



# Concept Waste Management Plan

Brewongle Solar Farm, NSW

March 25



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## Acronyms and Abbreviations

Acronym or Abbreviation	Meaning
AEMO	Australian Energy Market Operator
Ag	Silver
BESS	Battery Energy Storage System
Bi	Bismuth
Ca(OH) <sup>2</sup>	Calcium hydroxide
CBMP	Construction Bushfire Management Plan
CEMP	Construction Environmental Management Plan
CNVMP	Construction Noise and Vibration Management Plan
COA	Conditions of Approval
Cr	Chromium
Cu	Copper
DPI	NSW Department of Primary Industries
DPIE	NSW Department of Planning, Industry and Environment
DWMP	Detailed Waste Management Plan
EIS	Environmental Impact Statement
EMS	Environmental Management Strategy
EoL	End of Life
EPC	Engineering, Procurement, Construction
ESCP	Erosion and Sediment Control Plan
NER	National Energy Regulator
OEH	Office of Environment and Heritage
OH&S	Occupational Health and Safety
BSF	Brewongle Solar Farm
PV	Photovoltaic module
RAP's	Registered Aboriginal Parties



Acronym or Abbreviation	Meaning
RMS	NSW Roads and Maritime Services
SSD	State Significant Development
SWMP	Soil and Water Use Management Plan
TMP	Traffic management Plan
VLMP	Vegetation and Land Management Plan
WPMP	Weed and Pest Management Plan



## Introduction

This Concept Waste Management Plan (CWMP or Plan) has been prepared by Edify Energy Pty Ltd (Edify) to provide information regarding the intended management of waste associated with the development of the Brewongle Solar Farm (The Project).

The Plan also considers the NSW Waste and Sustainable Materials Strategy 2041, aiming to minimise waste and promote continual reuse of resources and maintain the uses for the Project infrastructure, thus improving the productivity of the projects resources (NSW Department of Planning, Industry and Environment, 2021).

Edify commits to providing a Detailed Waste Management Plan (DWMP) prior to construction commencing, to provide refined estimate quantities of key waste products, such as pallets, cardboard, polystyrene and other notable waste streams.

## Project Overview

The Project is located at Tarana Road, Bathurst NSW 2795, approximately 12 km from Bathurst town centre in the Bathurst Regional local government area (LGA). The Study area covers up to 299 hectares (ha) on land that is predominantly used for agricultural activities. The Project area is comprised of three (3) separate lot parcels. The Project Area covers approximately 170ha

The Project includes the construction, operation and maintenance of a solar facility and battery energy storage system (BESS), and associated infrastructure. This will include operation and maintenance buildings, internal access tracks, civil works, and electrical infrastructure. The solar facility is anticipated to have a generating capacity of up to 90MW and the BESS is anticipated to have a capacity of up to 90MW/180MW. The Project area refers to the area of land corresponding to the property boundaries on which the Project is located. This includes all Project elements and ancillary infrastructure

Key development and infrastructure components of the Project will include:

- Photovoltaic (PV) solar panels.
- Steel mounting frames with foundations.
- Single axis tracking system.
- Direct current (DC) / alternating current (AC) inverter stations.
- Medium voltage (33kV) electrical reticulation network.
- A 33/132kV switchyard, including an internal 33kV switch-room.
- Internal access tracks for operational maintenance and housekeeping, to be largely located in bushfire set-back zones.
- Security perimeter fencing.
- Staff car park and small amenities building; and
- Battery energy storage system facility.

Edify and the subsequent Engineering, Procurement and Construction (EPC) contractor will make sure that the following requirements are adhered to by all Sub-Contractors in accordance with the relevant contract/s:

- Suitably qualified environmental persons will be provided to undertake environmental duties relevant to the Project, including the implementation of the Construction Environment Management Plan (CEMP) and sub-plans as required.
- Mechanisms will be established and implemented to ensure continual improvement.
- Compliance with any reasonable direction given by a referral Agency representative to improve or rectify the Project's environmental practices is adhered to; and
- Avoidance of the disposal of solar modules to municipal landfills.



Edify will preference EPC contractors that maintain best practices in environmental management, systems and procedures defined by certification such as but not limited to international standards ISO14001:2015.

This CWMP has been prepared to expand upon the management methodologies as described under the Brewongle EIS, highlighting to Authorities and EPC contractors the environmental principles to be upheld throughout the project. The Plan is designed to achieve the following objectives:

- Minimise the waste generated by the development.
- Not dispose of solar photovoltaic modules or battery modules to landfill.
- Classify all waste generated by the development in accordance with the NSW EPA's Waste Classification Guidelines 2014 (or its latest version).
- Store and handle all waste on site in accordance with its classification.
- Not receive or dispose of any waste on site.
- Ensure chemicals and other construction materials are stored and disposed of in a manner that does not cause potential contamination; and
- Remove all waste from site as soon as practicable and ensure it is sent to an appropriately licensed waste facility for disposal or recycling.

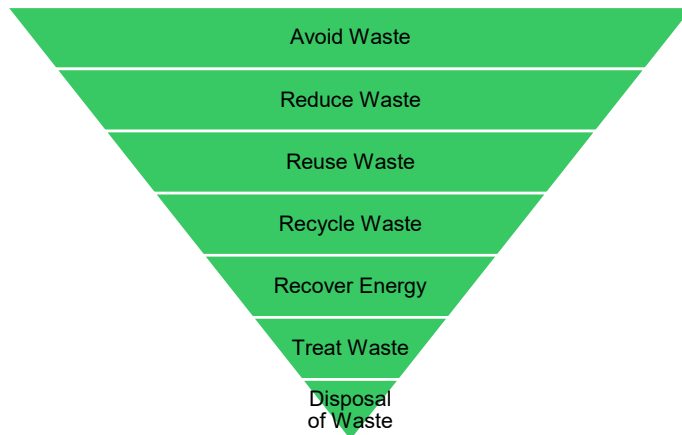
The Plan includes various secondary objectives, which include:

- Application of the waste hierarchy by identifying opportunities to avoid, reuse and recycle as much as possible during all phases of the development.
- Topsoil from disturbed areas will be stored for use in future rehabilitation activities onsite.
- Recovering or recycling materials for reuse or for a secondary purpose.
- Provision for recycling management onsite.
- The contractor will be responsible for toilet facilities onsite during construction, which includes the anticipated practice of collecting and transporting all sewage waste generated on site to be pumped out, as necessary, for offsite disposal to an appropriately licensed facility. Alternatively, in the event a bio-cycle septic system is installed on site, necessary approval will be sought from Bathurst Regional Council prior to construction commencing.
- Conduct routine checks for litter and rubbish along access tracks and roads and remove to appropriate disposal facilities.



## Legislation and Policy Requirements

Waste management in NSW is guided by the Protection of the Environment Operations Act 1997 (POEO Act) and Protection of the Environment Operations Amendment Act 2011 (POEO Amendment Act) and the Waste Avoidance and Resource Recovery Act 2001 (WARR Act). The WARR Act's objectives set out a waste management hierarchy, which prioritises avoidance of waste, then resource recovery, before disposal is considered. This hierarchy is illustrated below.



*Figure 1: Waste Hierarchy*

(DPE 2022)

To optimise the efficient use of resources and minimise adverse, waste-related impacts to the environment the following guidelines and strategies have been considered:

- DPE's Waste and Sustainable Materials Strategy 2041
- Stage 1: 2021–2027 (DPIE 2021)
- EPA's Waste Classification Guidelines (NSW EPA 2014)
- EPA's Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities 2012 (NSW EPA 2012).
- DPE's Large Scale Solar Energy Guideline

According to Waste Management and Circular Design section of the DPE's Large Scale Solar Energy Guideline, solar energy projects can generate different waste streams throughout the various phases of their lifecycle. Waste is typically minimal during the operation of a solar energy project. However, large volumes of waste may be generated during the construction period and again during the decommissioning phase. The key waste management principles that need to be considered during the construction, operation, and decommissioning stages are:

- Construction waste from large-scale solar energy projects must be minimised and the use of reusable and recyclable materials should be prioritised where possible.
- Impacts on local waste management facilities must be minimised as far as practicable during construction, operation, and decommissioning.
- Recycling of photovoltaic panels and associated equipment should be prioritised and maximised as far as possible to avoid landfill.

Adopting the above principles would encourage the most efficient use of resources and reduce costs and environmental harm in accordance with the principles of ecologically sustainable development.



## Regional Capabilities

### Voluntary Regional Waste Group

The Voluntary Regional Waste Group (VRWG) includes 26 member councils, including Bathurst Regional Council, to provide collaborative approaches to waste and resource management. The [Net Waste Regional Waste Strategy 2017–2021](#) was a strategy from the VRWG and was developed in line with EPA guidelines and aims to achieve a coordinated approach to waste management based on the WARR Strategy key result areas. Following this Strategy the [Net Waste Regional Waste and Sustainable Materials Strategy 2023-2027](#) was developed to facilitate a 20 year delivery horizon. Both strategies facilitate the logistics of waste disposal for remote areas of the Net Waste region, specific contracts have been set up with member councils to provide access services that overcome the economic and geographic constraints for these remote areas.

### Solar Material Recovery

The NSW Government has established the Circular Solar Grants Program in 2021 / 2022<sup>1</sup> allocating \$10 million to reduce the landfilling of solar panels and battery systems. This initiative aims to support the development of recycling facilities and technologies to manage solar panel waste effectively.

In June 2022<sup>2</sup>, the NSW Environment Protection Authority (EPA) announced funding for five projects totalling \$7.4 million. These projects include the construction of the first three solar panel and battery recycling facilities in NSW, located in Bankstown, Fairfield, Albury and Parkes. The facilities are expected to process thousands of tonnes of solar panel and battery waste annually, significantly diverting waste from landfills.

Edify has a letter of support (Appendix 1) from one of these grant recipients, Sircel, to recycle Edify's solar panels.

Sircel will establish a solar panel recycling facility in Parkes NSW, which will employ the most advanced and commercially proven solar panel processing technology available globally. The objective of the project is to process up to 2,000 tonnes per annum of solar panels and ancillary equipment to achieve a commodity recovery rate of more than 90%. The proposed facility will offer a commercially viable and sustainable solution for the recovery and recycling of valuable resources from end-of-life solar panels, and Sircel will also employ its sophisticated waste tracking system to demonstrate the reintroduction of recovered raw materials to the NSW economy.

The project includes partners across the NSW end-of-life solar panel value chain, including collection and logistics specialists, local councils, utility-scale solar power generation owners, operators and asset managers, solar panel installers, research and development, and technical advisory board, and Sircel accredited downstream commodity off-takers.

At the federal level, the Australian Government is working towards implementing regulations for solar panel recycling. The proposed regulations aim to establish stricter rules to ensure that solar panels and electronic goods are recycled, promoting a more sustainable approach to managing electronic waste.

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<sup>1</sup> [Circular solar grants program](#)

<sup>2</sup> [Circular economy boost for solar panels](#)



Research institutions, such as the University of New South Wales (UNSW), are actively involved in developing efficient recycling technologies<sup>3</sup>. Studies indicate that up to 95% of materials used in solar panels, including valuable components like silicon, aluminium frames, and silver, can be recycled.

The NSW Government's initiatives, combined with federal efforts and ongoing research, indicate a commitment to developing a comprehensive framework for solar panel recycling. While specific legislation is not yet in place, these policies and programs are paving the way for more structured regulations in the future.

Edify is committed to working with domestic e-waste recycling facilities to consider the most appropriate EoL recovery techniques to achieve sustainable outcomes. Edify continues to refine and consider the EoL strategy across its portfolio.

## Construction Waste (Solar Panels)

Table 1 below provides a breakdown of the typical inputs and outputs from processing 1,000kg of typical EoL solar modules, noting these estimates are provided as indicative and preliminary detail. From this typical sample, it is evident that over 92% of materials (by weight) can be recovered through simple techniques. Whilst it is beyond the scope of this report to explore technical recycling methods, such as incineration or pyrolysis, (Norgrem, Carpenter, & Heath, 2020) provides evidence how EoL regulations and various research funding have encouraged recovery and recycling methods to achieve improved environmental outcomes.

The general design, structure and components of a solar panel is shown in Figure 2 below (Lee, 2024)

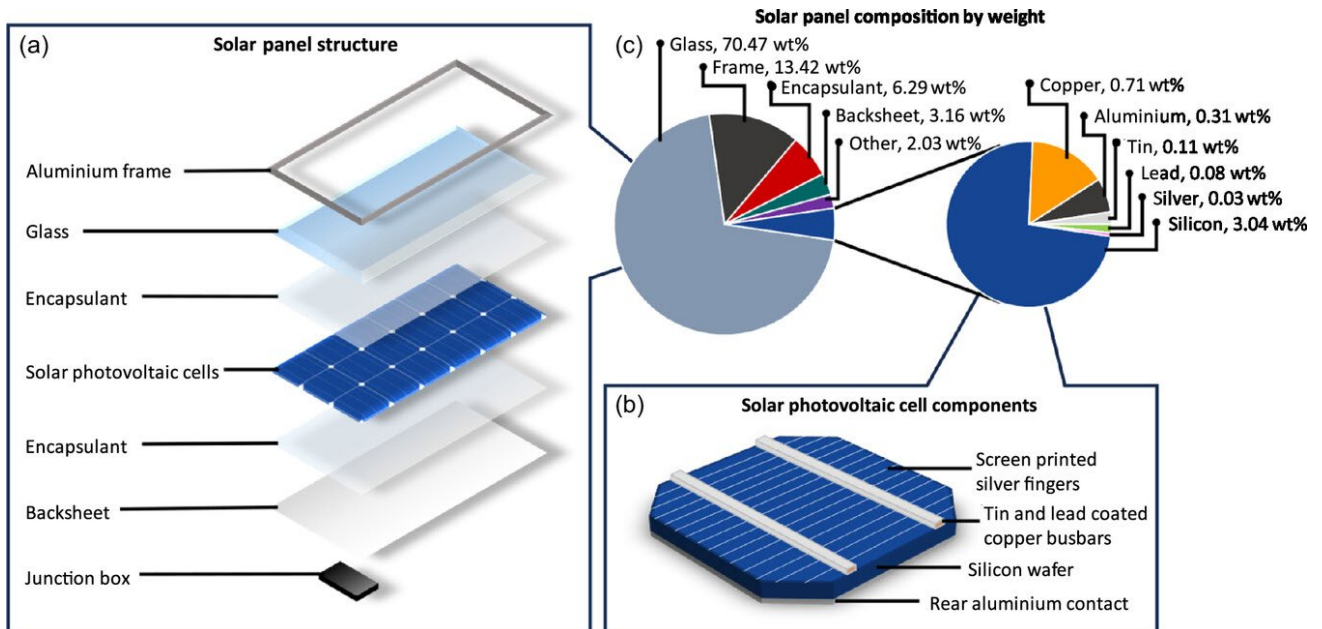


Figure 2 a) Deconstructed diagrammatic representation of a silicon solar panel structure; b) diagrammatic representation of a silicon solar photovoltaic cell composition; and c) silicon solar panel composition by weight, percentage

<sup>3</sup> [Repair, reuse and recycle dealing with solar panels at the end of their useful life](https://www.edifyenergy.com)  
edifyenergy.com



Table 1 – Inputs and outputs from typical recycling process for 1,000kg of EOL solar modules

Component	Quantity	Unit	Percentage (%)	Note
<b><u>Input</u></b>				
PV modules	1000	Kg	70	Glass
			18	PV Frame (aluminium)
			5.1	Polymer-based adhesive (EVA) encapsulation layer
			3.65	Solar cell, containing silicon metal
			1.5	Back-sheet layer (based on Polyvinyl Fluoride)
			1	Cables (containing copper and polymers)
			0.64	Conductor (containing aluminium, copper)
			0.053	Silver
			0.053	Other metals (tin, lead)
Electricity	113.55	kWh		Required in various treatment processes: disassembly, glass separation, module cutting, sieving, leaching, electrolysis
Diesel fuel	1.14	L		Forklift work
Water	309.71	kg		Water consumption for acid leaching, electrolysis and neutralisation process
Ca(OH) <sup>2</sup>	36.5	Kg		Neutralisation of solution
<b><u>Output, recovered materials (circa 92%)</u></b>				
Aluminium scrap	273.8	Kg	18.65	Recovered for reuse
Glass scrap	686	kg	68.6	
Copper scrap	4.38	Kg	0.4	
Silicon metal (Metallurgical Grade)	34.68	Kg	3.468	
Silver	0.5	Kg	0.05	
<b><u>Output, waste to landfill</u></b>				
Fly ash	2	Kg		Disposal in hazardous waste landfill



Component	Quantity	Unit	Percentage (%)	Note
Liquid waste	306.13	Kg		Disposal in landfill

Table 2 summarises the material recovery yield that comprises the major components of the PV module by weight. The PV module also contains a relatively small proportion of notable precious metals that can be preserved and recycled.

*Table 2 - Summary of highest recovery yield of each solar module component*

Component	Recovery Yield	Comment
Al frame	100%	Easily achievable
Glass	100%	See references (Deng, Chang, Ouyang, & Chong, 2019), (Jung, Park, Seo, & Park, 2016)
Cu	99%	
Si	95%	
Ag	94%	



## Construction Waste (other materials)

The typical construction materials required to build a solar farm and battery energy storage system include solar panels, mounting structures, electrical wiring, inverters, transformers, concrete foundations, underground cables, battery racks, battery management systems, control systems, and support equipment such as monitoring systems and meteorological stations.

Expected waste generated during the construction of the Brewongle Solar Farm includes the following:

*Table 3 Indicative Construction Waste*

Waste Type	Description	Preliminary Waste Classification	Proposed Management
Paper and cardboard	Packaging materials, general office wastes and confidential documents.	General Solid Waste (non-putrescible)	Separate for recycling
Wood	Pallets and cable drums, timber offcuts.	General Solid Waste (non-putrescible)	Chipped and reused on site or separated for reuse or recycling.
Plastic	Packaging materials ties, straps and excess building materials such as safety fencing and barriers.	General Solid Waste (non-putrescible)	Hard plastics separated for recycling, where possible. Soft plastics are disposed of to landfill.
Green waste	Vegetation wastes from clearing activities.	General Solid Waste (non-putrescible)	Beneficial onsite or offsite reuse or disposal to a green waste facility or landfill.
Soil	Surplus spoils from excavations and earthworks.	General Solid Waste (non-putrescible)	Onsite reuse or offsite reuse or disposal at a licensed facility.  Any contaminated soil (if encountered) would be tested and treated onsite and/or disposed of to a suitably licensed facility.
Electrical	Retired equipment or broken solar panels	General Solid Waste (non-putrescible)	Separated for reuse or recycling or disposal at an approved facility. Collection of PV panels by a specialised contractor for recycling e.g. Sircel Limited
Metals	Excess building materials such as safety fencing and barriers or retired equipment.	General Solid Waste (non-putrescible)	Separated for reuse or recycling.
Liquid waste	Oils and fuels, contaminated water from equipment washing.	Liquid waste	Collection in tanks and transported to an offsite licensed facility.



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Sewage	Biological waste from onsite septic systems.	Liquid waste and General Solid Waste (non-putrescible)	Collection in tanks and transported to an offsite licensed facility.
General	Food scraps aluminum cans, glass bottles, plastics and paper containers from the operations and maintenance buildings.	General Solid Waste (putrescible and non-putrescible)	Collection by a waste management contractor and disposed of to a suitably licensed facility.

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## Operational Waste Material

Waste streams likely to be generated during operations will be typically associated with maintenance activities and the presence of staff. As project operations will require up to 5 FTE jobs, only minor waste quantities are expected to be produced during operations. Waste streams likely to be generated during operations are outlined in Table 4

Quantities have not been provided as these are expected to be highly variable and dependent on activities required on-site and the level of corrective maintenance required throughout the life of the project. Recycling and reuse will be maximized as far as possible to avoid landfills.

*Table 4 Indicative Operational Waste*

Waste type	Description	Preliminary Classification	Management
General domestic	Food scraps, aluminum cans, glass bottles, plastics and paper containers from the operations and maintenance buildings.	General Solid Waste (putrescible and non-putrescible)	Separated for recycling and collection by a waste management contractor and disposed of to a suitably licensed facility
Liquid waste	Oils and fuels, contaminated water from equipment washing.	Liquid waste	Collection in tanks and transported to an offsite licensed facility.
Paper and cardboard	Packaging materials, general office wastes and confidential documents.	General Solid Waste (non-putrescible)	Separated for recycling.
Green waste	Waste from vegetation and weed management	General Solid Waste (non-putrescible)	Beneficial onsite or offsite reuse or disposal to a green waste facility or landfill.
Electrical	Retired equipment or broken solar panels	General Solid Waste (non-putrescible)	Separated for reuse or recycling or disposal at an approved facility.
Metals	Excess building materials such as safety fencing and barriers or retired equipment.	General Solid Waste (non-putrescible)	Separated for reuse or recycling.
Sewage	Biological waste from onsite septic systems.	Liquid waste and General Solid Waste (non-putrescible)	Collection in tanks and transported to an offsite licensed facility.



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Commercial waste	Oily rags, filters and drums (non-volatile).	General Solid Waste (non-putrescible)	Collection by a contractor and disposed of to a suitably licensed facility.
Waste batteries	Retired batteries used in appliances and construction equipment.	Hazardous waste	Collection by a contractor and disposed of to a suitably licensed facility.

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## Decommissioning Waste

Waste streams likely to be generated during decommissioning are outlined in Table 5. Recycling or reuse of PV modules and associated equipment will be maximised as far as possible to avoid landfill

*Table 5 Indicative Decommissioning Waste*

Waste type	Description	Preliminary Classification	Indicative quantity	Management
PV modules and associated infrastructure	Glass, copper cabling, aluminum framing, silicon wafers, silver, inverters and other materials.	General Solid Waste (non-putrescible)	~180,000 panels	Collection of PV panels by a specialised contractor for recycling e.g. Sircel Limited. Trackers separated for reuse or recycling.
Retired BESS and associated infrastructure	Retired batteries, inverters, transformers, steel enclosures, heating ventilation air conditioning	General Solid Waste (non-putrescible)	~49 BESS units	Collection by a specialised contractor for recycling or safe disposal.
Ancillary infrastructure	Cables and fencing	General Solid Waste (non-putrescible)	To be confirmed during decommissioning	Collection by a specialised contractor for recycling or safe disposal.



### **Facility locations**

Bathurst Regional Shire Council manages the Bathurst Waste Management Centre in South Bathurst this facility can take commercial recyclables, green waste, bricks and concrete and asbestos. Council will be contacted prior to construction if the facility is proposed to be used.

### **Environmental Management and Mitigation**

Table 7 provides a summary of waste related controls to be applied during the construction of the Project. Edify acknowledges that additional controls not recommended in Table 7 may be required during construction and these will be applied as required.



Table 6 - Process controls for managing project waste

Action	Responsibility	Timing
<b>Controls</b>		
Waste materials, including spoil and construction wastes, should be separated onsite into dedicated bins/areas where practicable, for either reuse onsite, or to be recycled or disposed of in an appropriate manner at licensed facilities. Local commercial reuse opportunities will be investigated where reuse onsite is not practical (EG. Use of waste concrete by Council in road pavement construction/maintenance as per the Specification for Supply of Recycled Material for Pavements, Earthworks and Drainage 2010 <b>(Institute of Public Works Engineering Australia (NSW Division); NSW Government, 2010).</b>	Construction Contractor  Subcontractors	Project duration  Project decommissioning
Topsoil from disturbed (hardstand) areas will be stored for use in future rehabilitation activities onsite.	Construction Contractor  Subcontractors	Project duration
Waste storage facilities and spoil placement areas shall be in easily accessible locations, away from existing drainage lines.	Construction Contractor  Subcontractors	Project duration
Watercourse, site drains and waterbodies shall not be polluted by waste. This will also be managed in part through a Construction Water Quality Management Plan as part of the Environmental Management Plan.	All Personnel	Project duration
Green waste shall be managed as per the project CBMP, including re-use for Erosion and Sediment Control or revegetation where practical.	Construction Contractor  Subcontractors	Project duration
Ordering will be limited to only the required amount of materials.	Construction Contractor  Subcontractors	Project duration
Lids and seals shall be maintained on all odour generating waste material; and all domestic and food scrap waste shall be secured to prevent wildlife access	All Personnel	Project duration
No waste is to be burned or buried on site	All Personnel	Project duration
Storage and disposal of chemicals shall be in accordance with SDS and Australian Standards for storage of chemicals and dangerous goods.	Construction Contractor	Project Duration



Action	Responsibility	Timing
	Subcontractors	
Regulated wastes shall be stored in an appropriately secure containment area and managed by appropriately qualified licensed contractors.	Construction Contractor Subcontractors	Project Duration
It is envisaged that all sewage waste generated on site shall be collected and pumped out as necessary for offsite disposal to an appropriately licensed facility.  In the event a bio-cycle septic system is installed on site, necessary approval will be sought from Bathurst Regional Shire Council prior to construction commencing.  This optionality is noted in the project's EIS	Construction Manager	Project Duration
Vehicle haulage is to occur as outlined under the Traffic Management Plan.	All Personnel	Project Duration
All loads must be covered as per NSW RMS requirements during delivery and removal from site. Materials with the potential for generating dust must be covered to prevent the spread of fugitive dust emissions.	All Personnel	Project Duration
In the event of a spill, appropriate spill management response will be undertaken in line with the Liquid Waste Fact Sheet ( <b>Department of Environment and Conservation NSW, 2005</b> ) such as: <ul style="list-style-type: none"> <li>• Stop the spill</li> <li>• Contain the spill.</li> <li>• Report the spill</li> <li>• Clean up the Spill. Use an adequately and suitably stocked spill kit (with all onsite staff being appropriately trained in its use).</li> <li>• Any spills unable to be contained or of sufficient quantity that causes or threatens material harm to the environment must be reported as pollution to NSW DPIE on 131 555.</li> <li>• Emergency response systems implemented and monitored for effectiveness.</li> <li>• Contaminated spill material would be removed offsite by a licenced contractor.</li> </ul>	All Personnel	Project Duration



Action	Responsibility	Timing
<b>Potential Contaminated Material Management</b>		
<p>For potential asbestos containing materials, they will be:</p> <ul style="list-style-type: none"> <li>• Characterised to determine if contaminated prior to disturbance and disposal.</li> <li>• Clearly delineated.</li> <li>• Disposed of at facility licensed to accept that material.</li> <li>• Removed from site as soon as possible following characterisation.</li> </ul> <p>The handling and management of potentially contaminated materials will comply with relevant Occupational Health and Safety (OH&amp;S) requirements, administered by SafeWork NSW</p> <p>SafeWork NSW will be notified as least five working days prior to the planned removal of material with the potential to contain asbestos.</p> <p>For pre-existing contaminated soils or soils contaminated by on-site activities, the contaminated areas will be managed in line with the NSW EPA 'Guidelines on the Duty to Report Contamination under the <i>Contaminated Land Management Act 1997</i>' (<b>NSW Environment Protection Agency (EPA), 2015</b>) and the 'Consultants reporting on Contaminated Land' guidelines' (<b>NSW Environment Protection Authority (EPA), 2020</b>)</p>	<p>Construction Manager</p> <p>Suitably Qualified Consultants</p>	<p>Project Duration</p>
<p>SafeWork NSW will be notified if the respirable asbestos fibre level exceeds 0.02 fibres/ml in the working area, or the current guidelines at the time.</p>	<p>Construction Manager</p>	<p>Project Duration</p>
<b>Monitoring</b>		
<p>Inspections of the waste storage area and facilities shall be conducted, as part of the scheduled environmental inspection. Inspections shall include.</p> <ul style="list-style-type: none"> <li>• Ensuring the waste material is being properly separated, stored and labelled.</li> <li>• General inspections of work areas and roads onsite to monitor whether personnel are using waste receptacles provided.</li> <li>• Checking the condition of the receptacles and secondary containment systems.</li> </ul>	<p>SHEQ Adviser</p>	<p>Project duration</p>



Action	Responsibility	Timing
<ul style="list-style-type: none"> <li>Ensuring the spill kits are available and full, and PPE is available where required</li> </ul>		
<b>Induction</b>		
The Site Induction & toolbox training shall include information on the following waste management issues: <ul style="list-style-type: none"> <li>Reuse and recycling strategies.</li> <li>Waste handling, waste storage and disposal.</li> <li>Classifying Environmental Incidents to determine appropriate response measures</li> </ul> Management and reporting of waste spills, contamination and contaminated material.	SHEQ Adviser	Project duration

## Implementation

### Training and awareness

All personnel and/or subcontractors shall be formally inducted and provided with specific awareness training in relation to the environmental aspects and mitigation methods outlined above, as they apply to each activity. All personnel will receive training in appropriate waste management procedures associated with the DWMP as part of the site induction. This includes classifying environmental incidents and determining the appropriate response measures.

Edify and the appointed Construction Contractor shall ensure that all project personnel are aware of and understand the environmental requirements of the project relevant to their role and responsibilities. This includes regulatory requirements, any contractual environmental requirements and associated procedures.

### Reporting Incidents to Regulatory Authorities

During the construction and operational phase of the Project, The Department must be notified in writing to [compliance@planning.nsw.gov.au](mailto:compliance@planning.nsw.gov.au) immediately after project staff become aware of an environmental incident. The notification must identify the development and set out the location and nature of the incident.

Land contamination must be reported to the NSW EPA via a Contaminated Land Notification Form to [ReqOps.MetroRegulation@epa.nsw.gov.au](mailto:ReqOps.MetroRegulation@epa.nsw.gov.au).

Pollution incidents that cause or threatens material harm to the environment must be reported to the NSW EPA through 131 555.



## Bibliography

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- Australian Government. (2021). *Make it Happen: The Australian Government's Modern Manufacturing Strategy*. Australian Government.
- Australian Renewable Energy Agency. (2019). *Research and Development Program Round 5: Addressing Solar PV End-of-Life Issues and Lowering the cost of Solar PV*.
- Clean Energy Council. (2019). *What you need to know for the Victorian e-waste ban*.  
<https://www.cleanenergycouncil.org.au/news/what-you-need-to-know-for-the-victoria-e-waste-ban>: CEC.
- Clean Energy Finance Corporation. (2021). *Australian Recycling Investment Fund*. (Clean Energy Finance Corporation) Retrieved from <https://www.cefc.com.au/where-we-invest/about-our-finance/investment-programs/australian-recycling-investment-fund/>
- Deng, R., Chang, N., Ouyang, Z., & Chong, C. (2019). A techno-economic review of silicon photovoltaic module recycling. *Renewables and Sustainable Energy Reviews*(109), 532-550.
- Department of Environment and Conservation NSW. (2005). *Responding to spills: Liquid Waste Fact Sheet - Protecting the environment and your business*. Sydney: Department of Environment and Conservation NSW.
- Florin, N., Wakefield-Rann, R., Dominish, E., Gertsakis, J., & Hartford, N. (2020). *Scoping study for solar panels and battery system reuse and recycling in NSW*. Sydney: Prepared for NSW Department of Planning, Industry and Environment by UTS Institute for Sustainable Futures and Equilibrium.
- Institute of Public Works Engineering Australia (NSW Division); NSW Government. (2010). *Specification for Supply of Recycled Material for Pavements, Earthworks and Drainage*. Sydney: NSW Government.
- Jung, B., Park, J., Seo, D., & Park, N. (2016). Sustainable system for raw-metal recovery from crystalline silicon solar panels: from noble-metal extraction to lead removal. *ACS Sustainable Chemistry & Engineering*, 4(8), 4079-4083.
- Lee, J. D. (2024). A Review of End-of-Life Silicon Solar Photovoltaic Modules and the Potential for Electrochemical Recycling. *Advanced Energy Sustainability*.  
doi:<https://doi.org/10.1002/aesr.202400254>
- Norgrem, A., Carpenter, A., & Heath, G. (2020). Design for Recycling Principles Applicable to Selected Clean Energy Technologies: Crystalline-Silicon Photovoltaic Modules, Electric Vehicle Batteries, and Wind Turbine Blades. *Journal of Sustainable Metallurgy*, 6, 761-744.
- NSW Department of Planning, Industry and Environment. (2021). *NSW Waste and Sustainable Materials Strategy 2041 - Stage 1: 2021-2027*. NSW Government.
- NSW Environment Protection Agency (EPA). (2015). *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997*. Sydney: NSW EPA.
- NSW Environment Protection Authority (EPA). (2020). *Consultants reporting on contaminated land - Contaminated Land Guidelines*. Sydney: NSW EPA.
- NSW Environmental Protection Agency. (2021). *Circular Solar Trials - expressions of interest*. Retrieved from <https://www.epa.nsw.gov.au/working-together/grants/infrastructure-fund/circular-solar-trials-expression-of-interest>



Planet Ark. (2020). *Find a a recycler.* (Planet Ark) Retrieved December 2022, from <https://businessrecycling.com.au/>



***Appendix A***      **Letter of Support – SIRCEL**

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25 September 2024

To whom it may concern

**Re: Letter of Support  
Edify Energy and Sircel Recycling (Solar PV) - Driving the Circular Economy**

Sircel is pleased to be entering a strategic relationship with Edify Energy as their preferred e-waste and solar PV recycling partner.

Like Edify Energy, Sircel is Australian owned and operated. We are a green technology company solving the global e-waste crisis with our world-leading, end-to-end, large-scale recycling process. Our process diverts up to 100% of e-waste from landfill, substantially greater than any other operator here or overseas. We operate at six sites in Australia, importantly one of those sites is located in Parkes, NSW.

Alongside our proprietary recycling and resource recovery process we have recently installed a world-class solar panel recycling facility, the first of its kind in the southern hemisphere. Located at our Parkes site, our new facility will recover valuable commodities to be redirected back into the circular economy.

Until now, dealing with damaged or end of life solar panels has had no real solution, now ethical companies, such as Edify Energy can partner with Sircel to deliver a responsible circular solution.

With sufficient recycling capacity, the Sircel facility in Parkes is approximately 60 km from Edify's Peninsula Project, making it a convenient option for handling these materials and diverting them from landfill.

Edify and Sircel will support the transition to a net zero and circular economy supporting the shift in how we consume materials and how industry produces and delivers goods and services.

Importantly, our site in Parkes is situated in the Special Activation Precinct delivered by the Regional Growth Development Corporation for the NSW Government. As Australia's first UNIDO Eco-Industrial Park, the precinct offers sustainability solutions, including waste and water reuse and energy use and generation.

Strategic partnerships, such as the one being developed between Sircel and Edify Energy represent a modern, sophisticated and responsible approach to sustainable development that can support circular economy solutions.

We are delighted that Edify Energy actively supports local businesses in the regions where their projects are based, fostering innovation in areas such as waste reduction and recycling.

We understand that Edify's approach aligns with the NSW EPA Waste and Sustainable Materials Strategy 2041<sup>1</sup> and DCCEEW Environmentally Sustainable Procurement Policy 2024<sup>2</sup> by integrating waste reduction and circular economy practices into our operations.

We commend Edify Energy's application and look forward to working with them and other stakeholders to contribute to Australia's clean energy & circular economy futures.

If you require any further information, please do not hesitate to contact me at [akaram@sircel.com](mailto:akaram@sircel.com) or +61 409 304 974.

Yours sincerely



**Anthony Karam**  
**CEO Sircel Limited**

[www.sircel.com](http://www.sircel.com)

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<sup>1</sup> [NSW Waste and Sustainable Materials Strategy 2041](#)

<sup>2</sup> [Environmentally Sustainable Procurement Policy and Reporting Framework - DCCEEW](#)

