ENVIRONMENTAL RISK REGISTER - UTILITIES

Risk #	Area and activity/service	Performance Criteria / Performance Requirement SUBJECT	Potential Hazard (Environmental Aspect)	At Risk (Potential Impact)	Probability (Table 2)	Consequence (Table 3)		Inherent Risk (Before Controls)	Controls: current or planned prior to work (Table 4 - reference specific option)	Control effectiveness (Table 5)	Probability (Table 2)	Consequence (Table 3)		Inherent Risk (After Controls)
	Definitions for consequence, probability and other abbreviations in this register can be found in the Risk (Aspects) Register and Risk Matrix													
	Utilities Site and ROW establishment													
1	**Land owner liaison, Geotechnical factual investigations, Feature survey**	**Access and activities on Agricultural land**	Spread of agricultural pests and disease	Movement of soils affected with Potato Cyst Nematode, Bovine Johne's disease and *Phytophthora cinnamomi*	C	3	C3	High	Develop a Biosecurity Management Procedure to direct the washdown of vehicles, plant, equipment and personnel on entry and exit of each property.	G	E	3	E3	Moderate
2	**Geotechnical investigation in areas of probable ASS**	**Acid sulfate soils, Agriculture**	Disturbance of PASS / AASS at geotechnical test sites	Adverse effects to receiving waters and associated ecosystems from run-off and leachate.	D	3	D3	Moderate	Strip topsoil above test pits to 150mm and stockpile separately to reinstate following testing.	VG	E	2	E2	Low
3			Disturbance of PASS / AASS at geotechnical test sites	Exposure of livestock to contaminated soil.	D	2	D2	Low	Strip topsoil above test pits to 150mm and stockpile separately to reinstate following testing.	VG	E	2	E2	Low
4	**Environmental surveys and baseline assessments**	**Flora and fauna**	Taking of protected flora and fauna (protected under EPBC and FFG Act)	Damage or disturbance to significant flora, fauna and habitats	C	3	C3	High	Ensure suitable trained and licensed persons undertake flora and fauna surveys	VG	D	2	D2	Low
5	**Fencing**	**Access and activities on Agricultural land**	Site establishment activities outside of corridor	Disturbance to farming activities resulting in loss of production or routine operations	D	3	D3	Moderate	Conduct pre-, during- and post-construction landowner liaison to provide landowners with relevant information about the project and project team to develop mitigation plans	VG	D	2	D2	Low
6	**Vegetation clearing**	**Flora and fauna**	Impact to native vegetation and/or retained vegetation. Impact to native fauna. Damage or disturbance to surface water ecosystems	Damage or disturbance to significant flora, fauna and habitats. Significant impact to threatened species. Fauna mortality resulting from vegetation clearing activities	C	3	C3	High	Pre-clearance habitat and targeted surveys. All known and potential habitat will be marked on SEPs. Targeted capture and relocation to be undertaken by fauna spotters at all areas of native fauna habitat (general and significant species). Refer to Flora and Fauna Sub Plan (Attachment I5).	G	E	3	E3	Moderate
7	**Vegetation clearing, selection of access tracks and extra work spaces**	**Flora and fauna**	Excavation, transfer of material and movement of stockpiles impacting on properties	Impact to native vegetation and/or retained vegetation	C	4	C4	Extreme	Pre clearance habitat assessments and targeted surveys for significant species. Minimise construction footprint, where possible, through areas of native vegetation. Refer to Flora and Fauna Sub Plan (Attachment I5).	G	D	3	D3	Moderate
8	**Topsoil stripping (150mm) and stockpiling using graders, excavators and dozers**	**Surface water quality, Erosion and sediment control**	Increase in sheet and rill erosion.	Increased sediment load to nearby surface waters. Erosion of land and loss of topsoil. Increase in sediment load to waterways. Non compliance under Water Act and SEPP (surface water and groundwater) requirements	C	3	C3	High	Prior to commencement of construction and site clearance, a network diversion drains will be constructed across slopes to direct runoff at a non erosive velocity. Temporary erosion and sediments control structures will be placed around stockpiles where required to minimise erosion.	G	D	3	D3	Moderate
9	**Topsoil stripping (150mm) and earthworks**	**Soil Management**	Exposure of contaminated materials	Impact to human health and habitat	C	3	C3	High	Confirm potential for contaminated spoil and acid sulfate soils prior to construction to prevent inappropriate management of such spoil types.	G	E	3	E3	Moderate

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10	**Topsoil stripping (150mm) and earthworks**	**Soil Management**	Exposure of contaminated 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	Contaminated spoil removed from the site is appropriately classified through completion of a sampling programme involving methodologies and procedures set out in the relevant sections of Schedule B(2) of the Assessment of Site Contamination NEPM, Victorian EPA Publication 448.3 – Classification of Wastes and State Environmental Protection Policy (Prevention and Management of Contaminated Land).	G	D	2	D2	Low
11	**Site establishment earthworks**	**Cultural Heritage**	Establishment of access roads , clearing for ROW and removal of topsoil	Impact to aboriginal sites previously unrecorded or recorded	E	4	E4	High	Implementation of cultural heritage management contingency plan from CHMP attached to the Archaeological and Cultural Heritage Sub Plan (Attachment I4.)	G	E	3	E3	Moderate
12	**Site establishment earthworks**	**Water quality and erosion control, Flora and fauna**	Changes to surface water hydrology.	Damage or disturbance to surface water ecosystems	C	4	C4	Extreme	A network diversion drains will be constructed across slopes to direct runoff at a non erosive velocity. Temporary erosion and sediments control structures will be placed around stockpiles where required to minimise erosion. Refer to the Water Quality and Erosion Control Sub plan (Attachment I 9).	G	D	3	D3	Moderate
13	**Bulk earthworks in areas of side cut and crossings using excavators and dozers**	**Contaminated soil**	Excavation, transfer of material and movement of contaminated 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	Contaminated spoil removed from the site is appropriately classified through completion of a sampling programme involving methodologies and procedures set out in the relevant sections of Schedule B(2) of the Assessment of Site Contamination NEPM, Victorian EPA Publication 448.3 – Classification of Wastes and State Environmental Protection Policy (Prevention and Management of Contaminated Land)	G	D	3	D3	Moderate
14	**Transportation of 100mm road base (siltstone from quarry)**	**Flora and fauna**	Spread of Phytophthora	Impact to remnant EVC and associated fauna habitat as a result of dieback	D	3	D3	Moderate	Develop a Biosecurity Management Procedure to direct the washdown of vehicles, plant, equipment and personnel on entry and exit of each property. Refer to Flora and Fauna Sub Plan (Attachment I5).	G	E	3	E3	Moderate
15	**Construction of haul road to provide all weather access along RoW**	**Public safety, surface water quality**	Vehicle movements on and off corridor resulting in transportation of mud onto public roads.	Public safety as a result of changed traffic conditions, particularly around schools. Increased turbidity in receiving waters.	D	5	D5	Extreme	Prepare traffic management plan in consultation with relevant road authorities to direct the movement of trucks between site and disposal locations. Limit truck movements around schools to outside of morning and afternoon drop off and pick up times. Monitor mud on roads. Use street sweepers as required. Install rumble grids, wheel wash and or washed ballast at entry points to paved road.	G	C	2	C2	Moderate
16	**Site office**	**Resource efficiency**	Generation of office waste	Increased waste to landfill.	C	2	C2	Moderate	Separated and recycle waste where possible.	G	D	2	D2	Low

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17	**Site office**	**Resource efficiency**	Excessive use of energy including for lights, air conditioning	Use of resources, increase in greenhouse gases gas production	C	2	C2	Moderate	Promote the efficient use and conservation of resources as part of the training program for all personnel including contractors, subcontractors and operators. Include the waste management hierarchy in the induction with an emphasis on avoidance and minimisation.	F	D	2	D2	Low
	General Utilities Construction Activities													
18	**All site works**	**Flora and fauna**	Taking of protected flora and fauna (protected under EPBC and FFG Act)	Damage or disturbance to flora, fauna and habitats	D	4	D4	High	All contractors will be made aware of the environmental values and areas of ecological sensitivity as and during site induction to the site. Refer to Flora and Fauna Sub Plan	G	D	3	D3	Moderate
19	**All site works**	**Flora and fauna**	Movement of machinery and site vehicles	Impact to fauna resulting from collision with vehicles and machinery	D	4	D4	High	Site speed limit to be restricted to 20km per hour. Refer to Flora and Fauna Sub Plan (Attachment I5).	G	D	3	D3	Moderate
20	**All site works**	**Water quality and erosion control**	Design of temporary sediment controls is insufficient for the maximum exposed area	Localised harm to soil and local water quality	C	3	C3	High	Inspections and maintenance of temporary erosion and sediment controls will be completed through construction phase. Refer to the Water Quality and Erosion Control Sub Plan (Attachment I9).	G	C	2	C2	Moderate
21	**Movement of plant, vehicles, equipment and personnel between waterways and EVCs**	**Flora and fauna**	Spread of known pathogen of flora and fauna (Phytophthora and Chytrid Fungus)	Infection of fauna and flora resulting from transmission of the disease by vehicle, person, disposal of contaminated material	C	4	C4	Extreme	Develop a Biosecurity Management Procedure to direct the washdown of vehicles, plant, equipment and personnel between patches of habitat. Refer to Flora and Fauna Sub Plan (Attachment I5).	G	E	3	E3	Moderate
22	**Bulk earthworks (ROW benching and trenching)**	**Cultural Heritage**	Excavation, transfer of material and movement of stockpiles impacting on properties, or sensitive receivers	Impact to aboriginal sites previously unrecorded or recorded	E	4	E4	High	Implementation of cultural heritage management contingency plan.	G	E	3	E3	Moderate
23	**Bulk earthworks (ROW benching and trenching)**	**Flora and fauna**	Excavation of soils leading to a large scale erosion event	Impact to protected species and other wildlife (e.g. aquatic species)	E	4	E4	High	Prior to commencement of construction and site clearance, a network diversion drains will be constructed across slopes to direct runoff at a non erosive velocity.	G	E	2	E2	Low
24	**Hazardous materials storage**	**Hazardous materials**	Hazardous material storage and disposal including use of fuels, gases and concrete. 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	3	D3	Moderate	Clean up all spills immediately. Contain and absorb spill with sand, earth, inert material or vermiculite. Clean area and DO NOT discharge into sewer or waterways. Refer to the Soil Management Sub Plan (Attachment I.7). Bulk storage chemicals will not occur within 30-50m of a waterway and will not occur within a floodplain or land subject to inundation. Refer to the Water Quality and Erosion Control Sub Plan (Attachment I9). Bulk fuel storage areas (drums or bulk storage tanks) will be bunded in accordance with EPA Bunding Guidelines. Refer to the Hazardous Materials Sub Plan (Attachment I2).	G	E	3	E3	Moderate

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25	**Hazardous materials bunding**	**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	C	3	C3	High	Bulk fuel storage areas (drums or bulk storage tanks) will be bunded in accordance with EPA Bunding Guidelines. Install bunds where appropriate to reduce the risk of spills entering the stormwater drainage system. Refer to the Hazardous Materials Sub Plan (Attachment I2).	G	D	2	D2	Low
26	**Hazardous materials transport**	**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	C	3	C3	High	Refer to Environmental Incident Response Plan (Attachment K). Refer to the contingency response for spills to water in Water Quality and Erosion Control Sub Plan (Attachment I9). Refer to Contaminated Land Procedure in Soil Management Sub Plan (Attachment I.7) for spills to soil.	G	D	3	D3	Moderate
27	**All works involving plant, vehicle or equipment with fuel or other hazardous substances**	**Hazardous materials**	Spill resulting from equipment or plant failure (i.e. accidental rupture of tank, etc), careless/negligent act	Pollution of soils, receiving waters or potential harm / injury to personnel, flora and fauna via discharge of hazardous substance	C	3	C3	High	Ensure appropriate capacity spills kits are readily accessible to areas where hazardous materials and specifically, hydrocarbons are stored. All employees and sub contractors will receive induction training which will include the safe use of hazardous substances being used at the workplace. Refer to Contaminated Land Procedure in Soil Management Sub Plan (Attachment I.7) for spills to soil	G	D	2	D2	Low
28	**Vehicle movements, excavation, site general**	**Air quality**	Excavation, transfer of material and movement of stockpiles and soils, or general site management resulting in reduction in air quality from dust	Dust disturbance and impacts on sensitive receptors	B	3	B3	High	Dust from stockpiles may also be controlled by allow vegetation to establish or spraying with a polymer based crusting agent that seals the surface of the stockpile to aid dust suppression. Refer to Air Quality Sub-plan (Attachment I4).	G	C	3	C3	High
29	**Works in periods of extreme weather**	**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	B	4	B4	Extreme	Under strong wind conditions, review the frequency of watering and spraying of surfaces and, if conditions are dry, increase across the site to control dust generation. Refer to Air Quality Sub-plan (Attachment I4).	F	B	3	B3	High
30	**Dust control**	**Resource efficiency**	Excessive use of water	Depletion of resources	C	2	C2	Moderate	Recycled water will be used for dust suppression spraying over potable water where possible.	G	D	2	D2	Low
31	**Hot works**	**Hazardous materials, social and economic, impacts to agricultural productivity**	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	C	3	C3	High	Dangerous goods storage areas will be isolated from all sources of ignition and appropriate fire extinguisher coverage provided.	G	D	2	D2	Low
32	**Hot works**	**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	4	D4	High	Permits will be obtained from the relevant authorities for welding and other hot works during total fire ban days . Refer to Air Quality Sub-plan (Attachment I4).	G	D	3	D3	Moderate
33	**Hot works**	**Flora and fauna**	Fire event	Impact to protected species and other wildlife	E	4	E4	High	Permits will be obtained from the relevant authorities for welding and other hot works during total fire ban days	G	E	3	E3	Moderate

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34	**Trenching and excavations**	**Flora and fauna**	Impact to fauna resulting from access to open pits/trenches (fall, entrapment or stress)	Impacts to protected native fauna.	D	4	D4	High	Daily trench checks. In areas of suitable habitat during construction, trenches will be open for minimum time practicable. Fauna ramps will be provided to enable small ground dwelling fauna which enter the trench to exit. Refer to Flora and Fauna Sub Plan (Attachment I5).	G	D	3	D3	Moderate
35	**Trenching and excavations**	**Flora and fauna**	Erosion and runoff from stockpiles with poor water quality.	Damage or disturbance to surface water ecosystems	C	4	C4	Extreme	Temporary erosion and sediments control structures will be placed around stockpiles where required to minimise erosion. Refer to the Water Quality and Erosion Control Sub Plan (Attachment I 9).	G	D	3	D3	Moderate
36	**Trenching and excavations**	**Flora and fauna, Soil Management**	Accidental disposal of ASS/PASS soils resulting in contamination of non-ASS affected areas	Impact to aquatic species from leachate	C	4	C4	Extreme	Assess the extent of ASS along utilities corridor and develop management plan in consultation with EPA. Refer to Acid Sulfate Soil Sub Plan (Attachment I12).	G	E	3	E3	Moderate
37	**Trenching and excavations**	**Soil Management**	Excavation, transfer of material and movement of stockpiles and soils	Impact to human health and habitat. Contaminated materials not handled in accordance with NEPM and EPA guidelines. Possible inappropriate disposal or further contamination of soils / waterways	C	2	C2	Moderate	In all areas regularly inspect and monitor spoil generated by excavation activities for indicators of possible contamination. Typical indicators of contamination include: - Odorous and/or discoloured/stained material - Asbestos containing materials - Oil/Grease and/or hydrocarbon sheen - Drums/containers of any sort - Fluids/liquids other than groundwater - Putrescibles wastes, general rubbish - Unknown wastes and objects - Unexpected fill materials. If any of the above items are identified, stop work and follow procedures detailed in the Soil Management Sub Plan, section 9 Contingency Measures Contaminated spoil removed from the site is appropriately classified through completion of a sampling programme involving methodologies and procedures set out in the relevant sections of Schedule B(2) of the Assessment of Site Contamination NEPM, Victorian EPA Publication 448.3 – Classification of Wastes and State Environmental Protection Policy (Prevention and Management of Contaminated Land). Refer to Soil Management Sub Plan	G	D	3	D3	Moderate
38	**Trenching and excavations**	**Soil Management**	Unexpected discovery of suspected contaminated soil or groundwater.	Localised harm to soil and local water quality	C	3	C3	High	Follow procedures detailed in the Soil Management Sub Plan, section 9 Contingency Measures	G	C	2	C2	Moderate
39	**Trenching and excavations**	**Soil Management**	Unexpected discovery of acid sulphate soil or rock during construction	Localised harm to soil and local water quality	C	3	C3	High	Follow procedures detailed in the Acid Sulfate Soil Sub Plan (Attachment I12).	G	C	2	C2	Moderate
40	**Trenching and excavations**	**Noise and vibration**	Excavation, transfer of material and movement of stockpiles and soils	Potential for noise and vibration to disturb sensitive receptor	C	3	C3	High	Restrict noisy works to normal working hours. Refer to the Noise and Vibration Sub Plan (Attachment I8).	VG	D	3	D3	Moderate

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	Trenching and excavations	**Water quality and erosion control**	Impacts to water quality level or quality.	Reduction in groundwater quality and levels.	E	3	E3	Moderate	Monitoring groundwater quality and levels pre- and post-construction. Notify EPA and SRW if significant change in quality and levels detected. Refer to Water Quality and Erosion Control Sub Plan (Attachment I 9).	VG	E	2	E2	Low
41	**Disposal of waste**	**Resource efficiency**	Unforseen contamination due to inappropriate or illegal disposal of waste	Localised harm to soil and local water quality	C	4	C4	Extreme	All waste to be classified and transported offsite in accordance with EPA Waste Management policies and a Waste Transport Certificate completed and retained where wastes are classified as Prescribed Waste. Consult the Area Environmental Manager on the nature or classification of a waste if it is unknown. Refer to the Resource Efficiency Sub Plan (Attachment I 6).	VG	D	3	D3	Moderate
42	**Disposal of waste**	**Resource efficiency**	Inappropriate handing of waste (e.g. packaging etc) not in accordance with the EPA Waste Management Policies	Contamination of soil and waterways	C	3	C3	High	All waste to be classified and transported offsite in accordance with EPA Waste Management policies and a Waste Transport Certificate completed and retained where wastes are classified as Prescribed Waste. Consult the Area Environmental Manager on the nature or classification of a waste if it is unknown. Refer to the Resource Efficiency Sub Plan (Attachment I 6).	VG	D	3	D3	Moderate
43	**Disposal of waste**	**Resource efficiency**	Unforseen contamination due to inappropriate or illegal disposal of waste	Localised harm to soil and local water quality	C	4	C4	Extreme	All waste to be classified and transported offsite in accordance with EPA Waste Management policies and a Waste Transport Certificate completed and retained where wastes are classified as Prescribed Waste. Consult the Area Environmental Manager on the nature or classification of a waste if it is unknown. Refer to the Resource Efficiency Sub Plan (Attachment I 6).	VG	D	3	D3	Moderate
44	**High and Medium Flow Waterway Crossings Construction Activities**													
	Waterway crossings	**Water quality and erosion control**	Establishment of access roads, clearing of ROW and removal of vegetation	Flood protection systems not maintained resulting in a flooding event.	C	4	C4	Extreme	Any works directly affecting flood control systems to be done under permit to work form relevant asset manager. Implement a flood warning system including daily check of weather forecasts (Bureau of Meteorology) and information distribution to key site personnel and installation of real time water level monitor. Refer to Waterways and Wetlands Sub Plan (Attachment I10).	G	E	4	E4	High
45	**Waterway crossings**	**Waterways and wetlands**	Excavation, transfer of material and movement of stockpiles, equipment and materials	Negative impact to sensitive waterways such as loss of habitat, reduction in habitat quality, damage to bank vegetation, loss of sediment to waterway.	C	3	C3	High	Temporary erosion and sediments control structures will be placed around stockpiles where required to minimise erosion.	G	D	3	D3	Moderate
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47	**Waterway crossings**	**Water quality and erosion control**	Open trench waterway crossings resulting in direct disturbance to waterways.	Disturbance to waterways and impact to flood dependent ecosystems	D	3	D3	Moderate	Works in medium and high flow waterways to be completed by a special crossing crew to minimise the construction period. Temporary reinstatement works to be completed if full reinstatement not possible following construction. Refer to Waterways and Wetlands Sub Plan (Attachment I10).	G	C	2	C2	Moderate
48	**Waterway crossings**	**Water quality and erosion control, Flora and fauna**	Change in surface hydrology or aquifer recharge as a result during construction.	Reduction in flow regime in waterways, wetlands or groundwater aquifers. Disturbance to flood dependent ecosystems	D	2	D2	Low	Works in medium and high flow waterways to be completed by a special crossing crew to minimise the construction period. Temporary reinstatement works to be completed if full reinstatement not possible following construction. Refer to Waterways and Wetlands Sub Plan (Attachment I10).	G	E	2	E2	Low
49	**Waterway crossings**	**Water quality and erosion control**	Increase in sediment load in waterways as s result of bypass / diversion pumps or flood event.	Reduction in surface water quality.	C	4	C4	Extreme	Temporary erosion and sediments control structures will be placed around stockpiles where required to minimise erosion. Refer to Waterways and Wetlands Sub Plan (Attachment I10)	G	C	2	C2	Moderate
50	**Waterway crossings**	**Water quality and erosion control**	Design not to Authority requirements.	Works not designed in accordance with Authority requirements resulting in impact to agricultural or sensitive receivers	C	3	C3	High	Waterways crossing designs to be provided to waterway asset manager.	VG	E	2	E2	Low
51	**Waterway crossings**	**Water quality and erosion control**	Excavation, transfer of material and movement of stockpiles and soils	Flood protection systems not maintained resulting in a flooding event	C	3	C3	High	Any works directly affecting flood control systems to be done under permit to work form relevant asset manager. Implement a flood warning system including daily check of weather forecasts (Bureau of Meteorology) and information distribution to key site personnel and installation of real time water level monitor. Refer to Waterways and Wetlands Sub Plan (Attachment I10).	G	C	2	C2	Moderate
52	**Waterway crossings**	**Water quality and erosion control**	Diversion of discharge of water from site.	Non compliance under Water Act and SEPP (surface water and groundwater) requirements. Increase in sediment to nearby surface waters and waterways	C	4	C4	Extreme	Any discharge to waterways must have approval from the EPA and relevant Waterway Management Authority. Refer to contingency plans in Attachment I9 Water Quality and Erosion Control Sub Plan.	G	C	2	C2	Moderate
53	**Waterway crossings**	**Water quality and erosion control**	Site dewatering including horizontal strip drains and vertical spears.	Reduction of groundwater recharge to wetlands, disturbing or depleting existing groundwater tables may affect spring fed dams	E	3	E3	Moderate	Monitoring groundwater levels pre- and post-construction. Notify SRW if significant change in levels detected. Attachment I9 Water Quality and Erosion Control Sub Plan.	VG	E	2	E2	Low
54	**Waterway crossings**	**Water quality and erosion control**	Construction in waterways, temporary reinstatement.	Reduction in groundwater quality and levels. Reduction in surface water quality	D	3	D3	Moderate	Monitoring groundwater quality and levels pre- and post-construction. Notify EPA and SRW if significant change in quality and levels detected.	G	C	2	C2	Moderate
55	**Waterway crossings**	**Water quality and erosion control**	Deep excavations below water table in areas of ASS.	Exposure of in situ PASS to oxidation and subsequent acidification of groundwater	D	3	D3	Moderate	Minimise period of dewatering / exposure of PASS. Monitoring groundwater quality pre- and post-construction in areas where dewatering of ASS will occur. Notify EPA and SRW if significant change in quality detected. Refer to Acid Sulfate Soil Management Plan	G	C	2	C2	Moderate

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56	**Waterway crossings**	**Water quality and erosion control**	Unforseen water and soil contamination due to fuel or oil spill such as during refuelling of pumps	Localised harm to soil and local water quality	C	3	C3	High	Refer to contingency plans in Attachment I9 Water Quality and Erosion Control Sub Plan	G	C	2	C2	Moderate
57	**Waterway crossings**	**Water quality and erosion control**	Surface water exposed to sediment flow	Localised harm to soil and local water quality	B	3	B3	High	Refer to contingency plans in Attachment I9 Water Quality and Erosion Control Sub Plan	G	C	2	C2	Moderate
58	**Waterway crossings**	**Water quality and erosion control**	Road collapse over a waterway	This may lead to bank collapse, toxicant influx into the waterway and mortality of significant fauna species.	E	3	E3	Moderate	Refer to contingency plans in Attachment I10 Waterways and Wetlands Sub Plan	G	E	2	E2	Low
59	**Waterway crossings**	**Water quality and erosion control**	Storm, flooding	Immediate danger to people's safety, environment, damage to equipment	C	4	C4	Extreme	Implement a flood warning system including daily check of weather forecasts (Bureau of Meteorology) and information distribution to key site personnel and installation of real time water level monitor. Refer to contingency response Waterways and Wetlands Sub Plan (Attachment I10).	G	B	2	B2	High
60	**Waterway crossings**	**Waterways and wetlands**	Pipe-jacking of waterway failure.	Sensitive waterway compromised as a result of destabilisation from pipe jack failure. There may be impacts on significant species and potentially the Western Port Ramsar site.	E	4	E4	High	Complete risk assessment of waterways to determine most suitable construction technique. Refer to contingency plans in Attachment I10 Waterways and Wetlands Sub Plan	G	E	3	E3	Moderate
61	**Waterway crossings**	**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.*	Negative impact to sensitive waterways such as loss of habitat, reduction in habitat quality from contamination.	C	4	C4	Extreme	Assess the extent of ASS along utilities corridor and develop management plan in consultation with EPA.	G	C	2	C2	Moderate
	Utilities Corridor - Acid Sulfate Soil Management													
62	**Excavation in areas of known or probable ASS**	**Acid sulfate soils, Groundwater**	Exposure of PASS on trench walls or floor resulting in in situ oxidation subsequent of formation of AASS.	Release of sulphuric acid, dissolve aluminium, iron and other metals into the soil and groundwater resulting in adverse impacts to beneficial uses and quality of groundwater.	C	4	C4	Extreme	Investigate and identify areas of ASS soils prior to excavation. Minimise the period that the trench in areas of PASS is open and exposed to oxygen. Apply lime or equivalent neutralising agent to trench walls to limit and neutralise oxidation. Establishment of groundwater monitoring bores and ongoing monitoring. Refer to Acid Sulfate Soil Sub Plan (Attachment I12).	VG	C	2	C2	Moderate
63		**Acid sulfate soils, Surface water**	Accumulation of acidic leachate / run off in trench.	Adverse impacts to surface water and associated aquatic ecosystems as a result of unsuitable disposal of water to the environment.	C	4	C4	Extreme	Investigate and identify areas of ASS soils prior to excavation. Bund trench in areas of know ASS to minimise surface water flow across affected areas. Test trench water prior to disposal to assess potential adverse effects to receiving areas. Treat unsuitable water with hydrated lime or other neutralising agent in tanks prior to disposal. Final disposal to be in accordance with SEPP (Waterways of Victoria). Refer to Acid Sulfate Soil Sub Plan (Attachment I12).	VG	C	2	C2	Moderate

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64	**Dewatering in areas of known or probable ASS**	**Acid sulfate soils, Groundwater**	Exposure of PASS surrounding the trench to air (in the cone of depression) due to the lowering of the watertable and oxidation subsequent of formation of AASS.	Acidification of groundwater and iron, aluminium and heavy metal contamination groundwater that will reside in the cone of depression. Adverse impacts to beneficial uses and quality of groundwater.	C	4	C4	Extreme	Investigate and identify areas of ASS soils prior to dewatering. Minimise duration of dewatering in areas of known PASS. Minimise the drainage of soils in areas of know PASS, such as through the use of sheet piling in directional drilling launch pits. Maintain high moisture content in soil to minimise exposure to air (i.e. only drain what is required to complete the works) Apply lime or equivalent neutralising agent to trench walls to limit and neutralise oxidation. Establishment of groundwater monitoring bores and ongoing monitoring. Refer to Acid Sulfate Soil Sub Plan (Attachment I12).	G	E	4	E4	High
65	**Stockpiling of soils contaminated with AASS or PASS**	**Acid sulfate soils, Surface water quality, aquatic flora and fauna.**	Oxidation of PASS resulting in contaminated run-off and leachate.	Contamination of soil, receiving waters or groundwater from contaminated run-off and leachate. Adverse impacts to aquatic ecosystems in receiving waters (potentially including Threatened species such as Growling Grass Frog and Dwarf Galaxias) .	C	3	C3	High	Investigate and identify areas of ASS soils prior to works. Form a leachate collection drain and bund stockpiles to contain runoff. Minimise the period that ASS is stockpiled on the ROW. Compact stockpile surface to minimise surface area and therefore drying and exposure to oxygen. Apply water to mitigate against drying and generation of dust. Stockpiles of extra high risk ASS (soils requiring >25kg CaCO3 / tonne soil) and other medium term-stockpiles will be placed on a guard layer of washed sand mixed with 5kg of fine aglime per square metre for each vertical metre of stockpiled spoil and treated with lime as excavated. Refer to Acid Sulfate Soil Sub	G	D	3	D3	Moderate
66	**Transportation of soils contaminated with AASS or PASS**	**Acid sulfate soils, Surface water quality**	Illegal transportation of contaminated material. Inadvertent spill of ASS material or leachate.	Breach of statutory requirements. Contamination of soil or receiving waters. Adverse impacts to aquatic ecosystems in receiving waters.	D	3	D3	Moderate	Review statutory requirements for transportation and unsure haulage company / vehicles have or meet statutory requirements. Avoid and minimise transportation of highly saturated material. Loads to be covered and not overfilled. Refer to Acid Sulfate Soil Sub Plan (Attachment I12).	VG	D	2	D2	Low
67	**On-site treatment of soils contaminated with AASS or PASS**	**Acid sulfate soils, Resource efficiency**	Illegal treatment and storage of contaminated material. Incomplete treatment of material resulting in ongoing oxidation.	Breach of statutory requirements. Contamination of soil, receiving waters or groundwater from contaminated run-off and leachate. Adverse impacts to aquatic ecosystems in receiving waters.	D	3	D3	Moderate	On site treatment of ASS to be completed in accordance with an EPA approved Acid Sulfate Management Plan. SPOCAS or Csr testing of ASS prior to construction required to determine liming rates. Post treatment verifications of treated material. Establishment of groundwater monitoring bores and ongoing monitoring. Refer to Acid Sulfate Soil Sub Plan (Attachment I12)	VG	E	3	E3	Moderate

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68	**Off-site disposal of soils contaminated with AASS or PASS**	**Acid sulfate soils, Resource efficiency, Waste**	Illegal disposal of contaminated material.	Breach of statutory requirements.	E	4	E4	High	Only dispose of contaminated material at a licensed ASS disposal site. Verify license to receive material contaminated with ASS. Refer to Acid Sulfate Soil Sub Plan (Attachment I12).	A	E	1	E1	Low
69	**Rehabilitation of areas of known or probable ASS**	**Acid sulfate soils, Agriculture, Terrestrial flora and fauna, Waterways and Wetlands, Site rehabilitation**	Incomplete treatment of material resulting in ongoing oxidation. Incomplete separation of ASS and non-contaminated material resulting in trace amounts of ASS in backfill.	Acidification of soil resulting in poor performance of pasture or vegetation reinstatement.	D	3	D3	Moderate	Investigate and identify areas of ASS soils prior to excavation. Rehabilitation Consultant to assess reinstatement of subsoils and advise if neutralisation required. Post reinstatement monitoring of rehabilitation to be completed by the Rehabilitation Consultant. Refer to Acid Sulfate Soil Sub Plan (Attachment I12).	G	D	2	D2	Low
	Utilities Corridor - Discharge of water to lands, dams or reuse													
70	**Discharge of water**	**Access and activities on agricultural land**	Trespassing resulting in prosecution. Spread of agricultural pests and disease.	Agricultural productivity. Landowner distress.	C	3	C3	High	Landowners permission to be obtained before discharging any water off the ROW. Personnel to undertake biosecurity washdown before entering properties off the ROW. Refer to Access and Activities on Agricultural Land (Attachment I1).	VG	D	2	D2	Low
71	**Discharge of water**	**Agricultural Land**	Deterioration of productivity of agricultural pasture or cropping systems.	Beneficial uses of water suitable for agriculture. Landowner complaint.	C	3	C3	High	Assessment of water quality prior and during discharge. Treatment of water in settlement tank where pH or electrical conductivity may result in harm to the environment (including pasture). Refer to Water Quality and Sediment Control Sub Plan (Attachment I9).	VG	D	2	D2	Low
72	**Discharge of water**	**Agricultural Land**	Contamination of receiving agricultural pasture or cropping systems with hydrocarbons or other contaminants.	Beneficial uses of water suitable for agriculture. Landowner complaint.	C	4	C4	Extreme	Visual and olfactory assessment of aesthetic values of water prior to discharge. Where water appears contaminated, discharge to cease. Refer to Water Quality and Sediment Control Sub Plan (Attachment I9).	VG	E	2	E2	Low
73	**Discharge of water**	**Water quality of receiving waters, Flora and fauna**	Increase in turbidity of nearby waterways	Beneficial uses of water. Aquatic ecosystems including threatened species of fish. Aesthetic and recreational values of waterway resulting in public or landowner complaint and / or prosecution from EPA or waterway asset manager.	C	3	C3	High	Assess and select suitable discharge point with consideration to the proximity to waterways and likelihood that water will flow overland to and enter waterway. Where possible discharge to vegetated areas to disperse flow and filter water. Assessment of water quality prior and during discharge. Refer to Water Quality and Sediment Control Sub Plan (Attachment I9).	G	D	2	D2	Low
74	**Discharge of water**	**Water quality of receiving waters, Flora and fauna**	Deterioration of other water quality parameters including salinity, dissolved oxygen, pH, temperature and aesthetic characteristics.	Beneficial uses of water. Aquatic ecosystems including threatened species of fish.	D	3	D3	Moderate	Assess and select suitable discharge point with consideration to the proximity to waterways and likelihood that water will flow overland to and enter waterway. Where possible discharge to vegetated areas to disperse flow and filter water. Assessment of water quality prior and during discharge. Refer to Water Quality and Sediment Control Sub Plan (Attachment I9).	G	D	2	D2	Low

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	Discharge of water	**Water quality of receiving waters, Flora and fauna**	Contamination of waterway with hydrocarbons or other contaminants	Beneficial uses of water. Aquatic ecosystems including threatened species of fish.	D	3	D3	Moderate	Visual and olfactory assessment of aesthetic values of water prior to discharge. Where water appears contaminated, discharge to cease. Water Quality and Sediment Control Sub Plan (Attachment I9).	VG	E	2	E2	Low
75	**Discharge of water**	**Agricultural Land**	Deterioration of livestock drinking water (agricultural productivity)	Beneficial uses of water suitable for agriculture. Landowner complaint.	C	3	C3	High	Assessment of water quality prior and during discharge. Treatment of water in settlement tank where pH or electrical conductivity may result in harm to the environment (including pasture). Water Quality and Sediment Control Sub Plan (Attachment I9).	G	E	1	E1	Low
76	**Discharge of water**	**Agricultural Land**	Contamination of water body with hydrocarbons or other contaminants	Beneficial uses of water suitable for agriculture. Landowner complaint.	D	4	D4	High	Visual and olfactory assessment of aesthetic values of water prior to discharge. Where water appears contaminated, discharge to cease. Water Quality and Sediment Control Sub Plan (Attachment I9).	VG	E	2	E2	Low
77	**Discharge of water**	**Water quality of receiving waters**	Scour or erosion of receiving areas resulting in mobilisation of sediment and increase in turbidity.	Beneficial uses of water. Aquatic ecosystems including threatened species of fish.	C	3	C3	High	Control of discharge point including directing outlet onto geotextile directly into waterway or onto vegetation with intercepting sedimentation fences to slow water flow across floodplain. Water Quality and Sediment Control Sub Plan (Attachment I9).	VG	D	2	D2	Low
78	**Discharge of water**	**Agricultural Land**	Scour of discharge area resulting in erosion of agricultural lands	Beneficial uses of water suitable for agriculture. Landowner complaint.	C	2	C2	Moderate	Control of discharge point including directing outlet onto geotextile directly into waterway or onto vegetation with intercepting sedimentation fences to slow water flow across floodplain. Water Quality and Sediment Control Sub Plan (Attachment I9).	VG	D	2	D2	Low
79	**Discharge of water**	**Erosion and Sediment, Agriculture, Flora & Fauna, Waterways & Wetlands**	Loss of sediment from construction site resulting from inappropriate discharge of site water	Beneficial uses of water suitable for agriculture. Landowner complaint. Aquatic ecosystems including threatened fish species	C	2	C2	Moderate	Control of discharge point including directing outlet onto geotextile directly into waterway or onto vegetation with intercepting sedimentation fences to slow water flow across floodplain. Refer to Water Quality and Sediment Control Sub Plan (Attachment I9).	VG	D	2	D2	Low
80	**Discharge of water**	**Acid Sulfate Soil, Agriculture, Flora & Fauna, Waterways & Wetlands, Site Rehabilitation**	Incorrect disposal of acidic water resulting contamination of uncontaminated materials, including topsoil and subsoil.	Acidification of soil resulting in poor performance of pasture and vegetation reinstatement.	C	3	C3	High	Assessment of water quality prior and during discharge. Treatment of water in settlement tank with hydrated lime where pH may result in harm to the environment (including pasture).	G	D	2	D2	Low
81	**Utilities Corridor - Discharge of water to waterways**													
	Removal of water from ROW to waterways	**Water quality of receiving waters**	Increase in turbidity in receiving waterway	Beneficial uses of water. Aquatic ecosystems including threatened species of fish.	A	3	A3	Extreme	Treatment of water in settlement tank and assessment of water quality prior and during discharge. Refer to Water Quality and Sediment Control Sub Plan (Attachment I9).	VG	D	2	D2	Low
82			Increase in turbidity in receiving waterway	Aesthetic and recreational values of waterway resulting in public or landowner complaint and / or prosecution from EPA or waterway asset manager.	B	3	B3	High	Treatment of water in settlement tank prior to discharge. Notification of EPA, waterway asset manager and surrounding landowner of proposed discharge. Refer to Water Quality and Sediment Control Sub Plan (Attachment I9).	VG	E	2	E2	Low
83														

Risk #	Area and activity/service	Performance Criteria / Performance Requirement SUBJECT	Potential Hazard (Environmental Aspect)	At Risk (Potential Impact)	Probability (Table 2)	Consequence (Table 3)		Inherent Risk (Before Controls)	Controls: current or planned prior to work (Table 4 - reference specific option)	Control effectiveness (Table 5)	Probability (Table 2)	Consequence (Table 3)		Inherent Risk (After Controls)
			Deterioration of other water quality parameters including salinity, dissolved oxygen, pH, temperature and aesthetic characteristics.	Beneficial uses of water. Aquatic ecosystems including threatened species of fish.	D	3	D3	Moderate	Assessment of water quality prior and during discharge. Refer to Water Quality and Sediment Control Sub Plan (Attachment I9).	VG	E	2	E2	Low
84			Contamination of waterway with hydrocarbons or other contaminants	Beneficial uses of water. Aquatic ecosystems including threatened species of fish.	D	3	D3	Moderate	Visual and olfactory assessment of water quality prior and during discharge. Refer to Water Quality and Sediment Control Sub Plan (Attachment I9).	M	E	1	E1	Low
85	**Treatment of water**	**Water quality of receiving waters**	Contamination of water as a result of chemical used in treatment of water prior to discharge.	Beneficial uses of water. Aquatic ecosystems including threatened species of fish.	D	3	D3	Moderate	Assessment of water quality prior and during discharge. Refer to Water Quality and Sediment Control Sub Plan (Attachment I9).	VG	E	2	E2	Low
86	**Discharge of water**	**Water quality of receiving waters**	Scour or erosion of receiving areas resulting in mobilisation of sediment and increase in turbidity.	Beneficial uses of water. Aquatic ecosystems including threatened species of fish.	C	3	C3	High	Control of discharge point including directing outlet onto geotextile directly into waterway or onto vegetation with intercepting sedimentation fences to slow water flow across floodplain. Refer to Water Quality and Sediment Control Sub Plan (Attachment I9).	VG	D	2	D2	Low
87	**Disposal of sediment**	**Waste management, Agricultural lands**	Inappropriate disposal of potentially contaminated sediment collected from tank.	Agricultural lands, soil contamination.	D	3	D3	Moderate	Sediment collected from tank will be disposed of at Lyndhurst, Taylors Road Landfill. Refer to Water Quality and Sediment Control Sub Plan (Attachment I9).	VG	E	1	E1	Low
88	**Utilities Site reinstatement**													
89	**Movement between agricultural properties**	**Spread of agricultural pests and disease**	Spread of agricultural or horticultural pests or diseases including BJH, Phytophthora or PCN.	Loss of agricultural productivity (PCN and BJH), spread of declared disease (PCN) to new areas, die back of native vegetation and remnant native vegetation communities.	D	4	D4	High	Develop a Biosecurity Management Procedure to direct the washdown of vehicles, plant, equipment and personnel on entry and exit of each property. Refer to Access and Activates on Agricultural Land Sub-Plan (Attachment I.1)	G	D	3	D3	Moderate
90	**Vehicle movements**	**Public safety, surface water quality**	Vehicle movements on and off corridor resulting in transportation of mud onto public roads.	Public safety as a result of changed traffic conditions, particularly around schools. Increased turbidity in receiving waters.	D	5	D5	Extreme	Prepare traffic management plan in consultation with relevant road authorities to direct the movement of trucks between site and disposal locations. Limit truck movements around schools to outside of morning and afternoon drop off and pick up times. Monitor mud on roads. Use street sweepers as required. Install rumble grids, wheel wash, wash down bays and or washed ballast at entry points to paved road. Refer to Water Quality and Erosion Control Sub Plan (Attachment I.9)	G	C	2	C2	Moderate

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91	**Removal of access roads**	**Soil Management**	Haul road or other areas of contaminated soil as a result of spills not removed during site reinstatement.	Contaminated materials not handled in accordance with NEPM and EPA guidelines. Possible inappropriate disposal or further contamination of soils / waterways	C	3	C3	High	Contaminated spoil removed from the site is appropriately classified through completion of a sampling programme involving methodologies and procedures set out in the relevant sections of Schedule B(2) of the Assessment of Site Contamination NEPM, Victorian EPA Publication 448.3 – Classification of Wastes and State Environmental Protection Policy (Prevention and Management of Contaminated Land).	G	D	2	D2	Low
92	**Removal of access roads**	**Water quality and erosion control**	Removal of access roads , replacement of topsoil, planting of vegetation	Flood protection systems not maintained resulting in a flooding event.	C	4	C4	Extreme	Any works directly affecting flood control systems to be done under permit to work form relevant asset manager.	G	D	2	D2	Low
93	**Soil reinstatement**	**Agricultural activity, waterways and wetlands**	Reinstatement of subsoil is not to the original grade resulting in depressions or mounding along the corridor.	Change in surface water flow, visual amenity.	C	3	C3	High	Rehabilitation consultant to verify that reinstatement is adequate. Refer to Site Reinstatement Sub Plan (Attachment I.3)	VG	D	2	D2	Low
94	**Soil reinstatement**	**Air Quality**	Reinstatement establishment activities impacting properties, fences, land, structures or houses	Potential for Dust disturbance and impacts on sensitive receptors	B	3	B3	High	Control dust from temporary stockpiles of spoil using appropriate measures such as by spraying water regularly, compacting the material or coating to reduce potential for dust generation during stockpiling	F	B	3	B3	High
95	**Soil reinstatement**	**Reinstatement, Agricultural activity**	Topsoil and Sub-soil condition (compaction, soil profile inversion) resulting in impacts rehabilitation and vegetation establishment.	Long term geomorphologic stability of landform, long term land use.	C	3	C3	High	Rehabilitation consultant to verify that reinstatement is adequate. Refer to Site Reinstatement Sub Plan (Attachment I.3)	VG	D	2	D2	Low
96	**Pasture establishment**	**Reinstatement, Agricultural activity**	Failure to establish pasture as a result of unsuitable pasture type, unsuitable timing of reinstatement, unsuitable topsoil	Long term land use.	D	3	D3	Moderate	Rehabilitation consultant to verify that reinstatement is adequate. Refer to Site Reinstatement Sub Plan (Attachment I.3)	VG	D	2	D2	Low
97	**Native revegetation**	**Reinstatement, Agricultural activity**	Revegetation and habitat restoration with unsuitable or non-endemic species of plant.	Introduction of species that are from non-providence stock or not representative of the regional EVCs.	C	4	C4	Extreme	Prepared landscape design of PR sensitive areas. Procurement of stock to specify native stock to come from providence stock.	VG	D	2	D2	Low
98	**Waterway reinstatement**	**Waterways and wetlands, flora and fauna**	Waterway reinstatement impacting fish passage of water quality in waterways and wetlands	Aquatic ecosystems including significant species	C	3	C3	High	Waterways to be reinstated to their precondition form. Requirement of relinquishment of waterway works permits.	VG	D	2	D2	Low
99	**Landscape reinstatement**	**Public amenity**	Unsuitable landscape design	Diminished community benefit and use of public areas.	D	4	D4	High	Landscape design for crown lands to be approved by land manager.	VG	D	2	D2	Low
102	**Bulk earthworks in areas of side cut and crossings using excavators and dozers**	**Erosion and sediment control**	Land-slip, mass movement or stockpiles or areas of cut and fill profile.	Increased sediment load to nearby surface waters. Erosion of land and loss of topsoil. Increase in sediment load to waterways. Non compliance under Water Act and SEPP (surface water and groundwater) requirements	C	3	C3	High	All areas of fill to be compacted. Diversion drains to be installed in areas of cut and fill to prevent water infiltration or pooling.	G	D	3	D3	Moderate

ENVIRONMENTAL RISK REGISTER - UTILITIES

Risk #	Area and activity/service	Performance Criteria / Performance Requirement SUBJECT	Potential Hazard (Environmental Aspect)	At Risk (Potential Impact)	Probability (Table 2)	Consequence (Table 3)		Inherent Risk (Before Controls)	Controls: current or planned prior to work (Table 4 - reference specific option)	Control effectiveness (Table 5)	Probability (Table 2)	Consequence (Table 3)		Inherent Risk (After Controls)
	Definitions for consequence, probability and other abbreviations in this register can be found in the Risk (Aspects) Register and Risk Matrix													
	Utilities Site and ROW establishment													
1	**Land owner liaison, Geotechnical factual investigations, Feature survey**	**Access and activities on Agricultural land**	Spread of agricultural pests and disease	Movement of soils affected with Potato Cyst Nematode, Bovine Johne's disease and *Phytophthora cinnamomi*	C	3	C3	High	Develop a Biosecurity Management Procedure to direct the washdown of vehicles, plant, equipment and personnel on entry and exit of each property.	G	E	3	E3	Moderate
2	**Geotechnical investigation in areas of probable ASS**	**Acid sulfate soils, Agriculture**	Disturbance of PASS / AASS at geotechnical test sites	Adverse effects to receiving waters and associated ecosystems from run-off and leachate.	D	3	D3	Moderate	Strip topsoil above test pits to 150mm and stockpile separately to reinstate following testing.	VG	E	2	E2	Low
3			Disturbance of PASS / AASS at geotechnical test sites	Exposure of livestock to contaminated soil.	D	2	D2	Low	Strip topsoil above test pits to 150mm and stockpile separately to reinstate following testing.	VG	E	2	E2	Low
4	**Environmental surveys and baseline assessments**	**Flora and fauna**	Taking of protected flora and fauna (protected under EPBC and FFG Act)	Damage or disturbance to significant flora, fauna and habitats	C	3	C3	High	Ensure suitable trained and licensed persons undertake flora and fauna surveys	VG	D	2	D2	Low
5	**Fencing**	**Access and activities on Agricultural land**	Site establishment activities outside of corridor	Disturbance to farming activities resulting in loss of production or routine operations	D	3	D3	Moderate	Conduct pre-, during- and post-construction landowner liaison to provide landowners with relevant information about the project and project team to develop mitigation plans	VG	D	2	D2	Low
6	**Vegetation clearing**	**Flora and fauna**	Impact to native vegetation and/or retained vegetation. Impact to native fauna. Damage or disturbance to surface water ecosystems	Damage or disturbance to significant flora, fauna and habitats. Significant impact to threatened species. Fauna mortality resulting from vegetation clearing activities	C	3	C3	High	Pre-clearance habitat and targeted surveys. All known and potential habitat will be marked on SEPs. Targeted capture and relocation to be undertaken by fauna spotters at all areas of native fauna habitat (general and significant species). Refer to Flora and Fauna Sub Plan (Attachment I5).	G	E	3	E3	Moderate
7	**Vegetation clearing, selection of access tracks and extra work spaces**	**Flora and fauna**	Excavation, transfer of material and movement of stockpiles impacting on properties	Impact to native vegetation and/or retained vegetation	C	4	C4	Extreme	Pre clearance habitat assessments and targeted surveys for significant species. Minimise construction footprint, where possible, through areas of native vegetation. Refer to Flora and Fauna Sub Plan (Attachment I5).	G	D	3	D3	Moderate
8	**Topsoil stripping (150mm) and stockpiling using graders, excavators and dozers**	**Surface water quality, Erosion and sediment control**	Increase in sheet and rill erosion.	Increased sediment load to nearby surface waters. Erosion of land and loss of topsoil. Increase in sediment load to waterways. Non compliance under Water Act and SEPP (surface water and groundwater) requirements	C	3	C3	High	Prior to commencement of construction and site clearance, a network diversion drains will be constructed across slopes to direct runoff at a non erosive velocity. Temporary erosion and sediments control structures will be placed around stockpiles where required to minimise erosion.	G	D	3	D3	Moderate
9	**Topsoil stripping (150mm) and earthworks**	**Soil Management**	Exposure of contaminated materials	Impact to human health and habitat	C	3	C3	High	Confirm potential for contaminated spoil and acid sulfate soils prior to construction to prevent inappropriate management of such spoil types.	G	E	3	E3	Moderate

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10	**Topsoil stripping (150mm) and earthworks**	**Soil Management**	Exposure of contaminated 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	Contaminated spoil removed from the site is appropriately classified through completion of a sampling programme involving methodologies and procedures set out in the relevant sections of Schedule B(2) of the Assessment of Site Contamination NEPM, Victorian EPA Publication 448.3 – Classification of Wastes and State Environmental Protection Policy (Prevention and Management of Contaminated Land).	G	D	2	D2	Low
11	**Site establishment earthworks**	**Cultural Heritage**	Establishment of access roads , clearing for ROW and removal of topsoil	Impact to aboriginal sites previously unrecorded or recorded	E	4	E4	High	Implementation of cultural heritage management contingency plan from CHMP attached to the Archaeological and Cultural Heritage Sub Plan (Attachment I4.)	G	E	3	E3	Moderate
12	**Site establishment earthworks**	**Water quality and erosion control, Flora and fauna**	Changes to surface water hydrology.	Damage or disturbance to surface water ecosystems	C	4	C4	Extreme	A network diversion drains will be constructed across slopes to direct runoff at a non erosive velocity. Temporary erosion and sediments control structures will be placed around stockpiles where required to minimise erosion. Refer to the Water Quality and Erosion Control Sub plan (Attachment I 9).	G	D	3	D3	Moderate
13	**Bulk earthworks in areas of side cut and crossings using excavators and dozers**	**Contaminated soil**	Excavation, transfer of material and movement of contaminated 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	Contaminated spoil removed from the site is appropriately classified through completion of a sampling programme involving methodologies and procedures set out in the relevant sections of Schedule B(2) of the Assessment of Site Contamination NEPM, Victorian EPA Publication 448.3 – Classification of Wastes and State Environmental Protection Policy (Prevention and Management of Contaminated Land)	G	D	3	D3	Moderate
14	**Transportation of 100mm road base (siltstone from quarry)**	**Flora and fauna**	Spread of Phytophthora	Impact to remnant EVC and associated fauna habitat as a result of dieback	D	3	D3	Moderate	Develop a Biosecurity Management Procedure to direct the washdown of vehicles, plant, equipment and personnel on entry and exit of each property. Refer to Flora and Fauna Sub Plan (Attachment I5).	G	E	3	E3	Moderate
15	**Construction of haul road to provide all weather access along RoW**	**Public safety, surface water quality**	Vehicle movements on and off corridor resulting in transportation of mud onto public roads.	Public safety as a result of changed traffic conditions, particularly around schools. Increased turbidity in receiving waters.	D	5	D5	Extreme	Prepare traffic management plan in consultation with relevant road authorities to direct the movement of trucks between site and disposal locations. Limit truck movements around schools to outside of morning and afternoon drop off and pick up times. Monitor mud on roads. Use street sweepers as required. Install rumble grids, wheel wash and or washed ballast at entry points to paved road.	G	C	2	C2	Moderate
16	**Site office**	**Resource efficiency**	Generation of office waste	Increased waste to landfill.	C	2	C2	Moderate	Separated and recycle waste where possible.	G	D	2	D2	Low

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17	**Site office**	**Resource efficiency**	Excessive use of energy including for lights, air conditioning	Use of resources, increase in greenhouse gases gas production	C	2	C2	Moderate	Promote the efficient use and conservation of resources as part of the training program for all personnel including contractors, subcontractors and operators. Include the waste management hierarchy in the induction with an emphasis on avoidance and minimisation.	F	D	2	D2	Low
	General Utilities Construction Activities													
18	**All site works**	**Flora and fauna**	Taking of protected flora and fauna (protected under EPBC and FFG Act)	Damage or disturbance to flora, fauna and habitats	D	4	D4	High	All contractors will be made aware of the environmental values and areas of ecological sensitivity as and during site induction to the site. Refer to Flora and Fauna Sub Plan	G	D	3	D3	Moderate
19	**All site works**	**Flora and fauna**	Movement of machinery and site vehicles	Impact to fauna resulting from collision with vehicles and machinery	D	4	D4	High	Site speed limit to be restricted to 20km per hour. Refer to Flora and Fauna Sub Plan (Attachment I5).	G	D	3	D3	Moderate
20	**All site works**	**Water quality and erosion control**	Design of temporary sediment controls is insufficient for the maximum exposed area	Localised harm to soil and local water quality	C	3	C3	High	Inspections and maintenance of temporary erosion and sediment controls will be completed through construction phase. Refer to the Water Quality and Erosion Control Sub Plan (Attachment I9).	G	C	2	C2	Moderate
21	**Movement of plant, vehicles, equipment and personnel between waterways and EVCs**	**Flora and fauna**	Spread of known pathogen of flora and fauna (Phytophthora and Chytrid Fungus)	Infection of fauna and flora resulting from transmission of the disease by vehicle, person, disposal of contaminated material	C	4	C4	Extreme	Develop a Biosecurity Management Procedure to direct the washdown of vehicles, plant, equipment and personnel between patches of habitat. Refer to Flora and Fauna Sub Plan (Attachment I5).	G	E	3	E3	Moderate
22	**Bulk earthworks (ROW benching and trenching)**	**Cultural Heritage**	Excavation, transfer of material and movement of stockpiles impacting on properties, or sensitive receivers	Impact to aboriginal sites previously unrecorded or recorded	E	4	E4	High	Implementation of cultural heritage management contingency plan.	G	E	3	E3	Moderate
23	**Bulk earthworks (ROW benching and trenching)**	**Flora and fauna**	Excavation of soils leading to a large scale erosion event	Impact to protected species and other wildlife (e.g. aquatic species)	E	4	E4	High	Prior to commencement of construction and site clearance, a network diversion drains will be constructed across slopes to direct runoff at a non erosive velocity.	G	E	2	E2	Low
24	**Hazardous materials storage**	**Hazardous materials**	Hazardous material storage and disposal including use of fuels, gases and concrete. 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	3	D3	Moderate	Clean up all spills immediately. Contain and absorb spill with sand, earth, inert material or vermiculite. Clean area and DO NOT discharge into sewer or waterways. Refer to the Soil Management Sub Plan (Attachment I.7). Bulk storage chemicals will not occur within 30-50m of a waterway and will not occur within a floodplain or land subject to inundation. Refer to the Water Quality and Erosion Control Sub Plan (Attachment I9). Bulk fuel storage areas (drums or bulk storage tanks) will be bunded in accordance with EPA Bunding Guidelines. Refer to the Hazardous Materials Sub Plan (Attachment I2).	G	E	3	E3	Moderate

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25	**Hazardous materials bunding**	**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	C	3	C3	High	Bulk fuel storage areas (drums or bulk storage tanks) will be bunded in accordance with EPA Bunding Guidelines. Install bunds where appropriate to reduce the risk of spills entering the stormwater drainage system. Refer to the Hazardous Materials Sub Plan (Attachment I2).	G	D	2	D2	Low
26	**Hazardous materials transport**	**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	C	3	C3	High	Refer to Environmental Incident Response Plan (Attachment K). Refer to the contingency response for spills to water in Water Quality and Erosion Control Sub Plan (Attachment I9). Refer to Contaminated Land Procedure in Soil Management Sub Plan (Attachment I.7) for spills to soil.	G	D	3	D3	Moderate
27	**All works involving plant, vehicle or equipment with fuel or other hazardous substances**	**Hazardous materials**	Spill resulting from equipment or plant failure (i.e. accidental rupture of tank, etc), careless/negligent act	Pollution of soils, receiving waters or potential harm / injury to personnel, flora and fauna via discharge of hazardous substance	C	3	C3	High	Ensure appropriate capacity spills kits are readily accessible to areas where hazardous materials and specifically, hydrocarbons are stored. All employees and sub contractors will receive induction training which will include the safe use of hazardous substances being used at the workplace. Refer to Contaminated Land Procedure in Soil Management Sub Plan (Attachment I.7) for spills to soil	G	D	2	D2	Low
28	**Vehicle movements, excavation, site general**	**Air quality**	Excavation, transfer of material and movement of stockpiles and soils, or general site management resulting in reduction in air quality from dust	Dust disturbance and impacts on sensitive receptors	B	3	B3	High	Dust from stockpiles may also be controlled by allow vegetation to establish or spraying with a polymer based crusting agent that seals the surface of the stockpile to aid dust suppression. Refer to Air Quality Sub-plan (Attachment I4).	G	C	3	C3	High
29	**Works in periods of extreme weather**	**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	B	4	B4	Extreme	Under strong wind conditions, review the frequency of watering and spraying of surfaces and, if conditions are dry, increase across the site to control dust generation. Refer to Air Quality Sub-plan (Attachment I4).	F	B	3	B3	High
30	**Dust control**	**Resource efficiency**	Excessive use of water	Depletion of resources	C	2	C2	Moderate	Recycled water will be used for dust suppression spraying over potable water where possible.	G	D	2	D2	Low
31	**Hot works**	**Hazardous materials, social and economic, impacts to agricultural productivity**	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	C	3	C3	High	Dangerous goods storage areas will be isolated from all sources of ignition and appropriate fire extinguisher coverage provided.	G	D	2	D2	Low
32	**Hot works**	**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	4	D4	High	Permits will be obtained from the relevant authorities for welding and other hot works during total fire ban days . Refer to Air Quality Sub-plan (Attachment I4).	G	D	3	D3	Moderate
33	**Hot works**	**Flora and fauna**	Fire event	Impact to protected species and other wildlife	E	4	E4	High	Permits will be obtained from the relevant authorities for welding and other hot works during total fire ban days	G	E	3	E3	Moderate

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34	**Trenching and excavations**	**Flora and fauna**	Impact to fauna resulting from access to open pits/trenches (fall, entrapment or stress)	Impacts to protected native fauna.	D	4	D4	High	Daily trench checks. In areas of suitable habitat during construction, trenches will be open for minimum time practicable. Fauna ramps will be provided to enable small ground dwelling fauna which enter the trench to exit. Refer to Flora and Fauna Sub Plan (Attachment I5).	G	D	3	D3	Moderate
35	**Trenching and excavations**	**Flora and fauna**	Erosion and runoff from stockpiles with poor water quality.	Damage or disturbance to surface water ecosystems	C	4	C4	Extreme	Temporary erosion and sediments control structures will be placed around stockpiles where required to minimise erosion. Refer to the Water Quality and Erosion Control Sub Plan (Attachment I 9).	G	D	3	D3	Moderate
36	**Trenching and excavations**	**Flora and fauna, Soil Management**	Accidental disposal of ASS/PASS soils resulting in contamination of non-ASS affected areas	Impact to aquatic species from leachate	C	4	C4	Extreme	Assess the extent of ASS along utilities corridor and develop management plan in consultation with EPA. Refer to Acid Sulfate Soil Sub Plan (Attachment I12).	G	E	3	E3	Moderate
37	**Trenching and excavations**	**Soil Management**	Excavation, transfer of material and movement of stockpiles and soils	Impact to human health and habitat. Contaminated materials not handled in accordance with NEPM and EPA guidelines. Possible inappropriate disposal or further contamination of soils / waterways	C	2	C2	Moderate	In all areas regularly inspect and monitor spoil generated by excavation activities for indicators of possible contamination. Typical indicators of contamination include: - Odorous and/or discoloured/stained material - Asbestos containing materials - Oil/Grease and/or hydrocarbon sheen - Drums/containers of any sort - Fluids/liquids other than groundwater - Putrescibles wastes, general rubbish - Unknown wastes and objects - Unexpected fill materials. If any of the above items are identified, stop work and follow procedures detailed in the Soil Management Sub Plan, section 9 Contingency Measures Contaminated spoil removed from the site is appropriately classified through completion of a sampling programme involving methodologies and procedures set out in the relevant sections of Schedule B(2) of the Assessment of Site Contamination NEPM, Victorian EPA Publication 448.3 – Classification of Wastes and State Environmental Protection Policy (Prevention and Management of Contaminated Land). Refer to Soil Management Sub Plan	G	D	3	D3	Moderate
38	**Trenching and excavations**	**Soil Management**	Unexpected discovery of suspected contaminated soil or groundwater.	Localised harm to soil and local water quality	C	3	C3	High	Follow procedures detailed in the Soil Management Sub Plan, section 9 Contingency Measures	G	C	2	C2	Moderate
39	**Trenching and excavations**	**Soil Management**	Unexpected discovery of acid sulphate soil or rock during construction	Localised harm to soil and local water quality	C	3	C3	High	Follow procedures detailed in the Acid Sulfate Soil Sub Plan (Attachment I12).	G	C	2	C2	Moderate
40	**Trenching and excavations**	**Noise and vibration**	Excavation, transfer of material and movement of stockpiles and soils	Potential for noise and vibration to disturb sensitive receptor	C	3	C3	High	Restrict noisy works to normal working hours. Refer to the Noise and Vibration Sub Plan (Attachment I8).	VG	D	3	D3	Moderate

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	Trenching and excavations	**Water quality and erosion control**	Impacts to water quality level or quality.	Reduction in groundwater quality and levels.	E	3	E3	Moderate	Monitoring groundwater quality and levels pre- and post-construction. Notify EPA and SRW if significant change in quality and levels detected. Refer to Water Quality and Erosion Control Sub Plan (Attachment I 9).	VG	E	2	E2	Low
41	**Disposal of waste**	**Resource efficiency**	Unforseen contamination due to inappropriate or illegal disposal of waste	Localised harm to soil and local water quality	C	4	C4	Extreme	All waste to be classified and transported offsite in accordance with EPA Waste Management policies and a Waste Transport Certificate completed and retained where wastes are classified as Prescribed Waste. Consult the Area Environmental Manager on the nature or classification of a waste if it is unknown. Refer to the Resource Efficiency Sub Plan (Attachment I 6).	VG	D	3	D3	Moderate
42	**Disposal of waste**	**Resource efficiency**	Inappropriate handing of waste (e.g. packaging etc) not in accordance with the EPA Waste Management Policies	Contamination of soil and waterways	C	3	C3	High	All waste to be classified and transported offsite in accordance with EPA Waste Management policies and a Waste Transport Certificate completed and retained where wastes are classified as Prescribed Waste. Consult the Area Environmental Manager on the nature or classification of a waste if it is unknown. Refer to the Resource Efficiency Sub Plan (Attachment I 6).	VG	D	3	D3	Moderate
43	**Disposal of waste**	**Resource efficiency**	Unforseen contamination due to inappropriate or illegal disposal of waste	Localised harm to soil and local water quality	C	4	C4	Extreme	All waste to be classified and transported offsite in accordance with EPA Waste Management policies and a Waste Transport Certificate completed and retained where wastes are classified as Prescribed Waste. Consult the Area Environmental Manager on the nature or classification of a waste if it is unknown. Refer to the Resource Efficiency Sub Plan (Attachment I 6).	VG	D	3	D3	Moderate
44	**High and Medium Flow Waterway Crossings Construction Activities**													
	Waterway crossings	**Water quality and erosion control**	Establishment of access roads, clearing of ROW and removal of vegetation	Flood protection systems not maintained resulting in a flooding event.	C	4	C4	Extreme	Any works directly affecting flood control systems to be done under permit to work form relevant asset manager. Implement a flood warning system including daily check of weather forecasts (Bureau of Meteorology) and information distribution to key site personnel and installation of real time water level monitor. Refer to Waterways and Wetlands Sub Plan (Attachment I10).	G	E	4	E4	High
45	**Waterway crossings**	**Waterways and wetlands**	Excavation, transfer of material and movement of stockpiles, equipment and materials	Negative impact to sensitive waterways such as loss of habitat, reduction in habitat quality, damage to bank vegetation, loss of sediment to waterway.	C	3	C3	High	Temporary erosion and sediments control structures will be placed around stockpiles where required to minimise erosion.	G	D	3	D3	Moderate
46														

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47	**Waterway crossings**	**Water quality and erosion control**	Open trench waterway crossings resulting in direct disturbance to waterways.	Disturbance to waterways and impact to flood dependent ecosystems	D	3	D3	Moderate	Works in medium and high flow waterways to be completed by a special crossing crew to minimise the construction period. Temporary reinstatement works to be completed if full reinstatement not possible following construction. Refer to Waterways and Wetlands Sub Plan (Attachment I10).	G	C	2	C2	Moderate
48	**Waterway crossings**	**Water quality and erosion control, Flora and fauna**	Change in surface hydrology or aquifer recharge as a result during construction.	Reduction in flow regime in waterways, wetlands or groundwater aquifers. Disturbance to flood dependent ecosystems	D	2	D2	Low	Works in medium and high flow waterways to be completed by a special crossing crew to minimise the construction period. Temporary reinstatement works to be completed if full reinstatement not possible following construction. Refer to Waterways and Wetlands Sub Plan (Attachment I10).	G	E	2	E2	Low
49	**Waterway crossings**	**Water quality and erosion control**	Increase in sediment load in waterways as s result of bypass / diversion pumps or flood event.	Reduction in surface water quality.	C	4	C4	Extreme	Temporary erosion and sediments control structures will be placed around stockpiles where required to minimise erosion. Refer to Waterways and Wetlands Sub Plan (Attachment I10)	G	C	2	C2	Moderate
50	**Waterway crossings**	**Water quality and erosion control**	Design not to Authority requirements.	Works not designed in accordance with Authority requirements resulting in impact to agricultural or sensitive receivers	C	3	C3	High	Waterways crossing designs to be provided to waterway asset manager.	VG	E	2	E2	Low
51	**Waterway crossings**	**Water quality and erosion control**	Excavation, transfer of material and movement of stockpiles and soils	Flood protection systems not maintained resulting in a flooding event	C	3	C3	High	Any works directly affecting flood control systems to be done under permit to work form relevant asset manager. Implement a flood warning system including daily check of weather forecasts (Bureau of Meteorology) and information distribution to key site personnel and installation of real time water level monitor. Refer to Waterways and Wetlands Sub Plan (Attachment I10).	G	C	2	C2	Moderate
52	**Waterway crossings**	**Water quality and erosion control**	Diversion of discharge of water from site.	Non compliance under Water Act and SEPP (surface water and groundwater) requirements. Increase in sediment to nearby surface waters and waterways	C	4	C4	Extreme	Any discharge to waterways must have approval from the EPA and relevant Waterway Management Authority. Refer to contingency plans in Attachment I9 Water Quality and Erosion Control Sub Plan.	G	C	2	C2	Moderate
53	**Waterway crossings**	**Water quality and erosion control**	Site dewatering including horizontal strip drains and vertical spears.	Reduction of groundwater recharge to wetlands, disturbing or depleting existing groundwater tables may affect spring fed dams	E	3	E3	Moderate	Monitoring groundwater levels pre- and post-construction. Notify SRW if significant change in levels detected. Attachment I9 Water Quality and Erosion Control Sub Plan.	VG	E	2	E2	Low
54	**Waterway crossings**	**Water quality and erosion control**	Construction in waterways, temporary reinstatement.	Reduction in groundwater quality and levels. Reduction in surface water quality	D	3	D3	Moderate	Monitoring groundwater quality and levels pre- and post-construction. Notify EPA and SRW if significant change in quality and levels detected.	G	C	2	C2	Moderate
55	**Waterway crossings**	**Water quality and erosion control**	Deep excavations below water table in areas of ASS.	Exposure of in situ PASS to oxidation and subsequent acidification of groundwater	D	3	D3	Moderate	Minimise period of dewatering / exposure of PASS. Monitoring groundwater quality pre- and post-construction in areas where dewatering of ASS will occur. Notify EPA and SRW if significant change in quality detected. Refer to Acid Sulfate Soil Management Plan	G	C	2	C2	Moderate

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56	**Waterway crossings**	**Water quality and erosion control**	Unforseen water and soil contamination due to fuel or oil spill such as during refuelling of pumps	Localised harm to soil and local water quality	C	3	C3	High	Refer to contingency plans in Attachment I9 Water Quality and Erosion Control Sub Plan	G	C	2	C2	Moderate
57	**Waterway crossings**	**Water quality and erosion control**	Surface water exposed to sediment flow	Localised harm to soil and local water quality	B	3	B3	High	Refer to contingency plans in Attachment I9 Water Quality and Erosion Control Sub Plan	G	C	2	C2	Moderate
58	**Waterway crossings**	**Water quality and erosion control**	Road collapse over a waterway	This may lead to bank collapse, toxicant influx into the waterway and mortality of significant fauna species.	E	3	E3	Moderate	Refer to contingency plans in Attachment I10 Waterways and Wetlands Sub Plan	G	E	2	E2	Low
59	**Waterway crossings**	**Water quality and erosion control**	Storm, flooding	Immediate danger to people's safety, environment, damage to equipment	C	4	C4	Extreme	Implement a flood warning system including daily check of weather forecasts (Bureau of Meteorology) and information distribution to key site personnel and installation of real time water level monitor. Refer to contingency response Waterways and Wetlands Sub Plan (Attachment I10).	G	B	2	B2	High
60	**Waterway crossings**	**Waterways and wetlands**	Pipe-jacking of waterway failure.	Sensitive waterway compromised as a result of destabilisation from pipe jack failure. There may be impacts on significant species and potentially the Western Port Ramsar site.	E	4	E4	High	Complete risk assessment of waterways to determine most suitable construction technique. Refer to contingency plans in Attachment I10 Waterways and Wetlands Sub Plan	G	E	3	E3	Moderate
61	**Waterway crossings**	**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.*	Negative impact to sensitive waterways such as loss of habitat, reduction in habitat quality from contamination.	C	4	C4	Extreme	Assess the extent of ASS along utilities corridor and develop management plan in consultation with EPA.	G	C	2	C2	Moderate
	Utilities Corridor - Acid Sulfate Soil Management													
62	**Excavation in areas of known or probable ASS**	**Acid sulfate soils, Groundwater**	Exposure of PASS on trench walls or floor resulting in in situ oxidation subsequent of formation of AASS.	Release of sulphuric acid, dissolve aluminium, iron and other metals into the soil and groundwater resulting in adverse impacts to beneficial uses and quality of groundwater.	C	4	C4	Extreme	Investigate and identify areas of ASS soils prior to excavation. Minimise the period that the trench in areas of PASS is open and exposed to oxygen. Apply lime or equivalent neutralising agent to trench walls to limit and neutralise oxidation. Establishment of groundwater monitoring bores and ongoing monitoring. Refer to Acid Sulfate Soil Sub Plan (Attachment I12).	VG	C	2	C2	Moderate
63		**Acid sulfate soils, Surface water**	Accumulation of acidic leachate / run off in trench.	Adverse impacts to surface water and associated aquatic ecosystems as a result of unsuitable disposal of water to the environment.	C	4	C4	Extreme	Investigate and identify areas of ASS soils prior to excavation. Bund trench in areas of know ASS to minimise surface water flow across affected areas. Test trench water prior to disposal to assess potential adverse effects to receiving areas. Treat unsuitable water with hydrated lime or other neutralising agent in tanks prior to disposal. Final disposal to be in accordance with SEPP (Waterways of Victoria). Refer to Acid Sulfate Soil Sub Plan (Attachment I12).	VG	C	2	C2	Moderate

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64	**Dewatering in areas of known or probable ASS**	**Acid sulfate soils, Groundwater**	Exposure of PASS surrounding the trench to air (in the cone of depression) due to the lowering of the watertable and oxidation subsequent of formation of AASS.	Acidification of groundwater and iron, aluminium and heavy metal contamination groundwater that will reside in the cone of depression. Adverse impacts to beneficial uses and quality of groundwater.	C	4	C4	Extreme	Investigate and identify areas of ASS soils prior to dewatering. Minimise duration of dewatering in areas of known PASS. Minimise the drainage of soils in areas of know PASS, such as through the use of sheet piling in directional drilling launch pits. Maintain high moisture content in soil to minimise exposure to air (i.e. only drain what is required to complete the works) Apply lime or equivalent neutralising agent to trench walls to limit and neutralise oxidation. Establishment of groundwater monitoring bores and ongoing monitoring. Refer to Acid Sulfate Soil Sub Plan (Attachment I12).	G	E	4	E4	High
65	**Stockpiling of soils contaminated with AASS or PASS**	**Acid sulfate soils, Surface water quality, aquatic flora and fauna.**	Oxidation of PASS resulting in contaminated run-off and leachate.	Contamination of soil, receiving waters or groundwater from contaminated run-off and leachate. Adverse impacts to aquatic ecosystems in receiving waters (potentially including Threatened species such as Growling Grass Frog and Dwarf Galaxias) .	C	3	C3	High	Investigate and identify areas of ASS soils prior to works. Form a leachate collection drain and bund stockpiles to contain runoff. Minimise the period that ASS is stockpiled on the ROW. Compact stockpile surface to minimise surface area and therefore drying and exposure to oxygen. Apply water to mitigate against drying and generation of dust. Stockpiles of extra high risk ASS (soils requiring >25kg CaCO3 / tonne soil) and other medium term-stockpiles will be placed on a guard layer of washed sand mixed with 5kg of fine aglime per square metre for each vertical metre of stockpiled spoil and treated with lime as excavated. Refer to Acid Sulfate Soil Sub	G	D	3	D3	Moderate
66	**Transportation of soils contaminated with AASS or PASS**	**Acid sulfate soils, Surface water quality**	Illegal transportation of contaminated material. Inadvertent spill of ASS material or leachate.	Breach of statutory requirements. Contamination of soil or receiving waters. Adverse impacts to aquatic ecosystems in receiving waters.	D	3	D3	Moderate	Review statutory requirements for transportation and unsure haulage company / vehicles have or meet statutory requirements. Avoid and minimise transportation of highly saturated material. Loads to be covered and not overfilled. Refer to Acid Sulfate Soil Sub Plan (Attachment I12).	VG	D	2	D2	Low
67	**On-site treatment of soils contaminated with AASS or PASS**	**Acid sulfate soils, Resource efficiency**	Illegal treatment and storage of contaminated material. Incomplete treatment of material resulting in ongoing oxidation.	Breach of statutory requirements. Contamination of soil, receiving waters or groundwater from contaminated run-off and leachate. Adverse impacts to aquatic ecosystems in receiving waters.	D	3	D3	Moderate	On site treatment of ASS to be completed in accordance with an EPA approved Acid Sulfate Management Plan. SPOCAS or Csr testing of ASS prior to construction required to determine liming rates. Post treatment verifications of treated material. Establishment of groundwater monitoring bores and ongoing monitoring. Refer to Acid Sulfate Soil Sub Plan (Attachment I12)	VG	E	3	E3	Moderate

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68	**Off-site disposal of soils contaminated with AASS or PASS**	**Acid sulfate soils, Resource efficiency, Waste**	Illegal disposal of contaminated material.	Breach of statutory requirements.	E	4	E4	High	Only dispose of contaminated material at a licensed ASS disposal site. Verify license to receive material contaminated with ASS. Refer to Acid Sulfate Soil Sub Plan (Attachment I12).	A	E	1	E1	Low
69	**Rehabilitation of areas of known or probable ASS**	**Acid sulfate soils, Agriculture, Terrestrial flora and fauna, Waterways and Wetlands, Site rehabilitation**	Incomplete treatment of material resulting in ongoing oxidation. Incomplete separation of ASS and non-contaminated material resulting in trace amounts of ASS in backfill.	Acidification of soil resulting in poor performance of pasture or vegetation reinstatement.	D	3	D3	Moderate	Investigate and identify areas of ASS soils prior to excavation. Rehabilitation Consultant to assess reinstatement of subsoils and advise if neutralisation required. Post reinstatement monitoring of rehabilitation to be completed by the Rehabilitation Consultant. Refer to Acid Sulfate Soil Sub Plan (Attachment I12).	G	D	2	D2	Low
	Utilities Corridor - Discharge of water to lands, dams or reuse													
70	**Discharge of water**	**Access and activities on agricultural land**	Trespassing resulting in prosecution. Spread of agricultural pests and disease.	Agricultural productivity. Landowner distress.	C	3	C3	High	Landowners permission to be obtained before discharging any water off the ROW. Personnel to undertake biosecurity washdown before entering properties off the ROW. Refer to Access and Activities on Agricultural Land (Attachment I1).	VG	D	2	D2	Low
71	**Discharge of water**	**Agricultural Land**	Deterioration of productivity of agricultural pasture or cropping systems.	Beneficial uses of water suitable for agriculture. Landowner complaint.	C	3	C3	High	Assessment of water quality prior and during discharge. Treatment of water in settlement tank where pH or electrical conductivity may result in harm to the environment (including pasture). Refer to Water Quality and Sediment Control Sub Plan (Attachment I9).	VG	D	2	D2	Low
72	**Discharge of water**	**Agricultural Land**	Contamination of receiving agricultural pasture or cropping systems with hydrocarbons or other contaminants.	Beneficial uses of water suitable for agriculture. Landowner complaint.	C	4	C4	Extreme	Visual and olfactory assessment of aesthetic values of water prior to discharge. Where water appears contaminated, discharge to cease. Refer to Water Quality and Sediment Control Sub Plan (Attachment I9).	VG	E	2	E2	Low
73	**Discharge of water**	**Water quality of receiving waters, Flora and fauna**	Increase in turbidity of nearby waterways	Beneficial uses of water. Aquatic ecosystems including threatened species of fish. Aesthetic and recreational values of waterway resulting in public or landowner complaint and / or prosecution from EPA or waterway asset manager.	C	3	C3	High	Assess and select suitable discharge point with consideration to the proximity to waterways and likelihood that water will flow overland to and enter waterway. Where possible discharge to vegetated areas to disperse flow and filter water. Assessment of water quality prior and during discharge. Refer to Water Quality and Sediment Control Sub Plan (Attachment I9).	G	D	2	D2	Low
74	**Discharge of water**	**Water quality of receiving waters, Flora and fauna**	Deterioration of other water quality parameters including salinity, dissolved oxygen, pH, temperature and aesthetic characteristics.	Beneficial uses of water. Aquatic ecosystems including threatened species of fish.	D	3	D3	Moderate	Assess and select suitable discharge point with consideration to the proximity to waterways and likelihood that water will flow overland to and enter waterway. Where possible discharge to vegetated areas to disperse flow and filter water. Assessment of water quality prior and during discharge. Refer to Water Quality and Sediment Control Sub Plan (Attachment I9).	G	D	2	D2	Low

Risk #	Area and activity/service	Performance Criteria / Performance Requirement SUBJECT	Potential Hazard (Environmental Aspect)	At Risk (Potential Impact)	Probability (Table 2)	Consequence (Table 3)		Inherent Risk (Before Controls)	Controls: current or planned prior to work (Table 4 - reference specific option)	Control effectiveness (Table 5)	Probability (Table 2)	Consequence (Table 3)		Inherent Risk (After Controls)
	Discharge of water	**Water quality of receiving waters, Flora and fauna**	Contamination of waterway with hydrocarbons or other contaminants	Beneficial uses of water. Aquatic ecosystems including threatened species of fish.	D	3	D3	Moderate	Visual and olfactory assessment of aesthetic values of water prior to discharge. Where water appears contaminated, discharge to cease. Water Quality and Sediment Control Sub Plan (Attachment I9).	VG	E	2	E2	Low
75	**Discharge of water**	**Agricultural Land**	Deterioration of livestock drinking water (agricultural productivity)	Beneficial uses of water suitable for agriculture. Landowner complaint.	C	3	C3	High	Assessment of water quality prior and during discharge. Treatment of water in settlement tank where pH or electrical conductivity may result in harm to the environment (including pasture). Water Quality and Sediment Control Sub Plan (Attachment I9).	G	E	1	E1	Low
76	**Discharge of water**	**Agricultural Land**	Contamination of water body with hydrocarbons or other contaminants	Beneficial uses of water suitable for agriculture. Landowner complaint.	D	4	D4	High	Visual and olfactory assessment of aesthetic values of water prior to discharge. Where water appears contaminated, discharge to cease. Water Quality and Sediment Control Sub Plan (Attachment I9).	VG	E	2	E2	Low
77	**Discharge of water**	**Water quality of receiving waters**	Scour or erosion of receiving areas resulting in mobilisation of sediment and increase in turbidity.	Beneficial uses of water. Aquatic ecosystems including threatened species of fish.	C	3	C3	High	Control of discharge point including directing outlet onto geotextile directly into waterway or onto vegetation with intercepting sedimentation fences to slow water flow across floodplain. Water Quality and Sediment Control Sub Plan (Attachment I9).	VG	D	2	D2	Low
78	**Discharge of water**	**Agricultural Land**	Scour of discharge area resulting in erosion of agricultural lands	Beneficial uses of water suitable for agriculture. Landowner complaint.	C	2	C2	Moderate	Control of discharge point including directing outlet onto geotextile directly into waterway or onto vegetation with intercepting sedimentation fences to slow water flow across floodplain. Water Quality and Sediment Control Sub Plan (Attachment I9).	VG	D	2	D2	Low
79	**Discharge of water**	**Erosion and Sediment, Agriculture, Flora & Fauna, Waterways & Wetlands**	Loss of sediment from construction site resulting from inappropriate discharge of site water	Beneficial uses of water suitable for agriculture. Landowner complaint. Aquatic ecosystems including threatened fish species	C	2	C2	Moderate	Control of discharge point including directing outlet onto geotextile directly into waterway or onto vegetation with intercepting sedimentation fences to slow water flow across floodplain. Refer to Water Quality and Sediment Control Sub Plan (Attachment I9).	VG	D	2	D2	Low
80	**Discharge of water**	**Acid Sulfate Soil, Agriculture, Flora & Fauna, Waterways & Wetlands, Site Rehabilitation**	Incorrect disposal of acidic water resulting contamination of uncontaminated materials, including topsoil and subsoil.	Acidification of soil resulting in poor performance of pasture and vegetation reinstatement.	C	3	C3	High	Assessment of water quality prior and during discharge. Treatment of water in settlement tank with hydrated lime where pH may result in harm to the environment (including pasture).	G	D	2	D2	Low
81	**Utilities Corridor - Discharge of water to waterways**													
	Removal of water from ROW to waterways	**Water quality of receiving waters**	Increase in turbidity in receiving waterway	Beneficial uses of water. Aquatic ecosystems including threatened species of fish.	A	3	A3	Extreme	Treatment of water in settlement tank and assessment of water quality prior and during discharge. Refer to Water Quality and Sediment Control Sub Plan (Attachment I9).	VG	D	2	D2	Low
82			Increase in turbidity in receiving waterway	Aesthetic and recreational values of waterway resulting in public or landowner complaint and / or prosecution from EPA or waterway asset manager.	B	3	B3	High	Treatment of water in settlement tank prior to discharge. Notification of EPA, waterway asset manager and surrounding landowner of proposed discharge. Refer to Water Quality and Sediment Control Sub Plan (Attachment I9).	VG	E	2	E2	Low
83														

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			Deterioration of other water quality parameters including salinity, dissolved oxygen, pH, temperature and aesthetic characteristics.	Beneficial uses of water. Aquatic ecosystems including threatened species of fish.	D	3	D3	Moderate	Assessment of water quality prior and during discharge. Refer to Water Quality and Sediment Control Sub Plan (Attachment I9).	VG	E	2	E2	Low
84			Contamination of waterway with hydrocarbons or other contaminants	Beneficial uses of water. Aquatic ecosystems including threatened species of fish.	D	3	D3	Moderate	Visual and olfactory assessment of water quality prior and during discharge. Refer to Water Quality and Sediment Control Sub Plan (Attachment I9).	M	E	1	E1	Low
85	**Treatment of water**	**Water quality of receiving waters**	Contamination of water as a result of chemical used in treatment of water prior to discharge.	Beneficial uses of water. Aquatic ecosystems including threatened species of fish.	D	3	D3	Moderate	Assessment of water quality prior and during discharge. Refer to Water Quality and Sediment Control Sub Plan (Attachment I9).	VG	E	2	E2	Low
86	**Discharge of water**	**Water quality of receiving waters**	Scour or erosion of receiving areas resulting in mobilisation of sediment and increase in turbidity.	Beneficial uses of water. Aquatic ecosystems including threatened species of fish.	C	3	C3	High	Control of discharge point including directing outlet onto geotextile directly into waterway or onto vegetation with intercepting sedimentation fences to slow water flow across floodplain. Refer to Water Quality and Sediment Control Sub Plan (Attachment I9).	VG	D	2	D2	Low
87	**Disposal of sediment**	**Waste management, Agricultural lands**	Inappropriate disposal of potentially contaminated sediment collected from tank.	Agricultural lands, soil contamination.	D	3	D3	Moderate	Sediment collected from tank will be disposed of at Lyndhurst, Taylors Road Landfill. Refer to Water Quality and Sediment Control Sub Plan (Attachment I9).	VG	E	1	E1	Low
88	**Utilities Site reinstatement**													
89	**Movement between agricultural properties**	**Spread of agricultural pests and disease**	Spread of agricultural or horticultural pests or diseases including BJH, Phytophthora or PCN.	Loss of agricultural productivity (PCN and BJH), spread of declared disease (PCN) to new areas, die back of native vegetation and remnant native vegetation communities.	D	4	D4	High	Develop a Biosecurity Management Procedure to direct the washdown of vehicles, plant, equipment and personnel on entry and exit of each property. Refer to Access and Activates on Agricultural Land Sub-Plan (Attachment I.1)	G	D	3	D3	Moderate
90	**Vehicle movements**	**Public safety, surface water quality**	Vehicle movements on and off corridor resulting in transportation of mud onto public roads.	Public safety as a result of changed traffic conditions, particularly around schools. Increased turbidity in receiving waters.	D	5	D5	Extreme	Prepare traffic management plan in consultation with relevant road authorities to direct the movement of trucks between site and disposal locations. Limit truck movements around schools to outside of morning and afternoon drop off and pick up times. Monitor mud on roads. Use street sweepers as required. Install rumble grids, wheel wash, wash down bays and or washed ballast at entry points to paved road. Refer to Water Quality and Erosion Control Sub Plan (Attachment I.9)	G	C	2	C2	Moderate

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91	**Removal of access roads**	**Soil Management**	Haul road or other areas of contaminated soil as a result of spills not removed during site reinstatement.	Contaminated materials not handled in accordance with NEPM and EPA guidelines. Possible inappropriate disposal or further contamination of soils / waterways	C	3	C3	High	Contaminated spoil removed from the site is appropriately classified through completion of a sampling programme involving methodologies and procedures set out in the relevant sections of Schedule B(2) of the Assessment of Site Contamination NEPM, Victorian EPA Publication 448.3 – Classification of Wastes and State Environmental Protection Policy (Prevention and Management of Contaminated Land).	G	D	2	D2	Low
92	**Removal of access roads**	**Water quality and erosion control**	Removal of access roads , replacement of topsoil, planting of vegetation	Flood protection systems not maintained resulting in a flooding event.	C	4	C4	Extreme	Any works directly affecting flood control systems to be done under permit to work form relevant asset manager.	G	D	2	D2	Low
93	**Soil reinstatement**	**Agricultural activity, waterways and wetlands**	Reinstatement of subsoil is not to the original grade resulting in depressions or mounding along the corridor.	Change in surface water flow, visual amenity.	C	3	C3	High	Rehabilitation consultant to verify that reinstatement is adequate. Refer to Site Reinstatement Sub Plan (Attachment I.3)	VG	D	2	D2	Low
94	**Soil reinstatement**	**Air Quality**	Reinstatement establishment activities impacting properties, fences, land, structures or houses	Potential for Dust disturbance and impacts on sensitive receptors	B	3	B3	High	Control dust from temporary stockpiles of spoil using appropriate measures such as by spraying water regularly, compacting the material or coating to reduce potential for dust generation during stockpiling	F	B	3	B3	High
95	**Soil reinstatement**	**Reinstatement, Agricultural activity**	Topsoil and Sub-soil condition (compaction, soil profile inversion) resulting in impacts rehabilitation and vegetation establishment.	Long term geomorphologic stability of landform, long term land use.	C	3	C3	High	Rehabilitation consultant to verify that reinstatement is adequate. Refer to Site Reinstatement Sub Plan (Attachment I.3)	VG	D	2	D2	Low
96	**Pasture establishment**	**Reinstatement, Agricultural activity**	Failure to establish pasture as a result of unsuitable pasture type, unsuitable timing of reinstatement, unsuitable topsoil	Long term land use.	D	3	D3	Moderate	Rehabilitation consultant to verify that reinstatement is adequate. Refer to Site Reinstatement Sub Plan (Attachment I.3)	VG	D	2	D2	Low
97	**Native revegetation**	**Reinstatement, Agricultural activity**	Revegetation and habitat restoration with unsuitable or non-endemic species of plant.	Introduction of species that are from non-providence stock or not representative of the regional EVCs.	C	4	C4	Extreme	Prepared landscape design of PR sensitive areas. Procurement of stock to specify native stock to come from providence stock.	VG	D	2	D2	Low
98	**Waterway reinstatement**	**Waterways and wetlands, flora and fauna**	Waterway reinstatement impacting fish passage of water quality in waterways and wetlands	Aquatic ecosystems including significant species	C	3	C3	High	Waterways to be reinstated to their precondition form. Requirement of relinquishment of waterway works permits.	VG	D	2	D2	Low
99	**Landscape reinstatement**	**Public amenity**	Unsuitable landscape design	Diminished community benefit and use of public areas.	D	4	D4	High	Landscape design for crown lands to be approved by land manager.	VG	D	2	D2	Low
102	**Bulk earthworks in areas of side cut and crossings using excavators and dozers**	**Erosion and sediment control**	Land-slip, mass movement or stockpiles or areas of cut and fill profile.	Increased sediment load to nearby surface waters. Erosion of land and loss of topsoil. Increase in sediment load to waterways. Non compliance under Water Act and SEPP (surface water and groundwater) requirements	C	3	C3	High	All areas of fill to be compacted. Diversion drains to be installed in areas of cut and fill to prevent water infiltration or pooling.	G	D	3	D3	Moderate