control.</li> <li>Segregation of process drainage pit from storm water system by design and construction</li> <li>Staff trained in the appropriate management of unplanned discharges and response in accordance with the D&amp;C PGA and Utilities EIRPs as appropriate.</li> <li>Stormwater discharge management system incorporates onsite treatment ponds and an ecological wetland.</li> </ul>	Design Package Manager; and Commissioning Completions Manager	Commissioning	<ul style="list-style-type: none"> <li>Design Package Reports</li> <li>Inspection records</li> <li>Monitoring data and reports</li> </ul>	28
46	Low discharge flow of mixed permeate and brine to marine environment Commissioning of first pass RO filters, without retention of permeate	33210	<ul style="list-style-type: none"> <li>The pH from the brine and permeate streams will be that of feedwater from DMPF, e.g. approx pH 6.8.</li> <li>The antiscalant dose will be flow based and is controlled by flow control loop.</li> <li>When first pass brine and 1st pass permeate are discharged to the DMPF Backwash Tank, the mixed liquid will have near neutral pH.</li> </ul>	Commissioning Completions Manager	Commissioning	<ul style="list-style-type: none"> <li>SCADA outputs from continuous In-plant monitoring</li> <li>Monitoring data and reports</li> </ul>	29
47	Overdosing of caustic soda to 2nd pass feed which discharges to the marine environment Commissioning of first pass RO filters, without retention of permeate	33210	<ul style="list-style-type: none"> <li>The caustic dose will be recipe based and depends on flow rate, heavy metal concentration in the seawater and seawater temperature. The pH of the 2nd pass feed is continuously monitored and automatically controls the caustic dosing.</li> <li>Multiple pH probes are used for monitoring and control of the pH.</li> <li>When first pass brine and 2nd pass permeate is discharged to the DMPF Backwash Tank, the mixed liquid will have near neutral pH.</li> <li>Multiple instruments used where critical.</li> <li>Water quality will be monitored at the outfall through inline water quality monitoring including redundancy instruments and real time alarms.</li> <li>Regular monitoring data reports will be generated and reviewed to demonstrate compliance.</li> <li>Commissioning will be implemented as per the Commissioning Environmental Monitoring &amp; Control Procedure (TDV-2-EV-PRD-0006).</li> </ul>	Commissioning Completions Manager	Commissioning	<ul style="list-style-type: none"> <li>SCADA outputs from continuous In-plant monitoring</li> <li>Monitoring data and reports</li> <li>Commissioning Environmental Monitoring &amp; Control Procedure (TDV-2-EV-PRD-0006).</li> </ul>	30
48	Potential discharge of RO potabilisation chemicals to the marine environment RO commissioning and Potabilisation Process	33210	<ul style="list-style-type: none"> <li>Potabilised water and brine will be mixed back together, resulting in a discharge flow to the Outlet similar to seawater (TDS similar and lower turbidity and Suspended Solids).</li> <li>Potabilisation chemicals are injected into the RO permeate under closed loop automatic control of pH, conductivity, fluoride level and sodium hypochlorite.</li> <li>Sodium bisulphite will be automatically dosed into the potabilised water being discharge to the outfall during the commissioning phase up until the Performance Test of each RO Bank. This is required to neutralise any sodium</li> </ul>	Commissioning Completions Manager	Commissioning	<ul style="list-style-type: none"> <li>SCADA outputs from continuous In-plant monitoring</li> <li>Monitoring data and reports</li> <li>Commissioning</li> </ul>	29, 31

#	Issue	PR #	Measure	Responsibility *	Project Phase	Evidence	Risk Register Reference
	Commissioning, without retention of permeate		<p>hypochlorite.</p> <ul style="list-style-type: none"> <li>SBS will be dosed at the potabilisation system discharge to neutralise the sodium hypochlorite</li> <li>Water quality will be confirmed through inline monitoring at the outfall. SBS can be dosed at the outfall as well if ORP reading is high</li> <li>Calibration and testing of chemical delivery system performed with water during pre-commissioning process to minimise risk of leaks.</li> <li>Commissioning will be implemented as per the Commissioning Environmental Monitoring &amp; Control Procedure (TDV-2-EV-PRD-0006).</li> </ul>			Environmental Monitoring & Control Procedure (TDV-2-EV-PRD-0006).	
49	Failure of inline monitoring system, resulting in potential discharge of off specification water to marine environment.	33210, 33211, 33212, 34222, 34219	<ul style="list-style-type: none"> <li>Primary and secondary instruments are used for control and monitoring.</li> <li>Calibration and testing of chemical delivery system performed with water during the pre-commissioning process to minimise the risk of leaks.</li> <li>Regular manual sampling and monitoring of the outfall discharges</li> <li>Regular visual inspection of the Marine Environment will be undertaken to detect changes to the marine environment. If necessary, shutdown procedures will be implemented.</li> </ul>	Commissioning Completions Manager	Commissioning	<ul style="list-style-type: none"> <li>SCADA outputs from continuous In-plant monitoring</li> <li>Monitoring data and reports</li> <li>Commissioning Environmental Monitoring &amp; Control Procedure (TDV-2-EV-PRD-0006).</li> </ul>	9, 19, 24, 32
50	Discharge to Outfall during Reliability Test - retention of permeate and discharge of brine.	33208, 33210	<ul style="list-style-type: none"> <li>Effective design of outlet diffuser structures to disperse the brine.</li> <li>Testing of salinity in the vicinity of the outlet diffusers to validate engineering design model.</li> <li>Water will be discharged in accordance with Works Approval Report 2.2 and 2.3.</li> <li>Discharge will occur in accordance with EPA 30A Commissioning approval requirements.</li> <li>Brine discharge is dispersed at the outlet structure to achieve adequate dilution at the edge of the mixing zone (&lt;1psu rise above ambient).</li> <li>Water quality will be confirmed through inline water quality monitoring including primary and secondary instruments, real time monitoring and alarms. Further details of the automated monitoring systems are detailed in the Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00).</li> <li>Chemical dosing will be automated and monitored in real time to ensure no over dosing.</li> <li>By automatic closed loop control of chemical dosing to achieve control target as described in the previous commissioning steps above.</li> <li>Regular monitoring data reports will be generated and reviewed to demonstrate compliance.</li> <li>Diffuser validation with 1 stream operation (worst case discharge) to confirm validate hydrodynamic modelling</li> <li>The Marine monitoring programs that will be conducted during Commissioning are set out in the Section 30A Commissioning Approval Application.</li> <li>Spills will be managed in accordance with the D&amp;C PGA Hazardous Materials Sub Plan (Attachment I2 to the D&amp;C PGA EMP)</li> </ul>	Commissioning Completions Manager	Design and Commissioning	<ul style="list-style-type: none"> <li>Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00).</li> <li>Tracer Testing (Diffuser Validation) and Direct Toxicity Assessment (COMM 053)</li> </ul>	33
51	Discharge to Outfall during Reliability Test - retention of permeate and discharge of brine.	33208, 33210	<ul style="list-style-type: none"> <li>Diffuser designed to perform with minimum equivalent flow</li> <li>Tracer testing to verify diffuser design achieves the dilution.</li> <li>Toxicity assessment to verify dilution results in no or minimum impact on marine biota</li> <li>Water will be discharged in accordance with Works Approval Report 2.2 and 2.3.</li> <li>Discharge will occur in accordance with EPA 30A Commissioning approval requirements.</li> <li>Regular monitoring data reports will be generated and reviewed to demonstrate compliance.</li> <li>The Marine monitoring programs that will be conducted during Commissioning are set out in the Section 30A Commissioning Approval Application.</li> </ul>	Commissioning Completions Manager	Design and Commissioning	<ul style="list-style-type: none"> <li>Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00).</li> <li>Tracer Testing (Diffuser Validation) and Direct Toxicity Assessment (COMM 053)</li> </ul>	34
52	Commissioning of	15106,	<ul style="list-style-type: none"> <li>Separate level monitoring instruments and level switches that interlock with inlet valves and pumps.</li> </ul>	Commissioning	Commissioning	<ul style="list-style-type: none"> <li>Commissioning</li> </ul>	35



#	Issue	PR #	Measure	Responsibility *	Project Phase	Evidence	Risk Register Reference
	Stabilisation Pond. Overflow of stabilisation ponds during filling.	15107	<ul style="list-style-type: none"> <li>Ample freeboard of stabilisation pond design on top of the maximum volume of discharge from the process.</li> <li>Additional control measures include, but are not limited to:</li> <li>Calibration and testing of instruments.</li> <li>Operator monitoring during discharge to stabilisation pond.</li> <li>Staff trained in the appropriate management of unplanned discharges and response in accordance with the D&amp;C PGA and Utilities EIRPs as appropriate.</li> </ul> <p>Commissioning will be implemented as per the Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00).</p>	Completions Manager		Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00).	
53	Commissioning of Stabilisation Pond. Discharge of un-neutralised or insufficiently neutralised chemicals to outfall.	33208, 33210	<ul style="list-style-type: none"> <li>Automatic interlock to prevent discharge from Stabilisation Ponds to Outfall if pH is outside permissible range.</li> <li>Chemical dosing will be automated and monitored in real time to ensure no over dosing.</li> <li>Plant design and control sequence allows the water to be tested, circulated, adjusted and managed prior to discharge.</li> <li>Run additional seawater lift pumps to ensure sufficient mixing of the liquid prior to discharge.</li> <li>Calibration and testing of chemical delivery system performed with water during pre-commissioning process to minimise risk of leaks.</li> <li>Water quality will be further confirmed through inline water quality monitoring including instrument redundancy and real time alarms. Further details of the automated monitoring systems are detailed in the Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00).</li> <li>Plant design allows water to be tested, circulated, adjusted and managed prior to discharge to ensure discharge quality specification is achieved.</li> <li>Spills to be managed in accordance with the D&amp;C PGA Hazardous Materials Sub Plan (Attachment I2 D&amp;C PGA EMP).</li> <li>Staff trained in the appropriate management of Hazardous materials and response to spills in accordance with the D&amp;C PGA and Utilities EIRPs as appropriate.</li> </ul> <p>Commissioning will be implemented as per the Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00).</p>	Commissioning Completions Manager	Commissioning	<ul style="list-style-type: none"> <li>Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00).</li> </ul>	36
54	Commissioning of the VDP - multiple streams & retention of permeate. Discharge of brine to Outfall.	33208, 33210	<ul style="list-style-type: none"> <li>Design: Higher brine flow rate results in more efficient and better dispersion of the brine at the outlet structure.</li> <li>By automatic closed loop control of chemical dosing to achieve control target as described in the previous commissioning steps above.</li> <li>Commissioning: Discharge will occur in accordance with EPA 30A Commissioning approval requirements.</li> <li>Calibration and testing of the chemical delivery system will be performed with water during the pre-commissioning process to minimise the risk of leaks.</li> <li>Brine discharge is dispersed at the outlet structure to achieve adequate dilution at the edge of the mixing zone (&lt;1psu rise above ambient).</li> <li>Water quality will be confirmed through inline water quality monitoring including primary and secondary instruments, real time monitoring and alarms. Further details of the automated monitoring systems are detailed in the Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00).</li> <li>Chemical dosing will be automated and monitored in real time to ensure no over dosing.</li> <li>Regular monitoring data reports will be generated and reviewed to demonstrate compliance.</li> <li>The Marine monitoring programs that will be conducted during Commissioning are set out in the Section 30A Commissioning Approval Application.</li> <li>Spills will be managed in accordance with the D&amp;C PGA Hazardous Materials Sub Plan (Attachment I2 to the D&amp;C PGA EMP).</li> </ul>	Commissioning Completions Manager	Design and Commissioning	<ul style="list-style-type: none"> <li>Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00).</li> <li>Tracer Testing (Diffuser Validation) and Direct Toxicity Assessment (COMM 053).</li> </ul>	33, 34, 37
55	Commissioning of the VDP - multiple streams. Noise generated by VDP	24158, 24164	<ul style="list-style-type: none"> <li>Design: The equipment which emits noise during operation is encapsulated in buildings or appropriate enclosures.</li> <li>Building ventilation systems incorporate noise attenuators to reduce noise emissions to the environment.</li> <li>The Desalination Plant is designed to EPA SEPP N1 and S3/89.</li> </ul>	Commissioning Completions Manager	Design and Commissioning	<ul style="list-style-type: none"> <li>Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00).</li> </ul>	5, 38

#	Issue	PR #	Measure	Responsibility *	Project Phase	Evidence	Risk Register Reference
	commissioning.		<ul style="list-style-type: none"> <li>Commissioning will be implemented as per following Commissioning Work Packs:</li> <li>Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00).</li> <li>Noise assessment will be performed to confirm design model as per the Environmental Noise Assessment (COMM-051).</li> </ul>			<ul style="list-style-type: none"> <li>00).</li> <li>Environmental Noise Assessment (COMM-051).</li> </ul>	
56	Commissioning of the VDP - multiple streams. Odour generated by VDP during commissioning.	23152, 23153, 23154, 23156	<ul style="list-style-type: none"> <li>Design: The sludge is contained in covered skips and located within the sludge building.</li> <li>Skips of sludge will be removed regularly (once filled) and disposed off site to avoid stockpiling of waste.</li> <li>Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00).</li> <li>The Odour assessment will be implemented as per the Commissioning Procedure for Odour Assessment (COMM 052).</li> </ul>	Commissioning Completions Manager	Design and Commissioning	<ul style="list-style-type: none"> <li>Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00).</li> <li>Commissioning Procedure for Odour Assessment (COMM 052).</li> </ul>	13, 16, 39
57	Pipeline Commissioning. Discharge of chlorinated or turbid water.	07060, 07063.1, 07064.2	<ul style="list-style-type: none"> <li>Water quality will be confirmed through onsite monitoring and vented in accordance with the Transfer Pipeline Hydrostatic Test and Commissioning Phase Environmental Discharge Procedure (PLV-3-EN-PR-0003-00) if water does not meet Melbourne Water Requirements for water entering Cardinia Reservoir.</li> <li>Staff trained in the appropriate management of unplanned discharges and response in accordance with the D&amp;C PGA and Utilities EIRPs as appropriate.</li> </ul>	Commissioning Completions Manager	Commissioning	<ul style="list-style-type: none"> <li>Transfer Pipeline Hydrostatic Test and Commissioning Phase Environmental Discharge Procedure (PLV-3-EN-PR-0003-00).</li> </ul>	40
58	Pipeline Commissioning. Leakage from pipeline fittings causing uncontrolled discharge.	07060, 07063.1, 07064.2	<ul style="list-style-type: none"> <li>Pneumatic pressure test scour valves prior to filling to verify seal.</li> <li>Minimise and control discharge in accordance with the Hydrotest Contingency Plan (PLV-3-MA-PR-0001-01) including shut down feed pumps of fill valves to cease further filling of pipe until leak is controlled and closure of isolation valves.</li> <li>Pipeline and appurtenances are hydrostatically tested to a higher pressure and all leaks rectified prior to process commissioning</li> <li>Implement contingency response procedure from Hydrotest and commissioning discharge procedure (PLV-3-EN-PR-0003-00) to manage impacts to water quality as required.</li> <li>Staff trained in the appropriate management of unplanned discharges and response in accordance with the D&amp;C PGA and Utilities EIRPs as appropriate.</li> <li>Commissioning will be implemented as per the Transfer Pipeline Hydrostatic Test and Commissioning Phase Environmental Discharge Procedure (PLV-3-EN-PR-0003-00).</li> </ul>	Commissioning Completions Manager	Commissioning	<ul style="list-style-type: none"> <li>Transfer Pipeline Hydrostatic Test and Commissioning Phase Environmental Discharge Procedure (PLV-3-EN-PR-0003-00).</li> </ul>	42
59	RO membranes Clean in Place (during operation, after approx 6-12 months from commissioning). Disposal of neutralised effluent from Cleaning In Place/flushing of membranes.	32208, 32210	<ul style="list-style-type: none"> <li>CIP fluid will be neutralised within piping loop or sent to stabilisation pond for treatment prior to disposal to Outfall.</li> <li>The chemicals can be sent to stabilisation ponds for further treatment or neutralisation.</li> <li>Water quality will be confirmed through inline water quality monitoring including instrument redundancy and real time alarms. Chemical dosing will be automated and monitored in real time to ensure no over dosing. Further details of the automated monitoring systems are detailed in the Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00).</li> <li>Regular monitoring data reports will be generated and reviewed to demonstrate compliance.</li> <li>The Marine monitoring programs that will be conducted during Commissioning are set out in the Section 30A Commissioning Approval Application.</li> <li>Spills will be managed in accordance with the D&amp;C PGA Hazardous Materials Sub Plan (Attachment I2 to the D&amp;C PGA EMP).</li> <li>Commissioning will be implemented as per the Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00).</li> </ul>	Commissioning Completions Manager	Commissioning	<ul style="list-style-type: none"> <li>Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00).</li> <li>Commissioning MIRA Schedule (Attachment I.4).</li> </ul>	43
60	Pipeline Commissioning - Discharge of pipeline	32208,	<ul style="list-style-type: none"> <li>Discharge from the pipeline will be managed in the same way as any other waste stream entering the outfall chamber.</li> </ul>	Commissioning Completions	Commissioning	<ul style="list-style-type: none"> <li>Commissioning Environmental Monitoring</li> </ul>	44

#	Issue	PR #	Measure	Responsibility *	Project Phase	Evidence	Risk Register Reference
	water into outfall to remove dust contaminants etc and stagnant water in the transfer pipeline Potential for discharge of fresh water with high pH and dust contaminants to the Marine Outlet.	32210	<p>Therefore it will be subject to the same water quality criteria and will be controlled as per below:</p> <ul style="list-style-type: none"> <li>The drainage flow rate of pipeline water is controlled, (max design flow is &lt;800L/s) so there will be little scouring of the main pipeline.</li> <li>Operate additional seawater lift pumps to ensure dilution of the pipeline water with seawater to both reduce pH of the pipeline water to within discharge targets as well as to limit reduction to the salinity of the water at outfall.</li> <li>Monitoring of pH at the outfall chamber and adjustment of the drainage flow rate of the pipeline water.</li> <li>Visual inspection of discharge and turbidity monitoring to detect any suspended material.</li> <li>Commissioning will be implemented as per the Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00).</li> </ul>	Manager		and Control Procedure (TDV-2-EV-PRD-0006-00).	
Potential Emergencies and Abnormal Events For All Commissioning Activities							
	Extreme hot dry conditions during a weekend or overnight break in commissioning causing excessive dust emanating from the site. Potential for Dust disturbance and impacts on sensitive receptors including loss of amenity.	22148, 22150	<ul style="list-style-type: none"> <li>Automated PM10 dust monitoring in place with alarm trigger.</li> <li>Refer to D&amp;C PGA EMP Air Quality D&amp;C PGA Sub-plan (Attachment I4 to the D&amp;C PGA EMP) and CESP Attachment I.2 (Commissioning Management Strategies) for further details.</li> </ul>	Area Environmental Manager Commissioning Completions Manager CER	Commissioning	D&C PGA EMP <ul style="list-style-type: none"> <li>Air Quality D&amp;C PGA Sub-plan (Attachment I4 to the D&amp;C PGA EMP)</li> <li>CESP Attachment I.2 (Commissioning Management Strategies)</li> </ul>	45
62	Fire event resulting from commissioning activities or natural events. Potential for air quality impacts on sensitive receptors.	23152, 23153, 23154, 23156	<ul style="list-style-type: none"> <li>Fire protection system within buildings and areas of higher risk will be in operation, e.g. cable chambers.</li> <li>Storage of flammable liquids/substances away from sources of extreme heat and or sparks as per the Hazardous Materials Sub Plan (Attachment I2 to the D&amp;C PGA EMP).</li> <li>Heat-out rules in place for extreme weather.</li> <li>Hand-held plant that may cause a spark are used according to site safety protocols and usage is restricted or forbidden on total fire ban days.</li> <li>Appropriate signage restricting smoking on site. along with designated 'smoking' areas with approved disposal bins.</li> <li>Regular updates on forecast storm conditions, to inform site supervisors of potential fire hazards, should a lightning storm ensure.</li> <li>Supply of suitable fire extinguishing equipment and training of relevant staff in fire fighting techniques.</li> <li>Landowners identified to be at risk of any fire will be notified as soon as practicable. D&amp;C PGA and Utilities EIRPs to be followed in emergency situations and for all incidents as appropriate.</li> <li>Refer to D&amp;C PGA EMP Air Quality Sub Plan (Attachment I4 to the D&amp;C PGA EMP) and CESP Attachment I.2 (Commissioning Management Strategies) for further details.</li> </ul>	Area Environmental Manager Commissioning Completions Manager CER	Construction and Commissioning	<ul style="list-style-type: none"> <li>D&amp;C PGA EMP Air Quality Sub Plan (Attachment I4 to the D&amp;C PGA EMP)</li> <li>CESP Attachment I.2 (Commissioning Management Strategies)</li> </ul>	46
63	Movement of machinery and site vehicles. Fauna mortality resulting from collision with vehicles and machinery.	06046	<ul style="list-style-type: none"> <li>Refer to D&amp;C PGA Flora and Fauna Sub Plan (Attachment I5)</li> <li>Utilising public road network.</li> <li>Minimising vehicle movements during the night time.</li> <li>Minimising vehicle movement through areas with significant fauna habitat.</li> <li>A reduced speed limit on access roads.</li> <li>Fencing of site to prevent stock or other fauna from wandering into work site.</li> <li>Education of work force through inductions and toolbox talks. D&amp;C PGA and Utilities EIRPs to be followed in emergency situations and for all incidents as appropriate.</li> </ul>	Area Environmental Manager Commissioning Completions Manager CER	Construction and Commissioning	<ul style="list-style-type: none"> <li>D&amp;C PGA and Utilities EIRPs</li> <li>D&amp;C PGA EMP Flora and Fauna Sub Plan (Attachment I5)</li> </ul>	47
64	Disease spread of	06041,	<ul style="list-style-type: none"> <li>Refer to D&amp;C PGA Flora and Fauna Sub Plan (Attachment I5)</li> </ul>	Area Environmental	Construction and	<ul style="list-style-type: none"> <li>D&amp;C PGA and Utilities</li> </ul>	48

#	Issue	PR #	Measure	Responsibility *	Project Phase	Evidence	Risk Register Reference
	known pathogen of flora and fauna. Infection of fauna and flora resulting from transmission of the disease by vehicle, person, disposal of contaminated material etc.	06053, 06058, 06059	<ul style="list-style-type: none"> <li>Application of disinfectant to vehicle tyres and footwear.</li> <li>Clearly signpost stockpiles, ensure spoil management records are sufficient to prepare monthly report, track spoil materials and provide staff with training.</li> </ul> <p>Should any infection occur, the following measures will be undertaken:</p> <ul style="list-style-type: none"> <li>Excavation of all contaminated soil.</li> <li>Design stockpile areas for treatment and or disposal.</li> <li>Cover infected stockpiles, install diversion banks, install sediment control structures, prevent human traffic through affected areas and clean equipment and machinery prior to leaving site.</li> <li>Inspection of all vegetation prior to and during clearing (by a qualified ecologist).</li> </ul> <p>EIRP to be followed in emergency situations and for all incidents (D&amp;C PGA EIRP for Plant Site Incidents and D&amp;C Utilities EIRP for Utilities corridor).</p>	Manager Commissioning Completions Manager CER	Commissioning	EIRPs <ul style="list-style-type: none"> <li>D&amp;C PGA EMP Flora and Fauna Sub Plan (Attachment I5)</li> </ul>	
65	Unforeseen contamination due to inappropriate or illegal disposal of waste. Environmental contamination.	20133	<ul style="list-style-type: none"> <li>Refer to the D&amp;C PGA Resource Efficiency Sub Plan (Attachment I6), and Waste Management Plan.</li> <li>Training programs for workforce (waste management is included in the Plant and Utilities site inductions).</li> <li>Response measures: Control the source of the contamination, assess the risk and source of contamination, and implement temporary controls to contain contamination and review commissioning method and control measures, monitor to ensure compliance.</li> <li>D&amp;C Plant and Utilities EIRPs to be followed in emergency situations and for all incidents as appropriate.</li> </ul>	Commissioning Completions Manager Area Environmental Manager CER	Construction and Commissioning	<ul style="list-style-type: none"> <li>D&amp;C PGA and Utilities EIRPs</li> <li>D&amp;C PGA EMP Resource Efficiency Sub Plan (Attachment I6)</li> </ul>	54
66	Extreme storm event leading to local flash flooding. Immediate danger to people's safety, environment and damage to equipment.	13092, 13096	<ul style="list-style-type: none"> <li>Design: Design of plant and roads above the 1 in 100 year flood level.</li> <li>Response Plan to incorporate advance warning forecasts and removal of plant and people to high ground. Monitoring of weather forecasts and communication to workforce.</li> <li>Site Environmental Manager to communicate predicted inclement weather and flood warnings to Supervisory Groups.</li> <li>D&amp;C Plant and Utilities EIRPs to be followed in emergency situations and for all incidents as appropriate.</li> </ul>	Area Environmental Manager Commissioning Completions Manager CER	Design, Construction and Commissioning	<ul style="list-style-type: none"> <li>D&amp;C PGA and Utilities EIRPs</li> <li>Design packages</li> </ul>	55
67	Contamination of existing waterways resulting from a storm event greater than the one in two year storm event. Localized harm to soil and local water quality.	07062, 16111	<ul style="list-style-type: none"> <li>D&amp;C Plant and Utilities EIRPs to be followed in emergency situations and for all incidents as appropriate.</li> </ul>	Commissioning Completions Manager Area Environmental Manager CER	Construction and Commissioning	<ul style="list-style-type: none"> <li>D&amp;C PGA and Utilities EIRPs</li> </ul>	56
68	Unforeseen water and soil contamination due to fuel or oil spill. Localized harm to soil and local water quality.	07062, 19126, 19128	<ul style="list-style-type: none"> <li>Refer to the Soil Management Sub Plan (Attachment I7 to both the PGA and Utilities D&amp;C EMP).</li> <li>Identifying the cause of any breach and informing EPA.</li> <li>Commissioning methods and control measures will be reviewed and improved if necessary, modified methods and controls will be monitored to ensure compliance, contingency measures will be taken in accordance with the Emergency Response Plan, where applicable.</li> <li>D&amp;C Plant and Utilities EIRPs to be followed in emergency situations and for all incidents as appropriate.</li> </ul>	Area Environmental Manager Commissioning Completions Manager CER	Construction and Commissioning	<ul style="list-style-type: none"> <li>D&amp;C PGA and Utilities EIRPs</li> <li>D&amp;C PGA EMP Soil Management Sub-Plan (Attachment I7)</li> <li>D&amp;C Utilities EMP Soil Management Sub-Plan (Attachment I7)</li> </ul>	58
69	Surface water exposed to sediment flow. Localized harm to soil and local water quality.	07062, 15103,	<ul style="list-style-type: none"> <li>Refer to the D&amp;C PGA Flora and Fauna Sub Plan and D&amp;C PGA Water Quality and Erosion Management Sub Plan (Attachments I5 and I9 respectively).</li> <li>Control measures to mitigate the unlikely event of a waterway exposed to sediment flow are inclusive of, but not limited to:</li> </ul>	Commissioning Completions Manager Area Environmental	Construction and Commissioning	<ul style="list-style-type: none"> <li>D&amp;C PGA and Utilities EIRPs</li> <li>D&amp;C PGA EMP Flora and Fauna Sub Plan</li> </ul>	59



#	Issue	PR #	Measure	Responsibility *	Project Phase	Evidence	Risk Register Reference
			<ul style="list-style-type: none"> <li>Stopping works directly or indirectly leading to a breach of sediment controls, instatement of further sediment control measures (egg. geotextile membrane covered straw bales).</li> <li>Salvage and translocation measures will be enacted to remove any significant species at risk.</li> <li>D&amp;C Plant and Utilities EIRPs to be followed in emergency situations and for all incidents as appropriate.</li> </ul>	Manager CER		(Attachment I5) <ul style="list-style-type: none"> <li>D&amp;C Utilities EMP Flora and Fauna Sub-Plan (Attachment I9)</li> </ul>	
70	Discharge of off specification water to marine environment or other uncontrolled discharge. Localised impact to water quality and/or impact to marine flora and fauna.	32208	<ul style="list-style-type: none"> <li>Process of investigation and progressive shut down in response to level 2 (alarm) trigger and Water Quality Parameter breaches as outlined by Commissioning Environmental Monitoring and Control Procedure.</li> <li>Continuous discharge outfall chamber WQ control parameters.</li> <li>Warning triggers and Alarm triggers. Further details of the automated monitoring systems are detailed in the Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00).</li> <li>SCADA system.</li> <li>Relevant staff trained in the appropriate management of process parameter excursions, unplanned discharges and emergency response in accordance with the D&amp;C PGA and Utilities EIRPs as appropriate.</li> <li>D&amp;C Plant and Utilities EIRPs to be followed in emergency situations and for all incidents as appropriate.</li> </ul>	Commissioning Completions Manager CER	Construction and Commissioning	<ul style="list-style-type: none"> <li>D&amp;C PGA and Utilities EIRPs</li> <li>Commissioning Environmental Monitoring and Control Procedure (TDV-2-EV-PRD-0006-00)</li> </ul>	60
71	Hazardous substance spill resulting from equipment or plant failure (i.e. accidental rupture of tank etc). Pollution of soils, receiving waters and potential harm/injury to personnel, flora and/or fauna.	19126, 19128	<ul style="list-style-type: none"> <li>Refer to above assessment for handling of chemicals.</li> <li>Refer to relevant chemical Commissioning Work Package.</li> <li>Transport, storage and handling of hazardous materials and dangerous goods will be managed as per the Hazardous Materials Sub Plan (Attachment I2 to the D&amp;C PGA EMP).</li> <li>In addition to this, all relevant personnel are to be educated in the Environmental Incident Response Plan, Site Emergency Response Plan and the site's evacuation procedures. D&amp;C Plant and Utilities EIRPs to be followed in emergency situations and for all incidents as appropriate.</li> </ul>	Commissioning Completions Manager Area Environmental Manager CER	Construction and Commissioning	<ul style="list-style-type: none"> <li>D&amp;C PGA and Utilities EIRPs</li> <li>D&amp;C PGA EMP Hazardous Materials Sub-Plan (Attachment I2)</li> </ul>	49
72	Careless/negligent act leading to a spill/discharge of a hazardous substance. Pollution of soils, receiving waters or potential harm/injury to personnel, flora and/or fauna.	19126, 19128	<ul style="list-style-type: none"> <li>Refer to relevant chemical Commissioning Work Package.</li> <li>Transport, storage and handling of hazardous materials and dangerous goods will be managed as per the Hazardous Materials Sub Plan (Attachment I2 to the D&amp;C PGA EMP).</li> <li>In addition to this, all relevant personnel are to be educated in the Environmental Incident Response Plan, Site Emergency Response Plan and the site's evacuation procedures. D&amp;C Plant and Utilities EIRPs to be followed in emergency situations and for all incidents as appropriate.</li> </ul>	Commissioning Completions Manager Area Environmental Manager CER	Construction and Commissioning	<ul style="list-style-type: none"> <li>D&amp;C PGA and Utilities EIRPs</li> <li>D&amp;C PGA EMP Hazardous Materials Sub-Plan (Attachment I2)</li> </ul>	50
73	Unexpected ignition of flammable and combustible liquids during normal commissioning operations. Pollution of soils, receiving waters or potential harm/injury to personnel, flora and/or fauna.	19126, 19128, 19129	<ul style="list-style-type: none"> <li>Diesel storage tank for generator in bunded compound and separated from other building in accordance with Australian Standard.</li> <li>Diesel generators are located in buildings separate to other facilities.</li> <li>Diesel engine driven pumps for fire fighting are housed in a separate building.</li> <li>Fire warning and fighting system in operation during commissioning</li> <li>Relevant personnel to be educated in the Environmental Incident Response Plans (D&amp;C PGA and Utilities EIRPs).</li> <li>Storage of chemicals to be in accordance with industry guidelines and with appropriate signage / warning labels.</li> <li>Transport, storage and handling of hazardous materials and dangerous goods will be managed as per the Hazardous Materials Sub Plan (Attachment I2 to the D&amp;C PGA EMP).</li> <li>In addition to this, all relevant personnel are to be educated in the Environmental Incident Response Plan, Site Emergency Response Plan and the site's evacuation procedures. D&amp;C Plant and Utilities EIRPs to be followed in emergency situations and for all incidents as appropriate.</li> </ul>	Area Environmental Manager Commissioning Completions Manager CER	Construction and Commissioning	<ul style="list-style-type: none"> <li>D&amp;C PGA and Utilities EIRPs</li> <li>D&amp;C PGA EMP Hazardous Materials Sub-Plan (Attachment I2)</li> </ul>	51

#	Issue	PR #	Measure	Responsibility *	Project Phase	Evidence	Risk Register Reference
74	Contamination of air, land and water, and human and ecological health, due to the incorrect separation and segregation of hazardous and dangerous substances. Pollution of soils, receiving waters or potential harm / injury to personnel, flora and fauna via discharge of hazardous substance.	19126, 19128, 19129	<p>Bulk chemicals are stored in designated bunded areas and design focused on maximise safety and minimise potential to cause environmental impact</p> <ul style="list-style-type: none"> <li>All truck unloading areas are designed to capture any spills from the truck unloading operation</li> <li>Pipe works outside buildings are in culverts or double contained if direct buried.</li> <li>Pipes will be hydrostatically tested to ensure installation is integral prior to introduction of chemicals</li> <li>Commissioning of chemical systems will follow procedure COMM-STD-00-PRD-005 - General Commissioning Procedure for Chemical Dosing Systems,</li> <li>Refer to relevant chemical Commissioning Work Package.</li> <li>Transport, storage and handling of hazardous materials and dangerous goods will be managed as per the Hazardous Materials Sub Plan (Attachment I2 to the D&amp;C PGA EMP).</li> <li>In addition to this, all relevant personnel are to be educated in the Environmental Incident Response Plan, Site Emergency Response Plan and the site's evacuation procedures. D&amp;C Plant and Utilities EIRPs to be followed in emergency situations and for all incidents as appropriate.</li> </ul>	Area Environmental Manager Commissioning Completions Manager CER	Construction and Commissioning	<ul style="list-style-type: none"> <li>D&amp;C PGA and Utilities EIRPs</li> <li>D&amp;C PGA EMP Hazardous Materials Sub-Plan (Attachment I2)</li> </ul>	52
75	Traffic incident involving the transportation of bulk hazardous materials and dangerous substances. Pollution of soils, receiving waters or potential harm/injury to personnel, flora and/or fauna.	19126, 19128, 19129	<ul style="list-style-type: none"> <li>Refer to Site Traffic Management Plan.</li> <li>All relevant personnel are to be educated in the Environmental Incident Response Plan, Site Emergency Response Plan and the site's evacuation procedures. D&amp;C Plant and Utilities EIRPs to be followed in emergency situations and for all incidents as appropriate.</li> <li>Transport, storage and handling of hazardous materials and dangerous goods will be managed as per the Hazardous Materials Sub Plan (Attachment I2 to the D&amp;C PGA EMP).</li> <li>Transport contractor to have established traffic incident management plan</li> </ul>	Area Environmental Manager Commissioning Completions Manager CER	Construction and Commissioning	<ul style="list-style-type: none"> <li>D&amp;C PGA and Utilities EIRPs</li> <li>D&amp;C PGA EMP Hazardous Materials Sub-Plan (Attachment I2)</li> </ul>	53
76	Design of temporary sediment controls is insufficient for the maximum exposed area. Localized harm to soil and local water quality.	16109, 16111	<ul style="list-style-type: none"> <li>Refer to the Soil Management Sub Plan (Attachment I7 to both the PGA and Utilities D&amp;C EMP).</li> <li>Identifying the cause of any breach and informing EPA.</li> <li>Commissioning methods and control measures will be reviewed and improved if necessary, modified methods and controls will be monitored to ensure compliance, contingency measures will be taken in accordance with the Emergency Response Plan, where applicable.</li> <li>Monitoring of weather forecasts and communication to workforce. Site Environmental Manager to communicate predicted inclement weather and flood warnings to Supervisory Groups to ensure preparedness for rainfall events.</li> <li>Weekly / Daily inspections of sedimentation controls.</li> <li>D&amp;C Plant and Utilities EIRPs to be followed in emergency situations and for all incidents as appropriate.</li> </ul>	Area Environmental Manager Commissioning Completions Manager CER	Construction and Commissioning	<ul style="list-style-type: none"> <li>D&amp;C PGA and Utilities EIRPs</li> <li>D&amp;C PGA EMP Soil Management Sub-Plan (Attachment I7)</li> <li>D&amp;C Utilities EMP Soil Management Sub-Plan (Attachment I7)</li> </ul>	57