

Victorian Desalination Project



D&C PGA Attachment C - Environmental Risk Register

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D&C EMP ATTACHMENT C														
ENVIRONMENTAL RISK REGISTER - PLANT AND GENERAL AREA														
Risk #	Activity / Construction Method	Performance Criteria / Performance Requirement SUBJECT	Potential Hazard (Environmental Aspect & Impact Pathway)	At Risk (Potential Impact)	Probability (Table 2)	Consequence (Table 3)	Inherent Risk (Before Controls)	Controls: current or planned prior to work to ensure obligations (including performance requirements and performance criteria) are met (Table 4 - reference specific option)	Control effectiveness (Table 5)	Probability (Table 2)	Consequence (Table 3)			Residual Risk (After Controls)

Definitions for consequence, probability and other abbreviations in this register can be found in the Risk (Aspects) Register and Risk Matrix

Site Establishment

1	Site Establishment (incl car parking, hard standing) and Site Deliveries	Amenity	Increased traffic to plant site increasing mud on public roads. Visual raised dust. Vegetation removal. Uncontrolled waste. Noise impacts. Nocturnal lighting.	Loss of localised water quality, loss of local amenity, safety risk to road users	C	3	C3	High	Early establishment of truck wash at main site entrance (refer DWG DG-PBB-CI-5-X-000-2011-A-00 General Area - Plant Entrance Area) plus other controls in D&C PGA EMP Att I9 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.19-03)(AEMP Att I) and underlying Work Packs, Work Method Statements and JSEAs to ensure runoff is controlled where vegetation has been removed. Light and heavy vehicle washes installed on site. Weekly inspection checklist is used to monitor impacts on amenity. Vehicles to keep to designated access roads. Vegetation clearance to be kept to a minimum. Bins to be covered where applicable. Dust sepression as needed. Lighting controls are outlined in the D&C PGA EMP Att I5 Flora and Fauna Sub-Plan (TDV-0-EV-SB-0011.15-03).	VG	E	2	E2	Low
2		Surface Water and groundwater	Site clearing and set up for site offices including civil works and service installation	Reduction in water quality and local amenity through erosion and sedimentation and contamination	C	3	C3	High	Early establishment of truck wash at main site entrance (refer to DWG DG-PBB-CI-5-X-000-2011-A-00 General Area - Plant Entrance Area) plus other controls in the D&C PGA EMP Att I9 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.19-03) (AEMP Att I) and underlying Work Packs, Work Method Statements and JSEAs to ensure runoff is controlled where vegetation has been removed. Light and heavy vehicle washes installed on site. Vegetation clearance kept to a minimum. Surface soil and vegetation stripped progressively and limited to only those areas being worked on immediately. Installation of appropriate erosion and sediment controls as required and regular inspection and maintenance carried out in these areas. The weekly inspection checklist is used to monitor signs of erosion and sedimentation. Temporary sedimentation controls to be progressively installed as required. All runoff captured is to enter the sedimentation basin through an appropriate drainage network. No water to be discharged from site without prior approval from regulatory authorities. Reuse when possible.	VG	D	2	D2	Low
3		Surface Water and groundwater	Site clearing and set up for site offices including civil works and service installation	poor drainage and treatment of stormwater increasing loss of local water quality, loss of amenity	B	3	B3	High	Early establishment of truck wash at main site entrance (refer DWG DG-PBB-CI-5-X-000-2011-A-00 General Area - Plant Entrance Area) PLUS other controls in D&C PGA EMP Att I9 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.19-03) (AEMP Att I) and underlying Work Packs, Work Method Statements and JSEAs. Light and heavy vehicle washes installed. Surface soil and vegetation stripped progressively and limited to only those areas being worked on immediately. Installation of appropriate erosion and sediment controls as required and regular inspection and maintenance. All runoff captured is to enter the sedimentation basin through an appropriate drainage network. Daily monitoring of the sediment pond water quality, monthly groundwater (monitoring wells on and off site) and surface water quality monitoring (wetlands, upstream and downstream of both the Wonthaggi Drain and the Powlett River). Weekly inspection of surface water bodies, sediment ponds and discharge points.	G	D	3	D3	Moderate
4		Air Quality	Movement of soils, stockpiles and equipment on site	Dust nuisance to neighbours and fauna. Breach of SEPP objectives. Impact on visual amenity.	C	3	C3	High	Refer to D&C PGA EMP Att I4 Air Quality Sub-Plan (TDV-0-EV-SB-0011.14-02). Mitigation measures include progressive revegetation where possible and limiting disturbance of existing vegetation. Use of watercarts on haul roads and site workings. Continuous dust monitoring equipment to determine when activities need to be altered to reduce dust emissions. Portable dust monitors onsite to respond to increased dust burdens. Dust emissions checked on weekly inspection.	G	D	2	D2	Low
5		Hazardous Materials	Inappropriate hazardous material storage and disposal	Pollution of soils, receiving waters or potential harm / injury to personnel, flora and fauna via discharge of hazardous substance	C	3	C3	High	All handling and storage of hazardous materials will be undertaken in compliance with the D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.12-02). Hazardous materials to be stored in bunded areas/Hazchem Containers. Weekly inspections undertaken to ensure hazardous materials are stored correctly onsite.	VG	D	2	D2	Low
6		Waste	Improper connection of wastewater or wastewater removal.	Negative impact on waterways, soil causing harm to local area	C	3	C3	High	All handling and storage of waste materials will be undertaken in compliance with the D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.12-02). All plumbing to be connected to storage tanks or sewer. Licenced waste disposal contractor to be used for all removal of waste water.	VG	D	2	D2	Low

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7		Flora and Fauna	Site clearing and set up for site offices including civil works and service installation	Injury and harm to protected species and other wildlife including Hooded Plover, Growling Grass Frog, River Swamp Wallaby Grass and Orange Bellied Parrot.	B	3	B3	High	Known locations of sensitive species will be identified on area SEPs. Refer to D&C PGA EMP Att I5 Flora and Fauna Sub-Plan (TDV-0-EV-SB-0011.I5-03). Prior to clearance of areas that support or may support significant (FFG or EPBC Act listed) flora or fauna species, pre-clearance flora and fauna surveys will be performed. Any significant species located are avoided where possible. When avoidance is not an option, salvage and translocation measures enacted in accordance with the conditions of the FFG Act permit and the relevant protocols and procedures as detailed in the D&C PGA EMP Att I5 Flora and Fauna Sub-Plan (TDV-0-EV-SB-0011.I5-03). Site Cyclone fenced to reduce fauna from entering and flora/fauna no go areas flagged and signed. No go areas checked as part of weekly inspection. All clearing to be done under the supervision of qualified ecologist. All translocation or handling of flora and fauna is to be done in accordance with the D&C PGA EMP Att I5 Flora and Fauna Sub-Plan (TDV-0-EV-SB-0011.I5-03), following the approved strategies.	F	D	3	D3	Moderate
8		Flora and Fauna	Site clearing and set up for site offices including civil works and service installation	introduce/spread weeds and pests	B	3	B3	High	Where possible weeds will be controlled and/or removed prior to commencement of construction works. Disturbed sites will be revegetated with indigenous species. Weed populations that establish in disturbed areas will be monitoring and controlled when required. Further detailed mitigation measures for vegetation management within the Desalination Plant site are outlined in the D&C PGA EMP Att I5 Flora and Fauna Sub-Plan (TDV-0-EV-SB-0011.I5-03), Flora, fauna and significant species management procedure (Attachment 15.2 (TDV-0-EV-SB-0011.I5-03)). Light and heavy vehicle washes installed. Biosecurity procedure followed when vehicles/personal enter/exit site from surrounding properties.	G	D	2	D2	Low
9		Archaeology and cultural heritage	Site clearing and set up for site offices including civil works and service installation	Impact to aboriginal sites previously unrecorded or recorded	C	4	C4	Extreme	Known locations of aboriginal sites will be identified on area SEPs. All discovery of any unidentified heritage items shall be undertaken in accordance with the D&C PGA EMP Att I1 Archaeology and Cultural Heritage Sub-Plan (TDV-0-EV-SB-0011.I1-02). Salvage has been completed, all known areas fenced and barricaded. Contingency plan in operation to reduce consequences. Cultural Heritage site check as part of weekly inspection.	G	D	3	D3	Moderate
10		Noise and Vibration	Site clearing and set up for site offices including civil works and service installation	nuisance to neighbours and fauna	C	2	C2	Moderate	Refer to D&C PGA EMP Att I8 Noise and Vibration Sub-Plan (TDV-0-EV-SB-0011.I8-02). Mitigations strategies include; correct maintenance and operation of all plant, use of noise suppression devices, noise labels on plant, dunes constructed as noise barriers and time frames limited for noisy works. Weekly inspection to check noise and vibration. Baseline noise monitoring completed. Specialist consultant engaged to respond to complaints as required. Handheld noise monitor onsite for further response as required.	G	D	2	D2	Low
11		Resource Efficiency	Excessive use of water and energy in site offices, generators, and other equipment	Use of resources, increase in greenhouse gases gas production	C	2	C2	Moderate	Provision of on-site potable water tank during site establishment until connection to mains; use of dam water and sediment pond water (non-potable) for dust suppression purposes on site. Education and signage to switch off electrical equipment when not in use.	G	D	2	D2	Low
12		Soil Management	Contaminated material uncovered during site clearing and set up for site offices including civil works and service installation	Impact to human health and habitat	D	2	D2	Low	Refer to D&C PGA EMP Att I7 Soil Management Sub-Plan (TDV-0-EV-SB-0011.I7-02). Phase 1 Environment Site Assessment of site undertaken prior to construction works with contamination not anticipated at the site. If contamination identified or hazardous substances come into contact with the environment as a result of construction works, all work to stop in the affected area, contamination reported to Area Environmental Manager, with work only continuing once the material has been assessed and removed or stabilised according to NEPM and EPA guidelines. All contaminated soil will be disposed off site in accordance with EPA requirements. All handling and storage of hazardous materials will be undertaken in compliance with the D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02).	G	E	2	E2	Low
13		Soil Management	Contaminated material uncovered during site clearing and set up for site offices including civil works and service installation	Contaminated materials not handled in accordance with NEPM and EPA guidelines. Possible inappropriate disposal or further contamination of soils/waterways.	D	2	D2	Low	Refer to D&C PGA EMP Att I7 Soil Management Sub-Plan (TDV-0-EV-SB-0011.I7-02). Phase 1 Environment Site Assessment of site undertaken prior to construction works with contamination not anticipated at the site. If contamination identified or hazardous substances come into contact with the environment as a result of construction works, all work to stop in the affected area, contamination reported to Area Environmental Manager, with work only continuing once the material has been assessed and removed or stabilised according to NEPM and EPA guidelines. All contaminated soil will be disposed off site in accordance with EPA requirements. All handling and storage of hazardous materials will be undertaken in compliance with the D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02).	G	E	2	E2	Low

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14		Soil Management	Exposure of ASS resulting in generation of acid runoff (leachate) to environment	Reduction in surface water and ground water quality, impacts to flora and fauna	C	3	C3	High	Surface water and groundwater will be monitored and managed in accordance with D&C PGA EMP Att I9 Soil Management Sub-Plan (TDV-0-EV-SB-0011.I9-03), (monitoring in accordance with MIRA schedule). Intrusive soil investigations of plant site undertaken. ASS management Plan (D&C PGA EMP Att I11 Acid Sulfate Soils Management Sub-Plan (TDV-0-EV-SB-0011.I11-02)) developed in response to findings of soil investigations and personnel trained in in-field sampling procedure. ASS managed on site with impacted soil removed to treatment pad, mixed with lime (according to liming rates from laboratory results), verification samples taken to ensure soil limed sufficiently to neutralise ASS and then material reused on site as fill. Inspection and Test Plan (ITP) - Treating Acid Sulphate Soils (ITP-2X-02-1111) procedure developed to track the location of the treated material when used as fill onsite. All management conducted in accordance with ASS Management Plan (D&C PGA EMP Att I11 Acid Sulfate Soils Management Sub-Plan (TDV-0-EV-SB-0011.I11-02)).	G	D	2	D2	Low
Bulk Earthworks														
15	Vegetation Clearing/Grubbing	Erosion and Sediment	Plant and equipment removing vegetation	Potential increase of sediment to waterway, loss of localised water quality, loss of local amenity, impact on flora and fauna within waterways	C	3	C3	High	Early installation of drainage controls - refer to D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03) and associated Work Packs, Work Method Statements and JSEAs. Pre-construction soil analysis completed to understand potential erosion risks. Vegetation removal kept to a minimum, stripped progressively and limited to only the areas being worked on immediately. Installation of appropriate erosion and sediment controls e.g sediment fences, as required with regular inspection and maintenance. Weekly environmental inspection checklist to monitor for signs of erosion and sedimentation. Regular monitoring of waterways and sedimentation pond.	G	D	2	D2	Low
16		Flora and Fauna	Excavation, movement and transport of soils to storage for landscaping	Injury and harm to protected species (including EPBC listed species) and other wildlife including Hooded Plover, Growling Grass Frog, River Swamp Wallaby Grass and Orange Bellied Parrot.	B	3	B3	High	Refer to D&C PGA EMP Att I5 Flora and Fauna Sub-Plan (TDV-0-EV-SB-0011.I5-03). Mitigation measures include; using public roads for plant access, minimising vehicle movement during night time, a reduced speed limit on access roads and minimise duration of open trenches. Prior to clearance of areas that support or may support significant (FFG or EPBC Act listed) flora or fauna species, pre-clearance flora and fauna surveys performed. Any significant species located are avoided where possible. When avoidance not an option, salvage and translocation measures enacted in accordance with the conditions of the FFG Act permit and the relevant protocols and procedures as detailed in the Flora and Fauna Sub-plan. High visibility fencing and signage installed around "no go zones" (habitat to be retained such as bog gums), salvage and translocation of native fauna (growling grass frogs and tadpoles) from areas impacted by construction (dams), daily trench inspections, fencing installed around construction site.	G	C	2	C2	Moderate
17		Archaeology and cultural heritage	Plant and equipment removing vegetation	Impact to aboriginal sites previously unrecorded or recorded	D	4	D4	High	Refer to D&C PGA EMP Att I1 Archaeology and Cultural Heritage Sub-Plan (TDV-0-EV-SB-0011.I1-02). Mitigation measures to include: – Salvage works at each site are to be undertaken by four archaeologists, with one representative from the Registered Aboriginal Parties (RAP) or RAP applicants to be present (for full details see Attachment A of the D&C PGA EMP Att I1 Archaeology and Cultural Heritage Sub-Plan (TDV-0-EV-SB-0011.I1-02)). Aboriginal heritage sites located and salvage undertaken. Contingency plan in place should any aboriginal cultural heritage artefacts/bones be found during construction.	G	D	3	D3	Moderate
18		Surface Water and groundwater	Plant and equipment removing vegetation	poor drainage and treatment of stormwater increasing loss of local water quality, loss of amenity	C	2	C2	Moderate	Early installation of drainage controls described in the D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03) and associated Work Packs, Work Method Statements and JSEAs. Where feasible clean surface water runoff around and/or away from disturbed areas and construction activities will be diverted. Drains cut to ensure silty run-off does not enter surface watercourses or drains directly. Daily monitoring of water quality in sediment ponds and dams. Water to be used for dust suppression and road construction. Weekly inspection of erosion and sediment control devices will be conducted to ensure minimum impact on surface water quality during construction. No water to be discharged offsite without adequate treatment that meets water quality standards as outlined in the D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03).	G	D	2	D2	Low

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19	Topsoil Stripping/ Stockpiling and Bulk Earthworks	Surface Water and groundwater	stormwater	poor drainage and treatment of stormwater increasing loss of local water quality, loss of amenity	B	4	B4	Extreme	Early installation of drainage controls - refer to D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.19-03) and associated Work Packs, Work Method Statements and JSEAs. Drains cut to ensure silty run-off does not enter surface watercourses or drains directly. All water from the excavation areas is to be directed via sedimentation controls or diverted to the sedimentation ponds for treatment. Water is to be contained, captured and treated to achieve water quality objectives prior to discharge to the wetland area onsite. Daily monitoring of water quality in sediment ponds and dams and use of water for dust suppression and road construction. Weekly inspection of erosion and sediment control devices. No discharge of water from site to adversely impact the receiving environment (to be demonstrated by water quality monitoring as per D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.19-03)).	G	C	2	C2	Moderate
20		Erosion and Sediment	Excavation, movement and transport of soils to storage for landscaping	Potential increase of sediment to waterway, loss of localised water quality, loss of local amenity	C	3	C3	High	Early installation of drainage controls - refer to D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.19-03) and associated Work Packs, Work Method Statements and JSEAs. Where feasible clean surface water runoff around and/or away from disturbed areas and construction activities will be diverted. Drains cut to ensure silty run-off does not enter surface watercourses or drains directly. Bunds will be built, as appropriate, around stockpiles to contain stockpile material and direct clean water flow away from stockpiles. All water from the excavation areas is to be directed via sedimentation controls or to the sedimentation ponds for treatment. Water is to be contained, captured and treated to achieve water quality objectives prior to discharge to the wetland area onsite. Daily monitoring of water quality in sediment ponds and dams and use of water for dust suppression and road construction. Weekly inspection of erosion and sediment control devices. No discharge of water from site to adversely impact the receiving environment (to be demonstrated by water quality monitoring as per D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.19-03)).	G	C	2	C2	Moderate
21		Erosion and Sediment	Excavation, movement and transport of soils to storage for landscaping	Erosion of land and loss of topsoil	C	3	C3	High	Refer to D&C PGA EMP Att I9 Soil Management Sub-Plan (TDV-0-EV-SB-0011.19-03) and D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.19-03) and associated Work Packs, Work Method Statements and JSEAs. Management includes the progressive revegetation of disturbed areas including establishment of reed systems and native vegetation. All water from the excavation areas is to be directed via sedimentation controls or to the sedimentation ponds for treatment. Water is to be contained, captured and treated to achieve water quality objectives prior to discharge to the wetland area onsite. Daily monitoring of water quality in sediment ponds and dams and use of water for dust suppression and road construction. Weekly inspection of erosion and sediment control devices. No discharge of water from site to adversely impact the receiving environment (to be demonstrated by water quality monitoring as per D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.19-03)).	VG	D	2	D2	Low
22		Flora and Fauna	Inappropriate wash down and inspection procedures after excavation, movement and transport of soils	spread weeds and pathogens	B	3	B3	High	Refer to D&C PGA EMP Att I5 Flora and Fauna Sub-Plan (TDV-0-EV-SB-0011.15-03). Actions to avoid and/or minimise impacts relating to weed management include: where possible weeds will be controlled and/or removed prior to commencement of construction works, disturbed sites will be revegetated with indigenous species, weed populations that establish will be monitored and controlled when required. Biosecurity protocols to be followed as required.	VG	D	2	D2	Low
23		Air Quality	Movement of soils, stockpiles and equipment on site	Potential for Dust disturbance and impacts on sensitive receptors	C	3	C3	High	Refer to D&C PGA EMP Att I4 Air Quality Sub-Plan (TDV-0-EV-SB-0011.14-02). Mitigation measures include progressive revegetation where possible and limiting disturbance of existing vegetation. Use of watercarts on roadways and site workings. Continuous dust monitoring equipment to determine when activities need to be altered to reduce dust emissions. Portable dust monitors onsite to respond to increased dust burdens. Dust emissions checked on weekly inspection.	G	D	2	D2	Low
24		Soil Management	Discovery of contamination during excavation, transfer of material and movement of stockpiles and soils	Impact to human health and habitat	C	3	C3	High	Refer to D&C PGA EMP Att I9 Soil Management Sub-Plan (TDV-0-EV-SB-0011.19-03). Phase 1 Environment Site Assessment of site undertaken prior to construction works with contamination not anticipated at the site. If contamination identified or hazardous substances come into contact with the environment as a result of construction works, all work to stop in the affected area, contamination reported to Area Environmental Manager, with work only continuing once the material has been assessed and removed or stabilised according to NEPM and EPA guidelines. All contaminated soil will be disposed off site in accordance with EPA requirements. All handling and storage of hazardous materials will be undertaken in compliance with the D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.12-02).	G	D	2	D2	Low

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25		Soil Management	Discovery of contamination during excavation, transfer of material and movement of stockpiles and soils	Contaminated materials not handled in accordance with NEPM and EPA guidelines. Possible inappropriate disposal or further contamination of soils/waterways.	C	3	C3	High	Refer to D&C PGA EMP Att I7 Soil Management Sub-Plan (TDV-0-EV-SB-0011.I7-02). Phase 1 Environment Site Assessment of site undertaken prior to construction works with contamination not anticipated at the site. If contamination identified or hazardous substances come into contact with the environment as a result of construction works, all work to stop in the affected area, contamination reported to Area Environmental Manager, with work only continuing once the material has been assessed and removed or stabilised according to NEPM and EPA guidelines. All contaminated soil will be disposed off site in accordance with EPA requirements. All handling and storage of hazardous materials will be undertaken in compliance with the D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02).	G	D	2	D2	Low
26		Soil Management	Exposure of ASS resulting in generation of acid runoff (leachate) to environment	Reduction in surface water and ground water quality, impacts to flora and fauna	C	3	C3	High	Intrusive soil investigations of plant site undertaken. ASS management Plan (D&C PGA EMP Att I11 Acid Sulfate Soils Management Sub-Plan (TDV-0-EV-SB-0011.I11-02)) developed in response to findings of soil investigations and personnel trained in in-field sampling procedure. ASS managed on site with impacted soil removed to treatment pad, mixed with lime (according to liming rates from laboratory results), verification samples taken to ensure soil limed sufficiently to neutralise ASS and then material reused on site as fill. All management conducted in accordance with ASS Management Plan (D&C PGA EMP Att I11 Acid Sulfate Soils Management Sub-Plan (TDV-0-EV-SB-0011.I11-02)).	VG	D	2	D2	Low
27	Transport of excavated material (spoil) from TBM Operations	Surface Water and groundwater	stormwater, increased runoff from wet material	poor drainage and containment of excess water increasing loss of local water quality, loss of amenity	B	4	B4	Extreme	Early installation of drainage controls for placement areas - refer to D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03) and associated Work Packs, Work Method Statements and JSEAs. Drains cut to ensure run-off does not enter surface watercourses or drains directly. All water from the excavation and spoil areas is to be directed via sedimentation controls or to the sedimentation ponds for treatment. Water is to be contained, captured and treated to achieve water quality objectives prior to discharge to the wetland area onsite. Daily monitoring of water quality in sediment ponds and dams and reuse of water for dust suppression and road construction. Weekly inspection of erosion and sediment control devices. No discharge of water from site to adversely impact the receiving environment (to be demonstrated by water quality monitoring as per D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03)).	G	C	2	C2	Moderate
28		Erosion and Sediment	Excavation, movement and transport of spoil	Potential increase of sediment to waterway, loss of localised water quality, loss of local amenity	C	3	C3	High	Early installation of drainage controls - refer to D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03) and associated Work Packs, Work Method Statements and JSEAs. Where feasible clean surface water runoff around and/or away from disturbed areas and construction activities will be diverted. Drains cut to ensure silty run-off does not enter surface watercourses or drains directly. Bunds will be built, as appropriate, around stockpiles to contain stockpile material and direct clean water flow away from stockpiles. All water from the excavation areas is to be directed via sedimentation controls or to the sedimentation ponds for treatment. Water is to be contained, captured and treated to achieve water quality objectives prior to discharge to the wetland area onsite. Daily monitoring of water quality in sediment ponds and dams and use of water for dust suppression and road construction. Weekly inspection of erosion and sediment control devices. No discharge of water from site to adversely impact the receiving environment (to be demonstrated by water quality monitoring as per D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03)).	G	C	2	C2	Moderate
29	Service Relocations and Installations	Social and economic	spoil generation	off-site disposal of excess spoil required plus resulting traffic impacts	A	2	A2	High	To be incorporated into site landscaping mounds (refer Construction Plan) and Site Environment Plans (D&C PGA EMP Att J SEP Overview (TDV-0-EV-DG-0011.J-00)).	VG	E	2	E2	Low
30		Erosion and Sediment	Excavation, movement and transport of soils to storage for landscaping	Potential increase of sediment to waterway, loss of localised water quality, loss of local amenity	C	3	C3	High	Early installation of drainage controls - refer to D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03). Where feasible clean surface water runoff around and/or away from disturbed areas and construction activities will be diverted. Drains cut to ensure silty run-off does not enter surface watercourses or drains directly. Bunds will be built, as appropriate, around stockpiles to contain stockpile material and direct clean water flow away from stockpiles. No water to be discharged offsite without adequate treatment that meets water quality standards as outlined in the D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03).	VG	D	2	D2	Low
31		Surface Water and groundwater	Excavation and movement of soils, vehicles	poor drainage and treatment of stormwater increasing loss of local water quality, loss of amenity	B	2	B2	High	Early installation of drainage controls - refer to D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03) and associated Work Packs, Work Method Statements and JSEAs.	VG	D	2	D2	Low

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32		Amenity	Increased traffic to plant site increasing mud on public roads	Loss of localised water quality, loss of local amenity, safety risk to road users	C	3	C3	High	Refer to D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03). Management measures include: Where possible, undertake any works near waterways in dry season and using Bureau of Meteorology weather forecasting information. Develop a flood warning system i.e. daily checking of weather forecasts (Bureau of Meteorology) and information distribution key site personnel	G	D	2	D2	Low
33		Archaeology and cultural heritage	Excavation and movement of soils, disturbance to existing land	Impact to aboriginal sites previously unrecorded or recorded	C	4	C4	Extreme	Known locations of aboriginal sites will be identified on area Site Environment Plans (D&C PGA EMP Att J SEP Overview (TDV-0-EV-DG-0011.J-00)). All discovery of any unidentified heritage items shall be undertaken in accordance with the D&C PGA EMP Att I1 Archaeology and Cultural Heritage Sub-Plan (TDV-0-EV-SB-0011.I1-02)). Salvage has been completed, all known areas fenced and barricaded. Contingency plan in operation to reduce consequences.	G	D	3	D3	Moderate
34		Air Quality	Movement of soils, stockpiles and equipment on site	Potential for Dust disturbance and impacts on sensitive receptors	D	3	D3	Moderate	Refer to D&C PGA EMP Att I4 Air Quality Sub-Plan (TDV-0-EV-SB-0011.I4-02). Mitigation measures include progressive revegetation where possible and limiting disturbance of existing vegetation. Use of watercarts on roadways and site workings for dust suppression. Continuous dust monitoring equipment to determine when activities need to be altered to reduce dust emissions. Portable dust monitors onsite to respond to increased dust burdens. Dust emissions checked on weekly inspection.	G	D	2	D2	Low
35		Flora and Fauna	Excavation, movement and transport of soils to storage for landscaping	Injury and harm to protected species and other wildlife including Hooded Plover, Growling Grass Frog, River Swamp Wallaby Grass and Orange Bellied Parrot.	D	3	D3	Moderate	Refer to D&C PGA EMP Att I5 Flora and Fauna Sub-Plan (TDV-0-EV-SB-0011.I5-03). Access of personnel to Williamson's Beach and Kilcunda – Hamer's Haven Coastal Reserve will be minimised, particularly during the breeding season of significant and/or sensitive fauna (August to February) (e.g. Hooded Plover)	G	D	2	D2	Low
36		Soil Management	Discovery of contamination during excavation, transfer of material and movement of stockpiles and soils	Impact to human health and habitat	D	3	D3	Moderate	Refer to D&C PGA EMP Att I7 Soil Management Sub-Plan (TDV-0-EV-SB-0011.I7-02). Phase 1 Environment Site Assessment of site undertaken prior to construction works with contamination not anticipated at the site. If contamination identified or hazardous substances come into contact with the environment as a result of construction works, all work to stop in the affected area, contamination reported to Area Environmental Manager, with work only continuing once the material has been assessed and removed or stabilised according to NEPM and EPA guidelines. All contaminated soil will be disposed off site in accordance with EPA requirements. All handling and storage of hazardous materials will be undertaken in compliance with the D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02).	G	D	2	D2	Low
37		Soil Management	Discovery of contamination during excavation, transfer of material and movement of stockpiles and soils	Contaminated materials not handled in accordance with NEPM and EPA guidelines. Possible inappropriate disposal or further contamination of soils/waterways.	D	3	D3	Moderate	Refer to D&C PGA EMP Att I7 Soil Management Sub-Plan (TDV-0-EV-SB-0011.I7-02). Phase 1 Environment Site Assessment of site undertaken prior to construction works with contamination not anticipated at the site. If contamination identified or hazardous substances come into contact with the environment as a result of construction works, all work to stop in the affected area, contamination reported to Area Environmental Manager, with work only continuing once the material has been assessed and removed or stabilised according to NEPM and EPA guidelines. All contaminated soil will be disposed off site in accordance with EPA requirements. All handling and storage of hazardous materials will be undertaken in compliance with the D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02).	G	D	2	D2	Low
38		Soil Management	Exposure of ASS resulting in generation of acid runoff (leachate) to environment	Reduction in surface water and ground water quality, impacts to flora and fauna	C	3	C3	High	Intrusive soil investigations of plant site undertaken. ASS management Plan ((D&C PGA EMP Att I11 Acid Sulfate Soils Management Sub-Plan (TDV-0-EV-SB-0011.I11-02)) developed in response to findings of soil investigations and personnel trained in in-field sampling procedure. ASS managed on site with impacted soil removed to treatment pad, mixed with lime (according to liming rates from laboratory results), verification samples taken to ensure soil limed sufficiently to neutralise ASS and then material reused on site as fill. All management conducted in accordance with ASS Management Plan ((D&C PGA EMP Att I11 Acid Sulfate Soils Management Sub-Plan (TDV-0-EV-SB-0011.I11-02))).	G	D	3	D3	Moderate
39	Plant and Landscaped Mounds	Air Quality	Movement of soils, stockpiles and equipment on site	Potential for Dust disturbance and impacts on sensitive receptors	C	3	C3	High	Refer to D&C PGA EMP Att I4 Air Quality Sub-Plan (TDV-0-EV-SB-0011.I4-02). Mitigation measures include a review of daily weather forecasts from the Bureau of Meteorology, or a private meteorology service provider to plan works i.e. manage wind-blown dust, use rain to suppress dust. Sudden onset of frontal systems that involve sharp increases in wind speed are of particular concern. The Site Manager to be notified daily of forecast weather conditions	G	D	3	D3	Moderate

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40		Erosion and Sediment	Excavation, movement and transport of soils to storage for landscaping	Potential increase of sediment to waterway, loss of localised water quality, loss of local amenity	C	3	C3	High	Early installation of drainage controls - refer to D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.19-03) associated Work Packs, Work Method Statements and JSEAs.	VG	D	3	D3	Moderate
41		Surface Water and groundwater	Plant and equipment refuelling	localised harm to soil, local water quality	C	3	C3	High	Refer to D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.12-02). Waste will not be stored adjacent to potentially sensitive areas such as natural vegetation, stormwater drains, residences or waterways	VG	D	2	D2	Low
42		Flora and Fauna	Excavation, movement and transport of soils to storage for landscaping	Injury and harm to protected species and other wildlife including Hooded Plover, Growling Grass Frog, River Swamp Wallaby Grass and Orange Bellied Parrot.	C	3	C3	High	Refer to D&C PGA EMP Att I5 Flora and Fauna Sub-Plan (TDV-0-EV-SB-0011.15-03). Access of personnel to Williamson's Beach and Kilcunda – Hamer's Haven Coastal Reserve will be minimised, particularly during the breeding season of significant and/or sensitive fauna (August to February) (e.g. Hooded Plover)	G	D	3	D3	Moderate
43		Archaeology and cultural heritage	Excavation and movement of soils, disturbance to existing land	Impact to aboriginal sites previously unrecorded or recorded	C	4	C4	Extreme	Known locations of aboriginal sites will be identified on area Site Environment Plans (D&C PGA EMP Att J SEP Overview (TDV-0-EV-DG-0011.J-00)). All discovery of any unidentified heritage items shall be undertaken in accordance with the D&C PGA EMP Att I1 Archaeology and Cultural Heritage Sub-Plan (TDV-0-EV-SB-0011.11-02). Salvage has been completed, all known areas fenced and barricaded. Contingency plan in operation to reduce consequences.	G	D	3	D3	Moderate
44		Surface Water and groundwater	non-potable water supply for construction purposes	purchase off-site and import	C	3	C3	High	Refer to Construction Plan and D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.19-03). Management measures include maximising the potential reuse of groundwater including reuse in TBM slurry top up, dust suppression and curing waters	G	D	3	D3	Moderate
General Construction Activities														
45	Additional Excavations, Placement of TBM, Operation of TBM Water Treatment Plant and General Construction of Desalination Plant Facilities	Noise and Vibration	Noise and vibration from initial excavations to place tunnelling equipment	Disruption and disturbance to sensitive receivers / nearby residences	C	3	C3	High	Refer to D&C PGA EMP Att I8 Noise and Vibration Sub-Plan (TDV-0-EV-SB-0011.18-02). Mitigation strategies include; correct maintenance and operation of all plant, use of noise suppression devices, noise labels on plant, noise barriers where appropriate and limiting time frames for noisy works.	G	D	2	D2	Low
46		Surface Water and groundwater	TBM excavations, TBM Slurry Treatment Plant	excess infiltration of fresh and saline groundwater into tunnel pit and TM tunnels, Water discharge from Treatment Plant outside of specifications, failure of TBM water treatment plant	C	3	C3	High	Refer to Work Method Statement MS-1B-01-3202-02 Tunnel Water Treatment Plant Operations - . Powlett River is an estuarine environment so discharge of saline waters to surrounding waterways is permitted in accordance with EPA SEPP (WoV) Estuaries and Inlets. Any excess water will be directed to the sedimentation basins onsite where it will be tested and monitored prior to discharge in accordance with Plant and General Area TDJVD&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.19-03) outlines further control measures and contingencies for water management. Where applicable maximise potential reuse of groundwater including reuse in TBM slurry top up and curing waters. Contingency measures defined in WQ Sub-Plan. All water from TBM treatment plant directed to sedimentation basins onsite prior to discharge. Refer to Work Method Statement MS-1B-01-3202-02 Tunnel Water Treatment Plant Operations - . Powlett River is an estuarine environment so discharge of saline waters to surrounding waterways is permitted in accordance with EPA SEPP (WoV) Estuaries and Inlets. Any excess water will be directed to the sedimentation basins onsite where it will be tested and monitored prior to discharge in accordance with Plant and General Area TDJV Environmental Procedure ENV-PR-001 Discharging Water. D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.19-03) outlines further control measures and contingencies for water management. Where applicable maximise potential reuse of groundwater including reuse in TBM slurry top up and curing waters. Contingency measures defined in WQ Sub-Plan. All water from TBM treatment plant directed to sedimentation basins onsite prior to discharge.	G	D	2	D2	Low

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47		Surface Water and groundwater	groundwater qualities and quantities	Negative impact to groundwater quality. Increased costs and methods for treatment/disposal of fresh and saline groundwater	C	3	C3	High	Refer to Work Method Statement MS-1B-01-3202-02 Tunnel Water Treatment Plant Operations - . Powlett River is an estuarine environment so discharge of saline waters to surrounding waterways is permitted in accordance with EPA SEPP (WoV) Estuaries and Inlets. Any excess water will be directed to the sedimentation basins onsite where it will be tested and monitored prior to discharge in accordance with Plant and General Area TDJV Environmental Procedure ENV-PR-001 Discharging Water. D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03) outlines further control measures and contingencies for water management. Where applicable maximise potential reuse of groundwater including reuse in TBM slurry top up and curing waters. Contingency measures defined in WQ Sub-Plan. All water from TBM treatment plant directed to sedimentation basins onsite prior to discharge.	G	D	2	D2	Low
48		Noise and Vibration	Construction of desalination plant buildings and tunnels	Noise and vibration impacts to sensitive receivers	C	3	C3	High	Refer to D&C PGA EMP Att I8 Noise and Vibration Sub-Plan (TDV-0-EV-SB-0011.I8-02). Mitigations strategies include; correct maintenance and operation of all plant, use of noise suppression devices, noise labels on plant, noise barriers where appropriate and limiting time frames for noisy works.	G	D	2	D2	Low
49		Noise and Vibration	Noise and vibration from TBM equipment	Disruption and disturbance to sensitive receivers / nearby residences	C	3	C3	High	Utilising of acoustic barriers or construction of landscaped dunes to minimise noise - refer to D&C PGA EMP Att I8 Noise and Vibration Sub-Plan (TDV-0-EV-SB-0011.I8-02).	G	D	2	D2	Low
50		Noise and Vibration	Noise from tunnelling equipment ventilation system outlets	Disruption and disturbance to sensitive receivers / nearby residences	D	3	D3	Moderate	Refer to D&C PGA EMP Att I8 Noise and Vibration Sub-Plan (TDV-0-EV-SB-0011.I8-02). Mitigations strategies include; correct maintenance and operation of all plant, use of noise suppression devices, noise labels on plant, noise barriers where appropriate and limiting time frames for noisy works.	G	D	3	D3	Moderate
51		Archaeology and cultural heritage	Excavation and movement of soils, disturbance to existing land	Impact to aboriginal sites previously unrecorded or recorded	C	3	C3	High	Known locations of aboriginal sites will be identified on area Site Environmental Plans (D&C PGA EMP Att J SEP Overview (TDV-0-EV-DG-0011.J-00)). All discovery of any unidentified heritage items shall be undertaken in accordance with the D&C PGA EMP Att I1 Archaeology and Cultural Heritage Sub-Plan (TDV-0-EV-SB-0011.I1-02). Salvage has been completed, all known areas fenced and barricaded. Contingency plan in operation to reduce consequences.	G	D	2	D2	Low
52		Air Quality	Movement of soils, stockpiles and equipment on site	Potential for Dust disturbance and impacts on sensitive receptors	D	2	D2	Low	Refer to D&C PGA EMP Att I4 Air Quality Sub-Plan (TDV-0-EV-SB-0011.I4-02). Mitigation measures include progressive revegetation where possible and limiting disturbance of existing vegetation. Use of watercarts on roadways and site workings. Continuous dust monitoring equipment to determine when activities need to be altered to reduce dust emissions. Portable dust monitors onsite to respond to increased dust burdens. Dust emissions checked on weekly inspection.	VG	D	2	D2	Low
53		Air Quality	Excessive idling of equipment and vehicles, poor maintenance of equipment or insufficient pollution control devices.	Potential for reduction of localised air quality. Consumption of excessive resources.	D	2	D2	Low	Refer to D&C PGA EMP Att I4 Air Quality Sub-Plan (TDV-0-EV-SB-0011.I4-02). Mitigation measures include identification of inefficient vehicles, weekly inspections. Continuous dust monitoring equipment to determine when activities need to be altered to reduce dust emissions. Portable dust monitors onsite to respond to increased dust burdens. Dust emissions checked on weekly inspection.	VG	D	2	D2	Low
54	Operation of Site Compounds, Workshops, Stores, Deliveries, (including Thiess Tunnelling and General TDJV site operations)	Surface Water and groundwater	erosion and sedimentation	Water run off poor quality. Loss of localised water quality (due to sediment loss), loss of local amenity, risk of prosecution	C	3	C3	High	Early installation of environmental controls as per D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03). Early establishment of grass cover and rehabilitation of completed areas. Temporary cut off drains and drainage lines to be directed to the sedimentation ponds or sedimentation controls. Erosion and sedimentation to be monitored via the Weekly Environmental Site inspection Checklist. Additional contingency measures are defined in the D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03).	VG	D	3	D3	Moderate
55		Surface Water and groundwater	spills, untreated discharges from wash bays	Water run off poor quality. Loss of localised water quality (due to sediment loss), loss of local amenity, risk of prosecution	C	3	C3	High	Early installation of environmental controls as per D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03). Early establishment of grass cover and rehabilitation of completed areas. Temporary cut off drains and drainage lines to be directed to the sedimentation ponds or sedimentation controls. Erosion and sedimentation to be monitored via the Weekly Environmental Site inspection Checklist. Additional contingency measures are defined in the D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03).	VG	D	3	D3	Moderate

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56		Hazardous Materials	hazardous material storage and disposal including use of fuels, gases and concrete	Pollution of soils, receiving waters or potential harm / injury to personnel, flora and fauna via discharge of hazardous substance	C	3	C3	High	Refer to D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02). Contingency measures to manage waste storage include: spare receptacles on site for use as required, and all bins to have a securable lid. Spill kits to be kept in all storage areas and made available across site as required. Monitored by both environmental and safety departments. Inspected weekly using the Weekly Environmental Checklist.	G	D	2	D2	Low
57		Resource Efficiency	Material selection, purchasing and consumption, excessive use of water and energy for generators, machines, and other equipment	Use of resources, increase in greenhouse gases gas production	C	2	C2	Moderate	Refer to D&C PGA EMP Att I6 Resource Efficiency Sub-Plan (TDV-0-EV-SB-0011.I6-03). All personnel will be introduced to the waste management hierarchy in the induction with an emphasis on avoidance and minimisation.	G	D	2	D2	Low
58		Air Quality	Movement of soils, stockpiles and equipment on site	Potential for Dust disturbance and impacts on sensitive receptors	D	2	D2	Low	Refer to D&C PGA EMP Att I4 Air Quality Sub-Plan (TDV-0-EV-SB-0011.I4-02). Mitigation measures include progressive revegetation where possible and limiting disturbance of existing vegetation. Use of watercarts on roadways and site workings. Continuous dust monitoring equipment to determine when activities need to be altered to reduce dust emissions. Portable dust monitors onsite to respond to increased dust burdens. Dust emissions checked on weekly inspection.	G	D	2	D2	Low
59	TBM Water Treatment Plant Operations	Hazardous Materials	Water treatment plant breakdown	Pollution of soils, receiving waters or potential harm / injury to personnel, flora and fauna via discharge of hazardous substance	C	3	C3	High	Refer to Tunnelling Work Method Statements MS-1B-01-3201-01 Tunnel Slurry Treatment Plant Operations, MS-1B-01-3202-02 Tunnel Water Treatment Plant Operations and D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02). Contingency measures to manage waste storage include: spare receptacles on site for use as required, and all bins to have a securable lid. Spill kits to be kept in all storage areas and made available across site as required. Monitored by both environmental and safety departments. Inspected weekly using the Weekly Environmental Checklist.	G	D	3	D3	Moderate
60		Hazardous Materials	Water treatment plant breakdown	discharge of untreated water resulting in localised harm to waterways	C	3	C3	High	Refer to Tunnelling Work Method Statements MS-1B-01-3201-01 Tunnel Slurry Treatment Plant Operations, MS-1B-01-3202-02 Tunnel Water Treatment Plant Operations and D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02). Contingency measures to manage waste storage include: spare receptacles on site for use as required, and all bins to have a securable lid. Spill kits to be kept in all storage areas and made available across site as required. Monitored by both environmental and safety departments. Inspected weekly using the Weekly Environmental Checklist.	G	D	3	D3	Moderate
61	Building Fit out	Hazardous Materials	hazardous material storage and disposal including use of fuels, gases and concrete	Pollution of soils, receiving waters or potential harm / injury to personnel, flora and fauna via discharge of hazardous substance	C	3	C3	High	Refer to D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02). Contingency measures to manage waste storage include: spare receptacles on site for use as required, and all bins to have a securable lid.	G	D	3	D3	Moderate
62		Resource Efficiency	Material selection, purchasing and consumption, excessive use of water and energy for generators, machines, and other equipment	Use of resources, increase in greenhouse gases gas production	C	2	C2	Moderate	Refer to D&C PGA EMP Att I6 Resource Efficiency Sub-Plan (TDV-0-EV-SB-0011.I6-03). Minimisation strategy for use of electricity and diesel to be promoted on site.	G	D	2	D2	Low
63		Noise and Vibration	Noise nuisance (general construction)	nuisance to neighbours and fauna	D	2	D2	Low	Refer to D&C PGA EMP Att I8 Noise and Vibration Sub-Plan (TDV-0-EV-SB-0011.I8-02) plus noise barriers from landscape mount and building cladding	VG	E	2	E2	Low
64	Drainage, Landscaping and Rehabilitation	Air Quality	Movement of soils, stockpiles and equipment on site	Potential for Dust disturbance and impacts on sensitive receptors	D	3	D3	Moderate	Refer to D&C PGA EMP Att I4 Air Quality Sub-Plan (TDV-0-EV-SB-0011.I4-02). Management measures include water spraying, road cleaning and covering of temporary stockpiles to minimise dust generation	G	D	2	D2	Low
65		Amenity	Visual amenity	Poor community interaction whilst landscaping bunds being constructed	C	3	C3	High	Active Community consultation	G	D	2	D2	Low
66		Soil Management	Incomplete removal of potentially contaminating materials	Impact to human health and habitat	C	3	C3	High	Refer to D&C PGA EMP Att I7 Soil Management Sub-Plan (TDV-0-EV-SB-0011.I7-02) and associated Work Packs, Work Method Statements and JSEAs. If contamination identified or hazardous substances come into contact with the environment as a result of construction works, all work to stop in the affected area, contamination reported to Area Environmental Manager, with work only continuing once the material has been assessed and removed or stabilised according to NEPM and EPA guidelines. All contaminated soil will be disposed off site in accordance with EPA requirements. All handling and storage of hazardous materials will be undertaken in compliance with the D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02).	G	D	2	D2	Low

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67		Soil Management	Exposure of ASS resulting in generation of acid runoff (leachate) to environment	Reduction in surface water and ground water quality, impacts to flora and fauna	C	3	C3	High	Intrusive soil investigations of plant site undertaken. D&C PGA EMP Att I11 Acid Sulfate Soils Management Sub-Plan (TDV-0-EV-SB-0011.I11-02) developed in response to findings of soil investigations and personnel trained in in-field sampling procedure. ASS managed on site with impacted soil removed to treatment pad, mixed with lime (according to liming rates from laboratory results), verification samples taken to ensure soil limed sufficiently to neutralise ASS and then material reused on site as fill. All management conducted in accordance with D&C PGA EMP Att I11 Acid Sulfate Soils Management Sub-Plan (TDV-0-EV-SB-0011.I11-02).	VG	D	2	D2	Low
68		Soil Management	Incomplete removal of potentially contaminating materials	Contaminated materials not handled in accordance with NEPM and EPA guidelines. Possible inappropriate disposal or further contamination of soils/waterways.	C	3	C3	High	Refer to D&C PGA EMP Att I7 Soil Management Sub-Plan (TDV-0-EV-SB-0011.I7-02). If contamination identified or hazardous substances come into contact with the environment as a result of construction works, all work to stop in the affected area, contamination reported to Area Environmental Manager, with work only continuing once the material has been assessed and removed or stabilised according to NEPM and EPA guidelines. All contaminated soil will be disposed off site in accordance with EPA requirements. All handling and storage of hazardous materials will be undertaken in compliance with the D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02).	G	D	2	D2	Low
Civil Works														
69	Concrete Works (On-site and Pre-cast)	Social and economic	Road use dust	Site traffic	C	3	C3	High	Refer to the Area EMP, Traffic Mgt Plan and Community Involvement Plan. Measures include visual monitoring of dust and use of water carts to control dust.	VG	D	2	D2	Low
70		Surface Water and groundwater	Water runoff and stormwater	Water run off poor quality. Loss of localised water quality (due to sediment loss), loss of local amenity, risk of prosecution	C	3	C3	High	Refer to D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03) and associated Work Packs, Work Method Statements and JSEAs. Mitigation strategy includes: vegetation clearance will be minimised where possible, and strip surface soil and vegetation progressively to limit to only those areas that will be worked on immediately, to minimise erosion and sedimentation.	G	D	3	D3	Moderate
71		Resource Efficiency	Material selection, purchasing and consumption, excessive use of water and energy for generators, machines, and other equipment	Use of resources, increase in greenhouse gases gas production	D	3	D3	Moderate	Refer to D&C PGA EMP Att I6 Resource Efficiency Sub-Plan (TDV-0-EV-SB-0011.I6-03). All personnel will be introduced to the waste management hierarchy in the induction with an emphasis on avoidance and minimisation.	VG	D	2	D2	Low
72	Piling/Structures	Noise and Vibration	noise nuisance (piling, metal grinding, general construction)	nuisance to neighbours and fauna	C	3	C3	High	Refer to D&C PGA EMP Att I8 Noise and Vibration Sub-Plan (TDV-0-EV-SB-0011.I8-02). Mitigations strategies include; correct maintenance and operation of all plant, use of noise suppression devices, noise labels on plant, noise barriers where appropriate and limiting time frames for noisy works.	G	D	2	D2	Low
73		Hazardous Materials	hazardous material storage and disposal including use of fuels, gases and concrete	Pollution of soils, receiving waters or potential harm / injury to personnel, flora and fauna via discharge of hazardous substance	C	3	C3	High	Refer to D&C PGA EMP Att I6 Resource Efficiency Sub-Plan (TDV-0-EV-SB-0011.I6-03). – The storage of prescribed waste shall be in accordance EPA Bunding Guidelines (Publication 347 or its most recent amendment) and the relevant Material Safety Data Sheet (MSDS) for the product. The storage of fuel, oil or chemicals on site will be undertaken in a designated area specifically designed to contain all chemical, fuel, and oil spills. Refer to D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02).	G	D	2	D2	Low
74		Surface Water and groundwater	stormwater	Water run off poor quality. Loss of localised water quality (due to sediment loss), loss of local amenity, risk of prosecution	C	2	C2	Moderate	Refer to D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03) and associated Work Packs, Work Method Statements and JSEAs. Management strategies include the following: divert clean surface water runoff around and/or away from disturbed areas and construction activities, where feasible. Minimise slope gradient and length, where feasible. Maintain run-off at non-erodible velocities. Implement erosion and sediment controls where feasible. Stockpiles only to be used where necessary.	VG	D	2	D2	Low
75		Noise and Vibration	Noise and vibration from piling equipment	nuisance to neighbours and fauna	D	3	D3	Moderate	Refer to D&C PGA EMP Att I8 Noise and Vibration Sub-Plan (TDV-0-EV-SB-0011.I8-02). Mitigations strategies include; correct maintenance and operation of all plant, use of noise suppression devices, noise labels on plant, noise barriers where appropriate and limiting time frames for noisy works.	G	D	2	D2	Low

Risk #	Activity / Construction Method	Performance Criteria / Performance Requirement SUBJECT	Potential Hazard (Environmental Aspect & Impact Pathway)	At Risk (Potential Impact)	Probability (Table 2)	Consequence (Table 3)	Inherent Risk (Before Controls)	Controls: current or planned prior to work to ensure obligations (including performance requirements and performance criteria) are met (Table 4 - reference specific option)	Control effectiveness (Table 5)	Probability (Table 2)	Consequence (Table 3)	Residual Risk (After Controls)		
76		Resource Efficiency	Material selection, purchasing and consumption, excessive use of water and energy for generators, machines, and other equipment	Use of resources, increase in greenhouse gases gas production	C	2	C2	Moderate	Refer to D&C PGA EMP Att I6 Resource Efficiency Sub-Plan (TDV-0-EV-SB-0011.I6-03). All personnel will be introduced to the waste management hierarchy in the induction with an emphasis on avoidance and minimisation.	G	D	2	D2	Low
77		Air Quality	Movement of soils, stockpiles and equipment on site	Potential for Dust disturbance and impacts on sensitive receptors	D	2	D2	Low	Refer to D&C PGA EMP Att I4 Air Quality Sub-Plan (TDV-0-EV-SB-0011.I4-02). Mitigation measures include a review of daily weather forecasts from the Bureau of Meteorology, or a private meteorology service provider to plan works i.e. manage wind-blown dust, use rain to suppress dust. Sudden onset of frontal systems that involve sharp increases in wind speed are of particular concern. The Site Manager to be notified daily of forecast weather conditions	G	D	2	D2	Low
78		Soil Management	Discovery of contamination during excavation, transfer of material and movement of stockpiles and soils	Impact to human health and habitat	D	3	D3	Moderate	Refer to D&C PGA EMP Att I7 Soil Management Sub-Plan (TDV-0-EV-SB-0011.I7-02). Phase 1 Environment Site Assessment of site undertaken prior to construction works with contamination not anticipated at the site. If contamination identified or hazardous substances come into contact with the environment as a result of construction works, all work to stop in the affected area, contamination reported to Area Environmental Manager, with work only continuing once the material has been assessed and removed or stabilised according to NEPM and EPA guidelines. All contaminated soil will be disposed off site in accordance with EPA requirements. All handling and storage of hazardous materials will be undertaken in compliance with the D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02).	G	D	2	D2	Low
79		Soil Management	Discovery of contamination during excavation, transfer of material and movement of stockpiles and soils	Contaminated materials not handled in accordance with NEPM and EPA guidelines. Possible inappropriate disposal or further contamination of soils/waterways.	D	3	D3	Moderate	Refer to D&C PGA EMP Att I7 Soil Management Sub-Plan (TDV-0-EV-SB-0011.I7-02). Phase 1 Environment Site Assessment of site undertaken prior to construction works with contamination not anticipated at the site. If contamination identified or hazardous substances come into contact with the environment as a result of construction works, all work to stop in the affected area, contamination reported to Area Environmental Manager, with work only continuing once the material has been assessed and removed or stabilised according to NEPM and EPA guidelines. All contaminated soil will be disposed off site in accordance with EPA requirements. All handling and storage of hazardous materials will be undertaken in compliance with the D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02).	G	D	2	D2	Low
80		Soil Management	Exposure of ASS resulting in generation of acid runoff (leachate) to environment	Reduction in surface water and ground water quality, impacts to flora and fauna	C	3	C3	High	Intrusive soil investigations of plant site undertaken. D&C PGA EMP Att I11 Acid Sulfate Soils Management Sub-Plan (TDV-0-EV-SB-0011.I11-02) developed in response to findings of soil investigations and personnel trained in in-field sampling procedure. ASS managed on site with impacted soil removed to treatment pad, mixed with lime (according to liming rates from laboratory results), verification samples taken to ensure soil limed sufficiently to neutralise ASS and then material reused on site as fill. All management conducted in accordance with D&C PGA EMP Att I11 Acid Sulfate Soils Management Sub-Plan (TDV-0-EV-SB-0011.I11-02).	VG	D	2	D2	Low
81	On-site fabrication	Air Quality	Movement of soils, stockpiles and equipment on site	Potential for Dust disturbance and impacts on sensitive receptors	D	2	D2	Low	Refer to D&C PGA EMP Att I4 Air Quality Sub-Plan (TDV-0-EV-SB-0011.I4-02). Mitigation measures include: carry out daily visual inspection to ensure that emissions of visible dust are not leaving the site	G	D	2	D2	Low
82		Noise and Vibration	Noise from construction of desalination plant and other facilities	Disruption and disturbance to sensitive receivers / nearby residences	C	3	C3	High	Refer to D&C PGA EMP Att I8 Noise and Vibration Sub-Plan (TDV-0-EV-SB-0011.I8-02). Mitigations strategies include; correct maintenance and operation of all plant, use of noise suppression devices, noise labels on plant, noise barriers where appropriate and limiting time frames for noisy works.	G	D	2	D2	Low
83		Resource Efficiency	Material selection, purchasing and consumption, excessive use of water and energy for generators, machines, and other equipment	Use of resources, increase in greenhouse gases gas production	C	2	C2	Moderate	Refer to D&C PGA EMP Att I6 Resource Efficiency Sub-Plan (TDV-0-EV-SB-0011.I6-03). All personnel will be introduced to the waste management hierarchy in the induction with an emphasis on avoidance and minimisation.	G	D	2	D2	Low
84		Hazardous Materials	hazardous material storage and disposal including use of fuels, gases and concrete	Pollution of soils, receiving waters or potential harm / injury to personnel, flora and fauna via discharge of hazardous substance	C	3	C3	High	Refer to D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02). All general inert and solid waste generated shall be stored in waste containers. All storage containers and locations for the various waste streams shall be clearly labelled to ensure that mixing of wastes is avoided	VG	D	2	D2	Low

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85		Surface Water and groundwater	Water runoff and stormwater	Water run off poor quality. Loss of localised water quality (due to sediment loss), loss of local amenity, risk of prosecution	C	3	C3	High	Early installation of drainage controls - refer to D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.19-03) and associated Work Packs, Work Method Statements and JSEAs. Management strategies include the following: divert clean surface water runoff around and/or away from disturbed areas and construction activities, where feasible. Minimise slope gradient and length, where feasible. Maintain run-off at non-erodible velocities. Implement erosion and sediment controls where feasible. Stockpiles only to be used where necessary.	G	D	3	D3	Moderate
Site Rehabilitation & reinstatement														
86		Site reinstatement and revegetation	Incorrect site reinstatement and revegetation	Inappropriate reinstatement and revegetation affecting amenity.	D	3	D3	Moderate	Refer to D&C PGA EMP Att I3 Site Rehabilitation Sub-Plan (TDV-0-EV-SB-0011.I2-02). Mitigation measures to include: education programs for workforce, and definition or contractual environmental responsibilities, control of noxious and environmental weeds and rehabilitation with approved non-invasive pasture species or indigenous species as soon as possible after construction	VG	E	2	E2	Low
87		Site reinstatement and revegetation	Slow revegetation	Surface runoff creating soil erosion and requiring re-seeding.	D	3	D3	Moderate	Refer to D&C PGA EMP Att I3 Site Rehabilitation Sub-Plan (TDV-0-EV-SB-0011.I2-02). Ensure that no waste of any kind other than clean fill soil (as defined in the Vic EPA Classification of Waste Guidelines) is placed in any trench or included in earthworks (see D&C PGA EMP Att I6 Resource Efficiency Sub-Plan (TDV-0-EV-SB-0011.I6-03)).	VG	E	2	E2	Low
88		Site reinstatement and revegetation	Stream profile being modified	Stream function being altered with different water flow patterns created.	D	3	D3	Moderate	Refer to D&C PGA EMP Att I3 Site Rehabilitation Sub-Plan (TDV-0-EV-SB-0011.I2-02). Identify areas where there is a risk of subsidence, and develop and implement construction approaches to mitigate the risk	VG	E	2	E2	Low
89		Site reinstatement and revegetation	Poor pasture establishment in agricultural land	Poor rainfall or disturbance of sowing of exotic pasture grasses.	D	3	D3	Moderate	Refer to D&C PGA EMP Att I3 Site Rehabilitation Sub-Plan (TDV-0-EV-SB-0011.I2-02). Monitor and rectify any defect.	VG	E	2	E2	Low
Activities below relate to Construction Verification and Cleaning.														
Hydrotesting Pipe Systems and Water retaining Structures														
90	Hydrotesting Pipe Systems and Water retaining Structures	Water Quality and Erosion Management.	Discharge of off specification water. Detrimental effect on environment and downstream community biodiversity.	Biological communities, habitat and beneficial uses downstream of the plant site.	C	3	C3	High	As per D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.19-03) and associated Work Packs, Work Method Statements and JSEAs. Any discharge of the hydrotesting water will be into designated drainage network to the sedimentation basin and undertaken in consultation with the Plant and general Area Environmental Manager. Discharges from the sedimentation basin will be undertaken in accordance with the site water discharge procedure (TDJV-ENV-PR-001) and in compliance with EPA 31(A)1 conditions. Additional contingency measures are defined in the WQ Sub-Plan. All discharges to the sedimentation ponds resulting from cleaning activities will be as per section 6.5 of the Temporary filtration system for recycling DMPF backwash effluent Commissioning Procedure (COMM-004-00-PRD-002).	VG	E	2	E2	Low

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91	Hydrotesting Pipe Systems and Water retaining Structures	Water Quality and Erosion Management.	Increased volumes of water entering existing waterway systems. Detrimental effect on environment and downstream community biodiversity.	Biological communities, habitat and beneficial uses downstream of the plant site.	D	2	D2	Low	As per D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.19-03) and associated Work Packs, Work Method Statements and JSEAs. Any discharges of the hydrotesting water will be into the sedimentation basin and undertaken in consultation with the Plant and general Area Environmental Manager. Discharges from the sedimentation basin will be undertaken in accordance with the EPA 31(A)1 conditions. Additional contingency measures are defined in the WQ Sub-Plan. All discharges to the sedimentation ponds resulting from cleaning activities will be as per section 6.5 of the Temporary filtration system for recycling DMPF backwash effluent Commissioning Procedure (COMM-004-00-PRD-002).	VG	E	2	E2	Low
92	Hydrotesting Pipe Systems and Water retaining Structures	Resource Efficiency	Inefficient operation, or use of poorly maintained plant and/or equipment. Unnecessary overuse of energy resources.	Available resources i.e water and energy supply.	D	3	D3	Moderate	All equipment involved will be maintained and checked in accordance manufacturers specifications. Pre-start equipment checklists, service records and Work Method statements will be used to maintain efficient operation.	G	E	2	E2	Low
Prefiltration Media Backwash Wastewater Production														
93	Operation of one DMPF as Pre-treatment Backwash Water treatment plant.	Water Quality and Erosion Management.	Discharge of off specification water. Detrimental effect on downstream community biodiversity.	Biological communities, habitat and beneficial uses downstream of the plant site.	C	3	C3	High	As per D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.19-03) . Any discharge of the Prefiltration Media Backwash Wastewater will be into the sedimentation basin in accordance with the Water Quality and Erosion Management Sub-Plan, as well as underlying Work Packs, Work Method Statements and JSEAs. Works will be conducted in consultation with the Plant and General Area Environmental Manager. Discharge flows from the DMPFs into the sedimentation pond are to follow measures as outlined in the Permit to Work - Fill and Discharge as obtained from the TDJV permit office. Discharges from the sedimentation basin will be undertaken in accordance with the site water discharge procedure (TDJV-ENV-PR-001) and in compliance with the EPA 31(A)1 conditions. Additional contingency measures are defined in the current D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.19-03). All management and treatment of hazardous materials resulting from the DMPF operation during the construction cleaning and hydrotesting phase will be managed in accordance with the D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.12-02) i.e. All waste produced from chemical usage will be tested in accordance with EPA requirements to identify the correct disposal requirements. If the waste is a prescribed waste a licensed waste contractor will be used to transport the waste to a licensed disposal facility as per EPA requirements. All prescribed waste will be tracked via EPA waste tracking dockets. All discharges to the sedimentation ponds resulting from cleaning activities will be as per section 6.5 of the Temporary filtration system for recycling DMPF backwash effluent Commissioning Procedure (COMM-004-00-PRD-002).	VG	E	2	E2	Low

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94	Operation of one DMPF as Pre-treatment Backwash Water treatment plant.	Water Quality and Erosion Management.	Increased volumes of water entering existing waterway systems. Detrimental effect on downstream community biodiversity.	Biological communities, habitat and beneficial uses downstream of the plant site.	D	2	D2	Low	As per D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03). Any discharge of the Prefiltration Media Backwash Wastewater will be into the sedimentation basin in accordance with the Water Quality and Erosion Management Sub-Plan, as well as underlying Work Packs, Work Method Statements and JSEAs. Works will be conducted in consultation with the Plant and General Area Environmental Manager. Discharge flows from the DMPFs into the sedimentation pond are to follow measures as outlined in the Permit to Work - Fill and Discharge as obtained from the TDJV permit office. Discharges from the sedimentation basin will be undertaken in accordance with the site water discharge procedure (TDJV-ENV-PR-001) and in compliance with the EPA 31(A)1 conditions. Additional contingency measures are defined in the current D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03). All discharges to the sedimentation ponds resulting from cleaning activities will be as per section 6.5 of the Temporary filtration system for recycling DMPF backwash effluent Commissioning Procedure (COMM-004-00-PRD-002).	VG	E	2	E2	Low
95	Operation of one DMPF as Pre-treatment Backwash Water treatment plant.	Visual Amenity - Leased Area, Transfer Pipeline and Booster Pump Station Land.	Nocturnal light spill from 24 hour operation of the DMPF water treatment plant causing loss of neighbourhood amenity from increased light spill.	Neighbourhood amenity	D	2	D2	Low	Where possible, light sources will be kept close to the ground and lighting will be shielded to reduce light-spill near and into any adjacent habitat areas; Where possible, lights that are least attractive to insects will be used. No extra lighting will be required for DMPF use outside of existing nightworks lighting.	G	E	2	E2	Low
96	Operation of one DMPF as Pre-treatment Backwash Water treatment plant.	Resource Efficiency	Inefficient operation, or use of poorly maintained plant and/or equipment. Unnecessary overuse of energy resources.	Available resources i.e water and energy supply.	D	2	D2	Low	All equipment involved will be maintained and checked in accordance manufacturers specifications. Pre-start equipment checklists, service records and Work Method statements will be used to maintain efficient operation.	VG	E	2	E2	Low
97	Operation of one DMPF as Pre-treatment Backwash Water treatment plant.	Hazardous Materials and Dangerous Goods	Hazardous materials storage and disposal including, the use of fuels, gases etc causing pollution of soils, receiving waters or potential harm / injury to personnel, flora and fauna.	Groundwater, surface water, waterways and wetlands.	B	3	B3	High	Refer to D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02). Contingency measures to manage waste storage include: spare receptacles on site for use as required, and appropriate types of bins available for different waste streams. Spill kits to be kept in all storage areas and made available across site as required. Monitored by both environmental and safety departments. Inspected weekly using the Weekly Environmental Checklist.	VG	D	2	D2	Low
98	Operation of one DMPF as Pre-treatment Backwash Water treatment plant.	Air Quality - Odour and Emissions	Power generator emissions. Effect on local air quality through generator emissions.	Neighbourhood amenity	C	2	C2	Moderate	Pre-start checks of generators to include visual check of exhaust emissions. Any actions generated from pre-start checks will be actioned via the projects corrective actions register (managed via the Safety Department).	VG	E	2	E2	Low
99	Operation of one DMPF as Pre-treatment Backwash Water treatment plant.	Water Quality and Erosion Management.	Discharge of off specification water. Detrimental effect on downstream community biodiversity.	Biological communities, habitat and beneficial uses downstream of the plant site.	C	3	C3	High	Activities will be immediately stopped and discharge from the water treatment plant stopped in accordance with the WP and operating procedure. Operations will not resume until water treatment plant is fully operational again. Hand held probes will be utilised to monitor water quality and manually confirm correct operation of in-line system as required. Water will be managed as per D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03) and directed to sedimentation ponds via the site drainage network. Any discharge of the Prefiltration Media Backwash Wastewater will be into the sedimentation basin in accordance with the D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03), as well as underlying Work Packs, Work Method Statements and JSEAs. Works will be conducted in consultation with the Plant and General Area Environmental Manager. Discharge flows from the DMPFs into the sedimentation pond are to follow measures as outlined in the Permit to Work - Fill and Discharge as obtained from the TDJV permit office. Discharges from the sedimentation basin will be undertaken in accordance with site water discharge procedure (TDJV-ENV-PR-001) and in compliance with SEPP (WoV) Estuaries and Inlets. Additional contingency measures are defined in the current EMP D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03).	VG	E	2	E2	Low

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100	Operation of one DMPF as Pre-treatment Backwash Water treatment plant.	Airborne Noise	Noise from Water Treatment Plant.	Neighbourhood amenity	C	2	C2	Moderate	As per noise limits and controls contained within D&C PGA EMP Att I8 Noise and Vibration Sub-Plan (TDV-0-EV-SB-0011.I8-02). All mechanical plant must be silenced by best practical means using current technology. For example, noise suppression devices should be maintained to the manufacturer's specifications and internal combustion engines are to be fitted with a suitable muffler in good repair. Pre-start checklists. Any actions generated from pre-start checks will be actioned via the projects corrective actions register (managed via the Safety Department).	VG	E	2	E2	Low
Prefiltration Media Backwash Solid Waste Production														
101	Cleaning Backwash Media	Water Quality and Erosion Management.	Discharge of offspec water containing Backwash sludge. Detrimental effect on downstream communities.	Biological communities, habitat and beneficial uses downstream of the plant site.	C	3	C3	High	All solid waste to be trucked offsite as per section 3.2.9 of the Temporary filtration system for recycling DMPF backwash effluent Commissioning Procedure (COMM-004-00-PRD-002).	A	E	1	E1	Low
RO Building Pipe Cleaning/														
102	RO building pipe cleaning	Waste	Discharge of RO pipe cleaning water. Detrimental effect on downstream communities.	Biological communities, habitat and beneficial uses downstream of the plant site.	C	3	C3	High	The sites sedimentation ponds are designed to handle turbid water and will be the primary area for treating RO Pipe Cleaning water. The water will be discharged to the ponds via the sites established surface and sub-surface drainage network which incorporates sedimentation controls such as rock checks, sumps and sedimentation fencing. No additional controls are needed to deal with the pipe cleaning water.	VG	D	2	D2	Low
Bypass of DMPF Filtrate to Feedwater Chanel - Closed Loop														
103	Bypass of DMPF Filtrate to Feedwater Chanel - Closed Loop	Water Quality and Erosion Management	Unplanned discharges of potable water to the sedimentation ponds	Waterways and wetlands downstream of the plant site	C	3	C3	High	As per D&C PGA EMP Att I9 - Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03) . Any discharge of the Bypass of DMPF Filtrate Closed Loop will be into the sedimentation basin in accordance with the Water Quality and Erosion Management Sub-Plan, as well as underlying Work Packs, Work Method Statements and JSEAs. Works will be conducted in consultation with the Plant and general Area Environmental Manager. Discharge flows from the DMPFs into the sedimentation pond are to follow measures as outlined in the Permit to Work - Fill and Discharge as obtained from the TDJV permit office. Discharges from the sedimentation basin will be undertaken in accordance with the site water discharge procedure (TDJV-ENV-PR-001) and in compliance with the EPA 31(A)1 conditions. Additional contingency measures are defined in the D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03). All discharges to the sedimentation ponds resulting from cleaning activities will be as per section 6.5 of the Temporary filtration system for recycling DMPF backwash effluent Commissioning Procedure (COMM-004-00-PRD-002).	VG	E	2	E2	Low
Potential Emergencies and Abnormal Events For All D&C Activities (across all areas)														

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104	Potential Emergencies and Abnormal Events (including but not limited to fire, extreme weather conditions including wind, rain, heat, dust, discovery of unexpected flora and fauna, protest action, site security breach or any other unexpected event.	Air Quality	Extreme hot dry conditions during a weekend or overnight break in construction causing excessive dust emanating from the site	Potential for Dust disturbance and impacts on sensitive receptors	E	4	E4	High	Refer to D&C PGA EMP Att I4 Air Quality Sub-Plan (TDV-0-EV-SB-0011.I4-02). Management measures include, but are not limited to: inspection of site for signs of dust, water spraying, road cleaning and covering of temporary stockpiles to minimise dust generation. Modifying or stopping dust generating works. Additional water carts if needed for predicted long periods of hot weather. Consult weather forecasts and communicate with workgroups as required. Plant Site EIRP to be followed in emergency situations and for all incidents.	G	E	2	E2	Low
105		Air Quality	Fire event resulting from construction activities or natural events leading to a fire event	Potential for air quality impacts on sensitive receptors	D	2	D2	Low	Refer to D&C PGA EMP Att I4 Air Quality Sub-Plan (TDV-0-EV-SB-0011.I4-02). Measures to minimise the likelihood of a fire event within the Plant Site are inclusive of, but not limited to the following procedures: retaining flammable liquids/substances within spark proof containers, storage of flammable liquids/substances away from sources of extreme heat and/or sparks, heat-out rules in place for extreme weather, hand-held plant that may cause a spark are used according to site safety protocols, and usage restricted or forbidden on total fire ban days, flagging of overhead power lines, appropriate signage restricting smoking on site, along with designated 'smoking' areas with approved disposal bins, and regular updates on forecast storm conditions, to inform site supervisors of potential fire hazards, should a lightning storm ensue. Further control measures to minimise the consequence of a fire include, but are not limited to: supply of suitable fire extinguishing equipment and training of relevant staff in fire fighting techniques. Landowners identified to be at risk of any fire will be notified as soon as practicable. Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)) to be followed in emergency situations and for all incidents. All handling and storage of hazardous materials will be undertaken in compliance with the D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02).	G	E	2	E2	Low
106		Archaeology and cultural heritage	Excavation and movement of soils, disturbance to existing land	Encounter unexpected archaeological item which delays program	D	3	D3	Moderate	Known locations of aboriginal sites will be identified on area Site Environment Plans (D&C PGA EMP Att J SEP Overview (TDV-0-EV-DG-0011.J-00)). All discovery of any unidentified heritage items shall be undertaken in accordance with the D&C PGA EMP Att I1 Archaeology and Cultural Heritage Sub-Plan (TDV-0-EV-SB-0011.I1-02). Salvage has been completed, all known areas fenced and barricaded. Contingency plan in operation to reduce consequences. Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)) to be followed in emergency situations and for all incidents.	G	D	2	D2	Low
107		Flora and Fauna	Movement of machinery and site vehicles	Fauna mortality resulting from collision with vehicles and machinery	B	3	B3	High	Refer to D&C PGA EMP Att I5 Flora and Fauna Sub-Plan (TDV-0-EV-SB-0011.I5-03). Mitigation measures include, but are not limited to: utilising public road network, minimising vehicle movements during night time, minimising vehicle movements through areas with significant fauna habitat, a reduced speed limit on access roads. Fencing of site to prevent stock or other fauna from wandering into work site. Education of work force through inductions and toolbox talks. Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)) to be followed in emergency situations and for all incidents.	G	C	2	C2	Moderate
108		Flora and Fauna	Excavation	Fauna mortality resulting from falls into open pits/trenches	C	2	C2	Moderate	Refer to D&C PGA EMP Att I5 Flora and Fauna Sub-Plan (TDV-0-EV-SB-0011.I5-03). The period for which any trenches or pits remain open will be minimised. Trench inspections, batters kept to a safe slope allowing fauna to exit trench, fencing of worksite and trenches as required. Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)) to be followed in emergency situations and for all incidents.	F	D	2	D2	Low
109		Flora and Fauna	Vegetation clearing	Fauna mortality resulting from vegetation clearing activities	B	4	B4	Extreme	Refer to D&C PGA EMP Att I5 Flora and Fauna Sub-Plan (TDV-0-EV-SB-0011.I5-03). Mitigation measures include limiting access of personnel to Williamson's Beach and Kilcunda - Harmer's Haven Coastal Reserve will be minimised, particularly during the breeding season of significant and/or sensitive fauna (i.e. August to February for Hooded Plover), vehicle movements will be minimised through areas supporting remnant native vegetation and important fauna habitat. Relocation of know existing fauna (such as wombats) prior to earthworks. All clearing to be done under the supervision of the environmental teams or qualified ecologist. Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)) to be followed in emergency situations and for all incidents.	VG	D	2	D2	Low

Risk #	Activity / Construction Method	Performance Criteria / Performance Requirement SUBJECT	Potential Hazard (Environmental Aspect & Impact Pathway)	At Risk (Potential Impact)	Probability (Table 2)	Consequence (Table 3)		Inherent Risk (Before Controls)	Controls: current or planned prior to work to ensure obligations (including performance requirements and performance criteria) are met (Table 4 - reference specific option)	Control effectiveness (Table 5)	Probability (Table 2)	Consequence (Table 3)		Residual Risk (After Controls)
110		Flora and Fauna	Disease spread of known pathogen of flora and fauna	Infection of fauna and flora resulting from transmission of the disease by vehicle, person, disposal of contaminated material	A	3	A3	Extreme	Refer to D&C PGA EMP Att I5 Flora and Fauna Sub-Plan (TDV-0-EV-SB-0011.I5-03). Mitigation measures include, but are not limited to: application of disinfectant to vehicle tyres and footwear, clearly signpost stockpiles, ensure spoil management records are sufficient to prepare monthly report, track spoil material, and provide staff with training. Should any infection occur the following measures will be undertaken: excavation of all contaminated soil, designed stockpile areas for treatment and/or disposal, 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. Inspection of all vegetation prior to and during clearing (by qualified ecologist). Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03))P to be followed in emergency situations and for all incidents.	VG	E	2	E2	Low
111		Flora and Fauna	Excavation of soils leading to a large scale erosion event	Injury and harm to protected species and other wildlife including Hooded Plover	B	3	B3	High	Refer to D&C PGA EMP Att I5 Flora and Fauna Sub-Plan (TDV-0-EV-SB-0011.I5-03). Mitigation measures include, but are not limited to: installation of sediment fencing, daily inspections of all sediment and erosion controls, minimise spoil retained on site, cease work during wet weather conditions or if any sediment control becomes compromised or breached, install diversion banks, locate stockpile areas at least 10m from waterways, appropriately bund areas to contain all spoil, progressively strip surface soil and vegetation, progressive revegetation of disturbed areas, develop a flood warning system, divert clean surface water runoff around and/or away from disturbed areas and construction activities and limit movements of machinery. Education via the induction and signage. Use of no go zones. Monitoring of all work areas for erosion - documented via the weekly inspection checklist.	VG	E	2	E2	Low
112		Flora and Fauna	Large scale dust event impacting the health of vegetation	Injury and harm to protected species and other wildlife including Hooded Plover	B	3	B3	High	Refer to D&C PGA EMP Att I4 Air Quality Sub-Plan (TDV-0-EV-SB-0011.I4-02) and D&C PGA EMP Att I5 Flora and Fauna Sub-Plan (TDV-0-EV-SB-0011.I5-03). Mitigation measures include, but are not limited to: application of water to potential dust sources, designated access tracks and designated construction areas, minimisation of heavy vehicle movements, exposed earth will be minimised, and all staff personnel will be informed and will follow protocols and restrictions during construction activities to prevent or limit the levels of dust. Should a dust event occur, the likely control measures will be inclusive of, but not limited to: temporary halt of all works contributing to dust levels, revision of measures to control dust levels and an assessment of the aquatic fauna values will be undertaken and salvage and translocation protocols enacted if required. Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)) to be followed in emergency situations and for all incidents.	G	D	1	D1	Low
113		Flora and Fauna	Fire event	Injury and harm to protected species and other wildlife including Hooded Plover	E	5	E5	High	Refer to D&C PGA EMP Att I4 Air Quality Sub-Plan (TDV-0-EV-SB-0011.I4-02). Measures to minimise the likelihood of a fire event within the Plant Site are inclusive of, but not limited to the following procedures: retaining flammable liquids/substances within spark proof containers, storage of flammable liquids/substances away from sources of extreme heat and/or sparks, heat-out rules in place for extreme weather, hand-held plant that may cause a spark are used according to site safety protocols, and usage restricted or forbidden on total fire ban days, flagging of overhead power lines, appropriate signage restricting smoking on site, along with designated 'smoking' areas with approved disposal bins, and regular updates on forecast storm conditions, to inform site supervisors of potential fire hazards, should a lightning storm ensue. Further control measures to minimise the consequence of a fire include, but are not limited to: supply of suitable fire extinguishing equipment and training of relevant staff in fire fighting techniques. Landowners identified to be at risk of any fire will be notified as soon as practicable. Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)) to be followed in emergency situations and for all incidents. All handling and storage of hazardous materials will be undertaken in compliance with the D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02).	VG	E	2	E2	Low

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114		Flora and Fauna	Hazardous chemical spill	Injury and harm to protected species and other wildlife including Hooded Plover	B	2	B2	High	Refer to D&C PGA EMP Att I5 Flora and Fauna Sub-Plan (TDV-0-EV-SB-0011.I5-03) and D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02). Measures to minimise the likelihood of a hazardous chemical spill are inclusive of, but not limited to the following procedures: identification at each site of any hazardous substances used, or stored on site, assessment of MSDS for each substance, an up-to-date Hazardous Substances Register will be maintained on site, emergency response training will be provided to staff, all oils, fuels and other potentially polluting chemicals will be stored away from drains and where practicable at least 10 m from any surface water bodies within an appropriately sized bunded area, drip trays capable of holding 25% of the total capacity of drums containing fuel or oil will be used, refuelling and servicing will take place, as far as practicable, away from from watercourses and within a designated area of hardstanding or bunded area, spills of fuel, oil or chemicals will be cleaned up immediately and any leaking containers will be replaced, drip trays will be provided for all static compressors, generators, and pumps, plant containing oil and fuel will be parked within a bunded area overnight/at weekends, as far as practicable, and spill kits will be provided in stie compound areas where hazardous substances are stored. Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)) to be followed in emergency situations and for all incidents.	VG	E	1	E1	Low
115		Flora and Fauna	Accidental disposal of ASS/PASS soils resulting in contamination of unaffected areas	Injury and harm to protected species and other wildlife including Hooded Plover	D	5	D5	Extreme	Refer to D&C PGA EMP Att I5 Flora and Fauna Sub-Plan (TDV-0-EV-SB-0011.I5-03), D&C PGA EMP Att I11 Acid Sulfate Soils Management Sub-Plan (TDV-0-EV-SB-0011.I11-02) and D&C PGA EMP Att I7 Soil Management Sub-Plan (TDV-0-EV-SB-0011.I7-02). Measures to ensure no accidental disposal of contaminated soil into unaffected areas will include, but not be limited to: confirmation of final location of stockpiles in daily pre-start meetings (as per D&C PGA EMP Att I7 Soil Management Sub-Plan (TDV-0-EV-SB-0011.I7-02)) and ensure all soil stockpile areas are clearly signposted to ensure clarity of sites and additional sediment traps/fencing is placed around contaminated soil stockpiles to ensure run-off of PASS or ASS soils does not occur, mix lime with the ASS/PASS to neutralise the acid within the soil, minimise the surface area exposed to oxidation and the surface area exposed to potential water infiltration at all times through the use of artificial capping, install diversion banks up-slope to prevent run-on water entering the ASS storage area, and install sediment control structures to ensure sulphide material is not eroded from the storage areas to the surrounding environment. Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)) to be followed in emergency situations and for all incidents.	G	E	3	E3	Moderate
116		Flora and Fauna	Accidental and/or unauthorised removal of native vegetation within the construction area.	Accidental and/or unauthorised removal of native vegetation within the construction area. Removal of native vegetation resulting from protected areas not being clearly marked or machinery moving carelessly through the site.	D	4	D4	High	Refer to D&C PGA EMP Att I5 Flora and Fauna Sub-Plan (TDV-0-EV-SB-0011.I5-03). Actions which will be implemented to avoid and prevent accidental or unauthorised removal of native vegetation will include: all areas of retained native vegetation outside the construction area will be marked or fenced (as 'no-go' zones) prior to the start of construction activities to prevent damage. Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)) to be followed in emergency situations and for all incidents.	VG	E	3	E3	Moderate
117		Hazardous Materials	hazardous material storage and disposal including use of fuels, gases and concrete	Pollution of soils, receiving waters or potential harm / injury to personnel, flora and fauna via discharge of hazardous substance	D	4	D4	High	All handling and storage of hazardous materials will be undertaken in compliance with the D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02). All staff should be educated in the Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)), Site Emergency Response Plan and the sites evacuation procedures. Plant Site EIRP to be followed in emergency situations and for all incidents.	VG	E	3	E3	Moderate
118		Hazardous Materials	Spill resulting from equipment or plant failure (i.e. accidental rupture of tank, etc)	Pollution of soils, receiving waters or potential harm / injury to personnel, flora and fauna via discharge of hazardous substance	D	4	D4	High	All handling and storage of hazardous materials will be undertaken in compliance with the D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02). All staff should be educated in the Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)), Site Emergency Response Plan and the sites evacuation procedures. Plant Site EIRP to be followed in emergency situations and for all incidents.	G	E	2	E2	Low

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119		Hazardous Materials	Careless/negligent act leading to a spill	Pollution of soils, receiving waters or potential harm / injury to personnel, flora and fauna via discharge of hazardous substance	D	4	D4	High	All handling and storage of hazardous materials will be undertaken in compliance with the D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02). All staff should be educated in the Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)), Site Emergency Response Plan and the sites evacuation procedures. Plant Site EIRP to be followed in emergency situations and for all incidents.	G	E	2	E2	Low
120		Hazardous Materials	Bund design is insufficient for the maximum volume of material stored	Pollution of soils, receiving waters or potential harm / injury to personnel, flora and fauna via discharge of hazardous substance	D	4	D4	High	All handling and storage of hazardous materials will be undertaken in compliance with the D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02). All staff should be educated in the Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)), Site Emergency Response Plan and the sites evacuation procedures. Plant Site EIRP to be followed in emergency situations and for all incidents.	G	E	2	E2	Low
121		Hazardous Materials	Unexpected ignition of flammable and combustible liquids during normal construction operations	Pollution of soils, receiving waters or potential harm / injury to personnel, flora and fauna via discharge of hazardous substance	E	4	E4	High	All handling and storage of hazardous materials will be undertaken in compliance with the D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02). All staff should be educated in the Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)). Storage of chemicals to be in accordance with industry guidelines. Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)) to be followed in emergency situations and for all incidents.	G	E	3	E3	Moderate
122		Hazardous Materials	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	D	4	D4	High	All handling and storage of hazardous materials will be undertaken in compliance with the D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02). All staff should be educated in the Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)), Site Emergency Response Plan and the sites evacuation procedures. Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)) to be followed in emergency situations and for all incidents.	G	E	2	E2	Low
123		Hazardous Materials	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 fauna via discharge of hazardous substance	D	5	D5	Extreme	All handling and storage of hazardous materials will be undertaken in compliance with the D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02). All staff should be educated in the Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)), Site Emergency Response Plan and the sites evacuation procedures. Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)) to be followed in emergency situations and for all incidents.	G	E	3	E3	Moderate
124		Resource Efficiency	Environmental contamination	Unforeseen contamination due to inappropriate or illegal disposal of waste	C	5	C5	Extreme	All handling and storage of hazardous materials will be undertaken in compliance with the D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02). Refer to D&C PGA EMP Att I6 Resource Efficiency Sub-Plan (TDV-0-EV-SB-0011.I6-03) and Waste Management Plan. Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)) to be followed in emergency situations and for all incidents. Mitigation measures to include: education programs for workforce, control the source of the contamination, assess the risk and source of contamination, implement temporary controls to contain contamination and review construction method and control measures, monitoring to ensure compliance.	G	E	2	E2	Low
125		Resource Efficiency	Environmental contamination	Unexpected discovery of suspected contaminated soil, liquid or waste material during construction	D	4	D4	High	Refer to D&C PGA EMP Att I6 Resource Efficiency Sub-Plan (TDV-0-EV-SB-0011.I6-03) and Waste Management Plan. Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)) to be followed in emergency situations and for all incidents. Mitigation measures to include: education programs for workforce, control the source of the contamination, assess the risk and source of contamination, implement temporary controls to contain contamination and review construction method and control measures, monitoring to ensure compliance.	G	E	2	E2	Low
126		Social and economic	Site security	Theft, vandalism, unauthorised entry, misuse of vehicles and plant, site damage from vehicles, sabotage, firearm discharge, gross pollution, bushfire ignition	D	2	D2	Low	Secure fuel and chemical stores as described in D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02). Permanent security presence as described in Construction Plan. Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)) to be followed in emergency situations and for all incidents.	VG	E	2	E2	Low

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127		Soil Management	Unexpected discovery of suspected contaminated groundwater.	Localised harm to soil and local water quality	E	4	E4	High Refer to D&C PGA EMP Att I7 Soil Management Sub-Plan (TDV-0-EV-SB-0011.I7-02). If any other contamination is found on site, which has not been previously identified, all work must stop in the affected area and the contamination reported immediately to the Area Environment Manager. Work can only continue, once the material has been assessed and removed, or stabilised. If material is to be retained on site ensure this is undertaken in accordance with the Contamination Investigation and Remediation Procedure. Ongoing monitoring of groundwater wells onsite in accordance with the Groundwater Monitoring and Mitigation Report. Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)) to be followed in emergency situations and for all incidents.	VG	E	1	E1	Low
128		Soil Management	Unexpected discovery of acid sulphate soil or rock during construction	Localised harm to soil and local water quality	E	4	E4	High In the event that acid sulphate soil or rock is encountered, the following contingency measures will be implemented: work will be suspended in the vicinity of the PASS and the Environmental Office (or Area Environment Manager if required) will be contacted, field and analytical testing of the suspected soil prior to excavation progressing to minimise the area of soil exposed, where necessary, any affected soil will be neutralised prior to replacement/reuse/disposal as deemed appropriate. Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)) to be followed in emergency situations and for all incidents.	VG	E	1	E1	Low
129		Surface Water and groundwater	storm, flooding	immediate danger to people's safety, environment, damage to equipment	D	4	D4	High Response Plan to incorporate advance warning forecasts and removal of plant and people to high ground. Monitoring of weather forecasts and communication to workforce. Site Environmental Manager to communicate predicted inclement weather and flood warnings to Supervisory Groups. Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)) to be followed in emergency situations and for all incidents.	VG	E	2	E2	Low
130		Surface Water and groundwater	Contamination of existing waterways resulting from a storm event greater than the one in two year storm event	localised harm to soil and local water quality	C	4	C4	Extreme Refer to D&C PGA EMP Att I7 Soil Management Sub-Plan (TDV-0-EV-SB-0011.I7-02). Mitigation measures include, but are not limited to the following: identifying the cause of any breach, informing EPA, construction 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. Monitoring of weather forecasts and communication to workforce. Site Environmental Manager to communicate predicted inclement weather and flood warnings to Supervisory Groups. D&C PGA EMP Att I7 Soil Management Sub-Plan (TDV-0-EV-SB-0011.I7-02) to be followed in emergency situations and for all incidents.	G	E	2	E2	Low
131		Surface Water and groundwater	Design of temporary sediment controls is insufficient for the maximum exposed area	localised harm to soil and local water quality	D	4	D4	High Refer to D&C PGA EMP Att I7 Soil Management Sub-Plan (TDV-0-EV-SB-0011.I7-02) Mitigation measures include, but are not limited to the following: identifying the cause of any breach, informing EPA, construction 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. 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. Weekly / Daily inspections of sedimentation controls. Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)) to be followed in emergency situations and for all incidents.	G	E	2	E2	Low
132		Surface Water and groundwater	Unforeseen water and soil contamination due to fuel or oil spill	localised harm to soil and local water quality	D	4	D4	High All handling and storage of hazardous materials will be undertaken in compliance with the D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02). Refer to D&C PGA EMP Att I7 Soil Management Sub-Plan (TDV-0-EV-SB-0011.I7-02). Mitigation measures include, but are not limited to the following: identifying the cause of any breach, informing EPA, construction 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. Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)) to be followed in emergency situations and for all incidents.	G	E	2	E2	Low

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133		Surface Water and groundwater	Surface water exposed to sediment flow	localised harm to soil and local water quality	C	4	C4	Extreme	Refer to D&C PGA EMP Att I5 Flora and Fauna Sub-Plan (TDV-0-EV-SB-0011.I5-03) and D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03). Some measures to mitigate the unlikely event of a waterway exposed to sediment flow are inclusive of, but not limited to: stopping works directly or indirectly leading to a breach of sediment controls, instatement of further sediment control measures (eg. geotextile membrane covered straw bales), salvage and translocation measures will be enacted to remove any significant species at risk. Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)) to be followed in emergency situations and for all incidents.	VG	E	3	E3	Moderate
134		Waterways and Wetlands	Accidental contamination of a waterway and/or area of vegetation or significant habitat, through the incorrect disposal of ASS/PASS soils or rock.		D	3	D3	Moderate	Refer to D&C PGA EMP Att I10 Wetlands and Waterways Sub-Plan (TDV-0-EV-SB-0011.I10-03). All staff should be educated in the Environmental Incident Response Plan. Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)) to be followed in emergency situations and for all incidents.	VG	E	2	E2	Low
135		Waterways and Wetlands	Accidental chemical spill within, or in the immediate vicinity of a waterway	Sensitive waterway be compromised as a result of de-stabilisation, there may be impacts on significant species and potentially the Western Port Ramsar site.	B	3	B3	High	All handling and storage of hazardous materials will be undertaken in compliance with the D&C PGA EMP Att I2 Hazardous Material Sub-Plan (TDV-0-EV-SB-0011.I2-02). Measures to address an accidental chemical spill within, or in the immediate vicinity of a waterway will include, but not be limited to: ~ Dam water flow either side of area of the spill; ~ Provision of booms and/or spill kits for clean up of spills within the waterway (where applicable); ~ Dependant on the type of spill (i.e. soluble versus insoluble), rapid instigation of the boom to clean the spill within the waterway; ~ Assess the risk from the contamination/spill, if required, the EPA will be informed; ~ Dependant upon extent of and type of spill, mitigation measures may be decided upon by the EPA in consultation with relevant CMAs and water management organizations (i.e. Melbourne Water); ~ Salvage and translocation measures will be undertaken within the waterway, in particular for significant species including Dwarf Galaxias, Australian Grayling and Australian Mudfish using a combination of fish survey equipment (i.e. collapsible bait traps, fyke nets, backpack electrofishing, seine nets and dip nets) as soon as possible to the incident occurring; ~ Undertake water testing to assess the potential effect on water quality within that waterway and connected waterways, dependant upon the extent and type of contamination; and, ~ A report will be made to the Environment Manager of the VDP detailing the location, size and composition of the spill within the waterway, along with any mitigation measure(s) used and photograph (where possible) of the incident. This will be logged in an Environmental Incident Report File and subject to auditing. Plant Site Environmental Incident Response Plan (D&C PGA EMP Att K Environmental Incident Response Plan (TDV-0-EV-PL-0011.K-03)) to be followed in emergency situations and for all incidents.	VG	E	3	E3	Moderate

Risk #	Activity / Construction Method	Performance Criteria / Performance Requirement SUBJECT	Potential Hazard (Environmental Aspect & Impact Pathway)	At Risk (Potential Impact)	Probability (Table 2)	Consequence (Table 3)	Inherent Risk (Before Controls)	Controls: current or planned prior to work to ensure obligations (including performance requirements and performance criteria) are met (Table 4 - reference specific option)	Control effectiveness (Table 5)	Probability (Table 2)	Consequence (Table 3)	Residual Risk (After Controls)	
136		Waterways and Wetlands	Waterway destabilisation is likely the result if a pipe-jacking attempt on a waterway is compromised	Sensitive waterway be compromised as a result of de-stabilisation, there may be impacts on significant species.	E	5	E5	High Refer to D&C PGA EMP Att I10 Wetlands and Waterways Sub-Plan (TDV-0-EV-SB-0011.I10-03). Appropriate mitigation to prevent such incidents will be inclusive of, but not limited to: ~ Suitably qualified specialist construction team will be employed to undertake pipe-jacking activities; ~ Construction team will be made aware of warning signs of bank/streambed de-stabilisation: i.e. - fissures, frags and bubbling along the stream bed; ~ Construction technique will be engineered in detail to minimize that likelihood of waterway collapse under pipe-jacking or trenching activities; and, ~ All appropriate sediment controls will be in place (as per Water Quality and Erosion Management Sub-Plan) to ensure minimisation of sediment flow and erosion, should any de-stabilisation occur and some damage occurs to the waterway banks and/or stream bed. Should any of these preventative measures be insufficient to prevent a waterway de-stabilisation, the following mitigation actions will be undertaken to ameliorate the potential effects; inclusive of but not limited to: ~ A suitably qualified zoologist/aquatic ecologist will be present at times of waterway crossings, or during significant excavation works in close proximity to a sensitive waterway (particularly those identified as sensitive or supporting significant fauna species); ~ Should any damage to the waterway occur during crossing (pipe-jacking or boring), an aquatic ecologist will undertake salvage and translocation measures as required. Fish surveys will be conducted using a combination of fish equipment (i.e. collapsible bait traps, fyke nets, backpack electrofishing, seine nets and dip nets) this will be conducted as soon as possible to the incident occurring; ~ The construction method and control measures will be immediately halted, reviewed and improved where necessary; ~ Placement of Rip Rap into the waterway where the banks have collapsed, to limit sedimentation and erosion of the adjoining banks into the unaffected sections of the waterway; ~ The modified methods and controls will be monitored to ensure compliance has been achieved and on-going; ~ On-going water quality monitoring will be undertaken in accordance with the Water Quality and Erosion Management Sub-Plan, to ensure no negative effects are imparted on the waterway; and, ~ Monitoring of populations of significant species (particularly Dwarf Galaxias, Australian Grayling and Australian Mudfish) will be undertaken using a combination of fish survey equipment (i.e. collapsible bait traps, fyke nets, backpack electrofishing, seine nets and dip nets) to assess any negative impacts as a result of damage to the waterway. Plant Site EIRP to be followed in emergency situations and for all incidents.	VG	E	2	E2	Low
137	Soil Management (ASS)	Surface Water and Goundwater	Acidification of groundwater as a result of susurface exposure, from the drawdown of groundwater during construction	Reduction in surface water and ground water quality, impacts to flora and fauna	C	3	C3	High Surface water and groundwater will be monitored and managed in accordance with D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03) (monitoring in accordance with MIRA schedule). Intrusive soil investigations of plant site undertaken. D&C PGA EMP Att I11 Acid Sulfate Soils Management Sub-Plan (TDV-0-EV-SB-0011.I11-02) developed in response to findings of soil investigations and personnel trained in in-field sampling procedure. ASS managed on site with impacted soil removed to treatment pad, mixed with lime (according to liming rates from laboratory results), verification samples taken to ensure soil limed sufficiently to neutralise ASS and then material reused on site as fill. All management conducted in accordance with D&C PGA EMP Att I11 Acid Sulfate Soils Management Sub-Plan (TDV-0-EV-SB-0011.I11-02).	G	C	2	C2	Moderate
138	Soil Management (ASS)	Surface Water and Goundwater	Accidental contamination of a surface water or groundwater through the incorrect disposal of ASS/PASS soils or rock.	Reduction in surface water and ground water quality, impacts to flora and fauna	C	3	C3	High Surface water and groundwater will be monitored and managed in accordance with D&C PGA EMP Att I19 Water Quality and Erosion Management Sub-Plan (TDV-0-EV-SB-0011.I9-03) (monitoring in accordance with MIRA schedule). Intrusive soil investigations of plant site undertaken. D&C PGA EMP Att I11 Acid Sulfate Soils Management Sub-Plan (TDV-0-EV-SB-0011.I11-02) developed in response to findings of soil investigations and personnel trained in in-field sampling procedure. ASS managed on site with impacted soil removed to treatment pad, mixed with lime (according to liming rates from laboratory results), verification samples taken to ensure soil limed sufficiently to neutralise ASS and then material reused on site as fill. All management conducted in accordance with D&C PGA EMP Att I11 Acid Sulfate Soils Management Sub-Plan (TDV-0-EV-SB-0011.I11-02).	G	D	2	D2	Low

ATTACHMENT C - ENVIRONMENTAL CONSEQUENCE LEVEL DEFINITIONS

Consequence Level		1 - Insignificant	2 - Minor	3 - Moderate	4 - Major	5 - Catastrophic
Category	Sub Category	Minimal impact in a localised area within natural variability	Low impact in a localised or regional area with a functional recovery within less than 1 year	Medium impact in a localised or regional area with a functional recover of 1 to 5 years	High impact in a localised or regional area with a functional recovery within 5 to 10 years	Very high impact in a regional area with functional recover in greater than 10 years if at all
Environmental	Ecosystem Function (need to consider resilience and resistance)	Alteration or disturbance to ecosystem interactions in the localised area, if any, unlikely to be detectable and within expected natural seasonal variation / occurrence.	Alteration or disturbance to ecosystem interaction in the localised or regional area, may be detectable but within expected natural annual variation / occurrence. Functional recovery within less than 1 year.	Alteration or disturbance to ecosystem interactions in the localised or regional area, detectable but within expected natural short-term variation / occurrence. Functional recovery within 1 to 5 years.	Alteration or disturbance to ecosystem interactions in the localised or regional area, detectable and beyond expected natural variation / occurrence. Functional recovery within 5 to 10 years.	Alteration or disturbance to ecosystem interactions in the regional area, substantially beyond expected natural variation / occurrence to irreversible. Functional recovery in greater than 10 years if at all.
	Fauna and Flora Communities and Species	Loss of individuals not apparent and without reduction in localised population viability (e.g. Mortality likely to be no greater than population experiences within natural annual variability).	Loss of small number of individuals without reduction in viability of population in the localised or regional area (e.g. Mortality likely to be no greater than population experiences within natural annual variability). Functional recovery within less than 1 year.	Loss of individuals leads to reduction in viability of population in the localised or regional area. Functional recovery within 1 to 5 years.	Loss of large number of individuals leads to a high impact on populations in the localised or regional area. Functional recovery within 5 to 10 years.	Long-term impact on populations in the regional area that may not be recoverable. Functional recovery in greater than 10 years if at all.
Social	Aboriginal Heritage Sites	No measurable impact on indigenous heritage sites in the project area.	Partial removal of one or more indigenous archaeological sites of low significance.	Complete or partial disturbance to between one and five indigenous archaeological sites of low to moderate significance.	Complete or partial disturbance to six or more indigenous archaeological sites of low-moderate significance.	Complete or partial disturbance to one or more indigenous archaeological sites of high significance.
	Historical Heritage Sites	No measurable impact on historical heritage sites.	Detectable impact to state or Commonwealth significant site with heritage values remaining largely intact.	Partial reduction in heritage value intrinsic to state or Commonwealth significant site.	Substantial reduction in heritage value intrinsic to state or Commonwealth significant site.	Complete loss of heritage value intrinsic to state or Commonwealth significant site.
	Maritime Heritage Sites	No measurable impact on maritime heritage sites.	Detectable impact to state or Commonwealth significant site with heritage values remaining largely intact.	Partial reduction in heritage value intrinsic to state or Commonwealth significant site.	Substantial reduction in heritage value intrinsic to state or Commonwealth significant site.	Complete loss of heritage value intrinsic to state or Commonwealth significant site.
	Health and Safety	Injury or illness treatable by basic first aid - no lasting effects on health.	Injury or illness requires professional medical assistance to treat.	Injury or illness requires admittance to hospital to treat.	Serious injury or illness requiring long term medical treatment.	Fatality or permanent disability as a result of injury or illness.
	Recreation	Temporary and localised impacts on recreation - no lasting effects.	Short term impacts on recreational activities within the localised area or regional area. Functional recovery within less than 1 year.	Impacts on recreational activities within the localised area or regional area that negatively impact on access to recreation opportunities and/or participation rates. Functional recovery within 1 to 5 years.	Impacts on recreational activities within the localised area or regional area that significantly negatively impact on access to recreation opportunities and/or participation rates. Functional recovery within 5 to 10 years.	Access to recreational activities within the regional area permanently reduced. Functional recovery in greater than 10 years if at all.
	Amenity (Physical factors e.g. Noise, air and water etc.)	Temporary localised impacts on amenity - no lasting effects.	Short term impacts on amenity to the localised area or regional area. Functional recovery within less than 1 year.	Impacts on amenity to the localised area or regional area that negatively alter perceptions of the area. Functional recovery within 1 to 5 years.	Impacts on amenity to the localised area or regional area that significantly negatively alter perceptions of the area. Functional recovery within 5 to 10 years.	Amenity of the regional area permanently negatively altered. Functional recovery in greater than 10 years if at all.
	Tourism	Limited and short-term reduction in tourist visitation not outside usual variation. No significant impact on tourism businesses. Region still seen as attractive place to visit. No recovery necessary.	Short-term reduction in tourism use. Recovery within less than 1 year.	Reduction in tourism use. Recovery within 1 to 5 years.	Large reduction of tourism uses. Business viability compromised across wide range of sectors with substantial business failure in both direct and flow-on sectors. Recovery within 5 to 10 years.	Permanent loss of iconic tourism assets of regional significance. Large flow-on effects to supporting businesses. Functional recovery in greater than 10 years if at all.
	Commercial Fishing	Limited and short-term reduction in activity within the localised area. No significant impact on businesses. No recovery necessary.	Short-term reduction in commercial activity, in the localised area or regional area. Functional recovery within less than 1 year.	Reduction of 5 - 30% in sustainable yield of the fishery in the localised area or	Reduction of 30 - 90% in sustainable yield of the fishery in the localised area or regional area. Functional recovery within 5 to 10 years.	Commercial fishing completely and permanently prohibited or destroyed in the regional area. Functional recovery in greater than 10 years if at all.
	Labour Markets	Limited and short-term impact on labour markets. No significant impact on business operations. No recovery necessary.	Short-term reduction in available local labour. Functional recovery within less than 1 year.	Medium-term reduction in available local labour. Functional recovery within 1 to 5 years.	Large reduction in available local labour. Business viability compromised across wide range of sectors. Functional recovery within 5 to 10 years.	Permanent loss of local labour. Large flow on effects to local businesses. Functional recovery in greater than 10 years if at all.