WINDIMURRA VANADIUM PTY LTD

WINDIMURRA VANADIUM PROJECT

SITE DATA AND PROJECT REQUIREMENTS SPECIFICATION

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CONTENTS

1.0 INTRODUCTION

1.1 General

This specification provides site data and project requirements applicable to the Windimurra Vanadium Project.

All suppliers and contractors supplying equipment and construction materials and services to the project shall incorporate these requirements into the planning, design and / or implementation of their contract works.

1.2 Standards and Codes

All equipment shall conform to the requirements of the current and applicable Australian Standards, unless specifically nominated otherwise in any of the equipment specifications, drawings or contract documents. The requirements of any relevant Statutory Authorities having jurisdiction shall be complied with.

2.0 GENERAL

2.1 Location

This site is located, approximately 80 km by road in an East South East direction from the township of Mt Magnet in Western Australia.

The site elevation is 474 m above mean sea level.

Plant Grid Monument Point is approximately S 28º17'27.38", E118º32'03.89

2.2 Site Climatic Conditions

2.2.1 General

The Windimurra Vanadium Project plant site is located in an elevated position on a gently, sloping area of land. The climate is typically dry with some rain during May, June and July.

2.2.2 Temperature (°)

Mean Daily Maximum	38.20ºC (January)	18.70ºC (July)
Mean Daily Minimum	22.20ºC (January)	6.70ºC (July)
Extreme Maximum (Design Max)	46.10ºC	
Extreme Minimum (Design Min)	-1.50ºC	

2.2.3 Relative Humidity (%)

	9.00 am	3.00pm
Monthly Mean	74 %(June)	50 % (June)
Monthly Mean	35 % (January)	21 % (January)

2.2.4 Rainfall

Annual mean rainfall	238.8mm
Wet days	46 days/annum
Wet period	Some light falls throughout the year Wettest months are May, June and July
Highest recorded daily rainfall	113 mm

2.2.5	**Snowfall**	0 days / annum
2.2.6	**Wind Loads**	
	Code	AS/NZS 1170.2 Structural Design Actions - Wind Actions
	Annual Probability of Exceedance	1/250 years
	Terrain Category	TC2
	Wind Region	A4
2.2.7	**Seismic Loads**	
	Code:	AS1170.4 Minimum design loads on structures – Earthquake Loads
	Site Factor:	s=0.67 for footings on rock s=1.00 for footings on soil
	Importance Level:	Normal
	Annual Probability of Exceedance	1/50 years
	Acceleration Coefficient	0.06
	Earthquake Design Category	A

3.0 OPERATING CONDITIONS

3.1 Plant Design Life

Minimum design life for equipment and components shall be 25 years.

3.2 Operating Hours

Hours per day	24 hours
Days per week	7 days
Weeks per year	52 weeks
Hours per year	7900 hours (Plant availability 90.2%)

3.3 Environmental Conditions

All components shall be capable of operating 24 hours per day continuously in an environment containing high concentrations of fine abrasive dust and at the extremes of ambient temperature specified for the site. If temperatures inside a building or machine enclosure exceed the design ambient temperature due to solar radiation or heat generated by the equipment, this shall be allowed for in the design of the equipment.

The equipment will not be protected from the environment or process slurries and liquors and will be cleaned by high pressure water hose down. Electrical equipment, apart from motors, will not be hosed down. The Supplier shall obtain written approval for any exceptions to this method.

4.0 ELECTRICAL REQUIREMENTS

4.1 Design Ambient Conditions

Indoor (sub-station) Ambient Temperature 28^{o}C

4.2 Power Supply and Control

4.2.1 System Standard Voltages and Design Fault Levels

HV Distribution and Power:	On-site generation at 11 kV, 3 phase, 50 Hz, ±10% 12.7kV Gas Turbine
	11 kV, 3 phase, 50 Hz, 3 wire impedance earth
	25 kA for 1 sec fault level
HV Distribution (Overhead Line)	11kV
	22kV for borefields equipment
LV Distribution and Power:	415 V AC, 3 phase, 50 Hz, 4 wire earthed neutral
	80 kA for 1 sec fault level
Lighting and all Power:	240 V AC, 1 phase, 50 Hz, 2 wire earthed neutral
	10 kA for 1 sec fault level
Field IO	24V DC
MCC Control:	24V DC
MCC Main Contactor Coil	240V AC
Pendant:	24V DC
Motor Anti Condensation Heaters:	240V AC
HV CB Open and Close	110V DC Battery

4.2.2 System Variations and Harmonics (design maximum)

Voltage	+15%, -10%
Frequency	± 1% Hz
Total Harmonic Voltage Distortion	
High voltage network	5%
Low voltage network	5%
Power Factor	0.9 lagging at full load

4.2.3 Control Interfacing

Voltage free contracts shall be suitable for 24 V DC.

4.3 Instrumentation

Power Supply:	24 V DC for four wire devices and two wire devices
Instrument Air:	700 kPa nominal (range 450 – 70 kPa)
Signals - Electrical	4-20 mA (isolated) Hart protocol optional
Instrument External Power Supply	24VDC
Signals - Pneumatic	20-100 kPa
Temperature:	Platinum 3 wire RTD
Field Devices:	IP65
Process Connections:	½“ NPT tapered thread
Instrument Tubing	UV resistant polypropylene or seamless 316
	Stainless steel tubing in 6mm or 12mm diameter
Tube Fittings	Swagelok (NPT)
Flanges	ANSI B 16.5
Solenoids:	24 V DC
PLC IO	24V DC

4.4 Motors

The nominated motor suppliers for low voltage squirrel cage motors shall be Toshiba High Efficiency Premium Motors.

Requirements for low voltage motors shall include the following:

Winding Temperature Sensors

Thermistors	For motors rated 22kW and above, thermistors are fitted as standard by Toshiba Motors rated 80kW and above shall have the thermistor wired back to the MCC
RTD's	For motors greater than and equal to 132 kW
Anti – condensation Heaters	Required on drives above and equal to 355kW

4.5 Equipment Panels

Control panels shall be designed constructed and tested in accordance with project standard Specification.

4.6 Installation and Wiring

All wiring shall be in accordance with AS/NZS 3000:2000 wiring codes.

All incoming and outgoing wires shall be connected to terminal strips.

4.7 Equipment Selection

Components shall be in accordance with the Electrical Preferred Equipment List.

5.0 SURFACE PROTECTION

5.1 Proprietary Equipment

By default, for proprietary equipment, the Contractor's standard surface treatment is generally acceptable, provided it is suitable for the intended duty and details are submitted to the Engineer for approval. Otherwise, required specific paint systems and colours will be defined in equipment specifications.

5.2 Fabricated Items

Surface treatment for fabricated items shall be in accordance with Technical Specification for protective coatings.

6.0 NOISE LEVELS

The sound pressure level shall note exceed 85dB (A) at a 1m radius from any part of the equipment, when measured in accordance with AS 3782.

Wherever the noise level is equal to or in excess of 85dB(A) from an individual source, additional sound control equipment which reduces the surface sound pressure level at a measuring distance on one metre from the equipment to 85dB(A) shall be provided.

7.0 IDENTIFICATION

7.1 Identification for Transport – Assemblies and Sub-assemblies

Each item of equipment (assemblies and/or sub assemblies) supplied under this specification and transported as a separate item shall be marked for transport as follows:

A light gauge metal tag to minimum dimensions 75mm by 100mm by 0.5mm thick shall be clearly stamped or painted 25mm high on both sides with the item equipment number and securely wired to the equipment item(s). Attachment wire shall be stainless steel of minimum diameter 0.5mm.

7.2 Equipment Nameplates

Equipment shall be permanently identified with stainless steel nameplates with minimum dimensions 25mm by 75mm. Nameplates shall be stamped or engraved with minimum 12mm high letters and shall be permanently secured to the equipment item(s) with rivets or other approved mechanical style fixings. As a minimum, nameplate details shall include manufacturer, model, serial number and equipment number.

7.3 Instrumentation

Each instrument shall be identified by a stainless steel tag of dimensions 70mm x 12mm, stamped on one side in letters and numerals 6mm high with the instrument equipment number. The tag shall be securely wired to the instrument with stainless steel wire of at least 0.5mm diameter.

8.0 HAZARDOUS MATERIALS

No design shall specify the use of any fibrous minerals of crocidolite, ammocete, chrysolite, antophylite, kemolite or actinolite or any material containing ant of those minerals in any plant areas.

The following materials and related compounds shall not be used:

- Asbestos
- Poly-chlorinated by-phenyls (PCBs)
- Chloro-fluoro-hydrocarbons (CFCs)

The following materials shall not be used without specific approval:

- Ceramic Fibres
- Radioactive materials unless as part of an instrumentation system

Hazardous materials shall be stored in accordance with relevant standards and legislation.