Project Risk Register
Nyngan Solar Power Station Project

Project/Site & Scope Nyngan Solar Power Station - Construction Phase	**Revision No. 1.1**
Project No. OFSC 1052	**Internal Ref: 1**

Prepared by: (*Note only First Solar employees that have been trained in the First Solar Risk Management Training Module are permitted to complete an assessment.)

Name:	Position:	Date of Risk Mgt Training*
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Reviewed and approved by:

Beresford Tuppin	**Signature:** B Tuppin	**Position: National HSE Manager**	

Date Risk Assessment prepared: December 2013	**Date work to be commenced: January 2014**

Actions before work commences: N/A

Schedule Review Date	Review Completed By	Date Completed	PM Signature	Revision No.
January-14	S. Street Shaun Street	23-01-14		
April-14				
July-14	B.Tuppin B Tuppin	30-07-14		
October-14	B.Tuppin B Tuppin	30-10-14		
January-15	B.Tuppin B Tuppin	11-01-15		
April-15				
July-15				

PROJECT EHS RISK REGISTER: Nyngan Solar Power Station - Operations and Maintenance Phase

Number	Risk	Project Phase	Cause	Effect/ Impact	Risk Rating						Risk Mitigation	Responsible Person First Solar	Residual Risk Rating						Comments
					Consequ-ence		Likelihood		Rating				Severity		Likelihood		Rating		
1	**Falls from Heights**	Deliveries and unloading Refuelling/Lubrication/Servicing Mobile Plant Delivery and installation of site sheds Construction of site offices, walkways etc Excavate, place, electrical (and other) services Site Sheds / Amenities Installation Delivery and installation of PCS structures Delivery and installation of PVIS structure Demobilising activities Maintenance on permanent strcutures	Unprotected edges (e.g. mobile scaffolding) Unprotected trenches and excavations Unprotected edges on Mobile Plant Loading and Unloading of Deliveries	Fatality Permanent Injury Minor injury	4	Critical	U	Unlikely	H	High	**HCP01: Work at Height** Where elimination of WAH and the risk of falling objects is not possible use the higherarchy of control as per HCP 01: **ABOVE THE LINE CONTROLS** - SiD - Design of PCS includes compliant access and edge protection - Fall prevention (stable secure platforms with guardrails, scaffolding, mobile plant edge protection as per project mobile plant specification matrix) - Physical Barriers - Open trench areas to have solid barriers installed and solid covers when not being worked on - EWP's and Scissor Lifts - Consultation with Suppliers to ensure deliveries meet the following: * Site sheds and accomodation modules to have lifting lugs/points at base eliminating working at height requirements. * Design specification for PCS / PVIS structures includes certified lifting lugs / points. Copies of certificates to be obtained by the project prior to lifting. * Container jacking / winching style of system for unloading sea containers to eliminate the need for lifting containers with mobile cranes * Tables, carteridge assemblies delivered palletised (or similar) to enable the use of Forklifts to unload sea containers and eliminating need for people working at heights where possible - Climbing on loads without effective fall protection is not permitted on the project. - Establish dedicated loading and unloading areas / facilities that allows safe access to rig loads for lifting and unloading. This area / facility may include equipment such as: * Scaffold platforms (or similar purpose designed access platforms) * EWPs * Overhead anchorage for securing Personal Fall Protection Equipment **BELOW THE LINE CONTROLS** - No work from A-Frame Ladders - Platform ladders only approved on site - Physical Restraint / fall arrrest systems as a primary means of control used as a last resort only and in accordance with a Work at Height Permit System - Trained and authorised personnel - where fall arrest/restraint equipment used workers trained as per AS1891.4 - Anchor points certified by suitably qualified and competent engineer - Anchor points installed by trained and competent persons as per AS1891.4 or qualified Rigger (i.e. Basic Rigging) - Equipment used inspected prior to use to ensure it is fit for purpose - Inspection and Testing processes for fall restraint / fall arrest equipment and anchor points as per AS1891.4 - Project ERP to include specific response protocol for rescue at heights - Emergency response protocols for harness based work at heights shall be established and incorporated into activity specific SWMS / JHAs	Site Supervisor	4	Critical	VU	Very Unlikely	M	Medium	
2	**Slip, trips, falls on same level (i.e. not from height)**	All stages of the project	Poor housekeeping Unclear lay down/delivery areas Uneven surfaces - lack of maintenance - high pedestrian areas Sloping surfaces Slippery/wet surfaces Footwear	Injuries (e.g. sprains / strains) requiring medical attention	2	Moderate	L	Likely	M	Medium	**SMP: 07 Project Site Safety Plans** **ABOVE THE LINE** - Site ground preparation prior to general construction access - Compliant handrails on stairways and walkways where these is a risk of fall - Treadgrips on stairs - Non slip surfaces - walkways, pathways - Limit worker access to high risk areas / unauthorised access areas (e.g. dam) through the use of suitable barricading (physical solid barriers) and signage **BELOW THE LINE CONTROLS** - Establish site vehicle movement plan which details all dedicated pedestrian access / egress pathways on-site - Provision of adequate lighting - Housekeeping practices - daily site clean up and maintenance eg; unobstructed walkways, regular rubbish removal - Review work environment in wet conditions - Regular health and safety inspections to review condition of pathways, stairways, lighting etc	Site Supervisor	2	Moderate	VU	Very Unlikely	L	Low	

	C	D	E	F	G	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE
2	Number	Risk	Project Phase	Cause	Effect/ Impact	Risk Rating						Risk Mitigation	Responsible Person First Solar	Residual Risk Rating						Comments
3						Consequ-ence		Likelihood		Rating				Severity		Likelihood		Rating		
7	3	**Person struck/crushed by mobile plant in work area**	All stages of the Project	Vehicles travelling or moving in proximity to people/work areas Poor delineation of site plant and pedestrian zones (i.e. access not restricted) Sudden/unexpected movement of plant Lack of protection for workers (i.e. less than adequate barriers) Plant design: Plant blind spots, poor operator visibility or poor hazard detection Lack of operator competence / Inexperienced plant operators Loss of control of machine / machine runaway Poor communication (i.e. btw operator & nearby workers)	Fatality	4	Critical	L	Likely	H	High	**HCP02: Mobile Plant** **ABOVE THE LINE CONTROLS** - Utilise physical (solid) barrier to separate people and/or LV's from mobile plant (i.e. restrict mobile plant entering area where people or light vehicles may operate) - Where spotters are required (on the ground) they should be protected by a physical barrier(s) where practicable; - Establish dedicated plant refuelling area(s) with physical (solid) barrier protection **BELOW THE LINE CONTROLS** - Where physical (solid) barriers are not practicable, identify type (e.g. crowd control barrier, parawebbing fencing, flagging etc.) & location of pedestrian / worker barriers to be established (i.e. around plant or general operating area). - If activity occurring over large &/or dynamic areas - barrier suitability is to be reviewed frequently & upgraded as required - Vehicle Movement Plans (VMPs) highlighting identify paths of travel for plant and people, designated parking areas (REVERSE PARKING ONLY), speed limits, laydown areas, signage (e.g. speed signs, reverse parking signs in parking areas) etc. to be established for the site and each activity area (i.e. daily through pre-start briefing) - UHF radio used by all mobile plant operators & supervisors for managing plant and vehicle operations - Establish project specific protocols (i.e. dedicated UHF channel, stand down process) for managing plant, LV/Buggy and worker movements through "RED ZONES" where mobile plant is operating - Speed limits (Access Road = 40km/hr) (Within Site & Between Blocks = 15km/hr) - Plant operator licensing and verification of competency (VOC) process - Plant Inspected & accepted as per project plant specification matrix - Establish safe operating procedure or JHA / SWMS for mobile plant operations - Establish safe operating procedure or JHA / SWMS for refuelling operations in the field - Mobile phone policy - prohibited use by workers in the construction areas and whilst operating plant and vehicles (communicated at induction) - Pre-start/ SWMS deliver method of separation of plant & people & details of vehicle movements	Site Supervisor	4	Critical	VU	Very Unlikely	M	Medium	**Action 1:** Establish a procedure / protocol for field based refuelling activities **Responsibility:** Con Catsicas **Action 2**: Establish a protocol for "RED ZONE" where mobile plant is operating **Responsibility:** Moran Stark
8												- Mobile plant fitted with warning devices such as flashing lights and audible alarm for reversing plant - Project induction to includes Plant Safety module (Plant specific blind spot buffer zones defined) - Where spotters are absolutely necessary they must be specifically trained and deemed competent								
9	4	**Collision between heavy mobile plant, light vehicles and site bus (e.g. utes)**	All Stages of the Project	Vehicle Movement Plan not implemented, enforced or followed Lack of delineation and exclusion zones between light vehicles and mobile plant Traffic control systems not implemented or managed Operator/driver distraction eg; mobile phone Reversing plant Poor visibility (fog, rain, smoke, dust) Restricted line of sight Communication less than adequate - Radio contact, visible communication Plant design: Plant blind spots, poor operator visibility or poor hazard detection Inexperienced plant operators Operator Fatigue Poor quality of haul road - wearing surface - Design (dust supression) Speeding	LV / buggy Crushed Resulting in Fatality; Plant / Vehicular damage	4	Critical	L	Likely	H	High	**HCP 02: Mobile Plant** **ABOVE THE LINE CONTROLS** - Utilise physical barriers or windrows to separate LVs / Buggies from heavy mobile plant where possible (i.e. restrict mobile plant entering area where light vehicles may operate) - Consider one way flow of plant / vehicle movements where possible (Site Vehicle Movement Plan) - Provide raised median or windrow built to minimum half the wheel height of the biggest wheel where possible to prevent head on collisions - Physical barrier segregating vehicles/plant - two way traffic flow **BELOW THE LINE CONTROLS** - Identify type & location of barriers to be established (i.e around plant or general operating area). - If activity occurring over large &/or dynamic area- Barrier suitability to be reviewed frequently & upgraded as required - Vehicle Movement Plans (VMPs) highlighting identify paths of travel for plant and people, designated parking areas (REVERSE PARKING ONLY), speed limits, laydown areas, signage (e.g. speed signs, reverse parking signs in parking areas) etc. to be established for the site and each activity / work area (i.e. daily through pre-start briefing) - Establish project specific protocols (i.e. dedicated UHF channel, stand down process) for managing plant, LV/Buggy and worker movements through "RED ZONES" where mobile plant is operating - Plant operator + LV licensing and verification of competency (VOC) process - Plant Inspected & accepted as per project specification matrix - Speed limits (Access Road = 40km/hr) (Within Site & Between Blocks = 15km/hr) - Establish safe operating procedure or SWMS for mobile plant operations - Mobile phone policy - prohibited use by workers in the construction areas and whilst operating plant and vehicles (communicated at induction) - Pre-start deliver method of separation of plant & people & details of vehicle movements - Project induction includes Plant Safety module	Site Supervisor	4	Critical	VU	Very Unlikely	M	Medium	

	C	D	E	F	G	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE
2	Number	Risk	Project Phase	Cause	Effect/ Impact	Risk Rating						Risk Mitigation	Responsible Person First Solar	Residual Risk Rating						Comments
3						Consequ-ence		Likelihood		Rating				Severity		Likelihood		Rating		
10													Site Supervisor							
11	5	**Collision between items of mobile plant**	All stages of the project	Vehicle Movement Plan not implemented / enforced or followed Multiple plant movements in close proximity to one another (e.g. in restricted area) Reversing plant Poor Visibility (fog, rain, smoke, dust) Restricted line of sight Failure/lack of communication (i,e. Radio contact) Plant Design: Plant blind spots, poor operator visibility or poor hazard detection Inexperienced plant operators Plant Failure Poor quality of haul road - wearing surface - design	Injuries requiring medical attention, Significant plant damage	2	Moderate	L	Likely	M	Medium	**HCP 02: Mobile Plant** **ABOVE THE LINE** - Utilise physical barrier to separate people and/or LV's from plant (i.e. restrict mobile plant entering area where people or light vehicles may operate) **BELOW THE LINE** - Where physical 'solid' barriers are not practicable, identify type & location of delineation / exclusion barriers to be established (i.e around plant or general operating area) - Where activity occurring over large, dynamic area- barrier suitability to be reviewed frequently & upgraded - Speed limits (Access Road = 40km/hr) (Within Site & Between Blocks = 15km/hr) - Dust management (i.e. Active dust suppression) Plant Safety: - Competent Plant Operators - Operator must be assessed as competent through VOC system before commencing work. - Site VMPs developed /Reviewed / Updated regularly. Site VMP's to identify paths of travel for plant and people, designated parking areas (REVERSE PARKING ONLY), speed limits, laydown areas, signage (e.g. speed signs, reverse parking signs in parking areas) etc. to be established for the site - An Activity/ Area VMP developed to provide vehicle movement details relevant to activity/ work area (e.g. designated parking areas, restricted Turning movements/Reversing of the various types of plant) - Pre Work briefings to ientify any adjacent / other mobile plant activity in work area - Mobile plant fitted with flashing lights and audible alarm for reversing plant - UHF radio required in all mobile plant + Supervisors. - Establish project specific protocols (i.e. dedicated UHF channel, stand down process) for managing plant, LV/Buggy and worker movements through "RED ZONES" where mobile plant is operating - Inducton provided to ALL personnel includes Plant Safety module - Mobile phone policy - prohibited use by workers in the construction areas and whilst operating plant and vehicles (communicated at induction)	Site Supervisor	2	Moderate	U	Unlikely	M	Medium	
12	6	**Collision between mobile plant/vehicles and fixed structures/installations**	Deliveries and unloading O&M materials Trenching and installation of cabling Driving on site to undertake monitoring and or repairs	Operating plant/Moving plant in areas adjacent to structures / installations (e.g. tables, combiner boxes etc.) Structures/Installations not physically protected Unplanned movement of plant/equipment	Significant damage to structures / installations, injuries requiring medical attention, Damage to plant	2	Moderate	VL	Very Likely	H	High	**ABOVE THE LINE CONTROLS** - Utliise hard barricading where possible - separating vehicles and plant from structures/infrastructure (e.g. combiner boxes, site sheds etc) which has been installed - Lighting installed to increase visibility early in morning and late afternoon (e.g. car park areas) **BELOW THE LINE CONTROLS** - Management/Supervision review when visibility conditions are poor (e.g. rain/fog) - Site VMPs Developed /Reviewed / Updated regularly. - Site VMPs developed /Reviewed / Updated regularly. Site VMP's to identify paths of travel for plant and people, designated parking areas (REVERSE PARKING ONLY), speed limits, laydown areas, signage (e.g. speed signs, reverse parking signs in parking areas) etc. to be established for the site - An Activity/ Area VMP developed to provide vehicle movement details relevant to activity/ work area (e.g. designated parking areas, restricted turning movements/reversing of the various types of plant) - Establish project specific protocols (i.e. dedicated UHF channel, stand down process) for managing plant, LV/Buggy and worker movements through "RED ZONES" where mobile plant is operating - Positive communications to control all mobile plant movements by UHF - Use of spotters around structures etc. only where absolutely necessary. Spotter must be specifically trained and assessed as competent. - Speed limits (Access Road = 40km/hr) (Within Site & Between Blocks = 15km/hr) - Competent Plant Operators - Operator must be assessed as competent through VOC system before commencing work. - Establish safe operating procedure or SWMS for mobile plant operations - Mobile phone policy - prohibited use by workers in the construction areas and whilst operating plant and vehicles (communicated at induction)	Site Supervisor	2	Moderate	U	Unlikely	M	Medium	

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2						Risk Rating							Residual Risk Rating							
3	Number	Risk	Project Phase	Cause	Effect/ Impact	Consequ-ence		Likelihood		Rating		Risk Mitigation	Responsible Person First Solar	Severity		Likelihood		Rating		Comments
13	7	**Collisions involving vehicles - General/Travel to & from Site**	All stages of the project	Driver fatigue Driver behaviour Poor vehicle management Sub-standard road conditions Sub-standard or poorly maintained vehicles	Vehicle incidents resulting in serious injuries / fatalities	4	Critical	L	Likely	H	High	**ABOVE THE LINE CONTROLS** - Camp constructed to accommodate workers locally & reduce driving - Fly-in-Fly out strategy + provision of bus transport to/from Airport in Dubbo - AGL upgrade to site access from Barrier Hwy to include accelaration and decelaration lanes and associated signage - Engage local drivers for bus transport to and from site to ensure familiarity with roads for bus transport - PSSP to include a description of the minimum safety features required for buses and any LV's which will enter and be used on site - Site Vehicles procured / hired by First Solar shall be Australian Design Rule compliant in all areas of mechanical, design and safety features or international equivalent. -Site Vehicles procured / hired by First Solar selection shall be based on risk assessment, taking account of tasks, application, environment, Principal (AGL) requirements and Australian New Car Assessment Program (ANCAP) rating three and above. **BELOW THE LINE CONTROLS** - Traffic Management Plan developed for the project by a competent traffic engineer. (police escorts and public notices about the timing and likelihood of delays for heavy equipment movements to site) - AOD and fatigue management programs to monitor and manage driver behaviours such as fatigue, dangerous driving and the use of alcohol or drugs. - Project expectations in relation to drivers behaviour to be communicated at project induction - Prior to any LV entering site, an appointed competent person shall assess the LV to ensure that it meets the requirements of the operating and design specification for the site. - Drivers of light vehicles on site shall conduct a 'pre-start' inspection to site and company requirements which include checking of key safety items (e.g. lights, indicators, horn, tyre condition, wipers, seatbelts, etc.) and recording the inspection. - Systems shall be in place to ensure that risks associated with vehicle / bus journeys are identified managed and controlled, including a Journey Management Plan (JMP) when applicable. - The JMP shall include but not be limited to an effective communications system, journey monitoring at both ends of the journey, environmental risks, fatigue management and competency. - A formal inspection and preventative maintenance system shall be implemented to ensure that vehicles are maintained in a safe and roadworthy condition. - Any deficiencies detected that may affect vehicle safety shall be reported and tagged out of service. - All repairs shall be performed by an authorised and competent person. - Supervisors are to inspect the log books of heavy vehicle drivers delivering materials to the project to ensure compliance with driver fatigue requirements (addressed in the PSSP) - A system shall be in place to ensure that loads do not exceed rated gross vehicle mass (GVM), and are adequately secured prior to leaving site.	Site Supervisor	4	Critical	VU	Very Unlikely	M	Medium	
14																				
15	8	**Collisions between vehicles and Wildlife - General/Travel to & from Site**	All stages of project	Travelling through rural areas heavily populated with wildlife (e.g. Kangaroos) Travelling at dawn and dusk Travelling at night time	Serious injuries; Significant vehicle damage	3	Major	U	Unlikely	M	Medium	**ABOVE THE LINE CONTROLS** - Site Vehicles procured / hired by First Solar shall be Australian Design Rule compliant in all areas of mechanical, design and safety features or international equivalent. -Site Vehicles procured / hired by First Solar selection shall be based on risk assessment, taking account of tasks, application, environment, Principal (AGL) requirements and Australian New Car Assessment Program (ANCAP) rating three and above. **BELOW THE LINE CONTROLS** - Project expectations in relation to driver behaviour to be communicated at project induction + reminder to exercise caution if travelling to and from the project at dawn or dusk	Site Supervisor	3	Major	U	Unlikely	M	Medium	

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2						Risk Rating							Responsible Person First Solar	Residual Risk Rating						
3	Number	Risk	Project Phase	Cause	Effect/ Impact	Consequ-ence		Likelihood		Rating		Risk Mitigation		Severity		Likelihood		Rating		Comments
16	9	**Loss of Load during Transport to and from Site**	All stages of project	Poorly secured loads Loads move in transit Incorrect / inadequate load restraints used Poorly maintained load restraint devices Workers lack training and knowledge in the selection and use of load restraint devices Human factors (e.g. workers hurrying to pack up and leave site at the end of a shift or roster)	Serious injuries; Significant vehicle damage	3	Major	U	Unlikely	M	Medium	**ABOVE THE LINE CONTROLS** - All loads are to be securely restrained during transport as per the requirements of the National Transport Commission Load Restraint Guide and by using only approved and appropriately rated chains, straps and lashings (i.e. load restraint devices). Blue and Yellow "Parramatta Rope" is not permitted for use on the project - Ensure that only indirect or double action load binders are used on chains - Ensure loose items are stored in a segregated storage compartment and are not carried unsecured in the passenger compartment of any vehicle - Only tow trailers if the vehicle has a properly designed towbar and trailer coupling with a certified weight rating - the loaded mass of the trailer must not exceed the load capacity of the towbar and trailer coupling and must be within the vehicle manufacturer's prescribed towing limits - Tarpaulin covers or nets should be applied over the top of cargo/loads liable to be blown off during transport. **BELOW THE LINE CONTROLS** - Project expectations for securing loads to light vehicles / trucks to be communicated to workers and contractors at induction - Subcontractors are to provide First Solar with a register of load restraint devices and provide evidence that they are regularly inspected and maintained as per OEM requirements - Delivery driver induction process. First Solar reserves the right to refuse entry for vehicles with loads which are inadequately secured or not as specified (e.g. palletised, pre-slung etc.) - Project health and safety inspections and task observations to address subcontractors vehicles and the securing of loads - Workers responsible for securing loads to light vehicles / trucks for transport shall be adequately trained and instructed in load restraint techniques	Site Supervisor	3	Major	VU	Very Unlikely	M	Medium	
17																				
18												Excavators & Earthmoving Machinery - Earthmoving equipment must only lift loads that are within its rated capacity (i.e. the mass of the lifted load and the lifting attachments at maximum lift point radius) - only use attachments identified on the load chart - ensure the rated capacity/working load limit (WLL) is permanently displayed in a prominent position near the lifting point - ensure that a load chart is mounted inside the operator's cabin - burst protection is to be fitted to the boom and dipper arm hydraulics (where attached) of any mobile plant used as a crane. - unless a designated lifting point is fitted elsewhere, loads should only be suspended from the manufacturer's designated lift point on the boom or the quick-hitch if fitted.							

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2	Number	Risk	Project Phase	Cause	Effect/ Impact	Risk Rating						Risk Mitigation	Responsible Person First Solar	Residual Risk Rating						Comments
3						Consequ-ence		Likelihood		Rating				Severity		Likelihood		Rating		
20	**10**	**Collapse of Excavation/ Trench**	Trench/cabling repairs during operations and maintenance phase	Lack of consideration of ground conditions and failure to conduct risk assessment Failure to engage Geotech Engineer for excavation/trench >1.5m or when faced with Poor ground or sub-Soil conditions Inadequate benching/battering Inadequate shoring Spoil placed in close proximity of trench Plant and vehicles loading zone of influence Poor weather conditions Failure to monitor/inspect condition of trench	Worker crushed resulting in serious personal injury or fatality	4	Critical	U	Unlikely	H	High	**HCP 04: Excavation and Trenching** **ABOVE THE LINE CONTROLS** - Safety in Design consideration for requirement of trenching to establish undergound services versus above ground services - Safety in Design Consideration (i.e. trench depth for services < 1500mm) - Engage Geotechnical Engineer to assist the project (as required) - Excavations and trenches > 1.5 metres in depth, where entry is required, shall either be shored, battered back or benched unless a geo-technical engineer confirms in writing that the excavation is stable and any conditions set by the engineer are followed. - Excavations and trenches < 1.5 metres in depth with unstable rock or soil and where access is required shall be shored, battered back or benched. - Each bench cut into the side of the excavation or trench must be no higher than it is wide. Step dimensions are to be suitable for the soil type and be no greater than 1.5 metres (or unless otherwise approved by geotech). - Battering is to be suitable for the soil type and be at an angle of 45° or less to the horizontal and start no higher than 1.5 metres above the bottom of the trench - Non-proprietary shoring is to be designed by an engineer and installed by trained personnel only after a competent person has inspected the trench, assessed the shoring and approved the use of the shoring. - Wherever practicable, a barricade or hoarding, 900mm high is to be erected to exclude entry to trenches of depth 1m or more where other on site personnel may be at risk due to its location and accessibility. - Wheel stops / windrows to be used to be prevent plant, vehicles from accessing the edge of trenches / excavations - Clearly marked covers suitable to sustain likely loads are to be placed on unattended excavations and secured where practicable on site. **BELOW THE LINE CONTROLS** - Permit to Excavate to be completed and issued by an authorised permit issuer / coordinator prior to any excavation activities being undertaken on site - Contractor SWMS reviewed and approved for any work involving excavation work > 1.5m deep and that it identifies and details controls for excavation collapse, falling objects, falling into the excavation & inhaling contaminated air. - Competent person (i.e. Supervisor) is to undertake, as a minimum, daily inspections of trenches and excavations and details of these inspections are to be recorded in an excavation log on site. A competent person is someone trained and assessed as competent in the First Solar 'in-house' trenching and excavation training module or a course approved by National HSE Mgr - Barricades and signs (are to be used at safe distances (e.g. 1 metre) from edges to protect unattended excavations that cannot be practicably covered. - Petrol driven machinery is not to be located in or near excavations and trenches. Plant and paths of travel / 'no go zones' to be addressed by the activity specific VMP - A safe means of access and egress is to be provided into excavations and trenches requiring access. Ladders providing a safe access and egress are to be placed in every 9-metre length of trench where workers are required to work. - Mobile plant, materials and spoil is to be kept at least 1000mm from the sides of a trench or excavation or at distances that ensures they do not endanger the stability of the trench or a person present below. - Emergency Response Plan to include project specific procedures for managing the collapse of a trench or excavation.	Site Supervisor	4	Critical	VU	Very Unlikely	M	Medium	
21																				
22	**11**	**Exposure to Lightning strike**	All stages of the project	Electrical Storms	Equipment damage, fires and electrocution	4	Critical	V U	Very Unlikely	M	Medium	**ABOVE THE LINE CONTROLS** **-** Installation of lightning rods - Lightening protection design to include surge protection **BELOW THE LINE CONTROLS** **-** Construction Manager and Project HSE Manager to monitor weather channels - Lightning meter/ monitoring equipment to be procured for use on-site - Electrical storm/lightning response protocols (distance based) incorporated into the project specific Emergency Response Plan - Project ERT members trained in their specific roles and responsibilities as they relate to project specific emergency response protocols - Workers and contractors provided with information and instruction as part of induction, tool-box talks, JHAs / SWMS / Daily Pre-starts.	Site Supervisor	4	Critical	VU	Very Unlikely	M	Medium	

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2	Number	Risk	Project Phase	Cause	Effect/ Impact	Risk Rating						Risk Mitigation	Responsible Person First Solar	Residual Risk Rating						Comments
3						Consequ-ence		Likelihood		Rating				Severity		Likelihood		Rating		
23	12	**Exposure to Static Discharge**	Refuelling mobile plant Testing and commissioning	Electrical testing (high potential testing) Refuelling	Electrocution Shock Burns Fires Explosions	4	Critical	U	Unlikely	H	High	**HCP05: Electrical** **HCP09: Hazardous Chemicals** **ABOVE THE LINE CONTROLS** - Lock out/Isolation and tagging processes (LOTO) - Grounding and bonding of refuelling systems / fuel storage tank complies with AS 1692 which specifies the requirements for design and construction **BELOW THE LINE CONTROLS** - Diesel fuel used where possible - Suitable Fire extinguishers are positioned based on the assessment of a competent person - Equipment or vehicles turned off prior to refuelling - Electrical Specific PPE defined in JHAs/SWMS - Authorised and Qualified Electricians	Site Supervisor	4	Critical	VU	Very Unlikely	M	Medium	
24																				
25	13	**Exposure to Electricity - General/Electrical tools/equipment/generators**	All stages of the project	Use of damaged and/or faulty electrical equipment (Tools, Leads, Temporary Distribution Boards) Failure to install/use earth leakage protection devices Failure to visually inspect tools / equipment prior to use Failure to conduct routine testing & tagging Placing/use of leads & equipment in hostile environments (Mechanical, Chemical, Thermal damage) Leads in damp/wet areas	Electrocution & Fatality	4	Critical	U	Unlikely	H	High	**HCP 05 - Electrical Work** **ABOVE THE LINE** - Only equipment that complies with the equivalent of the Australian Standards AS/NZS 3000 and AS/NZS 3012 is to be allowed on the Nyngan Solar Power Station Project - Work on low voltage electrical installation must only be done by a qualified electrician. - No Live work is permitted. Isolated circuits are to be treated as live until a test for dead (not live) has been completed - Approved earth leakage protection (RCD) will be provided for all circuits - Temporary distribution(switch) boards will have appropriate signage and be fixed on a pole, post, wall, floor or other structure, lockable (for isolation purposes), weatherproof and marked with the source of the supply and where it originates from. - If more than one switchboard is located on a site, markings must be provided to distinguish one switchboard from another. - All electrical leads will be secured off the ground by insulated hooks and/or lead stands to protect against damage. - Electrical socket-outlets on generators must be protected by RCD not exceeding 30 mA and should be connected in accordance with AS/NZS 3012. **BELOW THE LINE** - All construction wiring, switchboards and transportable structures must be inspected and tested by a licensed electrical worker (electrician) following the initial installation and in a period not exceeding six months - All other electrical equipment including power tools, flexible cords, cord extension sets (extension leads) and portable socket outlet assemblies and portable RCDs must be tested and inspected according to the methods in AS/NZS 3760 and in a period not exceeding three months. - No electrical equipment is to be used or be in place ready for use without a current test and tag - Non-compliant equipment must be withdrawn from service immediately and labelled with suitable warning against further use. If sent for repairs, it must be re-tested once returned to site. - Electrical testing and tagging performed only by qualified electricians. records of inspection and testing will be maintained in an Electrical Equipment Register. - JHA / SWMS require visual inspection for tag and damage prior to use of any electrical tool/lead. - Routine inspections of electrical switch boards, leads,power tools by supervisors and safety advisors.	Site Supervisor	4	Critical	VU	Very Unlikely	M	Medium	
26																				

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2	Number	Risk	Project Phase	Cause	Effect/ Impact	Risk Rating						Risk Mitigation	Responsible Person First Solar	Residual Risk Rating						Comments
3						Consequ-ence		Likelihood		Rating				Severity		Likelihood		Rating		
27	14	**Exposure to Electricity - Electrical supply systems (i.e. install, commissioning, maintenance)**	Servicing and maintaining mobile plant Site Offices / Sheds / Amenities - Electrical Installation, Commissioning and ongoing maintenance External Lighting - Install/Commissioning Testing and commissioning Operations and maintenance phase	Poor/inadequate safety in design (functional safety) Inadequate protection of energised conductors Inadvertant re-energisation of previously isolated energy source Failure of permit to work system Conducting 'Live' electrical work	Electrocution Fatality	4	Critical	L	Likely	H	High	**HCP 05 - Electrical Work** **ABOVE THE LINE CONTROLS** - Only equipment that complies with the equivalent of the Australian Standards AS/NZS 3000 and AS/NZS 3012 is to be allowed on the Nyngan Solar Power Plant project. - Work on low voltage electrical installation must only be done by a qualified electrician. - No Live work is permitted. Isolated circuits are to be treated as 'live' until a test for dead (not live) has been completed - Lock out and Isolation practices (LOTO) - All works are subject to a Energy Isolation Permit being in place managed by competent authorised persons - Approved earth leakage protection (RCD) will be provided for all circuits - Generators supplying a fixed installation will be installed and tested by a licensed electrical worker / contractor in accordance with the requirements of the Australian/New Zealand Standard, AS/NZS 3000 – 2000 Wiring Rules **BELOW THE LINE CONTROLS** - EPC LOTO procedures which have been developed specifically for First Solar - Energy Isolation Permit - an Energy Isolation Permit to work on electrical equipment, issued by an Authorised Person (AP) - Permit Issuers / Coordinators to be trained and assessed as competent in the First Solar in-house training module on issuing permits + the EPC LOTO training program - Permit acceptors (e.g. Supervisors) to be trained and assessed as competent in the First Solar in-house training module on working in accordance with permits + the EPC LOTO training program - Electrical workers performing work will be trained and deemed competent in the EPC LOTO training program - Provision of specific isolation procedures, personal isolation locks and danger tags - HV switching procedures developed in consultation with key stakeholders - Engerised sections to be excluded through creation of 'red roped energised zones' (Maps showing Energised sections communicated at Tool-Box and placed on designated notice boards) - JHA / SWMS for electrical install, maintenance and commision works - Provision of suitable Arc Flash PPE - Transfer of process from electrical to generator - to be managed by electrical workers trained and instructed in a MOP + JHA for the process - Emergency Response Plan to include site specific response protocol for electrocution	Site Supervisor	4	Critical	VU	Very Unlikely	M	Meduim	
28																				
29	15	**Exposure to Electricity - Contacting powerlines/aerial conductors [Note: At site access point off the Barrier Hwy]**	Deliveries of mobile plant and construction materials Tree Cutting and Vegetation Removal Access Road & Internal Road Construction Operations and maintenance phase	Failure to identify overhead services Failure to relocate the Overhead powerlines / services clear of the work area Failure to isolate powerlines / aerial conductors Mobile plant working around live overhead powerlines - contact Selection of plant inadequate Mobile plant encroaching safe approach distances Failure to install physical barriers (horizontal & vertical) Failure to install warning devices & signage No Accredited Person(s) and Safety Observer / Spotter	Electrocution & Fatality; Fires Plant damage	4	Critical	L	Likely	H	High	**HCP 05 - Electrical Work** **ABOVE THE LINE CONTROLS** - Engage with the asset owner and elimate the risk associated with live services by relocating the service (e.g. service connection to the house) clear of the work area - Consider relocating access roads/work areas to eliminate potential of contact with overhead powerlines - If relocation is not possible, consider substituting for items of mobile plant that cannot encroach on the safe approach distance to the service (e.g. an excavator replaced by a drott or trench digger) - Where services could be impacted by construction activities they are to be isolated / protected (as appropriate). Plan the works around a formal outage (Power Outage) - Consider limiting devices on plant (e.g. height restrictors fitted to excavators) with the potential to enter the danger zones (Check operation and functionality prior to entering work zone) - Physical barriers used for exclusion zones (e.g. jersey kerbs to prevent entry into exclusion zones, where physical barriers are not practicable establish delineated exclusion zone) **BELOW THE LINE CONTROLS** - Travel ways under overhead powerlines that may be impacted by mobile plant, including delivery vehicles, must have high visibility warning signage to make the powerline proximity clearly visible + include height of contact wire. - Soft barriers & Tiger tails to be considered only where all above the line controls have been explored with the asset owner - Overhead wires spotters trained in Crane & Plant Electrical Safety Course to be used when there is the potential for the accredited persons zone i.e. Safe Approach Distance (SAD) to be encroached - Surveyors As-built plans to include details of all new services - Emergency response plan to include response protocol for contact with aboveground and belowground services and utilities (e.g. powerline / aerial cable strike)	Project Manager Construction Manager & Supervisors	4	Critical	U	Very Unlikely	M	Medium	
30																				

	C	D	E	F	G	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE
2						Risk Rating							Responsible Person First Solar	Residual Risk Rating						
3	Number	Risk	Project Phase	Cause	Effect/ Impact	Consequ-ence		Likelihood		Rating		Risk Mitigation		Severity		Likelihood		Rating		Comments
31	16	**Exposure to Electricity - Disturbance of Underground Cables**	Excavation and installation of permanent construction site fencing General Earthworks & prep works for access roads, lay-down areas, site sheds, car parks, construction areas etc Access Road & Internal Road Construction (incl. drainage) Construciton of site offices Excavate, place, electrical (and other) services when installing site sheds / offices Trenching and installation of cabling Operations and maintenance phase	Site services (live and disused) not identified prior to work commencing Lack of information on underground essential services provided to the excavation contractor. Fail to expose and verify location / type of service (e.g. potholing) Fail to keep information up-to-date Fail to engage asset owner and establish methods to be adopted to isolate or protect existing assets Failure of Permit to work system for excavation Lack of training in the identification, protection of underground services Lack of procedures and training for dealing with emergency scenarios	Uncontrolled strike resulting in electrocution	4	Critical	UL	Unlikely	H	High	**HCP04: Excavation & Trenching** **ABOVE THE LINE CONTROLS** - All services are to be accurately located using the relevant services drawings i.e. Dial Before you Dig & where excavating on private property, contact the owner or occupier of the premises, land etc about buried cables before starting work. - The location of services is to be exposed and physically verified by a secondary means such as non-destructive potholing, ground penetrating radar, electronic detection of horizontal & vertical location (using suitable device) or hand digging - Utilise physical barricades to protect services and prevent contact/damage **BELOW THE LINE CONTROLS** - Permit to Excavate issued to work crew on-site by an authorised Permit Issuer / Coordinator trained and assessed as competent in the First Solar in-house training module on issuing permits - Trained and competent permit issuer appointed (in writing) by the Project Manager - Permit acceptors (e.g. Supervisors) to be trained and assessed as competent in the First Solar in-house training module on working in accordance with issued permits - Services must have physical identification signage such as type of service, line marking and/or area demarcation - New services as-built and consolidated on site services drawing/register (to be used for future excavations or passed on to owner / operator at the completion of the project) - Spotters to be utilised when digging near power & gas (as required by the utility owner) - Emergency response plan to include response protocol for contacting aboveground and belowground services and utilities (e.g. underground cable strike)	Site Supervisor	4	Critical	VU	Very Unlikely	M	Medium	
32	17	**Contact with undergound services - water and telecommunications**	Excavation and installation of permanent construction site fencing General Earthworks & prep works for access roads, lay-down areas, site sheds, car parks, construction areas etc Access Road & Internal Road Construction (incl. drainage) Construciton of site offices Excavate, place, electrical (and other) services when installing site sheds / offices Trenching and installation of cabling Operations and maintenance phase	Site services (live and disused) not identified prior to work commencing Lack of information on essential services provided to the camp construction contractor(s). Fail to expose and verify location / type of service (e.g. potholing) Fail to keep information up-to-date Failure of Permit to work system Fail to engage asset owner and establish methods to be adopted to protect existing assets Lack of procedures for working around services Lack of training in the identification, protection of underground services Incorrect drawings incorrectly identifying services	Loss of services Reputational loss Financial loss	3	Major	L	Likely	H	High	**HCP04: Excavation & Trenching** **ABOVE THE LINE CONTROLS** - All services are to be accurately located using the relevant services drawings i.e. Dial Before you Dig & where excavating on private property, contact the owner or occupier of the premises, land etc about buried cables before starting work. - The location of services is to be exposed and physically verified by a secondary means such as non-destructive potholing, ground penetrating radar, electronic detection of horizontal & vertical location (using suitable device) or hand digging - Utilise physical barricades to protect services and prevent contact/damage **BELOW THE LINE CONTROLS** - Permit to Excavate issued to work crew on-site by an authorised Permit Issuer / Coordinator trained and assessed as competent in the First Solar in-house training module on issuing permits - Trained and competent permit issuer appointed (in writing) by the Project Manager - Permit acceptors (e.g. Supervisors) to be trained and assessed as competent in the First Solar in-house training module on working in accordance with issued permits - Services must have physical identification signage such as type of service, line marking and/or area demarcation - New services as-built and consolidated on site services drawing/register (to be used for future excavations or passed on to owner / operator at the completion of the project) - Spotters to be utilised when digging near power & gas (as required by the utility owner) - Emergency response plan to include response protocol for contacting aboveground and belowground services and utilities (e.g. underground cable strike)	Site Supervisor	3	Major	VU	Very Unlikely	M	Medium	

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2	Number	Risk	Project Phase	Cause	Effect/ Impact	Risk Rating						Risk Mitigation	Responsible Person First Solar	Residual Risk Rating						Comments
3						Consequ-ence		Likelihood		Rating				Severity		Likelihood		Rating		
33	18	**Inhalation of Dust and other Airborne particles**	All Project Stages - travel on access roads General Earthworks & prep works for access roads, lay-down areas, site sheds, car parks, construction areas etc Access Road & Internal Road Construction (incl. drainage) Trenching and installation of cabling	Concrete cutting/breaking Insufficient dust supression Exposure naturally occuring crystalline silica Exisitng property restoration/repairs (House)	Acute or chronic respiratory illness, complaints from neighbours	2	Moderate	U	Unlikely	M	Medium	**SMP: 14 Workplace Exposure Monitoring & Health Surveillance** **ABOVE THE LINE CONTROLS** - Ensure the design specification for access roads considers the type and size of vehicles / plant, grading of materials, base material, road drainage, camber etc - Risk Assessment to be conducted by Qualified Occupational Hygienist at the commencement of construction activities **BELOW THE LINE CONTROLS** - Ongoing air monitoring as determined by qualified Occupational Hygienist - Ongoing dust supression measures (e.g. watercarts during earthworks) - Continued mointoring by Supervisors - Task specific dust inhalation PPE as required by JHAs / SWMS - Project PPE requirements include eye protection in all areas other than site offices, crib sheds - communicated to workers at induction - Health Surveillance procedures	Site Supervisor	2	Moderate	VU	Very Unlikely	L	Low	
34	19	**Exposure to an uncontrolled release from systems under pressure eg: Hydraulic fluid, air**	Operation of installed equipment eg transformers	Inadequately maintained plant/equipment Incompatible/not fit for purpose hoses, fittings, permanent fixtures	Injury requiring medical treatment, LTI;	2	Moderate	U	Unlikely	M	Medium	**HCP: 02 Mobile Plant** **ABOVE THE LINE CONTROLS** - Plant risk assessment process (including review and approval by First Solar) - Project specific mobile plant specification matrix - Plant acceptance process administered by qualified fitter / mechanic or members of the HSE team trained and assessed as competent in a tailored plant inspection and assessment course delivered by an RTO - Hose protection on high risk hoses on plant - Physical barrier seperation of personnel from mobile and fixed plant wherever practicable **BELOW THE LINE CONTROLS** - Regular and routine inspection and maintenance of mobile plant in accordance to OEM requirements - Proactive weekly inspections (i.e. site health and safety inspections) prompt checks to ensure plant is being maintained in accordance to OEM requirements - Proactive Quarterly inspections of all mobile plant on site. Compliant plant issued with a new plant acceptance sticker for the new Quarter. - Provision of Spill kits, spill response procedures and training for operators - Project Emergency Response Plan (ERP) includes a project specific response protocol for oil, fuel, chemical spills	Site Supervisor	2	Moderate	VU	Very Unlikely	L	Low	
35	20	**Exposure to Harmful Biological Agents / Contaminants**	All Stages of the project Cleaning site sheds & amenities	Exposure to bloodborne pathogens Exposure to biological content Treating injured personnel - First Aid Sewerage treatment plant on site Poor hygeine habits	Blood borne diseases Hepatitis viruses Skin infections Dermatitis	3	Major	U	Unlikely	M	Medium	**ABOVE THE LINE CONTROLS** - Full Health and Hygeine Risk Assessment by a qualified and competent Occupational Hygienist **BELOW THE LINE CONTROLS** - Necessary health surveillance and monitoring program (e.g. site cleaners) - First Aid facilities and kits on site with appropriate equipment - Hep A-B Vaccinations - for personnel working near sewerage treatment plant? Is this applicable for the Solar Power Station - Hygeine awareness for personnel included in tool-box talks	Site Supervisor	3	Major	VU	Very Unlikely	M	Medium	

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2	Number	Risk	Project Phase	Cause	Effect/ Impact	Risk Rating						Risk Mitigation	Responsible Person First Solar	Residual Risk Rating						Comments
3						Consequ-ence		Likelihood		Rating				Severity		Likelihood		Rating		
36	21	**Exposure to uncontrolled Fire (e.g. grass fires / site shed / building fire at site / Bushfire)**	All stages of the project	Sub-standard storage of hazardous chemicals Electrical faults Lack of emergency equipment Bush / grass fire spread from nearby areas	Fatality Permanent injury	4	Critical	V U	Very Unlikely	M	Medium	**CMP17: Emergency Preparedness** **ABOVE THE LINE CONTROLS** - Design of site accommodation and infrastructure to Australian Standards and Building Codes - Consult with NSW Firebrigade about the need to construct fire breaks around the the Solar Power Plant Project Site **BELOW THE LINE CONTROLS** - Bushfire Manaement Plan to be developed in consultation with NSW Fire Brigade (in Nyngan) and the Bogan Shire Council - Emergency Response plan to include site specific response protocols for uncontrolled fires (e.g. bush fires) developed in consultation with the NSW Fire Brigade (in Nyngan) and the Bogan Shire Council - Establish an Emergency Response Team and Emergency Control Centre (in training & induction room) to be used as the command centre in the event of a critical emergency situation. - FS to engage NSW Fire Brigade, Fire Engineer, or Emergency Consultant to assess the suitability, location and accessibility of emergency equipment for the Nyngan Solar Power Station project. - Hot work permits in place as required - Based on the foreseeable emergency scenarios and the role of First Solar, ERT members will complete a tailored 'in-house' training module including competency assessment - Project Induction to communicate site specific emergency response procedures to workers - Establish and maintain a schedule of drills to test the effectiveness of emergency response procedures. Emergency drills are scheduled at 3-monthly intervals according to the project risks, as identified in the project risk register and the project construction schedule - Ensure designated emergency personnel (e.g. wardens, emergency coordinators etc) are trained in emergency procedures appropriate to their allocated emergency response responsibilities and the degree of risk. - Hazardous Chemicals Risk Assessments - Hazardous chemicals physically separated from any chemicals or other things that may be incompatible by distance, barriers, or a combination of both barriers and distance - SDS on site/storage locations - Hazardous Chemical Training / Briefing for workers and supervisors - Routine workplace inspections of hazardous chemicals storage and emergency equipment on site - Mobile Plant specification matrix to define fire extinguisher requirements for items of mobile plant used on site	Site Supervisor	4	Critical	VU	Very Unlikely	M	Medium	
37																				
38	22	**Exposure to Dangerous Flora or Fauna e.g. Snakes, and spiders**	All stages of the project	Disturbing of habitat Clearing & Grubbing Access to confined space locations	Fatality, permanent injury, minor injury	4	Critical	U	Unlikely	H	High	**ABOVE THE LINE CONTROLS** - Enagage a competent person (i.e. fauna handler) if relocation is required - Perimiter fencing around site to be established prior to commencing construction - Inspect areas prior to work **BELOW THE LINE CONTROLS** - Conduct First Aid assessment to determine the first aid equipment requirements, numbers of trained first aiders and their qualifications for the Nyngan Solar Power Station (make sure there are workers with remote first aid qualifications and first aid kits suitable for snake bikes) - Supervisors site vehicles / buggies to be fitted with First Aid kits - The project will employ a full time fauna handler (trained) and develop project specific response protocols for reporting and responding to snake sightings - Project inductions and tool-box talks (e.g. Snake awareness sessions with reptile handler) to describe process for managing snake sightings on the project + first response actions - Signage will be used to highlight the locations of any snake sightings - Food bins to have full closing lids - preventing vermin, wildlife and snakes from gaining access - Housekeeping and waste management practices on site to be monitored by Supervisors - Emergency Response Plan to include project specific response protocol for the known fauna in the area (e.g. eastern brown snakes). ERP to include process for an emergency that requires Ambulance Service/Paramedic attention + escalation to air evacuation.	Site Supervisor	4	Critical	VU	Very Unlikely	M	Medium	

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2	Number	Risk	Project Phase	Cause	Effect/ Impact	Risk Rating						Risk Mitigation	Responsible Person First Solar	Residual Risk Rating						Comments
3						Consequ-ence		Likelihood		Rating				Severity		Likelihood		Rating		
39	23	**Exposure to working Above or Near Water (Dam on site)**	All phases	Unauthorised access due to a failure to physically protect Dam	Drowning	4	Critical	U	Unlikely	H	High	**ABOVE THE LINE CONTROLS** - Fencing to be erected around Dam along with 'warning' signage	Site Supervisor	4	Critical	VU	Very Unlikely	M	Medium	Likelihood viewed to reduce an order of magnitude due to fencing and physically protecting the Dam. Consequence remains unchanged.
40	24	**Contact with exposed moving parts of vehicle/plant/equipment**	Deliveries and unloading materials during operations	Lack of Plant Risk Assessment Failure to physically protect workers Inadequate guarding/shielding Human error Contact with hand tool moving parts	Fatality, permanent injury, minor injury	4	Critical	U	Unlikely	H	High	**HCP02: Mobile Plant** **ABOVE THE LINE CONTROLS** - Project specific mobile plant specification matrix - Plant Risk Assessments and review and approval process - Mobile plant acceptance process administered by qualified fitter / mechanic or members of the HSE team trained and assessed as competent in a tailored plant inspection and assessment course delivered by an RTO (and approved by the National HSE Manager) - Physical 'solid' barrier protection to separate people from plant - Guarding on rotating parts - Isolation process - ie: LOTO for maintenance,servicing and refuelling activities - Use remtoe controlled plant where possible eg when using grinders or chippers (for pallet cardboard mulching)+W54 **BELOW THE LINE CONTROLS** - Where physical 'solid' barriers are not practicable, identify type & location of delineation/exclusion barriers to be established (i.e around plant) - OEM specific plant pre-start inspections - Operator Verification of Competency process (VOC) - SWMS and/or standard operating instructions established for plant/equipment - Proactive weekly inspections (i.e. site health and safety inspections) prompt checks to ensure plant is being maintained in accordance to OEM requirements - Proactive Quarterly inspections of all mobile plant on site. Compliant plant issued with a new plant acceptance sticker for the new Quarter.	Site Supervisor	4	Critical	VU	Very Unlikely	M	Medium	
41	25	**Struck by projectiles or ejected materials**	Operations and maintenance activities	Use of Air tools (i.e. compressed air) Grinder wheel failure Mechanical failure of plant Nail guns	Permanent injury medical attention minor injury	3	Major	U	Unlikely	M	Medium	**ABOVE THE LINE CONTROLS** - Supervisors must inspect the condition of plant and equipment prior to introduction to site - Guarding on grinders - Exclusion zones where explosive power tools are in operation **BELOW THE LINE CONTROLS** - When using compressed air, couplings must have safety clips fitted to them to prevent inadvertant uncoupling when underpressure - no tie wire - Trained and authorised personnel to use explosive power and or power tool ie: Nationally accredited course for hand tools / power tools or in-house developed training and competency assessment - Plant and equipment maintenance and inspection schedule as per OEM requirements - Daily pre-operational inspections by competent person prior to operation. - Damaged or fauly equipment is to be tagged 'out of service' and quarantined or remove from site - JHA/SWMS or SOP for all power and hand tools - PSSP to include a procedures for managing work involving compressed air + power / explosive power tools - Appropriate PPE worn as per activity risk assessment - eg; double eye protection when grinding or cutting, hearing protection	Site Supervisor	2	Moderate	U	Unlikely	M	Medium	
42																				
43	26	**Exposure to cuts / punctures / pinches from hand tools, plant, objects.**	Operations and maintenance activities	Exposed re-bar, stakes Pinch points Pinch point during rigging/lifting Receiving goods - unpacking	Medical attention, minor injury	2	Moderate	L	Likely	M	Medium	**ABOVE THE LINE CONTROLS** - Plant Risk Assemements address all relevant phases of the plant lifecycle + review and approval by FS - Mobile plant acceptance procedures for mobile plant arriving to site - Guarding and shrouds around pinch points (mobile plant, equipment) **BELOW THE LINE CONTROLS** - Cut resistant gloves and sleeves - Rating Cut 5 and above for workers involved in fixing module tables to the tilt brackets and installing solar cartridge assemblies on the tables - Fit for purpose cutting tools ie; self retracting Stanley Knives	Site Supervisor	2	Moderate	L	Likely	M	Medium	

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2						Risk Rating							Responsible Person First Solar	Residual Risk Rating						
3	Number	Risk	Project Phase	Cause	Effect/ Impact	Consequ-ence		Likelihood		Rating		Risk Mitigation		Severity		Likelihood		Rating		Comments
44	27	**Worker Fatigue and Fitness for work**	All stages of the project	Pre-exising medical conditions Workers allowed to exceed max hours per shift and max number of continuous shifts Failure to consider distances travelled by workers to and from work Heat and strenuous work activities	Serious injury, medical attention	3	Major	L	Likely	H	High	**HCP11: Heat Stress** **HCP 27: Fatigue Management** **ABOVE THE LINE CONTROLS** • Camp is being constructed to accommodate workers locally to reduce driving • Fly-in-Fly out strategy + provision of bus transport to/from Airport for workers • Engage local drivers to ensure familiarity with roads for bus transport of workers to and from site • Workers will have access to air conditioned shelters for eating meals and taking breaks, and to protect them in adverse weather conditions **BELOW THE LINE CONTROLS** • Pre-employment medical screening prior to commencing work on the project • Project specific fatigue management plan / procedure • Maximum Work Hours in a 24hr period = 12 hrs • Minimum Break Length between Shifts = 10hrs • Maximum Number of Shifts Worked in a row = 21 • Minimum Number of Days off per 28 days = 7 • As soon as the need to work more than 12 hours is identified, a suitably trained and authorised person (e.g. Construction Manager or Supervisor) will undertake a formal fatigue risk assessment • Fatigue Observation and assessment process to be used for the following assessments: Random assessment; With cause (post incident); Reasonable suspicion; Self-identification • Project induction to be used to communicate fatigue signs, symptoms and risk management procedures to workers and contractors • Site monitoring of work crew hours by supervisors via site access / induction system • Supervisor training and instruction - 'in-house' Fatigue Management training module • Employee Assistance Program • Project specific travel and journey management requirements to be included in the project site safety plan • PPE (include cool vests/camel backs) • Regular rest / hydration breaks • Provide cool drinking water at the work site, and encourage 200ml every 15 to 20 minutes for all workers during hot periods of the day • Providing workers with information, instruction & training on recognizing heat related illness & on first aid. •Emergency response plan to include site specific response protocol for heat illness	Site Supervisor	3	Major	UL	Unlikely	M	Medium	
45													Site Supervisor							
46	28	**Working under the influence of Drugs and Alcohol**	All stages of the project	Drinking during working hours Drug & substance abuse Regular heavy drinking outside working hours Lack of D&A policy and program Lack of D&A testing	Serious injury, medical attention	3	Major	L	Likely	H	High	**SMP 26 - Alcohol and Other Drugs** **ABOVE THE LINE CONTROLS** - Pre-employment medical screening process to include drug and alcohol screening **BELOW THE LINE CONTROLS** - Drug and Alcohol testing program and procedures developed by competent person to comply with the requirements of AS4308 for urine screening - D&A Testing Program to include: * Self Testing - breathaliser at camp * Mandatory alcohol testing of all workers, visitors, delivery drivers on access to site * Random testing - target approximately 10% of the workforce on a monthly basis (note: contract needs to be established with a preferred provider for drug testing) * Post incident testing * Reasonable cause testing - Regular inspection and calibration of breathalyser units as per the OEM requirements - Personnel administering Alcohol tests with hand held breathalyser are to receive training from the supplier in the use of the device + training and instruction in SMP26 Alcohol and Other Drugs - 'in-house' training module as required by SMP26 to be delivered to the Project Manager, Supervisors and HSE team. - AOD information and instruction provided as part of the induction and ongoing through tool box talks - Self identification process and Employee assistance program - Project Site Safety Plan to incorporate a disciplinary process for responding to positive drug and alcohol test results	Site Supervisor	3	Major	UL	Unlikely	M	Medium	

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2						Risk Rating							Residual Risk Rating							
3	Number	Risk	Project Phase	Cause	Effect/ Impact	Consequ-ence		Likelihood		Rating		Risk Mitigation	Responsible Person First Solar	Severity		Likelihood		Rating		Comments
47																				
48	29	**Exposure to Psychological Stressors/Distress (i.e. workplace stress, bullying harassment, traumatic event)**	All stages of the project	Unreasonable behaviour directed towards someone Unwelcome conduct Verbal abuse Spreading rumours about someone Name calling Practical jokes Sexual harassment	Psychological damage / injury	3	Major	U	Unlikely	M	Medium	**ABOVE THE LINE CONTROLS** N/a **BELOW THE LINE CONTROLS** - Bullying and harassment to be addressed in the project induction. the induction will address: how individuals can respond to workplace bullying (workers, bystanders and managers; the process for reporting workplace bullying &/or harassment; the process for responding to reports of workplace bullying; the consequences for not complying; & where to go for more information and assistance. - Issue resolution procedures - EAP Program - Contractor Management procedures and Hazard Non-Compliance (HNC) Reports for non-compliance issues involving contractors	National HSE Manager	3	Major	U	Unlikely	M	Medium	
49	30	**Undertake hazardous manual task (Pushing / Pulling objects / materials)**	Operations and maintenance activities	Handling of heavy materials (e.g. tables), sustained awkward postures, repetitive / sustained actions Use of heavy tools and equipment	Musculoskeletal injury - Long term illness, medical, days off work	2	Moderate	L	Likely	M	Medium	**HCP 10: Manual Tasks** **ABOVE THE LINE** **-** Where practical, liaise with suppliers to arrange for construction materials to be palletised, pre-slung etc to minimise manual handling during unloading on site **-** Mechanical Lifting/Pulling tools/equipment to be used wherever practicable - Where possible, mobile plant to be used to deliver materials directly to the point of use to minimise manual handling **BELOW THE LINE** - Manual handling training - JHAs / SWMS (e.g. installing tables) - Worker rotation protocols incorporated in established procedures for installing tables	Site Supervisor	2	Moderate	L	Likely	M	Medium	**Action:** EPC team to investigate manual handling options (e.g. below the hook solutions) which may contribute to reducing the risk of manual handling injuries + interaction between workers and plant (forklift / manitou) whilst lifting and placing tables. **Responsibility:**

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2						Risk Rating							Responsible Person First Solar	Residual Risk Rating						
3	Number	Risk	Project Phase	Cause	Effect/ Impact	Consequ-ence		Likelihood		Rating		Risk Mitigation		Severity		Likelihood		Rating		Comments
50	31	**Exposure to Hazardous Chemicals (including gases) - Acute or Chronic**	All stages of the project	Release from equipment as a result of failure of component Refuelling and servicing of equipment Decanting of gases from cylinders or switchgear chambers Incorrect handling, storage, use or application of chemicals Lack of information, training and instruction Elevated exposure levels Pesticides or herbicides or baits used on site Hazardous environment Poor ventilation	Acute or chronic illness; Global warming potential increased	3	Major	U	Unlikely	M	Medium	**ABOVE THE LINE CONTROL** - Arrange for a qualified Occupational Hygienist to conduct a survey of theNyngan Solar Power Station site upon commencement of construction - Hazardous Chemicals Risk Assessment when procuring any item considered hazardous and/or dangerous - whereever possible substitute hazardous chemicals (e.g. substituting high hazard chemicals like carcinogens, mutagen, reproductive toxicants and sensitisers) with less hazardous chemicals - Site drainage system designed to allow retention of spills on site (e.g. bunds) - Hazardous chemicals must be physically separated from any chemicals or other things that may be incompatible and stored in accordance with SDS requirements **BELOW THE LINE CONTROL** - If required (as a result of a survey or hazardous chemical risk assessment), health surveillance/exposure monitoring requirements and information will be provided to relevant workers through tool-box talks. - Health surveillance/exposure monitoring will be conducted by a qualified medical practicioner. - All storage and handling facilities designed and operated to relevant Australian Standards (e.g. diesel storage tank) - A First aid assessment shall be conducted by a competent person to determine the type, location and accessibility of first aid equipment such as emergency showers / eye wash stations etc - ALL containers in which hazardous substances/dangerous goods are stored shall be appropriately labelled. -Placards must be displayed if dangerous goods are stored in bulk or in packages above the 'placarding quantity' as defined in Schedule 11 of the WHS Regulation. - SWMS / JSA's are specific and incorporate SDS requirements including exposure controls, specific PPE requirements and incident repose protocols. - Hazardous Chemicals Register & SDS's must be available on site - Routine site inspections of hazardous chemical storage arrangements - Spill response kits in designated refuelling areas and on all refuelling and servicing vehicles - CEMP procedures and worker training in spill response - Chemical incidents (e.g. spills) included in Emergency Response Plan to include site specific protocols for responding to oil, fuel, chemical spill	Site Supervisor	3	Major	VU	Very Unlikely	M	Medium	
51																				
52	32	**Exposure to Non-ionising Radiation (ultraviolet, lasers, welding flash)**	UV exposure during all stages of the project	Exposure to lasers UV exposure (sun)	Long term illness, serious injury, medical attention, first aid	3	Major	V U	Very Unlikely	M	Medium	**ABOVE THE LINE CONTROLS** - Segregated areas established when lasers are in use on the project - Welding activities area to be delinieated where possible (e.g. through establishing a dedicated welding / hot works bay on the projectl site) **BELOW THE LINE CONTROLS** - Welding Screens to be used when hot work being conducted - PPE for welding - Welding Helmets, Jackets, Gloves - Workers provided with Information/Instruction on use, storage and maintenance of activity specific PPE - Ensure personnel engaged to use lasers, welding equipment are suitably trained and assessed as competent - Where possible create shaded areas for workers to work under - PPE - Work helmets to have brims and flaps, dark glasses, high visibility long shirts / long cotton drill pants - Provision of sunscreen on site for workers - Sun safety training and awareness to be included as part of induction and ongoing in toolbox talks - Medical assessments - skin conditions (heat/sun related) - encourage to be conducted	Site Supervisor	3	Major	VU	Very Unlikely	M	Medium	

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2						Risk Rating							Responsible Person First Solar	Residual Risk Rating						
3	Number	Risk	Project Phase	Cause	Effect/ Impact	Consequ-ence		Likelihood		Rating		Risk Mitigation		Severity		Likelihood		Rating		Comments
53	**33**	**Hot Work and Bushfires**	Prep works for lay-down Areas, Site Offices, Site Sheds, Car Parks etc Construction of site offices	Welding Oxy Cutting Grinding	Burns resulting in medical treatment and LTI Fire - surrounding area	2	Moderate	L	Likely	M	Medium	**ABOVE THE LINE CONTROLS** - SiD to promote prefabrication off-site (to eliminate the need for welding / hot works on arrival to the project. - Where hot work is necessary, establishing a dedicated welding / hot works bay on the project site **BELOW THE LINE CONTROLS** - Hot work permit process for spark generating work activities - Hot work permits to be issued by a trained and competent permit issuer / coordinator - If there is going to be a need for Hot Works during the Summer and Total Fire Bans then we will need to engage the NSW Fire Brigade in order to seek an exemption based on our safety management system procedures - Engagement with RFS on regular (Monthly) basis - Emergency response planning eg; Fire watch established, fire extinguishers, water carts, immediate area clean and all flammables removed - Portable screens for welding/grinding - Appropriate activity specific PPE as defined in JHA/SWMS i.e. welding gloves, glasses, hearing protection etc. - Workers received training and instruction in the use and maintenance of activity specific PPE - Awareness of pending bushfire threats	Site Supervisor	2	Moderate	VU	Very Unlikely	L	Low	
54	**34**	**Exposure to Heat Stress**	All stages of the project	Alcohol intake the night before work shift Medication Poor fitness Pre-disposed to heat exhaustion Type of activity Lack of acclimatization Working in high temperatures & high warm winds Failure to maintain fluid intake	Worker dehydration resulting in heat stress and fatality, medical treatment	4	Critical	L	Likely	H	High	**Heat Stress Plan: HCP 11** **ABOVE THE LINE CONTROLS** **-** Site layout/design consider whether it would be possible to plan the temporary site offices / welfare facilities to be positioned in an area where shade trees may be able to provide some natural UV protection during breaks **-** Workers should have access to air conditioned shelters for eating meals and taking breaks, and to protect them in adverse weather conditions. **BELOW THE LINE CONTROLS** - Weather monitoring and project specific guidelines for monitoring work area temperatures using the Wet Bulb Globe Temperature (WBGT). - All workers and supervisors must be provided with awareness level training during the induction. Training is to address the signs and symptoms of heat illness, strategies for preventing heat stress & basic first aid response measures. - Supervisors to participate in an 'in-house' training module on heat stress. This training will include those contained in the awareness level training and the following: * the controls in place for each work zone to managing heat stress factors. * understand responsibilities and when to initiate heat stress controls. * how to appropriately manage employees who present signs of heat illness. - Provide cool drinking water at the work site, and encourage 200ml every 15 to 20 minutes for all workers during hot periods of the day. - Provision of electrolyte replacement fluids as a supplement to water(in moderation) Ready acccess to ice making machines and ice buckets - Regular rest / hydration breaks especially during high risk activities - Provision of adequate rest is required as per the Petroleum Fatigue Management procedure. - PPE (including provision of cool vests/camel backs) - Pre-employment medical screening prior to commencing work on the project - Emergency response plan to include site specific response protocol for responding to heat illness	Site Supervisor	4	Critical	U	Unlikely	H	High	**Action:** Project Manager to work with National Safety Manager and Project Site Manager to monitor heat illness incidents (if any). The rating may drop as monitoring advises of the actual risk onsite. **Responsibility:** Tony McSwaine, Julie Stiglish & Con Catsicas

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2						Risk Rating								Residual Risk Rating						
3	Number	Risk	Project Phase	Cause	Effect/ Impact	Consequ-ence		Likelihood		Rating		Risk Mitigation	Responsible Person First Solar	Severity		Likelihood		Rating		Comments
55	35	**Community (Neighbours) Interaction**	All stages of the project	Lack of communication with Neighbours Failure to communicate emergency response plans where there is a potential for impact to Neighbours	Public and Client Staff injury	3	Major	U	Unlikely	M	Medium	**ABOVE THE LINE CONTROLS** - Perimeter fencing and secure entry gates (e.g. boom gates, pedestrian turnstiles) to control access to Nyngan Solar Power Plant construction site. - Dedicated pedestrian walkways established as part of the site Vehicle Movement Plan **BELOW THE LINE CONTROLS** - Traffic Management plan to identify any suitable 'lead in' warning signage for traffic movements into and out of the Construction site on the Barrier Hwy - Induction procedure - Visitors Induction - Visitors/ clients are to be under site escort by a fully inducted project representative at all times whilst on site - Consultation and communication program (e.g. traffic management for deliveries to the site) - Principal Constructor Signage with emergency contact details displayed in prominant positions - Construction Site Warning Signage - Landowner gates to be locked at all times - this requirement will be communicated at induction - Where there is the potential for neighbours / other stakeholders to be impacted by emergency situations, ensure that they are briefed on the project specific emergency response procedures	Site Supervisor	3	Major	VU	Very Unlikely	M	Medium	

	C	D	E	F	G	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE
2						Risk Rating							Responsible Person First Solar	Residual Risk Rating						
3	Number	Risk	Project Phase	Cause	Effect/ Impact	Consequ-ence		Likelihood		Rating		Risk Mitigation		Severity		Likelihood		Rating		Comments
56	**36**	**Unauthorised Access to Nyngan Solar Power Station**	All stages of the project	Construction site poorly secured Forced entry by member(s) of the public	Serious injury to trespasser, Physical attack / assault to workers & / or Stolen items	3	Major	L	Likely	H	High	**ABOVE THE LINE CONTROLS** - Site Design to ensure adequate perimeter fencing to prevent unauthorised access to the camp construction site - Vehicle and pedestrian gates to be of similar configuration to prevent unauthorised access to site **BELOW THE LINE CONTROLS** - Signs denoting access to the area is restricted clearly visible around the perimeter. - Principal Constructor Signage with emergency contact details displayed in prominant positions - Construction Site Warning Signage to be established and maintained - All perimeter gates kept locked except when required to be opened to permit entry or exit. - Landowner gates to be locked at all times - this requirement will be communicated at induction - Trained and licensed contract security personnel to conduct security patrols when project site is unoccupied - Emergency Response Plan to include project specific procedures for responding to trespass / unauthorised access to the Nyngan Solar Power Station	Site Supervisor	3	Major	UL	Unlikely	M	Medium	
57	**37**	**Contractor Management failure**	All stages of the project	Lack of contractor capability Failure to have sufficiently skilled and experience resources to effectively manage the contract(s) Lack of recognition of the importance of contractor management Failure to act on contractor underperformance Differing and/or conflicting stakeholder expectations Failure to provide contract deliverables on time, to agreed quality standards Failure to adhere to agreed budget	Serious injury / fatality	4	Critical	L	Likely	H	High	**SMP: 12 Selection & Management of Contractors** **ABOVE THE LINE CONTROLS** - Pre-qualification process - Tender evaluation process - Pre-award alignment meeting with preferred Contractor - Pre-mobilisation workshop ('kick-off' meeting) **BELOW THE LINE CONTROLS** - Regular contractor audits and inspections - Prior to the commencement of work, all contractors must successfully complete the relevant First Solar project (site) safety induction - Hold regular meetings with the contractor to discuss progress, performance and any issues or concerns	Site Supervisor	3	Major	U	Unlikely	M	Medium	
58	**38**	**Flood**	All stages of the project	Extreme weather and flooding	Affect work schedule, damage to property, access roads	4	Critical	V U	Very Unlikely	M	Medium	**ABOVE THE LINE CONTROLS** - Solar Power Station design to consider 100 year flood elevations - Design specification for access roads and construction area to consider grading of materials, base material, drainage etc **BELOW THE LINE CONTROLS** - FS HSE team aligned with Bogan Shire (Nyngan) Emergency Services (member of ESC) Emergency Response Plan includes project specific response protocol for floods which shall be developed in consultation with local emergency services and the Bogan Shire Council - Emergency response procedures communicated to workers at induction - Site evacuation procedures etc to be posted on the site safety noticeboard(s) - Establish and maintain a drill of emergency response / evacuation exercises. If possible, schedule a critical response mock scenario / desk top drill (for major flooding) to coincide with known wet season for Western NSW	Site Supervisor	4	Critical	VU	Very Unlikely	M	Medium	

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2						Risk Rating							Responsible Person First Solar	Residual Risk Rating						
3	Number	Risk	Project Phase	Cause	Effect/ Impact	Consequ-ence		Likelihood		Rating		Risk Mitigation		Severity		Likelihood		Rating		Comments
59	39	**Oil, Fuel, Chemical Spills**	All stages of the project	Discharge of fuel onto surface Discharge of oil onto surface Discharge of Hazardous Chemicals/Substances onto surface Discharges to surface water or ground water Discharges of internal collection/treatment systems	Soil/Surface contamination Harmful fumes Potential fines Loss of reputation	4	Major	U	Unlikely	4	Medium	**ABOVE THE LINE CONTROLS** - Bunded fuel storage areas - Bunded oil storage areas - Self contained secondary storage tanks - Self bunded chemical storage cabinets - Portable bunds/trays - Mobile Plant acceptance process to ensure plant is fit for purpose and well maintained on arrival to the project **BELOW THE LINE CONTROLS** - Routine mobile plant maintenance in accordance with OEM requirements - Proactive weekly inspections (i.e. site health and safety inspections) prompt checks to ensure plant is being maintained in accordance to OEM requirements - Proactive Quarterly inspections of all mobile plant on site. Compliant plant issued with a new plant acceptance sticker for the new Quarter - Emergency Response plan to include site specific response protocol for oil, fuel or chamical spills - Spill kits placed in areas liquids are stored or accessed - Identified workers to receive training and instruction in the use of spill kits - Induction to include spill response requirements - Establish and maintain a drill of emergency response / evacuation exercises as per SMP 17 - Emergency Preparedness and Response. If possible, schedule a mock scenario (for hydraulic oil spill) to coincide with the earthworks phase of the project	Site Supervisor	4	Major	U	Unlikely	4	Medium	
60	40	**Drinking poor quality water**	All stages of the project	Contaminated water lines Contaminated potable water supply	Illness / Infections such as gastroenteritis,	2	Moderate	L	Likely	M	Medium	**ABOVE THE LINE CONTROLS** - Water testing program in place - Water filtration systems fitted to taps - Water Cooler units installed with drinking water supplied **BELOW THE LINE CONTROLS** Captured in the Envrionmental Risk Assessment in the OEMP	Site Supervisor	2	Moderate	L	Likely	M	Medium	
61	41	**Erosion and Sediment Control**	All stages of the project	Lack of planning Lack of awareness surrounding Erosion and Sediment control requirements	Increased erosion and runoff of sediment filled surface water during storm event	3	Major	L	Likely	H	High	**ABOVE THE LINE CONTROLS** - Site design / Layout to ensure (where practicable) that stockpiles are located away from natural drainage areas - Erosion and Sediment Control Plan must include a site layout showing all Erosion and Sediment Control structures and detailed drawings specifying installation requirements. - Stage works to minimising the area of disturbed land and exposed soil **BELOW THE LINE CONTROLS** - Marking out limit of disturbance for the works stage and communicating "No Go" areas (i.e. all other areas) to all site staff via toolbox and maps displayed onsite - Erosion control structures should be inspected at least weekly and following any rainfall event to ensure they remain effective. Records of inspection must kept and made available on request. - Earthmoving plant operators, supervisors and other relevant project staff are made aware via regular toolboxes, prestart briefings and information materials (e.g. posters) of key erosion and sediment controls including the following: * Site factors which affect erosion risk including soil type and structure, the erosive effects of wind and rain, lack of ground cover, trafficking; features of the site erosion and sediment control plan including maintenance of control devices; & Risk of erosion and potential environmental impact	Site Supervisor	3	Major	L	Likely	H	High	

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2	Number	Risk	Project Phase	Cause	Effect/ Impact	Risk Rating						Risk Mitigation	Responsible Person First Solar	Residual Risk Rating						Comments
3						Consequ-ence		Likelihood		Rating				Severity		Likelihood		Rating		
62	42	**Waste Management**	All stages of the project	Waste management requirements not clealry identified and planned for	Hygeine - causing illness Visual - community perception & Loss of reputation, Attract vermin Complaints relating to waste management	3	Major	L	Likely	H	High	**ABOVE THE LINE CONTROLS** - Approved site environmental management plan (Waste Management). The plan will address the waste management hierachy: * Waste avoidance * Waste reuse * Waste recycling * Energy recovery * Waste disposal - Waste management requirements included in impacts and aspects register **BELOW THE LINE CONTROLS** - General waste bins and containers (e.g. food scrap bins, recyclable bins, recyclable paper bins) are to be placed in easily accessible locations at all worksites. Recyclable waste should be stored separately from general waste, ensuring maximised segregation potential to minimise waste sent to landfill - Liquid and solid wastes must be segregated to allow for maximised recycling - Consider fencing for waste storage areas to prevent wildlife access - All lids and seals must be maintained on waste storage receptacles to ensure that the waste does not cause an odour nuisance - lids on general waste bins containing food scraps must have either a lock or a clasp to prevent access by wildlife - All waste storage areas must have adequate fire fighting equipment suitable for the type of waste stored in that particular area (type and location to be assessed by a competent person) - Suitably sized spill kits and spill containment systems relevant to the activities within the site must be available in the vicinity of the waste storage areas - maintenance of spill kits must be kept up to date, ensuring that no equipment is missing from the kit. - All site personnel are trained in waste management as, how to minimise wastes, recognise which types of materials are recyclable, waste segregation, spill response, their obligations to use recycling facilities provided on site and the impacts of poor waste management. - Waste management requirements must be included in site induction and toolbox training activities - Safety data sheets for wastes, where available, Must be kept on file at the administration office for all wastes that have the potential to cause harm - Regular waste management inspections (documented) . - Waste collected by suitably licenced operators **- Waste tracking - All wastes (general and regulated) transported offsite must have a "Waste Transportation Form" or similar (Note - this will need to be collected from the waste removal contractor).**	Site Supervisor	3	Major	U	Unlikely	M	Medium	
63																				
64	43	**Heritage items**	General Earthworks & Prep works for access rds, Lay-Down Areas, Site Sheds, Car Parks, construction area etc Tree Cutting and Vegatation Removal Access Road & Internal Road Construction (incl. drainage) Construction of site offices Excavate, place, electrical (and other) services when installing site sheds / offices Trenching and installation of cabling	Inadequate consultation with traditional owners/indigenous community prior to commencing operations	Complaints, delays and Loss of reputation	3	Major	V U	Very Unlikely	3	Medium	**ABOVE THE LINE CONTROLS** - Heritage assessment completed prior to commencing construction **BELOW THE LINE CONTROLS** - Project induction to include a process for managing the identification of suspected or actual heritage items - If heritage or sustpected heritage item is identified - work in area is to cease and area cordoned off - local Nyngan community team notified by the Project Manager	Site Supervisor	3	Major	VU	Very Unlikely	3	Medium	
65	44	**Community Complaints**	All stages of the project	Operations & Construction	Community complaints and Loss of reputation	4	Major	L	Likely	4	Major	**ABOVE THE LINE CONTROLS** - Regulated work periods - eg: 7:00am to 6:00pm Monday to Friday **BELOW THE LINE CONTROLS** - Complaints handling process established for the project and communicated to workers as part of the induction - Ongoing toolbox talks to reinforce procedures for responding to approaches from members of the public - Engineers and Supervisors to provide information to suppliers etc in relation to the restrictions on site deliveries	Site Supervisor	4	Major	L	Likely	M	Meduim	

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2						Risk Rating							Responsible Person First Solar	Residual Risk Rating						
3	Number	Risk	Project Phase	Cause	Effect/ Impact	Consequ-ence		Likelihood		Rating		Risk Mitigation		Severity		Likelihood		Rating		Comments
66	45	**Oil, Fuel, Chemical Spills**	All stages of the project	Discharge of fuel onto surface Discharge of oil onto surface Discharge of Hazardous Chemicals/Substances onto surface Discharges to surface water or ground water Discharges of internal collection/treatment systems	Soil/Surface contamination Harmful fumes Potential fines Loss of reputation	4	Major	U	Unlikely	4	Medium	**ABOVE THE LINE CONTROLS** - Bunded fuel storage areas - Bunded oil storage areas - Self contained secondary storage tanks - Self bunded chemical storage cabinets - Portable bunds/trays - Mobile Plant acceptance process to ensure plant is fit for purpose and well maintained on arrival to the project **BELOW THE LINE CONTROLS** - Routine mobile plant maintenance in accordance with OEM requirements - Proactive weekly inspections (i.e. site health and safety inspections) prompt checks to ensure plant is being maintained in accordance to OEM requirements - Proactive Quarterly inspections of all mobile plant on site. Compliant plant issued with a new plant acceptance sticker for the new Quarter - Emergency Response plan to include site specific response protocol for oil, fuel or chamical spills - Spill kits placed in areas liquids are stored or accessed - Identified workers to receive training and instruction in the use of spill kits - Induction to include spill response requirements - Establish and maintain a drill of emergency response / evacuation exercises as per SMP 17 - Emergency Preparedness and Response. If possible, schedule a mock scenario (for hydraulic oil spill) to coincide with the earthworks phase of the project	Site Supervisor	4	Major	U	Unlikely	M	Medium	
67	46	**Land Contamination** (Note: also addressed under Spills, hazardous substances and chemicals, refuelling)	All stages of the project	Previous site and/or landowner activities	Long term illness from exposure; delays due to remediation works, cost	4	Major	L	Likely	H	High	**ABOVE THE LINE CONTROLS** - Site survey to be conducted prior to construction commencing **BELOW THE LINE CONTROLS** - Any suspected land contamination (e.g. asbestos in soil) discovered during construction must be immediately reported to the Construction Manager and HSE Manager - If construction works uncover an area of unknown, suspected contamination is found within the approved construction area, all work within a defined area of the contamination must cease to enable an inspection to enable an assessment of contamination levels. - Secure area, briefing staff/erecting signage directing all staff to keep out of the area. - Detailed site investigation will be undertaken. - Works in the affected area must not recommence without the written approval of the Construction Manager and HSE Manager. - Any excavated contaminated material must be kept separate from other soil in a location approved by the Environmental Advisor to prevent cross-contamination and covered to prevent migration of contaminants. - Contaminated soil must not be removed from the site without the appropriate approvals including all those applicable to waste transport and disposal. - If material has been confirmed of containing asbestos, an Asbestos Management and Remediation Plan needs to be developed by an Occupational Hygienist to aid in the management of the contamination. Management strategies may include: defer management and restrict access to area; Regular removal/clean up of ACF's by an AS1 Contractor; Containment either by (i) capping in situ or (ii) surface clean-up and capping; Removal of the likely contaminated fill layers from the site and disposal off-site to an approved landfill by a licenses asbestos removalist. - Once the area has been cleaned of asbestos and confirmed by the Occupational Hygienist a Clearance Certificate can be issued and normal works can resume.	Site Supervisor National HSE Manager Environmental Manager	4	Major	U	Unlikely	M	Medium	
68	47	**Noxious weed management**	All stages of the project	Tracking seeds or soil onto site	Reduce effectiveness of groundcover (dust control); Act as source of seeds of these plants)	3	Major	4	Likely	H	High	**ABOVE THE LINE CONTROLS** - Weed and seed inspections have been conducted throughout construction stage - In operations stage vehicles will not be allowed to enter site unless they are visibly clean and free of soil and vegetable matter - Monthly environmental inspections include checking for the presence of noxious weeds and this provides the trigger for undertaking thier removal **BELOW THE LINE CONTROLS** - Inductions inform all personnel on site (or visiting site) what the weed preventions and controls are	Site Supervisor	2	Moderate	4	Likely	M	Medium	

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2						Risk Rating								Residual Risk Rating						
3	Number	Risk	Project Phase	Cause	Effect/ Impact	Consequ-ence		Likelihood		Rating		Risk Mitigation	Responsible Person First Solar	Severity		Likelihood		Rating		Comments
69	48	**Vegetation Growth in Arrays**	Operations	Nutrients and moisture under arrays favouring growth	Covering panels; Contributing to fuel loads	3	Moderate	4	Likely	H	High	**ABOVE THE LINE CONTROLS** - Control weeds growth as required eg chemical or slashing - explore use of grazing **BELOW THE LINE CONTROLS** - Monitoring growth during monthly environmental inspections	Site Supervisor	2	Minor	3	Moderate	M	Medium	
70	50	**Herbicide use on site**	Operations and construction	To control weed growth	Drift could kill revegetation growth; Drift into maintenance work areas (exposing workers)	4	High	3	Moderate	H	High	**ABOVE THE LINE CONTROLS** - Only spray at wind speeds less than 15 km/hr - restrict spraying to spot spraying where weeds are problematic and away from workers **BELOW THE LINE CONTROLS** - use a ChemCert certified sprayer only - Induсtions describe the hazards from chemicalsl used on site	Site Supervisor	3	Moderate	2	Unlikely	M	Medium	
71	51	**Dust and soil (mud) migrating/tracking offsite**	Operations and construction	Loss of groundcover Vehicle speeds too high Ground disturbance dutring hot dry windy weather Vehicles tracking mud onto Barrier Hwy when leaving site	Off site pollution; Disturbance to neighbours; Impeded vision of drivers on Barrier Hwy; Mud creates unsafe conditions (on Hwy)	4	High	3	Moderate	H	High	**ABOVE THE LINE CONROLS** - Maintain effective level of groundcover under arrays - Use water to suppress dust as required - Use dust suppressants as required for longer term dust control - Stop or reduce work until dust is mitigated - Minimise vehicles tracking off dedicated access roads and leaving site after heavy rains **BELOW THE LINE CONTROLS** - Induction of all personnel working on site covering how to minimise dust generation in their work areas and to not track mud off site onto Barrier Hwy	Site Supervisor	3	Moderate	2	Unlikely	M	Medium	
72	52	**Fauna entrapment by or within security fence**	Operational and construction	Fauna entering property while gate is open (during day) Fauna ingress under fence Avifauna striking fence	Fauna death	4	Major	3	Likely	H	High	**ABOVE THE LINE CONTROLS** - Gates kept closed - Don't chase fauna once trapped but allow them to escape safely on own terms - when required called fauna hanlder from WIRES to visit site and remove animals - Bird strike deterrents in place **BELOW THE LINE CONTROLS** - Provide inductions that address fauna interactions - regular monitoring to ensure fauna are not trapped (Fence monitoring and monthly environmental monitoring) - Monitor the fence perimeter for ingress points	Site Supervisor	3	Moderate	2	Likely	M	Medium	

	C	D	E	F	G	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE
2						Risk Rating								Residual Risk Rating						
3	Number	Risk	Project Phase	Cause	Effect/ Impact	Consequ-ence		Likelihood		Rating		Risk Mitigation	Responsible Person First Solar	Severity		Likelihood		Rating		Comments
73	53	**Explosion**	Operations	Failure in transformers in PCSs Explosion of stored chemicals	Injury or death Asset damage Spillage onto groudn and emissions to air Loss of fluids	5	Catastroph ic	1	Very Unlikely	H	High	**ABOVE THE LINE CONTROLS** - Transformers are enclosed in PCSs - Minimise storage of chemicals and fuels on site - Plant acceptance process to ensure any new or replacement plant is fit for purpose and well maintained on arrival to the project **BELOW THE LINE CONTROLS** - Routine mobile plant maintenance in accordance with OEM requirements - Monthly safety inspections to assess condition of transformers and any signs of leaks - Proactive monthly safety inspections (i.e. site health and safety inspections) prompt checks to ensure plant is being maintained in accordance to OEM requirements - Emergency Response plan to include site specific response protocol for oil, fuel or chemical spills - Spill kits placed in areas liquids are stored or accessed - Identified workers to receive training and instruction in the use of spill kits - Induction to include spill response requirements - Establish and maintain a drill of emergency response / evacuation exercises as per SMP 17 - Emergency Preparedness and Response. If possible, schedule a mock scenario (for transformer oil spill)	Site Supervisor	4	High	1	Very Unlikely	M	Medium	Medium

How severely could it hurt someone or how ill could it make someone?	How likely is it to occur?		
	Very Likely (VL)	**Likely (L)**	**Unlikely (U)**
	Could happen any time	Could happen sometime	Could happen but very rarely
Critical: Fatal or permanent disability	**H**	**H**	**H**
Major: Long term illness or serious injury	**H**	**H**	**M**
Moderate: Medical attention and several days off work	**H**	**M**	**M**
Minor: First aid needed	**M**	**M**	**L**

Very unlikely (VU)
Could happen, but probably never will
M
M
L
L

Minor Extremely Unlikely	Low
Minor Very Unlikely	Low
Minor Unlikely	Tolerable
Minor Improbable	Tolerable
Minor Probable	Tolerable if ALARP
Significant Extremely Unlikely	Low
Significant Very Unlikely	Tolerable
Significant Unlikely	Tolerable
Significant Improbable	Tolerable if ALARP
Significant Probable	Tolerable if ALARP
Severe Extremely Unlikely	Tolerable
Severe Very Unlikely	Tolerable
Severe Unlikely	Tolerable if ALARP
Severe Improbable	Tolerable if ALARP
Severe Probable	High - Intolerable
Major Extremely Unlikely	Tolerable
Major Very Unlikely	Tolerable if ALARP
Major Unlikely	High - Intolerable
Major Improbable	High - Intolerable
Major Probable	High - Intolerable
Catastrophic Extremely Unlikely	Tolerable if ALARP
Catastrophic Very Unlikely	Tolerable if ALARP
Catastrophic Unlikely	High - Intolerable
Catastrophic Improbable	High - Intolerable
Catastrophic Possible	High - Intolerable