

Document Cover Sheet

 Wasco (Australia) Pty Ltd 60 Commercial Drive, Shailer Park QLD 4128, Australia	Supplier PO/Contract No:	4600009152
	Supplier Item Description:	Western Sydney Green Gas Project Construction Works
	Equipment/Tag No:	N/A

Project Name:	WSGG Project		
Supplier Document Title:	Construction Safety Study		
Supplier Document No:	2018-PRM-PLN-005	Supplier Rev No:	0
Jemena ECMS Document No:	<i>This Section To Be Completed By Jemena</i>	Jemena Rev No:	<i>This Section To Be Completed By Jemena</i>
Jemena Aconex Document No:	P2G-2099-PA-HS-005	Total No of Pages (incl cover page)	344

Document Revision History:

Rev	Issue Date	Key Reason for Issue (as above table)	Approved By/ Signature	Company Name	Notes (if not applicable N/A)
A	25/09/20	Issued for Review	MW	Wasco	
0	08/10/20	Issued for Use	MW	Wasco	

Key Reason for Issue:

IFR- Issued for Review	IFI- Issued for Information	IFU- Issued for Use
IFP- Issued for Purchase	IFC- Issued for Construction	AB- As Built



WESTERN SYDNEY GREEN GAS PROJECT

194-214 Chandos Road, Horsley Park, NSW, 2175

CONSTRUCTION SAFETY STUDY REPORT

Document Number			2018-PRM-PLN-005		
Revision	Issue	Date	By	Check	Approve
O	Issued for Use	08/10/2020	Andrew Hargraves	Tegan Alexander	Andrew Freeman
A	For Client Review	25/09/2020	Andrew Hargraves	Tegan Alexander	Andrew Freeman

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 2 of 53

1. EXECUTIVE SUMMARY	4
1.1 INTRODUCTION	4
1.2 STUDY OBJECTIVES	4
1.3 CONSTRUCTION SAFETY STUDY TEAM	4
1.4 FINDINGS.....	5
1.4.1 Site Security.....	5
1.4.2 Existing Services	5
1.4.3 Traffic Management	6
2. OUTLINE OF PROPOSED AND EXISTING OPERATIONS	7
2.1 PROJECT BACKGROUND	7
2.2 EXISTING FACILITIES AND SURROUNDING LAND USE	7
3. STUDY METHODOLOGY	10
4. HAZARDS IDENTIFIED AND PROPOSED SAFEGAURDS	11
4.1 CONSTRUCTION AND SITE ACTIVITIES	11
4.2 CONSTRUCTION PROGRAM.....	12
4.3 CONSTRUCTION HAZARDOUS MATERIALS	12
4.4 HAZARD IDENTIFICATION	13
4.5 HAZARD ANALYSIS.....	14
5. ASSESSMENT OF OPERATIONAL SAFEGAURDS.....	15
5.1 SITE SAFETY	15
5.1.1 Roles and Responsibilities	15
5.1.2 Selection of Personnel and Training.....	16
5.1.3 Safe Work Method Statements (SWMS)	17
5.1.4 Subcontractor Management	18
5.1.5 Incident Procedures.....	18
5.1.6 Emergency Response.....	19
5.2 REVIEW/REVISION OF CONSTRUCTION PERIOD OPERATIONAL SAFEGUARDS	20
6. SAFETY AND QUALITY ASSURANCE	21
6.1 SAFETY AND QUALITY OF PLANT EQUIPMENT AND MATERIALS.....	21
6.2 SAFETY AND QUALITY OF CONSTRUCTION PROCESSES.....	21
6.3 PURCHASING AND CONTROL OF MATERIALS, EQUIPMENT AND SERVICES	21
6.4 WORK INSTRUCTIONS	22
6.5 QUALITY ASSURANCE SYSTEMS.....	22
6.6 TRAINING	24
7. MANAGEMENT OF CHANGE.....	25
7.1 RISK ASSESSMENT OF CHANGE.....	25
7.2 MANAGEMENT SYSTEM / PROJECT SCOPE MODIFICATIONS	25
7.3 PROJECT CHANGE MANAGEMENT	25
7.4 WORK ACTIVITY MODIFICATIONS / PROCEDURAL AND CHANGES	26
7.5 PLANT AND EQUIPMENT CHANGE MANAGEMENT	26
8. REFERENCE DOCUMENTS AND PROCEDURES.....	27

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 3 of 53

9. GLOSSARY AND ABBREVIATIONS 27

Appendix 1 – WSGGP Development Consent Conditions.....	29
Appendix 2 – WSGGP Health and Safety Management Plan.....	30
Appendix 3– Site Layout	31
Appendix 4 – Project Risk Register	32
Appendix 5 – Project Hazard Management and Control Strategies	33
Appendix 6 – Traffic Management Plan.....	45
Appendix 7 – Emergency Response Plan	46
Appendix 8 – Environmental Management Plan	47
Appendix 9 – Erosion and Sediment Control Plan	48
Appendix 10 – SWMS Example	49
Appendix 11 – Incident Reporting Procedure.....	50
Appendix 12 – Quality Management Plan	51
Appendix 13 – Wasco CARE Plan	52
Appendix 14 – Project Construction Schedule.....	53

Figure 2-1 : Site Location and Surrounding Area	8
Figure 2-2 - Site Area Legend	8
Figure 2-3 : Site Layout & Laydown	9

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 4 of 53

1. EXECUTIVE SUMMARY

1.1 INTRODUCTION

Jemena Gas Networks (NSW) Limited (Jemena) is undertaking the Western Sydney Green Gas Project (WSGGP) (the Project), which involves trialling Power-to-Gas (P2G) technology by converting purchased green energy from the electricity mains network into hydrogen gas and injecting it into its secondary gas distribution network over a 5-year period. The Project would potentially facilitate ongoing development of commercially viable P2G systems in Jemena's NSW gas network.

The Project is located at the existing Jemena high pressure gas facility in Horsley Park (Horsley Park Facility), located in Western Sydney. The P2G facility will use renewable electricity to generate hydrogen, which can be injected into the natural gas network or used to generate electricity back to the grid by means of a hydrogen-powered micro-turbine.

Jemena has appointed Wasco Australia as the Principal Contractor during the construction phase of the Project for the facility located at Jemena's existing Horsley Park High-Pressure Gas Facility which sits within the Western Sydney Parklands (WSP), Fairfield City Council (FCC) area.

1.2 STUDY OBJECTIVES

The objectives of this Construction Safety Study (CSS) study are;

- To identify potentially major hazardous incidents during construction and to identify appropriate upgrading and revision of programs, safeguards and safety and emergency procedures; and
- To ensure that all measures are in place, so that the selection, checking, fabrication, construction, and commissioning of all the safety critical elements of the facility are in accordance with the design intent and specifications, consistent with requirements and findings arising from other safety studies, and that the design and specifications are appropriate.

To address the objectives stated above, a Construction Safety Study team was formed using project team members with the overall responsibility for safety performance at Wasco and who have the authority to allocate resources and ensure that recommendations of the study are implemented.

1.3 CONSTRUCTION SAFETY STUDY TEAM

The Construction Safety Study team consisted of the following Project Members.

Andrew Freeman – Project Sponsor

Andrew has over 24 years' experience in the oil & gas industry. Ten of these years involved gaining experience as a Service Technician on packaged gas equipment. Andrew has used this knowledge and capability to manage Queensland gas compression equipment company offering sales, service plus OEM spare parts and run large multidiscipline construction/installation projects.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 5 of 53

Andrew Hargraves – Project Manager

Andrew has over 20 years' experience in oil & gas, infrastructure, mining, energy and defence sectors. He has been involved in all stages of the project lifecycle in various roles as he transitioned from his foundations working in construction through engineering design, project controls and project management.

Ross Clark – HSE Manager

Ross is a hands-on, solutions-focused Health & Safety Professional with a career demonstrating technical expertise and leadership and a reputation for directing and delivering safety strategies. He is recognised for integrity, hard work and a solid commitment to safe working practices and holds a diploma in Work Health and Safety and is a certified O.H.S trainer and assessor.

Michael Horgan – Construction Manager

Mick has vast experience in supervision and management of personnel. Ensuring at all times that Safety, Health and the environment regulations are compliant. Over his career Mick has planned, supervised, and managed installation of well site facilities, gathering, gas processing, steel pipeline and city gas reticulation and refurbishment projects.

Daniel Politylo – Project Engineer

Daniel has been involved with multiple gas pipeline and compression projects graduating and has been involved in every phase of a project lifecycle and strives to achieve the highest level of safety and quality for effective project delivery. He holds a Bachelor's Degree in Civil Engineering as well as a Certificate IV in Work Health and Safety.

1.4 FINDINGS

The study highlighted a number of potential hazardous events. Controls to prevent and mitigate these events are highlighted within this document. Site Security, Existing Services and Traffic Management activities were highlighted as key risks and are summarised as follows.

1.4.1 SITE SECURITY

As the site is an operating hazardous facility security is paramount and must be maintained for facilities and operations area. To mitigate this risk, where security fences are removed, temporary high-security fencing will be put in place to retain a secure facility.

1.4.2 EXISTING SERVICES

The Works will be constructed in close proximity to existing buried assets and services on the sites, including the high pressure secondary natural gas main which is being modified under these works, other third-party assets including, water, communication and electricity services, and buried services supplying the EGP site to the north of the JGN TRS facility. Wasco will manage these risks by ensuring that, appropriately qualified and experienced Service Locator will be engaged to provide a preliminary indication of the location of the buried Services with the use of appropriate equipment, as well as

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 6 of 53

positive identification of buried services through Non Destructive Digging methods (NDD) prior to mechanical excavation. This will be completed under an approved Permit to Work (PTW) system managed by the Principal.

1.4.3 TRAFFIC MANAGEMENT

During construction works, there will be an increase in local traffic as light and heavy vehicles will be required to enter the facility from Chandos Road. These include the movement of construction workers, delivery and removal of materials including but not limited to imported fill, line pipe, mechanical equipment, and electrical equipment. To ensure these operations are carried out in a safe and controlled manner, a Traffic Management Plan (TMP) has been implemented and control measures have been put in place. These include; pre-planning of all deliveries, the installation of signage at the site entrance and on site, traffic controllers employed to manage movements of Heavy Vehicles in and out of the facility and the creation approved transport routes to ensure that weight restrictions on rural roads are adhered to in accordance with NSW road laws.

This study has confirmed that the use of Wasco construction procedures, Jemena operational procedures and relevant NSW Regulations – Codes of Practice and Australian, International and industry standards. will address the operational safeguards required for the safe delivery of the Works.

Safety assurance for the project will be achieved using the approved Wasco management system which is designed to comply with the requirements of AS/NZS ISO 9001, AS/NZS ISO 4801 and AS/NZS ISO 14001 Quality, Safety and Environment Management Standards.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 7 of 53

2. OUTLINE OF PROPOSED AND EXISTING OPERATIONS

2.1 PROJECT BACKGROUND

The uptake in renewable power generation, coupled with growing demand for decarbonizing of energy sectors in Australia, presents a series of challenges and opportunities to the gas transmission and distribution network in NSW.

Jemena, own and operate a number of natural gas transmission and distribution assets in Australia, and are seeking to understand and develop technologies that allow for a transition to a low or zero carbon gas network, whilst delivering a competitive and sustainable consumer product. They believe that multiple technologies will be required, one of which is known as Power to Gas (P2G).

P2G technology is an energy conversion system that transforms electrical energy from the power grid to a combustible gas, hydrogen. The aim of the WSGGP project is to test and demonstrate P2G technology in the Sydney gas distribution network. This will help facilitate the development of commercially viable systems in the future.

The P2G facility will perform the following key functions:

- Convert mains water into hydrogen gas using grid electricity through electrolysis
- Store hydrogen gas in a buried on-site steel pipeline (this will be used for backup hydrogen gas supply and injection management)
- Control and safely manage hydrogen gas pressures, temperatures and flow rates for injection into Jemena's secondary gas pipeline network; and
- Provide a hydrogen microturbine generator to convert stored hydrogen gas into electrical energy.

The facility will use renewable electricity to generate hydrogen, which can be injected into the natural gas network or used to generate electricity back to the grid by means of a hydrogen-powered micro-turbine or similar technology. The plant will also generate wastewater which will be used for local irrigation following further approvals.

2.2 EXISTING FACILITIES AND SURROUNDING LAND USE

The Horsley Park High Pressure Gas Facility, located at 194-214 Chandos Road, Horsley Park NSW 2175, is comprised of a number of pressure let-down and pipeline pigging facilities, for the Eastern Gas Pipeline(EGP) pipeline, Jemena Gas Network (JGN), Trunk Receiving Station (TRS), Sydney Primary Loop and local secondary network.

The surrounding area is defined as multi-use including urban farmland, industrial and recreational.

The main works area for the P2G Plant will be within the northern portion of the existing facility, and will consist of a water tank, waste water sump, control hut, electrolyser package, gas and injection panel package, gas generator package, and includes the upgrading the existing outer security fencing.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 8 of 53

Figure 2-1 : Site Location and Surrounding Area

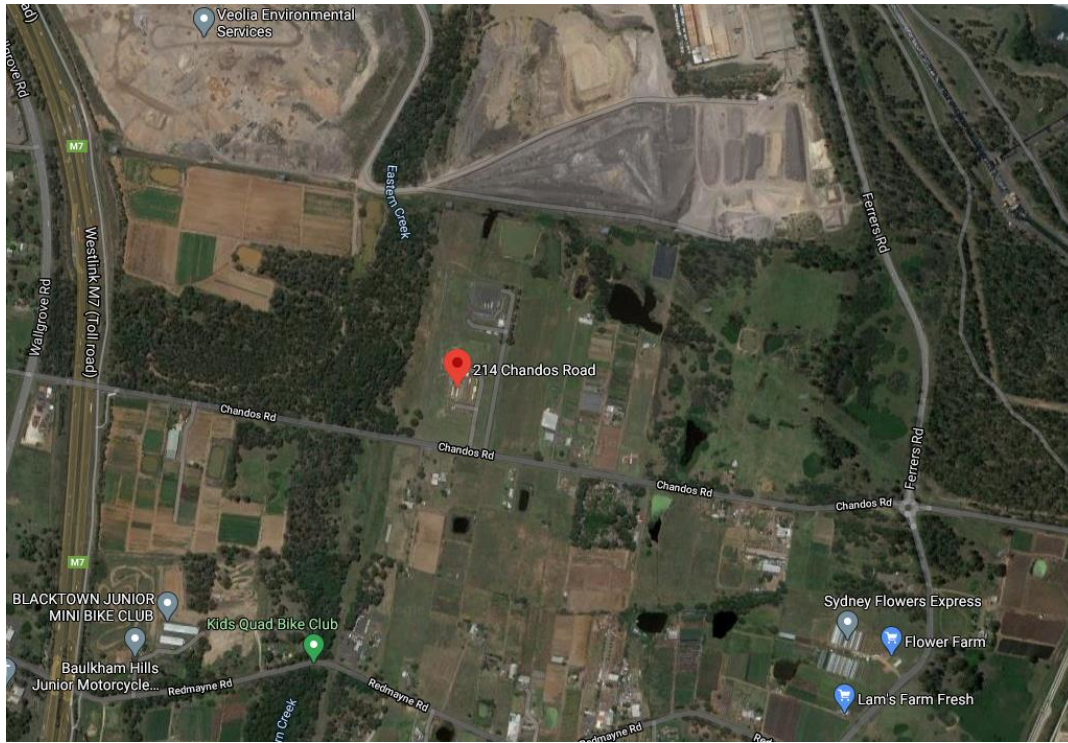


Figure 2-2 highlights site constraints, areas of construction shared areas and areas allocated for laydown.

Figure 2-2 - Site Area Legend



	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 9 of 53

The following specifics regarding Figure 2-2 are noted in the table below:

Layout Specifics	Details
Red – TRS Operational Facility Area	- Limited access available and entry points require 24 hours and 7 days a week. - Security to be maintained for facilities and operations area, were security fences are removed an alternative temporary high-security measure shall be put in place to retain security.
Blue – Construction Area	Location of construction area
Green – Shared Area	- Shared area accessible to JGN and EGP personnel personnel 24/7; - Notification and liaison is required with JGN and EGP prior to any temporary closure of the road.
Yellow – Laydown Area	- To be used for construction laydown and activities any - Refer for proposed laydown and office facility
Orange – Operations Area	Operations areas, used for various purposes, access to remain available to JGN personnel 24/7.
Purple – Turning Circle	Approximate location of the turning circle to be constructed as part of the Works.

Figure 2-3 : Site Layout & Laydown



	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 10 of 53

3. STUDY METHODOLOGY

The methodology used in the CSS follows the guidelines outlined within HIPAP 7. The study addresses the following questions.

1. What are the potentially hazardous incidents that could occur during the proposed construction and commissioning activities?
2. What procedures will be in place to:
 - a. Minimise the likelihood of construction causing a hazardous incident?
 - b. Ensure such incidents will not generate a hazardous incident external to the site?
3. Are emergency procedures in place to handle construction emergencies?
4. What safety assurance system is in place?
5. What arrangements are in place for management of change during construction?

This study has been completed following the completion and review of the following studies and documents in accordance with the recommended Construction Safety Process.

- Final Hazard Analysis (FHA) (Previously Submitted to DPIE)
- HAZOP (Previously Submitted to DPIE)
- WSGGP Development Consent Conditions (Appendix 1)
- Project Health and Safety management Plan (HSMP) (Appendix 2 – WSGGP Health and Safety Management Plan)
- Project Risk Register (Appendix 4 – Project Risk Register)
- Project Hazard Identification (Section 4 and Appendix 5 – Project Hazard Management and Control Strategies)
- Traffic Management Plan (TMP) (Appendix 6 – Traffic Management Plan)
- Emergency Response Plan (ERP) (Appendix 7 – Emergency Response Plan)
- Environmental Management Plan (EMP) (Appendix 8 – Environmental Management Plan)
- Erosion and Sediment Control Plan (ESCP) (Appendix 9 – Erosion and Sediment Control Plan)
- Quality Management Plan (Appendix 12 – Quality Management Plan)
- Wasco CARE Plan (Appendix 13 – Wasco CARE Plan)

The Project Management Team has adopted a risk acceptance criterion based on a rigorous risk identification and assessment process and through implementation of effective mitigation measures to reduce the level of risk associated with the business's activities to ALARP (as low as reasonably practicable).

The construction hazard risk ranking process is based on requirements under AS/NZS ISO 31000 Risk Management - Principles and guidelines. In assessing the level of risk associated with a particular construction hazard identified as being associated with a construction process, a risk ranking process based on the Wasco Risk Model was used consistent with the requirements of the Wasco Risk Management Procedure.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 11 of 53

4. HAZARDS IDENTIFIED AND PROPOSED SAFEGAURDS

4.1 CONSTRUCTION AND SITE ACTIVITIES

A site layout showing the areas of construction and commissioning is shown in **Error! Reference source not found.** & **Figure 2-2** The main sequence of construction is as follows:

Scope	Inclusion
Preliminaries	- Construction planning - Construction documentation and approvals - Workshop fabrication, as applicable - Weld and welder qualifications - Procurement of contractor-supplied items
Mobilisation and Site Establishment	- Mobilisation to site - Establishment of lay-down area, fencing and facilities - Site Security - Housekeeping and disposal/removal of waste - Relocate communications link between TRS and EGP
Site Civil Construction	- Hardstand, access road and truck turnaround - Foundations - Pipe and cable installation and trenching - Spoil and waste management
Installation of Major Package Equipment	- Electrolyser Package (process and electrical containers and separate cooler system) - Microturbine Package - Gas Panel Packages - Gas Injection Panel Package - Electrical Equipment Room - High Voltage Switchgear and Kiosk Transformer (HV substation) - Wastewater tank & irrigation system [HOLD 5]
Electrical Works	- Installation and termination of cabling - Installation of field junction boxes and electrical equipment. - Installation of instrumentation including tubing - Installation of Earthing and Earthing Connections - Preparation of Hazardous Area Dossier - Verification of HA installation
Carbon Steel Pipelines (Hydrogen Buffer Store and Natural Gas Connection)	- Excavation of pipeline trench and tie-in bell-holes - Transport, stockpiling and backfilling with controls on-site - Welding of pipeline strings - NDT and field-joint coating of welds - Lowering in of pipeline - Backfill of pipeline trench - Cleaning, hydro-testing and drying of pipeline - Hot tap coordination with the Principal

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 12 of 53

Scope	Inclusion
Mechanical and Structural Works	- Facility tubing and valves - Water piping system - Nitrogen cylinders - Facility signage, labelling
Demobilisation	Site restoration

4.2 CONSTRUCTION PROGRAM

The current construction project timeline is presented below, the construction works are anticipated to commence in late October 2020, pending approval of the required management plans. The timing presented below are indicative only and subject to change.

	Aug 20	Sep 20	Oct 20	Nov 20	Dec 20	Jan 20	Feb 20	Mar 20	Apr 20	May 21	Jun 21	Jul 21
Pre-Construction												
Construction [#]												
Pre-commissioning and Commissioning [#]												
Operation and Maintenance [*]												→

Notes

the phases that this management plan addresses

* 5 year operation in accordance with Condition A8 of the Development Consent SSD 10313

Grey – Float

Further detail for the construction sequence can be found in Appendix 14 – Project Construction Schedule

4.3 CONSTRUCTION HAZARDOUS MATERIALS

The hazardous materials used during construction and commissioning will be typical as follows:

- Welding consumable gas
- Chemset materials for concrete
- Diesel fuel and oils for construction equipment (supplied by a fuel truck or trailer);
- Paints
- Solvents
- Adhesives and sealants
- NDT equipment and consumables

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 13 of 53

For each chemical substance brought to site, a Safety Data Sheet (SDS) that conforms to the Work Safe Australia Code of Practice will be made available for all personnel required to use or work near a chemical substance.

The construction manager is to ensure that all SDS's for chemical substances be brought on site have been reviewed and all required risk management requirements (PPE, spills management, first aid etc) for these substances have been fulfilled.

A hazardous materials register will be maintained and updated by the Construction Manager at the Site Office (Figure 2-3). The Construction Manager shall ensure subcontractors provide an updated inventory of chemicals on site, and a copy of the relevant SDS information is provided to the Construction Manager prior to subcontractor works beginning.

All flammable and/or hazardous substances will be stored within the Site Laydown facility (**Error! Reference source not found.**) and in accordance with the Explosives and Dangerous Goods Legislation and relevant Australian Standards.

Where radioactive source instrumentation is to be used as part of construction testing, these will be stored, handled and installed in accordance with the Radiation Safety Legislation and the relevant codes of practice for radioactive substances.

The NDT Contractor will be required to demonstrate the adequacy of safe work practice to the Construction Manager / Construction Manager prior to their engagement. All Xray testing to be scheduled and notified JEMENA Representative.

Emergency and medical response with regards to hazardous material will managed in accordance with the ERP. (Appendix 7)

No asbestos containing products are to be used.

4.4 HAZARD IDENTIFICATION

Hazards associated with specific tasks of the project were assessed in consultation with involved personnel to utilise their skill, knowledge, and experience. Each identified hazard was assessed against the agreed Wasco's Risk Model for application of Risk Ranking. The identified hazards were against the qualitative Risk Ranking with the agreed control strategies listed. The Risk Model forms part of the Project Construction Risk Assessment Register. (Refer Appendix 4 – Project Risk Register)

As an output of this study, the project has developed a table which includes the work/process, hazards identified and proposed management has control strategies (Refer Appendix 5 – Project Hazard Management and Control Strategies)

In assessing the level of risk, the following processes were carried out:

- Identification of Injury/Illness, Environmental Impact, Societal or other loss potential and consequence.
- Assessment of the level of risk by considering the frequency of potential occurrence, duration of the event and loss severity or consequence.
- Prioritise control measures necessary to manage the identified hazard and assessed level of risk.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 14 of 53

- Matters considered include:
 - Type of hazard
 - Size and layout of project work site
 - Frequency of potential hazard
 - The situation or events in combination of circumstances that may give rise to the hazard
 - Consequences of injury or loss likely to occur as a result of being exposed to the hazard
 - Number of employees potentially exposed to the hazard and location (i.e. remote area)
 - Distance to available emergency services
 - Systems of emergency communication for personnel in remote locations; and
 - Health and Safety information available on site (i.e. Material Safety Data Sheets).

4.5 HAZARD ANALYSIS

The construction hazard identification and analysis has not brought forward any events that require further analysis by quantitative risk techniques. The key potential hazardous events identified in the study were the potential for interaction with existing buried services (Pipes, Cables etc.) and traffic impacts through increased construction traffic. Controls to prevent and mitigate these events are outlined within Appendix 4 – Project Risk Register and Appendix 6 – Traffic Management Plan. These were reviewed and assessed during the construction hazard study.

No events were identified with significant off-site impact. As such, the risk criteria as specified in the Department of Planning and Infrastructure's Hazardous Industry Planning and Advisory Paper (HIPAP) No. 4 are expected to be met for the proposed construction work. Additionally, there are no identified incidents where the risk of propagation to neighbouring land users is unacceptable.

Overall, the identified hazardous events are of a nature that proper planning and control during construction work is sufficient to achieve acceptable levels of risk. A Health and Safety Management Plan has been put in place and is summarised in the following sections. This plan will be implemented in conjunction with the Emergency Response Plan (ERP).

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 15 of 53

5. ASSESSMENT OF OPERATIONAL SAFEGAURDS

The Construction HSMP developed (Appendix 2) for this project, plans and describes the control mechanisms to be implemented during the construction and commissioning of the WSGGP.

This Plan operates under the Wasco Integrated Management System (IMS) which is accredited to AS/NZS4801, AS/NZS ISO 14001, and AS/NZS ISO 9001.

All work will be performed in accordance with Client requirements and relevant Regulations – Codes of Practice and Australian, International and industry standards. Copies of all relevant Safety Legislation – Australian Standards – Codes of Practice will be maintained at the site office.

All contractors, fabricators and suppliers will be managed by Wasco in accordance with the safety management system outlined in this Safety Study Report and its supporting documents.

5.1 SITE SAFETY

The safety controls relevant to the works include the following:

- Defined safety roles and procedures for project personnel and contractors.
- Communication and consultation procedures, Inductions, Daily prestart meetings, Weekly Toolbox meetings
- Safety Data Sheets (SDS) for all chemicals are kept on-site if information such as first-aid advice is required
- ERP which will be complementary to the Emergency response procedure in place at the operating facilities.
- Security measures including site fences
- Safe Work Method Statements (SWMS)
- Daily Prestart Plant checklists.
- Use / installation of safety equipment such as notices and signage, first aid facilities.
- Traffic management plan in place for the construction and commissioning works
- Personal Protective Equipment (including minimum of steel capped boots, high visibility cotton workwear, hard hats, gloves, safety glasses)
- Firefighting equipment will be installed / put in place and made available for use where required; and
- Auditing of compliance to the HSMP by the Wasco site Health and Safety representative.

5.1.1 ROLES AND RESPONSIBILITIES

The Project Management Team consists of the Project Manager, Construction Manager, Project Engineer, HSE Advisor and Brisbane Support Staff. The Project Manager is accountable for the success or failure of health and safety performance for the project.

The Project Management Team is assigned discipline authority and responsibility for establishing the Project Health and Safety objectives, and for ensuring that adequate resources are made available to the Construction supervision to enable these objectives to be achieved.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 16 of 53

The Project Management Team is responsible for the implementation of this HSMP in accordance with the Wasco and Jemena specified objectives on health, safety.

The Project Management Team shall actively promote and ensure that all Project personnel under their control are fully conversant with this Plan and any incumbent responsibilities.

The Project Management Team shall:

- Provide leadership in the implementation of all health and safety initiatives
- Determine the resources necessary to conduct specific activities and achieve project objectives
- Ensure that all operations have been assessed to evaluate the potential presence of risks and hazards that any specified mitigation measures have been implemented
- Develop a construction methodology with due regard for the health and safety
- Ensure mitigation actions agreed as part of the risk assessment process are included in the HSMP, supporting plans and procedures
- Establish sufficient resources for emergency response systems
- Provide training to ensure that each member of the project team within their discipline is competent to implement the HSMP
- Be actively involved in the HSE meetings, audits and reviews
- Produce Health and Safety objectives, tasks and targets for the contract.
- Each member of the project team within their discipline is competent to implement the HSMP
- Ensure the government approved COVID 19 plan is fully implemented for the project and all project team members are meeting its requirements
- Ensure client-imposed policy, procedure or systems are implemented as instructed

5.1.2 SELECTION OF PERSONNEL AND TRAINING

In understanding the requirements for employee selection, competency and training it is important to recognise that almost all personnel involved in construction, operation and maintenance can create a hazard if they are not competent, qualified and suitably trained to carry out their role.

The Project Manager, in consultation with the Construction Manager, will assess and plan the human resource requirements of the project to ensure personnel are suitably fit, competent and have the necessary personal safety attributes for the tasks assigned and to contribute to a positive safety culture on site.

The Project Manager, in consultation with the Construction Manager, will refer to the project work description and identify the competency criteria and safety attributes necessary for each construction position. Where a work description identifies statutory competencies (i.e. certification) the Project Manager will ensure that evidence of statutory competencies is obtained prior to selection and retained on site as documentary evidence of such competencies.

Wasco will specify within its Human Resources Management Planning, provisions to ensure the confirmation of employee competency and fitness for work during the employment process, the process of capture of competency information, responsibility and arrangements for maintaining that

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 17 of 53

information and methodology to ensure ongoing monitoring that employee competency remains current for the Project duration.

Certification – licenses – permits – will be maintained on site by the Construction Manager for occupations with this requirement and we list hereunder classifications that generally require certification:

- Mobile Plant and Equipment
- Cranes and Rigging
- Electrical Work
- Instrumentation Work
- Mechanical Fitting
- Welders
- First Aid Treatment
- Driving of vehicles
- NDT

In accordance with project requirements for Induction and Training, the Construction Manager is to ensure that all project personnel are inducted before commencement of project works. All personnel, including staff, inspectors and subcontractors will attend the Client's Project Induction and Wasco online Induction before accessing or commencing work on the site.

All personnel must have completed both the General Induction and Site-specific inductions to enter or work on the project. Contractors will need to undertake an induction appropriate to the sort of work they are undertaking on site. Visitors must undertake a visitors' induction and be accompanied by a fully inducted person at all times.

5.1.3 SAFE WORK METHOD STATEMENTS (SWMS)

The Project Management Team and each work crew will carry out task specific SWMS for all construction work processes and implement minimisation strategies for the hazards identified.

The Construction Manager shall ensure that all employees are to conduct a SWMS immediately prior to any new or changed work activity. This SWMS is to be conducted with each employee involved in the work activity when the work activity is conducted for the first time or where change has occurred in the construction process or receiving environment. The consequences and likelihood of occurrence of each hazard identified during task risk assessment will be assessed in accordance with the Wasco Risk Matrix.

Any work activity whether routine or non-routine will have a SWMS carried out immediately prior to commencing the task for the first time or where change has occurred in the construction process or environment.

For all work, which requires a permit, the specific procedure or work instruction being referenced must be identified on the permit and a SWMS specific to the job must accompany the displayed permit. A SWMS will need to be conducted prior to the following activities (but not limited to):

- Hot work

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 18 of 53

- Working at heights
- Excavation
- Lifting operations (Including lift studies for major equipment including Electrical Equipment Room, Electrolyser package (2 units) and Cooler.
- Energy isolations

The Construction Manager is responsible to ensure the highest level of personal safety for all people working on, or within, any phase of Construction activity under their control.

The Construction Manager and the Project Management Team are to monitor that all Project personnel comply with all construction safety instructions as required, in particular the control measures as identified in the SWMS process.

Refer to Appendix 10 for an example of a SWMS to be utilised on this project.

5.1.4 SUBCONTRACTOR MANAGEMENT

An online pre-qualification assessment will be undertaken via Rapid Contractor Management, to substantiate and qualify each Subcontractor's submission. In the evaluation process, preference will be given to those organisations that can demonstrate that they are currently assessed under an Industry recognised third party auditing system.

Where a Subcontractor is a "Major Subcontractor" they will be required to provide a copy of their Safety Management Plan along with records such as:

- Lost Time Injury and Medically Treated Injury Frequency Rate for the last two years (LTIFR / MTIFR) Total recordable Injury frequency Rate (TRIFR)
- Workcover Claims details for the last two year
- Plant / Machinery registrations and maintenance records
- Plant operator / Prescribed occupation qualifications
- Insurance Certificates

In addition to, and in support of Project Safety Management Planning, subcontractors will participate in risk assessment workshops as directed by the Project Manager, identifying hazards and assessing the adequacy of existing controls, interaction between the differing phases of contracted activity and existing operational infrastructure, and public impact potential.

The subcontractor shall actively encourage and facilitate the ongoing identification of hazards by its employees, agents and subcontractors during construction activities.

Where a Subcontractor is a "Minor Subcontractor" such as a welder they will be required to comply with the Wasco Safety Management Plan and Safety Management System.

5.1.5 INCIDENT PROCEDURES

Incident Reports are completed initially by the employee and the HSE Advisor or Construction Manager or Project Manager.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 19 of 53

All incidents are reported via Wasco Rapid Incident (Refer Appendix 11 – Incident Reporting Procedure), and other documentation such as witness statements, investigation forms or forms as required by the Client or government authorities are to be submitted.

Unless a significant hazard exists, the scene of any serious injury or incident location will not be disturbed until all evidence drawings, photographs, etc. have been prepared or taken and necessary details have been accurately recorded.

In the event of a serious incident, unless a significant hazard continues to exist, the scene will remain undisturbed until authorisation has been received from the Project Manager in consultation with Jemena and any designated Government Authority (in the case of a fatality, the police).

As soon as practicable verbally, but within 24 hours, the Project Manager will provide a report to the Jemena Project Manager setting out fully all material facts and circumstances concerning the incident that the Wasco Project Management Team is aware of or is able, by reasonable search and inquiry, to find out.

In the event of a case of Medical treatment or Lost Time Injury the HSE Advisor or Project Engineer is to provide to the Project Manager the following:

- Details of personal particulars of the injured party
- Date and location of occurrence
- Details of extent of injury
- Anticipated duration of treatment and recovery to normal duties
- Summary of events leading to the injury
- Details of Corrective or Remedial Actions
- Injury Management

All incident investigations are to focus on identifying the causes of the incident so that appropriate control measures may be implemented to prevent recurrence of the incident. All incident reports and incident investigation reports shall be completed using an approved Incident Investigation Procedure.

Wasco shall establish an incident investigation team comprising appropriately trained and qualified investigators.

The extent of the investigation will depend on the severity, or potential severity, of the incident.

Incident Reporting and Investigation Reports must be completed, and corrective action items implemented, verified, and signed off prior to the incident being closed out by the Wasco Project Manager and the Client Project Manager.

Closed out Incident Reporting and Investigation Forms and Reports shall be made available on Rapid Incident, Wasco's Online Incident Reporting System

Wasco shall develop and maintain a Corrective Actions Register (CAR) for the duration of the Project, and report on the status of close-out of actions in the Monthly Safety Performance Report.

5.1.6 EMERGENCY RESPONSE

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 20 of 53

The Jemena Emergency Response Plan (JEM PL 0013) is to be utilized for the project. The Wasco Emergency Response Plan (Appendix 7) is supplementary plan designed to describe construction specific emergency events relevant details of the construction contractor such as

- Fire or explosion
- Medical emergencies (i.e. life-threatening injury requiring urgent medical attention)
- Uncontrolled release of a flammable gas or liquid
- Major spill or other environmental emergencies (i.e. release of a substance other than flammable gas which presents a significant risk to safety or the environment).
- Significant Weather event

The Project Manager is responsible for;

- This Emergency Response Plan being implemented and correctly managed throughout the project
- Ensure all key stakeholders are briefed on the situation at regular intervals. Key stakeholders include Client Representatives, Wasco Management, local government agencies, state bodies
- This Emergency Response Plan being reviewed and amended as conditions change and communication of changes
- Ensuring all Workers are trained in and comply with the actions prescribed in this Emergency Response Plan
- Ensuring that all appropriate fire and emergency equipment is provided to site, inspected as part of the weekly HSE inspections and are maintained during the works.

5.2 REVIEW/REVISION OF CONSTRUCTION PERIOD OPERATIONAL SAFEGUARDS

It is not uncommon on construction projects for conditions to change (scope, weather etc.) that may impact established safeguards. It is critical that construction operational safeguards be reviewed and revised to suit these changing conditions. The responsibility for the review and implementation of these changes are per section 5 of the project HSMP (Refer Appendix 2).

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 21 of 53

6. SAFETY AND QUALITY ASSURANCE

6.1 SAFETY AND QUALITY OF PLANT EQUIPMENT AND MATERIALS

A fundamental aspect of assuring equipment safety and integrity is the quality control of design, purchasing, fabrication, installation and maintenance of all equipment that can lead to an unacceptable operating loss in terms of life and injury, environmental impact, efficiency, revenue, reputation and image.

Quality control is maintained by the application of the following principles:

- The design of equipment and system meets with service requirements;
- Purchased products conforms to specified requirements;
- Materials and fabrication meet with the design and technical specification;
- Equipment is fit for purpose;
- Equipment installation and ongoing operation is consistent with design specification and manufacturer's instructions; and
- Ensure ongoing equipment integrity by the application of maintenance, testing and inspection procedures.

6.2 SAFETY AND QUALITY OF CONSTRUCTION PROCESSES

The Project Manager is responsible to ensure that Work Method Statements are developed for complex construction processes involving a significant number of definable steps in most instances accompanied by Inspection and Test Plans, developed by the Project Manager in conjunction with the Project HSE Advisor. Safe Work Method Statements are also prepared, in conjunction with the project risk assessment.

Quality for construction and pre-commissioning is managed via the Project Quality Management Plan (Appendix 12) that will conform to the requirements of WAPL IMS under AS/NZS ISO 9001:2015. The quality assurance process and procedures used on the project provide a final hand-over process to ensure verification that the as-built construction complies with the design specification. The quality assurance process is also used to verify that the facility complies with and incorporates all approved design and construction changes in the Design Basis

6.3 PURCHASING AND CONTROL OF MATERIALS, EQUIPMENT AND SERVICES

The Project Manager shall ensure that it applies and considers implementation of this safety management system involving contractors and service providers across the project, to ensure that safe construction plant and equipment is provided to the project whether internal or external hire. This is to ensure that health and safety requirements for handling, storing, packaging and delivery of materials are addressed prior to materials arrival on the project site, and to ensure that relevant information is assessed with regard to all hazardous materials associated with the project.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 22 of 53

6.4 WORK INSTRUCTIONS

Due to the nature of the Construction Project being, at times, in close proximity to operating plant and equipment, there are several existing site-specific procedures in the Jemena Work Health and Safety Management System that are required to be adopted by Wasco into the health and safety arrangements for the Construction Project. The elements which are required to be incorporated into Wasco's safety management system for the delivery of the Construction Project are;

DOCUMENT NUMBER	OWNER	DOCUMENT TITLE
JEM HSE PR 0027	Jemena/Zinfra	Fitness for Work Drug and Alcohol Procedure
GAS-999-PR-HSE-006	Jemena/Zinfra	Permit to Work Procedure;
GAS-999-PR-HSE-007	Jemena/Zinfra	Isolating and Tagging Procedure
GAS-310-PA-HSE-004	Jemena/Zinfra	COVID-19 (Corona Virus) Management Plan Construction Work
GAS-399-PA-EV-003	Jemena/Zinfra	N Operational Environmental Management Plan
GAS-310-PR-EM-001 PCCS	Jemena/Zinfra	Station Evacuation Procedure
2018-HSS-PLN-001	Wasco	Health and Safety Management Plan
2018-ENV-PLN-001	Wasco	Construction Environmental Management Plan
2018-HSS-PLN-002	Wasco	Travel Management Plan
2018-HSS-PLN-003	Wasco	Emergency Response Plan
2018-HSS-PLN-004	Wasco	CARE Plan
WAPL-SYS-REG-004	Wasco	COVID19 Risk Register
WAPL-HSS-PRC-003	Wasco	Fitness for Work Procedure
WAPL-HSS-PLN-003	Wasco	Fatigue Management Plan
WAPL-HRE-PRC-014	Wasco	Training & Competency Procedure
WAPL-SYS-PLN-001	Wasco	Risk Management Plan
WAPL-SYS-PRC-002	Wasco	Incident Reporting Procedure

6.5 QUALITY ASSURANCE SYSTEMS

Safety monitoring and reporting is in three areas:

- (a) Medical incident including: First Aid / medical treatments / lost time injuries / near misses.
- (b) Other incidents including: damage to vehicles and plant / damage to property / near misses.
- (c) Performance objectives against targets:

- Pre-starts every day;

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 23 of 53

- Toolbox Talks every week;
- WHS Site Inspections every week;
- Plant checklists before working every day;
- All workers inducted before starting;
- All incidents reported;
- All hazards identified, reported and controlled; and
- All non-conformances closed out

Principle Project Responsibilities

The Project Manager

Will monitor safety management performance throughout the project and ensure appropriate corrective action is implemented where required. The scope of performance assessment will be via monitoring the implementation and effectiveness of safe work activity inclusive of the following:

- Daily reporting of the implementation and effectiveness of safe work activity via daily site meetings;
- inspections; and outcomes.
- CARE Plan

The Project Engineer will:

- Prepare, in consultation with the Construction Manager, a weekly report documenting incidents and identifying safety issues; and
- Forward a copy of these weekly reports to the Project Manager
- Conduct weekly formal workplace inspections
- Inspections shall be structured to provide an overview of general conditions, specific elements and close out status of previous deficiencies. A different set of elements shall be selected where practical for each inspection. Specific items shall include, but not be limited to, the following elements:
 - Emergency equipment and awareness
 - Rigging and lifting equipment
 - Electrical equipment
 - High Risk Work qualifications
 - Access and egress
 - Mobile equipment / vehicles
 - Personal protective equipment
 - Personnel qualifications and training
 - Housekeeping.

The Project HSE Advisor

- shall facilitate and conduct health and safety inspections with the Construction Manager
- Forward copies of health and safety inspection reports to the Project Manager for review
- Place copies of health and safety inspection reports and findings on notice boards
- Maintain a file of completed health and safety inspection records
- Assign actions to correct adverse findings; and

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 24 of 53

- Add items into the project corrective action register.

6.6 TRAINING

It is a requirement of Wasco that all employees of the company and contractors will be properly trained for the work they will be performing. Wasco will ensure that all Project Team employees arriving on location comply with the appropriate licensing, permit and/or certification requirements of the relevant statutory authorities.

All Wasco employees and sub-contractors engaged to work, as part of the project, will attend the project specific safety induction before commencing on site work. This induction will be reviewed and updated to suit the changing project conditions. The Project Manager shall develop, and the project team, will as required deliver and monitor and report on implementation of induction requirements for project staff and contract personnel. The Project Team shall maintain a register of inducted personnel.

The HSE Advisor in consultation with the Project Manager and admin team, will maintain at site the Project Training and Competency Matrix Register to support the facilitation of project training requirements completed and to monitor the adequacy and spread of location required task competency.

Personnel at all levels will be experienced and qualified in accordance with legislative and Jemena requirements. Records of certification, licenses and permits will be maintained on site by the HSE advisor for all machine operators, vehicle drivers and those performing works that require a permit.

For the operation of certain types of plant or equipment that do not fall within the certification standard, there are national competency standards. Undertaking a formal competency assessment and meeting national competency standards is a requirement by both Wasco and Jemena for the operation of certain types of plant or equipment that do not fall within the certification standard.

Verification of Competence (VOC) Assessments will be overseen by the Construction Manager / HSE Advisor and must be on the similar equipment to be used on site.

A number of processes concerning training, consultation and communication contribute to ongoing hazard identification, risk assessment and control, including:

- Daily Pre-Start briefings.
- Weekly Toolbox Talks.
- Incident and near miss reporting
- Suggestions for safety improvements
- Auditing
- Induction and orientation
- Project-specific Training
- Safety memos, alerts and bulletins
- Posters and noticeboards
- Safety stand-downs

These requirements will be adhered to throughout the construction and commissioning phases for this project.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 25 of 53

7. MANAGEMENT OF CHANGE

Wasco has identified strategies, policies and procedures that will ensure that all modifications are reviewed by competent people, are appropriately authorised and documented and that necessary training is provided before the modifications are implemented.

Wasco recognises and accepts its obligations in the transport chain of responsibility to maintain and promote safe operations.

7.1 RISK ASSESSMENT OF CHANGE

Proposed construction process changes are submitted to the Client's Representative by the Project Manager, who will in consultation with the Client's Representative assess the potential impact, give due consideration to the original design basis or management process and the effect of the change on other disciplines or other parts of the project.

Where project-controlled documents are required to be revised, these are updated, and the superseded documents removed from circulation in accordance with document control procedures.

7.2 MANAGEMENT SYSTEM / PROJECT SCOPE MODIFICATIONS

The Project Manager shall:

- Evaluate changes to Management Plans and scope by comparing them with the requirements of this document, standards and policies prior to being implemented
- Assess, in consultation with the Construction Manager as appropriate, the potential of impact on the original design basis and on the overall project program and schedule

Approved scope of work changes, including any additional risk controls or project modifications, are documented as approved before change implementation is initiated where appropriate. All variations and revisions to controlled documents are to be updated and superseded documents removed from circulation.

7.3 PROJECT CHANGE MANAGEMENT

All changes to the project design are to be identified and assessed prior to implementation. Changes in design, organisational structure, materials, or construction processes are to be initiated by the design or Construction Manager and recorded through technical query management process and be authorised by the Project Manager / Client. The Project Manager will assess the potential safety and risk implications of the change/query on the original design basis, impact on other project disciplines and on the Project and facility operations. Where necessary the Project Manager will assign competent personnel to independently review the technical query and proposed change and revise the risk assessment documentation or registers accordingly.

The Project Manager will notify project team members of approved changes or modification.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 26 of 53

7.4 WORK ACTIVITY MODIFICATIONS / PROCEDURAL AND CHANGES

All work instructions/standard operating procedure changes are required to be documented and monitored relative to implementation requirements and adequacy. Proposed changes are submitted to the Project Manager for review. Approved changes are confirmed by the Project Manager and documented. Major work activity modifications and changes are approved by the Project Manager and all relevant documentation including drawings are amended as required. The Project Manager and Construction Manager respectively will notify project team members of approved changes or modifications.

The only exception is for identified immediate risk control or in emergencies where the requirement is recognised as a non-routine situation or an immediate threat to the safety of personnel or the environment exists.

Changes which have the potential to impact on construction personnel and activities are communicated through the Pre-Start or Toolbox Meetings and documented in the SWMS.

7.5 PLANT AND EQUIPMENT CHANGE MANAGEMENT

Formal risk assessment processes are established by the Construction Manager / HSE Advisor as required to ensure that new materials and components are thoroughly tested and evaluated before being introduced into the construction process.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 27 of 53

8. REFERENCE DOCUMENTS AND PROCEDURES

Wasco Doc. No.	Jemena Doc. No.	Title
2018-HSS-PLN-001	P2G-2099-PA-HS-001	Wasco Health & Safety Management Plan
2018-HSE-REG-001	P2G-2099-RG-HS-001	Project Risk Register
2018-HSS-PLN-002	P2G-2099-PA-HS-002	Traffic Management Plan
2018-HSS-PLN-003	P2G-2099-PA-HS-004	Emergency Response Plan
2018-ENV-PLN-001	P2G-2099-PA-EV-001	Environmental Management Plan
2018-ENV-PLN-002	P2G-2099-PA-EV-002	Erosion & Sediment Control Plan
2018-HSS-WMS-001	-	Safe Work Method Statement Example
WAPL-SYS-PRC-002	-	Incident Reporting Procedure
2018-QAS-PLN-001	P2G-2099-PA-QA-003	Quality Management Plan
2018-HSS-PLN-004	P2G-2099-PA-HS-003	Wasco CARE Plan
-	JEM PL 0013	Jemena Emergency Management Plan

9. GLOSSARY AND ABBREVIATIONS

TERM	DESCRIPTION
ALARP	As Low as Reasonably Practicable
AS/NZS	Australian Standard / New Zealand Standard
CSS	Construction Safety Study
EGP	Eastern Gas Pipeline
ERP	WSGGP Emergency Response Plan
HIPAP 7	Hazardous Industry Planning Advisory Paper No. 7, Construction Safety
HSMP	WSGGP Health and Safety Management Plan
JGN	Jemena Gas Network
SDS	Safety Data Sheet
NDD	Non-Destructive Digging
P2G	Power to Gas Technology
Project Site	194-214 Chandos Road, Horsley Park NSW 2175
PTW	Permit to Work

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 28 of 53

SWMS	Safe Work Method Statements
TMP	WSGGP Traffic Management Plan
TRS	Trunk Receiving Station
WSGGP	Western Sydney Green Gas Project
WSP	Western Sydney Parklands
FCC	Fairfield City Council

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 29 of 53

Appendix 1 – WSGGP Development Consent Conditions

Development Consent

Section 4.38 of the *Environmental Planning & Assessment Act 1979*

As delegate of the Minister for Planning and Public Spaces, I approve the development application referred to in Schedule 1, subject to the conditions in Schedules 2 to 4.

These conditions are required to:

- prevent and/or minimise any adverse environmental impacts of the development;
- set standards and performance measures for acceptable environmental performance; and
- provide for the ongoing environmental management of the development.



Mike Young
Executive Director
Energy, Resources and Compliance

Sydney: 10 August 2020

SCHEDULE 1

Application Number:	SSD 10313
Applicant:	Jemena Gas Networks (NSW) Limited
Consent Authority:	Minister for Planning and Public Spaces
Land:	See Appendix 1
Development:	Western Sydney Green Gas Project

TABLE OF CONTENTS

DEFINITIONS	3
PART A ADMINISTRATIVE CONDITIONS	5
Obligation to Minimise Harm to the Environment	5
Terms of Consent	5
Limits of Operations	5
Structural Adequacy	5
Demolition and Rehabilitation	5
Protection of Public Infrastructure	6
Operation of Plant and Equipment	6
PART B ENVIRONMENTAL CONDITIONS – GENERAL	7
Hazards and Risks	7
Traffic	8
Amenity	9
Soil and Water	10
Waste	10
Heritage	10
PART C ENVIRONMENTAL MANAGEMENT AND REPORTING	11
Environmental Management	11
Compliance	11
Notifications	12
Independent Environmental Audit	12
Access to Information	12
APPENDIX 1: SCHEDULE OF LAND	14
APPENDIX 2: GENERAL LAYOUT OF DEVELOPMENT	15

DEFINITIONS

Applicant	Jemena Gas Networks (NSW) Limited, or any person who seeks to carry out the development approved under this consent
Blowdown	Ventilation of gas from the hydrogen gas buffer storage blowdown vent
Calendar Year	A period of 12 months from 1 January to 31 December
Cessation of operations	Operation of the development has ceased for a continuous period of 12 months
Conditions of this consent	Conditions contained in Schedules 1 to 4 inclusive
Construction	All physical works associated with the development, including but not limited to demolition and removal of buildings or works, erection or installation of buildings and infrastructure, road upgrades, and the carrying out of works permitted by this consent (but excludes minor pre-construction and preliminary works such as road dilapidation surveys, installation of fencing, geotechnical drilling and/or surveying)
Commencement of Operations	Operations start with the production of hydrogen gas using the power to gas facility
Council	Fairfield City Council
Decommissioning	The demolition and/or removal of buildings, infrastructure and works installed for the development and/or rehabilitation of the site
Department	Department of Planning, Industry and Environment
Development	The development described in the EIS as modified by the conditions of this approval
Development footprint	The area within the site on which the components of the project will be constructed (shown in Appendix 2)
EIS	The Environmental Impact Statement titled <i>Western Sydney Green Gas Project – Environmental Impact Statement</i> dated December 2019, the Submissions Report titled <i>Western Sydney Green Gas Project - Response to Submissions</i> dated May 2020, and additional information in a letter from the Applicant dated 16 June 2020.
EPA	Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000</i>
Feasible	Means what is possible and practical in the circumstances
FRNSW	Fire and Rescue NSW
Gas Supply Act	<i>Gas Supply Act 1996</i>
Heritage NSW	Heritage NSW within the Department of Premier and Cabinet
Heritage item	An item as defined under the <i>Heritage Act 1977</i> and/or an Aboriginal Object or Aboriginal Place as defined under the <i>National Parks and Wildlife Act 1974</i>
HRS	Hydrogen refuelling station to supply hydrogen gas for bus refuelling
Incident	An occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be or cause a non-compliance
Land	Has the same meaning as the definition of the term in section 1.4 of the EP&A Act
Material harm	Is harm that: - involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial, or - results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000, (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment)
Microturbine	Gas fuelled generator for the development that converts gas to electricity
Minimise	Implement all reasonable and feasible measures to reduce the impacts of the development
Minister	Minister for Planning and Public Spaces, or delegate
Mitigation	Activities associated with reducing the impacts of the development prior to or during those impacts occurring
Non-compliance	An occurrence, set of circumstances or development that is a breach of this consent but is not an incident
Operation	The operation of the development, but does not include commissioning, trials of equipment or the use of temporary facilities
POEO Act	<i>Protection of the Environment Operations Act 1997</i>

Public infrastructure	Linear and related infrastructure that provides services to the general public, such as roads, railways, water supply, drainage, sewerage, gas supply, electricity, telephone, telecommunications, irrigation channels, drainage channels
Reasonable	Means applying judgement in arriving at a decision, taking into account: mitigation benefits, cost of mitigation versus benefits provided, community views and the nature and extent of potential improvements
Rehabilitation	The restoration of land disturbed by the development to a good condition, to ensure it is safe, stable and non-polluting
RFS	NSW Rural Fire Service
Secretary	Planning Secretary under the EP&A Act, or nominee
Secretary - Authorising	Secretary with responsibility for the <i>Gas Supply Act 1996</i>
SES	NSW State Emergency Service
Site	As listed in Appendix 1 and shown in Appendix 2
TfNSW	Transport for NSW
Vehicle trip	One vehicle entering and leaving the site
WSPT	Western Sydney Parklands Trust

SCHEDULE 2

PART A ADMINISTRATIVE CONDITIONS

OBLIGATION TO MINIMISE HARM TO THE ENVIRONMENT

- A1. In addition to meeting the specific performance criteria established under this consent, the Applicant must implement all reasonable and feasible measures to prevent, and if prevention is not reasonable or feasible, minimise any material harm to the environment that may result from the construction and operation of the development, and any decommissioning of the development and/or rehabilitation required under this consent.

TERMS OF CONSENT

- A2. The Applicant must carry out the development:
- (a) generally in accordance with the EIS; and
 - (b) in accordance with the conditions of this consent.

Note: The general layout of the development is shown in Appendix 2.

- A3. If there is any inconsistency between the above documents, the most recent document must prevail to the extent of the inconsistency. However, the conditions of this consent prevail to the extent of any inconsistency.
- A4. The Applicant must comply with any requirement/s of the Secretary arising from the Department's assessment of:
- (c) any strategies, plans or correspondence that are submitted in accordance with this consent;
 - (d) any reports, reviews or audits commissioned by the Department regarding compliance with this consent; and
 - (e) the implementation of any actions or measures contained in these documents.

LIMITS OF OPERATIONS

- A5. A maximum of 52,600 kilograms of hydrogen gas may be produced at the site in any calendar year.
- A6. A maximum of 2% by volume of hydrogen gas may be injected into the Applicant's natural gas distribution network.
- A7. Hydrogen cylinder filling is not permitted.
- A8. The Applicant may carry out operations for 5 years from the date of commencement of operations.

STRUCTURAL ADEQUACY

- A9. The Applicant must ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the *Building Code of Australia*.

Notes:

- *Under Part 6 of the EP&A Act, the Applicant is required to obtain construction and occupation certificates for the development.*
- *Part 8 of the EP&A Regulation sets out the requirements for the certification of the development.*

DEMOLITION AND REHABILITATION

- A10. The Applicant must ensure that all demolition work on site is carried out in accordance with *Australian Standard AS 2601-2001: The Demolition of Structures*, or its latest version.
- A11. The Applicant must:
- (a) rehabilitate the site progressively, as soon as reasonably practicable following disturbance;
 - (b) minimise the disturbance area at any time;
 - (c) employ interim rehabilitation strategies to minimise dust generation, soil erosion and weed incursion on parts of the site that cannot yet be permanently rehabilitated; and
 - (d) within 18 months of the cessation of operations decommission and remove project infrastructure, unless the Secretary agrees otherwise.

PROTECTION OF PUBLIC INFRASTRUCTURE

- A12. Unless the Applicant and the applicable authority agree otherwise, the Applicant must:
- (a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the development; and
 - (b) relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of the development.

OPERATION OF PLANT AND EQUIPMENT

- A13. The Applicant must ensure that all plant and equipment used on site, or in connection with the development, is:
- (a) maintained in a proper and efficient condition; and
 - (b) operated in a proper and efficient manner.

SCHEDULE 3
PART B ENVIRONMENTAL CONDITIONS – GENERAL

HAZARDS AND RISKS

Pre-construction

- B1. Unless the Secretary agrees otherwise, the Applicant must prepare the following documents at least one month prior to commencing construction of the development to the satisfaction of the Secretary:
- (a) a Construction Safety Study that is consistent with the Department's *Hazardous Industry Planning Advisory Paper No. 7, 'Construction Safety'*;
 - (b) a Hazard and Operability Study, prepared by a suitably qualified, experienced and independent expert whose appointment has been endorsed by the Secretary, that is consistent with the Department's *Hazardous Industry Planning Advisory Paper No. 8, 'HAZOP Guidelines'*, and must be accompanied by a program for the implementation of all recommendations made in the report. The study must include a suitably designed firewall with Fire Resistance Level (FRL) of at least 240/240/240 to mitigate potential fire-related impacts from the high-pressure hydrogen storage facility. If the Applicant intends to defer the implementation of a recommendation, reasons must be documented;
 - (c) a Final Hazard Analysis based on the final design of the development that is consistent with the Department's *Hazardous Industry Planning Advisory Paper No. 6, 'Hazard Analysis'*; and
 - (d) a Fire Safety Study that is consistent with the Department's *Hazardous Industry Planning Advisory Paper No. 2, 'Fire Safety Study Guidelines'* and the New South Wales Government's *'Best Practice Guidelines for Contaminated Water Retention and Treatment Systems'*, and in consultation with FRNSW and RFS.

Following the Secretary's approval, the Applicant must operate the development in accordance with the approved Construction Safety Study, Hazard and Operability Study, Final Hazard Analysis, and Fire Safety Study.

Notes:

- *Construction, other than preliminary works that are outside the scope of the hazard studies, must not commence until study recommendations have been considered and, where appropriate, acted upon.*
- *For developments in which the construction period exceeds six months, the commissioning portion of the Construction Safety Study may be submitted two months prior to commencement of commissioning.*

- B2. Unless the Secretary agrees otherwise, the Applicant must prepare a revised Safety and Operating Plan (SAOP) at least one month prior to commencing construction of the development to the satisfaction of the Secretary – Authorising in relation to all the assets and equipment located within the development footprint, as shown in Appendix 2.

Pre-commissioning

- B3. Unless the Secretary agrees otherwise, the Applicant must develop the following documents at least one month prior to commencement of commissioning of the development to the satisfaction of the Secretary:
- (a) a comprehensive Emergency Plan. The Applicant must keep two copies of the plan on-site in a prominent position adjacent to the site entry points at all times. The Emergency Plan must:
 - be consistent with the Department's *Hazardous Industry Planning Advisory Paper No. 1, 'Emergency Planning'*;
 - identify the fire risks and controls of the development;
 - include procedures that would be implemented if there is a fire on-site or in the vicinity of the site; and
 - include an Evacuation Plan for flooding and bushfire events, in consultation with Council and the NSW SES; and
 - (b) a comprehensive Safety Management System, covering all on-site operations and associated transport activities involving hazardous materials. The Safety Management System must:
 - consistent with the Department's *Hazardous Industry Planning Advisory Paper No. 9, 'Safety Management'*; and
 - identify all safety related procedures, responsibilities and policies, along with details of mechanisms for ensuring adherence to the procedures. Records must be kept on-site and must be available for inspection by Secretary upon request.

Following approval, the Applicant must implement the Emergency Plan and Safety Management System.

Notes:

- *The update of a relevant existing site document may satisfy the condition where all the relevant requirements are addressed in the updated document.*

Pre-startup

- B4. The Applicant must prepare a Pre-startup Compliance Report for the development to the satisfaction of the Secretary. This report must be submitted to the Secretary for approval at least one month prior to carrying out any operations under this consent, and detail the development's compliance with the documents required under condition 1 of schedule 3 of this consent, including:
- (a) date of document preparation;
 - (b) date that construction and commissioning commenced; and
 - (c) actions proposed and/or taken in order to implement the recommendations made in the documents.

Storage and Handling of Dangerous Goods

- B5. The Applicant must ensure that all dangerous goods and hazardous materials storage and handling undertake on-site is in accordance with:
- (a) the requirements of all relevant Australian Standards; and
 - (b) the NSW EPA's *Storing and Handling of Liquids: Environmental Protection – Participants Handbook* if the chemicals are liquids, or its latest version.

In the event of an inconsistency between the requirements listed from (a) to (b) above, the most stringent requirement must prevail to the extent of the inconsistency.

Operating Conditions

- B6. The Applicant must:
- (a) Install and maintain a suitably designed firewall with Fire Resistance Level (FRL) of at least 240/240/240 to mitigate potential fire-related impacts from the high-pressure hydrogen storage facility;
 - (b) minimise the fire risks of the development, including managing vegetation fuel loads on-site;
 - (c) ensure that the development complies with the relevant objectives in the RFS's *Planning for Bushfire Protection 2019 (or latest version)*;
 - (d) assist the RFS and emergency services as much as practicable if there is a fire in the vicinity of the site; and
 - (e) notify the relevant local emergency management committee following construction of the development, and prior to commencing operations.

TRAFFIC

Traffic Management Requirements

- B7. The Applicant must:
- (a) minimise the impacts of the site access upgrades of the development;
 - (b) maintain all footpaths, roads and utility-related infrastructure on site in a safe and serviceable condition;
 - (c) upgrade the access road and turning circle to an all-weather sealed surface;
 - (d) provide sufficient parking on site for all vehicles and ensure vehicles associated with the development do not park on the public road network;
 - (e) ensure frequency of bus hydrogen refuelling does not exceed three bus trips daily for 350 days per year, unless otherwise agreed by the Secretary subject to the Final Hazard Analysis required under Schedule 3 Condition B1; and
 - (f) minimise the traffic noise impacts of the development.

Traffic Management Plan

- B8. Prior to the commencement of construction, unless the Secretary agrees otherwise, the Applicant must prepare a Traffic Management Plan for the development to the satisfaction of the Secretary. This plan must:
- (a) be prepared in consultation with WSPT, Council and TfNSW;
 - (b) describe the measures that would be implemented to comply with the transport management requirements in condition B7 above;
 - (c) include details of the transport route to be used for all construction and operational traffic;
 - (d) include details of the measures that would be implemented to minimise traffic safety issues and disruption to local users of the transport route/s during construction and operations;
 - (e) include a protocol for undertaking independent dilapidation surveys to assess the existing condition of Chandos Road, prior to and following construction or decommissioning activities;
 - (f) include a swept path analysis of entry and exit to the site and identify a schedule for access upgrades (if required) to the satisfaction of Council and TfNSW; and
 - (g) include a program to:

- record and track vehicle and bus movements; and
- monitor the effectiveness of these measures.

The Applicant must implement the approved Traffic Management Plan for the development.

AMENITY

Construction and Operating Hours

B9. The Applicant must comply with the operating hours set out in Table 1.

Table 1: Operating Hours

Activity	Operating Hours
Operations excluding microturbines and blowdowns	24 hours a day 7 days a week
Microturbines	7 am to 10 pm 7 days a week
Construction and decommissioning activities	7am to 6pm Monday to Friday 8am to 1pm Saturday
Blowdowns (excluding emergency work)	at no time on Sundays and NSW public holidays

The following activities may be undertaken outside of the hours identified in Table 1 without the approval of the Secretary:

- the delivery of materials as requested by the NSW Police Force or other authorities for safety reasons;
- emergency work to avoid the loss of life, property and/or material harm to the environment;
- construction works that cause L_{Aeq} (15 mins) noise levels that are:
 - no more than 5 dB(A) above the rating background level at any residence in accordance with the *Interim Construction Noise Guideline* (DECC, 2009), or its latest version; and
 - no more than the noise management levels specified in Table 3 of the *Interim Construction noise Guideline* (DECC, 2009), or its latest version, at other sensitive land uses; and
 - for continuous or impulsive vibration values, measured at the most affected residence, no more than those for human exposure to vibration, specified in Table 2.2 of *Assessing vibration: a technical guideline* (DEC, 2006), or its latest version; and
 - for intermittent vibration values measured at the most affected residence, no more than those for human exposure to vibration, specified in Table 2.4 of *Assessing vibration: a technical guideline* (DEC, 2006), or its latest version;
- where a negotiated agreement has been reached with affected receivers; or
- works as approved through the out-of-hours work protocol outlined in the Environmental Management Strategy under Schedule 4 of this consent.

Noise

B10. The Applicant must:

- minimise the noise generated by any construction or decommissioning activities on site in accordance with the best practice requirements outlined in the *Interim Construction Noise Guideline* (DECC, 2009), or its latest version;
- implement all reasonable and feasible measures to minimise the operational noise of the development;
- notify the occupants of residences within 200 metres of the site boundary and WSPT 24 to 48 hours prior to undertaking blow downs (excluding emergency works); and
- comply with the operational noise levels within the *Noise Policy for Industry* (NSW EPA, 2017), or its latest version.

Air

B11. The Applicant must minimise the:

- dust emissions of the development, including wind-blown and traffic generated dust;
- greenhouse gas emissions of the development;
- surface disturbance of the development; and
- other air emissions of the development.

B12. The Applicant must ensure that no offensive odours are emitted from the development, as defined under the POEO Act.

Visual

B13. The Applicant must:

- (a) minimise the off-site visual impacts of the development, including the potential for any glare or reflection;
- (b) ensure the visual appearance of infrastructure (including paint colours) blends in as far as possible with the surrounding landscape; and
- (c) not mount any commercial advertising signs or logos on site, except where this is required for identification or safety purposes.

Lighting

B14. The Applicant must:

- (a) minimise the off-site lighting impacts of the development; and
- (b) ensure that any external lighting associated with the development:
 - is installed as low intensity lighting (except where required for safety or emergency purposes);
 - does not shine above the horizontal; and
 - complies with *Australian Standard AS4282 (INT) 1997 – Control of Obtrusive Effects of Outdoor Lighting*, or its latest version.

SOIL AND WATER

Operating Conditions

B15. The Applicant must:

- (a) ensure that the development does not cause any water pollution, as defined under section 120 of the POEO Act;
- (b) ensure that stormwater runoff from the development is managed using Waster Sensitive Urban Design (WSUD) techniques consistent with the *Western Sydney Parklands Design Manual* and considers the Fairfield City Council *Stormwater Management Policy*; and
- (c) minimise any soil erosion associated with the construction of the development in accordance with the relevant requirements in the *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004) manual, or its latest version.

WASTE

B16. The Applicant must:

- (a) minimise the waste generated by the development;
- (b) classify all waste generated on site in accordance with the EPA's *Waste Classification Guidelines 2014* (or its latest version);
- (c) store and handle all waste on site in accordance with its classification;
- (d) not receive or dispose of any waste on site; and
- (e) remove all waste from the site as soon as practicable, and ensure it is sent to an appropriately licensed waste facility for disposal.

HERITAGE

Protection of Heritage Items

B17. The Applicant must ensure the development does not cause any direct or indirect impacts on heritage items located outside the approved development footprint.

B18. If historical and/or Aboriginal archaeological heritage items are unexpectedly discovered during construction of the development, all works must cease, and a suitably qualified and experienced archaeologist be brought in to assess the find. Depending on the nature of the discovery, additional assessment, recording and management measures may be required prior to the recommencement of works in the affected area. Heritage NSW and/or members of the relevant Local Aboriginal Land Council must be notified of this discovery in writing.

SCHEDULE 4

PART C ENVIRONMENTAL MANAGEMENT AND REPORTING

ENVIRONMENTAL MANAGEMENT

Environmental Management Strategy

- C1. Prior to commencing construction, the Applicant must prepare an Environmental Management Strategy for the development to the satisfaction of the Secretary. This strategy must:
- (a) prepared in consultation with the Council and WSPT;
 - (b) provide the strategic framework for environmental management of the development;
 - (c) identify the statutory approvals that apply to the development;
 - (d) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the development;
 - (e) describe the procedures that would be implemented to:
 - keep the local community and relevant agencies informed about the operation and environmental performance of the development;
 - receive, handle, respond to, and record complaints;
 - resolve any disputes that may arise;
 - respond to any non-compliance; and
 - respond to emergencies; and
 - (f) include:
 - the following sub-plans:
 - noise;
 - air quality;
 - stormwater management including erosion and sediment controls during construction; and
 - heritage.
 - copies of any strategies, plans and programs approved under the conditions of this consent; and
 - a clear plan depicting monitoring to be carried out in relation to the development.

Following the Secretary's approval, the Applicant must implement the Environmental Management Strategy.

Notes:

- *The update of a relevant existing site documents may satisfy the condition where all the relevant requirements are addressed in the updated document.*

Revision of Strategies, Plans and Programs

- C2. Within 3 months, unless otherwise agreed with the Secretary, of:
- (a) the submission of an incident report under condition C5 below;
 - (b) the submission of an audit report under condition C9 below; and
 - (c) the approval of any modification to the conditions of this consent; or
 - (d) a direction of the Secretary under condition A4 of schedule 2;

the Applicant must review, and if necessary revise, the strategies, plans, and programs required under this consent to the satisfaction of the Secretary.

Where this review leads to revisions in any such document, then within 4 weeks of the review the revised document must be submitted to the Secretary for approval, unless otherwise agreed with the Secretary.

Note: This is to ensure the strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the development.

COMPLIANCE

Incident Notification

- C3. The Applicant must immediately notify the Department, Council and any other relevant agencies immediately after it becomes aware of an incident. The notification must identify the development (including the development application number and name) and set out the location and nature of the incident.

Non-Compliance Notification

- C4. Within seven days of becoming aware of a non-compliance, the Applicant must notify the Department of the non-compliance. The notification must identify the development (including the development application number and name), set out the condition of this consent that the development is non-compliant with, why it

does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.

Note: A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.

Compliance Reporting

- C5. The Applicant must provide regular compliance reporting to the Department on the development in accordance with the relevant *Compliance Reporting requirements* (DPE May 2020), or its latest version.

NOTIFICATIONS

Notification of Department

- C6. Prior to commencing the construction, operations or decommissioning of the development or the cessation of operations, the Applicant must notify the Department and Council in writing of the date of commencement, or cessation, of the relevant phase.

If any of these phases of the development are to be staged, then the Applicant must notify the Department and Council in writing prior to commencing the relevant stage, and clearly identify the development that would be carried out during the relevant stage.

Final Layout Plans

- C7. Prior to commencing construction, the Applicant must submit detailed plans of the final layout of the development to the Secretary.

Work as Executed Plans

- C8. Prior to commencing operations, the Applicant must submit work as executed plans of the development to the Secretary.

INDEPENDENT ENVIRONMENTAL AUDIT

- C9. Unless the Secretary agrees otherwise, 12 months after the commencement of operations of the development and every three years thereafter, the Applicant must commission and pay the full cost of an Independent Environmental Audit of the development. This audit must:
- (a) be prepared in accordance with the relevant Independent Audit Post Approval requirements (DPE 2020);
 - (b) be conducted by a suitably qualified lead auditor and suitably qualified, experienced and independent team of experts in any field specified by the Secretary, whose appointment has been endorsed by the Secretary;
 - (c) include consultation with Council and relevant agencies;
 - (d) include a comprehensive Hazard Audit of the development in accordance with the Department's publication *Hazardous Industry Planning Advisory Paper No. 5, 'Hazard Audit Guidelines'* and include a review of the site Safety Management System and a review of all entries made in the incident register since the previous audit;
 - (e) review the adequacy of any strategies, plans or programs required under the abovementioned approvals;
 - (f) recommend appropriate measures or actions to improve the environmental performance of the development, and/or any strategy, plan or program required under the abovementioned approvals; and
 - (g) be conducted and reported to the satisfaction of the Secretary.

Note: This audit must be undertaken in accordance with the Independent Audit requirements (DPE 2018).

- C10. Within 12 weeks of commissioning this audit, or as otherwise agreed by the Secretary, the Applicant must submit a copy of the audit report to the Secretary, together with its response to any recommendations contained in the audit report and a timetable for the implementation of these recommendations as required.

The Applicant must implement these recommendations, to the satisfaction of the Secretary.

ACCESS TO INFORMATION

- C11. Unless the Secretary agrees otherwise, from the commencement of development under this consent, the Applicant must:
- (a) make the following information publicly available on its website as relevant to the stage of the development:

- the EIS;
 - the final general arrangement plans for the development;
 - current statutory approvals for the development;
 - approved strategies, plans or programs required under the conditions of this consent;
 - the proposed staging plans for the development if the construction, operation or decommissioning of the development is to be staged;
 - how complaints about the development can be made;
 - a complaints register;
 - compliance reports;
 - any independent environmental audit, and the Applicant's response to the recommendations in any audit; and
 - any other matter required by the Secretary; and
- (b) keep this information up to date.

APPENDIX 1: SCHEDULE OF LAND

Development Site	
Lot	Deposited Plan
1	499001
3	1002764

APPENDIX 2: GENERAL LAYOUT OF DEVELOPMENT



	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 30 of 53

Appendix 2 – WSGGP Health and Safety Management Plan



WESTERN SYDNEY GREEN GAS PROJECT

HEALTH & SAFETY MANAGEMENT PLAN

Document Number			2018-HSS-PLN-001		
Revision	Issue	Date	By	Check	Approve
0	Issued for Use	06/10/2020	DP	AMH	MPW
C	For Client Review	23/09/2020	DP	AMH	MPW
B	For Client Review	18/09/2020	RCL	AMH	MPW
A	For Client Review	04/09/2020	RCL	AMH	MPW

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 2 of 59

1. PURPOSE	5
2. SCOPE	5
3. DEFINITIONS AND ABBREVIATIONS	7
4. RELEVANT LEGISLATION.....	8
4.1 LEGISLATION	8
5. RESPONSIBILITIES	9
5.1 LEADERSHIP AND COMMITMENT.....	9
5.1.1 PRINCIPLE CONTRACTOR RESPONSIBILITIES	9
5.1.2 PROJECT MANAGEMENT TEAM	10
5.1.3 PROJECT MANAGER	10
5.1.4 CONSTRUCTION MANAGER.....	11
5.1.5 PROJECT ENGINEER.....	12
5.1.6 PROJECT ENGINEER.....	12
5.1.7 PROJECT HSE ADVISOR.....	13
5.1.8 WORKERS AND SUBCONTRACTORS	14
6. ORGANISATION CHART	14
7. PROJECT SCHEDULE	15
8. PROJECT ACTIVITIES.....	15
9. NON-COMPROMISING RULES	16
9.1 12 NON-COMPROMISING RULES.....	16
10. OBJECTIVES.....	17
10.1 LAGGING INDICATORS.....	18
10.2 LEADING INDICATORS	18
11. WASCO POLICY STATEMENTS	18
12. RISK ASSESSMENT AND HAZARD MANAGEMENT	18
12.1 RISK ACCEPTANCE CRITERIA	18
12.2 ASSESSMENT OF RISK/HAZARD	19
12.3 Hierarchy of Risk Reduction Measures.....	31
12.4 IDENTIFICATION AND ASSESSMENT METHODOLOGY	31
12.5 SWMS.....	32
12.6 TAKE 5	33
12.7 CONSTRUCTION HAZARD ELIMINATIONS (HAZOB CARDS)	33
12.8 HAZARD AND RISK COMMUNICATION	33
13. SELECTION OF PERSONNEL, COMPETENCY AND TRAINING	34
13.1 CERTIFICATES / RECORDS OF QUALIFICATION.....	34
13.2 CONSTRUCTION INDUSTRY INDUCTION (BLUE CARD / WHITE CARD)	35
13.3 INDUCTION AND TRAINING	35
13.3.1 MANDATORY TRAINING.....	35
13.3.2 FURTHER TRAINING / COMPETENCIES.....	36
13.3.3 WASCO PROJECT INDUCTION.....	36
13.3.4 VISITOR INDUCTION TRAINING	37
13.3.5 HSR TRAINING.....	37
13.4 HEALTH MENTORING SYSTEM.....	38

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 3 of 59

13.4.1	EMPLOYEE FITNESS AND HEALTH SURVEILLANCE.....	38
14.	PROTECTIVE CLOTHING AND EQUIPMENT	38
15.	EMPLOYEES INVOLVEMENT AND COMMUNICATION.....	39
15.1	HEALTH AND SAFETY COMMUNICATION	39
15.2	EMPLOYEE ELECTED WORKPLACE HEALTH AND SAFETY REPRESENTATIVES (HSRS)	39
16.	PRE-START BRIEFINGS.....	40
16.1	TOOLBOX MEETINGS.....	40
17.	SUBSTANCE ABUSE	40
18.	MONITORING AND EVALUATION.....	41
19.	INCIDENT / ACCIDENT REPORTING	41
19.1	INCIDENT REPORTING	42
19.2	INJURY MANAGEMENT	42
19.3	WORK COVER	43
19.4	CORRECTIVE AND PREVENTIVE ACTIONN	43
20.	INCIDENT INVESTIGATION	43
21.	EMERGENCY REPOSE.....	44
22.	HAZARDOUS SUBSTANCES - MATERIALS.....	44
23.	PERMITS	44
24.	SIGN POSTING	45
25.	TAGS.....	45
25.1	ISOLATION/OUT OF SERVICE TAGS.....	45
25.2	DANGER TAGS	46
26.	PURCHASING PLANT AND EQUIPMENT.....	46
27.	MAINTENANCE, INSPECTION, TESTING, PLANT AND EQUIPMENT.....	46
28.	PRESSURE TESTING OF PIPES AND VESSELS	47
29.	SAFE OPERATING PROCEDURES AND STANDARDS.....	47
30.	WORKPLACE ENVIRONMENT	48
30.1	SITE ACCESS.....	48
30.2	SITE SECURITY AND PUBLIC SAFETY	49
30.3	RIGHT OF ENTRY	49
30.4	FIREARMS AND WEAPONS	49
30.5	PETS.....	49
30.6	SMOKING	50
30.7	DRIVING	50
30.8	COMMUNICATION AND TWO-WAY RADIO OPERATION	50
30.9	WORKPLACE LIGHTING.....	50
30.10	WORKING HOURS	50
30.11	LONE WORK	51
30.12	FATIGUE MANAGEMENT	51
30.13	CONSTRUCTION NOISE LEVEL	51
30.14	FIRE PREVENTION	51

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 4 of 59

30.15	HOUSEKEEPING.....	52
30.16	ELECTRICAL SAFETY.....	52
30.17	COMPRESSED GAS CYLINDERS	52
30.18	WORKPLACE AMENITIES	52
30.18.1	<i>Drinking Water</i>	52
30.18.2	<i>Ablution Facilities</i>	52
30.18.3	<i>Crib Room Facilities</i>	52
31.	EXCAVATION	53
32.	CONFINED SPACE ENTRY MANAGEMENT.....	53
33.	WORK NEAR TO OVERHEAD POWERLINES.....	53
34.	WORK IN THE VICINITY OF LIVE GAS PIPELINES.....	54
35.	MOVEMENT AND CONTROL OF VEHICLES – PLANT AND EQUIPMENT.....	54
36.	MATERIALS HANDLING, LIFTING EQUIPMENT AND LIFTING.....	55
36.1	SAFETY OF PERSONNEL	56
37.	HEALTH.....	57
38.	FIRST AID	57
39.	MANAGEMENT OF CHANGE	58
39.1	RISK ASSESSMENT OF CHANGE	58
39.2	MANAGEMENT SYSTEM / PROJECT SCOPE MODIFICATIONS	58
39.2.1	<i>HANDOVER OF RESPONSIBILITIES</i>	<i>58</i>
39.3	PROJECT CHANGE MANAGEMENT	59
39.4	WORK ACTIVITY MODIFICATIONS/PROCEDURAL ANDCHANGES	59
39.5	PLANT AND EQUIPMENT CHANGE MANAGEMENT	60
40.	SUB-CONTRACTS.....	60
40.1	PRE-QUALIFICATION	60
40.2	SUBCONTRACTOR MANAGEMENT.....	60
41.	RECORDS & REPORTING	61
42.	REVIEW AND IMPROVEMENT	62

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 5 of 59

1. PURPOSE

The purpose of this Health Safety Management Plan (HSMP) is to plan and describe the control mechanisms to be implemented during the Scope of Work detailed for the Jemena Western Sydney Green Gas Project (Wasco 2018 Project) and to comply with the requirements of the Jemena Scope of Work and the Contract between Jemena Gas Networks (NSW) Ltd (Jemena | Client) and Wasco (Australia) Pty Ltd (Wasco).

Should there be any significant changes, or should amendments be made to the Contract or any significant risks be identified during the life of the project, this HSMP will be revised and changes to the plan will be made accordingly. All changes to the plan will be communicated to the appropriate parties prior to implementation. This Plan operates under the Wasco Integrated Management System (IMS) which is accredited to AS/NZS4801, AS/NZS ISO 14001, and AS/NZS ISO 9001. This plan should be read in conjunction with the Integrated Management System Manual WAPL-SYS-MAN-001 and the Jemena Safety Management Systems and Manuals. The following documents are integral to the Safety Management System that is established and delivered on the project. This HSMP combines the undertakings described in these documents into a single Inspection and Test regime that will be implemented to ensure that all items contained within these core documents are delivered.

- 2018-PRM-PLN-001 PROJECT EXECUTION PLAN
- 2018-HSS-PLN-001 HSE MANAGEMENT PLAN
- 2018-HSS-REG-001 PROJECT RISK REGISTER

These documents are considered within this document.

All work will be performed in accordance with all Client requirements and relevant Regulations – Codes of Practice and Australian, International and industry standards. Copies of all relevant Safety Legislation – Australian Standards – Codes of Practice will be maintained at the site office. The primary purpose of this document is to minimise health and safety impact by providing a Management Plan for general construction activities with potential health and safety risks, and to reduce the risks to as low as reasonably practical (ALARP).

2. SCOPE

The Western Sydney Green Gas (WSGG) Project involves the construction of a power to gas (P2G) hydrogen facility at the existing Jemena Horsley Park Trunk Receiving Station, located in Western Sydney. The facility will use renewable electricity to generate hydrogen, which can be injected into the natural gas network or used to generate electricity back to the grid by means of a hydrogen-powered micro-turbine or similar technology.

The Jemena Horsley Park Facility is located at 194 – 202 Chandos Road, Horsley Park (Lot 1 DP 499001 and Lot 3 DP 1002746)

Jemena has engaged Wasco to perform the role of the Principal Contractor for the duration of the Construction Project. As such, Wasco has been authorised to have management and control of the Construction Project, as required to discharge the duties of a Principal Contractor. This document will be the governing HSE Plan for the works while Wasco remains the Principal Contractor.

The scope of work defined under this Safety Management Plan is detailed in 2018-PRM-PLN-001 – Project Execution Plan and includes:

Preliminaries:

- Construction planning

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 6 of 59

- Construction documentation and approvals
- Workshop fabrication, as applicable
- Weld and welder qualifications
- Procurement of contractor-supplied items

Mobilisation and Site Establishment

- Mobilisation to site
- Establishment of lay-down area, fencing and facilities
- Site Security
- Housekeeping and disposal/removal of waste
- Relocate communications link between TRS and EGP

Site Civil Construction

- Hardstand, access road and truck turnaround
- Foundations
- Pipe and cable installation and trenching
- Spoil and waste management

Installation of Major Package Equipment

- Electrolyser Package (process and electrical containers and separate cooler system)
- Microturbine Package
- Gas Panel Packages
- Gas Injection Panel Package
- Electrical Equipment Room
- High Voltage Switchgear and Kiosk Transformer (HV substation)
- Wastewater tank & irrigation system [HOLD 5]
- Cylinder Filling Package [HOLD 5]

Electrical Works

- The electrical scope of works as per separate SOW

Carbon Steel Pipelines (Hydrogen Buffer Store and Natural Gas Connection)

- Excavation of pipeline trench and tie-in bell-holes
- Transport, stockpiling and backfilling with controls on-site
- Welding of pipeline strings
- NDT and field-joint coating of welds
- Lowering in of pipeline
- Backfill of pipeline trench
- Cleaning, hydro-testing and drying of pipeline
- Hot tap coordination with the Principal

Mechanical and Structural Works

- Facility tubing and valves
- Water piping system
- Nitrogen cylinders and network
- Facility signage, labelling

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 7 of 59

Demobilisation and Commissioning

- Demobilisation and site restoration
- Pre-commissioning and commissioning

There are several existing site-specific procedures in the Jemena Work Health and Safety Management System that are required to be adopted by Wasco into the health and safety arrangements for the Construction Project. The elements which are required to be incorporated into Wasco's safety management system for the delivery of the Construction Project are:

DOCUMENT NUMBER	OWNER	DOCUMENT TITLE
JEM HSE PR 0027	Jemena/Zinfra	Fitness for Work Drug and Alcohol Procedure
GAS-999-PR-HSE-006	Jemena/Zinfra	Permit to Work Procedure;
GAS-999-PR-HSE-007	Jemena/Zinfra	Isolating and Tagging Procedure
GAS-310-PA-HSE-004	Jemena/Zinfra	COVID-19 (Corona Virus) Management Plan
GAS-399-PA-EV-003	Jemena/Zinfra	Operational Environmental Management Plan
GAS-310-PR-EM-001	Jemena/Zinfra	Station Evacuation Procedure
2018-HSS-PLN-002	Wasco	Travel Management Plan
2018-HSS-PLN-003	Wasco	Emergency Response Plan
2018-HSS-PLN-004	Wasco	CARE Plan
2018-HSS-PLN-005	Wasco	COVID-19 Management Plan
WAPL-SYS-REG-004	Wasco	COVID-19 Risk Register
WAPL-HSS-PRC-003	Wasco	Fitness for Work Procedure
WAPL-HSS-PLN-003	Wasco	Fatigue Management Plan
WAPL-HRE-PRC-014	Wasco	Training & Competency Procedure
WAPL-SYS-PLN-001	Wasco	Risk Management Plan
WAPL-SYS-PRC-002	Wasco	Incident Reporting Procedure

3. DEFINITIONS AND ABBREVIATIONS

Abbreviation	Definition
ALARP	As Low as Reasonably Practicable
AS/NZS	Australian Standard/New Zealand Standard
CAR	Corrective Action Report
CEMP	Construction Environmental Management Plan
Contract	The agreement between Jemena to carry out the work
Client	Jemena Gas Networks (NSW) Ltd
ELCB	Earth Leakage Circuit Breaker
ERP	Emergency Response Plan
FSA	Formal Safety Assessment
HAZID	Hazard Identification
HAZOB	Hazard Observation System
HSE	Health, Safety and Environment
IMS	Integrated Management System
ISO	International Organisation for Standardisation
ITP	Inspection and Test Plan

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 8 of 59

Abbreviation	Definition
KPI	Key Performance Indicator
LTIFR	Lost Time Injury Frequency Rate
MTIFR	Medical Treatment Injury Frequency Rate
NATA	National Association of Testing Authorities
OHS	Occupational Health and Safety
PPE	Personal Protective Equipment
PTW	Permit to Work
RCD	Residual Current Device
RTW	Return to Work
RTWC	Return to Work Coordinator
SDS	Safety Data Sheet (also MSDS)
HSMP	Health, Safety Management Plan
SWL	Safe Working Load
SWMS	Safe Work Method Statement – Procedure for detailing specific requirements for high risk construction activities or designated
Take 5	Personal Task pre-start risk review
VRD	Voltage Reduction Device
Wasco	Wasco (Australia) Pty Ltd

4. RELEVANT LEGISLATION

The scope of work defined under this Safety Management Plan is detailed in 2018-PRM-PLN-001 – Project Execution Plan.

4.1 LEGISLATION

Legislative updates may occur during the life of the project, which may affect aspects of the project relating to safety requirements or regulations. Wasco subscribes to a Legislation Update and Alert service which provides information of changes as they are implemented, it is the responsibility of the Project Manager to provide updates to the Project and to ensure procedures and policies are appropriately updated and current. The Wasco Integrated Management System requires regular review and updating of legislation, codes of practice and standards.

Particular attention is drawn to the following:

Legislation Title
Work Health and Safety NSW Act 2011
Work Health and Safety NSW Regulations 2017
NSW Gas Supply Act 1996.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 9 of 59

5. RESPONSIBILITIES

The scope of work defined under this Safety Management Plan is detailed in 2018-PRM-PLN-001 – Project Execution Plan.

5.1 LEADERSHIP AND COMMITMENT

Wasco is committed to the safety, health, and welfare of all stakeholders on the project, and will demonstrate leadership in achieving the highest attainable standards in both the occupational and natural environments. Wasco shall consult with Client, subcontractors, and all personnel engaged on the project, to ensure that all personnel understand and commit to the same health and safety goals and initiatives.

The values supporting this commitment are:

- All injuries are preventable
- All levels of management will encourage involvement and ownership by leading through example
- Adopting safe work practices is a condition of employment
- Employee involvement and consultation is essential
- All levels of management are accountable for managing health and safety issues
- All hazards can be identified, assessed, and controlled; and
- Training employees to work safely is essential.

5.1.1 PRINCIPLE CONTRACTOR RESPONSIBILITIES

Wasco is responsible for the implementation of this HSMP in accordance with the Wasco and J specified objectives on health, safety. We are committed to ensuring we comply with the NSW Work Health and Safety Act 2011 and NSW Work Health and Safety Regs 2017. We will also comply with any other relevant legislation, applicable Codes of Practice and Australian Standards as far as possible.

Wasco shall actively promote and ensure that all Project personnel under their control are fully conversant with this Plan and any incumbent responsibilities.

Wasco shall:

- Ensure the health and safety of its workers and others in our workplace
- Ensure the health and safety of other persons is not put at risk from work carried out as part of its operations
- Provide and maintain a work environment that is without risks to health and safety
- Provide and maintain safe plant and structures
- Provide and maintain safe systems of work
- Ensure the safe use, handling and storage of plant, structures and substances
- Provide adequate facilities for the welfare of workers
- Provide information, training, instruction and supervision
- Monitor the health of workers and the conditions of our workplaces
- Consult so far as reasonably practicable with workers, their representatives and Health and Safety Representatives on work health and safety matters.
- Provide leadership in the implementation of all health and safety initiatives
- Determine the resources necessary to conduct specific activities and achieve project objectives
- Ensure that all operations have been assessed to evaluate the potential presence of risks and hazards that any specified mitigation measures have been implemented
- Develop a construction methodology with due regard for the health and safety
- Ensure mitigation actions agreed as part of the risk assessment process are included in the HSMP, supporting plans and procedures
- Establish sufficient resources for emergency response systems
- Be actively involved in the HSE meetings, audits and reviews; and
- Produce Health and Safety objectives, tasks and targets for the contract.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 10 of 59

5.1.2 PROJECT MANAGEMENT TEAM

The Project Management Team consists of the Project Manager, Construction Manager, Project Engineer, HSE Advisor and Brisbane Support Staff. The Project Manager is accountable for the success or failure of health and safety performance for the project.

The Project Management Team has assigned discipline authority and responsibility for establishing the Project Health and Safety objectives, and for ensuring that adequate resources are made available to the Construction supervision to enable these objectives to be achieved.

The Project Management Team is responsible for the implementation of this HSMP in accordance with the Wasco and Jemena specified objectives on health, safety.

The Project Management Team shall actively promote and ensure that all Project personnel under their control are fully conversant with this Plan and any incumbent responsibilities.

The Project Management Team shall:

- Provide leadership in the implementation of all health and safety initiatives
- Determine the resources necessary to conduct specific activities and achieve project objectives
- Ensure that all operations have been assessed to evaluate the potential presence of risks and hazards that any specified mitigation measures have been implemented
- Develop a construction methodology with due regard for the health and safety
- Ensure mitigation actions agreed as part of the risk assessment process are included in the HSMP, supporting plans and procedures
- Establish sufficient resources for emergency response systems
- Provide training to ensure that each member of the project team within their discipline is competent to implement the HSMP
- Be actively involved in the HSE meetings, audits and reviews
- Produce Health and Safety objectives, tasks and targets for the contract.
- each member of the project team within their discipline is competent to implement the HSMP
- Ensure the government approved COVID 19 plan is fully implemented for the project and all project team members are meeting its requirements
- Ensure client-imposed policy, procedure or systems are implemented as instructed

5.1.3 PROJECT MANAGER

The Project Manager is accountable to the Client and Wasco Senior Management for the success or failure of health and safety performance.

The Project Manager has ultimate authority and responsibility for establishing compliance with the Health and Safety Policy and Objectives, and for ensuring that adequate resources are made available to the Project Construction Manager to enable these objectives to be achieved.

The Project Manager shall:

- Provide leadership in the implementation of health and safety initiatives
- Determine the resources necessary to conduct specific activities and achieve project objectives
- Ensure that all operations have been assessed to evaluate the potential presence of risk and hazards that any specified mitigation measures have been implemented
- Develop a construction methodology with due regard for the health and safety; and
- Ensure mitigation actions agreed as part of the risk assessment process are included in the HSMP, supporting plans and procedures
- Establish sufficient resources for emergency responsesystems
- Provide for training to ensure that each member of the project team is competent to implement the HSMP

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 11 of 59

- Be actively involved in HSE meetings, HSE audits, HSE inspections and reviews
- Produce HSE objectives, tasks and targets for the contract
- Provide a copy of weekly HSE stats (leading indicators and lagging indicators) to Jemena through the weekly construction report.
- Ensure that personnel assigned to project activities are competent and, via pre-placement medical assessment, are physically fit when engaged to carry out specific work when required and for the duration that is required
- Notify the Wasco Corporate of all near misses and all incident events which involve significant personal injury, which compromise, or which impact the local community. All incidents are to be reported to the Client immediately or as soon as the situation has been stabilised as per Project incident reporting procedures
- Be the primary avenue of communication between Wasco and the Client on HSE matters.
- Develop, in consultation with the Wasco Corporate, terms of reference and decide the composition of the investigating team as appropriate with the designated Regulatory Authority; and
- Review the quality, thoroughness, and adequacy of corrective actions for each investigation.

5.1.4 CONSTRUCTION MANAGER

The Construction Manager is accountable and reports to the Wasco Project Manager for compliance with both company and project health and safety requirements. The Construction Manager has the overriding authority to make decisions with respect to field safety and pollution prevention.

The Construction Manager shall:

- Be responsible for the health and safety issues relating to the construction
- Be responsible for ensuring that sufficient resources are available for the implementation of both this HSMP
- Establish and allocate resources to manage emergencies. This shall include training and regular drills to ensure the preparedness to act on all identified potential emergency scenarios
- Identify and implement any specialised training for the construction crew required in relation to health and safety
- Be responsible for the movement of personnel and all plant and equipment and liaise with the Client Site Representative and Local Authorities in exercising this responsibility (i.e. Police, Local Shire Authorities);
- Be responsible for the implementation of health and safety related procedures during all construction activities
- ensuring that personnel assigned to project activities are competent and, via pre-placement medical assessment, are physically fit when engaged to carry out specific work when required and for the duration that is required
- Select Supervisors from experienced and competent persons
- Encourage hazard identification and reporting by all site personnel to ensure that information gained is used to best effect in ensuring preventative actions are implemented
- Ensure smooth interaction with neighbouring Jemena Operational Team members through coordinated Simultaneous Operations (SIMOPS) meeting as required.
- Cooperate with audits and inspections carried out by Jemena representatives.
- Reports all HSE incidents and near misses to Jemena representative within 24 hours of occurring.
- Ensure all employees and including subcontractors engaged by WASCO are site inducted prior to commencing works on site.
- Maintain copies of licenses, VOC's, and all relevant training records and qualifications on site of all site employees including subcontractors engaged by WASCO.
- Ensure supervision backup during leave rotations and/or absences due to the work cycle rotation stand-by supervisors where required with all appropriate and compulsory training as identified in the Training

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 12 of 59

Matrix including requirements by the Client

- Implement disciplinary actions for the breach of Project safety requirements
- Report all incidents to the Project Manager
- Encourage incident reporting by all site personnel to ensure that information gained from the incident is used to best effect in ensuring preventative actions are implemented
- Notify the Project Manager and the Client of all near misses and all incident events which involve significant personal injury, which compromise, or which impact the local community; and
- Ensure that a documented preliminary incident report is completed and provided to the Project Manager within 24 hours of a significant incident
- Inform the Project Manager of the injury or ill health
- Manage all medical emergencies at the construction site in accordance with the approved Emergency Response Plan
- Ensure that each employer (including subcontractors) will only allow employees to return to work strictly in accordance with the directions to resume work of the medical practitioner
- Nominate, in consultation with the Project Manager, a suitably qualified investigation team for any incident requiring submission to a statutory authority
- ensure investigation forms are accurately completed and closed out and involved employees have been informed
- Review the quality, thoroughness and adequacy of corrective actions for each investigation

5.1.5 PROJECT ENGINEER

The Project Engineer is accountable to the Project Manager. The Project Engineer shall be responsible for all factors relating to health and safety on the project, including facilitating the implementation of safety management planning and co-ordination of site safety activities.

The Project Engineer shall ensure that:

- The project HSMP is developed and implemented
- Health and safety requirements are in compliance with all current statutory obligations
- Health and safety requirements are in compliance with Jemena requirements
- Copies of relevant legislation, codes of practice, codes and standards are readily accessible
- Hazards are identified, and risk assessment procedures are instigated
- Subcontractors have suitable experience and knowledge to conduct any potential work scope in compliance with project health and safety requirements
- Plant and Equipment used on the site have completed and passed an appropriate Plant Risk Assessment
- Schedule and audit on project activities and subcontractors
- Performance is monitored, documented and reported to Project Manager
- The HSMP is regularly reviewed and system improvements initiated
- Procedures are established for distribution, reporting and reviewing HSE issues
- Adequate and effective training programs are developed and implemented
- Adequate resources are available for elected health and safety representatives.
- Maintain copies of licenses, VOC's, and all relevant training records and qualifications on site of all site employees including subcontractors engaged by Wasco.

5.1.6 PROJECT ENGINEER

Supervisors are accountable to the Construction Manager. Supervisors shall be responsible for determining the course of actions to be taken, to ensure minimal impact to health and safety.

Supervisors shall:

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 13 of 59

- Provide leadership which encourages a consultative interaction with all team members;
- Provide training to team members within the scope of their ability (ie Trade Training and experience);
- Ensure that personnel assigned to project activity are competent and via pre-placement medical assessment are physically fit when engaged to carry out specific work when required and for the duration that is required;
- Assist team members to identify risks and instigate mitigation measures (SWMSs) and record and passed on to the HSE Advisors; ensure that SWMSs are reviewed and signed onto by the assigned workforce;
- Comply with the requirements of this SMP and any applicable legislation or company specific safety requirements;
- Ensure that the personnel under their supervision have an understanding of the specified health and safety requirements and are provided with the necessary instructions and support to perform their tasks in a manner which minimises impact on health and safety;
- Ensure that workers operating machinery are competent and machinery unless inspected for suitability does not unless authorised by Client enter project areas;
- Ensure pre-starts are carried out daily;
- Ensure plant is subject to risk assessment by the operator before use in a new or changed work environment;
- Encourage hazard identification and reporting by all site personnel to ensure that information gained is used to best effect in ensuring preventative actions are implemented
- Data from Hazard Alerts/Observations will be subject to trend analysis and the Client Construction Manager and Client Field HSE Advisors will be advised by the Construction Manager at daily progress meetings as appropriate of trending information;
- Ensure that pre-start checks are documented daily and are carried out on all plant and equipment;
- Ensure the availability and wearing of PPE;
- Encourage incident reporting by all site personnel to ensure that information gained from the incident is used to best effect in ensuring preventative actions are implemented;
- Ensure that the injured employee receives appropriate first aid or medical treatment in the first instance and where required make arrangements for transport to community emergency medical facilities or hospital, when advised of an injury or incident;
- Notify the location HSE Advisor and commence preparation of an Incident Report; and
- Initiate disciplinary actions for the breach of project safety requirements.

5.1.7 PROJECT HSE ADVISOR

- Coordinate the activities of site medical and safety personnel
- Distribute health and safety information
- Coordinate/facilitate field-based inspections and audits on project activities and subcontractors
- Participate in the development of hazard identification and control mechanisms
- Review training records and qualifications to ensure each person is competent to perform tasks associated with their position
- Prepare and implement emergency response training drills and exercises
- Review performance monitoring reports;
- Prepare promotional material for HSE issues
- Provide leadership which encourages a consultative interaction with all team members
- Ensure that personnel assigned to the project activity are competent and via pre-placement medical assessment are physically fit when engaged to carry out specific work when required and for the duration that is required
- Comply with the requirements of this HSMP and any applicable legislation or Wasco / Jemena specific safety requirements
- Ensure that the personnel have an understanding of the specified health and safety requirements and are

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 14 of 59

provided with the necessary instructions and support to perform their tasks in a manner which minimises impact on health and safety

- Ensure that workers operating machinery are ticketed and competent
- Ensure pre-start meetings are carried out daily onsite
- Ensure plant is subject to risk assessment prior to being used at the site and is completed by the operator before use in a new or changed work environment
- Encourage hazard identification and reporting by all site personnel to ensure that information gained is used to best effect in ensuring preventative actions are implemented
- Data from Hazard Alerts/Observations will be subject to trend analysis and Jemena will be advised by the Construction Manager at daily progress meetings as appropriate of trending information
- Ensure that pre-start checks are documented daily and are carried out on all plant and equipment
- Ensure the availability and wearing of PPE
- Encourage incident reporting by all site personnel to ensure that information gained from the incident is used to best effect in ensuring preventative actions are implemented
- Ensure that the injured employee receives appropriate first aid or medical treatment in the first instance and where required make arrangements for transport to community emergency medical facilities or hospital, when advised of an injury or incident
- Notify the Project Manager and commence preparation of an Incident Report; and
- Initiate disciplinary actions for the breach of project safety requirements.
- Ensure the government approved COVID 19 plan is fully implemented for the project and all project team members are meeting its requirements
- Ensure client-imposed policy, procedure or systems are implemented as instructed
- Facilitate daily and for cause D&A testing

5.1.8 WORKERS AND SUBCONTRACTORS

All personnel, including subcontractors, are responsible as individuals for their health and safety and the wellbeing of others, in so far as they have some control, either direct or indirect.

Each person shall:

- Be responsible for keeping the workplace in a clean and tidy condition
- Immediately report all incidents/accidents, or other health and safety concerns in the workplace
- Only perform work for which they have been trained
- Comply with the requirements of statutory safety legislation
- Participate in health and safety awareness training
- Comply with, and adhere to health and safety management plans, instruction and procedures
- Take steps to fix, on their own initiative, and report any hazards that are identified at work
- Observe and practice safe work methods
- Correctly use tools, material, personal protective equipment, and pollution controls; and
- Immediately report to their manager or supervisor all injuries, illnesses, safety incidents and near misses, no matter how minor; and
- Ensure that all incidents are reported to Jemena immediately or as soon as the situation has been stabilised.

6. ORGANISATION CHART

Refer to 2018-PCO-OGC-001 Organisation Chart.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 15 of 59

7. PROJECT SCHEDULE

Work under the contract will commence in accordance with the Project Schedule 2018-PCO-SCH-001.

8. PROJECT ACTIVITIES

The Scope of Work includes:

- Mobilisation to Site
- Survey and Set Out
- Clearing, Grubbing and Right of Way preparation
- Earthworks including excavation, preparation of compacted hardstand and pavement, formwork, preparation, steel fixing, pouring of concrete
- Installation of Steel Driven Piles
- Installation of temporary and permanent erosion controls per approved ESC Plan
- Haulage and delivery of pipe to site
- Stringing and Welding
- Trench preparation, Lowering In and Backfill
- As built survey
- Hydrotesting & NDT
- Reinstatement
- Punch Listing
- Installation of Equipment Modules
- Installation of Pile Caps, Supports, Piping
- Electrical works includes all supports, cable pulling, glanding, terminations, Installation bedding, conduit
- Qualified HA inspections and documentation
- Instrumentation works includes all supports, tubing, fitting, leak testing, inspections, and documentation
- Commissioning Assistance

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 16 of 59

9. NON-COMPROMISING RULES

Wasco 12 Non-Compromising Rules are an important part of our Safety Commitment and it is up to everyone in Wasco and its Sub Contractors to know them, understand them and above all, follow them. Any incident that involves the violation of any of these rules will be thoroughly investigated. Based on the findings of the investigation, any individuals found in breach of the rules will be subject to Wasco's disciplinary policy, up to and including termination.

9.1 12 NON-COMPROMISING RULES

1. Protect yourself from a fall when Working at Height
2. Comply with State Laws and Company Policies When Driving
3. Work with a Valid Permit to Work (PTW) When Required
4. Secure Load Prior to Lifting and Transportation
5. Ensure you are not working in the Line of Fire
6. Ensure Positive Identification of All Services prior to Excavation
7. Obtain Authorisation before entering a confined space
8. Ensure you are Fit for Work
9. Always use the Correct PPE for the Task
10. Verify Gas Tests Are Conducted as Per Permit
11. Do Not Use Mobile Phone when operating Vehicles, Plant or Equipment
12. Do Not Enter any Exclusion Zones

Wasco 12 Non-Compromising Rules are key actions to prevent incidents during high risk activities:

- Draw attention to the activities most likely to lead to a serious incident.
- Not intended to address all risks and hazards
- Focused on those things an individual has control over
- Rely on existing company systems being in place

HOW SHOULD WE USE NON-COMPROMISING RULES?



Toolbox talks & Safety meetings

Can we learn from incidents that involved a Non-Compromising Rule not being followed?



Pre-job planning

- Are we doing any work today involving a Non-Compromising Rule?
- How can we follow the Rule from start to finish?
- What needs to be in place?
- Is everything in place, and in good working condition?



Last minute risk assessment

- Have I done all the Non-Compromising Rules actions?
- Is everything as we discussed in the pre-job planning?
- Are there any Line of Fire hazards or ignition sources we didn't identify?



Post-job reviews

- Did we take all the actions associated with the Non-Compromising Rules?
- What went well? What didn't go well?
- Anything to note for the next time we have to this perform task or work in this area?



Observations & walkabouts

- Do you see anyone performing work where a Non-Compromising Rule is relevant?
- Are they following the Rule?
- Yes? Great, recognise it!
- No? Intervene!



Intervention

- Intervene or stop the work if a Non-Compromising Rule is not being followed

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 17 of 59



10. OBJECTIVES

The overriding Project objective is ***“zero harm to personnel, the community and the environment”***

The objective of this Health Safety Management Plan (HSMP) is to establish, maintain and monitor measurable and achievable health and safety objectives and project performance targets consistent with the Wasco Corporate Health and Safety and Policies and those of Jemena.

This Safety Management Plan (HSMP) establishes procedures to ensure that the appropriate health and safety standards are maintained during the construction and commissioning phase of the project as determined by law, industry practice and specifically prepared guidelines and risk assessment for the project.

Wasco will provide an environment that is safe and promotes good health for all personnel. The success of this HSMP depends on ***all personnel*** engaged in company activities establishing and maintaining a positive attitude towards health and safety.

Wasco strives for the highest standard and promotes best practice in occupational health, safety and welfare. Wasco is aware of its responsibility to provide an occupational environment that fosters the well-being of its employees. Accident prevention is an integral part of Wasco management philosophy.

10.1 LAGGING INDICATORS

Measure	Target
Lost Time Injuries	0
Lost Time Injury Frequency Rate	0
Restricted Work Injuries	0
Reportable Injury Frequency Rate	0
Near Misses	0
Vehicle Incidents	0
Notifiable Injuries, Government Notices	0

10.2 LEADING INDICATORS

Measure	Target
Take 5	1/person/crew each day
Hazard Eliminations (Hazob cards)	Where required
Corrective Actions closeout	End of swing
Pre-start Meetings	daily
Audit compliance	90%
Site Inspections	Weekly
Environmental Inspections	Weekly and after each Rain event

11. WASCO POLICY STATEMENTS

The Wasco President has prepared and signed Wasco Policy Statements which is the recognition that each member of the Project Team is committed to the content and statements within these policies. Copies of the Wasco policy statements will be displayed at prominent locations at work sites.

Refer to:

- WAPL-HSS-POL-001_HEALTH AND SAFETY POLICY
- WAPL-HRE-POL-002_OCCUPATIONAL REHABILITATION POLICY
- WAPL-HSS-POL-004_CHAIN OF RESPONSIBILITY POLICY
- WAPL-ENV-POL-001_ENVIRONMENTAL POLICY

12. RISK ASSESSMENT AND HAZARD MANAGEMENT

The Project shall establish a multi-layer systems approach that enables the identification of hazards and assessment of risk and hazards associated with construction operations on the Project up to the time the facility is assigned for hand over to the Client, and implement control measures based on a hierarchy of risk control that ensures risk is reduced to as low as reasonable practicable (ALARP).

12.1 RISK ACCEPTANCE CRITERIA

The Wasco safety management implementation strategy for the Project is to identify the risks, hazards, consequences and likelihood of occurrence by an analysis of the scope of work prior to mobilisation where practicable.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 19 of 59

The Project Management Team has adopted a risk acceptance criterion based on a rigorous risk identification and assessment process and through implementation of effective mitigation measures to reduce the level of risk associated with the business's activities to ALARP. Project risk acceptance criteria encompass operational, technical, financial, legal, social, humanitarian aspects of the businesses. These risk acceptance criteria are based on the corporate values of Wasco in particular those of personal accountability of all project personnel to ensure that of being recognized as responsible corporate citizens, fulfilling their moral and legal duties. This personal accountability is based on the knowledge and experience of competent and experienced colleagues in assigning sufficient resources to ensure that the identified risks are reduced to ALARP and appropriate control measures are implemented to justify acceptance of the risk.

The term ALARP means that the degree of risk in a particular activity or environment can be balanced against the time, loss, cost and physical difficulty of taking measures to avoid the risk. If these are so disproportionate to the risk that it would be unreasonable for the persons concerned to have to incur them to prevent it, they are not obliged to do so. The greater the risk, the more likely it is that it is reasonable to go to very substantial expense, trouble and invention to reduce it. But if the consequences and the extent of a risk are small, insistence on great expense would not be considered reasonable. It is important to remember that the judgement is an objective one and the size or financial position of the employer is immaterial.

In considering the relationship of probability and consequence to qualitatively define the level of risk associated with a particular hazard and the effectiveness of control measures to mitigate the level of risk associated with a hazard, reasonably practicable measures will have regard to:

- The severity of the hazard or risk in question
- The state of knowledge about the hazard or risk and any ways of removing or mitigating that hazard or risk
- ways to remove or mitigate that hazard or risk; and
- The cost of removing or mitigating that hazard or risk

In assessing the level of risk associated with a Construction hazard the risk ranking process is based on requirements under AS/NZS ISO 31000 Risk Management - Principles and guidelines. In assessing the level of risk associated with a particular construction hazard identified as being associated with a construction process a risk ranking process based on the Wasco Risk Model is to be used consistent with the requirements of the Wasco Risk Management Procedure.

12.2 ASSESSMENT OF RISK/HAZARD

Wasco will facilitate a HAZID work shop with relevant Sub contractor and Jemena participation, hazards associated with specific tasks of the project are to be assessed in consultation with involved personnel to utilise their skill, knowledge and experience. Each identified hazard is to be assessed against the agreed Wasco's Risk Model for application of Risk Ranking. The identified hazards are to be tabulated against the qualitative Risk Ranking with the agreed control strategies listed. The Risk Model forms part the Project Construction Risk Assessment Register.

Where a hazard is identified, the risk of injury or harm to a person, damage, loss or activity interruption at the project site is to be assessed as a matter of priority.

In assessing the level of risk, the following processes are to be carried out:

- Identification of Injury/Illness, Environmental Impact, Societal or other loss potential and consequence.
- Assessment of the level of risk by considering the frequency of potential occurrence, duration of the event and loss severity or consequence.
- Prioritise control measures necessary to manage the identified hazard and assessed level of risk.
- Matters to be considered include:
 - Type of hazard
 - Size and layout of project work site

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 20 of 59

- Frequency of potential hazard
- The situation or events in combination of circumstances that may give rise to the hazard
- Consequences of injury or loss likely to occur as a result of being exposed to the hazard
- Number of employees potentially exposed to the hazard and location (i.e. remote area)
- Distance to available emergency services
- Systems of emergency communication for personnel in remote locations; and
- Health and Safety information available on site (i.e. Material Safety Data Sheets).

Construction processes and their hazards

Process	Hazards and Issues	Typical Management and Control Strategies
Survey	• Working alone • Driving • Weather exposure • Unsupervised remote work • Poor communications • Natural hazards • Fauna, stock, snakes • Poor communications • Long work cycles	• Remote Work Procedures • SWMS • Appropriate communications equipment • Check-in processes • Well-equipped vehicles • Maps, GPS • PPE
Protection of the Public	• Excavations • Plant and machinery • Access to construction sites • Vehicle access • Hazards associated with welding activities • Crossing roads, railways etc.	• Security of plant and equipment • Signage • Barricading and barriers • Traffic management Plan • Notifications and planning • Training of personnel • Qualifications of personnel • Security personnel (Where required) • Identification of high-risk areas/locations • Barriers
Fencing	• Working alone • Natural hazards • Poor communications • Electric fences, barb wire • Fauna and stock, snakes • Use of chainsaws • Walking on uneven ground • Dehydration • Overhead and underground hazards	• SWMS • Radio contact • First aid kits and qualifications • Adequate water • PPE including gloves • Manual Handling training • DBYD • Trained drivers • Vehicle equipment/ setup and spares • Call-in procedures

Process	Hazards and Issues	Typical Management and Control Strategies
Site Communication	• Lack of understanding of procedures • Errors and incidents • Poor emergency response	• Inductions • Prestart Meetings • Records • Newsletters • Toolbox meetings • Committee Meetings and distribution of minutes • Supervisor Meetings • Hazard reports/alerts
Use of Plant and loading and unloading	• Plant defects • Pinch points • Crush points • Noise exposure • Dust exposure • Rollover • injury	• Shut down plant for maintenance • Plant risk assessments conducted • Plant noise surveys • Wheeled plant to be fitted with ROPS • Sealed cabins • PPE and hearing protection • Guarding • Emergency stops • LUEZ Exclusion zones • SWMS • Powerlines marked; vehicle heights and crane reach known • Qualified and experienced dogmen and operators • Areas kept clear where lifting activities take place • Test loads • Lifting equipment inspections and registers • Stable areas nominated for Laydown • No one in the line of fire /Personnel clear of the fall zone • PPE includes good footwear, gloves and hardhats • Transport Management Plan • First aid kits and qualified personnel in crew • Observe maximum working at heights limits
Clear and Grade/Civils	• Overhead and underground hazards • Dust • Poor visibility • Poor ground conditions • Personnel in vicinity • Stranding/Breakdown	• SWMS • DBYD • PPE • Radio communications in all vehicles • Signage on powerlines, catenary wires • Check ground conditions • Inductions, trained and competent personnel • First aid kits and qualifications in crew • Check area before reversing or slewing • Vehicle setup and spares • Checking procedures

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 22 of 59

Process	Hazards and Issues	Typical Management and Control Strategies
Pipe Stringing and Loadout	• Overhead hazards due lifting, carrying, strapping, rigging • Crushing • Swinging pipe • Dropped loads • Rolling pipe • Trips, slips, falls • Wet, uneven and/or slippery surfaces	• SWMS • Powerlines marked; vehicle heights and crane reach known • Qualified and experienced dogmen and operators • Areas kept clear where lifting activities take place • Test loads • Lifting equipment inspections and registers • Stable areas nominated for pipe locations • Hands clear of pipe the pipe • PPE includes good footwear, gloves and hardhats • Transport Management Plan • Exclusion zones • First aid kits and qualified personnel in crew • Observe maximum working at heights limits • Personnel clear of the fall zone of pipe
Pipe cutting	• Crushing • Falls from height • Swinging pipe • Trips, slips, falls • Wet, uneven and/or slippery surfaces • Burns • Fire	• SWMS • PPE including gloves • Double eye protection • First aid kits and qualified personnel in crew • Qualified and experienced dogmen and operators • Personnel clear of the fall zone of pipe • Ensure stable pipe support for cutting pipe
Trenching including exposing buried services by hand	• Slips, trips, falls • Electricity • Manual handling • Overhead hazards • Underground hazards • Dust • Snakes, fauna • Trench collapse • Wet, uneven and/or slippery surfaces	• SWMS • Powerline signage • DBYD • First aid kits and qualified personnel in crew • Remain clear of machines when starting • Awareness of exposed moving parts • Guarding to remain in place • Remain safe distances from working machinery • PPE to include hearing protection and safety glasses • Persons setting range poles to be clear of and aware of ditching m/c • No entering trenches >1.5m • Personnel to remain clear of trench edges • Isolate machines for maintenance

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 23 of 59

Process	Hazards and Issues	Typical Management and Control Strategies
Excavations	• Public, personnel and fauna injury • Traffic hazards • Night-time hazards • Underground services such as power, water, telecommunications • Pipe damage • Confined space	• Barricading and barriers • Plant risk assessments conducted • Remain clear of machines when starting • Awareness of exposed moving parts • Guarding to remain in place • Remain safe distances from working machinery • PPE to include hearing protection and safety glasses • Notification • Minimise open trench • Procedures and processes to avoid trench entry • Lighting • Surveillance and/or security • Shoring • Minimise trench depth where possible
Piling	• Falling objects • Dropped loads • Swinging objects • Underground services • open penetration • Noise • Un authorised entry • Hammering • Line of fire • Crushing • Sparks, buffer wire, burrs • Broken grinding discs • Grinder kickback • Air pressure hoses • Slips, trips, falls • Eye injuries- dust, particles, weld flash • Burns • Fire • Oxygen and acetylene •	• Signage, Barricading and barriers • Plant risk assessments conducted • Remain clear of machines when starting • Awareness of exposed moving parts • Guarding to remain in place • Remain safe distances from working machinery • PPE to include hearing protection gloves, double eye protection, Welding ppe • Notification • All Penetrations to be barricaded or covered • Procedures, SWMS • Surveillance and/or security • Supervision and qualified tradesman • Spotters • Qualified and experienced dogmen and operators • Areas kept clear where lifting activities take place • Test loads • Lifting equipment inspections and registers • Stable areas nominated for Laydown • No one in the line of fire /Personnel clear of the fall zone • Transport Management Plan • First aid kits and qualified personnel in crew • Observe maximum working at heights limits • LUEZ Exclusion zones • Pre-use inspections for equipment and cables • Flash Arrestors

Process	Hazards and Issues	Typical Management and Control Strategies
Noise	• Public complaints • Noise induced hearing loss	• Mufflers and attenuation • PPE • Substitution • Procedures • Exposure times minimised
Welding, cutting and Tie-ins	• Falling or swinging pipe • Springing pipe – pipe movement • Crushing • Sparks, buffer wire, burrs • Broken grinding discs • Grinder kickback • Air pressure hoses • Slips, trips, falls • Eye injuries- dust, particles, weld flash • Burns • Fire • Oxygen and acetylene • Electrical hazards (overhead, underground) • Manual handling • Wet, uneven and/or slippery surfaces	• SWMS • No standing between pipe and boom • First aid kits and qualified personnel in crew • PPE includes gloves, double eye protection, anti-flash safety glasses • Pre-use inspections for equipment and cables • Firefighting equipment • Water tank • Secure and stable skid piles • Cap unattended pipes • Earthing of pipe
Blasting and Field Joint coating	• Abrasive blasting • Pressure hazards • Dust • Chemicals • Manual handling • Air quality • Fire/explosion • Air pressure hoses • Slips, Trips and falls • Chemical fumes and skin exposure • Fire • Static electricity • Wet, uneven and/or slippery surfaces	• SWMS • Personnel to be clear of grit blasting area • First aid kits & qualified personnel in crew • PPE to include safety glasses and blasting helmet • Ventilation suit with filter and air intakes clear • Pre-use inspection checks • Certified blasting equipment • Use less hazardous blasting medium • Hose fittings, dead man switches, whip checks, etc. • Housekeeping practices • SDSs, Chemical handling procedures • Manual handling training • PPE to include those required by SDS • Fire extinguishers • No smoking in vicinity of flammable chemicals • Job rotation

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 25 of 59

Process	Hazards and Issues	Typical Management and Control Strategies
Lower-in	• Overhead hazards • Falling pipe • Crushing • Slips, Trips, Falls • Wet, uneven and/or slippery ground • Electricity • Open trench, trench collapse	• SWMS • First aid kits and qualified personnel in crew • Powerlines marked • No standing between pipe and boom • Spotters as necessary • Lifting equipment register • Pre-use inspections • PPE to include hard hats • Earthing strings • Trained in use of Jeeper • No entry to trench >1.5 m
Bedding, Padding, Backfill	• Overhead hazards • Open trench, trench collapse • Dust	• Procedures and SWMS • First aid kits and qualified personnel in crew • No entry to trench >1.5 m • Spotters • PPE to include safety glasses and dust masks
Reinstatement	• Overhead hazards • Moving plant • Fire • Uneven ground	• Procedures and SWMS • First aid kits and qualified personnel in crew • Reversing alarms, flashing lights • Marking of powerlines • PPE to include hearing protection • Eye contact with operators • Ensure area clear before operating equipment • Fire extinguishers • Water tank where required • Plant pre-use inspections • Assess area for hazards (e.g. excessive slope, rocks, slippery conditions, muddy conditions)

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 26 of 59

Process	Hazards and Issues	Typical Management and Control Strategies
Clean and Dry Pipe and test	• Chemicals and fuel • Slips Trips Falls • Electricity • Working in Bellholes • Manual handling • Welding (see above) • High pressure hoses	• Procedures and SWMS • Appropriately rated whip checks • Correctly rated hoses • SDSs • Fire extinguishers • Pre-use inspections • Emergency plan for site • Tested and tagged equipment • Lifting aids such as cranes • Radio communications • Monitoring of pressures • Signage and barricading of the area • Access and egress from bellhole • Earthing • Secure the area
NDT	• Radiation exposure • Radiation Sources • Chronic health effects • Long term illness and /or death	• Procedures and SWMS • First aid kits and qualified personnel in crew • Radiation Management Plan • Trained and qualified personnel • Signage • Barriers • Training and induction of personnel • Radiation monitoring
Refuelling	• Fire • Explosion • Slips, trips Falls • Spills	• SWMS • No source of combustion within 20m of refuelling activity • Earthing • SDS
Fire Protection	• Bushfire, property damage, environmental damage	• Firefighting equipment such as water carts, fire extinguishers, • Clearing (where permitted) • Training and induction • Liaison and consultation with authorities • Liaison and consultation with Jemena and councils

Process	Hazards and Issues	Typical Management and Control Strategies
Power lines and Adjacent Infrastructure Including Underground Piping	- Induced voltage - Touch and Step potential - Fault currents - Electrical storms and lighting - Excavations hitting services	- Identification of power lines and underground services on Alignment sheets - DBYD - Catenary wires and Flagging - Notification to power authorities - Supervision - Working outside Exclusion zones - Procedures for working in storms - Earth mats - Engineering review of work adjacent to or under power lines - Spotters
Working in Hazardous Area/Facility	- Live gas environments - Live electrical equipment - Unidentified hazards - Simops	- High Risk Work Permit - Supervision - Procedures - SWMS - Gas monitoring - Barricading, fencing, - Identification of high-risk areas/locations - Authorised personnel - Inductions - Notifications and planning - Spotters for mobile equipment
Electrical Equipment and Electrical installation	- Electric shock - Pinch injuries - Hand tools - Power tools - Load handling - Sharp objects	- Electrical licenced personnel - Procedures - SWMS - Permit To Work - Pre-use inspections for equipment and cables - Earthing - Portable RCDs, including testing - Housekeeping - Test and tagging program - Lock out Tagout - Resuscitation qualified electrical personnel - All electric leads kept dry - All electric leads kept insulated - Avoid live work situations - Test for Dead - DBYD - Protect overhead cables - PPE –cut 5 gloves - Maintain safe clearances – exclusion zones

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 28 of 59

Process	Hazards and Issues	Typical Management and Control Strategies
Lifting of Materials/Units	- Falling objects - Dropped loads - Swinging objects	- SWMS - Lift Plans where required - Certified lifting equipment - PPE - Inspection of equipment - Use of correctly rated equipment - Training, Qualified personnel - Procedures - Minimise required access to height - Spotters - Drop Zones
Form work /Concreting	- Muscular Skeletal Injuries due to: - Posture strain - Repetitive strain - Vibration - Crushing injuries - Pinch injuries - Hand tools - Power tools - Load handling - Sharp objects - Mobile plant - Pumps - Concrete Burns	- SWMS - Assess area for hazards - clear access/egress - PPE – gloves - Load handling – team lifting - Mechanical devices - Rotate tasks - Caps on reo-bars/star pickets - Reversing alarms, flashing lights - Appropriately rated whip checks - Correctly rated hoses - SDSs - Spotters/ Positive communication - Delineated work area - Correct PPE as identified on SDS
General Labouring	- Strains - Sprains - Work at height - Slips, trips and falls - Manual handling injuries (cuts and abrasions)	- SWMS - Task assessments/Take5s - Pre-employment medicals - First aid kits and qualified personnel in crew - Rotate tasks - Mechanical Lifting devices - Procedures - Load handling – team lifting - Develop alternative handling techniques and use of equipment

Process	Hazards and Issues	Typical Management and Control Strategies
Mechanical Equipment	- Falling objects - Dropped loads - Swinging objects - Pinch injuries - Hand tools - Power tools - Load handling - Sharp objects	- SWMS - Lift Plans where required - Certified lifting equipment - PPE - Inspection of equipment - Use of correctly rated equipment - Training, Qualified personnel - Procedures - Minimise required access to height - Spotters - Drop Zones
Mechanical /bolt up	- Strains - Sprains - Work at height - Slips, trips and falls - Manual handling injuries (cuts and abrasions) - Vibration - Crushing injuries - Pinch injuries - Hand tools - Power tools	- SWMS - Task assessments/Take5s - Pre-employment medicals - First aid kits and qualified personnel in crew - Rotate tasks - Mechanical lifting devices - clear access/egress - PPE – gloves - Qualified personnel
High pressure, Air hoses and high-pressure equipment	- Eye and other serious injuries - Flailing equipment - Noise exposure	- SWMS - Task assessments/Take5s - Safety clips in place - Safety valves - Maintenance program - Pre-inspection checks - Hose inspections - Cylinders stored correctly - Pressure gauges checked - Appropriate whip checks (Stainless steel or 'stocking' type) keepers, chains, slings, and proprietary special couplings

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 30 of 59

Process	Hazards and Issues	Typical Management and Control Strategies
Falls from Height	• Injury • Death	• Eliminate the need to work at heights • Fall prevention devices • Work positioning systems • Fall arrest systems • Training in requirements • Supervision • ERP
Handling of Chemicals	• Spillage • Chemical exposure • Fire • Injury • Environmental damage	• Procedures and Manifests • Compliance with legislative requirements • SDS • Correct storage • Handling procedures • PPE • Material handling equipment • Signage • Training
Hazard/Incident Reporting & Investigations	• Lack of learning from incidents	• Reporting procedures • Training and induction • Records • Investigation processes • Corrective action database/list • Responsibilities assigned
Management of Change	• Lack of review of implications when changing process and plant	• Procedures • SWMS and SWMS review • Review of change implications prior to implementation • Communication of change • Document control processes
Competency	• Incidents and injury • Inefficient processes • Property and equipment damage	• Pre-employment processes • Interview and/or reference checks • On-the-job evaluation of skills • Inductions, Training records • Development of skills matrices • Training programs

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 31 of 59

Process	Hazards and Issues	Typical Management and Control Strategies
Fitness for Work	• Personnel putting themselves and others at risk • Impaired judgement • Fatigue • Safety of the worker and others	• Evaluation of cycle breaks in early stages of project development • Fit for Work policies • Rehabilitation services • Provision of exercise facilities • Management of hours of work • Management of extremes of climate • Camp/accommodation • Fatigue minimization measures • Drug and Alcohol policies and procedures • Pre-employment screening • Drug and alcohol testing programs • Supervisor and worker education and awareness

12.3 HIERARCHY OF RISK REDUCTION MEASURES

The approach to hazard control is based on selecting control methods from highest controls to least desirable controls as follows:

- Elimination
- Substitution/Isolation
- Engineering Controls
- Administrative Controls; then
- Personal Protective Equipment Controls

12.4 IDENTIFICATION AND ASSESSMENT METHODOLOGY

The Project Construction Manager, in consultation with the Client and Project Manager, will develop a base line Construction Risk Assessment Register for hazards identified for each project construction activity. The Construction Risk Assessment Register will be used to establish the means for setting priorities for the implementation of existing risk controls and developing additional controls to minimise potential hazards and risk for non-routine risk potential. The Construction Manager shall maintain the Construction Risk Assessment register as a Live Document. Where changes are being made, the Construction Manager shall inform the Client Representative of the changes

The register to be reviewed following any significant incidents. with the hazard source and corrective action entered into the Project Corrective Actions Register.

The Construction Manager will ensure that relevant parts of the Construction Risk Assessment Register are distributed to crew Supervisors as part of a work pack and be updated regularly for reference during SWMS.

The Construction Risk Assessment Register or relevant parts of it will be reviewed by Wasco with the Clients Representative as required with the site Management Team as part of the HSE standing agenda item during project weekly construction meeting.

The consequences and likelihood of occurrence of each hazard have been assessed in accordance with the agreed Client Risk Model. Control strategies have been developed in line with the Hierarchy of Hazard

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 32 of 59

Control(s) to either eliminate the occurrence of the hazard, and/or minimise the risk to the Low or Moderate region of the Risk Model (where ALARP is assumed).

The methodology used for hazard identification and risk assessment is dependent on the required level of control and may include one or a combination of any of the following:

- Hazard/Incident Reporting
- SWMS
- Workplace Inspections
- Audits
- Construction Hazard Identification (HAZID) Workshops; and
- Construction Hazard eliminations (HAZOB Cards).

12.5 SWMS

The Project Management Team and each work crew supervisor will carry out task specific SWMS for all construction work processes and implement minimisation strategies for the hazards identified.

The Construction Manager shall ensure that all employees are to review the SWMS immediately prior to any new or changed work activity. This SWMS is to be conducted with each employee involved in the work activity when the work activity is conducted for the first time or where change has occurred in the construction process or receiving environment. The consequences and likelihood of occurrence of each hazard identified during task risk assessment will be assessed in accordance with the Wasco Risk Matrix.

In confirming the establishment of a Safe System of Work, all persons reviewing a SWMS are to sign off on the SWMS to confirm that they have understood the risks and controls with the task, have through Supervision and to the best of their ability, undertaken a risk assessment identified change that may constitute a hazardous situation. The Construction Manager, HSE Advisor, and Project Manager will sign off the SWMS before work commences. The signed SWMS will be kept with the Supervisor in a workpack on the job the SWMS will be revised if any changes are to be made.

In signing off on a SWMS, personnel will be acknowledging acceptance on their individual Duty of Care as per statutory requirements. No person, at any time will be requested by Supervision to commence an assigned task until they have signed off on the SWMS.

The Construction Manager will ensure that any person entering into the general area of the workplace activity who will be unsupervised (e.g. fuel truck driver, field fitter) and is not part of the designated work crew are required to review the SWMS and the Pre-start minutes and sign on to confirm their awareness of the general hazards and work activity. Where an activity is being carried out under a Permit to Work, persons other than visitors will also be required to sign on and off the Work Permit as appropriate. Alternatively, as a visitor not permitted to undertake any work activity, a person may remain in the area for a short period of time under the direct supervision of one of the work crew (delegated by the Crew Supervisor) who has signed onto the SWMS and is aware of the current construction process and receiving working environment. Visitors under supervision must still be briefed and sign onto the Pre-start minutes.

The Project Management Team will maintain a site/project SWMS Register and provide relevant and updated copies of Standard Operating Procedures/Work Instructions and relevant sections of the Project Hazard Register to work crew Supervisors as part of their Work Pack.

Where Chemical Substances, Hazardous Substances or Dangerous Goods are in use as part of a task, the crew Supervisor is to ensure that SDS information is reviewed during the SWMS process and a copy of the SDS information is attached to the completed SWMS to confirm that employees involved in the task have been made aware of the requirements to safely use the chemicals concerned.

The HSEs Supervisor will provide relevant copies of SDS information available to work crew Supervisors.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 33 of 59

12.6 TAKE 5

Take 5s is an on-the-job personal risk assessment tool, which allows personnel to stop and look for hazards, before commencing tasks. Using the take 5 steps, the identified hazards are assessed for the risks they may impose and then steps are taken to manage those risks.

1. Stop, step back and think
2. Identify the hazard
3. Assess the risk
4. Control the hazard(s)
5. Proceed safely

The Take 5s are reviewed by the Manager or delegate, Updates to the SWMS and Project Risk Register is undertaken if required.

12.7 CONSTRUCTION HAZARD ELIMINATIONS (HAZOB CARDS)

A hazard report card is used when workers have identified a potential hazard that cannot be simply and immediately fixed.

A hazard report card shows:

- What is the hazard?
- What are the potential risks if left untreated?
- What controls can be implemented to eliminate, or control the risks, to a level that is acceptable to all parties exposed to the current hazard

Hazobs are reviewed by the Manager or delegate, the Project Engineer enters them into the Corrective Action Hazard Register. All Hazard to be communicated to Jemena for input into Jemena Aspire system. Supervisors must discuss potential controls with all workers involved to allow for open consultation, and always to eliminate the hazard.

Once all the controls have been implemented management should monitor the changes and make sure that:

- It has been discussed with all parties involved, and
- It has been controlled to a level acceptable by all parties involved, and
- It has not created any new issues.

If, after review of the changes, that the hazard has been effectively controlled, the form can be signed off.

12.8 HAZARD AND RISK COMMUNICATION

The Construction Risk Assessment Register is made available by the Construction Manager to all personnel and referenced during induction training regarding its implications on project work activity. The Construction Risk Assessment Register is maintained as current by the Project Management Team and relevant sections of Construction Risk Assessment Register is provided for review by crew Supervisors during review of task specific SWMSs.

The primary method of in field Hazard and Risk communication on site is through the SWMS. This analysis requires that each Supervisor and all members of the work crew be involved in the identification and controlling hazards and risk on site by actively participating in the development of the SWMS.

Hazards identified and assessed during construction or as part of the project inspection and audit program are to be entered on the Construction Risk Assessment Register by the Project Management Team under the

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 34 of 59

Supervision of the Project Construction Manager. Hazards and their control measures and updates to the Construction Risk Assessment Register will be discussed with site personnel during Toolbox Meetings by the Construction Manager with assistance provided by the Supervisors

13. SELECTION OF PERSONNEL, COMPETENCY AND TRAINING

The Wasco Project Team has the responsibility to ensure its management, supervision and employees have the necessary skills and knowledge and are competent to advise and enforce compliance of this Project HSMP.

In understanding the requirements for employee selection, competency and training it is important to recognise that almost all personnel involved in construction, operation and maintenance can create a hazard if they are not competent, qualified and suitably trained to carry out their role.

The Project Manager, in consultation with the Construction Manager, will assess and plan the human resource requirements of the project to ensure personnel are suitably fit, competent and have the necessary personal safety attributes for the tasks assigned and to contribute to a positive safety culture on site.

The Project Manager, in consultation with the Construction Manager, will refer to the project work description and identify the competency criteria and safety attributes necessary for each construction position. Where a work description identifies statutory competencies (i.e. certification) the Project Manager will ensure that evidence of statutory competencies is obtained prior to selection and retained on site as documentary evidence of such competencies.

Wasco will specify within its Human Resources Management Planning, provisions to ensure the confirmation of employee competency and fitness for work during the employment process, the process of capture of competency information, responsibility and arrangements for maintaining that information and methodology to ensure ongoing monitoring that employee competency remains current for the Project duration.

Sub-contractors will be responsible for engaging competent and experienced supervision and employees who hold the appropriate qualification for the required tasks

Certification – licenses – permits – will be maintained on site by the Construction Manager for occupations with this requirement and we list hereunder classifications that generally require certification:

- Mobile Plant and Equipment
- Cranes and Rigging
- Electrical Work
- Instrumentation Work
- Mechanical Fitting
- Welders
- First Aid Treatment
- Driving of vehicles
- NDT

13.1 CERTIFICATES / RECORDS OF QUALIFICATION

The Project Engineer will ensure that all Project Team employees arriving on location comply with the appropriate licensing, permit and/or certification requirements of the relevant statutory authorities. The Project Engineer in consultation with the Project Manager will maintain at site the Project Training and Competency Matrix Register to support the facilitation of project training requirements completed and to monitor the adequacy and spread of location required task competency.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 35 of 59

Personnel at all levels will be experienced and qualified in accordance with legislative and Jemena requirements. Records of certification, licenses and permits will be maintained on site by the Project Engineer for all machine operators, vehicle drivers and those performing works that require a permit.

For the operation of types of plant or equipment that do not fall within the certification standard, there are national competency standards. Undertaking a formal competency assessment and meeting national competency standards is a requirement by Jemena for the operation of types of plant or equipment that do not fall within the certification standard.

Verification of Competence (VOC) Assessments will be overseen by the Construction Manager and must be on the similar equipment to be used on site.

13.2 CONSTRUCTION INDUSTRY INDUCTION (BLUE CARD / WHITE CARD)

In accordance with statutory requirements, the Construction Manager shall ensure that all project personnel are inducted and are the holders of a Construction Industry Induction completed to the standard CPCCOHS1001A WORK SAFELY IN THE CONSTRUCTION INDUSTRY, before they commence project site works.

13.3 INDUCTION AND TRAINING

In accordance with project requirements for Induction and Training, the Construction Manager is to ensure that all project personnel are inducted by the Jemena before commencement of project works. All personnel, including staff, inspectors and subcontractors will attend the Client's Project Induction before accessing or commencing work on the site.

Wasco personnel must have completed both the General Induction and Site-specific inductions to enter or work on the project prior to deployment to site. Contractors will need to undertake an induction appropriate to the sort of work they are undertaking on site. Visitors must undertake a visitors' induction and be accompanied by a fully inducted person at all times.

13.3.1 MANDATORY TRAINING

The following training is mandatory:

Mandatory Training			
Training Type	Supervisor	Worker	Subcontractor
Jemena HSE Induction	✗	✗	✗
Jemena Environment Induction	✗	✗	✗
Jemena Site Specific Induction	✗	✗	✗
General Construction	✗	✗	✗
General Wasco Induction	✗	✗	
Wasco Site Specific Inductions	✗	✗	✗
Health and Safety Representative (HSR)		✗	

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 36 of 59

13.3.2 FURTHER TRAINING / COMPETENCIES

A training matrix will be developed to determine the training required by each individual on the project in accordance with their roles and responsibilities.

All personnel are to be trained and assessed as competent and authorised, by the Construction Manager, prior to performing required tasks. Where a nationally recognised license or certificate occurs, personnel will be required to provide evidence of their training, qualifications, and competence prior to arrival on site.

Further training / competencies required above and beyond are:

Training Type	Who attends
First aid & CPR	A minimum of one per 20 personnel High risk workplaces—one first aider for every 25 workers As per NSW code of Practice
Dogman / Rigger	Any worker performing rigging work or slinging of loads
Confined Space Entry	All supervisors & workers involved in CSE

Records of assessment and attendance are maintained in Rapid Online Induction Register, maintained by the Project Management Team.

The Construction Manager in consultation with the Project Management Team will periodically review training and competency records and monitor copies of training attendance.

13.3.3 WASCO PROJECT INDUCTION

All Wasco employees and sub-contractors engaged to work, as part of the project, will attend the project specific safety induction before commencing on site work. This induction will be reviewed and updated to suit the changing project conditions. The Project Manager shall develop, and the Project Engineer will as required deliver and monitor and report on implementation of induction requirements for project staff and contract personnel. The Project Team shall maintain a register of inducted personnel. It is the Project Team's responsibility to ensure that personnel do not commence field operations until inducted.

All personnel shall be required to sign and acknowledge that they have been inducted into the site and understand the requirements of the project. All licenses and certificates of competency held must be recorded in the skills matrix and copies of all such licenses and certificates attached.

The induction process will include an assessment indicating that the inducted employee has gained a suitable understanding of their responsibilities, project hazards and control measures.

The project induction will not only re-address relevant requirements of Jemena, but it will also address site specific health safety and environmental issues, safety management system and emergency response arrangements.

Consistent with the requirements of this HSMP, points of the Wasco project induction will include but not be limited to:

- Objectives of the project.
- Employee Consultative Arrangements

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 37 of 59

- Emergency Response Procedures/Muster points
- Pre-start & Toolbox meetings.
- Project safety rules
- 12 Non-Compromising Rules
- Location specific hazards
- TMP
- Smoking policy
- Policies
- PTW Systems Awareness
- Safe Work Method Statements
- Equipment Tagging & Identification Systems
- Personal Protective Equipment requirements
- Environmental concerns and activities
- Hazard and Incident Reporting
- Identification & management of hazardous substances
- Specific Working Procedures
- Basic HSE rules

13.3.4 VISITOR INDUCTION TRAINING

Short-term day visitors (who are not performing any physical construction work) to the project site are required to attend a short site-specific information session to be conducted by a member of the Project Team covering specific requirements and guidelines for the particular site, which shall include informing attendees of:

- Emergency Response
- Minimum mandatory requirements for the wearing of PPE
- Specific access restrictions or
- Hazards to be aware of pertaining to the work site

All visitors are required to sign a declaration of understanding and agreement with site access requirements. Completed visitor induction forms shall be maintained on site by the Project Engineer.

All visitors to site are assigned a Sponsor and must always be escorted. The Sponsor assigned will have completed a full project induction.

All visitors must undertake a BAC test prior to entering

13.3.5 HSR TRAINING

As per the WHS Regulations 2011, all HSRs must undertake the relevant approved training course within six months of their election. Existing HSRs, who have not already completed the training, will have 3 months from to undertake this training. If a worker chooses not to undertake the training within the time period, they will no longer be eligible to fulfil the role of HSR and will need to be replaced.

HSRs and deputy HSRs can ask a person conducting a business or undertaking (Wasco) to attend approved courses. The Wasco will give HSRs paid time off to attend a course and pay the course costs and reasonable expenses within three months of the request

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 38 of 59

13.4 HEALTH MENTORING SYSTEM

The Project shall establish systems that promote a healthy work environment and ensure that all personnel are fit to perform their work safely within the environment of the project, and ensure medical resources are appropriate and available to prevent and manage medical conditions arising during the project.

13.4.1 EMPLOYEE FITNESS AND HEALTH SURVEILLANCE

All personnel working on the Project are to be assessed for their fitness to carry out identified work activities on the project site. The Construction Manager will endeavor to ensure that all project personnel including sub-contractors are not affected by drugs or alcohol and are medically fit for the work to be undertaken.

All personnel will be BAC tested each day and that a random, for cause and suspicion drug testing program will be implemented.

Personnel taking any medicines for any reason – allergies, asthma, depression, heart problems, blood pressure or diabetes for example shall be encouraged to find out from their doctor or pharmacist how the medicine can affect them. All personal details of personnel medication will be kept on a register in confidence by a designed onsite register.

Where statutory health monitoring is required for exposure to noise, hazardous substances, ionizing radiation, etc. records of such monitoring are reported to authorities in line with legislation and the records are retained by the Wasco HR department on the employee's personal file.

The Project Management Team are to periodically review records of employee health monitoring to ensure programs to control risk exposure are effective.

14. PROTECTIVE CLOTHING AND EQUIPMENT

All personnel on site shall comply with PPE policies and procedures. Everyone will be issued with the mandatory PPE before commencing work on the site. The mandatory PPE requirements on the work site shall be:

- Lace up work boots with toe protectors (AS 2210)
- Vented Safety Helmet (AS 1800 & AS 1801)
- Eye Protection with side shields (AS 1336 & AS 1337)
- Hearing protection to AS1270 where SWMS and/or signs indicate hearing protection is required
- Hi-vis shirts with long sleeves – Cotton Day/night standard clothing
- Long trousers- Cotton
- As per SDS requirements and best practice
- Double eye protection for all cutting and grinding process
- Gloves as dictated by SWMS

The Project Manager shall ensure the supply of general personal protective equipment for all workers on site. The Project Construction Manager is to ensure that all visitors to site shall comply with the above PPE requirements. All visitors who do not have hi-vis clothing may be supplied with hi-vis safety vest where they are not performing any physical work.

The Project Manager in consultation with the Project Safety Advisor, and Construction Supervisor shall determine the full range of PPE safety gear/clothing/equipment required for tasks within the scopes of work and these shall be identified within the key safety documentation. The Project Engineer shall ensure adequate stocks are available to maintain compliance with all safety and health requirements.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 39 of 59

The Construction Manager is responsible to ensure that all employees under their supervision comply with the above PPE requirements.

PPE is to be considered as the last method of hazard control and only to be used after all other risk control measures have been investigated.

15. EMPLOYEES INVOLVEMENT AND COMMUNICATION

15.1 HEALTH AND SAFETY COMMUNICATION

Effective communication of Health and Safety matters is essential for ensuring all personnel are aware of the systems, client requirements, reporting and feedback mechanisms, and regulatory requirements. The different methods of communication include:

- HSE Meetings (prestart, HSE committee, toolbox, etc.)
- Incident and near miss reporting
- Suggestions for safety improvements
- Auditing
- Induction and orientation
- Project-specific Training
- Safety memos, alerts and bulletins
- Posters and noticeboards
- Safety stand-downs; and
- Other media as required

The Construction Manager will ensure a noticeboard is in place and accessible for the posting of the following in a community/meal area for access and reference by site employees:

- Emergency action plans
- Safety bulletins/Incident Report findings
- Posters and other information or promotional materials
- Copies of the relevant Legislation, Codes of Practice, etc.
- The HSMP; and
- Other key Client and Wasco documents and procedures

All personnel shall have the opportunity to be consulted with, to create positive health and safety culture for the Project and contribute to the continuous improvement of the Project and its HSMP.

Wasco recognises the importance of accurate and open communication with all personnel involved on the Project. Various techniques and forums shall be adopted to assist in achieving this goal. All personnel will be encouraged to participate where required.

15.2 EMPLOYEE ELECTED WORKPLACE HEALTH AND SAFETY REPRESENTATIVES (HSRS)

Wasco will encourage employees to elect a Health and Safety Representative (HSR) in accordance with the Work Health and Safety Act 2011. This shall be requested at the first opportunity where, if required, an election can be organised, anticipated to be the first Toolbox meeting. Elections shall be conducted in accordance with statutory guidelines with the successful candidate details forwarded for registration and training.

Where elected, employee HSR will take an active role in the workplace safety management. The Project Manager will ensure that the provision of resources for elected HSR is consistent with those required under the state legislation.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 40 of 59

16. PRE-START BRIEFINGS

The Construction Manager is to facilitate and organise shift/task Pre-start Meetings. Points of discussion / consultation will include but are not be limited to:

- Proposed activities and task assignments;
- Permit To Work (PTW) requirements;
- Activities to be conducted and Safe Work Method Statement (SWMS) requirements;
- Incidents and hazards that have recently occurred;
- Any changes that could affect current Standard Operating Procedure and require a SWMS;
- Changes to adjacent works and required a SWMS; and
- Individual concerns.
- Provide as appropriate a daily safety alert and/or other promotional information for inclusion to be addressed by field Supervisors
- Record these meeting and briefings
- Collect completed copies of meeting records to confirm attendance and facilitate any follow-up Requirements

16.1 TOOLBOX MEETINGS

Toolbox meetings are used to:

- Obtain feedback on safety performance from the workforce, including subcontractors
- Discuss and reinforce the requirements of this HSMP and associated Safety & Health rules and procedures.
- Communicate the results of health and safety activities
- Discuss any near misses, incidents or injuries that have been reported

Extraordinary special Toolbox meetings/briefings will follow an incident. These meetings will report on the findings and ensure any risks associated are understood and the necessary precautionary measures have been identified for each task to be conducted.

The Construction Manager is to:

- Conduct weekly toolbox meetings with all infield employees to discuss and report on safety issues;
- Invite Jemena Site Representative to attend Weekly Toolbox meetings and encourage and promote active participation in health safety and environmental awareness;
- Maintain a register of Toolbox meeting attendees;
- Maintain minutes of the Toolbox meetings;
- Ensure that minutes of these meetings are posted on safety notice boards around the workplace and in the main meals area;
- Review all meeting minutes and monitor that any action required has been recorded in the Corrective Action Register, has been implemented and advise Project Manager accordingly; and Investigate and raise a Hazard/Incident Investigation Report where appropriate, where an action has not been implemented.

17. SUBSTANCE ABUSE

In accordance with the Wasco Tobacco Alcohol and Drugs Policy (WAPL-HSS-POL-003), There will be Zero tolerance to Drug and Alcohol breaches.

The use of intoxicants, including excessive consumption of alcohol, 'unlawful drugs' or the willful abuse of non-prescription or prescription medications are practices that are unacceptable.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 41 of 59

The Construction Manager will ensure that adequate monitoring of the workforce is carried out in order to identify any instances of suspected willful substance abuse that is illegal and/or detrimental to the safe conduct of work.

0.00% BAC is required for all workers reporting for work or driving a company vehicle anywhere. (as per Wasco Fitness for Work WAPL-HSS-PRC-003 Procedure) All workers ,sub-contractors will be tested for alcohol prior to starting work, each day. All Jemena personnel and visitors will be tested when signing into site.

A drug testing program will be implemented on the project that includes, random, for cause and suspicion

Any person reporting for duty who is suspected of being intoxicated or suffering from substance abuse will not be permitted to commence work or remain on a Project site.

18. MONITORING AND EVALUATION

The Project Manager shall monitor safety management performance throughout the project and ensure appropriate corrective action is implemented where required. The scope of performance assessment will be via monitoring the implementation and effectiveness of safe work activity inclusive of the following:

- Daily reporting of the implementation and effectiveness of safe work activity via daily site meetings;
- inspections; and outcomes.
- CARE Plan

The Project Engineer shall:

- Prepare, in consultation with the Construction Manager, a weekly report documenting incidents and identifying safety issues; and
- Forward a copy of these weekly reports to the Project Manager and Client
- Conduct weekly formal workplace inspections
- Inspections shall be structured to provide an overview of general conditions, specific elements and close out status of previous deficiencies. A different set of elements shall be selected where practical for each inspection. Specific items shall include, but not be limited to, the following elements:
 - Emergency equipment and awareness
 - Rigging and lifting equipment
 - Electrical equipment
 - High Risk Work qualifications
 - Access and egress
 - Mobile equipment / vehicles
 - Personal protective equipment
 - Personnel qualifications and training
 - Housekeeping.
- The Project HSE Advisor shall facilitate and conduct health and safety inspections with the Construction Manager
- Forward copies of health and safety inspection reports to the Project Manager for review
- Place copies of health and safety inspection reports and findings on notice boards
- Maintain a file of completed health and safety inspection records
- Assign actions to correct adverse findings; and
- Add items into the project corrective action register.

19. INCIDENT / ACCIDENT REPORTING

All incidents/accidents must be reported as WAPL-SYS-PRC-002_Wasco Incident Reporting Procedure

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 42 of 59

The Construction Manager will closely monitor serious accident/incidents and keep the Client fully informed at all times.

All incidents and near misses shall be reported to Jemena Representative within 24hours

19.1 INCIDENT REPORTING

Project event reporting will include those persons who are injured or involved in a near miss or other hazardous incident, either on site or travelling to and from site and at provided accommodation. All Incidents and near miss incidents associated with community relations incidents must be reported. Event reporting of injury, incident or near miss are to be as soon as possible to the immediate supervisor or a member of the Project Management Team.

Incident Reports are completed initially by the employee and the Safety Advisor or Construction Manager or Project Manager.

All incidents are reported via Wasco Rapid Incident, and other documentation such as witness statements, investigation forms or forms as required by the Client or government authorities are to be submitted.

Unless a significant hazard exists, the scene of any serious injury or incident location will not be disturbed until all evidence drawings, photographs, etc. have been prepared or taken and necessary details have been accurately recorded.

In the event of a serious incident, unless a significant hazard continues to exists, the scene will remain undisturbed until authorisation has been received from the Project Manager in consultation with Jemena and any designated Government Authority (in the case of a fatality, the police).

As soon as practicable verbally, but within 24 hours, the Project Manager will provide a report to the Jemena Project Manager setting out fully all material facts and circumstances concerning the incident that the Wasco Project Management Team is aware of or is able, by reasonable search and inquiry, to find out.

In the event of a case of Medical treatment or Lost Time Injury the Safety Advisor or Project Engineer is to provide to the Project Manager the following:

- Details of personal particulars of the injured party
- Date and location of occurrence
- Details of extent of injury
- Anticipated duration of treatment and recovery to normal duties
- Summary of events leading to the injury
- Details of Corrective or Remedial Actions
- Injury Management

19.2 INJURY MANAGEMENT

In the event of any person sustaining an injury, they are required to report the injury as soon as possible to their Construction Manager, and promptly be assessed and receive first aid treatment as required.

The Jemena Site Representative will be advised by the Construction Manager of all injuries of all project personnel immediately or as soon as the situation has been stabilised.

Personnel are responsible to ensure the Project Manager receives a copy of a doctor's medical certificate for any time lost from work due to a work associated injury or illness. Personnel will not be permitted to return to work unless a doctor's medical certificate is sighted by their respective employer and the Construction Manager.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 43 of 59

19.3 WORK COVER

All notifications to WorkCover are to be made in accordance with the Incident Notification Flowcharts listed in Wasco Incident Reporting Procedure

WorkCover must be immediately notified of any workplace incident that results in death or serious injury, or that exposes a person in the immediate vicinity to an immediate health or safety risk.

A written record of a notifiable incident must also be sent to WorkCover within 48 hours.

The site of a notifiable incident must not be disturbed until an inspector arrives or directs otherwise at the time of notification, although the site may be disturbed to protect a person's health or safety, to help someone who is injured, or to make the site safe.

The WorkCover incident notification form must be used to send WorkCover a written record of a notifiable incident.

19.4 CORRECTIVE AND PREVENTIVE ACTION

The Construction Manager shall ensure that the immediate corrective action section of the incident/injury investigation report is completed and raise a corrective action report within the database where improvements arise as the result of an incident/injury investigation and ensure that the corrective action is closed out within the database in a timely manner and controlled through a corrective action register.

Anyone can place recommendations in the corrective action section of an investigation report; however, the Project Manager shall ensure that the corrective action section of the investigation and corrective action report in the event of an incident is completed.

Additionally, the Project Manager shall raise an improvement form in consultation with the Operations Manager where improvements to management system documents are required as a result of audits. These corrective actions shall be issued by the Project Manager with a statement of actions required, date to be completed, and date where follow-up will be performed to ensure effectiveness of the changes.

The corrective action register maintained shall indicate the closing out of the corrective action.

20. INCIDENT INVESTIGATION

All incident investigations are to focus on identifying the causes of the incident so that appropriate control measures may be implemented to prevent recurrence of the incident. All incident reports and incident investigation reports shall be completed using an approved WAPL-SYS-PRC-003 Incident Investigation Procedure.

Wasco shall establish an incident investigation team comprising appropriately trained and qualified investigators. The Jemena HSE Advisor is to be invited to participate in all incident investigations.

The extent of the investigation will depend on the severity, or potential severity, of the incident. Wasco's preferred root cause analysis technique is the 5 Whys method. The Jemena HSE Advisor is to be invited to participate in all incident investigations.

Incident Reporting and Investigation Reports must be completed, and corrective action items implemented, verified, and signed off prior to the incident being closed out by the Wasco Project Manager and the Client Project Manager.

Closed out Incident Reporting and Investigation Forms and Reports shall be made available on Rapid Incident, Wasco's Online Incident Reporting System

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 44 of 59

Wasco shall develop and maintain a Corrective Actions Register for the duration of the Project, and report on the status of close-out of actions in the Monthly Safety Performance Report.

21. EMERGENCY RESPONSE

The Construction Manager, in consultation with the Project Management Team any situation which requires emergency assistance to prevent or reduce harm to people, property or the environment actions to be taken, control measures required on Wasco site.

2018-HSS-PLN-002 Emergency Response Plan

- Fire or explosion
- Medical emergencies (i.e. life-threatening injury requiring urgent medical attention)
- Uncontrolled release of a flammable gas or liquid
- Major spill or other environmental emergencies (i.e. release of a substance other than flammable gas which presents a significant risk to safety or the environment).
- Significant Weather event

The procedure will be used in conjunction with the Jemena Emergency Response Plan – TBC

22. HAZARDOUS SUBSTANCES - MATERIALS

For each chemical substance brought to site, a Safety Data Sheet (SDS) that conforms to the Work Safe Australia Code of Practice will be made available for all personnel required to use or work near a chemical substance.

The construction manager is to ensure that all SDS's for chemical substances be brought on site have been reviewed and all required risk management requirements (PPE, spills management, first aid etc.) for these substances have been fulfilled.

A hazardous materials register will be maintained and updated by the Construction Manager at the Site Office. The Construction Manager shall ensure subcontractors provide an updated inventory of chemicals on site, and a copy of the relevant SDS information is provided to the Construction Manager prior to subcontractor works beginning.

All flammable and/or hazardous substances will be stored in accordance with the Explosives and Dangerous Goods Legislation and relevant Australian Standards.

Where radioactive source instrumentation is to be used as part of construction testing, these will be stored, handled and installed in accordance with the Radiation Safety Legislation and the relevant codes of practice for radioactive substances.

The NDT Contractor will be required to demonstrate the adequacy of safe work practice to the Construction Manager / Construction Manager prior to their engagement. All Xray testing to be scheduled and notified Jemena Representative.

23. PERMITS

Wasco will comply with the Client's Permit System to ensure the highest level of personal safety for all people working on, or within, any recognised hazardous work area.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 45 of 59

Where permits are required, for example on a flow line tie-in to operating facilities, the appropriate Client plant operations personnel will be notified, and permits obtained for the work to be carried out prior to commencing any work.

The objectives of the Permit System include ensuring that:

- A safe system of work and necessary precautions are implemented
- Authorisation is obtained for all work to be performed
- The identification of potential risks involved and the precautions necessary to minimise those risks to ALARP, and
- A Permit Authority is aware of the number and location of personnel working in each permit area and the type of work in progress

The Construction Manager will ensure that requirements of the Client's Permit System are followed.

24. SIGN POSTING

Safety Signs and/or Barricading shall be used to draw attention to objects and situations that may affect personnel safety and health.

All signposting shall be representative of a management instruction and conform to Australian Standards specification coding presented as:

- RED CIRCLE AND BAR (Prohibited)
- BLUE CIRCLE - WHITE PICTURE (Mandatory)
- YELLOW - BLACK WRITING (Caution)
- RED OR GREEN - WHITE WRITING (Fire or Safety)
- BLACK, RED AND WHITE (Danger)
- YELLOW - BLACK WRITING TRIANGLE (For Radiation, Fire or Explosion)

Where there is a potential hazard or an area which must be isolated, suitable delineation/barricading shall be erected around this location to limit access.

25. TAGS

The Construction Manager specifies the assignment of responsibility and provisions and strategies planned for the implementation of Isolation/Out of Service and Danger Tagging. The project induction training shall ensure that all personnel are instructed in the use of the "Danger and Out of Service Tagging" requirement.

25.1 ISOLATION/OUT OF SERVICE TAGS

Wherever it is necessary to access Wasco controlled plant for the purpose of maintenance, upgrade, cleaning or repair the Operator/Service man will ensure plant is isolated using isolation devices and, where practicable, locked using lockout devices.

The Operator/Service man will ensure that construction plant and equipment which is under maintenance or found to be faulty or in an unsafe condition during the project are mechanically or physically isolated (Quarantined) and identified as "Dangerous", and/or "Out of Service" by means of tagging. The requirement to tag unserviceable or damaged plant is mandatory for electrical plant.

Construction utility power systems requiring isolation are in accordance with Wasco isolation and tagging requirements under the control of a licensed electrician.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 46 of 59

25.2 DANGER TAGS

As per AS1319:

- Isolated equipment shall be danger tagged whenever personnel would be at risk if the equipment were energised or operated
- Locks are used where practicable
- Isolations are established to effectively protect all personnel

Danger Tags will not be used when personnel are not at risk (where personnel are not at risk 'Out of Service' tags may be used where plant is damaged or withdrawn from service)

26. PURCHASING PLANT AND EQUIPMENT

Plant and equipment that is purchased/leased/hired must be in accordance with specified standards and fit for its intended purpose. Vendor selection ordering, verification of purchased product and traceability must be in accordance with company quality, health and safety requirements and be inclusive of:

- Precise identification of the goods and services
- Relevant technical/HS&E material (eg specifications, permits, certification)
- Inspection/maintenance and test methods/records
- Methods of operating/control and handling of goods and services
- Contractual terms and conditions

27. MAINTENANCE, INSPECTION, TESTING, PLANT AND EQUIPMENT

The project shall ensure the provision of suitable plant, equipment and facilities be established so a safe place of work, safe systems of work and appropriate levels of response can be maintained and achieved.

All project plant and equipment shall be sized and specified to be able to execute the required works safely within its operating requirements. All incoming plant and equipment shall be inspected prior to being unloaded on site for compliance with required equipment standards and for maintenance and service history records. The Construction Manager will ensure that all plant and equipment is accompanied by

- Plant Log Book
- Plant Operating Manual
- Plant Hazard/Risk assessment document
- Fire extinguisher
- First Aid Kit
- Reversing alarms (as required)
- Amber coloured flashing warning lights (as required)
- Historical Records of Maintenance/Testing & Inspection as appropriate.

Also load-shifting equipment must be provided with certification and load charts.

All plant and equipment will be entered in the Plant and Equipment register 2018-HSS-REG-Plant and Equipment Register

All plant and equipment shall be maintained and service in accordance with the manufacturers' specification. Service and maintenance register shall be maintained by the Project Team for the life of project the register shall at a minimum record the following:

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 47 of 59

- Plant details (make/model/year/registration/ID number)
- Plant odometer reading
- Plant last service
- Plant next service
- Plant issues/maintenance requests
- Plant onsite dates

Plant or equipment which is under maintenance or found to be faulty or in an unsafe condition, will be isolated and identified as "Danger", and "Not for Use" or "Out of Service", as set out in Wasco's Safe Work Method Statements. The Project Engineer will maintain a Register of plant maintenance.

The condition of plant and equipment is the responsibility of the Construction Manager, and those personnel operating the plant or equipment. The condition of plant and equipment is monitored by:

- Initial plant inspections and plant risk assessments
- Daily pre-start inspections
- Weekly inspections as required or designated
- Scheduled maintenance
- Defect reporting
- Tag and isolation procedures
- Breakdown and repairs

28. PRESSURE TESTING OF PIPES AND VESSELS

All personnel assigned to pressure testing will attend a task specific training session to ensure they are aware of hazards relating to the testing of pressure containment pipes and vessels.

Before commencement of any pressure test, the Construction Manager shall:

- Review and authorize for use the hydrostatic testing procedure
- Ensure that all instruments and gauges to be used on the test are of suitable pressure range or test limits, and that valid calibration certificates are present
- Ensure that test areas will be isolated

All pressure testing of the pipeline and vessels will be carried in accordance with the Wasco Health & Safety Management System, Wasco Procedures, and Client requirements.

29. SAFE OPERATING PROCEDURES AND STANDARDS

Safe Operating Procedures are developed for standard activities so as to provide a standardised approach for the communication and implementation of safety precautions whilst engaged on a specific activity and/or working environment on the project. They are also subject to risk assessment and management of change via SWMS.

Safe systems of work on the Project are to be established and updated throughout the project. Regular review will address existing safety systems with a view of improvement and reflecting task specific activities.

Safe Work Method Statements (SWMS) will be used to identify and communicate the hazards and risks associated with a task and the safe work method statements that apply to the specific task. All tasks are required to have a SWMS carried out prior to the commencement of the task and signed off at the completion of the task. The SWMS is to be reviewed/revised if any part of the task execution is to be changed.

For all work, which requires a permit, the specific procedure or work instruction being referenced must be identified on the permit and a SWMS specific to the job must accompany the displayed permit. A SWMS will need to be conducted prior to the following activities (but not limited to):

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 48 of 59

- Hot work
- Working at heights
- Excavation
- Lifting operations
- Energy isolations

Project specific procedures developed by Wasco, in consultation with the Client as required, will be progressively reviewed, and/or developed from this baseline of approved work practice by Wasco. All changes to Project specific procedures are approved by the Project Manager.

Project specific Construction Execution Procedure standards of operating practice are developed for the following routine construction processes as applicable and are subject to SWMS:

- Survey and site set out
- Service Identification
- Clear and grade
- Excavation and Trenching
- Stringing
- Welding
- Coating
- Lowering in and Backfill
- Flange Management
- Hydrostatic Proof and Leak Test

In addition to this list, Procedures will be developed for any other operating activity identified during construction.

Any work activity whether routine or non-routine will have a SWMS carried out immediately prior to commencing the task for the first time or where change has occurred in the construction process or environment.

The Construction Manager is responsible to ensure the highest level of personal safety for all people working on, or within, any phase of Construction activity under their control.

The Construction Manager and the Project Management Team are to monitor that all Project personnel comply with all construction safety instructions as required, in particular the control measures as identified in the SWMS process.

30. WORKPLACE ENVIRONMENT

The Construction Manager will specify the assignment of particular responsibility and provisions to ensure that a safe place and systems of work are provided.

30.1 SITE ACCESS

Wasco shall ensure all personnel travelling to site are aware of the route and provide all other relevant information prior to travelling to the site.

A Traffic Management Plan (TMP) will be implemented

The TMP specifies the assignment of responsibility and provisions and strategies planned for the movement and control of:

- Personnel, plant and materials,
- The selection and management of designated road access,
- Land Access requirements

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 49 of 59

- Journey Management
- Loading and Unloading (LUEZ)
- Jemena site requirements
- Weed and Seed requirements
- The safety of the public in relation to planned construction activity interfaces.

The Plan will have the following objectives relating to construction access:

- To ensure that there is no damage to existing and new equipment onsite.
- To Ensure Land Access/ Landowner requirements are adhered to
- To ensure that personnel are protected whilst equipment is moved onsite.
- To minimize traffic hazards.
- To minimize impacts to fauna

30.2 SITE SECURITY AND PUBLIC SAFETY

The Project Manager in consultation with the Construction Manager specifies the assignment of particular responsibility and provisions and strategies planned for managing site security and public safety.

The Construction Manager will enforce the following requirements:

- Enforce security rules and regulations
- Secure tools, equipment and materials
- Report losses of tools, equipment, material, or other breaches of security to the Project Manager as soon as they are discovered.

The Project Manager in consultation with the Construction Manager will ensure that only authorised persons are working on or visiting the site and any associated areas and that all personnel in that controlled area are able to be accounted for in Emergency situations.

To ensure all operating equipment is secured from trespassers/vandals, the doors and windows shall be locked when left over night in areas deemed not secure.

The Construction Manager is to assess risk (likelihood and probable severity of public injury) in consultation with the Project Manager for all construction work undertaken in order to formulate and implement risk minimisation controls.

Necessary precautions will consider factors such as:

- Proximity to the public
- Hazards on the site (and the degree to which they can be made safe when unattended)

30.3 RIGHT OF ENTRY

All right of entry request will be dealt with in accordance with the Fair Work (Commonwealth Powers) and Other Provisions Act 2009 and the Work Health and Safety Act 2011.

30.4 FIREARMS AND WEAPONS

The use, possession and distribution of firearms, deadly weapons or unauthorized explosives are strictly prohibited on site.

30.5 PETS

Pets are not allowed on the project site.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 50 of 59

30.6 SMOKING

Smoking is only permitted in designated smoking areas.

30.7 DRIVING

Only licensed drivers are permitted to drive vehicles on the project. All road rules must be obeyed, and site-specific rules shall always be observed. Traffic Management Plan to be followed

30.8 COMMUNICATION AND TWO-WAY RADIO OPERATION

Wasco will establish a radio communication system, which shall have full coverage over the entire project area. The communication system shall remain in operation until all works are complete. Unless an alternative adequate communications protocol is established, this communication system shall be made available to all personnel working within the contract area including Client and authorities nominated by the Construction Manager.

The system shall be implemented during construction that will enable personnel working on the project to identify their position. The ability for personnel to identify their position is of paramount importance in the event of an emergency.

For communications outside of radio range, satellite phone will be provided to Crew Supervisors and in specific circumstance, lone workmen.

VHF #28	General Construction Communications (Note: This becomes the Emergency Channel on the greenfield site where the situation does not extend to Client Operations)
UHF# 28	Plant & Machinery

30.9 WORKPLACE LIGHTING

All project personnel including sub-contractors are required to obtain approval from the Construction Manager for any work to be conducted before/after normal daylight hours. The following activities are excluded from this requirement subject to a strict requirement to carry out a SWMS:

- Pressure testing activities
- Field Services

For any night work the intensity of illumination will be subject to risk assessment and as shall be such that permits the work to be performed in a workmanlike manner without risk to personnel or property

30.10 WORKING HOURS

The working hours and shift patterns are in accordance with the Wasco Certified Agreement. It is not expected that night work is common but may be appropriate for non-destructive testing (x-ray operations and testing operations. Wasco will comply with the laws and regulations governing work site hours for personnel

All night work is to be approved by the Construction Manager and Client representative. Night works are to be conducted in a manner consistent with the requirements subject to SWMS review.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 51 of 59

30.11 LONE WORK

No person shall be permitted to undertake physical construction work activities alone in the absence of an approved Safe Method of Work. Lone work is defined as:

- A person shall be deemed to be "Alone" or performing "Lone Work" when that person is more than 400 metres from another person, or 800 metres in the case of plant operators and is without access to communications (i.e. radio) for any period greater than 30 minutes.
- "Physical" is any construction activity that requires manual Labour, and includes but is not limited to, Plant Operation, Mechanical Repairs, Underground Service Location and Repairs, Fauna and Flora Monitoring, Survey Activities, Loading and Unloading of Plant and Transport, Refueling, Operation of Valves, NDT, etc.
- In situations of lone work, an assessment shall be undertaken, considering location of work in relation to Project, distance separating persons, traffic frequency, environmental conditions, and transport available to the individual.

30.12 FATIGUE MANAGEMENT

Working hours 6:00 am to 18:00pm

If more than Twenty-one days, the construction manager will conduct a fatigue risk management analysis prior to continuance of work. All extension risk assessment to support continuance of working past 21 days shift are to be reviewed by Jemena HSE and approved by Jemena Project Manager.

30.13 CONSTRUCTION NOISE LEVEL

The noise levels emitted from Wasco construction plant / activities will be monitored by the Construction Manager. Should the emitted noise be excessive, the Construction Supervisor must immediately notify the Construction Manager.

Should any construction activity, procedure, or any item of construction plant emit noise at levels beyond those permitted or recommended, the Construction Manager will either suspend the operations and/or as an immediate and temporary measure, provide appropriate personal protective equipment.

30.14 FIRE PREVENTION

The Construction Manager is responsible for ensuring that:

- There are adequate Fire Protection precautions in place
- An adequate number and type of fire extinguishers available to meet requirements and they are properly serviced and maintained in good working condition
- The workforce is aware of the hazard of ignition sources in "PROHIBITED AREAS"
- The workforce is aware of general fire restrictions, the risk of ignition and the potential spread of fire
- All vehicles, plant and equipment have appropriate fire extinguishers and they are serviced and checked on a regular basis

The Construction Manager will ensure that project employees are aware of the location points and correct use and operation of all firefighting equipment through induction and toolbox training.

The Construction Manager is responsible for ensuring that documented evidence of employee training in the use of firefighting equipment and will maintain on site a register of test and tagging of all fire extinguishers.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 52 of 59

30.15 HOUSEKEEPING

All personnel are responsible for ensuring that their work areas, offices, plant sites, vehicles are kept clean and tidy in accordance with the Client and Wasco's Health and Safety Management System.

30.16 ELECTRICAL SAFETY

The Construction Manager, in consultation with a licensed electrician, will specify the assignment of particular responsibility, provisions and strategies planned for the supply of electricity for the differing requirements of the construction activity and details the day to day management of electrical supply and electrical safety.

All portable electrical equipment will utilise a power supply protected with a Residual Current Device (RCD).

The Project Engineer will maintain a register for all electrical maintenance, testing and inspection activities carried out and made available to the Construction Manager for review on request.

30.17 COMPRESSED GAS CYLINDERS

All compressed gas cylinders shall be firmly secured by means of a chain or rope in the upright position. Empty cylinders may be laid down provided they are protected from possible damage and suitably chocked to prevent rolling. Empty cylinders should be clearly marked "empty".

Cylinders shall be stored in a ventilated area, out of direct sunlight. A fire extinguisher must be attached to all trolleys containing oxy-acetylene cylinders

30.18 WORKPLACE AMENITIES

The provision of work site amenities is an integral part of the general duty of care. The Construction Manager will ensure that sufficient and adequate amenities are provided for the welfare of personnel on the project site.

30.18.1 DRINKING WATER

Filtered clean potable drinking water, and ice are to be readily accessible and located where the water is unlikely to be contaminated.

Each employee on arrival to site will be issued with a lunch box cooler and a 5-litre water bottle. Each employee is required to carry with them to work at start of shift a minimum of 5 litres of drinking water.

30.18.2 ABLUTION FACILITIES

The Project Manager in consultation with the Construction Manager is to review and provide for adequate on-site ablution facilities. An ablution block shall be placed at the main laydown facility, amenities for both female and males shall be provided. A porta loo will be on the right of way

The placement of any ablution block on the worksite shall be approved by Jemena due to its classification of hazardous waste.

30.18.3 CRIB ROOM FACILITIES

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 53 of 59

The Project Manager in consultation with the Construction Manager is to review and provide for adequate crib room facilities for the work crew. The crib room shall be air-conditioned and be maintained with potable water, seating and tables and a refrigerator if required.

Cribbing and ablution facilities size and occupancy limits will be in accordance with current NSW state guidelines and the site COVID management plan.

31. EXCAVATION

All excavations shall be in accordance with the SWMS and Permit to Work (When required).

The Construction Manager will ensure the following have been assessed and control measures are in place:

- Location of utilities
- Ventilation
- Fumes or toxic atmosphere
- Wall and faces in excess 1.5 metres
- Daily or more frequent inspections
- Shoring battering sloping (if necessary)
- Hazard warning signs – marker lights (night)
- Records inspections, SWMS's, confined space permits
- DBYD
- Hazard assessment
- Potential flammables
- Low oxygen levels
- Entry and exit and ramps
- Training of employees
- Barricading
- Ladders (where required)

32. CONFINED SPACE ENTRY MANAGEMENT

Confined space work is deemed High Risk Construction Work and requires a Safe Work Method Statement.

In the Work Health and Safety Regulation 2011 NSW, a confined space is defined as follows:

Confined space means an enclosed or partially enclosed space that:

- (a) is not designed or intended primarily to be occupied by a person; and
- (b) is, or is designed or intended to be, at normal atmospheric pressure while any person is in the space; and
- (c) is or is likely to be a risk to health and safety from:
 - (i) an atmosphere that does not have a safe oxygen level; or
 - (ii) contaminants, including airborne gases, vapours and dusts, that may cause injury from fire or explosion; or
 - (iii) harmful concentrations of any airborne contaminants; or
 - (iv) engulfment;

For compliance with the NSW legislation, the Construction Manager will ensure that the SWMS is reviewed, and that a Confined Space Permit is completed before any work can take place.

33. WORK NEAR TO OVERHEAD POWERLINES

OES Guideline for Management of Electrical Hazards shall be adhered to.

The Construction Manager / Client will establish Permit and Isolation requirements where appropriate by contacting the Client / Power Supply Authority.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 54 of 59

Where overhead powerlines cross or are in close proximity to the Works, signs saying “Power Lines Overhead” shall be erected during the clear and grade operation to warn construction personnel of their presence.

No item of mobile plant may operate closer than 4 metres to High Voltage powerlines unless the lines have been isolated and/or work is carried out in accordance with approved Permit to Work Method Statements by the supply authority.

34. WORK IN THE VICINITY OF LIVE GAS PIPELINES

All works in the vicinity of a live gas pipeline shall be under the third-party approval, detection, SWMS and permit system.

35. MOVEMENT AND CONTROL OF VEHICLES – PLANT AND EQUIPMENT

All drivers will be fully and currently licensed, and competent to drive the type of vehicle they are using and will observe and obey local Road Laws at all times except where Traffic Signs impose further restrictions.

No vehicles are to be driven after dark, unless prior approval is provided by the Construction Manager / Client, and such approval will normally only be provided in emergency situations. The Construction Manager in providing such approval will have already obtained similar approvals from the Client.

Traffic control in areas of public road access will comply with local Road Traffic Authority and requirements as specified and referenced against AS 1742.4 - 1996.

Where there is a requirement to establish a strategy to ensure the safety of road users and/or the public in relation to general activity along the Major Roads, and in circumstances where there is crossing of a Major Road and/or an excavation of the road is required - A Traffic Management Plan/Controls will be developed and strictly adhered to by the Project Team.

Where appropriate, prior to commencement of any work involving road crossings involving excavation, the Traffic Management Plan will be prepared and issued for review by the local Road Traffic Authority.

Vehicles carrying hazardous goods or chemicals will carry appropriate signs, which will be clearly visible.

Where required for the operation of vehicles/equipment in poor visibility conditions, all vehicles will be fitted with a roof-mounted amber flashing beacon and a two-way radio.

All employees utilised for Road Traffic Control will have undertaken specific training in this area.

All personnel working on Road Traffic Control will wear high visibility clothing when directing traffic or working in a traffic control situation.

All vehicles on site will be registered. No vehicle will be permitted to enter the controlled area or remain on a construction activity location without the approval of the Construction Manager.

Vehicles with loads extending beyond the length of the vehicle will be flagged. Similarly, loads extending beyond the width of any vehicle will be clearly indicated by a notice on the front and rear of the vehicle, and vehicles will be escorted. Escort personnel must remain in continuous radio communication with that vehicle's driver as per Road Transport Legislative requirements.

Travel to and from site and long journeys shall be according to the Wasco Journey Management Plan

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 55 of 59

36. MATERIALS HANDLING, LIFTING EQUIPMENT AND LIFTING

The Construction Manager is to specify the assignment of particular responsibility and provisions and strategies planned for the risk assessment of manual handling activities, the selection, inspection and management of lifting equipment and the management of loads requiring a detailed lifting plan.

Manual handling is one of the major activities of the project. Manual Handling occurs on a construction project many times per hour and subsequently the risk rating for this group of hazards is high if nothing is done to control the hazards. A procedure has been developed to assist in understanding the Manual Handling group of hazards and how to address the control of these hazards. All manual handling tasks will be subject to SWMS and risk assessment.

All lifting and rigging equipment, including cranes and the equipment containers shall be certified in accordance with applicable load testing and lifting standards. Certificates and logbooks shall be maintained for all equipment with a lifting capacity exceeding a WLL of 10.0 tonne. Lifting equipment shall be labelled with its Safe Working Load (SWL) in accordance with Australian Standards and site requirements. All lifting equipment will have available a Load Chart.

All rigging work is to be carried out by certified competent riggers in accordance with statutory requirements. All slings, shackles etc., are to be clearly marked with their safe working load (SWL) or working load limit (WLL), rigging equipment is not to be used for other than its intended purpose.

The Construction Manager shall establish a rigging loft onsite that provides for clean, dry and chemical-free storage of all rigging equipment. A register of lifting equipment shall be maintained on site.

Only qualified operators who are properly trained in the operation of the type and size of lifting equipment and who hold the appropriate certification will be permitted to operate such equipment.

A Certificate of Competency (High Risk License) issued by State statutory health and safety authority will be required if operating any (National Standard for Licensing Persons Performing High Risk Work 2006). These include:

- slewing crane, tower crane, derrick crane, or portal boom crane;
- non-slewing mobile crane of capacity greater than 3 tonnes;
- vehicle self-loading crane (Hiab) of capacity 10 metre-tonne or greater.

Licensed operators will be directly responsible for ensuring that all equipment is used within its recommended load limitations and stored in a proper manner when not in use.

Lifting equipment will only to be used for the purpose for which it is designed and within its rated capacity and a Certified dogger (or Rigger) will sling loads where either:

- judgement is needed to either determine the mass, determine the centre of gravity of the load, select a sling, or select a sling configuration; or
- signalling to a crane/plant operator where the load is out of the operator's view.

The operator has the full responsibility for a safe operation when using hoisting equipment to make lifts and is required to provide a Critical Lifting Plan where required.

The operator will conduct a Critical Lift Assessment where:

- The load exceeds 75 percent of rated load chart for crane;
- The load exceeds 50 percent of rated load chart for crane, and possible failure would endanger existing facilities (thus always in and around operating plant);

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH & SAFETY MANAGEMENT PLAN	Page 56 of 59

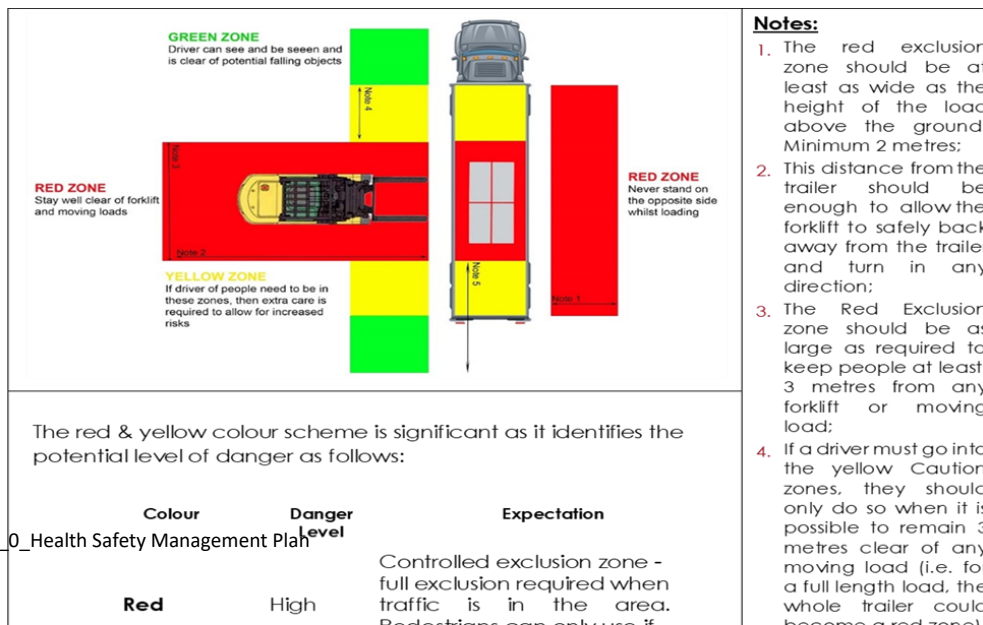
- Two booms are required to make the lift;
- The load Weighs over 20 tonnes
- Loads may be lifted in areas of difficult terrain
- Poles or derricks have been erected for this specific lift;
- Areas are heavily populated; and
- Loads may be lifted over or through critical plant areas where a Jemena Critical Lift Plan is in place.
- Where more than one crane is used to lift a load, the hoisting will be supervised by a competent person not otherwise involved in the operation. A Critical Lift Permit is also required.

36.1 SAFETY OF PERSONNEL

Site personnel and vehicles not directly involved in the operation of the crane will be excluded from areas of entrapment or danger from the load by use of signs, bunting or other relevant methods.

- LUEZ zones will be maintained at all times (see Diagram) All lifting will be subject to SWMS and risk assessment.
- As far as practicable, loads will not be suspended or travel over workers (especially where a vacuum, friction or magnetic device is used).
- Loads will not be suspended or travel over the public (and the public must be excluded from the area).
- Riding on loads is prohibited. Passengers on the plant will only use dedicated seats.
- Persons will only be suspended by a crane/hoist by the use of a state statutory health and safety authority approved workbox.
- Persons in a workbox must wear a safety harness and attachment and written instructions will be given to both the person in the workbox and the crane driver by the task Supervisor.
- The plant and its load will be operated such that it will not breach the 'Danger Zone' for power lines.
- Loads that may become unstable will be appropriately restrained.
- All loads require Tag lines (control lines) to be used.
- All rigging equipment to be used will be inspected by a licensed Rigger during mobilization and thereafter on a monthly basis.
- The Construction Manager will monitor that rigging equipment has been inspected prior to mobilization and at the prescribed defined intervals as required and details of inspection recorded in a Rigging Register and that all inspection certificates are available as appropriate for audit.
- The competent person will tag as 'Out of Service' all rigging equipment that has been quarantined for disposal.
- Required documentation includes Lift Plans/Drawings, Safe Work Method Statements, Rigging Equipment Register, and Lifting Equipment Register.

LUEZ DIAGRAM



	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH SAFETY MANAGEMENT PLAN	Page 57 of 59

37. HEALTH

In the event of any person sustaining an injury, they will be required to report the injury as soon as possible to their immediate supervisor.

An Injury/Illness Report will be completed in all cases where a person is injured to the extent that the person requires First Aid assistance and/or Medical treatment.

The Construction Manager will notify the Client as soon as possible after any incident involving an injury that requires medical treatment. A full incident investigation will be carried out and a Hazard/Incident Report initiated after medical treatment is given to the injured person.

In the event of a serious injury incident, written signed and dated statements will be recorded as soon as possible following the incident. The original copy of any statement will be attached to the original copy of the Hazard/Incident Report and duplicate copies distributed to the Client as soon as practicable. Those injured (if their condition permits) will be interviewed regarding specific details leading up to the incident. Each statement will be accurately recorded and signed as a true and correct record and witnessed.

Should any incident need to be reported to a Government Authority, this requirement will be met by the Manager HS&E in accordance with information as specified in AS 1885.1.

Unless further danger exists, any serious injury incident scene will not be disturbed until the required drawings and/or photographs are prepared or taken and details have been accurately recorded and any attendance required by Government Departments has occurred.

In the event of injury or ill health, the worker's Construction Supervisor and /or Construction Manager will arrange for the person to receive the proper treatment.

The Construction Manager will make arrangements for the provision of emergency assistance, including ambulance service in the case of serious injury/illness, and will co-ordinate medical treatment in conjunction with RFDS or Care Flight Medical Staff and utilise RFDS or Care Flight services when necessary.

Employees will be responsible to ensure their employer receives a copy of a doctor's Medical Certificate for any time lost from work due to a work associated injury or illness. Personnel will not be permitted to return to work until such time a clearance declaring them fit for suitable duties or able to resume normal duties is supplied

38. FIRST AID

The Construction Manager will provide and maintain appropriate First Aid facilities

As a minimum, one person in each separate workplace shall hold a current first aid qualification Provide First Aid HLTAID003 and HLTAID001 Provide CPR. Identification of nominated first aiders will be conveyed during induction training. Where the assessment of a workplace location has identified significant risk, additional trained first aid personnel will be assigned as appropriate.

- First Aiders shall be identified by a Green Cross sticker affixed to their hat.
- A list of all qualified "First Aiders" will be circulated and posted on all notice boards.

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH SAFETY MANAGEMENT PLAN	Page 58 of 59

- The Construction Manager will monitor supplies of first aid equipment and ensure all first aid boxes are always sufficiently maintained. All Wasco vehicles will carry a first aid kit.
- The Construction Manager will record First Aid Treatment and use records for reporting and replenishment of first aid kits.
- All first aid treatments must be entered into the incident register by the Construction Manager and forwarded to the HSEQ Manager daily for statistical purposes

39. MANAGEMENT OF CHANGE

Inadequate management of change significantly increases the risk of incidents. Uncontrolled modifications to plant and equipment or operating procedures have led to disasters. For this reason, Wasco has identified strategies, policies and procedures that will ensure that all modifications are reviewed by competent people, are appropriately authorised and documented and that necessary training is provided before the modifications are implemented.

39.1 RISK ASSESSMENT OF CHANGE

In every case, care is taken to ensure the safety implications of change are identified and assessed, and any risks are either eliminated or controlled.

Proposed construction process program changes are submitted to the Client's Representative by the Project Manager, who will in consultation with the Client's Representative assess the potential impact, give due consideration to the original design basis or management process and the effect of the change on other disciplines or other parts of the project.

Where project-controlled documents are required to be revised, these are updated, and the superseded documents removed from circulation in accordance with document control procedures.

39.2 MANAGEMENT SYSTEM / PROJECT SCOPE MODIFICATIONS

The Project Manager shall:

- Evaluate changes to Management Plans and scope by comparing them with the requirements of this document, standards and policies prior to being implemented
- Assess, in consultation with the Construction Manager as appropriate, the potential of impact on the original design basis and on the overall project program and schedule

Approved scope of work changes, including any additional risk controls or project modifications, are documented as approved before change implementation is initiated where appropriate. All variations and revisions to controlled documents are to be updated and superseded documents removed from circulation.

39.2.1 HANDOVER OF RESPONSIBILITIES

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH SAFETY MANAGEMENT PLAN	Page 59 of 59

The Construction Manager shall:

- Ensure that Project personnel carry out a suitable handover to ensure the succeeding incumbent is fully conversant with their responsibility and work status
- Ensure that supervisors handing over to succeeding incumbents' complete handover notes, which may be in the form of a diary, notes or a checklist of responsibilities and/or work status
- Ensure that, in the assignment of replacement personnel or the re-delegation of duties, personnel are competent to undertake the assigned duties and that the assigned workload (increase/decrease) is assessed for any change in risk/risk potential

Supervisors shall:

- Complete handover notes, when handing over to succeeding incumbents, which may be in the form of a diary, notes or a checklist of responsibilities and/or work status;
- Ensure that succeeding incumbents are fully conversant with the status of the project and responsibilities involved; and
- Familiarise themselves with the status of the work and site prior to recommencing work.

39.3 PROJECT CHANGE MANAGEMENT

Project changes, however minor, have the potential to create significant hazards. All changes to the project design are to be identified and assessed prior to implementation. Changes in design, organisational structure, materials or construction processes are to be initiated by the design or Construction Manager and recorded through technical query management process and be authorised by the Project Manager. The Project Manager will assess the potential safety and risk implications of the change/query on the original design basis, impact on other project disciplines and on the Project and facility operations.

Where necessary the Project Manager will assign competent personnel to independently review the technical query and proposed change and revise the risk assessment documentation or registers accordingly.

The Project Manager will notify project team members of approved changes or modification.

39.4 WORK ACTIVITY MODIFICATIONS/PROCEDURAL AND CHANGES

All work instructions/standard operating procedure changes are required to be documented and monitored relative to implementation requirements and adequacy. Proposed changes are submitted to the Project Manager for review. Approved changes are confirmed by the Project Manager and documented. Major work activity modifications and changes are approved by the Project Manager and all relevant documentation including drawings are amended as required. The Project Manager and Construction Manager respectively will notify project team members of approved changes or modifications.

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH SAFETY MANAGEMENT PLAN	Page 60 of 59

The only exception is for identified immediate risk control or in emergencies where the requirement is recognised as a non-routine situation or an immediate threat to the safety of personnel or the environment exists.

Changes which have the potential to impact on construction personnel and activities are communicated through the Pre-Start or Toolbox Meetings and documented in the SWMS.

39.5 PLANT AND EQUIPMENT CHANGE MANAGEMENT

Formal risk assessment processes are established by the Construction Manager as required to ensure that new materials and components are thoroughly tested and evaluated before being introduced into the construction process.

40. SUB-CONTRACTS

40.1 PRE-QUALIFICATION

An online pre-qualification assessment will be undertaken via Rapid Contractor Management, to substantiate and qualify each Subcontractor's submission. In the evaluation process, preference will be given to those organisations that can demonstrate that they are currently assessed under an Industry recognised third party auditing system.

Where a Subcontractor is a "Major Subcontractor" they will be required to provide a copy of their Safety Management Plan along with records such as:

- Lost Time Injury and Medically Treated Injury Frequency Rate for the last two years (LTIFR / MTIFR) Total recordable Injury frequency Rate (TRIFR)
- Workcover Claims details for the last two year
- Plant / Machinery registrations and maintenance records
- Plant operator / Prescribed occupation qualifications
- Insurance Certificates

40.2 SUBCONTRACTOR MANAGEMENT

In managing subcontracted activities, as with all activities, the key is planning. Therefore, the Project Manager in consultation with Jemena where required, will document and agree to all subcontracted activities prior to implementation.

The Project Manager has overall responsibility for monitoring the safety performance of subcontractors.

The Project Manager is to:

- Ensure that subcontractor's or service providers are provided with a copy of the applicable HSE documentation and environmental documentation.

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH SAFETY MANAGEMENT PLAN	Page 61 of 59

- Review the adequacy of each subcontractor's or service provider's submission.
- Ensure that a pre-qualification assessment of the preferred sub-contractor is undertaken as part of the final selection process and prior to appointment.

The Construction Manager is to:

- Ensure subcontractors or service providers have in place standard operating procedure and participate in the SWMS process for each task prior to commencement in accordance with the SWMS and risk management requirements.
- Ensure that all subcontractor personnel fulfil their health and safety obligations.

All subcontractors and service providers are to:

- Comply with all health and safety obligations and reporting requirements.
- Comply with and enforce the provisions of the relevant state health and safety legislation, Australian Standards and Codes of Practice.
- Comply with the most current version or edition of relevant standards.
- Comply with all contractor policies, instructions and safe work practices.
- Establish and participate in all Health & Safety Committees and consultative arrangements as determined by Wasco or where required under the Contract.
- Provide, upon specific request by Wasco, a copy of their relevant health and safety plans, procedures and documentation.
- Participate in drills, pre-start meetings/handovers, toolbox talks in addition to attending all project meetings requiring attendance.

In addition to, and in support of Project Safety Management Planning, subcontractors will participate in risk assessment workshops as directed by the Project Manager, identifying hazards and assessing the adequacy of existing controls, interaction between the differing phases of contracted activity and existing operational infrastructure, and public impact potential.

The result of these Project Risk Assessment workshops will facilitate the development of a project Hazard Register, incorporating specific control actions and strategies.

The subcontractor shall actively encourage and facilitate the ongoing identification of hazards by its employees, agents and subcontractors during construction activities.

Where a Subcontractor is a "Minor Subcontractor" such as a welder they will be required to comply with the Wasco Safety Management Plan and Safety Management System.

41. RECORDS & REPORTING

All project information maintained by the Construction Superintendent, Construction Supervisors, such as correspondence, notes, minutes of meetings, incident records, etc. will be filed in a dedicated project file in the central filing system. These records will be available for review on request.

All sub-contractor information, such as correspondence, notes, minutes of meetings, etc. will be filed in a dedicated project file in the central filing system, and available for review on request.

With respect to incident reporting in accordance with Occupational Safety & Health Legislation, where a notifiable incident occurs involving an employee or registered plant, the Construction

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-001	HEALTH SAFETY MANAGEMENT PLAN	Page 62 of 59

Superintendent / Construction Superintendent will ensure that the incident is reported to the Project Manager and HSEQ Manager.

The Project Manager is responsible to report all incidents immediately to the to the Company representative.

The Daily Construction Report will be provided to the Client and shall provide the following statistics:

- Lost time incidents
- Lost time duration
- Lost time frequency (monthly)
- First Aid statistics
- Medically treated injuries
- First Aid treatments (FAT)
- Hazardous incidents
- Non conformance
- Any other site Health and Safety

42. REVIEW AND IMPROVEMENT

During the Project, the Client's Representative and the Project Manager will periodically review the effectiveness of the HSMP through regular weekly progress reports and meetings. The objective of the review process is to determine which arrangements adopted for the project are being effective in meeting the Client's and Wasco' safety policy objectives.

An Audit and a Lesson Learnt review will be conducted at the end of the Project

The review process will focus on the effectiveness of implementation of the HSE Plan. Health and Safety Documentation used during the review process will include the following:

- Daily Construction Report
- Weekly reports
- Incident/Loss Reports and Investigations
- Site Inspection Reports
- The Project Hazard Register
- The Corrective Action Hazard Register
- Care plan

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 31 of 53

Appendix 3– Site Layout and Emergency Plan

JEMENA WESTERN SYDNEY GREEN GAS PROJECT

194-214 Chandos Road, Horsley Park, NSW, 2175



MUSTER POINT

SECONDARY

SPILL KIT



HAZARDOUS MATERIAL STORAGE

LUNCH ROOM



OFFICES



TEMPORARY CONSTRUCTION FACILITY AND LAYDOWN

MUSTER POINT

PRIMARY

EMERGENCY PHONE NUMBERS



FIRE BRIGADE



AMBULANCE



POLICE

OR RING
000

LEGEND

Egress Direction

NEAREST HOSPITAL

Fairfield Hospital

Address:
Corner Prairievale Road and
Polding Street, Prairiewood,
NSW, 2176

Contact: Ph: 02 9616 8111

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 32 of 53

Appendix 4 – Project Risk Register

Risk Matrix

Consequence Rating		Health, Safety and Security Consequences	Environmental Consequences	Community, Stakeholder and Reputation	Business/ Financial	Law / Compliance /Regulatory
5	Catastrophic	Fatality incident, total and permanent disability (TPD), major irreversible health effect / disease	Incident resulting in catastrophic regional environmental impact causing long term environmental harm. Major long-term remediation required (greater than 12 months / over multiple years). Major litigation or prosecution resulting in long term interruption to operations.	Wasco's reputation is damaged so significantly that it is unlikely it would be able to work in some areas. National adverse media or public criticism	>\$3,000,000	Material litigation, criminal investigation or proceedings involving officers, or directors, significant fines
4	Major	Lost time incident (LTI), partial permanent disability (PPD), major irreversible health effects	Incident resulting in major onsite/offsite environmental impact causing medium / long term environmental harm. Significant remediation required (typically less than 12 months) Significant legal issues, non-compliance and breaches of regulations that result in prosecution or citation or fine. Litigation issues involving many weeks of senior management time.	Will impact significantly on Wasco's reputation and impact future business; requires significant intervention to recover Wasco's reputation. Regional media or public concern, local criticism	\$1,000,000-\$3,000,000	Significant violation of law with material fines, penalties, or costs, serious dispute, major litigation
3	Moderate	Medical treatment injury (MTI), disabling reversible impairment, restricted work case (RWC)	Incident resulting in reversible onsite, and or offsite impact causing short term effect. Moderate remediation required (typically one month) Noncompliance and breaches of regulations that may result in prosecution or citation or punitive fine. Requirement or obligation to report to the regulators.	Will impact on Wasco's current project for its duration and will need remediation and management intervention to recover. Local media, public concern	\$100,000-\$1,000,000	Violation of law, regulation, permit or policy with moderate fines or penalties. Moderate litigation
2	Minor	First aid treatment (FAT), slightly injured, minimal health effects	Minor reversible environment impact, minor remediation (typically <5 days). Noncompliance and breaches of regulation that may result in a citation. May result in reporting to the regulators.	Short term impact (less than a month) on Wasco's reputation but will not impact its overall standing.	\$10,000-\$100,000	Reoccurring or systematic small violations of law, regulation, permits or policy, minimal fines, penalties or costs
1	Low	Near miss, no health effects	Negligible or reversible environmental impact. Nil or minor remediation (typically a shift). No breach of regulations or requirements to report to regulators.	Minor issue resolved immediately with no ongoing consequences, no public concern	<\$10,000	Minor, one off violations of law, regulation, permit or policy, no fines or penalties

Likelihood		
A	Almost Certain	Almost inevitable. Possible to occur and the team have knowledge of a similar event. Likely to occur repeatedly during the operational life of the facility / project. Is expected to occur in most circumstances and/or more than once a year.
B	Likely	Not certain to happen but an additional factor may result in occurrence. More than average i.e. the team do not have direct knowledge but suspect that an event has occurred and represents a credible scenario. Likely to occur from time to time.
C	Possible	Could happen when additional factors are present, but otherwise unlikely. Average i.e. easy to postulate a scenario for the occurrence but considered doubtful. Likely to occur once during the operational life of the facility / project. Might occur at some time.
D	Unlikely	A rare combination of factors would be required for an occurrence. Conceivable but would require multiple failures of systems and controls. Unlikely to occur during the operational life of the facility / project. Could occur at some time and/or Happened before.
E	Rare	A freak combination of factors would be required for an occurrence. Not credible i.e. the teams have never heard of the event occurring in the industry. Very unlikely to occur during the operational life of the facility / project. May occur only in exceptional circumstance.

		Consequence				
		Insignificant	Minor	Moderate	Major	Catastrophic
Likelihood	Almost Certain [A]	Moderate	Moderate	High	Extreme	Extreme
	Likely [B]	Low	Moderate	High	High	Extreme
	Possible [C]	Low	Moderate	High	High	Extreme
	Unlikely [D]	Low	Low	Moderate	Moderate	High
	Rare [E]	Low	Low	Low	Moderate	Moderate

Residual Risk		Controls	
Extreme	This level of risk is unacceptable and. The Task / operation shall not commence until risk reduction measures are implemented or the risk eliminated	Approval to commence by Wasco President	
High	Determine if the risk can be eliminated. If the risk cannot be eliminated, then the task / operation shall not commence until effective risk reduction measures are identified and implemented to reduce the risk to ALARP. If the risk cannot be reduced to an acceptable level, then an alternate way of conducting the operation shall be found	Approval to commence by General Manager	
Moderate	Consideration shall be given to to implement additional effective controls if risk reduction to ALARP can be achieved	Approval to commence by Project Manager / Head of Department	
Low	Implement agreed risk mitigation controls before proceeding	This level of risk is controlled through SWMS, procedures, supervision, etc	

Attendees

[illegible]

	Wasco Australia Pty Ltd																	
	Construction Risk Register																	
	2018 - JEMENA WSGGP Project																	
	Revision No.	Issue Date	Description of Issue			Prepared by				Approved by Project Manager								
	A	14/09/2020	Issued for Client Review			Ross Clarke				Andrew Hargraves								
Item Number	Activity / Product / Task / Process	Risk/ Hazard	Major Effect	Impact / Consequence	Risk			Control measures	Residual Risk				Additional Controls	Residual Risk				Comments
					L	C	R		L	C	RR	ALARP		L	C	RR	ALARP	
1	Logistics Coordinating the transportation of good (including transportation procured goods)	Loading or transportation of goods Unknown weights Oversize and awkward loads Load not suitably restrained	Health & Safety	Overloading Transport Trucks Unplanned movement occurs during transport Procedure and regulatory breach for not complying with COR requirements	C	4	H	All personnel involved in the chain of procurement must hold the relevant nationally accredited Chain of Responsibility training. Shipping container to be accompanied with 'Container Weight Declarations' Oversize and awkward loads to be assessed to confirm suitable restraint method and weight distribution Project Management to allow realistic timeframes for items to be delivered Restraint of load to be regularly inspected during transit to ensure effectiveness Oversize loads to be escorted (where required) Utilise approved transport companies Engineers to design load restraint method for complex loads Loading and unloading exclusion zones (LUEZ) must be used at all times during loading/unloading activity associated with a vehicle. Competent personnel will be utilised for each task, they will report in to the Construction Superintendent, Construction Supervisor and the Project Engineer who will have ultimate responsibility for ensuring the work is performed in a safe manner. Wasco's C.A.R.E Program which provides a framework for inspections and management interactions (both project and head office) will be utilised as a	D	4	M	Yes				0		
2	Mobilisation to site Transport people to site by road	Fatigued personnel	Health & Safety	personal injury from vehicle accident	C	4	H	HV driving to be conducted as per the nation heavy vehicle log book process HV drivers to stop every 5 hours for 15 minutes LV drivers to stop every 2 hours for 15 minutes Driver fatigue topic covered as part of the project induction Project approved roads to be used to transport people and plant to and from the project work fronts Crew Bus will be used to transport personnel to / from airport. A licensed bus driver will be used (if required) Journey management procedure/plan	D	4	M	Yes						
3	Mobilisation to site	Personnel not fit for work (in sound medical condition to perform work duties)	Health & Safety	personal Injury	C	4	H	Personnel must complete a pre employment medical. This includes a drugs and alcohol test Covid !9 risk Assessment	D	4	M	Yes						
4	Mobilisation to site Mobile plant and Equipment	Faulty Plant Not fit for purpose Poor mechanical condition	Health & Safety	personal injury from vehicle accident	C	4	H	All plant to be maintained as per the OEM or equivalent. Plant risk assessment , Certificates of compliance,Service History,pre acceptance site inspection and are to be readily available on site for the durationof the project All plant to have a daily pre start check done by the operator each shift and recorded. Copies of the daily pre start check must be submitted at the completion of each day to the HSE advisor or Supervisor. All faulty plant to be tagged out of service and quarantined until deemed acceptable Plant must be fit for purpose and will be recorded onto a Plant Register	D	4	M	Yes				0		

Item Number	Activity / Product / Task / Process	Risk/ Hazard	Major Effect	Impact / Consequence	Risk			Control measures	Residual Risk				Additional Controls	Residual Risk				Comments
					L	C	R		L	C	RR	ALARP		L	C	RR	ALARP	
5	General Site Work	Driving	Community, Stakeholder and Reputation	Community complaints poor reflection on the project	B	3	H	Wasco Inductions ,Client Inductions. Speed limits to be adhered to . All requirements of Client Only use registered, roadworthy and correctly maintained vehicles and pre start checks done. Licenced drivers with suitable class of drivers licence. Use of small buses to transport the bulk of the workforce to site to minimise the number of drivers and vehicles on the road. Project fatigue management procedure to be followed (includes 0 Breath alcohol limit. Travel management procedure to be followed. All vehicles will be fitted with radios. Drive to the conditions. Drivers and passengers are to be courteous at all times to fellow road users and pedestrians. Project penalties to be applied for poor driver/passenger behaviour (including loss of driver privileges or other penalties up to and not excluding removal from the project as determined after suitable investigation and then deliberation of the facts by the WASCO project manager). Construction Manager Project Engineer and HSE Advisor will be responsible for ensuring all personnel are fit for duty Construction Manager, Project Engineer and HSE advisor will be trained and competent in performing breath alcohol testing.	D	3	M	Yes				0		
6	General Site Work	Driving	Health & Safety	Motor vehicle accident resulting in personal and or property damage	C	4	H	Wasco Inductions ,Client Inductions. Speed limits to be adhered to . Only use registered, roadworthy and correctly maintained vehicles and pre start checks done. Licenced drivers with suitable class of drivers licence. Use of small buses to transport the bulk of the workforce to site to minimise the number of drivers and vehicles on the road. (If Required) Project fatigue management procedure to be followed (includes 0 Breath alcohol limit. Travel management procedure to be followed. All vehicles will be fitted with radios. Drive to the conditions. Drivers and passengers are to be courteous at all times to fellow road users and pedestrians. Project penalties to be applied for poor driver/passenger behaviour (including loss of driver privileges or other penalties up to and not excluding removal from the project as determined after suitable investigation and then deliberation of the facts by the WASCO project manager). Construction Manager Project Engineer and HSE Advisor will be responsible for ensuring all personnel are fit for duty Construction Manager, Project Engineer and HSE advisor will be trained and competent in performing breath alcohol testing.	D	4	M	Yes				0		
7	General Site Unloading/Loading plant, equipment or materials from trucks/transport HRCW (High Risk Construction Work due to "Work in an area with movement of powered plant")	moving plant, uncontrolled loads interaction between plant and personnel	Health & Safety	Personal Injury .	C	4	H	Maintain a dedicated area for loading / unloading Exclusion zones LUEZ Spotters in place Spotters to be in place at all times whilst unloading Trucks to be isolated during task and fundamentally stable Transport loading and unloading of equipment and materials use a Take 5 to identify hazards and control risks . Craneage SWMS to be used if using craneage. Checking load shift had not occurred during transit - check with driver who will assess and release load binders . Trained , competent and VOC'd operators / dogman only used. Deny access to unauthorised personnel. Delivery drivers to have a visitor induction and be under direct supervision of a fully inducted person. Competent personnel will be utilised for each task, they will report in to the Project Engineer or the Construction Supervisor who will have ultimate responsibility for ensuring the work is performed in a safe manner by utilising the Wasco's C.A.R.E	D	4	M	Yes				0		

Item Number	Activity / Product / Task / Process	Risk/ Hazard	Major Effect	Impact / Consequence	Risk			Control measures	Residual Risk				Additional Controls	Residual Risk				Comments
					L	C	R		L	C	RR	ALARP		L	C	RR	ALARP	
8	General Site Work HRCW (High Risk Construction Work due to "Work in an area with movement of powered plant")	Faulty Plant Not fit for purpose Poor mechanical condition	Health & Safety	Personal injury Damage to mobile plant	C	4	H	All plant to be maintained as per the OEM or equivalent. Plant risk assessment ,to be readily available on the vehicle ,reviewed and signed by the operator Operators to be ticketed and VOC'd All plant to have a daily pre start check done by the operator each shift and recorded. Copies of the daily pre start check must be submitted at the completion of each day to the HSE advisor or Supervisor. All faulty plant to be tagged out of service and the fault reported to the supervisor for rectification before the plant can be operated. Plant must be fit for purpose and will be recorded onto a Plant Register	D	4	M	Yes				0		
9	General Site Work Working in hot environment	Heat Stress	Health & Safety	Serious Personal injury	C	4	H	Fit for work ,Construction Manager Project Engineer and HSE Advisor will be responsible for ensuring all personnel are fit for duty Adequate fresh cool water available at all times for the work site. Shade shelters as required Wasco management/supervision to ensure that adequate resources are available to allow rotation of tasks and increased rest breaks etc if required. Reschedule non essential tasks to cooler times of the day Provide Toolbox meetings topics including "Managing heat stress" Client Induction prior to starting Wasco Inductions Company provided clothing and PPE Sun protection provided (wide brims , sunblock) Air conditioned crib room Site Supervisor to monitor condition of workers Access to up to date weather forecasts .	D	4	M	Yes				0		
10	General Site Work Extreme weather event	Lightning, Rain ,Storms, Wind, Local Flooding	Health & Safety	Personal Injury	C	4	H	Site supervisor to monitor the Bureau of Meteorology (BOM) day weather forecasts and incorporate in planning. Site Supervisor to monitor the Bureau of Meteorology (BOM) flood warnings and notify project personnel and contractors if local flooding is evident which impacts access to site. Site Supervisor to monitor and cease work if weather conditions are dangerous - electrical storms , high wind days , heavy rain. The Supervisor on site will make the call on rain effected days Crew to de-mob off work area and into crib rooms , if conditions worsen crew will demob from site back to accommodation.	D	4	M	Yes						
11	General Site Work	Fitness for work	Health & Safety	personall injury ,damage to plant and equipment	B	4	H	Ensure WASCO Fit For Work policy is followed. 100% alcohol testing of the work force prior to starting work each day. 0 alcohol level required for work. Random drug testing and targeted drug testing if required. 5% drug testing average over the term of the project. Personnel to be adequately rested prior to start each day ,rosters to be designed so there is adequate recovery time between shifts to travel, eat, wash and sleep. 10 hours' continuous rest time prior to and between shifts WASCO has an EAP available for employee wellness through the services of "Workplace Wellness" (Contact number is office (07) 35351239 or EAP service line 1300 326 350) Inductions and tool box. Construction Manager Project Engineer and HSE Advisor will be responsible for ensuring all personnel are fit for duty Construction Manager, Project Engineer and HSE advisor will be trained and competent in performing breath alcohol testing. Toolbox dicussions and site inductions	D	4	M	Yes				0		
12	General Site Work	Fatigue	Health & Safety	personal injury ,damage to plant and equipment	B	4	H	Ensure compliance with the WASCO Fatigue Management Plan (WAPL-HSS-PLN-003) Fitness for work Monitor workers to ensure are rested Consult with the workforce to ensure the work schedule is realistic and fatigue is being managed adequately.Inductions and Tool Box	D	4	M	Yes				0		

Item Number	Activity / Product / Task / Process	Risk/ Hazard	Major Effect	Impact / Consequence	Risk			Control measures	Residual Risk				Additional Controls	Residual Risk				Comments
					L	C	R		L	C	RR	ALARP		L	C	RR	ALARP	
13	General Site Work	Poor Communication /simops	Health & Safety	Instructions/direction not clear resulting in a health or safety incident	C	3	H	Ensure all work/task Instructions/directions are clear and concise. Ensure communication between all work crews is maintained (SIMOPS).In conjunction with Prestart meetings, Hazob cards, Take 5s, SWMS, toolbox meetings Ensure planning takes into account work crew interactions and suitable meetings/directions are given and understood before starting tasks. Onboarding inductions to include Simops Interface meetings with Jemena Management team to be carried out to manage interactions with JGN (Jemena Gas Networks) and EGP (Eastern Gas Pipeline) Operational Team members.	D	3	M	Yes				0		
14	General Site Work	Poor Communication	Environmental	Instructions/direction not clear resulting in a diversion from the Construction Environment management Plan and a possible environmental incident	C	3	H	Ensure all work/task Instructions/directions are clear and concise. Ensure communication between all work crews is maintained (SIMOPS). Ensure planning takes into account work crew interactions and suitable meetings/directions are given and understood before starting tasks. Ensure all environmental controls are installed and maintained as per the site EMP. Onboarding inductions to include environmental information	D	3	M	Yes				0		
15	General Site Work	Poor Communication	Community, Stakeholder and Reputation	Instructions/direction not clear resulting in an incident involving project personnel and a member of the public	C	3	H	All project personnel are to be courteous and polite to any I member of the public. All questions or concerns are to be directed to the Client personnel for their attention.	D	3	M	Yes				0		
16	Site Establishment General Site Work Emergency Response	Poor access to emergency services/ medical facilities	Health & Safety	personal injury	C	4	H	Client Emergency response plan. Wasco Emergency Response Plan Regularly review site first aid kits (6 monthly). Maintain Fire extinguisher register(6 monthly test and tag period) UHF radios issued for site . muster point identified at induction. First aiders identified. Emergency Numbers including medical facilities are placed in common areas. Smoking is only allowed in authorized areas.	D	4	M	Yes				0		
17	General Site Work HRCW (High Risk Construction Work due to "Work in an area with movement of powered plant")	personnel Interaction with plant (line of fire)	Health & Safety	personal injury	C	4	H	Restricted access work areas to be set up/defined around working plant. Prestart meetings Exclusion Zones Erect appropriate signage where applicable. No person to be in the operational range of operating plant. The direction of work flow is to be determined by the supervisor and clearly communicated to the plant operators prior to the start of any new task or if there is a change of conditions including new personnel to the task. Two way radios, Light beacons Reverse beacons on mobile plant while working on the site. Positive communication(Radio and Visual) Operator: to stop work if positive communications is not established. Spotters to be used when required	D	4	M	Yes				0		
18	General Site Work		Health & Safety	personal injury	C	4	H	Plant and machinery to have suitable edge protection in place to access the plant/machine for operation or service/maintenance.	D	4	M	Yes				0		
19																		
20	General Site Work	Slips / trips and falls	Health & Safety	Personal injury	C	3	H	Ensure walkways are clear and stable. Ensure good housekeeping Wear correct footwear in good condition. Three points of contact when accessing plant or machinery. Dry off wet access points to plant if required. Remove mud build up on plant access points as required. Eyes on path	D	3	M	Yes				0		
21	General Site Work	Noise	Health & Safety	Possible serious injury	C	3	H	Hearing protection to be worn when working around machinery ,compressors,grinding and power tools Ensure good communication within the work crew and especially between the escorting vehicles, dogman/rigger and the crane operator. Crane crew to nominate what form of signals to be used eg. hand or radio before any lift. Verify ambient noise does not interfere with clear communication and adjust communication plan appropriately.	C	2	M	Yes						

Item Number	Activity / Product / Task / Process	Risk/ Hazard	Major Effect	Impact / Consequence	Risk			Control measures	Residual Risk				Additional Controls	Residual Risk				Comments
					L	C	R		L	C	RR	ALARP		L	C	RR	ALARP	
22	General Site Work	Uncontrolled construction waste disposal Rubbish being poorly managed on site!	Community, Stakeholder and Reputation	Breach of client agreement	C	2	M	Wasco to ensure that adequate waste bins are available at all times on site. Change out of full bins as required. Skip bins to be covered at all times Covers (shade cloth or the like) for windy conditions if required on light general waste bins. Any rubbish not contained in a suitable receptacle to be picked up and placed into the relevant waste bin. Waste is to be recycled wherever practicable.	D	2	L	Yes				0		
23	General Site Work Craneage/lifting	Dropped loads overturned cranes (Plant used in crane mode), unstable crane pad, crane failure	Health & Safety	crush injuries,	C	4	H	A SWMS for general site craneage for under 10 t and under 80% compacity Lift Study to be carried out and approved by competent person for all critical lifts. Only high risk licenced operators and dogman/riggers to be used to operate a crane and select rigging and direct the crane operator. Plant used in crane mode must be operated by personnel with appropriate proof of training and competence. Tested and tagged lifting equipment. Rigging Register maintained and gear inspected by a Competent Person must be tagged (RuGBY System 3 monthly intervals) and in good order Rigger/Dogman to inspect all lifting Equipment prior to lift and are to ensure the slings/chains are within the safe working load Mobile crane operations must be within the lift charts of the machine with adequate derating for any slope etc. Spotters to be used as/if required. No person to be under a suspended load. Exclusion Zones in place If there is any unauthorised entry to site/exclusion zone then work must cease until the unauthorised personnel are moved to a position of safety. Ensure good communication within the work crew and especially between the dogman/rigger and the crane operator. Crane crew to nominate what form of signals to be used eg. hand or radio before any lift..	D	4	M	Yes				0		Competent personnel will be utilised for each task, they will report in to the Project Engineer or the Construction Supervisor who will have ultimate responsibility for ensuring the work is performed in a safe manner by utilising the Wasco's C.A.R.E Program which provides a framework for inspections and management interactions (both project and head office) will be utilised as a method of ensuring compliance.
24	General Site Work	manual handling	Health & Safety	Musculoskeletal injuries	C	4	H	Use mechanical aids wherever possible Use correct lifting techniques. eg 1. Plan Your Lift 2. If the load is too heavy or awkward to handle alone, get assistance. ... 3. Get a Firm Footing. ... 4. Bend Your Knees. ... 5. Tighten Your Stomach Muscles. ... 6. Lift with Your Legs. ... 7. Keep the Load Close. ... 8. Avoid Twisting and Turning Your Back. Personnel only lift weight that is comfortable to lift for that individual. Use team lifts where required. Ensure clear path of travel when moving an item from point to point. Plan any manual tasks to ensure adequate resources and rotation of tasks if required.	D	4	M	Yes				0		
25	General Site Work Use of electrically powered equipment/power tools	Using electrical equipment	Health & Safety	electric shock or electrocution Personal injury	C	4	H	All electrical equipment must be tested and tagged (RuGBY System) and in good order. All electrical equipment must be visually inspected before use each shift to ensure it is in good repair with no damage. All damaged or out of test date electrical equipment must not be used and must be tagged out of service and removed from the job site as soon as practicable for repair by a qualified/ certified repair person (Licenced electrician) before returning to the work area or condemned and replaced. Electrical circuits must be protected by RCD and tested before the first use daily. Use electrical equipment with the correct IP rating for the environment in which it is being used. Use battery operated power tools where possible All electrical leads to off the ground on insulated hooks and lead stands	D	4	M	Yes				0		

Item Number	Activity / Product / Task / Process	Risk/ Hazard	Major Effect	Impact / Consequence	Risk			Control measures	Residual Risk				Additional Controls	Residual Risk				Comments
					L	C	R		L	C	RR	ALARP		L	C	RR	ALARP	
26	General Site Work Handling Dangerous Goods or Hazardous Substances	Inhalation ,ingestion ,skin contact ,splash to eyes,	Health & Safety	Personal injury	C	3	H	Storage of DG and hazardous substances as per relevant standards and codes of Practice . MSDS register to be maintained MSDS Register to be readily available where the hazardous substances are used and stored. Hazardous Goods cabinet on site . Hazardous Gases stored as per standard. All DG and hazardous substances to be risk assessed . Provide work crews with the correct PPE inline with SDS requirements. Provide Appropriate First aid equipment , Emergency response and Spill response equipment available as required and as recommended by SDS. Personnel to read SDS and incorporate controls into SWMS or Take 5. Spill kits	D	3	M	Yes				0		
27	General Site Work Handling Dangerous Goods or Hazardous Substances	Environmental leaks , poor disposal of substances	Environmental	Environmental damage	C	4	H	Storage of DG and hazardous substances as per relevant standards and codes of Practice . MSDS register . Hazardous Goods container on site Hazardous Gases stored as per standard. Emergency response and Spill response equipment available as required and as recommended by SDS. All disposals in accordance with statutory requirements and in full compliance with the EMP. Spill kits	D	2	L	Yes				0		
28	General Site Work Use of Compressed air (Compressors)and air tools	Air injection, whipping hoses and fittings,Noise	Health & Safety	hearing damage,personnel injury	C	3	H	All air compressors to be serviced and maintained in accordance with the OEM. All hoses and attachments to be in good working order. Safety clips and whip checks to be in place on all air hoses and air tools when in use. No person to direct compressed air at themselves or another person. No person to blow off clothing. There must be someone else working in the vicinity or a spotter capable of shutting down the compressor should there be an emergency. A daily prestart must be conducted on all compressors before use each shift. Hearing protection to be worn. Double eye protection to be worn on specific tasks	D	3	M	Yes				0		
29	Earth works and Civil HRCW (High Risk Construction Work due to "Work in an area with movement of powered plant")	Interaction of plant or equipment with third party property or personnel. Underground services (e.g. power, gas)	Health & Safety	Possible damage to plant or personnel	C	4	H	Review DBYD / Client plans / as built drawings Full service location (potholing) prior to mechanical excavation on site (as required) Hand-dig in immediate vicinity to known services Spotter to accompany mechanical excavation at all times Monitor and restrict the entrance/access to site to reduce the possibility of a third party entering site unauthorised with their vehicle/property. Ensure site security is monitored constantly by supervision. Work crew to set up an exclusion zone around Earth works /piling activities. Signage to be placed for exclusion of personnel not directly involved with the task. If there is any unauthorised entry to site/exclusion zone then work must cease until the unauthorised personnel and or their property are moved to a position of safety .Ensure communication between all work crews is maintained (SIMOPS).In conjunction with Prestart meetings, Hazob cards, Take 5s, SWMS, toolbox meetings.	D	4	M	Yes				0		
30	Earth works and Civil	Disturbance/ work outside of defined work area (co-ords)	Business, Financial	Construction delays	C	3	H	Survey to identify area of ground disturbance prior to any excavation commencingEnsure that boundary survey is complete and boundaries are clearly marked before commencing on site clear and grub etc.Review DBYD / Client plans / as built drawings	E	2	L	Yes				0		
31	Earth works and Civil	Interaction of plant or equipment or personnel.	Business, Financial	Possible damage to plant or personnel	C	4	H	Current and approved drawings on site and issued to Excavation team Current GIS data and Information from client. Appropriate spotters will be assigned where required. . Work crew to set up an exclusion zone around piling activities. If there is any unauthorised entry to site/exclusion zone then work must cease until the unauthorised personnel are moved to a position of safety..	E	4	M	Yes				0		

Item Number	Activity / Product / Task / Process	Risk/ Hazard	Major Effect	Impact / Consequence	Risk			Control measures	Residual Risk				Additional Controls	Residual Risk				Comments
					L	C	R		L	C	RR	ALARP		L	C	RR	ALARP	
32	Earth works and Civil Work near Third Party Assets	Failure to follow safety requirements of the Asset Owner	Health & Safety	possible personal or property damage	C	4	H	PTW in place Area surveyed Dial before you dig and site as built drawings. Positively identify service using Vacuum Truck excavation Hard barricade excavations of known services The location of the gas lines shall be clearly marked. Spoil to be placed over existing pipeline	D	4	M	Yes						
33	Earth works and Civil	Inadequate sediment and erosion control	Environmental	Environmental damage	C	3	H	Ensure all sediment and erosion controls are installed as per the EMP and ESCP the specific drawings for the pipeline	D	3	M	Yes						
34	Earth works and Civil Formwork/ concreting	Manual handling hand tools sharp edges /objects Muscular Skeletal Injuries due to: Posture strain Repetitive strain Vibration concrete burns Concrete slurry contact with eyes	Health & Safety	Musculoskeletal injuries	C	4	H	Use mechanical aids wherever possible Use correct lifting techniques. eg 1.Plan Your Lift 2.If the load is too heavy or awkward to handle alone, get assistance. ... 3.Keep the Load Close. ... 4. Avoid Twisting and Turning Your Back. Personnel only lift weight that is comfortable to lift for that individual. . Ensure clear path of travel when moving an item from point to point. Plan any manual tasks to ensure adequate resources and rotation of tasks if required. Gloves to be used PPE - site requirements SWMS Assess area for hazards clear access/egress Caps on reo-bars/star pickets Correct PPE as identified on MSDS Check formwork for residual nails prior to use Formwork to have nails removed when stored for reuse Correct use of tools Portable eye wash station to be on site where	D	4	M	Yes				0		
35	Earth works and Civil Use of concrete pumps/trucks	Collapse of concrete pump, line blockage	Health & Safety	possible plant property and personal damage	C	4	H	All concrete pumps to be maintained in accordance with the OEM and pipes to be thickness tested. Concrete pump log book to be available at all times the pump is on site. The log book must be current and up to date. Only suitably qualified and trained personnel (High Risk Licensed as required) to operate concrete pumps and concrete trucks.Concrete pumps to be set up on the plant hard stand (Known bearing capacity of the hard stand) in accordance with the operators manual. Ensure no person in the line of fire when cleaning the pump lines or where there is a blockage	E	4	M	Yes						
36	Earth works and Civil Use of concrete pumps/trucks	Concrete slurry contact with eyes/skin	Health & Safety	Possible eye injury or skin irritation or dermatitis	C	2	M	Use appropriate PPE (Glasses) and gloves. Ensure an adequate supply of eye wash is on site from mobilisation onwards. If contact occurs use eyewash to irrigate the affected eye and wash other affected body part with clean running water. Any eye injury requires a medical investigation to ensure no damage to the eye. Medical investigation as a precaution only and NOT a medically treated injury unless there is a need for further medical treatment.Full Sleeve Shirts to be worn and rolled down.	D	2	L	Yes				0		
37	Earth works and Civil Concrete works Concrete truck/ pump wash out	uncontrolled wash out of concrete trucks/pumps	Environmental	Contamination of area with uncontrolled wash out of concrete trucks/pumps	B	2	M	Wasco to install and maintain a designated wash out area for the concrete delivery trucks and concrete pumps.	E	2	L	Yes						
38	Earth works and Civil Concrete works Concrete delivery to site	poor mix design or lengthy delar between batching and delivery to site/placement on site.	Business, Financial	Concrete not to spec and not complying with the Quality parameters	C	2	M	Wasco to ensure an approved concrete mix design to comply with the time paremeters of the quality requirements for concrete placement. Only order concrete when everything is ready for placement. Where required there may be a need to use ice in the concrete mix to allow for travel time/ heat of day issues.	D	2	L	Yes						
39	Earth works and Civil Trench excavation, backfill	Excavation, Non compliant open trench causing possible trench collapse and personal damage to workers	Health & Safety	personal injury	C	4	H	•Whenever any person is to enter the trench it shall be battered, benched or shored if deeper than 1.5m. •2 suitable forms of ingress/egress (Stairs / ramps) (bellholes) • All operating plant and equipment (including stationary motors, welders etc.) must be at a minimum or 1.5 x depth from the excavation when personnel are to work in the excavation. No vehicles or plant/equipment are to be placed in the zone of influence of the trench.when personnel are to work in the excavation. no person to enter an excavation while working alone. Open trenches/excavations to be protected/identified as required with either an earth bund or bunting or other suitable method (e.g. A cover over a penetration).	D	4	M	Yes						
40	Installation Pre Cast Concrete HRCW (High Risk Construction Work due to "Work in an area with movement of powered plant")	Working around suspended loads	Health & Safety	Crush injuries	C	4	H	Only those personnel required for the task to be in the work area to reduce congestion. Involve Crane/excavator operator ,dogman and other relevant persons when planning, SWMS for task Competent Operators , Tested and tagged lifting equipment . Rigger Gloves Inspect ground conditions and confirm suitability Determine the movement limitations of any excavators and the load,	D	4	M	Yes				0		

Item Number	Activity / Product / Task / Process	Risk/ Hazard	Major Effect	Impact / Consequence	Risk			Control measures	Residual Risk				Additional Controls	Residual Risk				Comments
					L	C	R		L	C	RR	ALARP		L	C	RR	ALARP	
41	Earthworks / Piling	Interaction of plant or equipment or personnel.	Business, Financial	Possible damage to plant or personnel	C	4	H	Current and approved drawings on site and issued to Earth works/Piling team. Current GIS data and Information from client. Appropriate spotters will be assigned where required. . Work crew to set up an exclusion zone around piling activities. If there is any unauthorised entry to site/exclusion zone then work must cease until the unauthorised personnel are moved to a position of safety..	E	4	M	Yes				0		
42	Earthworks / Piling	Incorrect operation of piling rig	Health & Safety	Failure of piling rig, dropped cage, personal damage to personnel working with piling rig Rotating Auger	C	4	H	Exclusion zone to be established around piling activities. Ensure communication between all work crews is maintained (SIMOPS).In conjunction with Prestart meetings, Hazob cards, Take 5s, SWMS, toolbox meetings. The number of other trades on site is minimal at the piling stage eliminating unnecessary personnel at the work site. Only experienced suitably licenced/trained personnel to be involved with the tasks .High risk licenced dogman to attach and direct suspended loads. . Plant hazard risk assessments.SWMS and SOPs . Competent personnel will be utilised for each task, they will report to the Construction Superintendent, Construction Supervisor and the Project Engineer who will have ultimate responsibility for ensuring the work is performed in a safe manner.	D	4	M	Yes				0		
43	Stringing of pipe	Unsafe operation of excavator	Health & Safety	Personal injury	C	3	H	A LOAD/ UNLOAD EXCLUSION ZONE is to be established prior to any lifting.No person to access on to the load without adequate edge protection in place to prevent a fall. Excavator operator must be competent and VOC'd Trained and competent rigger/dogman slinging the load.Lifting equipment inspected ,Test and tagged by a competent person. One person directing lifting operations – single point of contact. Truck to escorted onto site Positive communications. Spotter in place. Truck driver to remain in the truck at all times •Ensure all non-essential equipment and personnel clear of area and pipeline (Close off ROW if necessary). •truck driver will drive forward as instructed by the spotter •Excavator to position bundlesa at intervals along the right of way No body parts in the line of fire. Personnel ensure no part of body is placed under the suspended load. (Positive communications) Operator to slew without unnecessary sharp movements Ensure pipe is no higher than 1m from the ground if walking excavator is necessary.	D	3	M	Yes						
44	Welding	Pipe joining	Business, Financial	Incorrect welding materials, technique, procedures etc	C	4	H	1. Inspection/Quality Processes 2. Visual inspection of pipe. 3. Weld procedures and independent third party validation 4. Qualified Welders.	D	3	M	Yes						
45	Welding	Pipe joining Pinchpointsmanual handling.	Health & Safety	Musculoskeletal injuries Hand injuries	C	4	H	Clamps etc. Pinchpoints Gloves to worn Personnel only lift weight that is comfortable to lift for that individual. Use team lifts where required. Ensure clear path of travel when moving an item from point to point. Pipe supports	D	3	M	Yes						
46	Welding	Suspended Pipe during alignment & tackingDropped pipe	Health & Safety	Dropped pipe/Significant crush if pipe rolls after drop	C	4	H	Welding work procedures including fit- up .Accepted work procedures Knee high drop height. Use of chocks/skids Qualified Welders No work under suspended loads	D	3	M	Yes						
47	Welding and Grinding	Electricity ,	Health & Safety	Electrical Shock / Burns/	C	4	H	Only welders with VRD (Voltage Reduction Devices) fitted may be used on site. All electrical equipment must be tested and tagged (RuGBY System) and in good order. All electrical equipment must be visually inspected before use each shift to ensure it is in good repair with no damage. All damaged or out of test date electrical equipment must not be used and must be tagged out of service and removed from the job site as soon as practicable for repair by a qualified/ certified repair person (Licenced electrician) before returning to the work area or condemned and replaced. Electrical circuits must be protected by RCD and tested before the first use daily. . All electrical leads to off the ground on insulated hooks and lead stands	D	4	M	Yes						

Item Number	Activity / Product / Task / Process	Risk/ Hazard	Major Effect	Impact / Consequence	Risk			Control measures	Residual Risk				Additional Controls	Residual Risk				Comments
					L	C	R		L	C	RR	ALARP		L	C	RR	ALARP	
48	Welding/grinding	Welding flash/burns etc	Health & Safety	Potential eye injuries, burns etc.	C	3	H	Use correct PPE for the task, (Welding masks, welding gloves,) appropriate for the specific task. Restrict unnecessary personnel from entry into the welding work area. SWMS to show controls. Take 5 as required. Only experienced and suitably qualified welders to be used. All welding plant and consumables to be in good order. Ensure part rods etc. are not just dropped and are disposed of safely. Welders to use correct welding eye protection at all times when welding. Double eye protection when grinding Welding Humpies to be utilised	D	3	M	Yes				0		
49	Welding/grinding	uncontrolled movement of grinder, failure of oxy set/hoses)	Health & Safety	Personal Injury	C	4	H	Use flash back arrestors on both gauge and hand piece ends of oxy set, guarding to be in place with grinders., handle to be in place on grinder in accordance with OEM, experienced trades people and trades assistants to use tools of trade. All tools to be inspected prior to use each shift. Any damaged tools to be tagged out of service and repaired or replaced before use on site. Hazards and controls to form a part of the relevant SWMS for the tasks involving these tools. Use correct PPE for the task, (Welding masks, welding gloves,) appropriate for the specific task. Double Eye protection when grinding and oxy cutting	D	4	M	Yes				0		
50	Welding	.Uncontrolled Fire	Health & Safety	Property, Plant & Equipment Damage, Injury to Personnel	C	4	H	Fire Extinguishers on Each Welding Rig Humpy to be used during welding and grinding Fire watcher to be in place• Conditions to be assessed and monitored each day by senior representative onsite. Consideration given to wind direction and adjacent land use	D	4	M	Yes						
51	Welding Welding in bell holes	Possible trench collapse and engulfment, equipment roll over, unsuitable access points, trenches not correctly protected, adverse weather conditions affecting the integrity of the trench/excavation	Health & Safety	personal injury	C	4	H	Well ventalated area All operating plant and equipment (including stationary motors, welders etc.) must be at a minimum or 1.5 x depth from the excavation when personnel are to work in the excavation. Check wind direction Spotters in place No personnel are to enter a trench unless site specific Risk Assessments conducted and deemed safe by the supervisor No person is authorised to enter a trench if lone working Assessment of ground conditions to be conducted constantly by a competent trenching supervisor Use of battering, benching or shoring as determined by availability of space and ground conditions must be constructed No working in trenches greater than 1.5 metres if benching, battering or shoring is not constructed/installed and something could affect the stability of the trench (eg. water seepage from side or base, cracks appearing, subsidence beside the excavation). 2 Access & Egress points at all times must be installed where personnel will be working & 1 x ladder at the site as an emergency back up.	D	4	M	Yes				0		
52	Hot tap HRCW (High Risk Construction Work due to"Work on or near energised electrical installations or services and/or work on or near pressurised gas mains or piping"	Uncontrolled gas release,ignition of gas,eg. underground pipes Damage to existing infrastructure	Health & Safety	Damage to existing infrastructure resulting in personal damage to personnel	C	5	H	Client Induction Any work within 5 meters of the live gas assets shall require work to be conducted under Client PTW with all the associated conditions,controls and information. Personal Gas detectors used with every work group in Hazardous areaWork shall not start until all relevant service plans have been received and service locations marked on the pipe and. SWMS and procedures in place Specilised Contractor with trained and competent personnel to be utilised for hot Tap work Discharge stored energy Check depressurisation prior to unbolting / cut-ins Double isolation where possible	E	5	M	Yes						
53	NDT	Radiation exposure	Health & Safety	Health effect	B	3	H	1. Only conducted by NATA approved, competent & licensed personnel 2. Safe System of Work SWMSN 3. Supervision/Pre-start/Check safe 4. Sub-contractors Procedures and emergency response for use with radioactive materials 5. Inductions 6. Exclusion zones 7. Signage 8. Exposure monitors for technicians 9. Sequencing of work	C	2	M	Yes						

Item Number	Activity / Product / Task / Process	Risk/ Hazard	Major Effect	Impact / Consequence	Risk			Control measures	Residual Risk				Additional Controls	Residual Risk				Comments
					L	C	R		L	C	RR	ALARP		L	C	RR	ALARP	
54	Field Joint Coating Stopag	Eye injury Skin contamination on pipe Dust	Health & Safety	Medical Treatment	C	4	H	Ensure a current copy of all the MSDS's for the product being used are available onsite where the work is being carried out. All personnel shall read through the MSDS's and be aware of the known risks and associated hazards with each material they will be using. Ensure appropriate PPE are worn and used in accordance with MSDS requirements Surface must be clean to ensure adhesion and prevent rework	C	2	M	Yes						
55	Field Joint Coating	cutting of tape ,hand injury	Health & Safety	Medical Treatment	C	2	M	PPEgloves to worn scissors to be used Competent personnel Safe System for Work * (SWMS)	C	1	L	Yes						
56	Field Joint Coating	Manual handling	Health & Safety	Possible serious injury	C	3	M	Where awkward positions are required to be maintained in order to complete wrapping take regular breaks Rotate tasks Use correct manual handling techniques. Wear appropriate gloves for manual tasks being undertaken	D	3	M	Yes						
57	Trench excavation, lay , backfill	Work near Third Party Assets, Failure to follow safety requirements of the Asset Owner	Health & Safety	possible personal or property damage	C	4	H	Client PTW required withiin 20m of underground services and 5m of aboveground services (signage required for exclusion zones) •Area surveyed •Dial before you dig and site as built drawings. •Positively identify service using Vacuum Truck excavation •Hard barricade excavations of known services (where required) •The location of the gas lines shall be clearly marked. Spoil to be placed over existing pipeline •Approval from asset owner prior to any works in asset exclusion zone •Authorisation to excavate	D	4	M	Yes						
58	Trench excavation, lay , backfill	Excavation, Non compliant open trench causing possible trench collapse and personal damage to workers	Health & Safety	personal injury	C	4	H	•Whenever any person is to enter the trench it shall be battered, benched or shored if deeper than 1.5m. •2 suitable forms of ingress/egress (Stairs / ramps) (bellholes) • All operating plant and equipment (including stationary motors, welders etc.) must be at a minimum or 1.5 x depth from the excavation when personnel are to work in the excavation. No vehicles or plant/equipment are to be placed in the zone of influence of the trench.when personnel are to work in the excavation. no person to enter an excavation while working alone. Open trenches/excavations to be protected/identified as required with either an earth bund or bunting or other suitable method (e.g. A cover over a penetration).	D	4	M	Yes						
59	Trench excavation, lay , backfill	Excavation - plant Line of fire	Health & Safety	crush injuries	C	4	H	•Exclusion zone around mobile plant •Positive communication with operator •Deadman switch to be used at all times •Competent operator •Only essential personnel in work area *Spotters when required *SWMS	D	4	M	Yes						
60	Trench excavation, lay , backfill	Install Pipe Trench collapse, overturned excavator	Health & Safety	, crush injuries	C	4	H	•The lifting in of the pipe by the Excavators shall be deemed a multiple lift and a lift plan is required to demonstrate adequate capacity of the machines for the placement of pipe into the trench. All Dual lifts to rigging and direction to be conducted by a Intermediate rigger or above Excavators is to remain >2m from the edge of the trench to avoid collapse where possible.No vehicles or plant/equipment are to be placed in the zone of influence of the trench •Exclusion zone around the slew area of the excavator •Positive communications •No personnel to be between the pipe and the trench when lifting is undertaken. "Line of Fire" shall be addressed in the SWMS for the task. •Spotter when required *SWMS *Inspection of all lifting equipment prior to use by a competent person and tagged	D	4	M	Yes						
61	Trench excavation, lay , backfill	Holiday Inspection (steel transition fittings) for risers	Health & Safety	Electrical Shock	C	2	M	•Experienced Jeepor Operator *All other personnel clear of Pipe under test.☐ •Ensure Jeepor is turned off whilst not in use. •Pipe is earthed *SWMS *Site Supervision	D	2	L	Yes						
62	Trench excavation, lay , backfill	Install Pipe Pipe damaged during the placement process	Business, Financial	Delays financial loss	C	2	M	•Ensure that the pipe is handled in a manner to prevent damage to the pipe. •Ensure correct bedding is installed to protect the pipe. •Ensure that the pipe is controlled to prevent permanent distortion of the pipe through excessive flexing/bending during placement after welding. *SWMS Ensure pipe joins are suitably coated to protect the pipe	D	2	L	Yes						
63	Trench excavation, lay , backfill	As-built survey Line of fire	Health & Safety	crush injuries	C	3	H	•As-built survey to be recorded from side of trench, no walking on top of pipe •Suitable attachment on the survey pole shall be installed so the operator does not lean too far over the trench •Survey will take place once there is sufficient static pipe in the trench, to be clear of lower in operations	D	3	M	Yes						

Item Number	Activity / Product / Task / Process	Risk/ Hazard	Major Effect	Impact / Consequence	Risk			Control measures	Residual Risk				Additional Controls	Residual Risk				Comments
					L	C	R		L	C	RR	ALARP		L	C	RR	ALARP	
64	Trench excavation, lay , backfill	Backfill Plant personnel interaction	Health & Safety	Personal Injury	C	4	H	•Competent operator •Restricted access work areas to be set up/defined around working plant and exposed edges/excavations Call up, •Positive coms with operators •The supervisor must clearly communicate site conditions and control measures to be adopted/followed to the plant operators and other work crew members prior to the start of any new task or if there is a change of conditions including new personnel to the task. •Spotter if required. •Speed limit, parking for light vehicles away from the pipeline machinery and its work range, •Two way radios, •Light beacons on mobile plant while working on the site. *SWMS	D	4	M	Yes						
65	Trench excavation, lay , backfill	Backfill Poor compaction	Environmental	Poor implementation of final environmental controls	C	2	M	•Ensure all fill is compacted with adequate passes of the grader tyres, or other suitable plant on the trench line to reduce possible subsidence which may required rework at a later date. •Competent operator	D	2	L	Yes						
66	Reinstatement of is returned to pre construction state	Poor implementation of final environmental controls	Environmental	Re work Poor implementation of final environmental controls	C	3	H	•Ensure that all required permanent controls are in place in accordance with the EMP. •Photographic proof of reinstatement to be collected as proof of compliance with all relevant environmental requirements. •This may be achieved through a pre-construction photographic survey and a post-construction photographic drive through.	D	3	M	Yes						
67	Reinstatement Interaction with plant/other personnel	Interaction with plant/other personnel	Health & Safety	personal injury plant damage	C	4	H	•Competent operator Restricted access work areas to be set up/defined around working plant. •The direction of work flow is to be determined by the supervisor and clearly communicated to the plant operators prior to the start of any new task or if there is a change of conditions including new personnel to the task. • Spotter if required. Speed limit, allocated parking for light vehicles, Two way radios.	D	4	M	Yes						
68	Reinstatement Installation of Marker signs	Manual Handling Noise Using jackhammer Electric shock	Health & Safety	Personal Injury	C	4	H	•Electrical equipment serviceable / tested and tagged •RCD to be use with all electrical tools & equipment •Pneumatic equipment inspected prior to use •Hoses with safety clips / Pins / whip checks •Share the task between crew, job rotation •Correct PPE for the task, gloves, hearing protection extra •As built survey of constructed line •Known offsets (1m) *SWMS	D	4	M	Yes						
69																		
70	Structural, Mechanical and Piping Use of cutting tools (Grinder, oxy set, cut off saw, etc.)	uncontrolled movement of grinder, failure of oxy set/hoses)	Health & Safety	Personal Injury	C	4	H	Use flash back arrestors on both gauge and hand piece ends of oxy set, guarding to be in place with grinders/cut off saws ., handle to be in place on grinder in accordance with OEM, experienced trades people and trades assistants to use tools of trade. All tools to be inspected prior to use each shift. Any damaged tools to be tagged out of service and repaired or replaced before use on site. Hazards and controls to form a part of the relevant SWMS for the tasks involving these tools. Double eye protection to be used. Gloves to be worn.	D	4	M	Yes				0		
71	Structural, Mechanical and Piping Painting/protective coating	Painting/protective coating	Health & Safety	Personal injury to hazardous nature of required coatings	C	4	H	Only experienced personnel to be used to apply protective coatings. All applications and preparation of the surface to be protected to be in accordance with the MSDS for the product. A SWMS must be prepared for the task in consultation with the work force. Adequate and appropriate PPE must be supplied and utilised in accordance with the MSDS for the product/s being used.	E	4	M	Yes				0		
72	Structural, Mechanical and Piping Painting/protective coating	Painting/protective coating	Environmental	Incorrect disposal of hazardous substances. Escape of hazardous substances to the environment	C	2	M	Ensure all hazardous products are stored correctly (i.e. Haz Substances Container) and all empty /used containers are disposed of in accordance with the MSDS and the Project EMP. Any spills to be contained, reported, investigated and cleaned up in accordance with the EMP and in accordance with the Qld Environmental Protection Act 1994.	D	2	L	Yes				0		
73	Structural, Mechanical and Piping	Failure to ensure structural items secured correctly HRCW (High Risk Construction Work due to "Work in an area with movement of powered plant")	Health & Safety	Potential for collapse and injury to personnel	C	4	H	All structural work to be conducted in accordance with the SWMS. Ensure structural items are secured in accordance with the design drawings. Ensure all bolts are positively identified when tightened to specification. Use only high risk licenced crane operator and rigger/dogmen. Dogman /rigger to ensure that the structural items are correctly secured before removing the rigging from the load (Positive communication with the personnel securing the structural members).	E	4	M	Yes				0		

Item Number	Activity / Product / Task / Process	Risk/ Hazard	Major Effect	Impact / Consequence	Risk			Control measures	Residual Risk				Additional Controls	Residual Risk				Comments
					L	C	R		L	C	RR	ALARP		L	C	RR	ALARP	
74	Structural, Mechanical and Piping Welding	Welding flash/burns etc	Health & Safety	Potential eye injuries, burns etc.	C	3	H	Use correct PPE for the task, (Welding masks, welding gloves, etc.) Use welding screens and /or welding huts appropriate for the specific task. Restrict unnecessary personnel from entry into the welding work area. SWMS to show controls. Take 5 as required. Only experienced and suitably qualified welders to be used. All welding plant and consumables to be in good order. Check where welding / electrical leads will run not to cause entanglement Welding humpies and screens to be utilised	D	3	M	Yes				0		
75	Structural, Mechanical and Piping Welding	Restricted work area, minimal working room resulting in awkward positions and poor access and egress	Health & Safety	Musculoskeletal injuries	C	4	H	Rotate task between welders or give adequate rest periods between each pile/skid weld. Encourage the work crew involved to do stretching exercises prior to and after each weld cycle. Welder to have a TA available to assist and reduce stress on the welders body and the need to get in and out to source materials. Adequate means of access and egress Clear the area around the openings of tools, equipment and material. Check where welding / electrical leads will run not to cause entanglement Combustion engine equipment i.e. compressor, generator, shall never be positioned to allow exhaust fumes to be drawn into the work area Set up welding machines away from work area and run leads to work area	D	4	M	Yes						
76	Structural, Mechanical and Piping	Damage to installed building, pipe, pipe racks, infrastructure HRCW (High Risk Construction Work due to "Work in an area with movement of powered plant")	Health & Safety	Plant, machine, Crane or lifted load strikes infrastructure causing damage to infrastructure or load and possible damage to crew working in vicinity	C	4	H	Use spotters when working close to above ground assets (Dogman Rigger and other as required.). Only those personnel required for the task to be in the work area. Exclusion zones delineated as required. No personnel under a suspended load. Use tag lines to eliminate personnel in the line of fire. Ensure adequate escape path for dogman/rigger or other worker involved in the task. Use only experienced and where required high risk licenced personnel to undertake the task. Ensure good communication within the work crew and especially between the dogman/rigger and the crane operator. Ensure slew cranes are set up correctly in accordance with the crane OEM with adequate crane pads and on known bearing capacity hard stand.	D	4	M	Yes				0		
77	Structural, Mechanical and Piping	Pipe rolling on stands or supports	Health & Safety	hand Injuries. Musculoskeletal injuries	C	4	H	Only those personnel required for the task to be in the work area to reduce congestion.	D	4	M	Yes				0		
78		Congestion within the work area, rushing ,		crush injuries														
79	Electrical Disconnection and installation	Electrical Stripping, Glanding and termination (Strip cables, crimp cables Install cables into switchboard)	Health & Safety	Hand injuries, Crushes/ Pinch points Slips, trips, Manual handling	C	3	H	Appropriate tools and equipment available and relevant to task Ensure all personnel are fit for work Site access approval and relevant inductions completed Trained and competent personnel to complete scope of works Licensed electrician performing work File burrs Awareness of surroundings Maintain good housekeeping Maintain good posture, avoid twisting, use additional persons for larger cables Use a cable stripping tool where possible, wear gloves where required Keep hands clear of crimping jaw, positive communications No work to be done inside the Hazardous area without the appropriate Client Permit to Work with all the associated conditions and information. Personal Gas detectors used with every work group	D	3	M	Yes				0		
80	Electrical Disconnection and installation	Use of Ladder	Health & Safety	personnel injury	C	4	H	Use platform type ladder	D	3	M	Yes				0		
81																		

Item Number	Activity / Product / Task / Process	Risk/ Hazard	Major Effect	Impact / Consequence	Risk			Control measures	Residual Risk				Additional Controls	Residual Risk				Comments
					L	C	R		L	C	RR	ALARP		L	C	RR	ALARP	
82	Electrical and instrumentation Setup cable onto cable stands, installing cables on cable tray, Cable tie cables in place, electrical testing of cables as per relevant standards	Slips, trips, pinch points, manual handling, cable drum falling, Restricted access, Damage to cables	Health & Safety	Personnel Injury	C	3	H	Practise safe lifting technique Check for sharp edges along cable route, use cable rollers where required Maintain good posture, additional personnel required during pull, Use of winch where required ,Competent operator ,rated winch and rope cut cable ties flush, Housekeeping Avoid overreaching Trained and competent personnel to be present on both ends of cable being tested. Awareness of surroundings,	D	3	M	Yes				0		
83	Electrical Disconnection and installation Electrical Equipment installation Mounting of electrical equipment	Manual handling	Health & Safety	Musculoskeletal injuries Pinch point injuries, crushing injuries Hand injuries	C	3	H	Ensure all persons conducting activity are trained, competent correctly licensed to perform task. Wear appropriate PPE to perform task Be aware of surroundings Ensure good housekeeping round work area Positive communication between activity team members to ensure everyone knows what is happening Provide an exclusion zone around the area when conducting lifts Two man lifts or mechanical aids for heavy or awkward equipment lifts	D	3	M	Yes				0		
84	Electrical Disconnection and installation Instrument tubing and instrument panels	Cutting of tubing, attachment of tubing to devices tube bending	Health & Safety	Musculoskeletal injuries hand injuries from sharp edges, sprain	C	3	H	Ensure all persons conducting activity are trained, competent correctly licensed to perform task. Wear appropriate PPE to perform task eg gloves to worn Correct tools for the Task Ensure good housekeeping round work area Positive communication between activity team members to ensure everyone knows what is happening Mark tube to ensure visual check is possible after termination of tube into device	D	3	M	Yes				0		
85	Electrical Disconnection and installation Electrical & Instrumentation Cable Testing	incorrect drawings/installations equipment not fit for purpose / suitably maintained electrical equipment not isolated	Health & Safety	Electric shock personal injury	C	4	H	Licenced Electrician to carry out electrical installation works Wear gloves if contact with sharp edges is possible Carry out inspection without handling equipment where possible Confirm equipment to be tested is recorded as isolated as per isolation procedure prior to works. Use correct tools for inspection ☒ No LV equipment to be opened when not isolated.	D	4	M	Yes				0		
86	Testing	Hydro testing sudden/ unsuspected release of stored energy	Health & Safety	Personal Injury	C	4	H	Exclusion zones during onsite testing Trained and experienced/qualified hydro testing crew Testing times scheduled to eliminate excess workers on site: i.e. at lunch breaks, out of normal hours, etc. A specific SWMS for all hydro testing. Line of Fire" hazards must be addressed in the SWMS. Ensure that all fittings/hoses are correctly pinned and have whip checks correctly applied. Clear communication with all other personnel who are to remain working on the processing construction site, during any of the hydro testing processes, near the exclusion zone.	D	4	M	Yes				0		
87	Testing	Hydro testing	Environmental	Potential for contaminated water to be released to the environment	C	2	M	All hydro water to be captured and where possible reused . All hydro water to be released or used in another way is to meet the environmental requirements ..	D	2	L	Yes				0		

Item Number	Activity / Product / Task / Process	Risk/ Hazard	Major Effect	Impact / Consequence	Risk			Control measures	Residual Risk				Additional Controls	Residual Risk				Comments			
					L	C	R		L	C	RR	ALARP		L	C	RR	ALARP				
88	NDT testing	NDT testing Radiation	Health & Safety	Potential for personal damage to work crew and others in the work area.	C	4	H	Exclusion zones during onsite testing Trained and experienced/qualified testing crew Testing times scheduled to eliminate excess workers on site: i.e. at lunch breaks, out of normal hours, etc. A specific SWMS for all NDT e.g. A specific SWMS for radiography and other forms of NDT. Clear communication with all other personnel who are to remain working on the construction site during any of the NDT processes.	E	4	M	Yes				0					
89	Pre commissioning Commissioning	Operating on live infrastructure. Failure of isolation HRCW- High Risk Construction Work	Health & Safety	Personal injury electric shock electrocution explosion exposure to gasses (Nitrogen etc.)	C	5	H	Lock Out Tag Out Permit system to be fully implemented during all Isolations and recommissioning activities where there is a potential for personal damage to personnel involved with recommissioning or plant damage to the section of plant being tested etc. Only experienced, licensed, qualified personnel. Full compliance with the Pre commissioning Plan				No				0		A SEPARATE RISK WORKSHOP, (Location and date to be determined)SHALL BE CONDUCTED BEFORE ANY PRE COMMISSIONING OR COMMISSIONING ACTIVITIES ARE UNDERTAKEN ON SITE.			
	CONSTRUCTION RISK REGISTER (Part B)							Functional Area:							Heavy Lifts						
	Note: All relevant items in Part A apply to this section																				
1	Lifting of Units	Faulty Plant/crane/equipment	Health & Safety	Personal injury caused by faulty plant	C	4	H	All crane certifications , Specs and maintenance records to be submitted before coming to site and reviewed . Rigging arrangements to be inspected and verified for condition, suitability and tagging prior to dispatch to site. Only approved plant and equipment to be allowed to operate on site. Equipment to match that used to generate lift study, All plant to be maintained as per the OEM or equivalent. Plant risk assessment , Operators to be ticketed and VOCed All plant to have a daily pre start check done by the operator each shift and recorded. Copies of the daily pre start check must be submitted at the completion of each day to the Supervisor. All faulty plant to be tagged out of service and the fault reported to the supervisor for rectification before the plant can be operated.	D	4	M	Yes				0					
2	Lifting of Units Unloading/Loading plant, equipment or materials from trucks/transport	Plant/ Plant or Plant/ Personnel interaction	Health & Safety	in personal or plant damage	C	4	H	Maintain a dedicated area for loading / unloading crane components and set up. Restricted access work areas to be set up/defined around working plant. Breach of a restricted access work area shall result in disciplinary action as determined by the WASCO Construction Supervisor. The direction of work flow is to be determined by the supervisor and clearly communicated to the plant operators prior to the start of any new task or if there is a change of conditions including new personnel to the task. Reversing beeper on vehicles and plant. Spotter if required. Speed limit, allocated parking for light vehicles, Two way radios, Light beacons on mobile plant while working on the site.	D	4	M	Yes				0					
3	Lifting of Units	Poor Communication	Health & Safety	Instructions/direction not clear resulting in a health or safety incident	C	3	H	Site Ensure communication between all work crews is maintained (SIMOPS). Ensure planning takes into account work crew interactions and suitable meetings/directions are given and understood before starting tasks. Carry out daily pre-lift meetings with the client rep on site, prior to carrying out heavy lifting operations Assess prior to access to the work front Updated drawing Lift study, compaction tests All assets will be positively located and clearly marked.ER procedure	D	3	M	Yes				0					
4	Lifting of Units	Plant/personnel interactions No exclusion zones	Health & Safety	No exclusion zones Possible plant strike on personnel	C	4	H	No personnel to work inside the work zone of plant where practicable. Delineation of the work zone is the minimum required with no go areas clearly signposted for exclusion of personnel not directly involved with the task .Spotters in place SIMOPS to be discussed and advised at morning prestart. Communication between work crews to ensure risks are controlled. .	D	4	M	Yes				0					
5	Lifting of Units	Positioning of Truck and Cranes in wrong position Rushing ,Complacency ,unplanned movement ,eyes not on task ,loss of balance/traction/grip , unsuitable ground conditions	Health & Safety	resulting in injury to personnel	C	4	H	Follow lift study/plan for positioning of cranes and truck Checking load shift had not occurred during transit - check with driver who will assess and release load binders . Review load on arrival and confirm generally consistent with the design details used to generate the lift study. Heights and clearances for any lift over activities to be verified against design details via dummy run prior to commencing lift over. Trained , competent and VOCed operators / dogman only used. Fence to be removed for truck and crane access Site to be secured at night . Operator to verify radii in the required boom configuration by positioning hook and reading off computer prior to rigging load. Check slew radius clear of obstructions all round. Ground bearing capability to be tested and report to be prepared by authorized engineer. Monitor and inspect ground conditions in the lead up to the lift to verify no substantial change from ground bearing tests, particularly, wet weather. •Matt's to be used under all out-riggers to spread load and minimize ground bearing pressure, min. size as listed on drawing. Matt's to be monitored during lifting activities. Check slew radius clear of obstructions all round	D	4	M	Yes	Provide additional bog matts available to use if require	D	4	M	Yes				

Item Number	Activity / Product / Task / Process	Risk/ Hazard	Major Effect	Impact / Consequence	Risk			Control measures	Residual Risk				Additional Controls	Residual Risk				Comments
					L	C	R		L	C	RR	ALARP		L	C	RR	ALARP	
6	Lifting of Units	Craneage/lifting HRCW (High Risk Construction Work due to "Work in an area with movement of powered plant")	Health & Safety	Possible crush injuries, dropped loads, pinch points, overturned cranes unstable crane pad, underground services,	C	4	H	A SWMS to be developed in conjunction and consultation with the workforce involved for general site craneage. Only high risk licensed operators and dogman/riggers to be used to operate a crane and select rigging and direct the crane operator. For Heavy lifts the crane pad will be tested for compaction and bearing pressure capacity. All heavy lifts will be performed with a Lift plan/Lift study commensurate with the weight of the load and the potential risk. Tested and tagged lifting equipment. Mobile crane operations must be within the lift charts of the machine with adequate derating for any slope etc. For dual lifts only one nominated intermediate rigger or better to control the lift Spotters to be used ... Lifting points loose or damaged Inspect, verify tight and tighten as necessary. Rigging to be re-inspected onsite prior to use .Remove items placed on skids for transport (where arise) prior to slew and place. Inspect for accumulation of water or other foreign materials during transport which may increase weight, remove as necessary. Crane operator/s to verify weights as load taken.No person to be under a suspended load. No person to be in the operational range of operating plant. Exclusion zones to be installed for lifting tasks to ensure other work crews are not in the firing line. Don't place body parts in the firing line.	D	4	M	Yes				0		
7	Lifting of Units	Damage to existing, pipe, piperacks, infrastructure	Health & Safety	g damage to infrastructure or load and possible injury to crew working in vicinity	C	4	H	Use spotters when working close to above ground assets (Dogman Rigger and other as required.). Only those personnel required for the task to be in the work area. Exclusion zones delineated as required. No personnel under a suspended load. Use tag lines to eliminate personnel in the line of fire. Ensure adequate escape path for dogman/rigger or other worker involved in the task. Use only experienced and where required high risk licensed personnel to undertake the task. Ensure good communication within the work crew and especially between the dogman/rigger and the crane operator. Ensure slew cranes are set up correctly in accordance with the crane OEM with adequate crane pads and on known bearing capacity hard stand. Ground bearing capability to be tested and report to be prepared by authorized engineer. Monitor and inspect ground conditions in the lead up to the lift to verify no substantial change from ground bearing tests, particularly, wet weather. •Matts to be used under all out-riggers to spread load and minimize ground bearing pressure, min. size as listed on drawing. Matts to be monitored during lifting activities. Check slew radius clear of obstructions all round. Operator to verify radii in the required boom configuration by positioning hook and reading off computer prior to rigging load	D	4	M	Yes				0		
8	Lifting of Units	Noise	Health & Safety	Possible serious injury	C	3	H	Ensure good communication within the work crew and especially between the dogman/rigger and the crane operator.Crane crew to nominate what form of signals to be used eg. hand or radio before any lift.. Verify ambient noise does not interfere with clear communication and adjust communication plan appropriately.	D	3	M	Yes						

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 33 of 53

Appendix 5 – Project Hazard Management and Control Strategies

Process	Hazards and Issues	Typical Management and Control Strategies
Survey	- Working alone - Driving - Weather exposure - Unsupervised remote work - Poor communications - Natural hazards - Fauna, stock, snakes - Poor communications - Long work cycles	- Remote Work Procedures - SWMS - Appropriate communications equipment - Check-in processes - Well-equipped vehicles - Maps, GPS - PPE
Protection of the Public	- Excavations - Plant and machinery - Access to construction sites - Vehicle access - Hazards associated with welding activities - Crossing roads, railways etc.	- Security of plant and equipment - Signage - Barricading and barriers - Traffic management Plan - Notifications and planning - Training of personnel - Qualifications of personnel - Security personnel (Where required) - Identification of high-risk areas/locations - Barriers
Fencing	- Working alone - Natural hazards - Poor communications - Electric fences, barb wire - Fauna and stock, snakes - Use of chainsaws - Walking on uneven ground - Dehydration - Overhead and underground hazards	- SWMS - Radio contact - First aid kits and qualifications - Adequate water - PPE including gloves - Manual Handling training - DBYD - Trained drivers - Vehicle equipment/ setup and spares - Call-in procedures
Site Communication	- Lack of understanding of procedures - Errors and incidents - Poor emergency response	- Inductions - Prestart Meetings - Records - Newsletters - Toolbox meetings - Committee Meetings and distribution of minutes - Supervisor Meetings - Hazard reports/alerts

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 34 of 53

Process	Hazards and Issues	Typical Management and Control Strategies
Traffic Management	• Collision • Pedestrians • Rural roads • Heavy vehicles • Road use • Contractor Management • Vehicle access • Access to construction sites	• Transport plans and procedures • Security of plant and equipment • Signage • Barricading and barriers • Traffic management Plan • Notifications and planning • Training of personnel • Qualifications of personnel • Identification of high-risk areas/locations • Refer to relevant legislation and statutory authorities
Use of Plant and loading and unloading	• Plant defects • Pinch points • Crush points • Noise exposure • Dust exposure • Rollover • injury	• Shut down plant for maintenance • Plant risk assessments conducted • Plant noise surveys • Wheeled plant to be fitted with ROPS • Sealed cabins • PPE and hearing protection • Guarding • Emergency stops • LUEZ Exclusion zones • SWMS • Powerlines marked; vehicle heights and crane reach known • Qualified and experienced dogmen and operators • Areas kept clear where lifting activities take place • Test loads • Lifting equipment inspections and registers • Stable areas nominated for Laydown • No one in the line of fire /Personnel clear of the fall zone • PPE – Personnel Protective Equipment

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 35 of 53

Process	Hazards and Issues	Typical Management and Control Strategies
Clear and Grade/Civils	- Overhead and underground hazards - Dust - Poor visibility - Poor ground conditions - Personnel in vicinity - Stranding/Breakdown	- SWMS - DBYD - PPE - Radio communications in all vehicles - Signage on powerlines, catenary wires - Check ground conditions - Inductions, trained and competent personnel - First aid kits and qualifications in crew - Check area before reversing or slewing - Vehicle setup and spares - Checking procedures
Pipe Stringing and Loadout	- Overhead hazards due lifting, carrying, strapping, rigging - Crushing - Swinging pipe - Dropped loads - Rolling pipe - Trips, slips, falls - Wet, uneven and/or slippery surfaces	- SWMS - Powerlines marked; vehicle heights and crane reach known - Qualified and experienced dogmen and operators - Areas kept clear where lifting activities take place - Test loads - Lifting equipment inspections and registers - Stable areas nominated for pipe locations - Hands clear of pipe the pipe - PPE includes good footwear, gloves and hardhats - Transport Management Plan
Pipe cutting	- Crushing - Falls from height - Swinging pipe - Trips, slips, falls - Wet, uneven and/or slippery surfaces - Burns - Fire	- SWMS - PPE including gloves - Double eye protection - First aid kits and qualified personnel in crew - Qualified and experienced dogmen and operators - Personnel clear of the fall zone of pipe

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 36 of 53

Process	Hazards and Issues	Typical Management and Control Strategies
Trenching including exposing buried services by hand	• Slips, trips, falls • Electricity • Manual handling • Overhead hazards • Underground hazards • Dust • Snakes, fauna • Trench collapse • Wet, uneven and/or slippery surfaces	• SWMS • Powerline signage • DBYD • As built drawings • Vacuum Excavation (potholing) • First aid kits and qualified personnel in crew • Remain clear of machines when starting • Awareness of exposed moving parts • Guarding to remain in place • Remain safe distances from working machinery • PPE to include hearing protection and safety glasses • Persons setting range poles to be clear of and aware of ditching m/c • No entering trenches >1.5m • Personnel to remain clear of trench edges • Isolate machines for maintenance
Excavations/piling	• Public, personnel and fauna injury • Traffic hazards • Night-time hazards • Underground services such as power, water, telecommunications • Pipe damage • Confined space	• Barricading and barriers • Plant risk assessments conducted • Remain clear of machines when starting • Awareness of exposed moving parts • Guarding to remain in place • Remain safe distances from working machinery • PPE to include hearing protection and safety glasses • Notification • Minimise open trench • Procedures and processes to avoid trench entry • Lighting • Surveillance and/or security • Shoring • Minimise trench depth where possible
Noise	• Public complaints Noise induced hearing loss	• Mufflers and attenuation • PPE • Substitution • Procedures • Exposure times minimised

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 37 of 53

Process	Hazards and Issues	Typical Management and Control Strategies
Welding, cutting and Tie-ins	- Falling or swinging pipe - Springing pipe – pipe movement - Crushing - Sparks, buffer wire, burrs - Broken grinding discs - Grinder kickback - Air pressure hoses - Slips, trips, falls - Eye injuries- dust, particles, weld flash - Burns - Fire - Oxygen and acetylene - Electrical hazards (overhead, underground) - Manual handling - Wet, uneven and/or slippery surfaces	- PTW - Procedures - SWMS - No standing between pipe and boom - First aid kits and qualified personnel in crew - PPE includes gloves, double eye protection, anti-flash safety glasses - Pre-use inspections for equipment and cables - Firefighting equipment - Water tank - Secure and stable skid piles - Cap unattended pipes - Earthing of pipe
Field Joint coating	- Pressure hazards - Dust - Chemicals - Manual handling - Air quality - Fire/explosion - Air pressure hoses - Sips, Trips and falls - Chemical fumes and skin exposure - Fire - Static electricity - Wet, uneven and/or slippery surfaces	- SWMS - First aid kits & qualified personnel in crew - PPE to include safety glasses and blasting helmet - Pre-use inspection checks - Certified blasting equipment - Use less hazardous blasting medium - Hose fittings, dead man switches, whip checks, etc. - Housekeeping practices - SDSs, Chemical handling procedures - Manual handling training - PPE to include those required by SDS - Fire extinguishers - No smoking

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 38 of 53

Process	Hazards and Issues	Typical Management and Control Strategies
Lower-in	• Overhead hazards • Falling pipe • Crushing • Slips, Trips, Falls • Wet, uneven and/or slippery ground • Electricity • Open trench, trench collapse	• SWMS • First aid kits and qualified personnel in crew • Powerlines marked • No standing between pipe and boom • Spotters as necessary • Lifting equipment register • Pre-use inspections • PPE to include hard hats • Earthing strings • Trained in use of Jeepers • No entry to trench >1.5 m
Bedding, Padding, Backfill	• Overhead hazards • Open trench, trench collapse • Dust	• Procedures and SWMS • First aid kits and qualified personnel in crew • No entry to trench >1.5 m • Spotters • PPE to include safety glasses and dust masks
Reinstatement	• Overhead hazards • Moving plant • Fire • Uneven ground	• Procedures and SWMS • First aid kits and qualified personnel in crew • Reversing alarms, flashing lights • Marking of powerlines • PPE to include hearing protection • Eye contact with operators • Ensure area clear before operating equipment • Fire extinguishers • Water tank where required • Plant pre-use inspections

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 39 of 53

Process	Hazards and Issues	Typical Management and Control Strategies
Clean and Dry Pipe and test	- Chemicals and fuel - Slips Trips Falls - Electricity - Working in Bell holes - Manual handling - Welding (see above) - High pressure hoses	- Procedures and SWMS - Appropriately rated whip checks - Correctly rated hoses - SDSs - Fire extinguishers - Pre-use inspections - Emergency plan for site - Tested and tagged equipment - Lifting aids such as cranes - Radio communications - Monitoring of pressures - Signage and barricading of the area - Access and egress from bell hole - Earthing - Secure the area
NDT	- Radiation exposure - Radiation Sources - Chronic health effects - Long term illness and /or death	- Procedures and SWMS - First aid kits and qualified personnel in crew - Radiation Management Plan - Trained and qualified personnel - Signage - Barriers - Training and induction of personnel - Radiation monitoring
Refuelling	- Fire - Explosion - Slips, trips Falls - Spills	- SWMS - No source of combustion within 20m of refuelling activity - Earthing - SDS
Fire Protection	Bushfire, property damage, environmental damage	- Firefighting equipment such as water carts, fire extinguishers, - Clearing (where permitted) - Training and induction - Liaison and consultation with authorities - Liaison and consultation with Jemena

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 40 of 53

Process	Hazards and Issues	Typical Management and Control Strategies
Power lines and Adjacent Infrastructure Including Underground Piping	• Induced voltage • Touch and Step potential • Fault currents • Electrical storms and lighting • Excavations hitting services	• Identification of power lines and underground services on Alignment sheets • DBYD • Catenary wires and Flagging • Notification to power authorities • Supervision • Working outside Exclusion zones • Procedures for working in storms • Earth mats • Engineering review of work adjacent to or under power lines • Spotters
Working in Hazardous Area/Facility	• Live gas environments • Live electrical equipment • Unidentified hazards • Simops	• High Risk Work Permit • Supervision • Procedures • SWMS • Gas monitoring • Barricading, fencing, • Identification of high-risk areas/locations • Authorised personnel • Inductions • Notifications and planning • Spotters for mobile equipment

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 41 of 53

Process	Hazards and Issues	Typical Management and Control Strategies
Electrical Equipment and Electrical installation	• Electric shock • Pinch injuries • Hand tools • Power tools • Load handling • Sharp objects	• Electrical licenced personnel • Procedures • SWMS • Permit To Work • Pre-use inspections for equipment and cables • Earthing • Portable RCDs, including testing • Housekeeping • Test and tagging program • Lock out Tagout • Resuscitation qualified electrical personnel • All electric leads kept dry • All electric leads kept insulated • Avoid live work situations • Test for Dead • DBYD • Protect overhead cables
Lifting of Materials/Units	• Falling objects • Dropped loads • Swinging objects	• SWMS • Lift Plans where required • Certified lifting equipment • PPE • Inspection of equipment • Use of correctly rated equipment • Training, Qualified personnel • Procedures • Minimise required access to height • Spotters • Drop Zones

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 42 of 53

Process	Hazards and Issues	Typical Management and Control Strategies
Form work /Concreting	• Muscular Skeletal Injuries due to: • Posture strain • Repetitive strain • Vibration • Crushing injuries • Pinch injuries • Hand tools • Power tools • Load handling • Sharp objects • Mobile plant • Pumps • Concrete Burns	• SWMS • Assess area for hazards • clear access/egress • PPE – gloves • Load handling – team lifting • Mechanical devices • Rotate tasks • Caps on reo-bars/star pickets • Reversing alarms, flashing lights • Appropriately rated whip checks • Correctly rated hoses • SDSs • Spotters/ Positive communication • Delineated work area • Correct PPE as identified on SDS
General Labouring	• Strains • Sprains • Work at height • Slips, trips and falls • Manual handling injuries (cuts and abrasions)	• SWMS • Task assessments/Take5s • Pre-employment medicals • First aid kits and qualified personnel in crew • Rotate tasks • Mechanical Lifting devices • Procedures • Load handling – team lifting • Develop alternative handling techniques
Mechanical /bolt up	• Strains • Sprains • Work at height • Slips, trips and falls • Manual handling injuries (cuts and abrasions) • Vibration • Crushing injuries • Pinch injuries • Hand tools • Power tools	• SWMS • Task assessments/Take5s • Pre-employment medicals • First aid kits and qualified personnel in crew • Rotate tasks • Mechanical lifting devices • clear access/egress • PPE – gloves • Qualified personnel

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 43 of 53

Process	Hazards and Issues	Typical Management and Control Strategies
High pressure, Air hoses and high-pressure equipment	• Eye and other serious injuries • Flailing equipment • Noise exposure	• SWMS • Task assessments/Take5s • Safety clips in place • Safety valves • Maintenance program • Pre-inspection checks • Hose inspections • Cylinders stored correctly • Pressure gauges checked • Appropriate whip checks (Stainless steel or 'stocking' type) keepers, chains, slings, and proprietary special couplings
Falls from Height	• Injury • Death	• Eliminate the need to work at heights • Fall prevention devices • Work positioning systems • Fall arrest systems • Training in requirements • Supervision • ERP
Handling of Chemicals	• Spillage • Chemical exposure • Fire • Injury • Environmental damage	• Procedures and Manifests • Compliance with legislative requirements • SDS • Correct storage • Handling procedures • PPE • Material handling equipment • Signage • Training
Hazard/Incident Reporting & Investigations	• Lack of learning from incidents	• Reporting procedures • Training and induction • Records • Investigation processes • Corrective action register/list • Responsibilities assigned
Management of Change	• Lack of review of implications when changing process and plant	• Procedures • SWMS and SWMS review • Review of change implications prior to implementation • Communication of change • Document control processes

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 44 of 53

Process	Hazards and Issues	Typical Management and Control Strategies
Competency	• Incidents and injury • Inefficient processes • Property and equipment damage	• Pre-employment processes • Interview and/or reference checks • On-the-job evaluation of skills • Inductions, Training records • Development of skills matrices • Training programs
Fitness for Work	• Personnel putting themselves and others at risk • Impaired judgement • Fatigue • Safety of the worker and others	• Evaluation of cycle breaks in early stages of project development • Fit for Work policies • Rehabilitation services • Provision of exercise facilities • Management of hours of work • Management of extremes of climate • Camp/accommodation • Fatigue minimization measures • Drug and Alcohol policies and procedures • Pre-employment screening • Drug and alcohol testing programs • Supervisor and worker education and awareness

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 45 of 53

Appendix 6 – Traffic Management Plan



WESTERN SYDNEY GREEN GAS PROJECT

TRAFFIC MANAGEMENT PLAN

Document Number		2018-PRM-PLN-001		
Revision	Issue	By	Check	Approve
C	For Client Review	DP	AMH	MPW
B	For Client Review	RC	AMH	MPW
A	For Client Review	RC	AMH	MPW

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 2 of 38

1. INTRODUCTION	4
1.1 OVERVIEW	4
1.2 PROGRAM	4
1.3 CONSTRUCTION ACTIVITIES	4
1.4 PROJECT APPROVALS	5
1.5 PURPOSE	5
1.6 OBJECTIVE	5
1.7 CONSULTATION SUMMARY	6
2. STATUTORY AND PLANNING FRAMEWORK	7
2.1 LEGISLATION AND PLANNING INSTRUMENTS	7
2.2 CONDITIONS OF APPROVAL	7
2.3 REFERENCE DOCUMENTS	10
3. RESPONSIBILITIES	11
3.1 CHAIN OF RESPONSIBILITY	11
3.1.1 <i>Client responsibility</i>	11
3.2 PROJECT MANAGER	11
3.3 CONSTRUCTION MANAGER	12
3.4 WASCO PERSONNEL (AND SUBCONTRACTORS)	12
3.5 SAFETY ADVISOR	12
4. SITE LOCATION AND LAYOUT	14
5. RESPONSIBILITIES	15
6. TRAFFIC MANAGEMENT	15
6.1 POTENTIAL IMPACTS	15
6.1.1 <i>Chandos Road</i>	15
6.1.2 <i>Construction Area</i>	16
6.2 MANAGEMENT MEASURES	16
6.3 CONSTRUCTION TRAFFIC VOLUMES	18
6.4 TRAFFIC NOISE MANAGEMENT	18
6.5 TRANSPORTATION OF REGULATED WASTE	19
7. TRANSPORT AND TRAFFIC ASPECTS	19
7.1 SITE ACCESS	19
7.1.1 <i>Heavy Vehicle Traffic Route</i>	19
7.1.2 <i>Site Entry and Exit</i>	20
7.2 SITE TRAFFIC RULES	20
7.2.1 <i>Speed Limits</i>	20
7.2.2 <i>Transport of Pipe and Equipment</i>	21
7.2.3 <i>Escorting of Machines or other Vehicles</i>	21
7.2.4 <i>Seating and Seat Belts</i>	21
7.2.5 <i>Access and Restricted Areas</i>	21
7.3 LAYDOWN	21
7.4 CONSTRUCTION AREA	23
7.5 RESTRICTED AREAS (JEMENA GAS NETWORKS AREA (JGN))	23
7.6 TRAFFIC FLOW	24

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 3 of 38

7.7	PARKING	24
7.8	SIGNAGE	24
7.9	WEED AND HYGIENE CONTROL	24
8.	DRIVER REQUIREMENTS	25
8.1	GENERAL	25
	INDUCTION AND	25
8.2	TRAINING	25
8.2.1	WASCO PROJECT INDUCTION	26
8.2.2	VISITOR INDUCTION TRAINING	26
8.3	FITNESS FOR WORK	27
8.4	AUTHORISATION	27
8.5	LICENSING	27
8.6	SAFE DRIVING BEHAVIOURS	28
8.7	DRIVING HAZARDS	28
8.8	DRIVING HAZARDS CONTROL MEASURES	28
9.	MONITORING AND REPORTING	32
9.1	VEHICLE TRACKING	32
9.2	COMMUNICATION	32
9.3	COMPLAINT MANAGEMENT	32
9.4	INSPECTIONS	32
9.5	COMPLIANCE AND REVISION	33
9.6	INCIDENT NOTIFICATION	33
9.7	REPORTING	33
10.	DEFINITIONS	34
	Appendix 1 – Site Layout	36
	Appendix 2 – Traffic Control Plan	37
	Appendix 3 – Traffic Route and Turning Path	38

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 4 of 38

1. INTRODUCTION

1.1 OVERVIEW

Jemena Gas Networks (NSW) Limited (Jemena) is undertaking the Western Sydney Green Gas Project (the Project), which involves trialling Power-to-Gas (P2G) technology by converting purchased green energy from the electricity mains network into hydrogen gas and injecting it into its secondary gas distribution network over a 5-year period. The Project would potentially facilitate ongoing development of commercially viable P2G systems in Jemena's NSW gas network.

The Project is located at the existing Jemena high pressure gas facility in Horsley Park (Horsley Park Facility), located in Western Sydney. The P2G facility will use renewable electricity to generate hydrogen, which can be injected into the natural gas network or used to generate electricity back to the grid by means of a hydrogen-powered micro-turbine.

1.2 PROGRAM

The current construction project timeline is presented below, the construction works are anticipated to commence in October 2020, pending approval of the required management plans. The timing presented below are indicative only and subject to change.

	Aug 20	Sep 20	Oct 20	Nov 20	Dec 20	Jan 20	Feb 20	Mar 20	Apr 20	May 21	Jun 21	Jul 21
Pre-Construction												
Construction [#]												
Pre-commissioning and Commissioning [#]												
Operation and Maintenance [*]												→

Notes

[#] the phases that this management plan addresses

^{*} 5 year operation in accordance with Condition A8 of the Development Consent SSD 10313

Grey – Float

1.3 CONSTRUCTION ACTIVITIES

The construction activities to be undertaken as part of the works are summarised below:

- Completion of pre-construction documentation, inductions and establishment of site amenities and delineation of construction;
- Coordination and management of site delivery, off-loading and installation of major equipment packages (inclusive of all electrical packages);
- Completion of construction, installation, testing and commissioning of carbon steel pipelines including buffer store;
- Completion of civil, structural, piping as well as mechanical, process and electrical of the P2G Facility, including the spray sealed coating of the turning circle; and

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 5 of 38

- Completion of pre-commissioning and commissioning works.

The works noted above will be completed works in a manner consistent with relevant laws, policies and guidelines.

The construction works will commence following approval of all relevant pre-construction deliverables in accordance with the Project Approvals

It is noted that designs may indicate holds/future scope, the construction works covered under this TMP do not cover the following future scope:

- hydrogen refuelling station (HRS); and
- cylinder filling package.

1.4 PROJECT APPROVALS

The delivery of the Project is facilitated by the Development Consent SSD 10313 approved by the Minister for Planning and Public Spaces, under Part 4, Division 4.7 of the *Environmental Planning and Assessment Act 1979* and, in accordance with Section 4.38 (Approval).

1.5 PURPOSE

The purpose of this traffic management plan (TMP) is to address the construction environmental requirements related to the use and operation of vehicles for the purpose of construction, service, and transport. The purpose of this plan is to provide an overview of the recommended procedures and available resources for the expected safe and legal operation of vehicles during the construction, pre-commissioning and commissioning phase of the Jemena Western Sydney Green Gas Project (WSGGP).

This TMP has been completed in accordance with the:

- Project Approval (SSD 10313);
- *Western Sydney Green Gas Project – Environmental Impact Statement (EIS)* (Dec 2019); and
- Relevant guidelines, policies and laws.

information that, if followed, will assist drivers and project personnel in minimizing injuries and incidents.

Note: This TMP does not address the operational and decommissioning phase of the project.

1.6 OBJECTIVE

The TMP has the following objectives relating to construction:

- To ensure that there is no damage to existing and new equipment onsite.
- To ensure that traffic is suitably controlled onsite.
- To ensure Jemena access requirements are adhered to.
- To ensure that personnel are protected whilst equipment is moved onsite.
- To ensure Wasco complies with regulatory approvals for traffic movement.
- To ensure the Client and community concerns are observed and respected.
- To ensure the requirements for road use are complied with.
- To minimize traffic hazards.

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 6 of 38

- To minimize destructive influences on site.
- To minimize potential fire risk.

1.7 CONSULTATION SUMMARY

In accordance with Schedule 3, Condition 8 of the Approval, the TMP is to be prepared in consultation with;

- Transport for New South Wales (TfNSW); and
- Fairfield City Council (Council)

Comments from the consultation process have been incorporated into this plan where appropriate and are summarised in the table below.

Date	Consultation	Outcomes
21 September 2020	TMP emailed to TfNSW and Council with request for comments	TBC

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 7 of 38

2. STATUTORY AND PLANNING FRAMEWORK

2.1 LEGISLATION AND PLANNING INSTRUMENTS

Commonwealth and State legislation, as well as state planning instruments relevant to the project are outlined within Jemena's *Western Sydney Green Gas Project - Environment Management Strategy* (Sep 2020).

Legislation relevant to traffic and transport management includes:

- Dangerous Goods (Road and Rail Transport) Act 2008;
- Environmental Planning and Assessment Act 1979 (EP&A Act);
- Environmental Planning and Assessment Regulation 2000 (EP&A Regulation);
- Heavy Vehicle National Law (NSW) (2013 No 42a);
- Roads Act 1993;
- Road Rules 2014
- Road Transport Act 2013; and
- Transport Administrations Act 1988.

2.2 Conditions of Approval

The Approval conditions relevant to the management of site access, egress, traffic and transport are presented in the table below

This TMP responds to the specific relevant requirements of the Approval Development Consent, as follows:

Condition	Requirement	Addressed
Schedule 2 – Part A – Administrative Conditions		
DEMOLITION AND REHABILITATION		
A11	The Applicant must: (b) minimise the disturbance area at any time; (c) employ interim rehabilitation strategies to minimise dust generation, soil erosion and weed incursion on parts of the site that cannot yet be permanently rehabilitated; and 	Section 8.1 Section 7.4
PROTECTION OF PUBLIC INFRASTRUCTURE		
A12	Unless the Applicant and the applicable authority agree otherwise, the Applicant must: (a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the development; and 	Section 6.1.1
OPERATION OF PLANT AND EQUIPMENT		

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 8 of 38

Condition	Requirement	Addressed
A13	The Applicant must ensure that all plant and equipment used on site, or in connection with the development, is: (a) maintained in a proper and efficient condition; and (b) operated in a proper and efficient manner.	Section 8.1
Schedule 3 – Part B - Environmental Conditions – General		
TRAFFIC		
Traffic Management Requirements		
B7	The Applicant must:	Section 7.1
	(a) minimise the impacts of the site access upgrades of the development;	
	(b) maintain all footpaths, roads and utility-related infrastructure on site in a safe and serviceable condition;	Section 6.2
	(c) upgrade the access road and turning circle to an all-weather sealed surface;	Section 1.3
	(d) provide sufficient parking on site for all vehicles and ensure vehicles associated with the development do not park on the public road network;	Section 7.2
	(e) ensure frequency of bus hydrogen refuelling does not exceed three bus trips daily for 350 days per year, unless otherwise agreed by the Secretary subject to the Final Hazard Analysis required under Schedule 3 Condition B1; and	Prior to Operation phase (if future scope completed)
	(f) minimise the traffic noise impacts of the development.	Section 6.4
B8	Prior to the commencement of construction, unless the Secretary agrees otherwise, the Applicant must prepare a Traffic Management Plan for the development to the satisfaction of the Secretary. This plan must:	This Document
	(a) be prepared in consultation with WSPT, Council and TfNSW;	Section 1.7
	(b) describe the measures that would be implemented to comply with the transport management requirements in condition B7 above;	Section 2.2
	(c) include details of the transport route to be used for all construction and operational traffic;	Section 7.1
	(d) include details of the measures that would be implemented to minimise traffic safety issues and disruption to local users of the transport route/s during construction and operations;	Section 7.1
	(e) include a protocol for undertaking independent dilapidation surveys to assess the existing condition of Chandos Road, prior to and following construction or decommissioning activities;	Section 6.1.1

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 9 of 38

Condition	Requirement	Addressed												
	(f) include a swept path analysis of entry and exit to the site and identify a schedule for access upgrades (if required) to the satisfaction of Council and TfNSW; and	Section 7.1												
	(g) include a program to: - record and track vehicle and bus movements; and - monitor the effectiveness of these measures. The Applicant must implement the approved Traffic Management Plan for the development.	Section 6.3												
AMENITY														
Construction and Operating Hours														
B9	The Applicant must comply with the operating hours set out in Table 1. <table><tr><th colspan="2">Table 1: Operating Hours</th></tr><tr><th>Activity</th><th>Operating Hours</th></tr><tr><td>Operations excluding microturbines and blowdowns</td><td>24 hours a day 7 days a week</td></tr><tr><td>Microturbines</td><td>7 am to 10 pm 7 days a week</td></tr><tr><td>Construction and decommissioning activities</td><td>7am to 6pm Monday to Friday 8am to 1pm Saturday</td></tr><tr><td>Blowdowns (excluding emergency work)</td><td>at no time on Sundays and NSW public holidays</td></tr></table> The following activities may be undertaken outside of the hours identified in Table 1 without the approval of the Secretary: (a) the delivery of materials as requested by the NSW Police Force or other authorities for safety reasons; (b) emergency work to avoid the loss of life, property and/or material harm to the environment; (c) construction works that cause LAeq (15 mins) noise levels that are: - no more than 5 dB(A) above the rating background level at any residence in accordance with the Interim Construction Noise Guideline (DECC, 2009), or its latest version; and - no more than the noise management levels specified in Table 3 of the Interim Construction noise Guideline (DECC, 2009), or its latest version, at other sensitive land uses; and - for continuous or impulsive vibration values, measured at the most affected residence, no more than those for human exposure to vibration, specified in Table 2.2 of Assessing vibration: a technical guideline (DEC, 2006), or its latest version; and - for intermittent vibration values measured at the most affected residence, no more than those for human exposure to vibration, specified in Table 2.4 of Assessing vibration: a technical guideline (DEC, 2006), or its latest version; (d) where a negotiated agreement has been reached with affected receivers; or (e) works as approved through the out-of-hours work protocol outlined in the Environmental Management Strategy under Schedule 4 of this consent.	Table 1: Operating Hours		Activity	Operating Hours	Operations excluding microturbines and blowdowns	24 hours a day 7 days a week	Microturbines	7 am to 10 pm 7 days a week	Construction and decommissioning activities	7am to 6pm Monday to Friday 8am to 1pm Saturday	Blowdowns (excluding emergency work)	at no time on Sundays and NSW public holidays	Section 6.4
Table 1: Operating Hours														
Activity	Operating Hours													
Operations excluding microturbines and blowdowns	24 hours a day 7 days a week													
Microturbines	7 am to 10 pm 7 days a week													
Construction and decommissioning activities	7am to 6pm Monday to Friday 8am to 1pm Saturday													
Blowdowns (excluding emergency work)	at no time on Sundays and NSW public holidays													

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 10 of 38

Condition	Requirement	Addressed
Noise		
B10	The Applicant must: (a) minimise the noise generated by any construction or decommissioning activities on site in accordance with the best practice requirements outlined in the Interim Construction Noise Guideline (DECC, 2009), or its latest version;	Section 6.4
Air		
B11	The Applicant must minimise the: (a) dust emissions of the development, including wind-blown and traffic generated dust; (b) greenhouse gas emissions of the development; (c) surface disturbance of the development; and (d) other air emissions of the development.	Section 6.2 Section 7.4
Soil and Water		
B16	The Applicant must: .. (e) remove all waste from the site as soon as practicable, and ensure it is sent to an appropriately licensed waste facility for disposal.	Section 6.5
Part B Environmental Conditions – General		
COMPLIANCE		
Incident Notification		
C3	The Applicant must immediately notify the Department, Council and any other relevant agencies immediately after it becomes aware of an incident. The notification must identify the development (including the development application number and name) and set out the location and nature of the incident.	Section 9.6

2.3 REFERENCE DOCUMENTS

Term	Definition
2018-HSS-PLN-001	Wasco Health & Safety Management Plan
NSW Code of Practice	How to Manage Work Health and Safety Risks 2019
NSW Code of Practice	Managing Risks of Plant in the Workplace 2019
NSW Code of Practice	Work Health and Consultation Co-operation and Co-ordination 2019
NSW Code of Practice	Construction Work 2019
Guidance Notes Safe Work Australia	Workplace Traffic Management Guidance Material
National Transport Council	Load Restraint Guide 2018

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 11 of 38

3. RESPONSIBILITIES

3.1 CHAIN OF RESPONSIBILITY

Wasco recognises and accepts its obligations in the transport chain of responsibility to maintain and promote safe operations. Wasco shall:

- Undertake to comply with all road transport laws, codes and guidelines applying to our operations, including COR Registered Industry Code of Practice (RICP) Master Code.
- Not knowingly make or meet any demand or requirement that would cause us to breach road transport laws applying to our operations.
- Ensure we have in place suitable and adequate processes, programmes, and training so that we can demonstrate we have taken reasonable steps to comply with all relevant laws.
- Conduct training to develop staff awareness of business policies and procedures and their obligations such as;
 - Fatigue management
 - Speed compliance
 - Loading and unloading requirements
 - Scheduling requirements
 - Well maintained and appropriately designed and equipped vehicles; and
 - Driver health, safety and security requirements.
- Ensure staff are not just aware of their obligations but are actively engaged in implementing practices.
- Request information from transport operators and/or drivers about what systems they have in place to prevent breaches of road transport laws when transporting goods.
- Cause all new contracts or arrangements to include compliance with the relevant laws as a material requirement.
- Recognise and accept that cost alone should not be a determining factor in meeting our transport obligations.

3.1.1 CLIENT RESPONSIBILITY

Jemena shall be ultimately responsible for managing all approvals and providing oversight to the project. As owners of the existing facility and new construction, onus shall lie with Jemena to ensure traffic management obligations are being fulfilled by all. All incident reporting shall first be issued by Wasco to Jemena with the understanding that Jemena shall notify the relevant parties.

3.2 PROJECT MANAGER

The Project Manager shall ensure that this procedure is provided to the Construction Supervisor and their personnel are trained as required.

- Ensure the health and safety of all workers and others in the workplace.
- Ensure the safe use, handling and storage of plant.
- Notify the Client of all near misses and all incident events which involve significant personal injury, which compromise, or which impact the local community.
- Ensure the health and safety of other persons is not put at risk from work carried out as part of its operations.

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 12 of 38

- Ensure that all Traffic and Travel operations have been assessed to evaluate the potential presence of risks and hazards that any specified mitigation measures have been implemented.
- Determine the resources necessary to conduct specific activities.
- Ensure that personnel assigned to project activities are competent and, via pre-placement medical assessment, are physically fit when engaged to carry out specific work when required and for the duration that is required.
- Subcontractors have suitable experience and knowledge to conduct any potential work scope in compliance with traffic and journey management, and project health and safety requirements.
- Ensure that the Client is kept informed of planned materials and equipment delivery.
- Ensure that all vehicles are fully insured, registered and maintained in company policy and procedures.

3.3 CONSTRUCTION MANAGER

The Construction Manager shall ensure that this procedure is implemented on site and all personnel and subcontractors adhere to the requirements. The Construction Manager shall also,

- Be responsible for the movement of personnel and all plant and equipment and liaise with the Client Site Representative and Local Authorities in exercising this responsibility (i.e. Police, Local Shire Authorities etc.)
- Notify the Project Manager and the Client of all near misses and all incident events which involve significant personal injury, which compromise, or which impact the local community.
- Subcontractors have suitable experience and knowledge to conduct any potential work scope in compliance with traffic and journey management, and project health and safety requirements.
- Ensure that the Client is kept informed of planned materials and equipment delivery.
- Ensure that all vehicles are fully insured, registered and be fit for purpose, roadworthy per legal requirements.
- Ensure that all drivers hold a current license for the vehicle they operate.

3.4 WASCO PERSONNEL (AND SUBCONTRACTORS)

Wasco personnel and subcontractors are to comply with the requirements of this procedure. The shall also,

- Hold a current license for the vehicle they operate and be familiar with the project road conditions and driving hazards.
- Obey New South Wales road rules and regulations, including:
 - the wearing of seatbelts
 - compliance with posted speed limits, especially 10km/hr speed limit on site.

3.5 SAFETY ADVISOR

The Safety Advisor shall ensure that the project is operating in compliance with this plan and will arrange for periodic audits to be carried out to confirm compliance including;

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 13 of 38

- Review training records and qualifications to ensure each person is competent to perform tasks associated with.
- Ensure that personnel assigned to the project activity are competent and via pre-placement medical assessment are physically fit when engaged to carry out specific work when required and for the duration that is required their position.

Ensure that all Traffic and Travel operations have been assessed to evaluate the potential presence of risks and hazards that any specified mitigation measures have been implemented.

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 14 of 38

4. SITE LOCATION AND LAYOUT

The Horsley Park High Pressure Gas Facility is located at 194-214 Chandos Road, Horsley Park in Western Sydney and is shown on the figure below.

Co-ordinate -33.831004, 150.864826

Figure 4 -1: Site Location

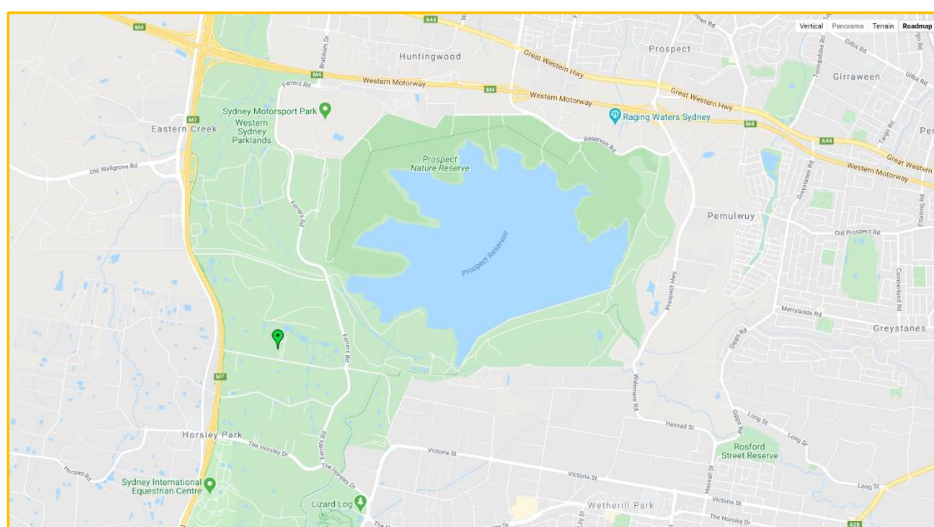


Figure 4 -2: Site Entry



	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 15 of 38

5. RESPONSIBILITIES

The roles, responsibilities, of all key personnel involved in the management of cultural heritage during construction works on the Project are summarised below.

Role	Responsibility
General Manager Systems & Facilities	Provide Wasco with advice in relation to heritage management and support the Project in complying with NSW State regulations.
HSE Advisor	Provide training in this Plan, monitoring and reporting on the day-to-day operation of this Plan, regular auditing and updating the Plan.
Construction Manager / Site Supervisors	Ensure all measures are implemented as per requirements detailed in this Plan and included in the project risk register, plans and induction. Where there is an unexpected find of a heritage item ensure that the Plan is followed including any notification.
Construction Manager/ Site Supervisors	Coordinate implementation of this Plan on site.
All Employees and Contractors	Ensure awareness of any sites adjacent to the works, minimise risk and report issues to their immediate supervisor.

6. TRAFFIC MANAGEMENT

6.1 POTENTIAL IMPACTS

6.1.1 CHANDOS ROAD

It is not the expectation that significant infrastructure disturbance will be caused during construction activities, heavy vehicle volumes and loadings are not in excess of typical design parameters for the roadways in question. To ensure all impacts are captured and rectified; dilapidation surveys shall be undertaken prior to the commencement of and following to completion of construction.

Extent of survey will encompass all roadway between Ferrers Road (850m east) and Wallgrove Road (850m west) of site entry.

On completion of the project rectification shall be undertake if there is a discrepancy between the initial dilapidation report. All traffic incidents shall be reported as per Section 9.6 throughout the course of the project.

Traffic shall be managed as per use of approved access roads, refer to Section 7.1.1, in conjunction with all other management techniques implemented by this document, it is the opinion of Wasco that very little effect to infrastructure and other road users will be caused.

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 16 of 38

6.1.2 CONSTRUCTION AREA

The following potential impacts may result from un-controlled access to the construction area:

- Increased safety hazard resulting from increases in traffic volume.
- Potential damage to existing equipment.
- Injury to Site personnel.
- Site road access degradation.
- Uncontrolled release of hazardous substances.
- Unauthorized third-party access to previously inaccessible (Jemena Gas Networks) areas.
- Overhead Power lines.
- Underground services.

6.2 MANAGEMENT MEASURES

The management measures, in conjunction with the Project's Health & Safety Management Plan, will be applied. Key management measures are as follows.

No.	Control measure	Responsibility	Timing
1	Pre-start meeting shall be used to inform work crews of equipment and / or trucks arriving at Site.	CM/Supervisor	Daily
2	Jemena shall be kept informed via SIMOPS of planned materials and equipment delivery. Onsite representatives will be informed once scheduled deliveries have been confirmed.	CM/Supervisor	Daily
3	Journey Management to be implemented when required (mobilisation/demobilisation/HV movements).	HSE Advisor	As required
4	Personnel other than delivery drivers will be site inducted to familiarise with the driving hazards and site rules associated with the location.	All Personnel	Ongoing
5	All vehicles to remain on existing roads or demarcated areas within designated project areas at all times.	All Personnel	Ongoing
6	Personnel shall comply with Jemena speed limits and traffic rules when bringing vehicles onto the Project.	All Personnel	Ongoing
7	Personnel shall comply with Jemena Permit to Work when bringing vehicles into JGN areas onsite.	All Personnel	Ongoing
8	Heavy vehicles and delivery trucks shall be escorted onto site.	CM/Supervisor	Ongoing
9	A spotter will be used when trucks and plant are travelling onto new pad area or into the facility.	Supervisor	Ongoing
10	Gates will be left as they are found.	All Personnel	Ongoing

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 17 of 38

No.	Control measure	Responsibility	Timing
11	Appropriate measures will be applied to ensure vehicles are within defined construction area.	Supervisor	Ongoing
12	The Site Team and any visitors travelling in light vehicles shall park in the designated parking area.	All Personnel	Ongoing
13	(Approved) Vehicles onsite shall be kept to a minimum, adequate parking shall be made available within laydown area.	Project Team	Ongoing
14	Vehicles shall not park within public roadway when attending site.	Project Team	Ongoing
15	At no time shall the access road be blocked and prevent access or egress in an emergency.	All Personnel	Ongoing
16	Hazard and incident reporting via Wasco reporting systems.	Project Team	As required
17	Only qualified personnel shall drive machinery and vehicles in accordance with their credentials.	Project Team	Ongoing
18	Maintenance of machinery as per equipment specifications and Wasco Procedures.	CM/Supervisor	Ongoing
19	Designated Call up point. Site Personnel mobile numbers and site UHF channel.	CM/Supervisor	Ongoing
20	Traffic control in areas of public road access will comply with local Road Traffic Authority and requirements as specified and referenced against AS 1742.4 - 1996.	Project Team	Ongoing
21	Trucks, machinery and equipment to be free of soil clumps and vegetative matter upon access and issued with a valid Washdown Inspection certificate including the loads being carried by trucks.	Drivers/HSE Advisor	On arrival
22	A delivery instruction will be given to the transport company prior to coming to site and that all deliveries shall adhere to the Traffic Route detailed in Section 6.1.1	Project Team	Prior to arrival
23	Dust suppression shall be employed in accordance with 2018-ENV-PLN-001 and 2018-ENV-PLN-002 to mitigate dust generation	CM/Supervisor	Ongoing
24	Employ appropriate driver techniques where dust may be generated	All Personnel	Ongoing

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 18 of 38

6.3 CONSTRUCTION TRAFFIC VOLUMES

Throughout construction traffic volumes will differ slightly, the below table approximates frequencies due to be experienced. These figures can be checked against actual volumes throughout the project as proposed in Section 9.1.

Vehicle Type	Quantity	Frequency	Construction Phase*	Contractor
Light Vehicle	4-6	Daily	All	All
20' and 40' Container Truck	3	Total	Mob/Demob (ea)	TBA
HV Plant Deliveries	4	Total	Mob/Demob (ea)	Mikcon
HV Earthworks Cartage	2	Daily	Bulk Earthworks	Mikcon
HV Piling Deliveries	4	Total	Civil Works	DFI Piling
HV Concrete Delivery	4	Total	Civil Works	
HV Package Deliveries	1	Daily	Per Package Delivery (11)	TBA
HV Craneage	1	Daily	Per Package Delivery (11)	TBA
Pipe Deliveries (CS and PE)	10	Total	Pipeline	TBA
MR Welding Rig	2	Daily	Pipeline	FWS
Testing Rig (MR & LV)	2	Daily	Pipeline NDT	Sonix
Testing Rig (MR & LV)	2	Daily	Hydro Testing/Drying	AXS
Pipework/etc Deliveries	5	Total	Mechanical	TBA
MR Crew Truck	2	Daily	E&I	ICE Engineering
General Deliveries (MR/LV)	2	Weekly	All	Startrack/Toll/TNT
MR Ablution Management	1	Weekly	All	TBA
HV Rubbish Management	1	Weekly	All	TBA

* Refer to project schedule for specific dates/timeframes

6.4 TRAFFIC NOISE MANAGEMENT

Precautions will be undertaken to ensure traffic noise is kept to as low as reasonably possible to comply with Approval condition B9 and B10. These shall include as a minimum;

- Minimising engine braking on approach to site and surrounding areas
- Staggering vehicle and truck movements to site
- Limiting HV movements in keeping proposed frequencies outlined in Section 6.3
- No deliveries to site outside of approved construction hours

Delivery instructions shall outline to drivers these requirements. Onsite inductions shall reinforce these requirements to returning drivers/contractors.

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 19 of 38

General site noise controls shall be implemented as per project Construction Noise & Vibration and Management Noise Policy for Industry (NSW EPA, 2017).

If a valid noise complaint is received, sound abatement modifications may be deployed.

6.5 TRANSPORTATION OF REGULATED WASTE

Waste management to comply with Project and regulatory requirements as per 2018-ENV-PLN-001

- General wastes will be removed from the site by, and disposed of, at an appropriately licensed waste disposal facility.
- Regulated wastes will be transported off site by a person holding appropriate licences and permits.
- All wastes will be classified using the Waste Classification Guidelines (DECC 2009) prior to disposal and transportation.
- All waste disposal receipts will be retained and included in a register.

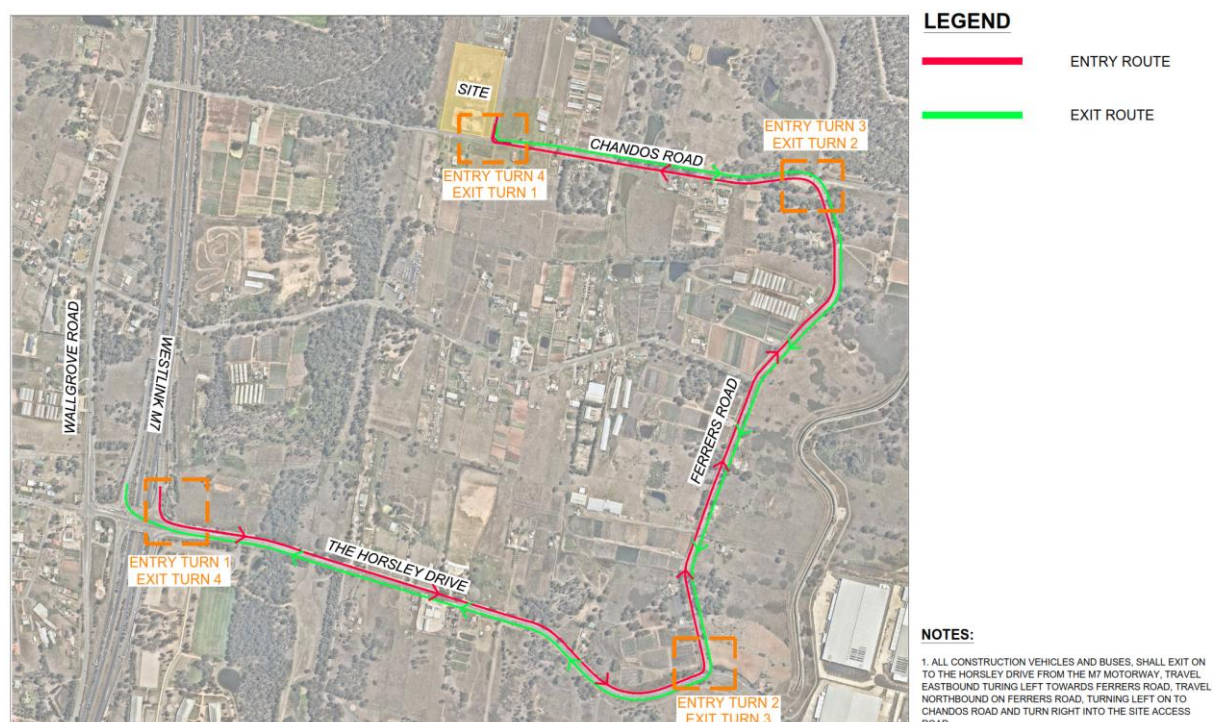
7. TRANSPORT AND TRAFFIC ASPECTS

The following information is a summary of the traffic management measures in place to control specific areas. A general proposed construction layout is provided in Appendix 1.

7.1 SITE ACCESS

7.1.1 HEAVY VEHICLE TRAFFIC ROUTE

The traffic route for all heavy vehicles will be via the traffic route shown below and in greater detail in Appendix 3. The general route is as follows:



	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 20 of 38

As the construction vehicles entering and exiting the site will be managed through a traffic control plan, additional construction works to facilitate entry and exit from site is not required.

7.1.2 SITE ENTRY AND EXIT

A traffic control plan has been developed by a registered traffic management company to ensure the safety of workers and the public during the entrance and departure of heavy vehicles. required during the construction phase of the Project. Refer Appendix 2.

It is also noted that;

- traffic management signage will be erected when required;
- Accredited Traffic Controllers with stop / slow bat
- pedestrians are to be escorted past the entry and exit during heavy vehicle movements
- designated area will be clearly marked, and sign posted as a restricted area. warning signs will be erected;
- call up points are to be installed;
- water filled barriers will be utilised;

7.2 SITE TRAFFIC RULES

In addition to general New South Wales Road Rules, the following additional site requirements must be met when driving on site.

- Visiting light vehicles shall park in the designated area.
- Heavy vehicles must be positioned by a site representative.
- A site visitor's induction shall be provided by the Site Safety Advisor for short term personnel to ensure that they understand Site access rules.
- During the induction, personnel shall be requested to confirm their BAC is 0.00% and temperature is the normal range (COVID-19 Plan requirement) before entering Site.
- Construction Supervisor to organize personnel to meet truck /float drivers then escort truck for delivery.
- Only vehicles which have been given clearance are permitted to enter production areas.
- All vehicles are required to be fully insured, registered and maintained in company policy and procedures
- Operators using the site roads will ensure that the vehicle or equipment using the roads, maintains a suitable speed and driving line to negotiate safely in all situations.

7.2.1 SPEED LIMITS

Speed limits are set for safety in accordance with the road laws. Unless otherwise stated, maximum speed limit shall be:

- Speeds as signposted, or
 - 10 kph within the Site Compound,

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 21 of 38

- 10 kph in Lay down area, and any construction / moving equipment situations (except where sign posted).
- Per Jemena site requirements.
- Walking pace going past work crews.
- Driven to road conditions.
- Abide by all State Laws notwithstanding the above

7.2.2 TRANSPORT OF PIPE AND EQUIPMENT

A transport company will be utilized for the transportation of all Pipe, heavy and oversize equipment. A separate transport plan will be supplied by the transport company which is compliant with State and Federal transport regulations. A delivery instruction will be given to the transport company prior to coming to site to comply with Section 3.1 – Chain of responsibility.

7.2.3 ESCORTING OF MACHINES OR OTHER VEHICLES

- Machines or vehicles being escorted in the construction area must have their lights and hazard lights on.
- The escort vehicle will have headlights and a revolving light/s on and working.
- The lead vehicle will notify all personnel by radio that a machine or vehicle is being escorted from a given point to a given point and by what road or area.
- The supervisor is to be informed of the escort prior to the escort being arranged

7.2.4 SEATING AND SEAT BELTS

Seat belts must always be worn by all vehicle occupants. It is the driver's responsibility to ensure all passengers are wearing their seat belts.

7.2.5 ACCESS AND RESTRICTED AREAS

- Site access shall be designed and maintained to accommodate the intended traffic volume
- At no time shall the access road be blocked and prevent access or egress in an emergency.
- Pre-starts shall be used to inform work crews of equipment and / or trucks arriving at Site.
- Jemena Projects and Operations shall be kept informed of materials and equipment delivery via emails from the Construction Superintendent. Traffic Areas
- During construction, access infrastructure, including signage, is maintained to appropriate standards

7.3 LAYDOWN

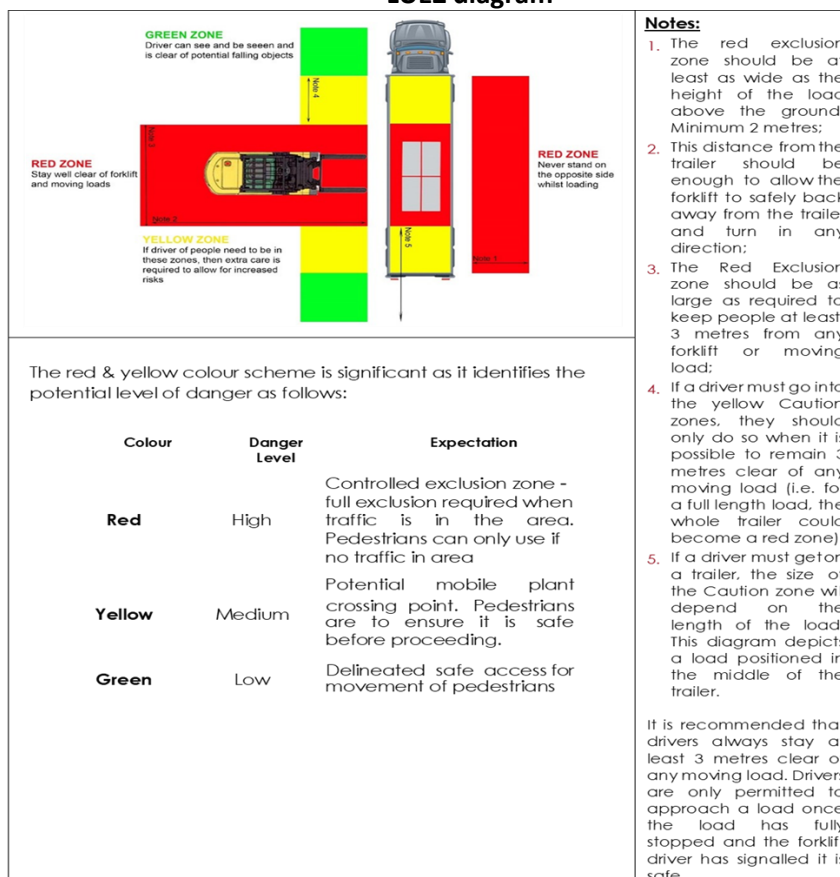
To conduct loading and unloading operations without interference from adjacent activities, mobile machinery, equipment, and employees, a designated area (LUEZ see diagram) will be established where practical.

- The designated area will be clearly marked, and sign posted as a restricted area

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 22 of 38

- Delivery truck to be escorted to laydown yard and parked up
- Delivery Drivers must have a visitor's induction and to be escorted at all times
- Driver and crew are to assess the load before securing or releasing the load
- Access to loading and unloading zones must be controlled at all times, including an exclusion zone
- Designated driver safety zones located to keep the driver away from the loading or unloading work
- Defined methods for communicating between the driver and the person loading or unloading
- Driver stores his load binders and escorted from the work area to the crib hut whilst truck is unloaded
- No one to access load on the back of trucks unless adequate fall protection is in place
- Speed limits will be adhered to in accordance with 1.1..
- A total 'no-go' area exists directly in front of, and behind, heavy equipment (within the "line of fire" of travel forwards and backwards) and 10 meters surrounding the heavy equipment.
- Light vehicles are not permitted to enter anywhere within close proximity while the heavy equipment is operating (i.e. – cranes operating, trucks being loaded, etc.) unless clearance had been obtained.
- Heavy vehicles must be positioned using spotters.

LUEZ diagram



	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 23 of 38

7.4 CONSTRUCTION AREA

- All vehicles driven into an construction area must have effective means of communication; i.e. UHF radio positioned on Channel 28. Positive visual or radio contact and clearance to proceed must be established, by using positive identification of the vehicles and personnel , the possibility of miscommunication is reduced.
- A total 'no-go' area exists directly in front of, and behind, heavy equipment (within the "line of fire" of travel forwards and backwards) and 10 meters surrounding the heavy equipment.
- The equipment operator must not grant clearance to proceed until all engaging equipment attachments have been grounded and the test for fundamentally stable parking has been completed.
- Light vehicles/personnel are not permitted to enter anywhere within the general exclusion zone while the heavy equipment is operating (i.e. – excavators digging, trucks being loaded, Cranes operating.) unless clearance had been obtained.
- Once the work is completed, the heavy equipment operator should confirm all vehicles are clear of the exclusion zone before commencement of operating the equipment, by visual and radio contact.
- Light vehicles must always be parked so they can be seen from the cab of the heavy equipment, and the heavy equipment cab can be seen from the light vehicle.
- Light vehicles intending to enter a heavy vehicle exclusion zone should approach from a direction where they can be seen by the operator either directly or in the rear view mirrors – i.e. from the general front or rear direction rather than from the sides and avoid entering or crossing the 'no-go' area in front of, and behind, heavy equipment.
- Speed limits will be adhered to in accordance with 1.1. Spotters to be used in restricted areas
- During construction, access infrastructure, including signage, is maintained to appropriate standards.
- Throughout construction, areas should be progressively rehabilitated to assist in the mitigation of dust generation, soil erosion and weed incursion. Temporary measures should also be taken in areas which cannot be fully rehabilitated in conjunction with 2018-ENV-PLN-002

7.5 RESTRICTED AREAS (JEMENA GAS NETWORKS AREA (JGN))

The following management measures will be implemented for all project traffic in the JGN areas. All demarcated areas will be sign posted.

- Access to any JGN areas shall require adherence to Jemens Permit to Work conditions.
- Machinery and vehicles shall always have an escort/spotter using a gas detector in JGN area.
- Machines or vehicles being escorted in an area must have their lights and hazard lights on.
- A total 'no-go' area exists directly in front of, and behind when escorting /spotting all vehicles(within the "line of fire" of travel forwards and backwards) and 10 meters surrounding the heavy equipment.

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 24 of 38

- Speed limits will be adhered to in accordance with 1.1. Light vehicles and personnel are not permitted to enter anywhere within close proximity while the heavy equipment is operating (i.e. – Cranes operating, trucks being unloaded, etc.) unless clearance had been obtained.

7.6 TRAFFIC FLOW

- UHF channel 28 shall be used for onsite radio communications.
- Only vehicles which have been given clearance can enter restricted areas

7.7 PARKING

- Parking at the Project site will be in the designated areas only as indicated.
- Vehicles onsite shall be kept to a minimum, adequate parking shall be made available within laydown area
- Reverse parking is applied to these areas.
- When parking, make sure the vehicle is fundamentally stable, handbrakes must be on and vehicles left in gear or park.
- Wheel chocks to be used where required.
- Only vehicles directly involved in construction activities will be permitted to park within the construction area.
- When parking in a JGN area, vehicle must abide by permit conditions.
- Keys will be left in the ignition during daylight construction periods to allow them to be moved in an emergency.

7.8 SIGNAGE

- All signs and traffic control devices shall comply with AS1742.3:2009 – Manual of Uniform Traffic Control Devices.
- Clear signs designating speeds will be placed in appropriate areas. Safety Signs and/or barricading will be used to draw attention to objects and situations that may affect personnel safety and health. Signage of particular transport risks, such as pipeline cross over points or excavations will fall under these requirements.
- Where there is a potential hazard or an area that must be isolated, barricading will be erected around the location to limit access.
- Barricades will be (where practical):
 - Not less than 1 meter from the hazard
 - Erected to between 1 meter to 1.5 meters height
 - Well anchored with sufficient supports to prevent sagging of the rope, tape, chain, etc.
 - In the case of excavations, barriers may entail solid earth barriers in the form of windrows, or cattle panels
 - Tagged and/or signposted at access points describing Hazard; and
 - May be illuminated at night-time if the Site Supervisor believes it necessary.

7.9 WEED AND HYGIENE CONTROL

Vehicles and equipment undertaking activities involved in site works have the highest potential to encounter and spread live weed plants and associated reproductive material. These tasks typically

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 25 of 38

involve travelling off road in vehicles across paddocks, bushland, and uncleared vegetation where weeds may be present.

- All vehicles, machinery and equipment are to declare the vehicle clean prior to entry to site.
- Declaration may be undertaken by the driver upon arrival at site and shall only be required on the first instance of entry
- It shall be at the discretion of Wasco site representatives to waive these declarations for 'metro restricted' vehicles such as metro delivery vehicles or LVs not exposed to potential biosecurity threats.

8. DRIVER REQUIREMENTS

8.1 GENERAL

- All personnel using vehicles must always obey New South Wales road rules and regulations, including:
 - Wearing of seatbelts
 - Compliance with posted speed limits, especially 10km/hr speed limit on site.
 - Will ensure that the vehicle or equipment using site roads maintain a suitable speed and driving line to negotiate safely in all situations.
- All drivers must hold a current license for the vehicle they operate and be familiar with the project road conditions, driving hazards and correct operating procedures.
- No smoking in vehicles.
- Appropriate measures are applied to ensure vehicles remain on designated access roads, and within the defined construction area and associated work sites.
- Where possible, drivers are to remain on sealed roads to prevent unnecessary dust generation
- Some roads in the area are unsealed and care is required to prevent excessive dust generation and minimize impact on the environment. It is important to use vehicles in a manner that will minimize dust generation.
- In tight situations, no light vehicle should pass a heavy vehicle until radio contact has been made with the heavy equipment operator and acknowledged.
- Drivers to wear the correct PPE when / if exiting the vehicle on site.
- All vehicles/plant must be well maintained and in good working order. Pre-starts shall be undertaken to comply with project requirements and Wasco policies.

8.2 INDUCTION AND TRAINING

In accordance with project requirements for Induction and Training, the Construction Manager is to ensure that all project personnel are inducted by Jemena before commencement of project works. All personnel, including staff, inspectors and subcontractors will attend the Client's Project Induction before accessing or commencing work on the site.

- Wasco personnel must have completed both the General Induction and Site-specific inductions to enter or work on the project prior to deployment to site.
- Contractors will need to undertake an induction appropriate to the sort of work they are undertaking on site.
- Visitors must undertake a visitors' induction and be accompanied by a fully inducted person at all times.

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 26 of 38

8.2.1 WASCO PROJECT INDUCTION

All Wasco employees and sub-contractors engaged to work, as part of the project, will attend the project specific safety induction before commencing on site work. This induction will be reviewed and updated to suit the changing project conditions.

All personnel shall be required to sign and acknowledge that they have been inducted into the site and understand the requirements of the project.

All licenses and certificates of competency held must be sighted.

The induction process will include an assessment indicating that the inducted employee has gained a suitable understanding of their responsibilities, project hazards and control measures.

Points of the Wasco project induction will include but not be limited to:

- Objectives of the project.
- Employee Consultative Arrangements
- Emergency Response Procedures/Muster points
- Pre-start & Toolbox meetings.
- Project safety rules
- 12 Non-Compromising Rules
- Location specific hazards
- TMP
- Smoking policy
- Policies
- PTW Systems Awareness
- Safe Work Method Statements
- Equipment Tagging & Identification Systems
- Personal Protective Equipment requirements
- Environmental concerns and activities
- Hazard and Incident Reporting
- Identification & management of hazardous substances
- Specific Working Procedures
- Basic HSE rules

8.2.2 VISITOR INDUCTION TRAINING

Short-term day visitors (who are not performing any physical construction work) to the project site are required to attend a short site-specific information session to be conducted by a member of the Project Team covering specific requirements and guidelines for the particular site, which shall include informing attendees of:

- Emergency Response
- Minimum mandatory requirements for the wearing of PPE
- Specific access restrictions or
- Hazards to be aware of pertaining to the work site
- TMP

All visitors are required to sign a declaration of understanding and agreement with site access requirements. Completed visitor induction forms shall be maintained on site by the Project Engineer. All visitors to site are assigned a Sponsor and must always be escorted. The Sponsor assigned will have completed a full project induction.

All visitors must undertake a BAC test prior to entering

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 27 of 38

8.3 FITNESS FOR WORK

Personnel must have the functional compacity to operate the vehicle and ensure they are fit to drive in accordance with the Tobacco, Alcohol and Drugs Policy (WAPL-HSS-POL-003_2) and Fatigue Management Plan. Drivers must be fit to drive and must:

- have 0.00% blood alcohol concentration (BAC) / breath alcohol concentration (BrAC)
- not be impaired from prohibited or illegal substances
- not be impaired from medication that may cause drowsiness or dizziness
- not be fatigued

If a driver feels they may not be fit for work or are taking medication that may cause drowsiness they must report this immediately to their manager.

8.4 AUTHORISATION

Personnel must be authorized by a Wasco manager / supervisor prior to operating a Wasco vehicle or plant. The manager / supervisor should satisfy themselves that the person is competent to drive the vehicle and in a fit for work state prior to granting approval.

8.5 LICENSING

Drivers must hold a current license of a class appropriate for their vehicle, and load, where applicable, as required by law. Drivers must immediately notify their manager if their license has been suspended or revoked, or if restrictions have been placed upon it that may affect their work activities.

Australian Classes of Driver's Licences:

License Type	Required
C - Car	A motor vehicle with a gross vehicle mass (GVM) not greater than 4.5 tonnes and constructed or equipped to seat no more than 12 adults
LR - Light Rigid	A motor vehicle with a gross vehicle mass over 4.5 tonnes to a maximum of 8 tonnes or which carries more than 12 passengers (including the driver) to a
MR - Medium Rigid	A motor vehicle that has 2 axles and a gross vehicle mass greater than 8 tonnes.
HR - Heavy Rigid	A motor vehicle that has 3 or more axles and a gross vehicle mass greater than 8
HC - Heavy Combination	A prime mover to which is attached a single semi-trailer plus any unladed converter dolly, or rigid motor vehicle attached to a trailer that has a gross vehicle mass greater than 9 tonnes plus any unladen converter dolly.
MC - Multi-Combination	Any heavy combination unit towing one or more trailers, each having a gross vehicle mass greater than 9 tonnes.
F (bus) extension	Transporting passengers in a vehicle that seats more than 12 persons (including the driver).

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 28 of 38

8.6 SAFE DRIVING BEHAVIOURS

Drivers are expected to follow safe driving behaviour's, including but not limited to the following:

- Always Abide by the applicable State traffic laws and signposted instructions.
- Adhering to 'defensive driving' principles (allowing for unexpected hazards and errors of the self and others)
- Safely leave the road and bring the vehicle to a complete stop in a safe parking area prior to using mobile phones, GPS navigation devices, portable computers, or other similar devices
- Parking in a manner that allows the first movement to be forward wherever practical
- Reporting unsafe or unusual road conditions
- No smoking is permitted in company vehicles

8.7 DRIVING HAZARDS

Driving on any road has inherent hazards. Hazards that may be encountered during this Project are as following but limited to:

- Construction traffic at Site entrance
- Local traffic and road works
- Adverse weather; slippery roads due to wet weather
- Additional hazards introduced by third parties (general traffic, pedestrians, bicycles, schools)
- Narrow roads with uneven edges requiring caution when overtaking and passing
- Excessive glare from sunrise/sunset
- Wildlife and livestock on road
- Vehicle breakdown
- Flat tyre/blow out
- Fatigue
- Spread of declared weeds

8.8 DRIVING HAZARDS CONTROL MEASURES

Refer below to project specific control measures to be implemented throughout the project.

Hazards and Impacts	Risk Rating	Control	Risk Rating	Responsibility
Faulty equipment Unlicensed drivers	High	• Operators must be fully licensed • Vehicle Inspections prior to operation. • Faulty plant or equipment must be isolated, tagged as "Out of Service" and reported to the Supervisor.	Mod	All

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 29 of 38

Hazards and Impacts	Risk Rating	Control	Risk Rating	Responsibility
		- Emergency response plan in place - Mobile phone /Radio coverage - First Aid Kits in all vehicles		
Unsecured loads	High	- Secure all loads appropriately in vehicle ensuring goods are stored with the use of nets, tarpaulins, cargo straps etc. - Ensure no loose items are within the passenger area as they may become projectiles in the event of an accident	Mod	All
Unfit drivers Fatigue	High	- Drivers to be not affected by drugs, alcohol or medication - Pre-Start Alco test. - Random drug screening	Mod	Supervisor
Driving on public roads :- Other drivers. Fauna. Pedestrians. Non-motorized transport (bicycles, horses). Rail crossings. School zones. Rough surfaces. Change in speed limits. Road works.	High	- Drivers to hold appropriate driver's license. - Scan area for wildlife, especially on verges. - Scan area, especially around pedestrian crossings, roadsides and around larger vehicles. - Slow down for rail crossings scan left and right to ensure no trains, stop for train red lights and booms. - Obey school signs speed limits. - Slow down for uneven road surfaces. - Reduce speed when approaching numbers of vehicles/persons. - Obey posted roadwork signs, slow down. - Understand and comply with regulated road rules.	Mod	All
Driving on unsealed roads: Other drivers. Rough surfaces.	High	- Speed on Access tracks and ROW – 10km/hr - Pos. radio communications	Mod	All

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 30 of 38

Hazards and Impacts	Risk Rating	Control	Risk Rating	Responsibility
Change in speed limits.		- Only travel on LV designated roads. - Always give way to Plant/Heavy Vehicles. - Use approved access tracks / roads only - Increase the separation distance behind your vehicle and the vehicle in front - Drive with Lights On at all times		Supervisor to monitor
Speeding	High	- Drivers to observe local and site speed limits - Speed on ROW – 10km/hr and vigilance around pedestrians and operating machinery - Drivers MUST always drive to the conditions	Mod	All Supervisor to monitor
Driving in sun glare	High	- Ensure the vehicle windscreen is clean and undamaged - Use vehicle sunvisor - Wear shaded glasses - Reduce speed when visibility is impacted - Stop the vehicle if unsafe to continue	Mod	All Supervisor to monitor
Driving in adverse weather conditions Poor visibility Slippery conditions.	High	- Drivers MUST drive to the road and weather conditions - Reduce speed and increase following distances in wet conditions - Be aware of the potential for flooding during wet weather - Stop the vehicle if unsafe to continue	Mod	All Supervisor to monitor
Dusk/Dawn Driving: Inadequate vehicle lights Driver fatigue. livestock / wildlife	High	- Ensure headlights are always clean and on. - Understand and comply with regulated road rules. - Scan road for fauna. - Drivers should not swerve to avoid wildlife (may result in roll over)	Mod	All Supervisor to monitor

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 31 of 38

Hazards and Impacts	Risk Rating	Control	Risk Rating	Responsibility
		Maintain safe distance from other vehicles (3 seconds).		
Driver distracted by phone	High	- Mobile phone devices MUST not be used when the vehicle engine is running - Drivers MUST, when it is safe to do so, pull over off the road to use phone if hands free option is not available	Mod	All
Vehicle collision with open trench / live pipeline / buried service	High	- Drivers MUST only cross live pipelines at appropriate and designated crossing points - Open trenches MUST be clearly marked - Supervisors and Managers MUST ensure that personnel are appropriately trained and experienced and have good awareness of the location of buried services and current project activities - Drivers to observe local and site speed limits	Mod	All Supervisor to monitor
Flat Type/Unloading	High	- Stop the vehicle in a safe location - Wear hi-visibility ppe - Use care and correct lifting techniques e.g.: Plan Your Lift when removing item from the vehicle If the load is too heavy or awkward to handle alone, get assistance. If another person is available Get a Firm Footing and bend knees, tighten stomach muscles and lift with your legs. Keep the load close and avoid twisting or turning your back - Refer to vehicle manual for safety requirements when changing tyres - Suitable gloves and PPE for the task	Mod	Work Crew

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 32 of 38

9. MONITORING AND REPORTING

9.1 VEHICLE TRACKING

Wasco owned and operated vehicles are fitted with in vehicle monitoring systems (IVMS). Heavy vehicle movements will be provided by subcontractors ahead of time (18hrs) to Wasco representatives on site to ensure clear and unimpeded access to site. Subcontractors will be issued an approved site access road map as part of their delivery instruction; this will include approved roads, site PEE requirements and details of site contacts (below)

- Mick Horgan (Construction Manager) – 04 0849 4568
- Daniel Politylo (Project Engineer) – 04 3035 5266
- Shane Horgan (Construction Supervisor) – 04 0710 0184

Delivery sign in will be required by all drivers as per project site access requirements. These figures can be provided as part of HSE reporting statistics.

9.2 COMMUNICATION

External communication to surrounding stakeholders will be undertaken prior to the commencement of construction works and traffic impacts, this will include a notification of planned works and construction timelines.

All relevant project communication will be made available to everyone on the community website <https://haveyoursay.jemena.com.au/western-sydney-green-gas-project>

9.3 COMPLAINT MANAGEMENT

Wasco will notify the Jemena Project Team immediately of any issues or complaints raised by any relevant stakeholder, so that the most consistent and up to date information is provided and a suitable resolution is reached. All complaints will be recorded by Wasco.

The complaint investigation process will be completed within 24 hours a responses/resolutions to the complaint is to be communicated by the Jemena Project Team for communication with the complainant

9.4 INSPECTIONS

Inspections of traffic, transport and access management measures will be undertaken regularly during construction with attention being made to those areas that interface with the public and affecting public safety. These shall be conducted weekly as part of a weekly HSE site inspection in accordance with 2018-HSS-PLN-001. Standalone inspections shall also be undertaken as required if concern is raised to Wasco Project Team.

No.	Inspection Type	Responsibility	Timing
1	Weekly HSE Site Inspection	HSE Advisor	Weekly
2	HAZOB/Incident Related Inspection	Project Team	As Required

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 33 of 38

9.5 COMPLIANCE AND REVISION

Regular monitoring and reporting of Traffic Management Plan compliance will be conducted in conjunction with regular Project reporting. All road degradation shall be reported immediately.

9.6 INCIDENT NOTIFICATION

All incidents, as defined in the Development Consent, will be reported to the, Council and any other relevant government agencies immediately after it becomes aware of an incident.

In the event of any incident, unless a significant hazard continues to exist, the scene will remain undisturbed until authorisation has been received from the Project Manager in consultation with Jemena and any designated Government Authority (in the case of a fatality, the police).

As soon as practicable verbally, but within 24 hours, the Project Manager will provide a report to Jemena outlining fully all material facts and circumstances concerning the incident that the Wasco Project Management Team is aware of or is able, by reasonable search and inquiry, to find out.

Jemena Shall then pass on to the relevant parties as per condition of Development Consent outlined below.

A non-compliance includes contravention of a condition of Schedules 2, 3 or 4 of the Development Consent. Within seven days of becoming aware of a non-compliance, Jemena must notify the Department. The notification must identify the development (including the development application number and name), set out the condition of this consent that the development is non-compliant with, why it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.

Note: A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.

9.7 REPORTING

Wasco will report to Jemena and other agencies as required on transport management issues related to the Project. Reporting will include:

- Notification of works commencement (including prior to construction commencement and completion)
- Monitoring records;
- Non-compliances; and
- Project website updates.

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 34 of 38

10. DEFINITIONS

Term	Definition
Accredited Traffic Controllers	Trained and approved to direct traffic in accordance with a work zone traffic management plan
AS	Australian Standard
BAC	Blood Alcohol Concentration
Client	Jemena Gas Networks Pty Ltd
Contractor	Wasco Energy or person employed by Wasco Energy directly
COR	Chain of Responsibility
Council	Fairfield City Council
dB(A)	A-weighted decibels, abbreviated dBA, or dBa, or dB(a), are an expression of the relative loudness of sounds in air as perceived by the human ear.
Development Consent	Approval conditions as per granted by Council
HAZOB	Hazard Observation
Heavy Vehicle (HV)	A vehicle that has a gross vehicle mass (GVM) or aggregate trailer mass (ATM) of more than 4.5 tonnes. (Semi Trailer, Heavy Rigid Truck, Crane, etc)
HSE	Health, Safety and Environment
JGN Area	Jemena Gas Networks Area, areas with existing Jemena Gas infrastructure
LAeq	Leq is the preferred method to describe sound levels that vary over time, resulting in a single decibel value which takes into account the total sound energy over the period of time of interest.
Light Vehicle (LV)	Not more than 4.5 tonnes (t) Gross Vehicle Mass (GVM) built to carry not more than 12 adults including the driver
LUEZ	Loading and unloading Exclusion Zone
Medium Rigid (MR)	Medium rigid truck more than 8 t GVM with not more than 2 axles
P2G	Power to Gas
PTW	Permit to Work
Road Traffic Authority	See TfNSW

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 35 of 38

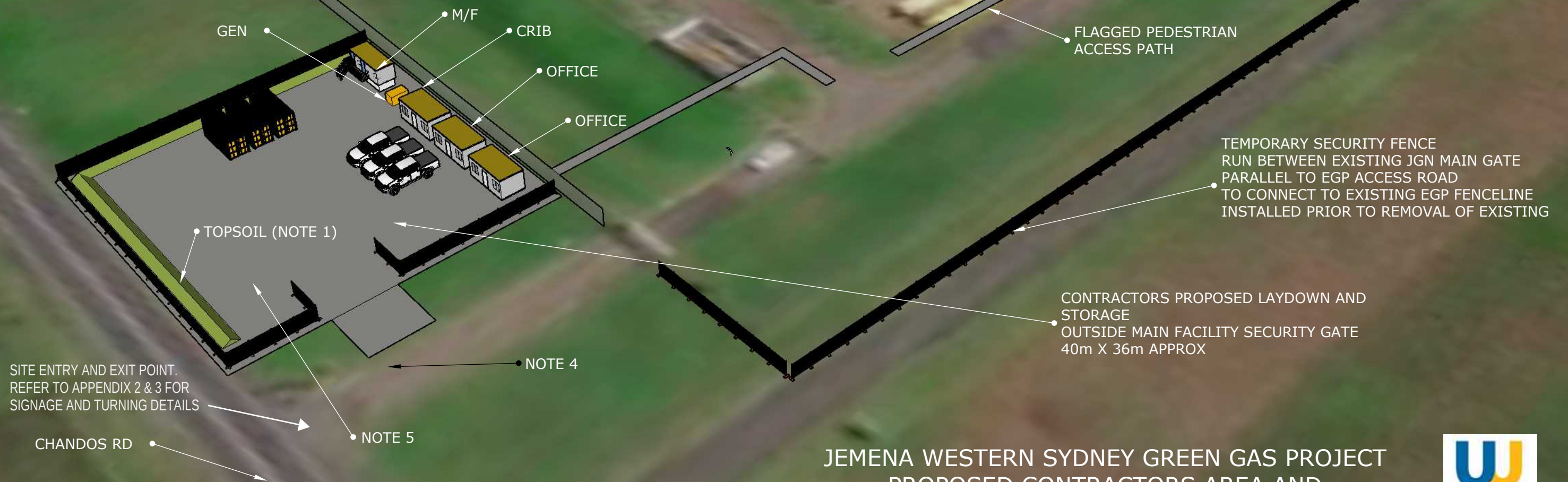
Term	Definition
Site Team or Project Team	Refers to Construction Manager, Project Engineer, Construction Supervisor and HSE Advisor who are on site.
Spotter	A person external from the plant/vehicle to assist the operator in manoeuvring equipment into position to prevent injury to the operator, other personnel or prevent property damage
Staff	Any personnel involved with the project
Sub-Contractor	Any service/contractor/supplier engaged by Wasco Energy
TfNSW	Transport for New South Wales
The Applicant	Jemena Gas Networks Pty Ltd on behalf of Wasco Energy
The Company	Jemena Gas Networks Pty Ltd
The Development	WSGG Construction Site or Horsley Park High Pressure Gas Facility. Located at 194-214 Chandos Road, Horsley Park
TMP	Traffic Management Plan
WSGG	Western Sydney Green Gas Project

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 36 of 38

Appendix 1 – Site Layout

NOTES:

1. TOPSOIL TO BE REMOVED AND STORED PER APPROVED ESCP.
2. ALL ESCP SILT FENCING, COIR LOGS AND DRAINAGE DIVERSION MEASURES TO BE INSTALLED AT ESTABLISHMENT.
3. SILT TRAPS TO BE INSTALLED AS NOTED IN ESCP.
4. KERB CROSSING TO BE INSTALLED TO MINISE DISTURBANCE AND ALLOW SAFE VEHICLE PASSAGE.
5. TEMPORARY SURFACE TO BE LAID AND REMOVED AFTER CONSTRUCTION. CRUSHED CONCRETE OR SIMILAR.



**JEMENA WESTERN SYDNEY GREEN GAS PROJECT
PROPOSED CONTRACTORS AREA AND
SECURITY FENCING LAYOUT**



	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 37 of 38

Appendix 2 – Traffic Control Plan

CHANDOS ROAD, Horsley Park



PROJECT/SITE OVERVIEW

Project/Site Description:

CHANDOS ROAD

Location of Works:

CHANDOS ROAD, HORSLEY PARK

Anticipated Commencement Date:

8/09/2020

Estimated Duration of Works:

16 Weeks

Working Hours:

Mon-Fri 7:00-18:00

Sat 7:00 -12:00

CLIENT DETAILS

Client Name:

WASCO PTY LTD

Client Contact Name:

MICHAEL HORGAN

Client Contact Number:

04 08 494 568

PO/Contract Number:

HORSLEY PARK

Site Contact:

MICHAEL HORGAN

Site Contact Number:

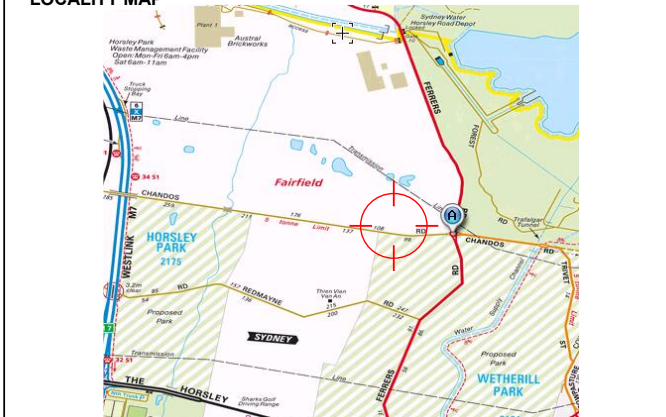
04 08 494 568

SCOPE OF WORKS

This Traffic Management Plan has been developed to allow the client to conduct works at the above location and to display a commitment to Traffic and Pedestrian Management, Reporting, and Reviewing. These works will include, but not limited to:

HYDROGEN PLANT

LOCALITY MAP



THIS DOCUMENT HAS BEEN DEVELOPED IN ACCORDANCE WITH THE INFORMATION SUPPLIED BY OUR CLIENT: WASCO PTY LTD. THE SIGNING TMD IS NOT RESPONSIBLE FOR ANY OMISSIONS OR ERRORS IN THE BASE INFORMATION SUPPLIED BY THE ABOVE MENTIONED "CLIENT" WHILE DUE CARE HAS BEEN TAKEN IN THE PREPARATION OF THIS DOCUMENT, TRAFFIC AND ON SITE CONDITIONS AT THE TIME OF THE WORKS MAY VARY FROM THOSE ESTABLISHED WITHIN THIS DOCUMENT. THE PRINCIPAL CONTRACTOR IS RESPONSIBLE FOR UNDERTAKING OF AN EVALUATION OF THE SITE AND TRAFFIC CONDITIONS AGAINST THOSE OUTLINED WITHIN THE TMP AND IN THE TGS's AS APPROPRIATE. WHERE CONDITIONS VARY FROM THOSE DOCUMENTED, ADDITIONAL INPUT FROM A TMD (TRAFFIC MANAGEMENT DESIGNER) SHOULD BE SOUGHT.

Evolution Traffic Management

51 Heathcote Road, Moorebank
New South Wales, 2170

Ph: 1300 880 481.

RMS REGISTRATION CATEGORY G

evolution
TRAFFIC MANAGEMENT

APPROVED BY TM DESIGNER:
STEVE JW ROBERTS
004857333 PNC72145-ENC-ND5030

EVOLUTION JOB NUMBER:

440390105

REV# 00 PAGE: 1 of 3

IMPLEMENTATION INSTRUCTIONS

Before work commences, signs and devices at the approaches to and within the work area SHALL be implemented in accordance with the approved Traffic

Guidance Schemes and the Traffic Control Companies Safe Work Method Statements, in the following sequence:

- 1) Traffic Controllers implementing signage are to ensure all signage is available for implementation prior to shift.
- 2) Signs & devices in side streets leading into the works are to be implemented first. Where required, detours are to be in place before commencing any closures.
- 3) All signage on arterial and main road alignments to be implemented with the flow of traffic.
- 4) Signs are to be implemented in all non affected lane(s) first and all conflicting signs are to be covered.
- 5) Signs in the affected lane to be implemented; Taper, Speed Reduction, Safety buffer (if applicable), and Delineation to be implemented with the traffic flow. Conflicting signs to be covered in process.
- 6) Ensure signs & devices are correct before works commence.
- 7) Once works have finished, Traffic Control are to pick up delineation and taper's in reverse. Then pick up advance warning signs with the flow of traffic.

RECORDING & MONITORING

Regular inspections of traffic control devices SHALL be carried out a minimum of twice daily and recorded in The Daily Traffic Diary. These records SHALL be available for inspection during the project. These records will be held on site by The Client. Details of all changes in traffic movements shall be recorded and maintained throughout the construction period and submitted within 7 days from the date of practical completion. In the event of a traffic related incident with in the site, The Client SHALL immediately notify the principal's representative, the police, and any necessary emergency services.

PEDESTRIAN & CYCLIST MANAGEMENT

All pedestrian & cyclist control measures, for the duration of the construction works will be monitored as required for effectiveness & improvements. Appropriate warning signage and directional signage will be in place and monitored throughout the works as per the provided TGS's attached to this document. Where current documented control measures are ineffective, A TMD qualified person(s) should be contacted to suggest changes.

GENERAL NOTES

- The Designer preparing this plan has ensured it complies with the RMS TCAWS (Version 5, 27 July 2018). Any unapproved variations to the design will negate the Designers liability. Variations and amendments to this TGS are to be recorded on this TGS with the changes noted, along with the date and time of the change and the accreditation details of the TMD making the change.
- The attached TGS's SHALL be read in conjunction with this notes page and the associated risk assessments and an on site risk assessment SHALL be performed before any implementation works takes place.
- It is the Clients responsibility to ensure they have a copy of the permits (in date) for the closure being implemented.
- This TGS SHALL only be implemented by a competent person(s) with a current Traffic Management Implementation (TMI) qualification.
- A toolbox talk is to take place before works commencing.
- Work Site Safety Traffic Management Checklist to be filled out prior to implementation, and upon completion.
- Traffic Controllers to identify and make note of escape routes prior to commencement of works.
- Hand held UHF radios are to be utilised where required to communicate between traffic control & site vehicles.
- Principal Contractor to notify local Emergency Services in advance of commencing works.
- Traffic Controller's to ensure ROLS has been activated prior to each shift via the TMC website or Mobile App. ROL must also be deactivated once shift has ended.
- Advance signs SHALL be mounted at a minimum height of 200mm displayed as prominently as possible by selecting the longitudinal location of the sign for best sight distance for approaching traffic. Signs continuously required for works which will be in progress for periods longer than 2 weeks should be erected in a permanent manner, e.g. on posts sunk into the ground, and duplicated on the right side of the road.
- Traffic volumes should be monitored throughout the implementation of the TGS(s). In the event queue lengths become unmanageable, works should cease if possible and traffic cleared before recommencing.

SITE SPECIFIC NOTES

Ⓢ Where this symbol appears, please refer back to the coinciding note below.

- 01 - Workman symbolics SHALL be removed or covered when workers are no longer visible to traffic. (TCAWS Ver.5, 5.2.3)
- 02 - Traffic Controller Ahead/Prepare to Stop sign SHALL be used when a traffic controller is attending traffic. The sign SHALL NOT be displayed when the traffic controller is not in attendance controlling traffic. (TCAWS Ver.5, 8.1.4)
- 03 - Existing or Conflicting signage SHALL be covered or removed when this TGS is operational. (TCAWS Ver.5, 8.2.5)
- 04 - Access to local businesses and driveways will be maintained during works. Unless otherwise shown on the TGS(s) and site specific notes. It is the Principal Contractors responsibility to seek permission prior to blocking public and private access.
- 05 - 700mm traffic cones will be positioned at a maximum 4m apart. (AS 1742.3 Clause 4.11 - Table 4.7)
- 06 - At an active traffic control position, under conditions of heavy traffic or lengthy delays, or a combination of the two, long queues may form. Depending on speed of traffic and sight distance to the end of a queue, additional advance warning may be required to avoid end-of-queue collisions. (TCAWS Ver.5, 3.5.7)
- 07 - Existing 3.0m lane width shall be maintained. A clearance area between the edge of traffic lane and delineation SHALL be provided. Measurements for this clearance are outlined under AGTTM03 CL 2.5.8 Table 2.5.
- 08 - Pedestrians to be escorted through work area when safe, as required.
- 09 - Workers to remain greater than 1.2m at all times.

LEGEND:

	ACCREDITED TRAFFIC CONTROLLER with Approved Stop / Slow Bat
	LATERAL HAZARD MARKER either T5-5 or T5-4 (Horizontal)
	TRAFFIC CONES per TCAWS V5 Clause 3.3.3
	DELIVERY TRUCK ROUTE
	PROPOSED WORK AREA as advised by Client
	PROPOSED LANE CLOSURE per TCAWS requirements / Client request

DESKTOP RISK ASSESSMENT

LOCATION OF WORKS CHANDOS ROAD, Horsley Park				DATE 04/09/2020	
RISK RATING:		4 = (VERY HIGH)	3 = (HIGH)	2 = (MEDIUM)	1 = (LOW)
IDENTIFIED HAZARDS/RISKS:					
1 - Clearance to traffic.					
2 - Presence of workers at worksite.					
3 - Cyclist / pedestrians through worksites.					
4 - Truck turning					
ACTIONS TAKEN :					
1,2,3 - Placement and duplication of advance warning signs.					
1,2,3 - Separation of works from road users through delineation (cones).					
3 - Placement of advance warning signs for Cyclist / pedestrians.					
4 - Hold and release as required					
CONTROL LEVEL REQUIRED:					
1 - ELIMINATE		2 - SUBSTITUTE	3 - ISOLATE	4 - ENGINEER	5 - ADMIN
6 - PPE					
FURTHER ACTION REQUIRED:					
- Pedestrians to be escorted through the work area when safe, as required.					
RESIDUAL RISK:		4 = (VERY HIGH)	3 = (HIGH)	2 = (MEDIUM)	1 = (LOW)
Likelihood		CONSEQUENCE			
		Insignif.[1]	Minor [2]	Modera. [3]	Major [4]
Almost Certain [5]		3	3	4	4
Likely [4]		2	3	3	4
Possible [3]		1	2	3	4
Unlikely [2]		1	2	2	3
Rare [1]		1	2	2	3
4 Very High [VH]		URGENT - Stop work immediately, the risk requires immediate attention			
3 High [H]		Continue with supervision and control measures in SWMS or site risk assessment			
2 Medium [M]		Use control measures to ensure risk is low as reasonably possible			
1 Low [L]		Manage by routine procedures and safe practices			

CLIENT: WASCO PTY LTD

TGS REFERENCE:	REV.	DATE	PAGE(S) NO#	DESCRIPTION
217732	00	04/09/2020	ENTIRE DOCUMENT	TRAFFIC MANAGEMENT PLAN DEVELOPED FOR WASCO PTY LTD
	01			
	02			
	03			
	04			

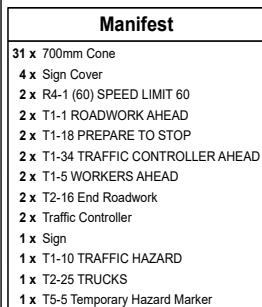
PWZTMP	INIT
0049937533	SJWR

HYDROGEN PLANT

Evolution Traffic Management
51 Heathcote Road, Moorebank
New South Wales, 2170
Ph: 1300 880 481.
RMS REGISTRATION CATAGORY G

APPROVED BY TM DESIGNER: STEVE JW ROBERTS 0049937533 PWZTMP-ROICWDS030			
EVOLUTION JOB NUMBER: 440390105			
REFERENCE ID:	REV#	PAGE:	
EVO	NOTES 01	00	2 of 3

evolution
TRAFFIC MANAGEMENT



THIS (TGS) SHALL BE READ IN CONJUNCTION WITH **NOTES 01**. IT HAS BEEN DEVELOPED TO ALLOW THE CLIENT TO CONDUCT WORKS AT THE LISTED LOCATION AND TO DISPLAY A COMMITMENT TO TRAFFIC AND PEDESTRIAN MANAGEMENT, REPORTING, AND REVIEWING. AN ON SITE RISK ASSESSMENT SHALL BE CONDUCTED PRIOR TO ERECTING ANY TRAFFIC CONTROL DEVICES.



NOT TO SCALE

TERM:	SHORT
ROAD TYPE:	TWO WAY
POSTED SPEED:	60KPH
OPERATION:	VERGE CLOSURE
TRAVELLED PATH:	PAST

Evolution Traffic Management
51 Heathcote Road, Moorebank
New South Wales, 2170
Ph: 1300 880 481.
RMS REGISTRATION CATEGORY C

APPROVED BY TM DESIGNER:
STEVE JW ROBERTS
0049937533 PWZTMP-RIICWD503D

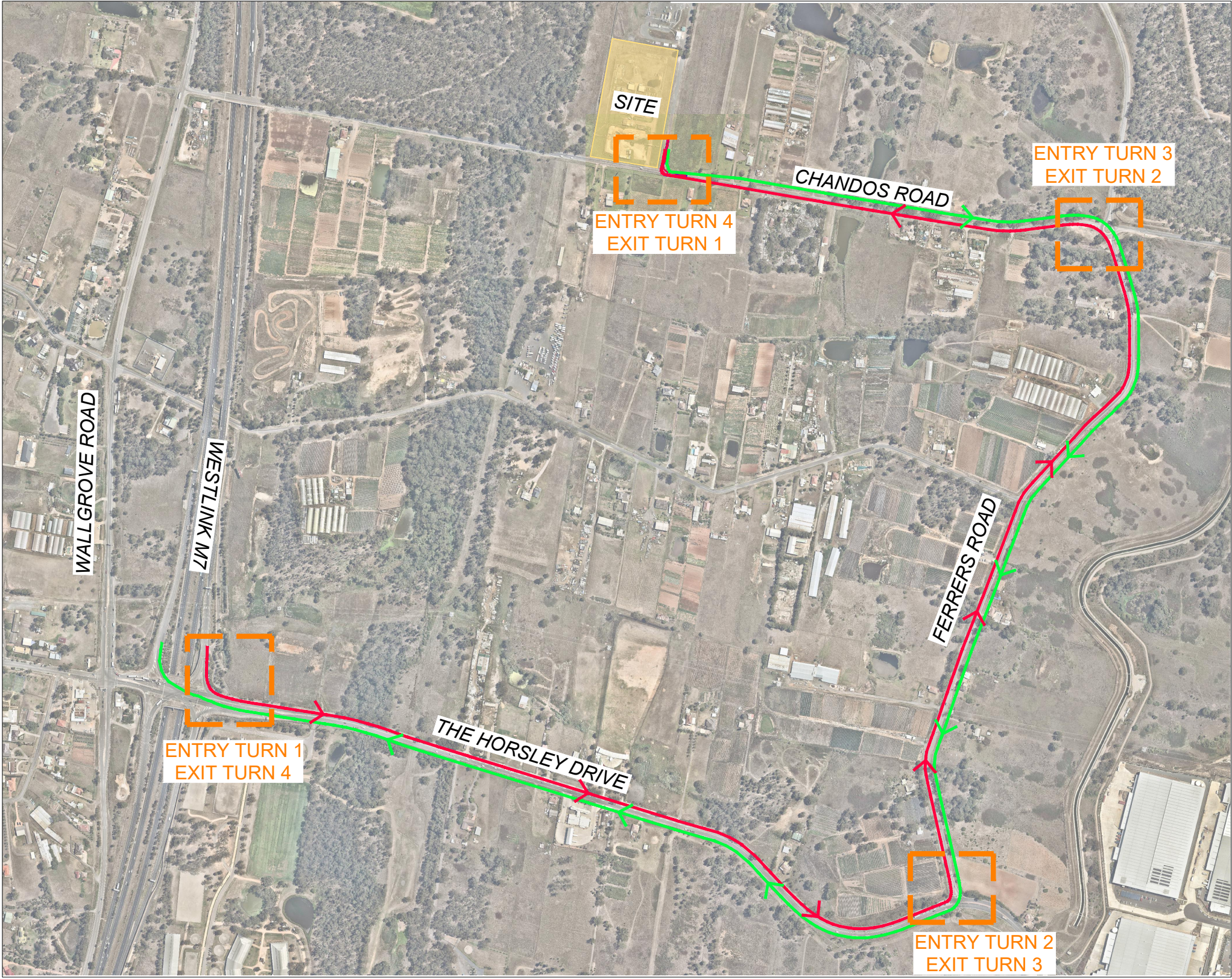
EVOLUTION JOB NUMBER:
440390105

EVO	REFERENCE ID: 217732	REV# 00	PAGE: 3 of 3
------------	--------------------------------	-------------------	------------------------

	JEMENA WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-002	TRAFFIC MANAGEMENT PLAN	Page 38 of 38

Appendix 3 – Traffic Route and Turning Path

\\ttm\ps01\ttm\local\synergy\synergy\projects\19sy\19sy\0068 - western sydney green gas trial horsley park - traffic assessment\3 - plans\trm\20 06 03\19sy0068.dwg



PROPOSED 19m AV ROUTE INTO SITE

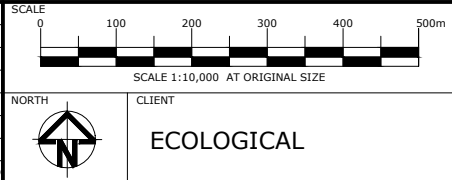
NOTES:

1. ALL CONSTRUCTION VEHICLES AND BUSES, SHALL EXIT ON TO THE HORSLEY DRIVE FROM THE M7 MOTORWAY, TRAVEL EASTBOUND TURNING LEFT TOWARDS FERRERS ROAD, TRAVEL NORTHBOUND ON FERRERS ROAD, TURNING LEFT ON TO CHANDOS ROAD AND TURN RIGHT INTO THE SITE ACCESS ROAD.

LEGEND

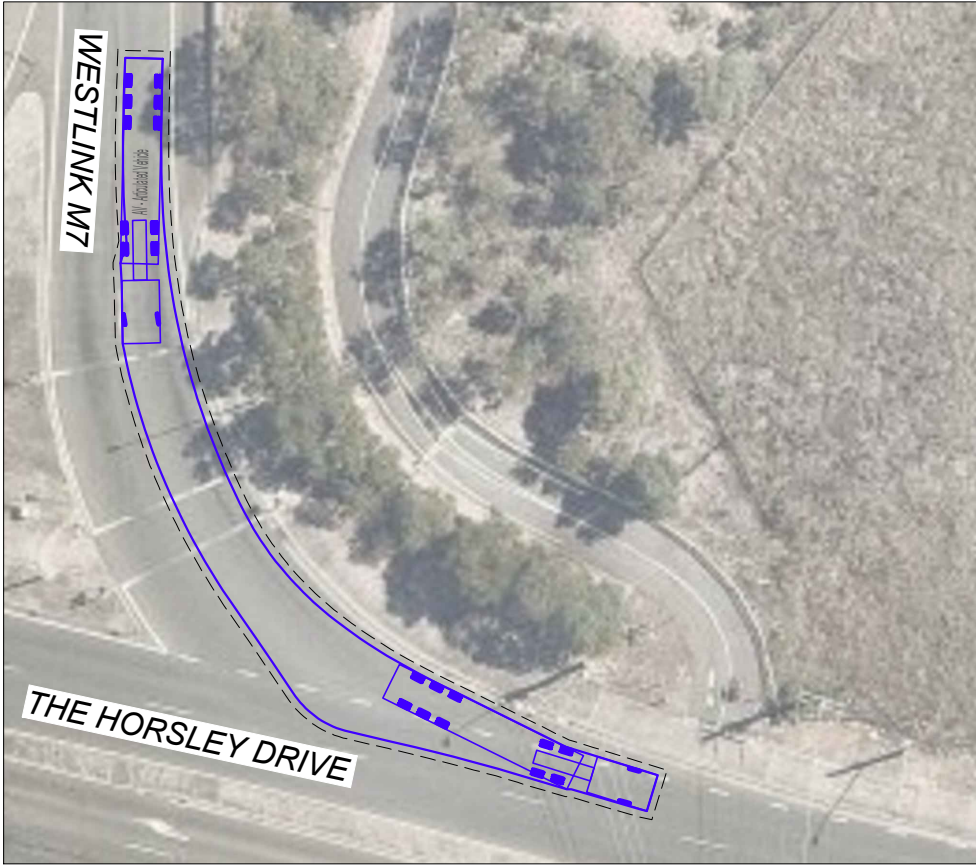
- PROPOSED ENTRY ROUTE
- PROPOSED EXIT ROUTE

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
B	11-06-20	EXIT ROUTE UPDATED	LD	BH	BH
A	30-04-20	ORIGINAL ISSUE	LD	BH	BH

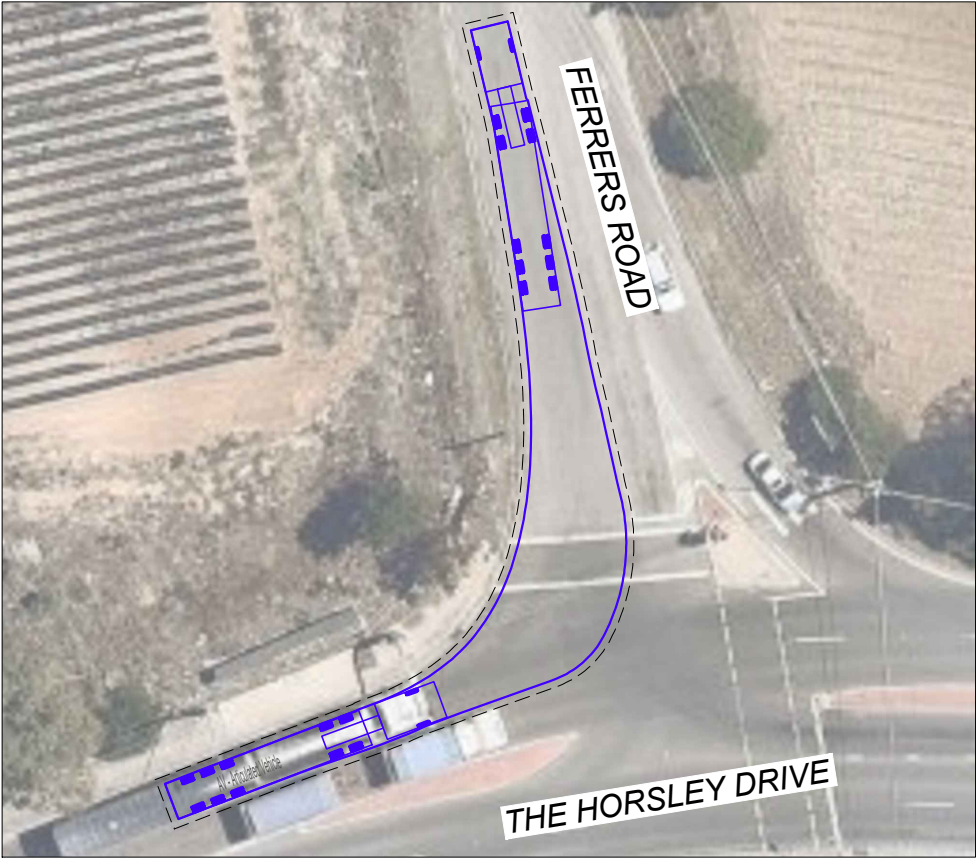


TTM CONSULTING PTY LTD
ABN 65 010 868 621
LEVEL 5, Suite 501, 174 Pacific Highway
Greenwich NSW 2065
T: (02) 9418 3033 F: (02) 9418 3112
E: ttmbri@ttmgroup.com.au W: www.ttmgroup.com.au

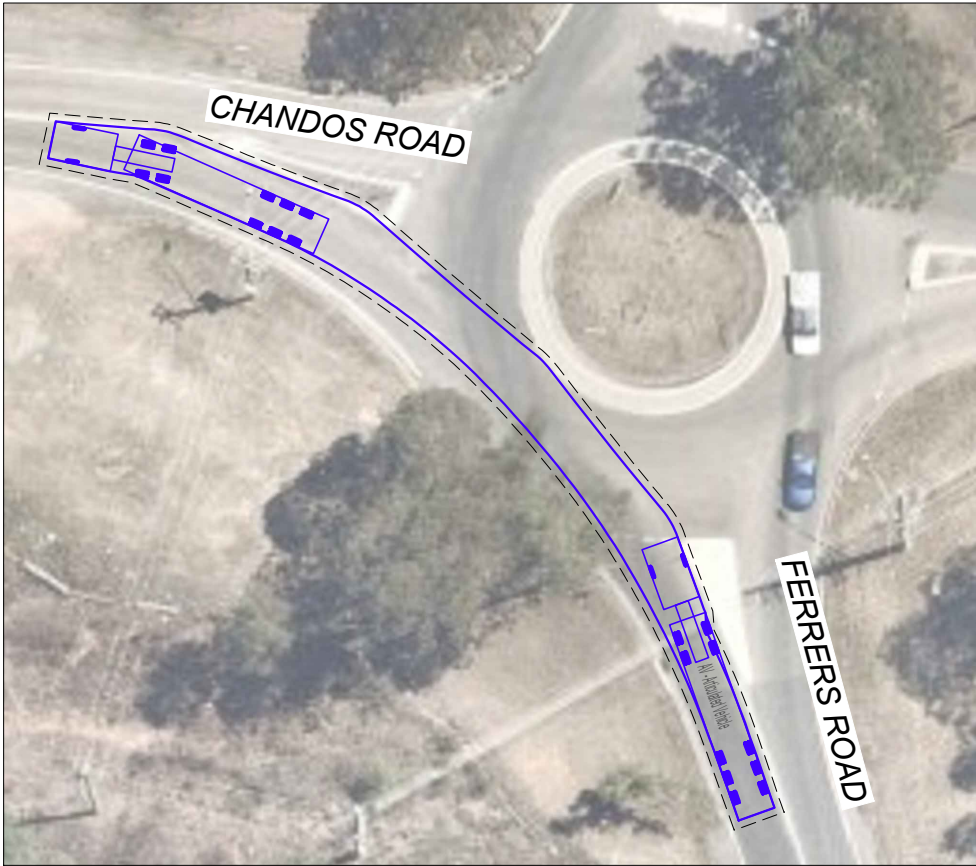
PROJECT	WESTERN SYDNEY GREEN GAS TRIAL HORSLEY PARK	PROJECT NUMBER	19SYT0068	ORIGINAL SIZE	A3
DRAWING TITLE	TRAFFIC MANAGEMENT PLAN VEHICLE ROUTE DIAGRAM	DRAWING NUMBER	18SYT0068-02	REVISION	B
		DATE	11 Jun 2020	SHEET	1 OF 1



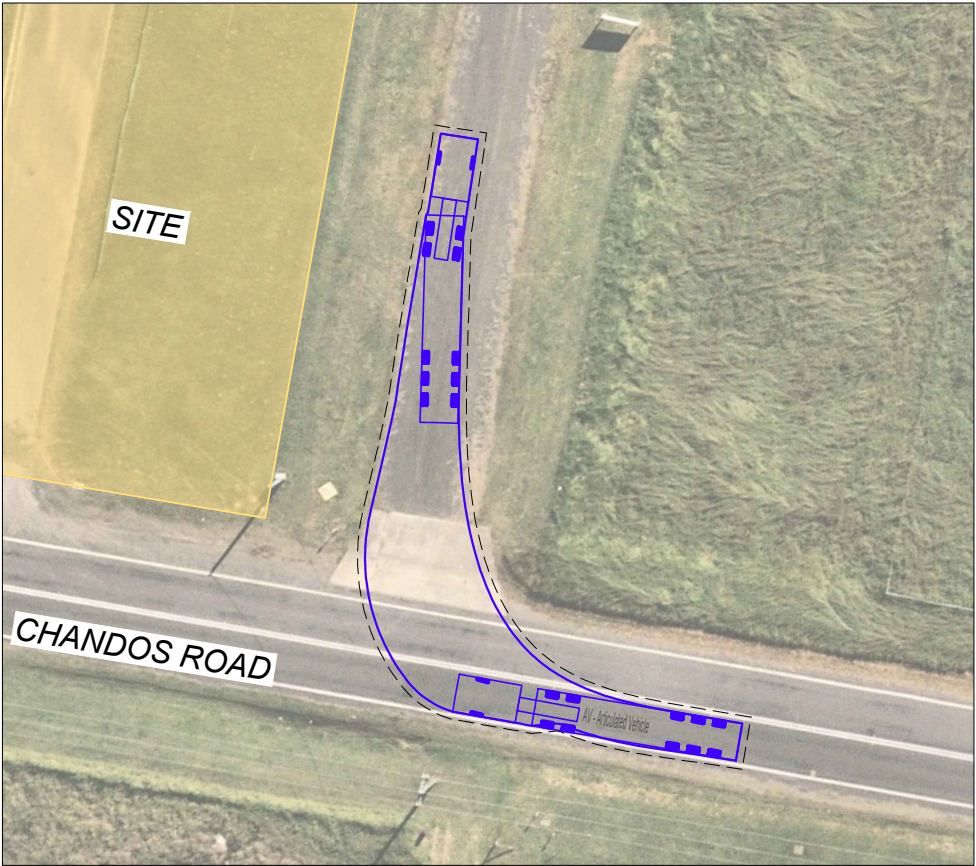
TURN 1 - WESTLINK M7 INTO THE HORSLEY DRIVE



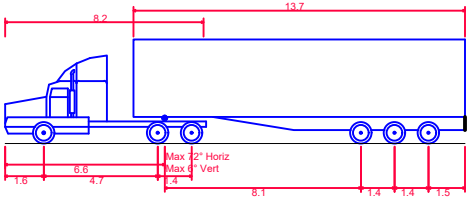
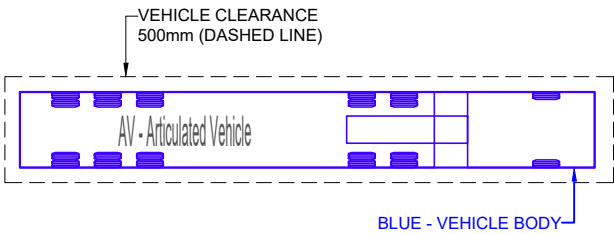
TURN 2 - THE HORSLEY DRIVE INTO FERRERS ROAD



TURN 3 - FERRERS ROAD INTO CHANDOS ROAD

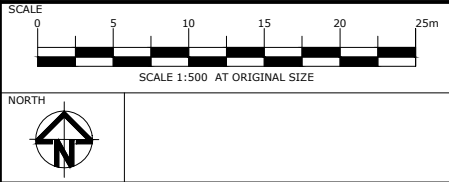


TURN 4 - CHANDOS ROAD INTO SITE



AV - Articulated Vehicle
Overall Length 19.000m
Overall Width 2.500m
Overall Body Height 4.301m
Min Body Ground Clearance 0.418m
Track Width 2.500m
Lock-to-lock time 6.00s
Curb to Curb Turning Radius 12.500m

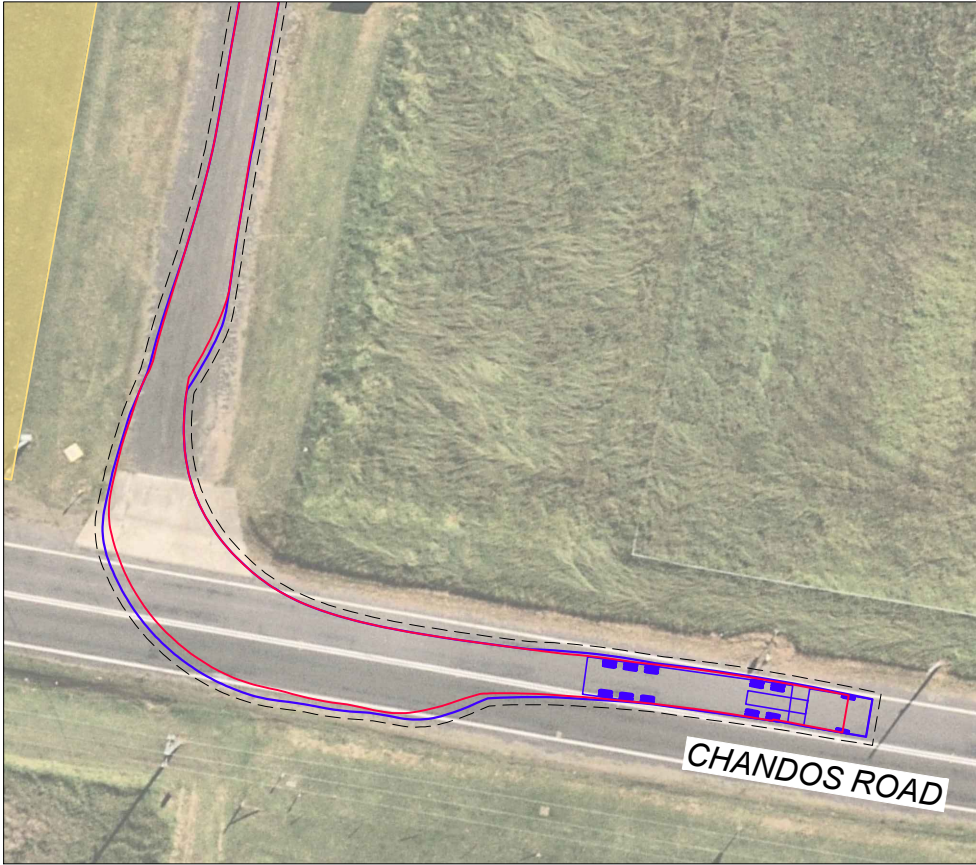
REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
A	30-04-20	ORIGINAL ISSUE	LD	BH	BH



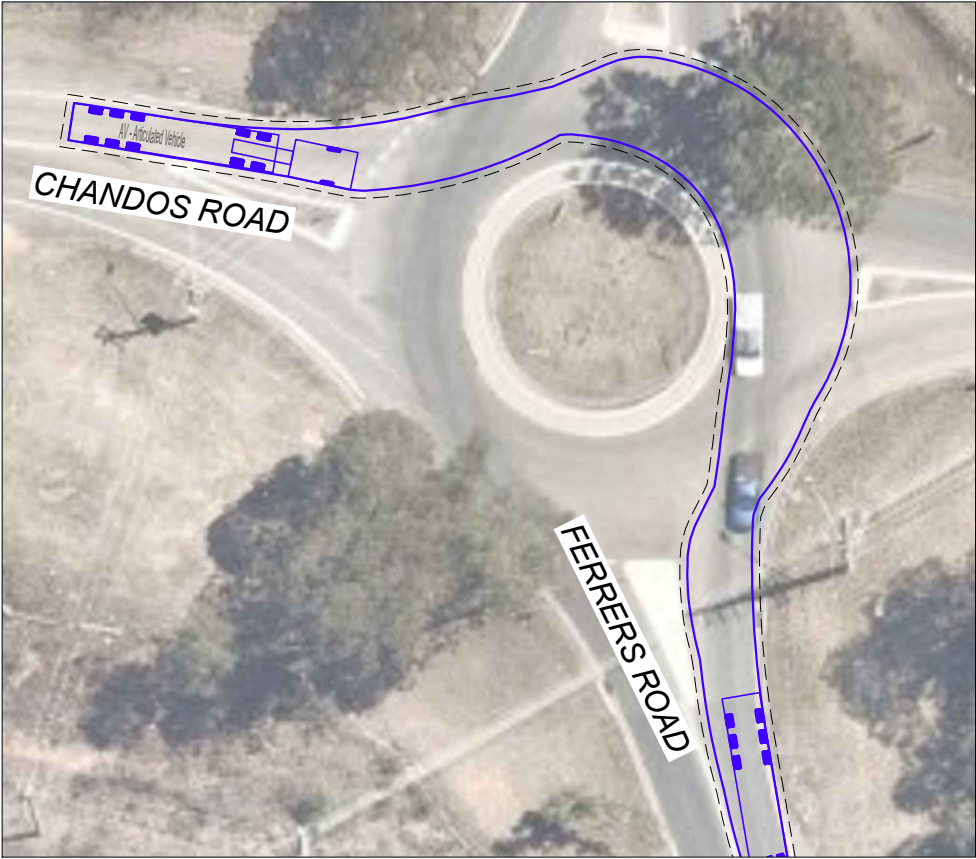
TTM CONSULTING PTY LTD
ABN 65 010 868 621
LEVEL 5, Suite 501, 174 Pacific Highway
Greenwich NSW 2065
T: (02) 9418 3033 F: (02) 9418 3112
E: ttmbri@ttmgroup.com.au W: www.ttmgroup.com.au

PROJECT	WESTERN SYDNEY GREEN GAS TRIAL HORSLEY PARK
DRAWING TITLE	TRAFFIC MANAGEMENT PLAN AV ENTRY INTO SITE FROM M7

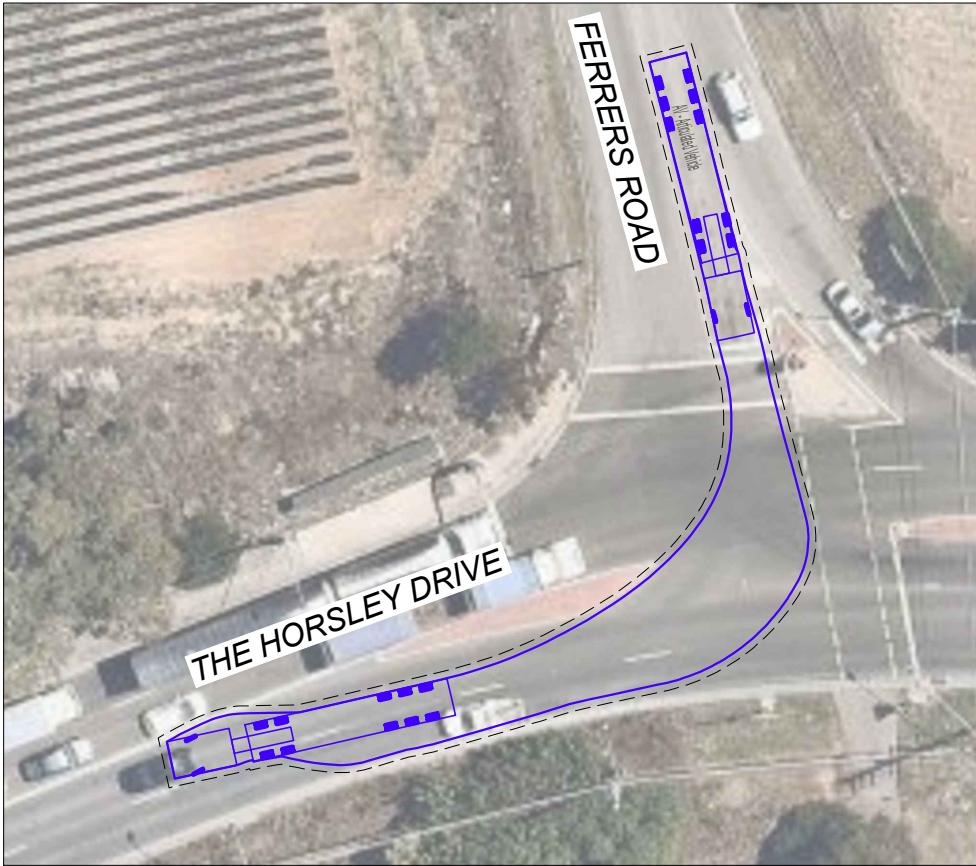
PROJECT NUMBER	19SYT0068	ORIGINAL SIZE	A3
DRAWING NUMBER	18SYT0068-03	REVISION	A
DATE	11 Jun 2020	SHEET	1 OF 2



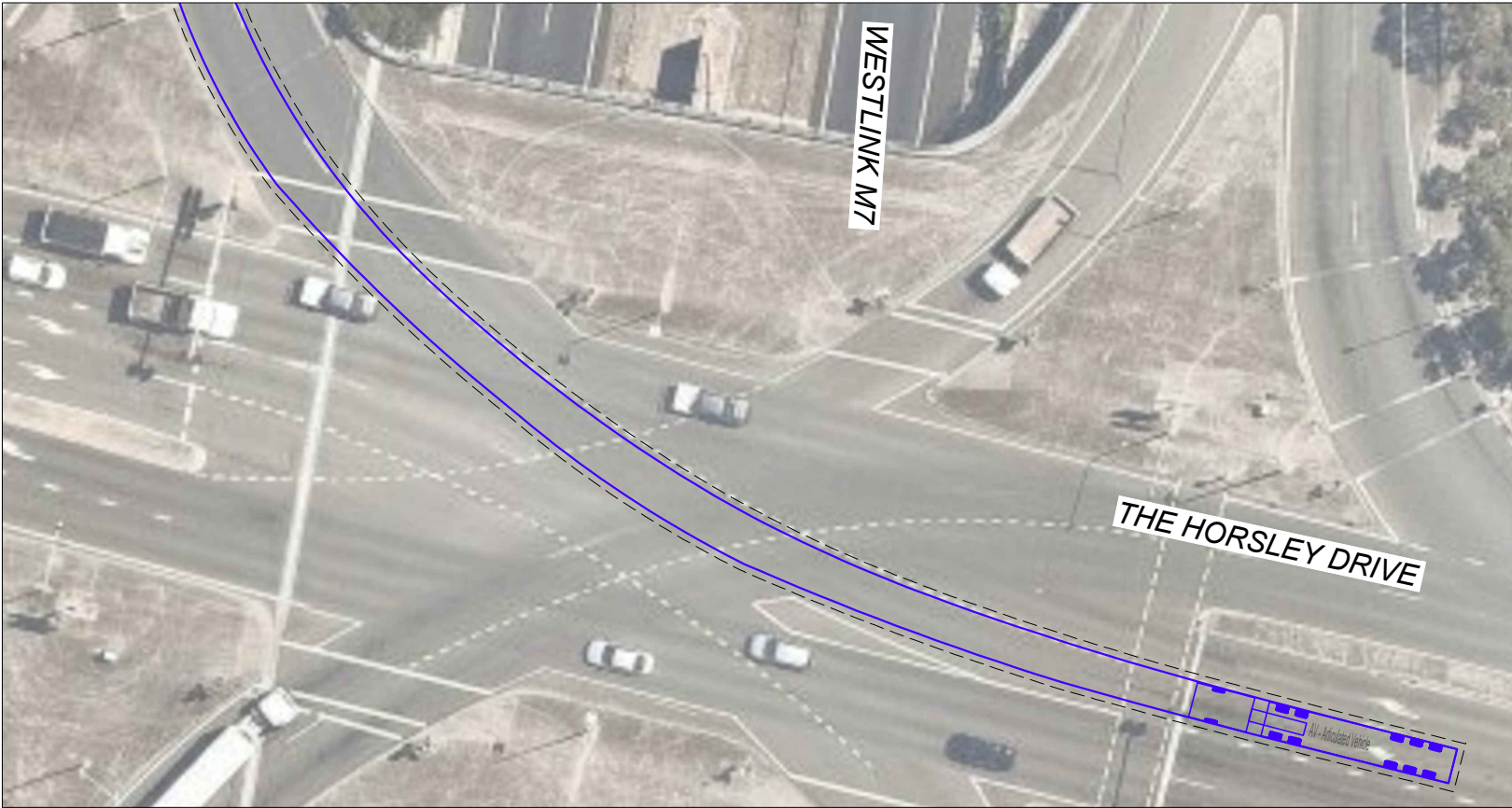
TURN 1 - ENTRY INTO CHANDOS ROAD



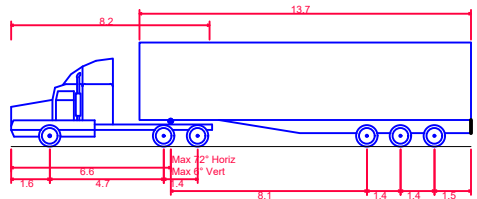
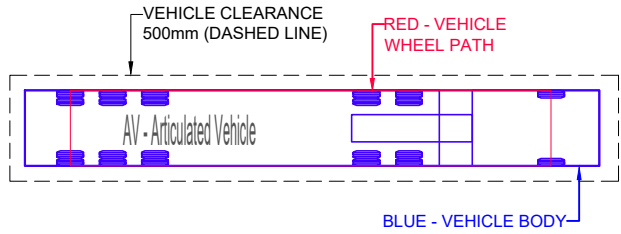
TURN 2 -CHANDOS ROAD INTO FERRERS ROAD



TURN 3 - FERRERS ROAD INTO THE HORSLEY DRIVE



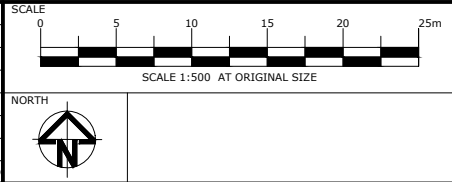
TURN 4 - THE HORSLEY DRIVE INTO M7



AV - Articulated Vehicle
Overall Length 19.000m
Overall Width 2.500m
Overall Body Height 4.301m
Min Body Ground Clearance 0.418m
Track Width 2.500m
Lock-to-lock time 6.00s
Curb to Curb Turning Radius 12.500m

\\ttm\p01\itm\local\synergy\synergy\projects\19sy\19sy\0068 western sydney green gas trial horsley park - traffic assessment\3 - plans\itm\20 06 03\19sy0068.dwg

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
A	11-06-20	ORIGINAL ISSUE	LD	BH	BH



TTM CONSULTING PTY LTD
ABN 65 010 868 621
LEVEL 5, Suite 501, 174 Pacific Highway
Greenwich NSW 2065
T: (02) 9418 3033 F: (02) 9418 3112
E: ttmbri@ttmgroup.com.au W: www.ttmgroup.com.au

PROJECT	WESTERN SYDNEY GREEN GAS TRIAL HORSLEY PARK	PROJECT NUMBER	19SYT0068	ORIGINAL SIZE	A3
DRAWING TITLE	TRAFFIC MANAGEMENT PLAN AV EXIT FROM SITE TO M7	DRAWING NUMBER	18SYT0068-03	REVISION	A
		DATE	11 Jun 2020	SHEET	2 OF 2

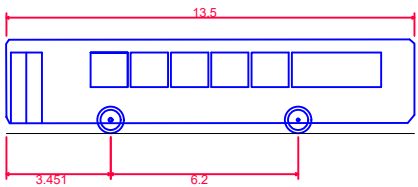
\\ttm\projects\19sy\19sy0068 - western sydney green gas trial horsley park - traffic assessment\3 - plans\19sy0068.dwg



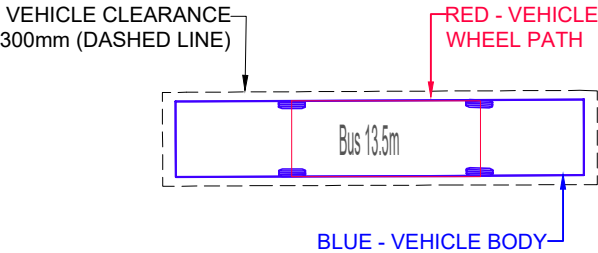
13.5m BUS SITE ENTRY



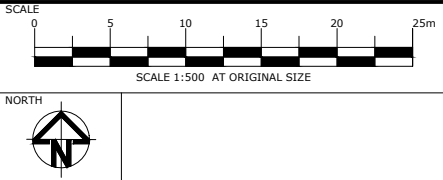
13.5m BUS SITE EXIT



Bus 13.5m
Overall Length 13.500m
Overall Width 2.500m
Overall Body Height 3.102m
Min Body Ground Clearance 0.337m
Track Width 2.500m
Lock-to-lock time 4.00s
Curb to Curb Turning Radius 12.410m



REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
A	11-06-20	ORIGINAL ISSUE	LD	BH	BH



TTM CONSULTING PTY LTD

ABN 65 010 868 621
LEVEL 5, Suite 501, 174 Pacific Highway
Greenwich NSW 2065

T: (02) 9418 3033 F: (02) 9418 3112
E: ttmbri@ttmgroup.com.au W: www.ttmgroup.com.au

PROJECT	WESTERN SYDNEY GREEN GAS TRIAL HORSLEY PARK	PROJECT NUMBER	19SYT0068	ORIGINAL SIZE	A3
DRAWING TITLE	TRAFFIC MANAGEMENT PLAN 13.5m SITE EXIT	DRAWING NUMBER	18SYT0068-04	REVISION	A
		DATE	11 Jun 2020	SHEET	1 OF 1

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 46 of 53

Appendix 7 – Emergency Response Plan



WESTERN SYDNEY GREEN GAS PROJECT

PROJECT EMERGENCY RESPONSE PLAN

Document Number			2018-HSS-PLN-002		
Revision	Issue	Date	By	Check	Approve
B	Issued for Client Review	08/10/2020	RC	AMH	AF
A	Issued for Client Review	04/09/2020	RC	AMH	

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-HSS-PLN-002	PROJECT EMERGENCY RESPONSE PLAN	Page 2 of 27

1. INTRODUCTION	3
1.1 PURPOSE	3
1.2 PROJECT DESCRIPTION	3
1.3 PROJECT LOCATION	3
1.4 SCOPE	4
2. RESPONSIBILITIES	4
2.1 PROJECT MANAGER	4
2.2 SITE EMERGENCY CONTROL ORGANISATION (ECO)	4
2.3 CONSTRUCTION MANAGER (CHIEF WARDEN)	5
2.4 PROJECT ENGINEER (DEPUTY CHIEF WARDEN)	5
2.5 SITE SUPERVISORS AND LEADING HANDS (AREA WARDENS)	6
2.6 HSE ADVISOR (COMMUNICATIONS OFFICER)	6
2.7 FIRST AIDER	6
2.8 ALL OTHER PERSONNEL	7
3. EMERGENCY SCENARIOS	8
4. SITE PROFILE	15
4.1 SITE OFFICE, FACILITIES PAD & LAYDOWN YARD	15
4.2 ROVING WORK FRONT	15
5. COMMUNICATION AND TRAINING REQUIREMENTS	16
5.1 PROJECT INDUCTION AND TRAINING REQUIREMENTS	16
5.2 EMERGENCY RESPONSE DRILLS	16
5.3 FIRST AID PERSONNEL	17
5.4 EVACUATION ASSEMBLY (MUSTER) POINTS	17
6. EMERGENCY RESPONSES	17
6.1 RAISE THE ALARM	17
6.2 EVACUATION PROCEDURE	18
6.3 FIRE RESPONSE	19
6.4 FLAMMABLE GAS RELEASE	20
6.5 MEDICAL EMERGENCY	20
6.6 MAJOR SPILL	21
6.7 SIGNIFICANT WEATHER EVENT	22
7. WORK PERMIT CANCELLATION	22
8. POST EMERGENCY DEBRIEF AND COUNSELLING	22
9. COMMENTS TO THE MEDIA	22
10. EMERGENCY CONTACT DETAILS	23
11. EMERGENCY SCENARIOS	24
12. REFERENCES	24

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-HSS-PLN-002	PROJECT EMERGENCY RESPONSE PLAN	Page 3 of 27

1. INTRODUCTION

1.1 PURPOSE

The purpose of this Emergency Response Plan (ERP) is to set out the requirements for the control of emergency situations that may arise during the course of construction of the Jemena Gas Networks (NSW) Limited's (JGN) Western Sydney Green Gas facility (the Project).

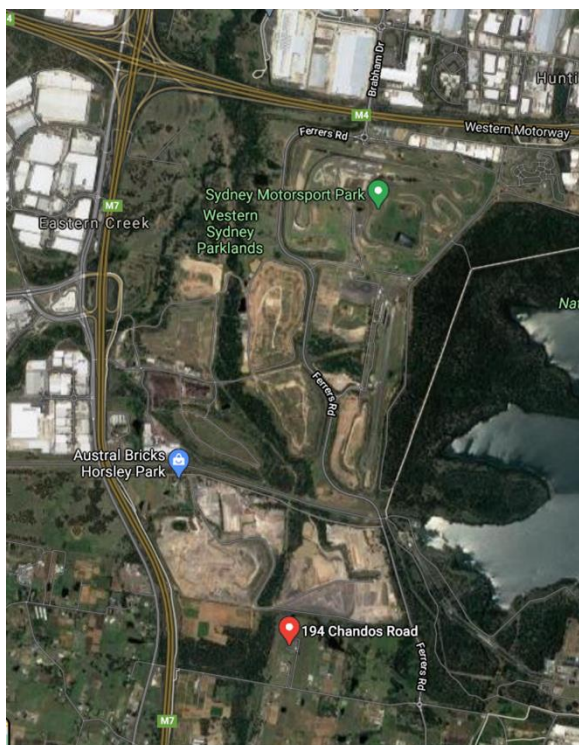
Note: This Emergency Response Plan does not address the operational and decommissioning phase of the project.

1.2 PROJECT DESCRIPTION

The Western Sydney Green Gas (WSGG) Project involves the construction of a power to gas (P2G) hydrogen facility at the existing Jemena Horsley Park Trunk Receiving Station, located in Western Sydney. The facility will use renewable electricity to generate hydrogen, which can be injected into the natural gas network or used to generate electricity back to the grid by means of a hydrogen-powered micro-turbine or similar technology.

1.3 PROJECT LOCATION

The Jemena Horsley Park Facility is located at 194 – 202 Chandos Road, Horsley Park (Lot 1 DP 499001 and Lot 3 DP 1002746)



Project Location



Site Layout

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-HSS-PLN-002	PROJECT EMERGENCY RESPONSE PLAN	Page 4 of 27

1.4 SCOPE

This plan applies to all Wasco employees, contractors and visitors, throughout the duration of the project while Wasco is Principle Contractor (PC). This plan is to be used in conjunction with Jemena Emergency Response Procedures and Plans listed below.

DOCUMENT NUMBER	OWNER	DOCUMENT TITLE
GAS-310-PR-EM-001 PCCS	Jemena/Zinfra	Station Evacuation Procedure
JEM PL 0013	Jemena/Zinfra	Jemena Emergency Management Plan
2018-HSS-PLN-001	Wasco	Health, Safety & Environmental Management Plan
2018-HSS-REG-001	Wasco	Project Risk Register
WAPL-SYS-PRC-002	Wasco	Incident Reporting Procedure
WAPL-SYS-PRC-003	Wasco	Incident Investigation Procedure

2. RESPONSIBILITIES

2.1 PROJECT MANAGER

The Project Manager is responsible for;

- This Emergency Response Plan being implemented and correctly managed throughout the project
- Ensure all key stakeholders are briefed on the situation at regular intervals. Key stakeholders include Client Representatives, WASCO Management, local government agencies, state bodies
- This Emergency Response Plan being reviewed and amended as conditions change and communication of changes
- Ensuring all Workers are trained in and comply with the actions prescribed in this Emergency Response Plan

2.2 SITE EMERGENCY CONTROL ORGANISATION (ECO)

The Emergency Control Organisation (ECO) is responsible for implementing the site Emergency Management Plan (EMP).

- The ECO must ensure the EMP complies with AS 3745-2010, and work together to action the emergency response procedures when necessary.
- This includes performing duties such as evacuating the site and notifying the correct authorities in an emergency.
- There are different roles within an ECO, each with responsibilities and actions that they must perform, both regularly and in the event of an emergency.
- These are the main roles in an ECO, and what their key responsibilities are:

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-HSS-PLN-002	PROJECT EMERGENCY RESPONSE PLAN	Page 5 of 27

2.3 CONSTRUCTION MANAGER (CHIEF WARDEN)

The Construction Manager is responsible for;

- Ensuring all Workers are trained in and comply with the actions prescribed in this Emergency Response Plan
- Communication of this Emergency Response Plan to all visitors to the site
- Communication of changes to site conditions that could result in review/revision of this plan
- Contact Jemena site representative in the event of an emergency
- Ensuring all emergency equipment is operational and compliant
- Organising and conducting emergency drills and evacuation exercises as required
- When an emergency alarm sounds, the Chief Warden must investigate and determine if they should declare an emergency.
- In an emergency, the Chief Warden is responsible for everyone on site from the moment the emergency alarm sounds.
- The Chief Warden is responsible for making sure that either they or the Deputy Chief Warden are present during each shift. They cannot both be absent on any work day.
- Co-ordinating response to emergencies, as per emergency procedures
- If safe to do so carry out a sweep of the area to clear all persons from the area accounting for all persons from/missing from their area
- Ensuring clear and unhindered access to all exits and identify any alternate escape routes if required
- Participating in reviews of emergency procedures

2.4 PROJECT ENGINEER (DEPUTY CHIEF WARDEN)

The Deputy Chief Warden must be able to perform the Chief Warden's duties in the event that the Chief Warden isn't in the workplace.

- Ensuring all emergency equipment is operational and compliant
- Ensuring all workers are trained in and comply with the actions prescribed in this Emergency Response Plan
- Organising and conducting emergency drills and evacuation exercises as required Co-ordinating response to emergencies, as per emergency procedures
- When an emergency alarm sounds, as the Chief Warden must investigate and determine if they should declare an emergency.
- In an emergency, as the Chief Warden is responsible for everyone on site from the moment the emergency alarm sounds.
- Co-ordinating response to emergencies, as per emergency procedures
- If safe to do so carry out a sweep of the area to clear all persons from the area accounting for all persons from/missing from their area
- Ensuring clear and unhindered access to all exits and identify any alternate escape routes if required Participating in reviews of emergency procedures

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-HSS-PLN-002	PROJECT EMERGENCY RESPONSE PLAN	Page 6 of 27

2.5 SITE SUPERVISORS AND LEADING HANDS (AREA WARDENS)

Site Supervisors (or Leading Hands in their absence) are responsible for:

- Ensuring all emergency equipment is operational and compliant
- Ensuring all workers are trained in and comply with the actions prescribed in this Emergency Response Plan
- Organising and conducting emergency drills and evacuation exercises as required
- Co-ordinating response to emergencies, as per emergency procedures
- If safe to do so carry out a sweep of the area to clear all persons from the area accounting for all persons from/missing from their area
- Ensuring clear and unhindered access to all exits and identify any alternate escape routes if required
- Participating in reviews of emergency procedures

2.6 HSE ADVISOR (COMMUNICATIONS OFFICER)

HSE Advisors will:

- Brief all location personnel on the project Emergency Response Plan during site induction
- Communicate any changes to personnel via pre-start or Toolbox Meetings
- Maintain and review the list of emergency contacts in the project Emergency Response Plan
- Display the emergency contact list at prominent locations
- Provide each project vehicle with this emergency contact list
- Ensure that everyone in the ECO knows how to use any communication equipment,
- The Communications Officer must share messages from the Chief Warden, and be in touch with them and the Area/Floor Wardens as much as possible.
- Ensure that the correct, detailed information is being given at all times.
- Establish and maintain a site visitor's logbook to ensure all personnel and visitors are accounted for
- Monitor and ensure emergency exits are adequate, clearly signposted
- Keep clear records of the sequence of emergency events in the Emergency Events Log as included in the Emergency Response Plan
- Organising and conducting emergency drills and evacuation exercises as required
- Participating in reviews of emergency procedures
- Assisting in the response to emergencies, as per emergency procedures

2.7 FIRST AIDER

The role of the site First Aider shall be filled by a nominated person(s) on the work site. First Aiders should:

- Provide first aid assistance following recognised first aid protocol
- Maintain approved first aid equipment/facilities applicable to their level of training
- Participate in courses to maintain their first aid skills at the required level
- Provide first aid treatment to any injured persons applicable to their level of training

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-HSS-PLN-002	PROJECT EMERGENCY RESPONSE PLAN	Page 7 of 27

- In the event of an evacuation, report to muster point with the site first aid kit and provide first aid treatment to any injured persons applicable to their level of training

2.8 ALL OTHER PERSONNEL

All employees, subcontractors and visitors have the following responsibilities:

- Be familiar with all the site's emergency procedures
- Initiate emergency procedures immediately after receiving notification by moving to a muster point and wait for further direction from Construction Manager
- Inform themselves of the location of emergency response equipment.
- Be competent at operating all emergency equipment
- Report emergency equipment that is dysfunctional or out of date
- Be knowledgeable of this procedure and any related safety procedures.



3. EMERGENCY SCENARIOS

Emergency	Scenario	Hazards	Injuries	Response	Emergency Management Responsibility – Construction Works
Explosion	Exploding • Gas bottles • Fuel tank	• Debris • Engulfment • Entrapment • Fire • Further explosions • Heat	• Asphyxiation • Bleeding • Blistering • Burns • Choking • Crush • Dislocations • Eye injury • Fractures • Lacerations • Poisoning • Scalds • Shock • Spinal • Sprains • Strains • Swelling • Unconsciousness	Emergency • Assess the danger • Evacuate and remove casualties • Notify the Client • Notify Emergency Services • First Aid	Wasco



Emergency	Scenario	Hazards	Injuries	Response	Emergency Management Responsibility – Construction Works
Fire	Ignition of: • Gas bottle • Fuel tank • Grass and bush	• Combustible material is abundant • Heat • Spread • Source is unable to be contained	• Asphyxiation • Blistering • Burns • Choking • Eye injury • Poisoning • Scalds • Unconsciousness	Initial • Assess the danger • Extinguish the fire if safe to do so Emergency • Evacuate and remove casualties • Notify Emergency Services • First Aid	Wasco
Confined space	Severe injury whilst working in confined space	• Engulfment • Entrapment	• Fractures • Spinal • Sprains • Strains • Swelling • Heart attack • Psychological • Seizure • Stroke • Asphyxiation	Initial Assess for danger Assess the type of medical condition Emergency Rescue plan as per Confined Space risk assessment and PTW • Notify Emergency Services • Provide First Aid if safe to do so • Warn others	Wasco



Emergency	Scenario	Hazards	Injuries	Response	Emergency Management Responsibility – Construction Works
Gas leak	Gas bottles	- Pressurised leak - Source is unknown - Source is unable to be contained - Unknown concentration	- Asphyxiation - Blistering - Burns - Choking - Eye injury - Poisoning - Scalds - Unconsciousness	Emergency - Evacuate and remove casualties to a safe location up-wind from the leak - Warn others - Notify the Client - Notify Emergency Services if required - First Aid	Wasco
Infectious Disease	- Covid 19 - Influenza	- Contamination of self - Spread of the disease - Unknown source	- Asphyxiation - Infection	Emergency - Isolate the person - Notify Construction Manager and Jemena Representative. - Warn others	Wasco
Reputation	- Loss of landowner confidence - Community outrage	- Non-compliance with landowner requirements - Anti-social behaviour	Nil	Initial - Assess the situation - Notify the Client	Jemena / Wasco

Emergency	Scenario	Hazards	Injuries	Response	Emergency Management Responsibility – Construction Works
Medical	- Severe injury whilst working - Fall from height - Asthma attack - Diabetes - Heart attack - Psychological - Seizure - Stroke - Electrocution	- Escalation of severity - Complications - Entrapment	- Fractures - Spinal - Sprains - Strains - Swelling - Asthma attack - Diabetes - Heart attack - Psychological - Seizure - Stroke - Shock	Emergency - Assess the type of medical condition - Notify Emergency Services - First Aid	Wasco

Emergency	Scenario	Hazards	Injuries	Response	Emergency Management Responsibility – Construction Works
Natural disaster	- Bush fire - Lightning - Extreme weather - Flood - Storm - Earthquake - Cyclone	- Debris - Engulfment - Entrapment - Fire - Flood water - Further explosions - Heat	- Bleeding - Burns - Crush - Dislocations - Drowning - Electric shock - Fractures - Heat stress / stroke - Hypothermia - Lacerations - Shock - Spinal - Sprains - Strains - Swelling	Initial - Remain indoors - Warn others Emergency - Assess for danger - Evacuate and remove casualties - Notify Emergency Services - First Aid	Wasco

Emergency	Scenario	Hazards	Injuries	Response	Emergency Management Responsibility – Construction Works
Spill	- Diesel fuel - Hydraulic oil - Engine oil - Detergent	- Engulfment - Entrapment - Ignition sources present - Uncontainable rate of release - Unknown concentration - Unidentified substance	- Asphyxiation - Blistering - Burns - Choking - Eye injury - Poisoning - Scalds - Unconsciousness	Initial - Isolate the source - Contain the spill Emergency - Notify the emergency services - Provide first aid - Evacuate - Warn others	Wasco
Subversive activities	- Vandalism - Sabotage - Bomb threat - Protest - Criminal Act	- Antagonise the perpetrator - Psychological trauma	Psychological	Initial - Assess the danger - Notify the Client - Record information about the perpetrator Emergency - Notify the Emergency Services - Evacuate - Warn others	Jemena / Wasco

Emergency	Scenario	Hazards	Injuries	Response	Emergency Management Responsibility – Construction Works
Transport incident Vehicle/ Mobile Plant Accident – On Site and Off site	- Collision - Entanglement - Entrapment - Roll-over	- Debris – glass, burred metal - Fire - Inclement weather - No access and egress - Slips and trips - Spill of hazardous substance - Traffic – vehicle and pedestrian	- Bleeding - Burns - Crush - Dislocations - Fracture - Lacerations - Shock - Spinal - Sprains - Strains - Swelling	- Assess for danger - Notify Emergency Services - Provide First Aid if safe to do so - Warn others	Wasco
Working at heights	- Fall - Entanglement - Roll over of EWP	- No access and egress - Entrapment	- Bleeding - Burns - Crush - Dislocations - Fracture - Lacerations - Shock - Spinal - Sprains - Strains - Swelling	- Assess for danger - Rescue plan as per risk assessment - Notify Emergency Services - Provide First Aid if safe to do so - Warn others	Wasco

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-HSS-PLN-002	PROJECT EMERGENCY RESPONSE PLAN	Page 15 of 27

4. SITE PROFILE

This project will have multiple locations of work mainly at the Construction area, Site Office & Laydown Facility. The following table and Appendix 1 – Emergency Response Map identifies the emergency equipment available, location and inspection frequency.

4.1 SITE OFFICE, FACILITIES PAD & LAYDOWN YARD

Equipment	Location	Inspection / Calibration
Firefighting equipment	• 1 per vehicle / plant / equipment • 1 at Site Office • 1 at Crib • 1 per tool container	6 monthly
First Aid Facilities	• 1 per vehicle / plant / equipment • 1 at Site Office	As per 'use by dates'
Spill Response Kits	• 1 spill kit bin at Laydown chemicals area • 1 spill kit bin at Office Generator • 1 spill kit bin at Facilities pad • 1 mobile spill kit per vehicle / plant / equipment	Replenished as required
Gas Detectors	• 1 per person or work crew as required by work activity	6 monthly
SDS Information	• With chemicals (Obtainable within 10mins) • SDS register	5 years
UHF radios (hand-held)	• 1 per work front and must be intrinsically safe for use inside any hazardous area or a hot work permit is required	As required

4.2 ROVING WORK FRONT

Equipment	Location	Inspection / Calibration
Firefighting equipment	• 1 per vehicle / plant / equipment	6 monthly
First Aid Facilities	• 1 per vehicle / plant / equipment	As per 'use by dates'
Spill Response Kits	• 1 mobile spill kit per vehicle / plant / equipment	Replenished as required
Gas Detectors	• 1 per person or work party as required by work activity	6 monthly
SDS Information	• With chemicals (Obtainable within 10mins)	5 years
UHF radios (hand-held)	• 1 per work front	As required

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-HSS-PLN-002	PROJECT EMERGENCY RESPONSE PLAN	Page 16 of 27

5. COMMUNICATION AND TRAINING REQUIREMENTS

5.1 PROJECT INDUCTION AND TRAINING REQUIREMENTS

The Project Manager shall ensure all project personnel, including subcontractors, are provided with a project-specific induction which adequately addresses the emergency response plan for the project (including methods for raising the alarm and evacuation protocols).

The Project Manager shall also ensure persons with specific responsibilities for the control of emergency situations are provided with the necessary training to fulfil their roles (e.g. Supervisors, Leading Hands, HSE and First aid personnel).

A training and competency register will be maintained in the site office at all times

5.2 EMERGENCY RESPONSE DRILLS

The Project Manager shall ensure emergency response reviews and drills are conducted in accordance with the table below:

Review / Drill Requirement	Minimum Frequency	Responsibility	Documentation Required	Comments
Desktop review of Site Emergency Response Plan	3 monthly	Site / Project Manager or Project Engineer	Documented evidence of review via meeting minutes, audit records or similar.	Review should assess the currency and availability of response plans, contact lists, equipment test records and names of key personnel, including First Aiders.
Emergency Response Drill	Once within one week of project commencement then as scheduled by the Project Manager	Site / Project Manager or Engineer	Record of Emergency Event or Drill Form	The scope of emergency drills shall be determined by the Project Manager; however, over time they should be sufficiently varied to test a range of emergency responses.

Approval for any emergency drill must first be obtained from the Project Manager and the Jemena nominated representative. Prior to any drill the Project Manager shall ensure the following key stakeholders are notified:

- Relevant emergency services (e.g. fire, ambulance etc);
- Relevant Jemena Representative who will contact Jemena Control Rooms – Melbourne and Sydney.
 - Mel: 1300 137 978 or 1300 132 018
 - Syd: 1300 717 209
- Relevant WASCO Managers (including Corporate Safety Manager);

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-HSS-PLN-002	PROJECT EMERGENCY RESPONSE PLAN	Page 17 of 27

- Relevant Landholders or other stakeholders who may be affected.

All messages relayed during the course of a drill must be prefixed by the words “For emergency exercise only”.

Following any emergency drill the Project HSE Advisor (or authorised designate) shall conduct a de-brief meeting and communicate outcomes to participants. De-brief meetings shall be documented via completion of Emergency Response Drill Report WAPL-HSS-FRM-012. Actions to address identified deficiencies shall be recorded in the HSE Actions Register for monitoring and close-out purposes.

5.3 FIRST AID PERSONNEL

The Project Manager and Supervisors shall ensure all work crews have immediate access to a qualified first aider at all times. In providing this, due consideration shall be given to break times, rosters and distribution of work fronts.

The names of First Aid personnel shall be clearly communicated to project personnel and displayed on site WHS notice boards.

The Project Manager shall ensure First Aid personnel are provided with the necessary training to maintain their qualifications and skill level.

5.4 EVACUATION ASSEMBLY (MUSTER) POINTS

The emergency muster points and site ERP will be communicated to all personnel and visitors during the site induction and at the start of each day during the pre-start meeting. Refer to Appendix 1 for details.

6. EMERGENCY RESPONSES

6.1 RAISE THE ALARM

Any personnel at a field worksite must immediately raise the alarm if they are first to identify an emergency situation. The alarm may be raised via one or more of the following methods:

- Face to face communication with persons at the worksite; and/or
- UHF Radio
- Site emergency siren/alarm will be used to raise all site wide emergency evacuations and will be triggered by the ECO when advised of any emergency requiring evacuation.
- Continuously sounding the horn of a vehicle – This method should be used where it is not possible to verbally alert all endangered persons;
- Where required, the construction manager or Project Engineer will make radio contact with Jemena operations via closed radio channel to alert staff to wider emergency

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-HSS-PLN-002	PROJECT EMERGENCY RESPONSE PLAN	Page 18 of 27

Note:

The site Construction Manager/Chief Warden must be notified ASAP following any emergency situation. Incident notifications shall then be triggered in accordance with Wasco Reporting Procedure.

6.2 EVACUATION PROCEDURE

6.2.1 GENERAL PROCEDURE – ALL WORKERS

The order to evacuate may be given on the spot by persons raising the alarm or by the site Construction Manager/Chief Warden after assessment of the situation.

Upon being ordered to evacuate all persons must immediately take the following action (unless they are providing direct emergency assistance):

Table 1- General Response Steps

General Steps to be Taken	
STEP 1	Remain calm. Raise the alarm and shut down if safe, evacuate to the designated muster point or safe location (if required).
STEP 2	First Aid - DRSABCD protocol to be followed first Call 000 emergency (if required), or radio alert Wasco Ch. 28 UHF Radio Protocol - Call the following: “EMERGENCY, EMERGENCY, EMERGENCY” 1. Give your name 2. Nature of incident 3. Location of incident 4. Persons involved 5. Services needed
STEP 3	Immediately notify Wasco Construction Manager/ Chief Warden or Wasco Project Manager
STEP 4	Wasco Construction Manager/ Chief Warden or Wasco Project Manager shall immediately notify Jemena Site Representative
STEP 4	At muster point: Give First Aid, Head Count Send escort to meet Emergency Services if required

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-HSS-PLN-002	PROJECT EMERGENCY RESPONSE PLAN	Page 19 of 27

Note:

All vehicles at the worksite must immediately stop and park in a safe location. Vehicles must not obstruct roadways or access ways. The site Construction Manager/ Chief Warden must delegate a person, if it is safe to do so, to drive out to the nearest access point and escort Emergency Services to the scene where necessary.

6.2.2 EMERGENCY CONTROL

In the event of an evacuation, the site *ECO* will:

- Ensure all personnel have evacuated the area and retrieve casualties if safe to do so;
- Proceed to the Muster Point and use the prestart sign on to account for all personnel at the worksite, both accounted and unaccounted for;
- Notify Emergency Services if not done already (e.g. Ambulance, Fire, Police etc) and make arrangements for them to be escorted to the incident scene if necessary;
- Act as a single point of contact for Emergency Services;
- Regularly brief the Project Manager on the situation, including the status of casualties;
- Where necessary and safe to do so, nominate personnel to conduct a search for missing persons;
- Where safe to do so, initiate steps to control the situation (e.g. commence firefighting, isolate services etc).
- Ensure personnel remain at the Muster Point until directions are received from the Project Manager or Emergency Services.

The Construction Manager will:

- Confirm with the Supervisor/Leading Hand that all persons are accounted for;
- provide necessary assistance to control the situation and mitigate consequences;
- Advise personnel when it is safe to resume work, or if further removal from the affected area is required;
- Ensure incident notifications have been triggered in accordance with Appendix 1.

6.3 FIRE RESPONSE

In the event of a fire, the following response shall be applied:

Table 2 - Fire Response Steps

Fire Response	
STEP 1	Persons should only attempt to fight the fire if it is safe to do so and they confident in the operation of fire extinguishers. Under no circumstances should you attempt to extinguish a gas fire
STEP 2	Immediately raise the alarm as Ensure the Supervisor/Leading Hand is notified ASAP. Radio calls "Evacuate, Evacuate, Evacuate"

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-HSS-PLN-002	PROJECT EMERGENCY RESPONSE PLAN	Page 20 of 27

Fire Response	
Step 3	Notify 2 x Jemena Control Rooms – Melbourne and Sydney. Mel: 1300 137 978 or 1300 132 018 Syd: 1300 717 209
STEP 4	All persons at the worksite, other than those directly engaged in firefighting, must proceed directly to the nominated Muster Point.
STEP 5	If the fire is beyond control, the Construction Manager/ Chief Warden must notify Fire Authorities and evacuate all personnel from the worksite
STEP 5	Notify the Project Manager ASAP. The Project Manager will assess the situation and notify all stakeholders of the incident, including WASCO Management and Client Representatives.

6.4 FLAMMABLE GAS RELEASE

The following steps shall be undertaken in event of an uncontrolled release flammable gas at the worksite (e.g. rupture of live gas lines):

Table 3 - Flammable Gas Release Steps

Flammable Gas Release Response	
STEP 1	Immediately raise the alarm Ensure the Supervisor/Leading Hand is notified ASAP.
STEP 2	Eliminate ignition sources (e.g. turn off vehicles, shutdown plant/equipment, any electronic devices including mobile phone sand prevent all persons from smoking).
Step 3	Notify 2 x Jemena Control Rooms – Melbourne and Sydney. Mel: 1300 137 978 or 1300 132 018 Syd: 1300 717 209
STEP 4	Prevent other persons and vehicles entering the affected area (e.g. delegate personnel to block roads).
STEP 5	Evacuate the worksite by moving toward the Muster Point that is upwind from the source of the leak.
STEP 6	Construction Manager/ Chief Warden to notify Fire Authorities and Jemena
STEP 7	Notify Project Manager ASAP. The Project Manager will assess the situation and notify all stakeholders of the incident, including WASCO Management and Client Representatives.

6.5 MEDICAL EMERGENCY

The following response shall be undertaken in the event of a medical emergency (i.e. a life threatening injury, illness requiring urgent medical attention):

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-HSS-PLN-002	PROJECT EMERGENCY RESPONSE PLAN	Page 21 of 27

Table 4 - Medical Emergency Steps

Medical Emergency Response	
STEP 1	Immediately raise the alarm .Ensure Supervisor/Leading Hand is notified ASAP.
STEP 2	Immediately notify Ambulance and provide immediate first aid treatment – Keep all non-essential personnel clear of the area.
STEP 3	In accordance with Ambulance advice, either transport casualty to medical facilities or await arrival of Paramedics at the scene (if Paramedics are despatched the site Construction Manager/ Chief Warden should make arrangements to escort them to the casualty).
STEP 4	Project Manager to delegate responsibility for notifying injured person's next of kin and obtaining information on any pre-existing medical conditions.
STEP 5	Project Manager to notify all key stakeholders (including Client Representatives and WASCO Management).

6.6 MAJOR SPILL

The following response shall be undertaken following any major spill that presents an immediate risk to safety or the environment:

Table 5 - Major Spill Response Steps

Major Spill Response	
STEP 1	Immediately raise the alarm. Ensure site Construction Manager/ Chief Warden is notified ASAP.
STEP 2	Attempt to isolate the source of the spill if safe to do so.
STEP 3	If flammable substance, shut-down plant/equipment, remove ignition sources and evacuate all non-essential personnel from the area.
STEP 3	Immediately deploy spill kits – Use booms or construct a wall of earth material to contain the spill. **Take extra precautions to protect drains and water courses.
STEP 3	Clean up the spill – Spread absorbent material over the spill if required. Shovel contaminated material into suitable containers or the rear of a utility vehicle (create a stockpile of contaminated earth if a large area has been affected). **Do not disturb vegetation unless specifically authorised by the client.
STEP 4	Arrange for disposal of contaminated material in an approved manner.
STEP 5	Project Manager to notify all key stakeholders (including Client Representatives and WASCO Management).

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-HSS-PLN-002	PROJECT EMERGENCY RESPONSE PLAN	Page 22 of 27

6.7 SIGNIFICANT WEATHER EVENT

The following response shall be undertaken following any predicted or detected significant weather event that presents an immediate risk to safety or the environment:

Table 6 - Significant Weather Event Steps

Significant Weather Event Response	
STEP 1	Immediately raise the alarm. Ensure all site personnel are notified ASAP.
STEP 2	Account for all Personnel and Assets
STEP 3	Monitor passage of storm cell/s and temporarily suspend outdoor movement if risk of lightning strike
STEP 4	If strong winds are anticipated, ensure that any objects that could become airborne in strong wind gusts and cause, damage are secured
STEP 5	Monitor the event and communicate with all personnel
STEP 6	Return to normal operations when the event has passed
STEP 7	Review the effects of the event and modify procedures as necessary

7. WORK PERMIT CANCELLATION

The occurrence of an emergency situation automatically voids any work permits that may be in force at the worksite. Work cannot resume until the “All Clear” has been given and all relevant permits have been re-validated by the Permit Issuer.

8. POST EMERGENCY DEBRIEF AND COUNSELLING

Following an actual emergency situation, the Project Manager shall conduct a debrief session with ECO. The debrief shall review the emergency response and identify strengths, weaknesses and opportunities for improvement. A documented record of the debrief shall be maintained and improvement actions shall be recorded.

The Project Manager shall also ensure all personnel are offered immediate physiological counselling by a qualified person following any critical incident or traumatic event. Such counselling may be offered in a group environment; however, personnel shall be provided with confidential individual counselling upon request. Requests for counselling shall be directed to the WASCO Employee Assistance Provider detailed below:

WASCO Counselling Provider: Workplace Wellness

Phone: 1300 326 350

9. COMMENTS TO THE MEDIA

Employees, Subcontractors or Visitors are not permitted to make comment to the media.

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-HSS-PLN-002	PROJECT EMERGENCY RESPONSE PLAN	Page 23 of 27

All media enquiries shall be referred to the Project Manager (authorisation from the Managing Director must first be obtained before making any comment). Liaison with the Clients Project Manager and Media representative is required. No commentary by site personal is to be made at any time.

10. EMERGENCY CONTACT DETAILS

Wasco Personnel		Jemena Personnel		Emergency Services	
Andrew Hargraves Project Manager	0455348408	Jarrold Irving Project Manager	0439 430 600	Police Ambulance Fire	000
Michael Horgan Construction Manager/chief Warden	0408494568	Control Rooms JGN and EGP facilities	Mel: 1300 137 978 1300 132 018 Syd: 1300 717 209	Police 332 Prairie Vale Rd Wetherill Park NSW 2164	02 87885199
Ross Clarke Safety advisor (Brisbane based)	0419711450			Fairfield Hospital Polding St & Prairie Vale Road, Prairiewood NSW 2176	02 96168111
Daniel Politylo Project Engineer	0430355266			Horsley Park RFS Station Arundle Rd & The Horsley Dr, Horsley Park NSW 2175	02 96201386
TBC Site Safety Advisor				Horsley Park Medical Centre 1818 The Horsley Dr, Horsley Park NSW 2175	02 9620 2880

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-HSS-PLN-002	PROJECT EMERGENCY RESPONSE PLAN	Page 24 of 27

Wasco Personnel		Jemena Personnel		Emergency Services	
TBC Supervisor				Poisons Information Centre	131 126

11. EMERGENCY SCENARIOS

Emergency situation: Any situation which requires emergency assistance to prevent or reduce harm to people, property or the environment. Examples of emergency situations include, but are not limited to:

- Fire or explosion;
- Fatalities
- Medical transfers (i.e. life threatening injury requiring urgent medical attention);
- Rescue from Height
- Rescue from Confined Space
- Uncontrolled release of a flammable gas or liquid;
- Major spill or other environmental emergencies (i.e. release of a substance other than flammable gas which presents a significant risk to safety or the environment).
- Missing person/s
- Vehicle incidents
- Significant Weather Event (any predicted or detected significant weather event that presents an immediate risk to safety or the environment)
- Pandemic Outbreak
- Offsite Emergency – Mutual Aid
- Contact with Electricity
- Bomb Threat
- Criminal Act
- Earthquake
- Cyclone Alert
- Bushfire

12. REFERENCES

WAPL-HSS-FRM-012 - Emergency Response Drill Report Form

WAPL-HSS-FRM-013 - Medical Emergency Information Form

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-HSS-PLN-002	PROJECT EMERGENCY RESPONSE PLAN	Page 25 of 27

Appendix 1 – Emergency Response Map

JEMENA WESTERN SYDNEY GREEN GAS PROJECT

194-214 Chandos Road, Horsley Park, NSW, 2175



MUSTER POINT

SECONDARY

SPILL KIT



HAZARDOUS MATERIAL STORAGE

LUNCH ROOM



OFFICES



TEMPORARY CONSTRUCTION FACILITY AND LAYDOWN

MUSTER POINT

PRIMARY

EMERGENCY PHONE NUMBERS



FIRE BRIGADE



AMBULANCE



POLICE

OR RING
000

LEGEND

Egress Direction

NEAREST HOSPITAL

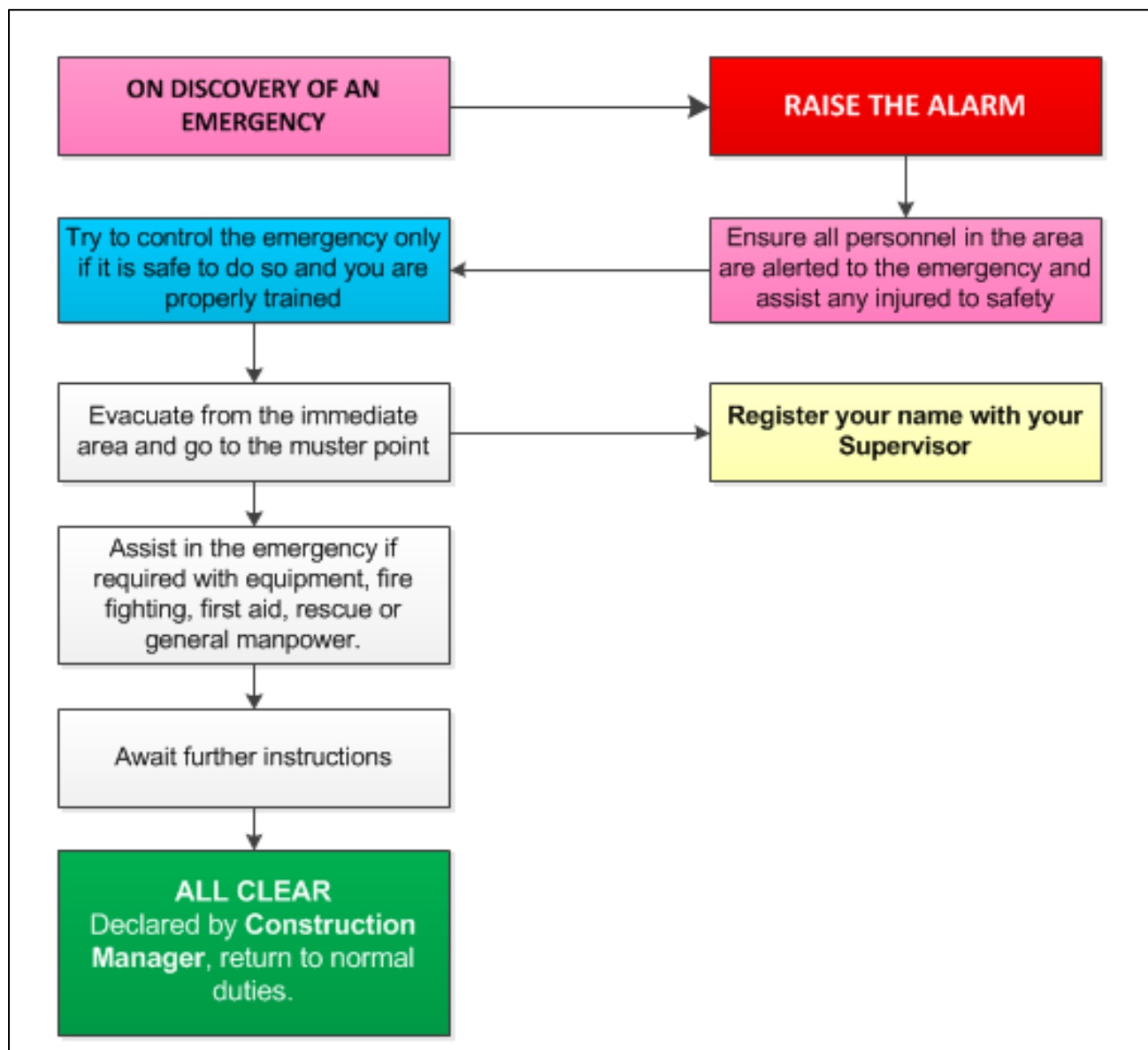
Fairfield Hospital

Address:
Corner Prairievale Road and
Polding Street, Prairiewood,
NSW, 2176

Contact: Ph: 02 9616 8111

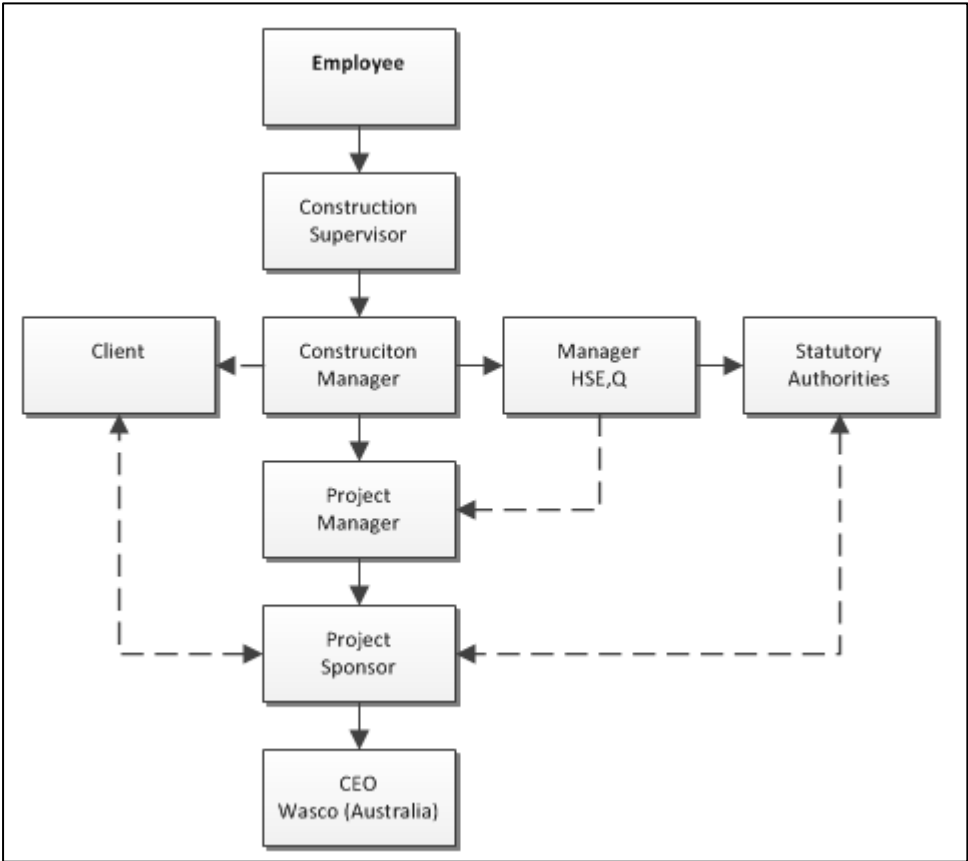
	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-HSS-PLN-002	PROJECT EMERGENCY RESPONSE PLAN	Page 26 of 27

Appendix 2 - Emergency Response Flowchart



	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-HSS-PLN-002	PROJECT EMERGENCY RESPONSE PLAN	Page 27 of 27

Appendix 3 - Incident Reporting and Investigation Flowchart



	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 47 of 53

Appendix 8 – Environmental Management Plan



WESTERN SYDNEY GREEN GAS PROJECT

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

Document Number			2018-ENV-PLN-001		
Revision	Issue	Date	By	Check	Approve
0	Issued for Use	25/09/2020	DP	AF	MW
C	Issued for Client Review	22/09/2020	DP	AMH	MW
B	Issued for Client Review	18/09/2020	EE	AMH	MW
A	Issued for Client Review	04/09/2020	EE	TGA	MW

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 2 of 34

1. PURPOSE	4
1.1 PROJECT DESCRIPTION	4
1.2 PROGRAM	5
1.3 CONSTRUCTION ACTIVITIES	6
1.4 SUPPORTING MANAGEMENT PLANS AND STRATEGIES	6
1.5 CONSULTATION SUMMARY	7
2. STATUTORY AND PLANNING FRAMEWORK	7
2.1 STATE LEGISLATION AND PLANNING INSTRUMENTS	7
2.2 COMMONWEALTH LEGISLATION	8
2.3 CONDITIONS OF APPROVAL	8
3. STANDARDS AND CODES OF PRACTICE	12
4. ENVIRONMENTAL POLICY AND OBJECTIVES	14
4.1 OBJECTIVES	14
4.2 INTEGRATED MANAGEMENT SYSTEM	14
4.3 PROJECT MANAGEMENT	14
4.4 EMPOWERMENT TO STOP WORK	15
5. ROLES AND RESPONSIBILITIES	15
6. KEY WASCO CORPORATE SPECIFICATIONS	16
7. EMPLOYEE SELECTION, TRAINING AND QUALIFICATIONS	16
7.1 INDUCTIONS	17
8. ENVIRONMENTAL PROMOTION AND COMMUNICATION	18
9. DESCRIPTION OF ACTIVITIES	18
10. ASSESSMENT OF ENVIRONMENTAL IMPACTS AND RISKS	18
10.1 METHODOLOGY	19
10.2 CONTINUOUS REVIEW OF RISKS	19
11. ENVIRONMENTAL GUIDELINES – KEY ASPECTS	19
12. EMERGENCY RESPONSE	19
13. COMMUNICATION, MONITORING AND REPORTING	20
13.1 COMMUNICATION	20
13.2 COMPLAINT MANAGEMENT	20
13.3 MONITORING	21
13.4 INSPECTIONS	21
13.5 KEY PERFORMANCE INDICATORS	21
13.6 INCIDENT INVESTIGATION	22
13.7 INCIDENT REPORTING	22
13.8 INCIDENT NOTIFICATION	22
13.9 REPORTING	22
13.10 AUDITS	22
14. FIELD ACTIVITIES AND CONTROL MEASURES	23

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 3 of 34

14.1	GENERAL CONDITIONS.....	23
14.2	AIR EMISSIONS	24
14.3	WATER MANAGEMENT	25
14.4	NOISE AND VIBRATION.....	26
14.5	WASTE MANAGEMENT	26
14.6	LAND MANAGEMENT.....	27
14.7	HERITAGE	29
14.8	WEED AND PEST CONTROL	29
14.9	FAUNA AND FLORA	29
14.10	SEWAGE TREATMENT AND EFFLUENT MANAGEMENT.....	30
14.11	STORAGE AND HANDLING OF CHEMICALS, FLAMMABLE AND COMBUSTIBLE SUBSTANCES	30
14.12	MONITORING AND REPORTING	31
15.	ABBREVIATIONS	32
	Appendix 1 - Environmental Checklist.....	34

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 4 of 34

1. PURPOSE

The purpose of this Construction Environmental Management Plan (CEMP) describe the control mechanisms to be implemented during the construction of Jemena Gas Networks (NSW) Limited's (JGN) Western Sydney Green Gas Project (the Project).

This CEMP has been prepared to cover construction activities associated with the Project which should be read and applied in conjunction with the Project Environmental Management Strategy (EMS).

The purpose of the CEMP is to ensure that appropriate environmental protection and impact minimisation techniques are implemented during construction. The purpose of this CEMP is to:

- Identify potential impacts of the project that will require monitoring and management during the project scope of works.
- Link Wasco's Environmental Management systems to Project systems
- Demonstrate the general intentions, approach and objectives with regard to Environmental Management
- Provide a framework for control of Project impacts
- Provide reference for the Project's environmental documents
- Set performance standards the Project is to achieve in its implementation.

To ensure the management of the Project is conducted in an environmentally sustainable manner, this CEMP has carefully considered and will interface with the following documents to meet good industry practice and Wasco (Australia) Pty Ltd (WAPL) environmental management objectives:

- Scope of Work and Specifications
- Client Health, Safety and Environmental Requirements
- State and Commonwealth legislation
- Conditions of Contract
- Wasco Integrated Management System
- Project Environmental Management Strategy (EMS).
- Western Sydney Green Gas Project – Environmental Impact Statement
- Approval Development Consent

Should there be any significant changes or amendments made to the contract or any significant risks be identified during the life of the project, this CEMP will be revised and changes to the plan will be made accordingly. All changes to the plan will be communicated to the appropriate parties prior to its implementation in accordance with either Wasco or Project Specific Document control procedures.

Note: This Construction Environment Management Plan does not address the operational and decommissioning phase of the project.

1.1 PROJECT DESCRIPTION

The Western Sydney Green Gas (WSGG) Project involves the construction of a power to gas (P2G) hydrogen facility at the existing Jemena Horsley Park Trunk Receiving Station, located in Western Sydney. The facility will use renewable electricity to generate hydrogen, which can be injected into the natural gas network or

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 5 of 34

used to generate electricity back to the grid by means of a hydrogen-powered micro-turbine or similar technology.



The Jemena Horsley Park Facility is located at 194 – 202 Chandos Road, Horsley Park (Lot 1 DP 499001 and Lot 3 DP 1002746)

1.2 PROGRAM

The current construction project timeline is presented below, the construction works are anticipated to commence in October 2020, pending approval of the required management plans. The timing presented below are indicative only and subject to change.

	Aug 20	Sep 20	Oct 20	Nov 20	Dec 20	Jan 20	Feb 20	Mar 20	Apr 20	May 21	Jun 21	Jul 21
Pre-Construction												
Construction [#]												

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 6 of 34

Pre-commissioning and Commissioning [#]	
Operation and Maintenance*	→

Notes

[#] the phases that this management plan addresses

* 5 year operation in accordance with Condition A8 of the Development Consent SSD 10313

Grey – Float

1.3 CONSTRUCTION ACTIVITIES

The construction activities to be undertaken as part of the works are summarised below:

- Completion of pre-construction documentation, inductions and establishment of site amenities and delineation of construction;
- Coordination and management of site delivery, off-loading and installation of major equipment packages (inclusive of all electrical packages);
- Completion of construction, installation, testing and commissioning of carbon steel pipelines including buffer store;
- Completion of civil, structural, piping as well as mechanical, process and electrical of the P2G Facility, including the spray sealed coating of the turning circle; and
- Completion of pre-commissioning and commissioning works.

The works noted above will be completed works in a manner consistent with relevant laws, policies and guidelines.

The construction works will commence following approval of all relevant pre-construction deliverables in accordance with the Project Approvals.

1.4 SUPPORTING MANAGEMENT PLANS AND STRATEGIES

It is noted that the CEMP is supported by the following sub-plans, which should be read in conjunction with this document:

- Noise and Vibration Management Plan (NVMP)
- Air Quality Management Plan (AQMP)
- Erosion and Sediment Control Plan (ESCP) – The ESCP addresses stormwater management during the construction works
- Cultural Heritage Management Plan (CHMP)

It is noted the following documents additionally support the construction and commissioning of the Project in accordance with the development consent, including:

- WSGG Construction Traffic Management Plan (TMP), Wasco (Sep 2020); and
- WSGG Project Environmental Management Strategy (EMS), Jemena (Sep 2020)

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 7 of 34

1.5 CONSULTATION SUMMARY

In accordance with Schedule 4, Condition 1 of the Approval, the CEMP (and sub-plans) have been prepared in consultation with;

- Fairfield City Council (Council); and
- Western Sydney Parklands Trust (WSPT)

Comments from the consultation process have been incorporated into this plan where appropriate and are summarised in the table below.

Date	Consultation	Outcomes

2. STATUTORY AND PLANNING FRAMEWORK

2.1 STATE LEGISLATION AND PLANNING INSTRUMENTS

State legislation, as well as state planning instruments relevant to the project are outlined below:

- Aboriginal Land Rights Act 1983
- Biodiversity Conservation Act 2016
- Biodiversity Conservation Reg 2017
- Biosecurity Act 2015
- Biosecurity Act 2017
- Contaminated Land Management Act 1997
- Dangerous Goods (Road & Rail Transport) Act 2008
- Dangerous Goods (Road & Rail Transport) Reg 2014
- Environmental Planning and Assessment Act 1979
- Environmental Planning and Assessment Reg 2000
- Environmentally Hazardous Chemicals Act 1985
- Environmentally Hazardous Chemicals Reg 2017
- Gas Supply (Safety & Network Mgmt) Reg 2013
- Ozone Protection Act 1989
- Pipelines Act 1967
- Pipelines Regulation 2013
- Protection of the Env. Administration Act 1991
- Protection of the Environment Legislation Miscellaneous Amendments Act 2017
- Protection of the Env. Operations (Clean Air) Reg '10
- Protection of the Environment Operations Act 1997
- Protection of the Env. Operations (Gen.) Reg 2009
- Protection of the Env. Operations (Waste) Reg 2014
- Road Transport (General) Reg 2013
- Soil Conservation Act 1938
- Waste Avoidance and Resource Recovery Act 2001
- Water Management Act 2000

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 8 of 34

- Heavy Vehicle (Fatigue Mgmt) National Ref (NSW)
- Heritage Act 1977
- Heritage Reg 2012
- Land Management (Native Vegetation) Code 2018
- National Parks and Wildlife Act 1974
- National Parks and Wildlife Reg 2019
- Water Management (General) 2018
- Water Management Amendment Act 2010, '14, '18
- Work Health and Safety Act 2011
- Work Health and Safety Reg 2017
- WH&S (Mines and Petroleum Sites) Act 2013
- WH&S (Mines and Petroleum Sites) Reg 2014

2.2 COMMONWEALTH LEGISLATION

Commonwealth legislation, relevant to the Project are outlined below:

- Clean Energy Regulator Act 2011 (Cwth)
- Environment Protection and Biodiversity Conservation Act 1999 (Cwth)
- Environment Protection and Biodiversity Conservation Amendment (Wildlife Protection) Act 2001 (Cwth)
- Industrial Chemicals (Notification and Assessment) Act 1989 (Cwth)
- National Environment Protection Measures (Implementation) Act 1998 (Cwth)
- National Greenhouse and Energy Reporting Act 2007 (Cwth)

2.3 CONDITIONS OF APPROVAL

The Development Consent (SSD 10313) Approval conditions relevant to the Construction Environment Management Plan are presented in the table below. This CEMP responds to the specific relevant requirements of the Approval Development Consent, as follows:

Condition	Requirement	Addressed
Schedule 2 – Part A – Administrative Conditions		
STRUCTURAL ADEQUACY		
A9	The Applicant must ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the Building Code of Australia	Section 14.1
DEMOLITION AND REHABILITATION		
A10	The Applicant must ensure that all demolition work on site is carried out in accordance with <i>Australian Standard AS 2601-2001: The Demolition of Structures</i> , or its latest version.	Section 14.1
A11	The Applicant must: (a) rehabilitate the site progressively, as soon as reasonably practicable following disturbance; (b) minimise the disturbance area at any time; (c) employ interim rehabilitation strategies to minimise dust generation, soil erosion and weed incursion on parts of the site that cannot yet be permanently rehabilitated; and	• AQMP • ESCP • Construction TMP

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 9 of 34

Condition	Requirement	Addressed												
														
PROTECTION OF PUBLIC INFRASTRUCTURE														
A12	Unless the Applicant and the applicable authority agree otherwise, the Applicant must: (a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the development; and	Construction TMP												
OPERATION OF PLANT AND EQUIPMENT														
A13	The Applicant must ensure that all plant and equipment used on site, or in connection with the development, is: (a) maintained in a proper and efficient condition; and (b) operated in a proper and efficient manner.	• AQMP • Construction TMP												
Schedule 3 – Part B - Environmental Conditions – General														
HAZARDS AND RISKS														
Storage and Handling of Dangerous Goods														
B5	The Applicant must ensure that all dangerous goods and hazardous materials storage and handling undertake on-site is in accordance with: (a) the requirements of all relevant Australian Standards; and (b) the NSW EPA’s Storing and Handling of Liquids: Environmental Protection – Participants Handbook if the chemicals are liquids, or its latest version. In the event of an inconsistency between the requirements listed from (a) to (b) above, the most stringent requirement must prevail to the extent of the inconsistency.	Section 14.11												
AMENITY														
Construction and Operating Hours														
B9	The Applicant must comply with the operating hours set out in Table 1. <table><tr><th colspan="2">Table 1: Operating Hours</th></tr><tr><th>Activity</th><th>Operating Hours</th></tr><tr><td>Operations excluding microturbines and blowdowns</td><td>24 hours a day 7 days a week</td></tr><tr><td>Microturbines</td><td>7 am to 10 pm 7 days a week</td></tr><tr><td>Construction and decommissioning activities</td><td>7am to 6pm Monday to Friday 8am to 1pm Saturday</td></tr><tr><td>Blowdowns (excluding emergency work)</td><td>at no time on Sundays and NSW public holidays</td></tr></table> The following activities may be undertaken outside of the hours identified in Table 1 without the approval of the Secretary: (a) the delivery of materials as requested by the NSW Police Force or other authorities for safety reasons; (b) emergency work to avoid the loss of life, property and/or material harm to the environment; (c) construction works that cause LAeq (15 mins) noise levels that are:	Table 1: Operating Hours		Activity	Operating Hours	Operations excluding microturbines and blowdowns	24 hours a day 7 days a week	Microturbines	7 am to 10 pm 7 days a week	Construction and decommissioning activities	7am to 6pm Monday to Friday 8am to 1pm Saturday	Blowdowns (excluding emergency work)	at no time on Sundays and NSW public holidays	• NVMP • Construction TMP
Table 1: Operating Hours														
Activity	Operating Hours													
Operations excluding microturbines and blowdowns	24 hours a day 7 days a week													
Microturbines	7 am to 10 pm 7 days a week													
Construction and decommissioning activities	7am to 6pm Monday to Friday 8am to 1pm Saturday													
Blowdowns (excluding emergency work)	at no time on Sundays and NSW public holidays													

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 10 of 34

Condition	Requirement	Addressed
	- no more than 5 dB(A) above the rating background level at any residence in accordance with the Interim Construction Noise Guideline (DECC, 2009), or its latest version; and - no more than the noise management levels specified in Table 3 of the Interim Construction noise Guideline (DECC, 2009), or its latest version, at other sensitive land uses; and - for continuous or impulsive vibration values, measured at the most affected residence, no more than those for human exposure to vibration, specified in Table 2.2 of Assessing vibration: a technical guideline (DEC, 2006), or its latest version; and - for intermittent vibration values measured at the most affected residence, no more than those for human exposure to vibration, specified in Table 2.4 of Assessing vibration: a technical guideline (DEC, 2006), or its latest version; (d) where a negotiated agreement has been reached with affected receivers; or (e) works as approved through the out-of-hours work protocol outlined in the Environmental Management Strategy under Schedule 4 of this consent.	
Noise		
B10	The Applicant must: (a) minimise the noise generated by any construction or decommissioning activities on site in accordance with the best practice requirements outlined in the Interim Construction Noise Guideline (DECC, 2009), or its latest version; 	NVMP
Air		
B11	The Applicant must minimise the: (a) dust emissions of the development, including wind-blown and traffic generated dust; (b) greenhouse gas emissions of the development; (c) surface disturbance of the development; and (d) other air emissions of the development.	- AQMP - ECSP - Construction TMP
Visual		
B13	The Applicant must: (c) not mount any commercial advertising signs or logos on site, except where this is required for identification or safety purposes.	Section 14.1
Lighting		
B14	The Applicant must: (a) minimise the off-site lighting impacts of the development; and (b) ensure that any external lighting associated with the development: - is installed as low intensity lighting (except where required for safety or emergency purposes); - does not shine above the horizontal; and	Section 14.1

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 11 of 34

Condition	Requirement	Addressed
	complies with <i>Australian Standard AS4282 (INT) 1997 – Control of Obtrusive Effects of Outdoor Lighting, or its latest version.</i>	
SOIL AND WATER		
Operating Conditions		
B15	The Applicant must: (a) ensure that the development does not cause any water pollution, as defined under section 120 of the POEO Act; (c) minimise any soil erosion associated with the construction of the development in accordance with the relevant requirements in the Managing Urban Stormwater: Soils and Construction (Landcom, 2004) manual, or its latest version.	ESCP
WASTE		
B16	The Applicant must: (a) minimise the waste generated by the development; (b) classify all waste generated on site in accordance with the EPA's Waste Classification Guidelines 2014 (or its latest version); (c) store and handle all waste on site in accordance with its classification; (d) not receive or dispose of any waste on site; and (e) remove all waste from the site as soon as practicable, and ensure it is sent to an appropriately licensed waste facility for disposal.	Section 14.5
HERITAGE		
Protection of Heritage Items		
B17	The Applicant must ensure the development does not cause any direct or indirect impacts on heritage items located outside the approved development footprint.	CHMP
B18	If historical and/or Aboriginal archaeological heritage items are unexpectedly discovered during construction of the development, all works must cease, and a suitably qualified and experienced archaeologist be brought in to assess the find. Depending on the nature of the discovery, additional assessment, recording and management measures may be required prior to the recommencement of works in the affected area. Heritage NSW and/or members of the relevant Local Aboriginal Land Council must be notified of this discovery in writing.	CHMP
Part B Environmental Conditions – General		
ENVIRONMENTAL MANAGEMENT		
Environmental Management Strategy		
C1(f)	include:	NVMP
	- the following sub-plans: - noise; - air quality;	AQMP

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 12 of 34

Condition	Requirement	Addressed
	– stormwater management including erosion and sediment controls during construction; and	ESCP
	– heritage	CHMP
	• copies of any strategies, plans and programs approved under the conditions of this consent; and	Environmental Management Strategy
	• a clear plan depicting monitoring to be carried out in relation to the development	Section 13.3
COMPLIANCE		
Incident Notification		
C3	The Applicant must immediately notify the Department, Council and any other relevant agencies immediately after it becomes aware of an incident. The notification must identify the development (including the development application number and name) and set out the location and nature of the incident.	Section 13.7

3. STANDARDS AND CODES OF PRACTICE

The following list of Standards, Codes and Guidelines are not exhaustive. All crew must ensure they are aware of the standards, codes, and guidelines relevant to their work.

Document Description	
APGA Code of Environmental Practice – Onshore Pipelines Rev 4 Sept 2017	
Australian drinking Water Guidelines 6 (2011) – NHMRC Ver 3.4 Oct 2017	
Australian and New Zealand Guidelines for Fresh and Marine Water Quality (October 2000)	
AS 1171:1998	Non-Destructive Testing – Magnetic particle testing of ferromagnetic products
AS/NZS ISO 14001:2015	Environmental management systems
AS/NZS ISO 14015-2003	Environmental management - Environmental assessment of sites and organizations
AS 1692-2006 Rec:2016	Tanks for flammable and combustible liquids
AS 1726-2017	Geotechnical Site Investigations
AS 1940-2017	Storage and handling of flammable and combustible Liquids
AS 2062: 1997	Non-Destructive Testing – Penetrant testing of products and

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 13 of 34

Document Description	
	compounds
AS 2168.2:2009	Non-Destructive Testing – Computerized radiography testing of metallic materials using X-rays and gamma rays.
AS 2207:2007	Non-Destructive Testing – Ultrasonic Testing of Fusion Welded Joints in Carbon and Low Alloy Steel
AS 2436-2010	Guide to noise control on construction, maintenance, and demolition sites
AS 2507-1998	Storage and handling of agricultural and veterinary chemicals
As 2550.1:2011	Cranes, Hoists and Winches – Safe Use
AS/NZS 2885.1-2018	Pipelines – Gas and liquid petroleum – Design and construction
AS/NZS 2885.2:2016	Pipelines – Gas and liquid petroleum- Welding
AS/NZS 2885.3:2012	Pipelines - Gas and liquid petroleum – Operation and maintenance
AS/NZS 2885.5:2012	Pipelines - Gas and liquid petroleum – Field pressure testing
AS 31000:2018	Risk management – Principles and guidelines
AS 3780:2008	The storage and handling of corrosive substances
AS 3833:2007	The storage and handling of mixed classes of dangerous goods, in packages and intermediate bulk containers
AS/NZS 5911-2013	General guidelines on the verification, validation, and assurance of environmental and sustainability reports
AS/NZS 60079	Electrical Equipment in Hazardous Area Series
HB 203:2012	Managing environment-related risk
ASME B31.12:2019	Hydrogen Pipelines and piping
ISO 14001:2016	Environmental management systems – Requirements for guidance with use
Australian Dangerous Goods Code, 7.6, 2018	
National Code of Practice for Labelling of Workplace Substances Sept 2015	
National Code of Practice for Managing risks of hazardous chemicals in the workplace May 2018	
Land Access Code Department of Natural Resources and Mines September 2016 Version 2	

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 14 of 34

4. ENVIRONMENTAL POLICY AND OBJECTIVES

Wasco is committed to responsible environmental management and all of its activities are conducted in accordance with the Wasco Workplace Health & Safety Policy and the Wasco Environmental Policy. WASCO is committed to the principles of Ecological Sustainable Development as per legislation and guidance documentation.

4.1 OBJECTIVES

Environmental objectives have been developed for this project based on the information and issues identified in the conditions of the contract and Wasco previous experience of conducting construction work. These objectives will provide a clear guide for management of environmental issues during construction.

It is emphasized that all activities related to all phases of the project should:

- Ensure adequate planning and resources
- Minimise harm to the environment
- Minimise waste
- Avoid disturbance to sites of cultural heritage significance
- Minimise social impacts to inhabitants of the area and its surrounds
- Achieve excellent reinstatement outcomes

Given the nature of activities proposed, the level of investigation and refinement undertaken to date and ongoing, and the standard of mitigation measures proposed by Wasco to minimise impacts, it is not likely that the construction works will result in any significant, long-term or irreversible environmental impacts.

Construction will result in short-term disturbance, which is minimised to the greatest extent practicable through implementation of a range of management measures.

4.2 INTEGRATED MANAGEMENT SYSTEM

Wasco operates a comprehensive Management System that provides a structure for managing business development and project delivery whilst addressing quality, health, safety and environmental requirements. The Management System has been designed to satisfy the requirements of national and international standards and is certified in:

- ISO 9001:2015 - Quality management systems
- ISO 14001:2015 - Environmental management systems

4.3 PROJECT MANAGEMENT

Within the framework provided by the corporate Management System, Wasco prepares project specific management documentation for each project, incorporating contract conditions and specific design requirements.

As set out in the rest of this document, we will achieve our environmental objectives by:

- Ensuring adequate planning and allocation of resources

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 15 of 34

- Applying risk management principles
- Documenting procedures and plans
- Training personnel and contractors
- Measuring and reporting our performance
- Conducting a review of our performance

4.4 EMPOWERMENT TO STOP WORK

All persons working on the project are Empowered and obliged to call a stop to work where it is reasonable to believe that a continuation of such work will result in a non-conformance with a management action in the CEMP.

5. ROLES AND RESPONSIBILITIES

The Wasco Project Manager for construction of the (JGN) Western Sydney Green Gas (WSGG) Project has primary responsibility for the Project and acts to ensure that the project is managed in accordance with this CEMP, the SMP and site-specific procedures.

The Wasco Construction Manager ensures the day-to-day operations onsite comply with this CEMP and that staff are informed about, and understand, their environmental responsibilities as described in this plan.

Environmental management and compliance are the responsibility of all personnel involved in the project.

THE INDUCTION TRAINING OF ALL PERSONNEL INVOLVED IN THE PROJECT WILL ENSURE EACH INDIVIDUAL IS AWARE OF THE ENVIRONMENTAL OBJECTIVES AND THEIR INDIVIDUAL RESPONSIBILITY AND ACCOUNTABILITY FOR THEIR ACTIONS. SPECIFIC ENVIRONMENTAL PROJECT ROLES AND RESPONSIBILITIES ARE OUTLINED IN THE FOLLOWING TABLE:

Position	Responsibilities
Wasco - Project Manager	Responsible for the management of the Construction project, including all environmental aspects and regulatory aspects. Responsible for ensuring that relevant reporting is completed and submitted to the Client, and all aspects of health safety and environment conditions within the projects are followed. Reports directly to the Client.
Wasco – Project Engineers	Responsible for ensuring that relevant reporting is completed and submitted to the Client, and all aspects of quality, health safety and environmental conditions within the project are followed. Reports to the Project Manager regarding the project's health safety and environmental performance and due diligence.
Wasco – Construction Manager	Responsible for overseeing and fulfilling the commitments contained in this CEMP during site works. Responsible for ensuring that construction is managed in accordance with the CEMP and site-specific procedures. Reports to the Project Manager regarding the project's environmental and safety performance and due diligence.

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 16 of 34

Position	Responsibilities
Wasco- HSE Advisor	Coordinates the monitoring and audit program. Responsible for reporting on health, safety, and environmental compliance to the Construction Manager. Reports to the Construction Manager regarding the project's environmental performance and due diligence.
All personnel	Responsible for ensuring the day-to-day activities of their tasks comply with the CEMP, health and safety requirements, regulatory requirements and all other project obligations detailed in the associated project documents. All personnel are required to instil and abide by good housekeeping principles to ensure the minimization of waste, segregation of recyclable products and general care for the environment.

6. KEY WASCO CORPORATE SPECIFICATIONS

Wasco has developed a suite of documentation which outlines and defines key focuses for the company and their undertakings, these documents form the basis of site implemented procedures, policies, plans and registers.

Project Documents	Document
2018-HSS-REG-003	SDS Register
2018-HRE-REG-002	Project Training Matrix
2018-HSS-TRG-001	Project Induction
2018-HSS-REG-004	Project Risk Assessment
2018-ENV-PRC-004	Erosion and Sediment Control Procedure
2018-ENV-PLN-007	Project Traffic Management Plan
2018-HSS-PLN-001	Project Health and Safety Management Plan
2018-QAS-PLN-003	Project CARE Plan
2018-HSS-PLN-002	Project Emergency Response Plan
WAPL-HSS-PRC-001	Incident Reporting and Notification Procedure
WAPL-HSS-PRC-002	Incident Investigation Procedure

7. EMPLOYEE SELECTION, TRAINING AND QUALIFICATIONS

Project Employee Selection, Induction and Training are defined in the Project Health and Safety Management Plan (HSMP).

The Wasco Project Management Team has the responsibility for ensuring all Employees have the necessary skills and knowledge to fulfil the requirements of their positions including any environmental responsibilities.

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 17 of 34

A training matrix of personnel qualifications including inductions and operators permits or licences will be maintained.

7.1 INDUCTIONS

Construction personnel, including sub-contractors are required to attend a project induction prior to commencing work. The induction program includes a significant environmental and heritage component designed to ensure that all personnel are aware of their environmental and heritage responsibilities. The induction will be modified depending on target audience (e.g. supervisors, crew) to ensure it remains relevant. The construction environmental and heritage induction component covers general environmental and heritage management issues, including:

- Jemena High Pressure Induction
- Site specific requirements relating to the Development Consent conditions
- Site hazards in an operational facility on a high-pressure gas site
- Relevant legislation and legislative requirements
- Roles and responsibilities
- General awareness of environmental and heritage management protocols and procedures
- Incident reporting, spill management and response
- Air quality and dust management
- Management of sensitive areas and Aboriginal/Historic heritage
- Vegetation and habitat management including fauna
- Biosecurity and declared weeds
- Waste management
- Water management
- Access Conditions including stakeholder and public communication
- Emergency response plan
- Traffic management plan

In addition, meetings are conducted with supervisors and crew prior to commencement of construction activities to review the procedures, ITP, and SWMS relevant to that activity, including required environmental and heritage management actions. Daily pre-start meetings are held during the course of construction activities. These will periodically include Toolbox Talks providing information on specific environmental and heritage issues relevant to the current location and activity. The procedures and SWMS will be reviewed should any aspect of the work change, including changes to crew, work method or environmental conditions.

The Induction would also ensure all construction personnel are aware of their environmental and heritage responsibilities in compliance with the Commonwealth and New South Wales laws and have the necessary knowledge and skills to fulfil them.

All inductions are recorded in a training matrix. The register will be maintained throughout the construction period.

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 18 of 34

8. ENVIRONMENTAL PROMOTION AND COMMUNICATION

Wasco recognises the importance of promoting environmental awareness and understanding to Employees, sub contactors and where appropriate to the wider community as part of working towards achieving environmental objectives. Environmental management is promoted through:

- Displaying the Environmental Policy Statement
- Communicating environmental objectives to Employees and contractors, through environmental inductions, toolbox talks, pre-start meetings and other means
- Sharing environmental performance data with Employees and contractors
- Periodic use of site noticeboards for display of environmental material
- Incorporating environmental considerations into pre-start meetings
- Displaying and presenting environmental incident response procedures
- Documenting of community interactions
- Communicating environmental inspection and audit results.

Environmental matters are communicated through the following internal communication channels:

- Project Management Progress Meetings
- Project Daily Field Progress Management Meetings
- Pre-start meetings/Team Briefings
- Toolbox Meetings/Briefings
- Noticeboards.

9. DESCRIPTION OF ACTIVITIES

Refer to Section 1.3 in conjunction with the Construction Risk Register 2018-HSE-REG-001 and Project Scope of Work

10. ASSESSMENT OF ENVIRONMENTAL IMPACTS AND RISKS

To manage the interactions with the environment that would result from construction of the Project, the potential aspects and impacts of the Project must first be established.

Environmental aspects are the elements of an activity which can interact with the environment, and impacts are the effect of that aspect on the environment. The environmental aspects and impacts that may result from construction of the Project are examined below. The significance of each impact is also assessed by allocating the likelihood and consequence of an environmental impact occurring using Client environmental risk models. The risk of impacts occurring is then reassessed in light of proposed mitigation measures.

The Project HAZID and Project Risk register will be used to record all risks, impacts, hazards and mitigation measures at the commencement of the Project.

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 19 of 34

10.1 METHODOLOGY

The construction environmental aspects are identified from the client's Environmental Impact Statement (EIS) Development consent conditions, baseline surveys and other provided studies. Management measures to address each of these generic construction environmental impacts and risks are detailed in the Environmental Management Protocols for the Project – Construction Environment Management Plan (CEMP) Section 18.

The construction environmental aspects will comply with the Client and legislative requirements.

10.2 CONTINUOUS REVIEW OF RISKS

Over the course of the Project, the Risk register will be reviewed and updated to ensure that as the Project progresses, new and changed risks and hazards are assessed and addressed. Where necessary, procedures, SWMSs, SOPs and ITPS may be revised.

11. ENVIRONMENTAL GUIDELINES – KEY ASPECTS

An Environmental Impact Statement (EIS), Eco Logical Australia 2019 Western Sydney Green Gas Project Environmental Impact Statement was prepared for Jemena Gas Networks (NSW) Lth (JGN) in accordance with Schedule 2 of the Environmental Planning and Assessment Regulation 2000. The EIS and Development Consent conditions stipulate the mitigation details for the construction activities. Section 18 of the EIS stipulates the control methods to ensure compliance.

The EIS and Development Consent application SSD-10313 as issued to JGN will be used by all project personnel to ensure compliance. Wasco's environmental procedures use the following principles as a basis; a general environmental duty of care, a duty to notify environmental harm, the offence of causing serious or material environmental harm, the offence of causing environmental nuisance, the offence of depositing prescribed water contaminants in waters and related matters and the offence to place contaminant where environmental harm or nuisance may be caused.

The relevant sections of the APGA Code of Environmental Practice – Onshore Pipelines Rev 4 Sept 2017 are also noted below.

Environmental Risk Area	Page
Native vegetation	39
Fauna	40
Biosecurity	40
Natural and Built Heritage	41
Aboriginal Heritage	42
Soil	44
Water	46
Waste	47
Emissions	48
Third Parties	49
Chemical and contamination	50

12. EMERGENCY RESPONSE

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 20 of 34

The Construction Manager, in consultation with the Project Management Team and the Client's Representative, will assess each project activity and potential external factors or influences that may lead to identifiable operational emergency conditions.

An Emergency Response Plan (2018-HSS-PLN-003 Emergency Response Plan) has been prepared by Wasco for the Project.

Environmental emergencies may include:

- Significant spills of fuels or other hazardous materials
- Bushfire
- Large scale trench flooding
- Release of contaminated water

13. COMMUNICATION, MONITORING AND REPORTING

13.1 COMMUNICATION

External communication to surrounding stakeholders will be undertaken by Jemena prior to the commencement of construction works, this will include a notification of planned works and construction timelines.

In addition, activities may be undertaken outside of the hours notified in Development Consent conditions Table 1 without the approval of the Secretary in accordance with the Schedule 3 Condition 9 and only where negotiated agreement has been reached with affected receivers, this shall be communicated appropriately.

All relevant project communication will be made available to everyone on the community website <https://haveyoursay.jemena.com.au/western-sydney-green-gas-project>

13.2 COMPLAINT MANAGEMENT

Wasco will notify the Jemena Project Team immediately of any issues or complaints raised by any relevant stakeholder, so that the most consistent and up to date information is provided and a suitable resolution is reached. All complaints will be recorded by Wasco, and the complaint record must include the following details:

- Date and time of the complaint;
- The method by which the complaint was made;
- Any personal details of the complainant which were provided by the complainant or, if no such details we provided, a note to that effect;
- The nature of the complaint;
- The action taken in relation to the complaint, including any follow-up contact with the complainant; and
- If no action was taken, the reasons why no action was taken.

The complaint investigation process will be completed within 24 hours a responses / resolutions to the complaint is to be communicated by the Jemena Project Team for communication with the complainant.

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 21 of 34

13.3 MONITORING

Environmental records will include inspection reports undertaken by the HSE Advisor and/or Construction Supervisor or delegate. Any other required monitoring and data recorded will be captured and available to be provided when required.

The CEMP, and Project Risk Register specify control actions developed to reduce the risk associated with potential environmental impacts. These preventative actions have been incorporated into the relevant procedures.

During construction, additional preventative actions may be identified through review of SWMS, HAZOB cards and work processes. New preventative actions will be incorporated into SWMS, and where appropriate into the relevant procedures and the Project Risk Register.

Corrective actions may be required to address an actual environmental impact (for instance a spill or erosion event) or near miss during construction and will be developed through incident and hazard investigations according to the Incident Reporting Procedure (WAPL-SYS-PRC-002). These corrective actions may include actions intended to prevent a recurrence, such as an update of relevant procedures and construction documentation, SWMS and training materials.

Corrective actions identified through incident and hazard investigations will be recorded in the Corrective Action Register as part of that system. Through this system, actions will be assigned to a responsible person, given a due date and tracked to completion.

13.4 INSPECTIONS

Weekly checklists (WAPL-HSS-FRM-003 Environmental Inspection Form) will be completed by the Project HSE advisor. These forms will be kept onsite and recorded in the project HSE folder.

The Project environmental performance data will be incorporated into the Weekly and Monthly Progress reports submitted to the Wasco Project Management Team and the Client, summarising:

- Environmental management activities including inspections
- Compliance with the Development Consent conditions via the application of construction phase management plans
- Environmental management documents (procedures, SWMSs etc) developed or reviewed
- Summary of environmental incidents or non-compliances
- Areas of concern.

The Project HSE Advisor will have overall responsibility for the timely submission of complete and accurate environmental reports.

13.5 KEY PERFORMANCE INDICATORS

- Closeout of all corrective actions by the due date.
- Environmental aspects monitored as required, undertaken via site inspections by project management.
- No incidents causing Environmental or Cultural Heritage impact.

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 22 of 34

13.6 INCIDENT INVESTIGATION

All incidents are required to be investigated in accordance with Wasco and the Client's incident investigation procedures. Closeout of actions must be completed by the due date.

Outcomes of incidents, the investigation and the remediation must be communicated as soon as possible to all personnel, Wasco management, and the Client.

13.7 INCIDENT REPORTING

The responsibility for initial reporting of an incident lies with the personnel and associated supervisor involved. All incidents shall be reported to the Construction Manager immediately after they occur and recorded using Rapid Incident as per the Wasco Incident Reporting Procedure (WAPL-SYS-PRC-002). The Project Manager or delegate shall report the incident to the Client Site Representative. Jemena shall pass notify relevant parties as required (Section 13.8).

Non-compliances with environmental procedures will be also reported in accordance with this procedure as an incident.

The CEMP and associated procedures include contingency actions, the majority of which are triggered when an environmental incident takes place.

13.8 INCIDENT NOTIFICATION

The Client, as the proponent for the Project, is required to report certain events to the EPA and DPI&E as soon as possible after an event occurs. In the event of a reportable incident, the Project Manager will report the required information to the Client Representative. Incidents shall be reported within 24 hours, in accordance with the Client's requirements. The Client will then communicate the incident to the EPA and DPI&E. A copy of all documented incidents will be retained at the site project office and within project archives for a minimum period of 5 years.

13.9 REPORTING

Wasco will report to Jemena and other agencies as required on issues related to the Project. Reporting will include:

- Notification of works commencement (including prior to construction commencement and completion)
- Monitoring records;
- Non-compliances; and
- Project website updates and inclusion of any revision of this plan.

13.10 AUDITS

Project audits will be conducted as identified and required, with a minimum of one every six months. The scope of such audits will include relevant project work sites and environmental compliance with the project requirements.

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 23 of 34

14. FIELD ACTIVITIES AND CONTROL MEASURES

The following subsections (14.1 – 14.12) summarise the key control measures implemented throughout the project. For further detail of each section, refer to the respective plan/procedure listed below.

- 2018-ENV-PLN-002 Erosion and Sediment Control Plan
- 2018-ENV-PLN-003 Construction Air Quality Management Plan
- 2018-ENV-PLN-004 Construction Noise and Vibration Management Plan
- 2018-ENV-PLN-005 Cultural Heritage Management Plan
- 2018-HSS-PLN-001 Project Health and Safety Management Plan
- 2018-HSS-PLN-002 Project Traffic Management Plan
- 2018-HSS-PLN-003 Project Emergency Response Plan
- 2018-HSS-PLN-004 Project CARE Plan
- 2018-HSS-REG-001 Project Risk Register
- WAPL-HSS-PRC-001 Incident Reporting and Notification Procedure
- WAPL-HSS-PRC-002 Incident Investigation Procedure

Control measures to be implemented have been developed in conjunction with Section 8 (Environmental Management) of Environmental Impact Statement (EIS)

14.1 GENERAL CONDITIONS

Activities	Control Measures
Site Management	• All works are to be conducted according to the relevant Environmental Impact Statement (EIS), Development Consent (SSD 10313), Scope of Work (SOW), and permit to work (PTW) conditions. • If any variation is deemed necessary, the Client Site Representative will be notified.
Training and Inductions	• Minimum training required for workers on this site includes: ○ Wasco Online Inductions ○ Client Site Induction. ○ White card construction industry • Wasco will create a site-specific induction for all workers on this site that includes pertinent elements of the CEMP. • Elements of the CEMP will be interjected in SWMS and daily toolbox meetings. • A specially designed visitor induction will include pertinent elements of the CEMP.
Records	• Records including but not limited to: Community/Landholder complaints, Prestart meeting, SDS copies, audits and incident report forms will be maintained, kept on-site and made available to all workers and client personnel as required.

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 24 of 34

Incident reporting	All community, landholder, environmental incidents, inquiries, safety incidents and near misses shall be maintained and reported to the Wasco Project Team and Client Representative.
Emergency response	All workers and visitors will be inducted on the site-specific Wasco Emergency Response Plan (2018-HSS-PLN-003).
Maintenance	- Plant and equipment will be maintained to not present a hazard to the environment. - Site supervisor will periodically ensure the effectiveness of equipment, plant and erosion and sediment control measures.
Biosecurity	All vehicles and plant operating on site will be washed down prior to their project commencement and after their project completion, to manage the introduction and spread of weed propagules.
Access	- Fences and barricades will be maintained where required to secure the construction site and limit access to site. - Traffic management will be carried out according to the site access conditions and Traffic Management Plan (2018-HSS-PLN-002) - A site-specific traffic management plan will be established for the site and complied with.
Record keeping	Inspection records, incidents and non-compliances will be recorded and presented to the Project Team and Jemena as required.
Buildings and Structures	- Any newly renovated, installed, or mobilised buildings (permanent or temporary) shall adhere to relevant requirements of the Building Code of Australia - There is currently no planned activity for the removal/demolition of existing structures within the site, if this scope change, Contractor shall comply to <i>Australian Standard AS 2601-2001: The Demolition of Structures</i>
Signage	Site signage shall only be installed to assist in site identification, convey health and safety information and outline entry to site requirements
Lighting	- Lighting installed shall comply with Australian Standard AS4282 (INT) 1997 – Control of Obtrusive Effects of Outdoor Lighting, or its latest version. - Any temporary lighting will be positioned to minimise the off-site lighting impacts and should not shine above the horizontal

14.2 AIR EMISSIONS

Activities	Control Measures
Dust	Dust suppression will involve minimising soil disturbance on site, and speed limiting traffic.

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 25 of 34

	- High dust generating activities will be assessed and mitigation measures will be implemented such as applying water. - Water required for dust suppression activities will come from an approved source. - During high wind periods works will be minimised. - Stockpiles covered or watered down if dust is a risk - Vegetation clearing activities staged to minimise exposure to bare soil - Period of time between excavating and backfilling minimised where possible - Groundcover maintained particularly surrounding access tracks
Traffic	- All vehicles will follow the traffic management plan. - Plant and vehicles will not be left running where possible.
Fuel Burning	- Fuel consumption will be kept to a minimum. - All plant and equipment will be maintained as per OEM requirements.

14.3 WATER MANAGEMENT

Quality Parameters	Control Measures
Stormwater	- Storm water and runoff will be managed in accordance with the ESCP. (2018-ENV-PLN-002) - Sediment fences will be constructed as described in the ESCP following Managing Urban Stormwater: Soils and construction - Volume 1 https://www.environment.nsw.gov.au/research-and-publications/publications-search/managing-urban-stormwater-soils-and-construction-volume-1-4th-edition - All site stormwater control features will be identified prior to construction and appropriate controls included in the ESCP. - Weather reports to be checked daily. - Appropriate controls put in place, preparations made, stockpiles prepared, and worksite prepared prior to significant predicted rainfall events.
Groundwater	- Where beneficial use is required, an assessment of potential impacts to ground water will be undertaken prior to dispersal as per site EIS and Development Consent. - As required a sump pump will be used for any groundwater seepage and controls implemented (silt sock, sediment trap, flow rate) around discharging water.
Hydro testing	- Water will come from an approved source. - The Water Source will be tested for Chemical and Bacterial Analysis as per the APGA guidelines.

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 26 of 34

	• Biocide may be required for hydrotesting water subject to sample analysis as per APGA guidelines. • Water disposal after Hydro Testing will be as per the site EIS, Development Consent, EPA waste classification guidelines. • A test plan will be developed.
--	--

14.4 NOISE AND VIBRATION

Quality Parameters	Control Measures
Working Hours	• Project activities will be conducted between 7:00am and 18:00pm Monday to Friday and 7:00am to 13:00pm Saturdays. • No construction activities will occur on Sundays or Public Holidays. • Noise levels will be minimised during operational working hours to comply with the requirements of the Environmental Impact Statement and Development Consent conditions. • In addition to the project hours above the project activities will also occur outside these hours strictly in accordance with Environmental Planning and Assessment (Covid Development-Construction workdays) Order 2020
Traffic	• Traffic times, travel locations and speeds will comply with site Traffic Management Plan (2018-HSS-PLN-002) including the mandated access path to site.
Vehicles and equipment activities	• All plant and equipment will be turned off wherever possible when not in use. • Simultaneous operation of plant near sensitive receivers will be minimised. • If a valid noise complaint is received, sound abatement modifications may be deployed. • Vibration activities will be minimised where possible.
Acoustic Fencing	• If required, temporary acoustic barriers can be installed on perimeter fencing to reduce noise levels experienced off-site

14.5 WASTE MANAGEMENT

Quality Parameters	Control Measures
General waste handling and storage	• No wastes will be burnt or buried on site. • Minimise the waste generated by the development • General wastes will be stored in bins provided for that purpose, which will be covered where possible.

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 27 of 34

	- Regular inspections will be carried out to ensure operational sites are well maintained. - Waste storage will not be placed in a position that has the potential for the wastes to enter a waterway or any sensitive receptor. - Designated waste receptacles will be used. (in accordance with its classification)
Waste disposal and transport	- Wastes will be segregated, stored and managed according to their classification. - Waste will be removed from the site by, and disposed of, at an appropriately licensed waste disposal facility. - Regulated wastes will be transported off site by a person holding appropriate licences and permits. - Waste recycling where appropriate will be practiced. - All wastes will be classified using the EPA Waste Classification Guidelines (2014) prior to disposal and transportation. - All waste disposal receipts, and waste vehicle movements will be retained and included in a register.

14.6 LAND MANAGEMENT

Quality Parameters	Control Measures
Earthworks	- Wasco will limit any earthworks to allocated areas. - Works to be scheduled outside of predicted heavy rainfall times. - Vehicles will commute on designated tracks and roads. - All disturbance works will occur only within the area approved by the Client. - Earthworks will not be undertaken during rain events
Stockpiling	- Disturbed soil will be amended as required and reinstated as soon as practicable according to EIS and Development Consent conditions. - The battery limits as defined in the approval conditions will be clearly delineated and marked on site prior to the commencement of any earthworks. - Any Erosion control measures are to be derived from the Erosion and Sediment Control Plan following IECA best practice guidelines (Blue Book). - Stockpiling will be minimised and covered as appropriate. • No stockpiles greater than 2m in height

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 28 of 34

Land contamination	- Any stockpiling of soil will be designed with minimum slope. - No stockpiles will be located further than 10 m from grass cover or a sediment fence. - Any potentially contaminated soil is to be immediately reported to the site supervisor for communication to Jemena within 24hrs. With no works to intrude into the potentially contaminated soil until appropriate measures and authority have been approved by Jemena. - Any materials for off-site disposal needs to be sampled, analysed and compared against EPA 2014 waste classification guidelines prior to off-site disposal to a licensed facility - If any contamination is discovered during work, operation will cease, and Jemena's PM and Environmental Representative notified immediately.
Topsoil	- If any contamination is discovered during work, operation will cease, and Jemena's PM and Environmental Representative notified immediately. - Any excavated contaminated materials will be isolated, stockpiled on an impermeable material, silt-fenced and covered until it is tested and processed according to EPA 2014 Waste Classification Guidelines. - Topsoil will be stripped to a nominal depth of 100 to 150mm, or as per ground truthed conditions.
Soil Management	Topsoil will be separated from any subsoil works.
Sediment Control	- The site ESCP will be followed. - Work in wet weather will be avoided where practical. - Site based management measures will be implemented according to their potential occurrence following IECA best practice guidelines (Blue Book). - Inspections will be conducted daily by site supervisor and damaged controls fixed immediately.
Reinstatement	- All disturbed soil shall be reinstated to original profiles. - Cleared vegetation to be stockpiled. - All imported materials require a VENM certificate
Rehabilitation	Wasco is required to rehabilitate the site in accordance with the project scope of works and requirements.

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 29 of 34

14.7 HERITAGE

Quality Parameters	Control Measures
Earthworks	- Any works area will be clearly delineated and marked prior to commencement of works. - No Culturally significant materials are to be disturbed. - All works will cease immediately if any relics of historical or cultural significance are found on-site and the Construction Manager is to inform the Jemena Project Manager and Environmental Representative immediately. - All discoveries of Aboriginal objects to be fenced off and Jemena Representative notified immediately. - If human remains located Jemena Representative is to be notified immediately.

14.8 WEED AND PEST CONTROL

Quality Parameters	Control Measures
Vehicle wash-down	- All site equipment and vehicles are to be washed down prior to project commencement and at the conclusion of works. - All traffic will be kept to a minimum.
Weed control measures	- Traffic will be limited to designated access tracks to avoid any possible disturbance. - Site to be monitored during construction for any weed outbreaks.

14.9 FAUNA AND FLORA

Quality Parameters	Control Measures
Vegetation	- The authorised clearing limits will be delineated and marked prior to any earthworks. - Clearing of any vegetation shall be as per the client authorisations. - Any discovered threatened species or communities reported to Jemena and works halted until DPIE approval given.
Protected species	- Adherence to legislation will be observed during construction works. - Injured fauna shall be handled according to competency and legislation.

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 30 of 34

Fauna and habitat disturbance	- Visual checks for fauna will be made before conducting and during earthworks - Harm to fauna will be avoided, if such occurs, it will be reported to Client site representative as soon as it is possible to do so. - All orphaned or injured fauna will be contained where possible and reported to WIRES on 1300-094-737 for collection.
--------------------------------------	--

14.10 SEWAGE TREATMENT AND EFFLUENT MANAGEMENT

Quality Parameters	Control Measures
Transportable toilets	- Wastes from portable toilets will be transported off site and disposed of in a municipal waste transfer station by a licensed transporter. - Waste that is removed from site will be documented in the environmental management register with the accompanying waste certificate.

14.11 STORAGE AND HANDLING OF CHEMICALS, FLAMMABLE AND COMBUSTIBLE SUBSTANCES

Quality Parameters	Control Measures
Chemical storage and handling	- All hazardous chemicals and dangerous goods will be stored and handled according to their SDS, applicable Australian Standards and the EIS/Development Consent conditions. - The chemical contents will be appropriately labelled in accordance with the National Code of Practice for Labelling of Workplace Substances Sept 2015 - All liquid based chemicals will be stored in approved plastic containers within bunded areas. Volumes stored will be reduced to the minimum required for operations. Bunded area equal to or greater than 110% of the contents. - Spill kits, SDS, first aid kits and fire extinguishers suitable for containment will be made accessible to all workers. - Spills to be immediately isolated, contained and disposed according to legislation. - Fuel or hazardous chemicals will not be stored or handled within 50 m of waterways or within 50 m of any wetlands, lakes or springs and will be stored within 150% bunded areas or container. - A register of hazardous goods will be maintained. - The storage and handling will be according to relevant legislation that includes, but not limited to: AS 1940:2017 The storage and handling of flammable and combustible liquid.

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 31 of 34

	○ all relevant Australian Standards; and ○ the NSW EPA's Storing and Handling of Liquids: Environmental Protection – Participants Handbook if the chemicals are liquids, or its latest version. • Suitable fire prevention equipment will be kept on-site and will be made available to all workers.
Fuel storage and refuelling	• Refuelling locations will be offsite where possible • Onsite refuelling will occur as far away as practicable from natural drainage lines and sensitive receptors to reduce the possibility of soil contamination. • Remote petrol- or diesel-powered pumps located on site will be set within spill trays. They will be fuelled in-situ to lower the risk of associated water spillage caused by connecting and disconnecting water lines to pumps. • No auto lock nozzles are permitted on site
Transportation	• Hazardous goods will be transported by appropriately licenced carriers and according to SDS, relevant Australian Standards and regulatory guidelines. • All goods transported shall contain labels, signage and appropriate packaging.
Emergency preparedness	• All employees will undergo site specific training and induction, discussing hazards on site, emergency exits, location of safety equipment, and first aid. • The Emergency Response Plan (2018-HSS-PLN-003) in place will form the basis.

14.12 MONITORING AND REPORTING

Quality Parameters	Control Measures
General Operations	• A daily operations report through Envision will be completed to note the following ○ Any environmental issues ○ Toolbox and SWMS forms ○ Project progress against planned activities ○ Near misses and non-conformance ○ Records of induction and training
Site Supervisor	• Will keep records of the results of all monitoring required by this plan, in accordance with the EIS and development consent conditions for the project.

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 32 of 34

	• Ensure that hard copies of such records are conveniently located for examination by any authorised person. • Ensure that HSE and SWMS forms are completed prior to commencing work; and permits issued when necessary.
Earthworks	• Earthworks will be monitored daily during the works to assess soil segregation, reinstatement and to assess erosion potential. • Compaction of the fill going into the reconstructed landscape will be monitored periodically. • All material disposed off-site to be tracked from the site to the licensed disposal facility • All material imported to site to be tracked from source to site • All material entering and leaving site to be tracked
Audit & Review	• A weekly environmental walk will be undertaken, and any raised issues entered into the risk register. • The CEMP will be reviewed at the conclusion of the project to assess its efficacy and identify needed changes in future CEMPs. • Corrective actions and non-conformance from incident reports and weekly environmental inspections will be included • The incident reports, corrective actions, non-conformance and efficiency of systems in place will be considered and new controls will be placed accordingly. • Compliance to land access conditions, reinstatement/rehabilitation requirements will be reviewed at the completion of the project.

15. ABBREVIATIONS

Abbreviation or Term	Description
AHD	Australian Height Datum
APGA	Australian Pipeline and Gas Association
APPEA	Australian Petroleum Production & Exploration Association
AS	Australian Standards
ASS	Acid Sulphate Soils
BCD	Biodiversity and Conservation Division
BoM	Bureau of Meteorology
CAR	Corrective Actions Register

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 33 of 34

Abbreviation or Term	Description
CEMP	Construction Environmental Management Plan
Cwth	Commonwealth
Client	Jemena Gas Networks (NSW) Ltd
EIS	Environmental Impact Statement
EMS	Environmental Management System
EPA	Environmental Protection Authority
ERP	Emergency Response Plan
ESA	Environmentally Sensitive Area
ESCP	Erosion and Sediment and Control Plan
GHG	Greenhouse gas
HAZID	Hazard Identification process
HSE	Health, Safety and Environment
HSMP	Health and Safety Management Plan
IECA	International Erosion Control Association
ITP	Inspection and Test Plan
JGN	Jemena Gas Networks (NSW) Ltd
KM	Kilometre
MS	Meter station
NOHSC	National Standard for Construction Work
PASS	Potential Acid Sulphate Soils
PTW	Permit to Work
ROW	Construction Right-of-Way
SDS	Safety Data Sheet
SMP	Safety Management Plan
SOW	Scope of Work
SWMS	Safe Work Method Statement
VENM	Virgin Excavated Natural Material
WASCO	Wasco (Australia) Pty Ltd
WSGG	Western Sydney Green Gas Project

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-ENV-PLN-001	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN	Page 34 of 34

Appendix 1 - Environmental Checklist

Workplace # & Location	WSGG Project Site			
Activity	All	Date		
Inspection By				
Signatures				

A = Acceptable			NI = Needs Improvements		UA = Unacceptable		N/A = Not Applicable		
#	Inspection Item	Verification	Compliance Achieved				Comments / Action Required	Person Responsible	Close Out Date
			A	NI	UA	NA			
1.	Current environmental policy displayed?	Visual inspection.							
2.	Is there an environmental management plan developed and approved for the workplace?	Review workplace document control folder for approved management plan.							
3.	Is a waste management plan developed and approved for the workplace?	Review workplace document control folder for approved management plan.							
4.	Has a spill response scenario been developed for the workplace and included in Emergency response management plan (ERMP)?	Review approved emergency response management plan.							
5.	Are environmental hazards reported?	Review of hazard report cards/ corrective actions register?							
6.	Are toolbox talks / training sessions conducted on the workplace aspects?	Review of toolbox talk meetings folder.							
7.	Surface water/sediment controls and watercourse protection measures set up?	Visual inspection.							
8.	Is there a designated refuelling area?	Visual inspection.							
9.	Are fuel tanks adequately bunded covered and drip trays in place?	Visual inspection.							

A = Acceptable		NI = Needs Improvements		UA = Unacceptable		N/A = Not Applicable		Person Responsible	Close Out Date		
#	Inspection Item	Verification	Compliance Achieved				Comments / Action Required				
			A	NI	UA	NA					
10.	Are hazardous substance stores available and all drums, containers stored appropriately?	Visual inspection.									
11.	Are all hazardous storage areas ventilated and bunded (110% capacity)?	Visual inspection.									
12.	Are all bunds maintained? (No standing water etc.)	Visual Inspection.									
13.	Concrete wash out provided and maintained?	Visual Inspection.									
14.	Drip trays under non bunded static plant (incl. pumps)?	Visual Inspection.									
15.	Spill kits available in appropriate locations?	Visual Inspection.									
16.	Spill kits appropriate to substances being used?	Visual Inspection.									
17.	Spill kits adequate to contain spill?	Visual Inspection.									
18.	Appropriate PPE available in the event of a spill?	Visual Inspection.									
19.	Signs displayed indicating protected areas (archaeological and cultural heritage)?	Visual Inspection.									
20.	Dust suppression in operation and adequate?	Visual Inspection.									
21.	Designated waste skips available or butt bins available?	Visual Inspection.									
22.	Waste bins located in office and crib rooms?	Visual Inspection.									
23.	No smoking being undertake on site	Visual Inspection.									
24.	Is the workplace kept neat and tidy?	Visual Inspection.									
25.	Recycling of materials occurring? Poly or steel pipe laydown	Visual Inspection.									

A = Acceptable		NI = Needs Improvements		UA = Unacceptable		N/A = Not Applicable		Person Responsible	Close Out Date		
#	Inspection Item	Verification	Compliance Achieved				Comments / Action Required				
			A	NI	UA	NA					
26.	Chemicals segregated as per their classification compatibility?	Visual Inspection.									
27.	Is there a workplace layout map with - Spill kits; - workplace/office layout; - Stormwater drains; and - Laydown / hazardous substance storage areas.	Visual Inspection.									
28.	Overflow warning signals working for ablution facilities?	Test warning signals.									
29.	Are Employees and Subcontractors aware of their environmental responsibilities?	Spot check signed statement of responsibilities against names of personnel taken?									
30.	Is all waste removed by a licensed contractor to a licensed facility?	Review Contractors license?									
31.	Waste collection receipts available for all waste removed?	Review waste facility license?									
32.	Is all grey water discharged to sewer or septic systems?	Visual inspection.									
33.	Are environmental control measures being met (e.g. dust, noise, vibration, water quality) being conducted?	Visual inspection.									
34.	Current SDS folder held in all hazardous storage areas?	Review SDS folder to ensure there are no expired SDS's.									
35.	Are plant and equipment well maintained (smoky exhaust emissions) and checked regularly for potential leaks?	Visual inspection & review of maintenance records .									
36.	Batteries stored correctly?	Visual inspection.									
37.	Are workplace stormwater drains marked to remind that no wastewater should be discharged to these drains?	Visual inspection.									

A = Acceptable			NI = Needs Improvements		UA = Unacceptable		N/A = Not Applicable		
#	Inspection Item	Verification	Compliance Achieved				Comments / Action Required	Person Responsible	Close Out Date
			A	NI	UA	NA			
38.	Stop valves in place and shut correctly?	Visual Inspection							
39.	Draining taps on bunding shut and in good working order?	Visual Inspection							
40.	How is hydro test water disposed of, or is it stored for later use.	Visual Inspection, records							
41.	Has Contaminated soil been stored as per EMP.	Visual inspection							
42.	Flammable materials stored in a locked cage?	Visual inspection.							

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 48 of 53

Appendix 9 – Erosion and Sediment Control Plan



WESTERN SYDNEY GREEN GAS PROJECT

EROSION AND SEDIMENT CONTROL PLAN

Document Number			2018-ENV-PLN-002		
Revision	Issue	Date	By	Check	Approve
0	Issued for Use	25/09/2020	DP	AF	MPW
C	For Client Review	23/09/2020	DP	AMH	MPW
B	For Client Review	18/09/2020	EE	AMH	MPW
A	For Client Review	04/09/2020	EE	AMH	MPW

	JEMENA GAS NETWORKS (NSW) LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-ENV-PLN-002	EROSION AND SEDIMENT CONTROL PLAN	Page 2 of 22

1. INTRODUCTION	3
1.1 PURPOSE	3
1.2 PROJECT DESCRIPTION	3
1.3 CONSTRUCTION ACTIVITIES	3
1.4 OBJECTIVES	5
2. STATUTORY AND PLANNING FRAMEWORK	5
2.1 LEGISLATION, STANDARDS AND GUIDELINES.....	5
2.2 CONDITIONS OF APPROVAL.....	5
3. SITE DESCRIPTION	7
3.1 CLIMATE	7
3.2 TOPOGRPAHY	8
3.3 DRAINAGE	8
3.4 SOILS.....	9
4. EROSION RISK ASSESSMENT	9
5. SEDIMENT CONTROL.....	11
6. DRAINAGE CONTROL	12
6.1 DRAINAGE CONTROL REQUIREMENTS	12
7. EROSION CONTROL.....	13
7.1 EROSION CONTROL REQUIREMENTS.....	13
7.2 NOMINATED EROSION CONTROLS	13
8. REINSTATEMENT PLAN	14
8.1 REQUIREMENTS	14
8.2 REINSTATEMENT WORKS	15
8.3 HAZARDS AND CONTROLS	15
9. ROLES AND RESPONSIBILITIES	16
10. EMPLOYEE SELECTION, TRAINING AND QUALIFICATIONS	17
11. MONITORING AND REPORTING.....	18
11.1 MONITORING	18
11.2 INSPECTIONS	18
11.3 INCIDENT NOTIFICATION	19
11.4 REPORTING.....	19
Appendix 1 - Sediment Fence	20
Appendix 2 - Standard Drawing Rock Sediment Basin.....	21
Appendix 3 - ESC Feature Layout.....	0

	JEMENA GAS NETWORKS (NSW) LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-ENV-PLN-002	EROSION AND SEDIMENT CONTROL PLAN	Page 3 of 22

1. INTRODUCTION

1.1 PURPOSE

The purpose of this Construction Erosion and Sediment Control Plan (ESCP) describe the stormwater management control mechanisms to be implemented during the construction of Jemena Gas Networks (NSW) Limited's (JGN) Western Sydney Green Gas Project (the Project).

Note: This Erosion and Sediment Control Plan does not address the operational and decommissioning phase of the project.

This plan should be read in conjunction with the Construction Environmental Management Plan (CEMP)

1.2 PROJECT DESCRIPTION

The Western Sydney Green Gas (WSGG) Project involves the construction of a power to gas (P2G) hydrogen facility at the existing Jemena Horsley Park Trunk Receiving Station, located in Western Sydney. The facility will use renewable electricity to generate hydrogen, which can be injected into the natural gas network or used to generate electricity back to the grid by means of a hydrogen-powered micro-turbine or similar technology.

The Jemena Horsley Park Facility is located at 194 – 202 Chandos Road, Horsley Park (Lot 1 DP 499001 and Lot 3 DP 1002746)

1.3 CONSTRUCTION ACTIVITIES

The construction activities to be undertaken as part of the works are summarised below:

- Completion of pre-construction documentation, inductions and establishment of site amenities and delineation of construction;
- Coordination and management of site delivery, off-loading and installation of major equipment packages (inclusive of all electrical packages);
- Completion of construction, installation, testing and commissioning of carbon steel pipelines including buffer store;
- Completion of civil, structural, piping as well as mechanical, process and electrical of the P2G Facility, including the spray sealed coating of the turning circle; and
- Completion of pre-commissioning and commissioning works.

The works noted above will be completed works in a manner consistent with relevant laws, policies and guidelines.

The construction works will commence following approval of all relevant pre-construction deliverables in accordance with the Project Approvals. Figure 1 below shows a proposed construction layout.

	JEMENA GAS NETWORKS (NSW) LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-ENV-PLN-002	EROSION AND SEDIMENT CONTROL PLAN	Page 4 of 22

Figure 1 WSGGP P2G Site 194 to 214 Chandos Road Horsley Park.



	JEMENA GAS NETWORKS (NSW) LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-ENV-PLN-002	EROSION AND SEDIMENT CONTROL PLAN	Page 5 of 22

1.4 OBJECTIVES

Wasco is committed to environmental protection through responsible erosion and sediment control, all of Wasco's activities are conducted in accordance with State and Federal Legislation coupled with the Wasco Workplace Health & Safety Policy and the Wasco Environmental Policy.

The key overarching objective of this plan is to demonstrate how to minimise erosion and sedimentation arising from construction activities and retain sediment on the site by concentrating efforts to prevent erosion. With respect to the process of erosion and sediment control management, objectives are to:

- Prevent the loss of the soil resources from the site.
- Promotion of sustainable use of the resource.
- Control of sediment into creeks, rivers, and lakes.
- That the biodiversity values of the locality be maintained and enhanced.
- Identify construction activities with the potential to cause erosion and generate sediment.
- Define the best practice Erosion and Sediment Control (ESC) principles which will guide all ESC activities on site.
- Outline monitoring, inspection, and maintenance requirements.
- Plan ahead for current activities and wet weather events;
- To maintain the land use capabilities of disturbed areas with respect to land's soil, water, and vegetation attributes

2. STATUTORY AND PLANNING FRAMEWORK

2.1 LEGISLATION, STANDARDS AND GUIDELINES

Commonwealth and State legislation, as well as state planning instruments relevant to the project are outlined within Jemena's *Western Sydney Green Gas Project - Environment Management Strategy* (Sep 2020).

Legislation relevant to this plan include:

- Protection of the Environment Operations Act 1997
- Protection of the Environment Operations (General) Regulation 2009
- National Environment Protection (Ambient Air Quality) Measure

2.2 CONDITIONS OF APPROVAL

The Approval conditions relevant to the this plan are presented in the table below. This ESCP responds to the specific relevant requirements of the approval Development Consent, as follows:

Condition	Requirement	Addressed
Schedule 2 – Part A – Administrative Conditions		
DEMOLITION AND REHABILITATION		
A11	The Applicant must:	Section 8.2

	JEMENA GAS NETWORKS (NSW) LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-ENV-PLN-002	EROSION AND SEDIMENT CONTROL PLAN	Page 6 of 22

Condition	Requirement	Addressed
	(a) rehabilitate the site progressively, as soon as reasonably practicable following disturbance; (b) minimise the disturbance area at any time; (c) employ interim rehabilitation strategies to minimise dust generation, soil erosion and weed incursion on parts of the site that cannot yet be permanently rehabilitated; and	
Schedule 3 – Part B - Environmental Conditions – General		
SOIL AND WATER		
Operating Conditions		
B15	The Applicant must: (a) ensure that the development does not cause any water pollution, as defined under section 120 of the POEO Act; (c) minimise any soil erosion associated with the construction of the development in accordance with the relevant requirements in the Managing Urban Stormwater: Soils and Construction (Landcom, 2004) manual, or its latest version.	This Document
Part B Environmental Conditions – General		
ENVIRONMENTAL MANAGEMENT		
Environmental Management Strategy		
C1(f)	- stormwater management including erosion and sediment controls during construction; and	This document
COMPLIANCE		
Incident Notification		
C3	The Applicant must immediately notify the Department, Council and any other relevant agencies immediately after it becomes aware of an incident. The notification must identify the development (including the development application number and name) and set out the location and nature of the incident.	Section 11.3

3. SITE DESCRIPTION

3.1 CLIMATE

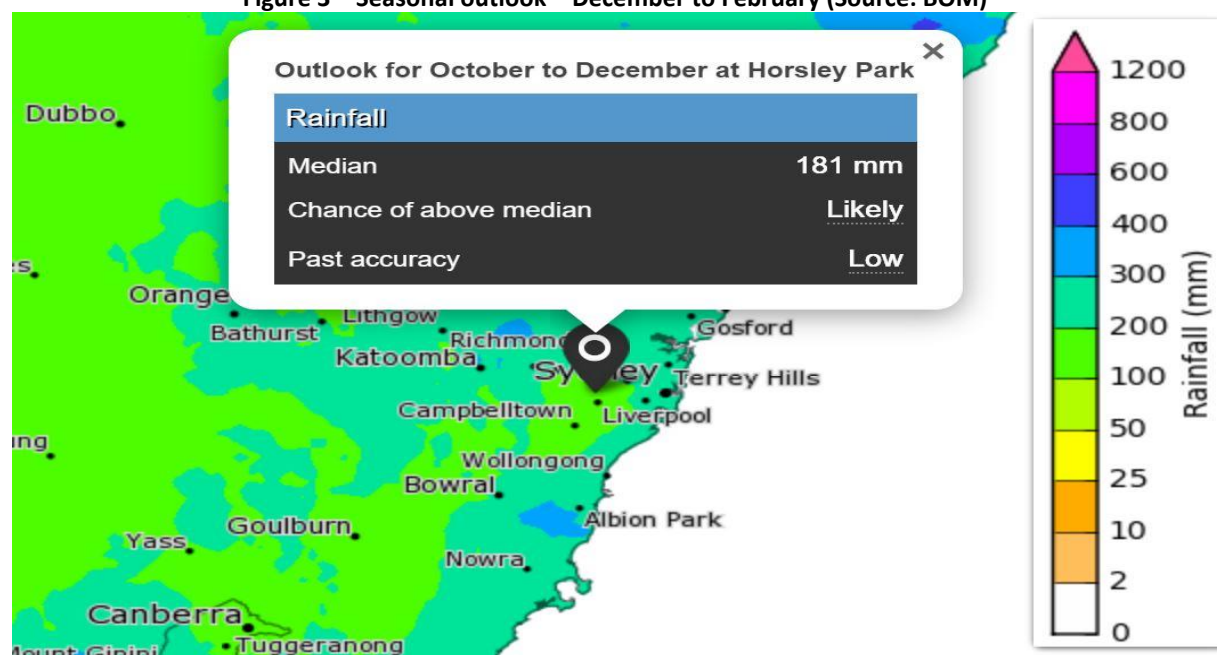
Historically, the project area receives the majority of annual rainfall between November and March, with the majority of falls in February. The historical rainfall from 1997 to 2019 for the region is presented below in Figure 2.

Figure 2 – Historic mean rainfall (source: Benbow Environmental 2019)

Month	Mean Maximum Temperature (°C)	Mean Minimum Temperature (°C)	Daily Wind Run (km)	Mean Rainfall (mm)	Mean Number of Days of Rain ≥ 1 mm
January	30.1	17.9	212	75.6	7.6
February	28.9	17.8	204	103.6	7.1
March	26.9	16.2	177	83.3	8.0
April	23.9	13.0	174	70.3	6.8
May	20.6	9.0	157	41.9	5.0
June	17.6	7.2	174	74.7	6.3
July	17.4	5.8	177	35.2	5.0
August	19.0	6.4	198	36.8	4.0
September	22.4	9.3	211	35.1	4.9
October	24.7	11.8	202	58.8	5.8
November	26.4	14.4	215	78.6	7.0
December	28.4	16.3	211	66.4	7.1
Annual	23.9	12.1	193	757.3	74.6

The seasonal outlook for October to December (refer Figure 3) indicates the median rainfall for the region is 181mm with the forecast indicating rainfall between 100mm and 200mm as illustrated in Figure 3.

Figure 3 – Seasonal outlook – December to February (Source: BOM)



	JEMENA GAS NETWORKS (NSW) LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-ENV-PLN-002	EROSION AND SEDIMENT CONTROL PLAN	Page 8 of 22

3.2 TOPOGRAPHY

The project has been divided into a single catchment and the topography assessed for each section of the project. The topography varies from 62 to 66m being relatively flat with a grade of 3 to 4%. The slope assessment has been utilised in the erosion risk assessment, as detailed in **Section 4**.

Figure 4 WSGGP Topography Map



3.3 DRAINAGE

Flood mapping sourced from Fairfield City Council, identifies all waterway locations which may intersect the WSGGP site. Only Eastern Creek borders the site with flood mapping demonstrating a slight overlap should a 100 year flood occur. The flood zone is illustrated in Figure 5 with the WSGGP site outlined in black.

Figure 5 – Eastern Creek Flood Mapping (Source: Fairfield City Council)



	JEMENA GAS NETWORKS (NSW) LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-ENV-PLN-002	EROSION AND SEDIMENT CONTROL PLAN	Page 9 of 22

3.4 SOILS

3.4.1 FIELD SURVEY

Wasco has based initial implementation strategies off the Alliance Geotechnical Report October 2018, where soils or project areas are not consistent with the report, soil testing may be undertaken in accordance with International Erosion Control Association IECA (2015).

Geotechnical investigations completed by Alliance Geotechnical (Oct 2018) in an assessment of the Jemena Gas Networks Trunk Receiving Station Facility identified a thin layer of topsoil with underlying clay, with a medium to high plasticity at 0.7-1.6m depth, overlying extremely low to very low strength shale.

3.4.2 SOIL MANAGEMENT

All soils will be stripped and stockpiled separately. The topsoil should consist approximately of the first 100mm of soil, with the exact depth determined on site, according to depth conditions.

Soil management for reinstatement is further discussed in Section 9.

Given the nature and properties of subsoils in the region, a focus should be on minimising the duration and extent of subsoil exposure during construction activities (i.e. minimising rainfall and overland flows contacting exposed portions of the cleared Right of Way (RoW) for pipeline area). Management of construction sequencing to achieve the above will result in a far superior outcome (both environmentally and financially) coupled with installing downslope sediment control measures in an attempt to retain a portion of mobilised sediment whilst areas are exposed. Just as critical will be reinstating surface cover and vegetation as soon as possible following construction activities.

4. EROSION RISK ASSESSMENT

An erosion risk assessment has been conducted using the Revised Universal Soil Loss Equation (RUSLE) to estimate soil loss rates along the project. Based on estimated soil loss rates, erosion risk can be assigned, and the level of sediment and erosion control management applied relevant to the varying risk.

$$A = K \times R \times LS \times P \times C$$

Where:

- A is the predicted soil loss per hectare per year
- K is the soil erodibility factor
- R is the rainfall erosivity factor
- LS is the slope length/gradient factor
- P is the erosion control practice factor
- C is the ground cover and management factor

	JEMENA GAS NETWORKS (NSW) LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-ENV-PLN-002	EROSION AND SEDIMENT CONTROL PLAN	Page 10 of 22

4.1.1 K-FACTOR – SOILS

Considering the description provided, a conservative K factor value of 0.038 has been adopted above that typically provided for sandy-clay Table 19 of *App C Managing Urban Stormwater: Soils and Construction Volume 1, 4th Edition, March 2004*.

Table 19 Penrith Soil Landscapes

Soil landscape	Common constraints	Slope range	Soil hydrologic group	Acid sulfate risk	USCS class	K- factor	Sediment type	Sediment basin wall construction (earth)
Agnes Banks (ab)	high wind and soil erosion hazards; non cohesive soils with low fertility, high permeability and seasonally high watertables	0-5	Group A	no A-S data available for this sheet	na	na	Type C	I
Bakers Lagoon (ba) (bl)	high watertables plastic soils	0-5	not applicable		OL CL	0.051 0.043	Type D Type D	J D
Berkshire Park (bp) (bp)	impermeable waterlogged subsoils, low fertility	0-5	Group C		CL	0.048	Type F	A
Blackdown (bt)	soils poorly drained with low fertility, localised high plasticity and expansive subsoils	0-5	Group C		ML/CL CL CL	na 0.038 na	Type F Type D Type D	B G G
Burrallow Swamp (bs)	high flooding hazard, seasonally high watertable, soils with high permeability and low fertility	0-10	Group B		SP SC	0.023 0.011	Type C Type C	J J
Faulconbridge (fb) (fb)	shallow, highly permeable soils with low fertility; rock outcrop	0-5	Group D		SM CL	ft 0.035	Type C Type D	J A
Freemans Reach (fr)	high flooding and streambank erosion hazards; soils with high permeability and low fertility	0-5	Group B/C		ML CL-ML CL	0.046 0.038 0.025	Type F Type F Type D	A B A
Gymea (gy)	shallow highly permeable soils with very low fertility; rock outcrop; localised steep slopes with high soil erosion hazard	10-25	Group C/D		SM SC CL	0.022 0.034 0.032	Type C Type F Type D	B&I C A
Hawkesbury (ha)	high soil erosion and mass movement hazard; steep slope, rock outcrop, shallow stony highly permeable soils with low fertility	>25	Group D		SC SC	na 0.033	Type C Type F	C C
Hazelwood (hw)	high mass movement and sheet erosion hazards; soil with high permeability, high erodibility and low fertility	>60	Group B		SM CL	0.035 0.034	Type C Type F	J A
Kurrajong (kg)	localised mass movement hazard; localised waterlogging; localised steep slopes; some soils shallow and expansive	>10	Group C		CL	0.033	Type D	B
Lucas Heights (lh)	stony soil, low soil fertility, low available water capacity	0-10	Group C/D		SM SC CL	0.053 0.042 0.024	Type C Type D Type F	B&I B A
Luddenham (lu)	moderately expansive, low wet strength, localised impermeable and highly plastic subsoils	5-20	Group C		CL CL CL	0.038 na na	Type D Type F Type D	B A A
Picton (pn)	high mass movement hazard; low permeability; low fertility; localised high expansion	>20	Group C		CL CL	na 0.034	Type D Type D	D B
Richmond (ri)	high soil erosion hazard (particularly at terrace edges) and localised flooding hazards; localised salinity	0-1	Group C		CL	0.059	Type F	A
South Creek (sc)	high flooding hazard; localised permanently high watertables; low fertility; localised salinity	0-5	Group C/D		CL	0.05	Type F	A
Upper Castlereagh (up)	very high soil erosion hazard; dispersible, impermeable soil layers	0-5	Group C/D		SC CL	na 0.032	Type D Type F	D D
Volcanic (vo)	moderately expansive soils with low wet strength, high soil erosion and mass movement hazards on steep slopes	5-60	Group C/D		CL	0.029	Type F	B
Warragamba (wb)	very high mass movement and soil erosion hazards; steep slopes, highly permeable soils with low fertility	>35	Group C		SM SC	0.036 0.032	Type C Type D	J B
Woodlands (wl)	soils with low fertility and low water holding capacity	0-10	Group B/D		CL CL	0.029 na	Type F Type F	C B

	JEMENA GAS NETWORKS (NSW) LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-ENV-PLN-002	EROSION AND SEDIMENT CONTROL PLAN	Page 11 of 22

4.1.2 R- FACTOR – RAINFALL

An annual erosivity factor of 2500 has been adopted for site, extrapolated from MUSSC App B Map 10.

4.1.3 LS - SLOPE-LENGTH

Slopes vary between flat and 4% throughout the project. To minimise the potential soil loss, cross drainage will need to be installed at specified intervals to minimise the potential for rill erosion. The Ls factors adopted for the project has been determined based on installation of this cross-drainage. If cross-drainage is not installed, the sediment control or erosion control requirements for the site will increase from that provided in this report.

4.1.4 EROSION CONTROL PRACTICE (P) FACTORS

Default factors of .9 has been adopted for across the site, in accordance with App A, Table A2 MUSSC. The construction activities will involve the movement of heavy machinery across the site up and down the slope.

4.1.5 ESTIMATED SOIL LOSS

The resulting soil loss calculated using RUSLE is 26t/ha/yr. with cross drainage installed indicating a very low to low erosion risk.

5. SEDIMENT CONTROL

Sediment control on pipeline and facility projects is largely focused on the following:

- Retention or treatment of ‘dirty’ water runoff generated within the RoW/cleared area
- Managing vehicle exit points from the pipeline RoW/cleared area
- Integration of sediment control attributes into the drainage/erosion control practices installed at drainage lines.

5.1.1 NOMINATED SEDIMENT CONTROLS

An assessment of the disturbance area, erosion risk rating and spatial constraints has been undertaken in identifying suitable sediment controls. Control type and locations are presented on the ESC standard arrangement drawings in Appendix A.

Noting the low grade and short slope lengths, sediment fencing aligning with the disturbed area with rock sediment basins at each discharge point are nominated as the primary sediment controls.

The attached ESCP drawing in Appendix A notes key location points of the sediment fencing and discharge points. During ground truthing adjustments may be required which shall be noted on the drawing during construction.

	JEMENA GAS NETWORKS (NSW) LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-ENV-PLN-002	EROSION AND SEDIMENT CONTROL PLAN	Page 12 of 22

6. DRAINAGE CONTROL

Drainage control considers three main principles; diverting external flow before it enters site, directing site runoff to an appropriate sediment control, and ensuring runoff is conveyed in a non-erosive manner.

Typically, the above principles are achieved by forming diversion bunds (vegetation/topsoil) along the upslope portion of the RoW and diversion bunds (trench/pad spoil) along the downslope edge of disturbance. Depending on construction constraints the bunding may consist of vegetation, topsoil or subsoil on either side of the RoW. External flows should be conveyed across the RoW at existing drainage points which should be appropriately managed.

6.1 DRAINAGE CONTROL REQUIREMENTS

Reference to Table P22 of International Erosion Control Association guidelines IECA (2015) indicates the following drainage control standard for the disturbance area:

- Vegetation/Topsoil windrows as Flow Diversion Banks
- For low risk - drainage controls are designed for a 4-EY (four exceedances per year) storm event
- For moderate risk - drainage controls (excluding those across the RoW such as contour berms) are designed for at least a 1-year ARI storm.

6.1.1 LONGITUDINAL DRAINAGE

Achieved by windrows or bunds along the upslope and downslope edge of disturbance.

Within 50 m of waterways, and 25m of drainage lines or where slopes exceed 2 % longitudinally, the windrows should be lined with jute/geotextile along the flow path to limit mobilisation of sediment. The 2% limit has been determined based on a 1-year ARI drainage design standard and a maximum drainage catchment of 0.5 ha (200m of RoW length) in lowly erodible soils. Where soils are highly erodible or where drainage catchments exceed 0.5 ha and 2%, lining will be required.

6.1.2 STORMWATER ASSETS

The site has a stormwater asset which directly links to the Eastern Creek. Due to the high risk of sediment entering a waterway through this drain extra precautions need to take place.

The stormwater ingress point lies on the edge of the pipeline trench entering the facility and thus the distance of drain to disturbed soil will necessarily be minimal.

Due to this high risk, ground truthing will be required to assess the area and ensure that adequate controls are implemented. As per the ESCP drawing the drain will need to have a rock basin surrounding it with a sediment fence surrounding the rock basin.

Where practicable all sediment controls along the pipeline RoW will need to be angled such that all run off is directed away from the drain ingress point.

	JEMENA GAS NETWORKS (NSW) LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-ENV-PLN-002	EROSION AND SEDIMENT CONTROL PLAN	Page 13 of 22

6.1.3 CROSS DRAINAGE

As required existing drainage lines and/or temporary concentrated flow paths conveying runoff across the RoW will be managed by lining the RoW with sediment fencing. Due to the facilities pad being upstream of the drainage slope the downstream edge of the facilities pad will be edged with sediment fencing terminating in a rock basin. This is deemed sufficient due to the low grade and short slope length.

7. EROSION CONTROL

In pipeline construction, erosion control practices are typically restricted to the effective management of clearing/disturbance works and site rehabilitation activities (IECA, 2015). Given the narrow width of the pipeline RoW it is usually impractical to employ general erosion control practices during the construction phase, unless warranted by erosion risk.

The key to effective 'erosion control' is to:

- minimise the extent and duration of soil disturbance during periods when significant rainfall is possible, and
- promptly cover exposed soils once the construction phase has been completed.

Topsoil stripping and reinstatement requirements are presented in Section 8.

7.1 EROSION CONTROL REQUIREMENTS

7.1.1 BEST PRACTICE REQUIREMENTS

Reference to Table P23 of IECA (2015) indicates no specific erosion controls required other than normal best practice. Based on a low erosion risk during the nominated construction period. Normal best practice erosion control requirements would include:

- Appropriate management of work programming and the scheduling of forward works with the aim of minimising the erosion risk
- Control of soil erosion at drainage lines caused by run-on water passing through (across) the RoW (associated with 'drainage control' measures)
- Control of soil erosion at vehicle crossings of drainage lines
- Minimising the extent of vegetation and soil disturbance at drainage lines
- Erosion control practices during site reinstatement.

7.2 NOMINATED EROSION CONTROLS

The primary erosion control measure for the facilities construction pad is management of construction activities to minimise the cross flow of surface water. The erection of downstream sediment fencing terminating in a rock basin is deemed sufficient.

The primary erosion control measure for the RoW is management and scheduling of construction activities to minimise the extent and duration of clearing prior to pipe installation and commencement of reinstatement. Given the nominated timing for the project and generally low erosion risks the extent of physical erosion controls measures (i.e. not management or scheduling) is limited to:

	JEMENA GAS NETWORKS (NSW) LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-ENV-PLN-002	EROSION AND SEDIMENT CONTROL PLAN	Page 14 of 22

- Stabilisation of vehicle crossings at drainage lines.
- Installation of erosion controls around the facilities pad during construction activities.
- Appropriate erosion control techniques for reinstatement of drainage lines.

7.2.1 LAND CLEARING

- The timing of soil disturbances along the pipeline RoW, laydown pad and facilities pad is critical. Establish exclusion zones to prevent over-disturbance and restrict stripping to approved areas only.
- Land clearing should proceed just ahead of the pipe installation, laydown pad and facilities pad construction so as to minimise the duration of soil exposure to rainfall.

8. REINSTATEMENT PLAN

8.1 REQUIREMENTS

The re-establishment of surface cover on disturbed soils is a fundamental component of reducing the risk of erosion and offsite sediment and turbid water release. Table 9 summarises the best practice timing, per IECA (2015) for execution of rehabilitation works based on erosion risk parameters and proximity to sensitive receiving environments. The timeframes within Table 9 should not be considered mandatory.

Best practice timeframes for reinstatement and rehabilitation works

PARAMETER	MAXIMUM DELAY BEFORE START OF SITE STABILISATION ¹	MAXIMUM DAYS TO ACHIEVE SOIL COVERAGE ^{2,3}
General works - Low Risk	10	50
General works - Moderate Risk	10	30
Identified Good Quality Agricultural Land (GQAL)	10	30
Works within 50 m of an ephemeral watercourse. Works less than 200 m upstream of a cultural heritage site, regional ecosystem, or organic farm.	10	10
Works within the banks of a watercourse that is likely to experience flow within the stabilisation period. Works within 100 m of a watercourse.	5	5

¹ Maximum ~~days~~ following completion of pipe laying and trenching or construction works before ~~stabilisation~~ and rehabilitation works commence.

² Maximum days following completion of pipe laying and ~~trenching~~ or construction works before the ~~stabilised~~ area achieves the specified soil cover.

³ Soil cover may consist of organic or rock mulch, synthetic blankets, vegetation or combination thereof, as appropriate for the area.

	JEMENA GAS NETWORKS (NSW) LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-ENV-PLN-002	EROSION AND SEDIMENT CONTROL PLAN	Page 15 of 22

8.2 REINSTATEMENT WORKS

Throughout construction, areas should be progressively reinstated to assist in the mitigation of dust generation, soil erosion and weed incursion. Temporary measures should also be taken in areas which cannot be fully rehabilitated

Reinstatement works should address the specific conditions onsite which may impact the long term stability of soils and vegetation. A key criteria of reinstatement planning is to assess whole of life cost for incorporating temporary measures to protect soil surfaces and assist in establishment of suitable ground cover quickly following construction. It is intended that the reinstatement measures outlined will achieve the reinstatement requirements and objectives at the lowest overall cost, considering preparation, establishment and maintenance.

8.3 HAZARDS AND CONTROLS

Hazards	Control Methods	Construction Phase
• Soil erosion and sediment release to land and water. • Potential modification to surface water flows (drainage lines and streams).	• Environmental risk management methods shall be implemented from the environmental management plan (2018-ENV-PLN-001-Environmental Management Plan). • Pre-construction environmental assessments including photographs and GPS references shall be undertaken as required - for use as pre-construction baseline information, (Dilapidation Survey). • Adequate plant and equipment should be maintained to ensure rehabilitation is completed adequately	During Planning/Pre-works
• Potential for site run-off into drainage lines and watercourses. • Potential for contamination of land / water. • Generation of hazardous (liquid /water) waste. • Temporary disruption to landowners (water logging). • Potential impacts to visual and aesthetic amenity	• Environmental risk management methods shall be implemented from the environmental management plan (2018-ENV-PLN-001-Environmental Management Plan). • Compaction relief shall be undertaken, as required, by ripping or scarifying soils along the contours. • The pipeline corridor should be re-profiled to original or stable contours, re-establishing surface drainage lines and other land features. • Where topsoil has been removed, it should be re-spread. If clean topsoil needs to be imported where there are insufficient stockpiles, biosecurity measures shall be applied to imported topsoil as per JGN instruction. • Erosion and sediment control measures shall be installed as per this Erosion and Sediment Control Plan to manage the disturbed area whilst revegetation occurs. • Ongoing review of control measures • Pre/post rainfall monitoring and audits • Incident reporting	During Earthworks
	• Environmental risk management methods shall be implemented from the environmental management	During Reinstatement

	JEMENA GAS NETWORKS (NSW) LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-ENV-PLN-002	EROSION AND SEDIMENT CONTROL PLAN	Page 16 of 22

Hazards	Control Methods	Construction Phase
	plan (2018-ENV-PLN-001-Environmental Management Plan). • Third party, stock and wildlife access to newly reinstated areas should be excluded where possible, to allow for establishment of seed and plant stock sufficient for area stabilisation. • Third party, stock and wildlife access to above-ground infrastructure, such as valves or scraper stations, shall be controlled by installing barriers (e.g. fencing). • Flagging used to identify sensitive environmental features (e.g. natural and cultural heritage), shall be removed and disposed of at the completion of construction in order to avoid drawing attention to sites. • Ongoing review of control measures • Pre/post rainfall monitoring and audits • Incident reporting	

9. ROLES AND RESPONSIBILITIES

Please refer to below summary and Project Execution Plan 1902_PRN_PLN_001

Element	Project Manager	Construction Manager	HSE Advisor	Site Project Engineer	Earthworks Supervisor	All personnel (WAPL)
ESC Procedure is implemented, and confirming understanding by construction personnel of Procedure	X		X			
ESC Plan, including drawings, to be present and approved before disturbance			X	X		
Access points to be assigned and rumble strips installed as required		X				
Design of any Sediment Basins to be in accordance with IECA requirements		X	X	X		
Stage works to reduce erosion potential		X			X	
ESC measures to be installed prior to clearing or within 24 hrs of start		X	X		X	
ESC controls to be in place prior to disturbance if rain predicted		X			X	
Appropriate controls to be used in diversion channels (sandbags, matting, etc)			X	X	X	
Stormwater to be directed to catchments using swales, berms, contours, etc				X	X	
Vehicle movement restricted to approved areas and tracks				X	X	
Controls regularly inspected and repaired when 60% capacity breached			X	X	X	
Minimise length of flow paths and low gradients.			X	X	X	
Inlet and outlet energy dissipators to be used (filter rolls, sandbags, rock)			X	X	X	
Direct runoff around areas where contaminants are stored			X	X	X	

	JEMENA GAS NETWORKS (NSW) LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-ENV-PLN-002	EROSION AND SEDIMENT CONTROL PLAN	Page 17 of 22

Element	Project Manager	Construction Manager	HSE Advisor	Site Project Engineer	Earthworks Supervisor	All personnel (WAPL)
Drains cut to promote water to existing drainage lines				X	X	
Contour banks on slopes prone to erosion				X	X	
Keep topsoil stockpiles to 2m and away from drainage lines, watercourses		X	X	X	X	
Washdown of plant on purpose-built facilities for sediment capture		X	X			
Remove sediment from external roads as soon as possible		X	X			
Watering roads for dust suppression to be done to minimise runoff				X	X	
Stockpiles > 1 month to be covered, roughened or compacted			X	X	X	
Sediment controls to be downslope from stockpiles			X	X	X	
Use stabilisation products as required		X		X	X	
Communicate to construction (during the site walk through) areas of problematic soils on site		X	X			
Develop (in consultation with construction) the ESC Site Environmental Plans for each construction phase			X	X		
Release of collected runoff to be in accordance with DA conditions			X			
For floccing, use gypsum to remove excess sediment			X	X	X	
Silt curtains should be considered for works close to permanent waterways		X	X			
If potential disturbance to waterways, works: - Must only be undertaken where necessary for the authorised petroleum activities - Must be no greater than the minimum area necessary for the purpose of the significant disturbance - Must be designed and undertaken by a qualified & experienced person		X				
Upon cessation of works, commence rehab as soon as is practicable		X	X			
Responsible to uphold the General Environmental Duty and undertake works in accordance with all contractual and legislative requirements.			X			X

10. EMPLOYEE SELECTION, TRAINING AND QUALIFICATIONS

Project Employee Selection, Induction and Training are defined in the Health Safety Management Plan 2018-HSS-PLN-001.

The Wasco Project Management Team has the responsibility for ensuring all employees have the necessary skills and knowledge to fulfil the requirements of their positions including any environmental responsibilities. A training register of personnel qualifications including inductions and operators permits or licences will be maintained.

Personnel involved in the development of ESCP and installation or maintenance of ESC must be suitably competent in understanding:

- Requirements of and how to interpret an ESCP.

	JEMENA GAS NETWORKS (NSW) LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-ENV-PLN-002	EROSION AND SEDIMENT CONTROL PLAN	Page 18 of 22

- IECA specifications.
- Managing Urban Stormwater Soils and Construction
- Correct installation, maintenance and operation and ESC measures.
- Spill Response and Management

11. MONITORING AND REPORTING

11.1 MONITORING

ESCPs are considered live documents that in some instances require review and updating as site conditions change, or if the adopted measures fail to achieve the required treatment standard.

When a site inspection detects a notable failure in the adopted ESC measures, the source of this failure must be reported, investigated using the normal incident reporting process' and appropriate amendments made to the site and if required the ESCP, in the form of 'redline' mark-ups.

The following should be read in conjunction with the Project (CEMP)

Best practice site management requires all ESC measures to be inspected at the following frequencies and include the following checks as a minimum:

Daily site inspections (during rainfall)

- All drainage, erosion and sediment control measures
- Occurrences of excessive sediment deposition (whether on-site or off-site)
- All site discharge points (including dewatering activities as appropriate)

Weekly site inspections (even if work is not occurring on-site)

- All drainage, erosion and sediment control measures
- Occurrences of excessive sediment deposition (whether on-site or off-site)
- Occurrences of construction materials, litter or sediment placed, deposited, washed or blown from the site, including deposition by vehicular movements
- Litter and waste receptors
- Oil, fuel and chemical storage facilities

Prior to anticipated runoff producing rainfall (within 24 hours of expected rainfall)

- All drainage, erosion and sediment control measures
- All temporary flow diversion and drainage works

Following runoff producing rainfall (within 18 hours of rainfall event)

- All drainage, erosion and sediment control measures
- Occurrences of excessive sediment deposition (whether on-site or off-site)
- Occurrences of construction materials, litter or sediment placed, deposited, washed or blown from the site, including deposition by vehicular movements

11.2 INSPECTIONS

Weekly Environmental Site Inspection checklist (2018-ENV-CHK-001) will be completed by the Construction Manager or delegate. This form will be kept onsite and recorded in the HSE register folder.

	JEMENA GAS NETWORKS (NSW) LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-ENV-PLN-002	EROSION AND SEDIMENT CONTROL PLAN	Page 19 of 22

The Project performance data will be incorporated into the Monthly Progress reports submitted to the Wasco Project Manager and the Client, summarising:

- Erosion and sediment control activities including inspections;
- Erosion and sediment control documents (check list, procedures etc) developed or reviewed;
- Summary of environmental incidents or non-compliances;
- Fauna data;
- Weed management strategies and wash-downs;
- Extent of trench open and inspected; and
- Areas of concern.

The Project HSE advisor will have overall responsibility for the timely submission of complete and accurate reports.

11.3 INCIDENT NOTIFICATION

The Client, as the proponent for the Project, is required to report certain events to the EPA and DPI&E as soon as possible after an event occurs. In the event of a reportable incident, the Project Manager will report the required information to the Client Representative. Incidents shall be reported within 24 hours, in accordance with the Client's requirements. The Client will then communicate the incident to the EPA and DPI&E. A copy of all documented incidents will be retained at the site project office and within project archives for a minimum period of 5 years.

11.4 REPORTING

Wasco will report to Jemena and other agencies as required on issues related to the Project, all reporting required to be completed in accordance with the Development Conditions will be reported in accordance with the CEMP requirements these include:

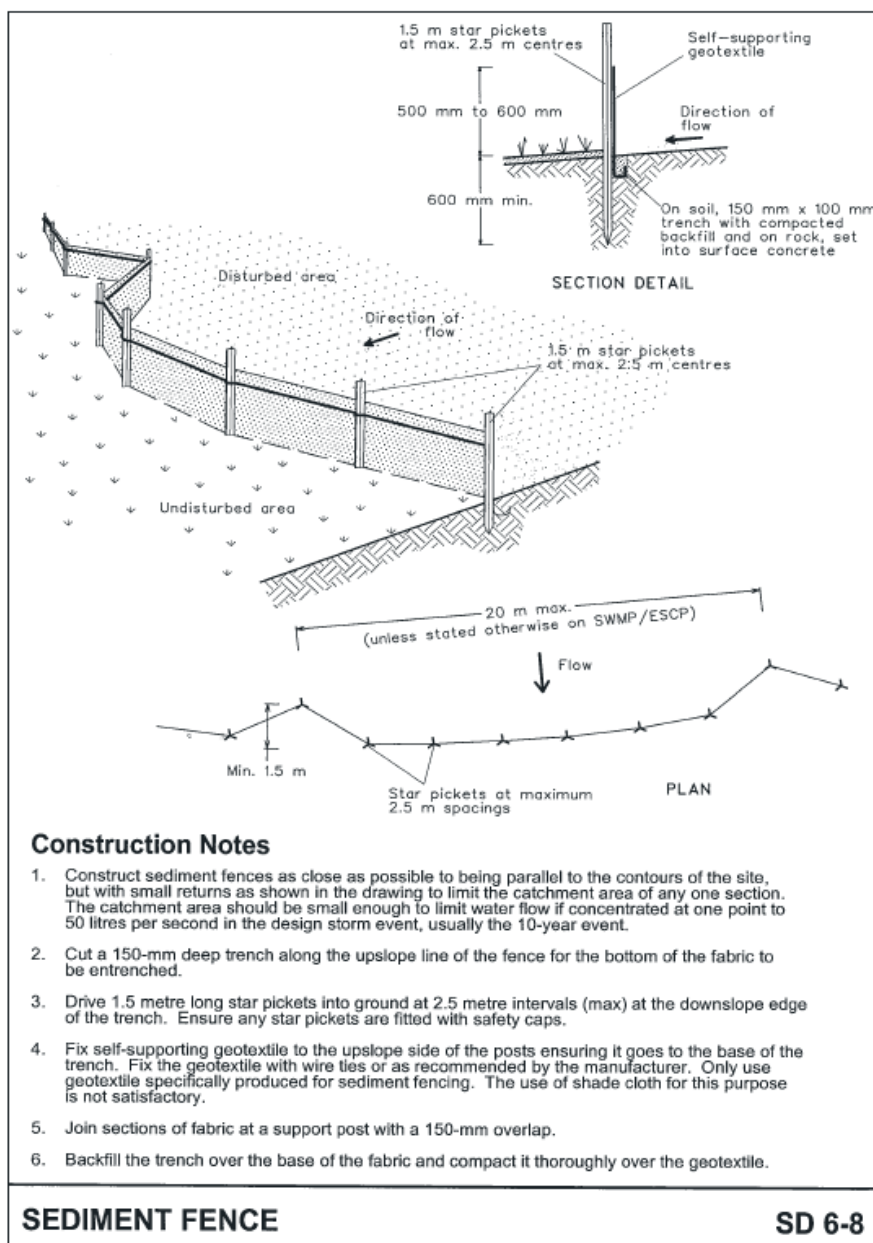
- Incidents
- Non-compliance

Reporting provided to Jemena relating to the ECSP will include the following:

- Weekly checklists (2018-HSS-FRM-001_Environmental checklist); and
- Any revision of this plan.

	JEMENA GAS NETWORKS (NSW) LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-ENV-PLN-002	EROSION AND SEDIMENT CONTROL PLAN	Page 20 of 22

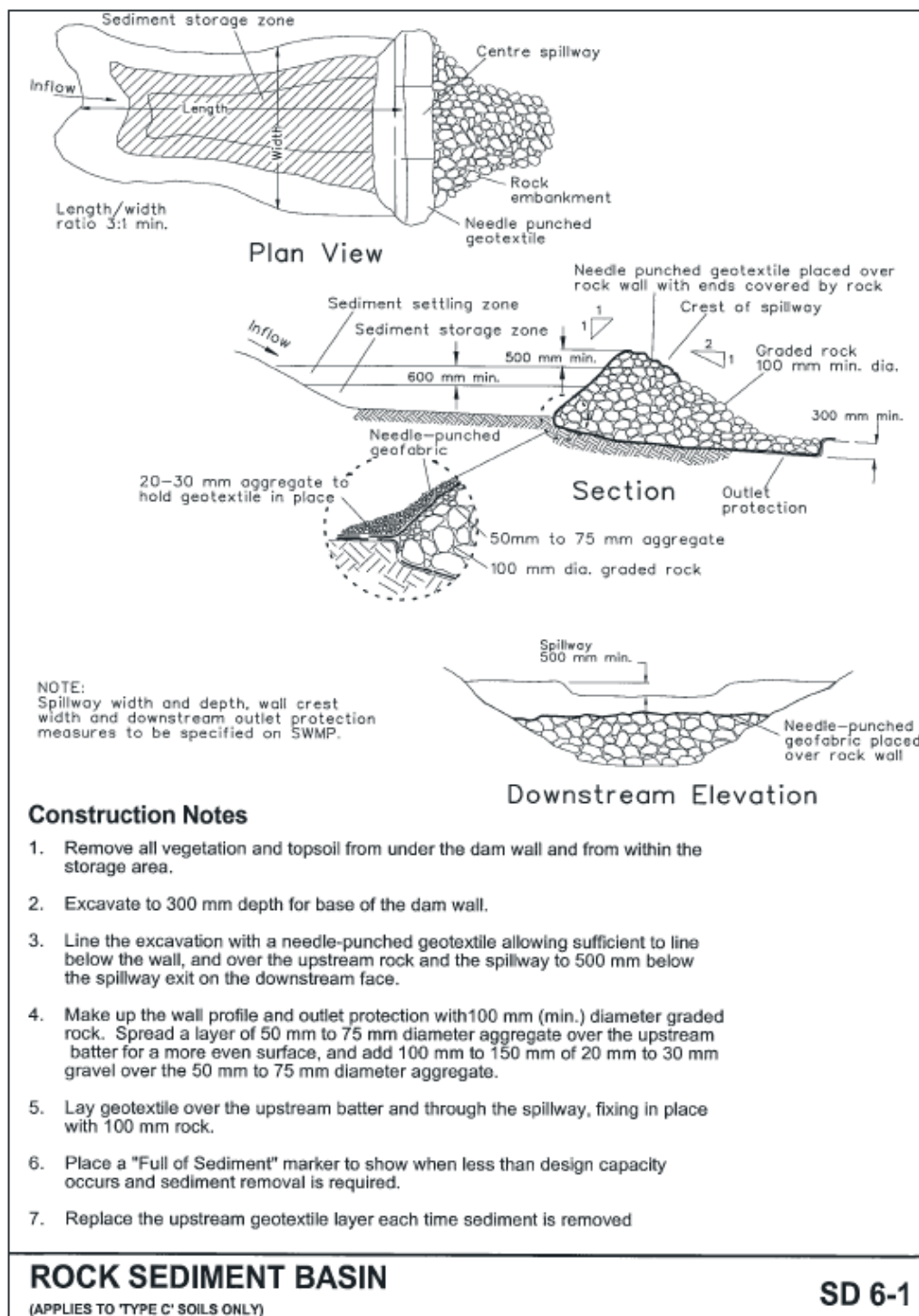
Appendix 1 - Sediment Fence



Managing Urban Stormwater: Soils and Construction Vol 1 (2004)

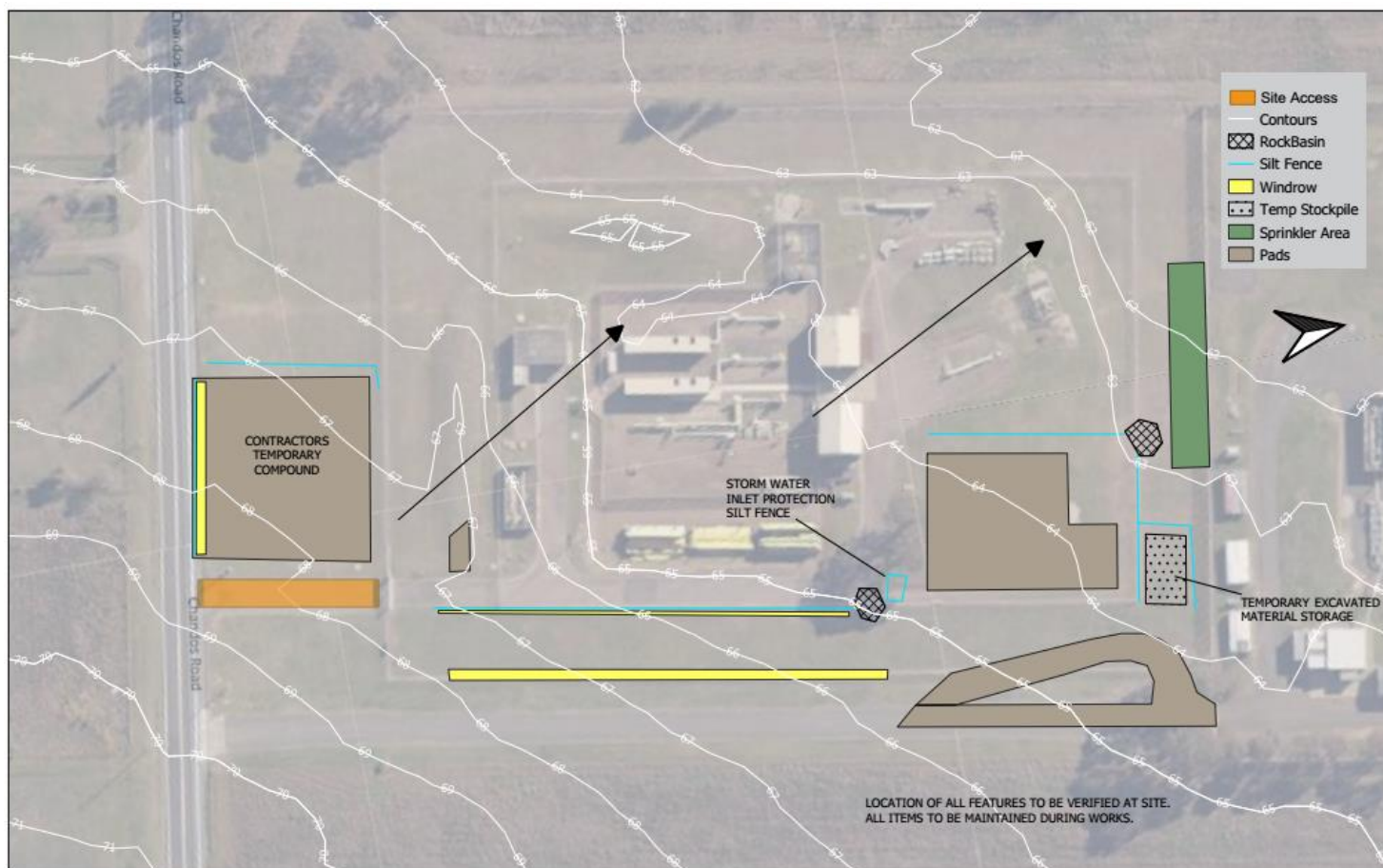
	JEMENA GAS NETWORKS (NSW) LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-ENV-PLN-002	EROSION AND SEDIMENT CONTROL PLAN	Page 21 of 22

Appendix 2 - Standard Drawing Rock Sediment Basin



Managing Urban Stormwater: Soils and Construction Vol 1 (2004)

Appendix 3 - ESC Feature Layout



	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 49 of 53

Appendix 10 – SWMS Example

1. Activity/Task:	Mobilisation, Site Set Up & Demobilisation	SWMS Number:	2018-HSS-WMS-001	Rev:	
2. Project Name, Principal Contractor Name & Address	JEMENA WESTERN SYDNEY GREEN GAS PROJECT Wasco Australia Pty Ltd 60 Commercial Drive Shailer Park 4128		ABN:	29 122 647 287	

3. Potential Hazards Associated with the Activity/Task

- Identify each of the Hazards associated with the Activity/Task by placing a (✓) next to the potential Hazard, and ensure the hazard is adequately addressed within the SWMS.
- Potential Site specific hazards shall be addressed at site and recorded within the Site Risk Assessment book.

Work Environment		Energy		Work Process		Chemicals		Plant/Equipment		People	
Entry/Exit	x	Gas L/P		Working at Height	x	Dangerous Goods		Elev. Wk. Platform	x	Communication	x
Temp. Extremes/ Weather		Gas M/P		Falling Objects		Toxic Substances	x	Cranes	x	Fatigue	x
Confined Space		Gas H/P	x	Sharp Materials		Inhalation		Excavator		Stress	
Trench Collapse		Water		High Noise Levels		Contact With		Plant Movement	x	Working alone	
Oxygen Atmospheric Level		Electricity H/V		Ladders	x	Dust		Explosive Tools		Personnel Threat	
Remote Site/Difficult Rescue		Electricity L/V	x	Manual Handling	x	Bacteria		Suspended Loads			
Poor Lighting/Visibility		Hydraulic Pressure	x	Procedural Failure		Oils	x	Winches			
Trip/Slip Hazards	x	Kinetic		Height Access		Contaminated Fluids		Hauling Equipment	x		
Vehicles / Pedestrians	x			Spills	x	Fuels	x	Guards			
Erosion/ Flora/Fauna				Switching		Drilling Muds/Silt run off		Lockouts / Valves			

4. PPE to be Utilised:	Long Sleeve/Pants	Footwear	High Vis	Hard Hat	Eyewear	Fall Arrest	Gloves	Hearing	Dust Mask
									
	X	X	X	X	X		X	X where required	☐
ADDITIONAL PPE: (Task Specific)									

5. High Risk Construction Work:	☒ Risk of a person falling more than 2 metres	☒ Work on or near energised electrical installations or services	☐ Work on or near chemical, fuel or refrigerant lines
	☒ Work in an area with movement of powered plant	☒ Work on or near pressurised gas mains or piping	☐ Demolition of load-bearing structure
	☐ Work in or near a shaft or trench deeper than 1.5 m or a tunnel	☐ Work in or near water or other liquid that involves a risk of drowning	☐ Temporary load-bearing support for structural alterations or repairs
	☐ Work in or near a confined space	☐ Likely to involve disturbing asbestos	☐ Tilt-up or precast concrete elements
	☐ Work in an area that may have a contaminated or flammable atmosphere	☐ Work on a telecommunication tower	☐ Use of explosives
	☐ Work in areas with artificial extremes of temperature	☐ Work on, in or adjacent to a road, railway, shipping lane or other traffic corridor in use by traffic other than pedestrians	☐ Diving work

6. Acknowledgement (Signatures must be obtained prior to the commencement of work and in the order indicated below.)

1. Written by	Ross Clarke	Signature:		Date:	
2. Reviewed by Site Supervisor / Foreman responsible to execute the work		Signature:		Date:	
3. Reviewed by Project H&S Advisor		Signature:		Date:	
4. Approved by Superintendent/ Project Manager		Signature:		Date:	
5. Approved by General Manager (If required)		Signature:		Date:	

Next SWMS Review is 6 monthly from Date of Approval. After 6 months, SWMS will be invalid for use.

7. Personnel consulted on development of this SWMS:

Name	Signature	Date	Name	Signature	Date

Applicable Legislation:	Code of Practices and Australian Standards	Relevant Wasco Procedures
Work Health and Safety NSW Act 2011 Work Health and Safety NSW Regulations 2017 NSW Gas Supply Act 1996 Australian Road Rules 1999 NSW Road Rules 2014 Heavy Vehicle (General) National Regulation Heavy Vehicle (Fatigue Management) National Regulation Heavy Vehicle (Mass, Dimension and Loading) National Regulation Heavy Vehicle (Vehicle Standards) National Regulation	NSW Construction Work COP 2019 NSW First aid in the workplace COP 2020 NSW Hazardous manual tasks COP NSW How to manage work health and safety risks COP 2019 NSW Managing Electrical Risks 2019 NSW Managing noise and preventing hearing loss at work COP 2019 NSW Managing risks of falls in the workplace COP 2019 NSW Managing risk of hazardous chemicals in the workplace COP 2019 NSW Managing risks of plant in the workplace COP 2019 NSW Managing the work environment and facilities COP 2019 NSW Work health and safety consultation, co-operation and co-ordination COP 2019 AS NZ 4991 2004 Lifting Devices AS NZS 1418 Cranes Hoists and Winches Safer Together Loading, Unloading, Exclusion Zones & Spotting Guideline	WAPL-HSS-PCR-003-02 Fitness for work procedure WAPL-HSS-PCR-021-01 Manual Handling Procedure WAPL-HSS-PCR-023-01 Powered Mobile Plant Procedure

Plant, Equipment & Tools Used	Maintenance Checks	Materials and Hazardous Chemical Used
Crane ,Light Vehicles Trucks	Pre start checks on plant and Machinery Maintenance records	Diesel Fuel, Engine Oil, Grease
Licences and Qualifications to complete task	Training required to complete task	Applicable Permits or Approval:
HRWL Crane, Rigger and Dogman Truck Licence Light Vehicle Licence	General Industry Induction (white card) Wasco Inductions Jemena Inductions	☐ Confined Space ☐ Electrical Isolation ☐ Excavation (Including Wall Penetration) ☐ Work at Height ☐ Hot Work ☐ Other: _____

Risk Assessment – Align Consequence category with Likelihood category utilising the Risk Matrix to calculate the Risk (Based on AS2885)

RISK ASSESSMENT PARAMETERS

Evaluation of Consequences

Consequence Rating	Health, Safety and Security Consequences	Environmental Consequences	Community, Stakeholder and Reputation	Business/ Financial	Law / Compliance /Regulatory
5 Catastrophic	Fatality incident, total and permanent disability (TPD), major irreversible health effect / disease	Incident resulting in catastrophic regional environmental impact causing long term environmental harm. Major long-term remediation required (greater than 12 months / over multiple years). Major litigation or prosecution resulting in long term interruption to operations.	Wasco's reputation is damaged so significantly that it is unlikely it would be able to work in some areas. National adverse media or public criticism	>\$3,000,000	Material litigation, criminal investigation or proceedings involving officers, or directors, significant fines
4 Major	Lost time incident (LTI), partial permanent disability (PPD), major irreversible health effects	Incident resulting in major onsite/offsite environmental impact causing medium / long term environmental harm. Significant remediation required (typically less than 12 months) Significant legal issues, non-compliance and breaches of regulations that result in prosecution or citation or fine. Litigation issues involving many weeks of senior management time.	Will impact significantly on Wasco's reputation and impact future business; requires significant intervention to recover Wasco's reputation. Regional media or public concern, local criticism	\$1,000,000-\$3,000,000	Significant violation of law with material fines, penalties, or costs, serious dispute, major litigation
3 Moderate	Medical treatment injury (MTI), disabling reversible impairment, restricted work case (RWC)	Incident resulting in reversible onsite, and or offsite impact causing short term effect. Moderate remediation required (typically one month) Noncompliance and breaches of regulations that may result in prosecution or citation or punitive fine. Requirement or obligation to report to the regulators.	Will impact on Wasco's current project for its duration and will need remediation and management intervention to recover. Local media, public concern	\$100,000-\$1,000,000	Violation of law, regulation, permit or policy with moderate fines or penalties. Moderate litigation
2 Minor	First aid treatment (FAT), slightly injured, minimal health effects	Minor reversible environment impact, minor remediation (typically <5 days). Noncompliance and breaches of regulation that may result in a citation. May result in reporting to the regulators.	Short term impact (less than a month) on Wasco's reputation but will not impact its overall standing. Local media, public concern	\$10,000-\$100,000	Reoccurring or systematic small violations of law, regulation, permits or policy, minimal fines, penalties or costs
1 Low	Near miss, no health effects	Negligible or reversible environmental impact. Nil or minor remediation (typically a shift). No breach of regulations or requirements to report to regulators.	Minor issue resolved immediately with no ongoing consequences, no public concern	<\$10,000	Minor, one off violations of law, regulation, permit or policy, no fines or penalties

Evaluation of Likelihood

Likelihood		
A	Almost Certain	Almost inevitable. Possible to occur and the team have knowledge of a similar event. Likely to occur repeatedly during the operational life of the facility / project. Is expected to occur in most circumstances and/or more than once a year.
B	Likely	Not certain to happen but an additional factor may result in occurrence. More than average i.e. the team do not have direct knowledge but suspect that an event has occurred and represents a credible scenario. Likely to occur from time to time.
C	Possible	Could happen when additional factors are present, but otherwise unlikely. Average i.e. easy to postulate a scenario for the occurrence but considered doubtful. Likely to occur once during the operational life of the facility / project. Might occur at some time.
D	Unlikely	A rare combination of factors would be required for an occurrence. Conceivable but would require multiple failures of systems and controls. Unlikely to occur during the operational life of the facility / project. Could occur at some time and/or Happened before.
E	Rare	A freak combination of factors would be required for an occurrence. Not credible i.e. the teams have never heard of the event occurring in the industry. Very unlikely to occur during the operational life of the facility / project. May occur only in exceptional circumstance.

Risk Matrix

The Likelihood and Consequence ratings are entered into this table and there are four ratings:

- Low
- Moderate
- High
- Extreme

		CONSEQUENCES				
		Insignificant	Minor	Moderate	Major	Catastrophic
		[1]	[2]	[3]	[4]	[5]
LIKELIHOOD	Almost Certain [A]	Moderate	Moderate	High	Extreme	Extreme
	Likely [B]	Low	Moderate	High	High	Extreme
	Possible [C]	Low	Moderate	High	High	Extreme
	Unlikely [D]	Low	Low	Moderate	Moderate	High
	Rare [E]	Low	Low	Low	Moderate	Moderate

Residual Risk		Controls
Extreme	This level of risk is unacceptable and. The Task / operation shall not commence until risk reduction measures are implemented or the risk eliminated	Approval to commence by Wasco President
High	Determine if the risk can be eliminated. If the risk cannot be eliminated, then the task / operation shall not commence until effective risk reduction measures are identified and implemented to reduce the risk to ALARP. If the risk cannot be reduced to an acceptable level, then an alternate way of conducting the operation shall be found	Approval to commence by General Manager
Moderate	Consideration shall be given to implement additional effective controls if risk reduction to ALARP can be achieved	Approval to commence by Project Manager / Head of Department
Low	Implement agreed risk mitigation controls before proceeding	This level of risk is controlled through JHA, SWMS, procedures, supervision, etc

SAFE WORK METHOD STATEMENT

	Sequential Steps List the basic task steps in a sequential order.	Hazards and Impacts Identify the health and safety or environmental Hazards and Impacts associated with each step and examine each to determine the Risk Rating.	Risk Rating Rate the risk prior to controls being in place. (Consequence x Likelihood)	Controls Determine what actions are required to eliminate or minimise all hazards that could lead to an accident or environmental incident. Indicate who is to perform the action where applicable against each action	Risk Rating Re-rate the risk with controls in place. (Consequence x Likelihood)	Persons responsible for ensuring compliance with controls
	Pre-operational Checks	Personnel and/or plant not approved for site or not fit for purpose or not aware of site requirements with the potential for personal, plant or environmental damage (failure of hydraulic hose, etc)	4 X C High	- Ensure all personnel undertaking the task are suitably inducted, trained, qualified and instructed for the task, have been consulted about and are signed on to the SWMS. - All plant to be accepted to site must satisfy the prequalification requirements i.e. - Operator's Manual with plant, - Fire Extinguisher in test date and tagged as applicable, no damage affecting the safety of the plant or its operator/s or those in the vicinity. - Edge protection in place to allow operator to access high areas as required (e.g. excavator engine area). - Plant Hazard Risk assessment with the plant (for large plant), service records available with the machine and entered on to the Plant and Equipment Register.	4 x D Moderate	Project Engineer Supervisor Safety Advisor
	Mobilisation / Demobilisation of personnel and equipment	Hazards related with Road Travel to site	4 X C High	- Experienced Drivers familiar with Route. - Journey management plan - Vehicle Inspections prior to operation. - Emergency Response Plan. - Project Safety Management Plan. - Pre-Start Alco test. - Random drug screening - Potable water in all vehicles - Emergency response plan in place	4 x D Moderate	Work crew

SAFE WORK METHOD STATEMENT

	Sequential Steps List the basic task steps in a sequential order.	Hazards and Impacts Identify the health and safety or environmental Hazards and Impacts associated with each step and examine each to determine the Risk Rating.	Risk Rating Rate the risk prior to controls being in place. (Consequence x Likelihood)	Controls Determine what actions are required to eliminate or minimise all hazards that could lead to an accident or environmental incident. Indicate who is to perform the action where applicable against each action	Risk Rating Re-rate the risk with controls in place. (Consequence x Likelihood)	Persons responsible for ensuring compliance with controls
				- Mobile phone /Radio coverage - First Aid Kits in all vehicles - Loads restrained in accordance with national load restraint guidelines and load security checked before departure and regularly by driver		
	Work in hazardous Area (Brown Fields where required)	Exposure to gas, Fire , Explosion possible personal injury and plant damage Unsuitable Ground Conditions / Underground services	4 x C High	- Assess prior to access to the work front - Updated drawings - No work inside the Facility without the appropriate Clients Permit to work with all the associated conditions and full compliance with the conditions imposed. - ER procedure. - All assets will be positively located and clearly marked. - Approved works procedures SWMS/SOPS. - Personal Gas detectors used with every work group. - Work crew to set up an exclusion zone between existing Plant and construction work. Erect appropriate signage where applicable. - Set up signage and delineation for access to office and lay-down area - Spotters to be used - Positive communications	4 x D Moderate	Rigger/Dogger Crane operator Work Crew Supervisor
	Site Checks/establishment	- Limited access - No access / egress in emergency	3 X C High	Review ground conditions PRIOR to any works Ensure safe access / egress available at all times; Ensure access / egress to all work areas is clear at all times. Erect barriers / signage • Set up a lay down area/exclusion zone Emergency Response Plan	3 x D Moderate	Project Engineer Supervisor Safety Advisor

SAFE WORK METHOD STATEMENT

	Sequential Steps List the basic task steps in a sequential order.	Hazards and Impacts Identify the health and safety or environmental Hazards and Impacts associated with each step and examine each to determine the Risk Rating.	Risk Rating Rate the risk prior to controls being in place. (Consequence x Likelihood)	Controls Determine what actions are required to eliminate or minimise all hazards that could lead to an accident or environmental incident. Indicate who is to perform the action where applicable against each action	Risk Rating Re-rate the risk with controls in place. (Consequence x Likelihood)	Persons responsible for ensuring compliance with controls
				First aid Kits Competent and ticketed First Aiders		
		- Entering restricted areas - Security issues - infrastructure	3 X C High	Work to scope of works within site Plans / Drawings and verification of Services. Consultation with Client to establish workspace extents Establish No go Zones TMP	3 x E Low	Project Engineer Supervisor Safety Advisor
		Underground services	4 x C High	Dial Before You Dig (DBYD) check – or service owners contacted to verify all known services are identified-Positively identify service using Hand Excavation or Vacuum Truck Flag service so operators can see location. Updated Drawings GPS As built	4 x D Moderate	Work Crew Supervisor to monitor
		Overhead services	4 x C High	Work area examined to ensure all overhead services have been identified and clearance distances are known, Spotters used where required Use trained and competent electrical spotters if any plant has the potential to encroach into an exclusion zone. Ensure that the power lines are clearly identified, and height of lines are clearly marked on signage. Catenary lines in place	4 x D Moderate	Work Crew Supervisor to monitor
	Site Communications	Poor site communications Poor electronic communication capabilities. Instructions/direction not clear resulting in a health or safety incident	3 X C High	- Ensure all work/task Instructions/directions are clear and concise. - Site Ensure communication between all work crews/Client is maintained (SIMOPS). - Ensure planning takes into account work crew interactions and suitable meetings/directions are given and understood before starting tasks.	3xD Moderate	Site Supervisor

SAFE WORK METHOD STATEMENT

	Sequential Steps List the basic task steps in a sequential order.	Hazards and Impacts Identify the health and safety or environmental Hazards and Impacts associated with each step and examine each to determine the Risk Rating.	Risk Rating Rate the risk prior to controls being in place. (Consequence x Likelihood)	Controls Determine what actions are required to eliminate or minimise all hazards that could lead to an accident or environmental incident. Indicate who is to perform the action where applicable against each action	Risk Rating Re-rate the risk with controls in place. (Consequence x Likelihood)	Persons responsible for ensuring compliance with controls
				- Onboarding inductions to include SIMOPS and work in Hazardous area. - Set up Radio and phone communication for offices - Dedicated Radio channels		
	Unloading/Loading & installation/de-installation of container /workshop / Site offices /crib huts/ equipment	Uneven/slippy surfaces, congested work areas resulting in possible slips, trips and falls	3 x C High	Assess the area. Ensure that the work area is tidy and free of unnecessary obstructions. Eyes on the path, look before moving.	3 x D Moderate	Work Crew
		Manual Handling	3 x C High	Use correct lifting techniques.eg 1. Plan Your Lift 2. If the load is too heavy or awkward to handle alone, get assistance. ... 3. Get a Firm Footing. ... 4. Bend Your Knees. ... 5. Tighten Your Stomach Muscles. ... 6. Lift with Your Legs. ... 7. Keep the Load Close. ... 8. Avoid Twisting and Turning Your Back. - Take regular breaks from repetitive movement and cramp postures - Use mechanical aids where possible - Clear work area and ensure unobstructed path before moving item/s to work area. - Suitable gloves for the task	3 x D Moderate	Work Crew
		Hot Weather causing heat stress	4 x C High	All personnel to ensure that they get adequate rest between shifts. Fit for work.	4 x D Moderate	Work Crew Supervisor to monitor

SAFE WORK METHOD STATEMENT

	Sequential Steps List the basic task steps in a sequential order.	Hazards and Impacts Identify the health and safety or environmental Hazards and Impacts associated with each step and examine each to determine the Risk Rating.	Risk Rating Rate the risk prior to controls being in place. (Consequence x Likelihood)	Controls Determine what actions are required to eliminate or minimise all hazards that could lead to an accident or environmental incident. Indicate who is to perform the action where applicable against each action	Risk Rating Re-rate the risk with controls in place. (Consequence x Likelihood)	Persons responsible for ensuring compliance with controls
				Reduce coffee/alcohol/energy drinks to improve/ maintain hydration between shifts. Plant to have environment control cab fitted whenever practicable. Wide brims on hard hats. Where practicable stage manual work in cooler parts of the day. Ensure adequate cool water available to all personnel at the work site. Take rest breaks and /or rotate personnel as required if doing manual tasks. Supervisors to monitor workers water intake and for signs of heat stress.		
		Plant and personnel interaction	4 x C High	Trucking Contractor to be supervised at all times/Approved trucking contractors Escort of trucks Traffic Management Plan All work fronts will be separated. Ensuring good plant and personnel separation Positive communications -no personnel to approach operating machine -clear exclusion zones established and understood by all personnel -Only VOC'd and authorised operators on machinery -All guards must be in place on machinery before operation All vehicles to be fitted within audible reversing alarms and flashing beacons	4 x D Moderate	Work Crew Supervisor to monitor

SAFE WORK METHOD STATEMENT

	Sequential Steps List the basic task steps in a sequential order.	Hazards and Impacts Identify the health and safety or environmental Hazards and Impacts associated with each step and examine each to determine the Risk Rating.	Risk Rating Rate the risk prior to controls being in place. (Consequence x Likelihood)	Controls Determine what actions are required to eliminate or minimise all hazards that could lead to an accident or environmental incident. Indicate who is to perform the action where applicable against each action	Risk Rating Re-rate the risk with controls in place. (Consequence x Likelihood)	Persons responsible for ensuring compliance with controls
				Operator to stop work and stop if personnel/vehicles come within zone and positive communications not established.		
		Work at height	4 x C High	Assess load do a take 5 before Task Ensure adequate access and suitable work platform. Ensure drop bar is in place at all times when working on platform ladder. Non-platform ladders to be used for access and egress only. Use of an EWP will be in accordance with "HSS-WMS-- Use of an EWP". EWP basket is to never be positioned below/ under the boom of a crane. No EWP is to be positioned underneath a suspended load. "line of fire"	4 x D Moderate	Work Crew Supervisor to monitor
		Hazardous chemicals	3 x C High	Chemicals are approved for use pre-mobilisation SDS register spill kits to be available with liquids chemical storage Hazardous goods container / Cabinet	3 x D Moderate	Work Crew Supervisor to monitor
	Lifting, Preparation and Installation/De-installation of Site offices /crib huts/containers	- Pinch / Crush Points - Slips, Trips & Falls - Swinging / falling loads	4 x C High	- Spotters in place - Exclusion Zones in place - All mechanical lifts are to be undertaken by the licenced, VOC, d personnel in accordance with the SWMS General Site Cranage - Third party crane company to be utilised - All lifting gear to be tagged and inspected by a competent person	4 x D Moderate	Operators Site Supervisor

SAFE WORK METHOD STATEMENT

	Sequential Steps List the basic task steps in a sequential order.	Hazards and Impacts Identify the health and safety or environmental Hazards and Impacts associated with each step and examine each to determine the Risk Rating.	Risk Rating Rate the risk prior to controls being in place. (Consequence x Likelihood)	Controls Determine what actions are required to eliminate or minimise all hazards that could lead to an accident or environmental incident. Indicate who is to perform the action where applicable against each action	Risk Rating Re-rate the risk with controls in place. (Consequence x Likelihood)	Persons responsible for ensuring compliance with controls
				- No body parts in the line of fire. No person to be under a suspended load at any time. - Drop zone installed for lifts. - Tag lines to be used at all times - Review ground conditions PRIOR to any works - Test lift the load to check weight and balance of the load - Loads to be escorted, flashing lights to be used at all times on plant - PPE - Positive Communication - Traffic Management Plan		
	Electrical installation/de-installation of/ Site offices /crib huts	Electrocution	4 X C High	Trained and licenced Contract Electricians to be obtained Permit to work SWMS No live works Lock out Tag out	4 x D moderate	Supervisor
	Refuelling plant and vehicles	Spills Fire	3 x C High	- Spill kit - Spill contingency plan - Site induction - Fire protection to plant and equipment - Fire extinguishers - Water trailer - Fuel Drip Trays - SWMS Refuelling	3 x D Moderate	Work Crew
	Disposal of Waste Material	- Environmental Contamination - Poor Housekeeping	3 x C High	- Good housekeeping - All wastes to be disposed of progressively – Skip Bins may be required – clean up at end of each day	3 x E Low	Site Supervisor/Crew

SAFE WORK METHOD STATEMENT

	Sequential Steps List the basic task steps in a sequential order.	Hazards and Impacts Identify the health and safety or environmental Hazards and Impacts associated with each step and examine each to determine the Risk Rating.	Risk Rating Rate the risk prior to controls being in place. (Consequence x Likelihood)	Controls Determine what actions are required to eliminate or minimise all hazards that could lead to an accident or environmental incident. Indicate who is to perform the action where applicable against each action	Risk Rating Re-rate the risk with controls in place. (Consequence x Likelihood)	Persons responsible for ensuring compliance with controls
				• Spill Kits • Proper disposal of waste materials to a suitable location • Project Safety Management Plan • Environmental Management plan • Skip bins to be covered to prevent wind spread of litter and access from crows etc		

SAFE WORK METHOD STATEMENT

	Sequential Steps List the basic task steps in a sequential order.	Hazards and Impacts Identify the health and safety or environmental Hazards and Impacts associated with each step and examine each to determine the Risk Rating.	Risk Rating Rate the risk prior to controls being in place. (Consequence x Likelihood)	Controls Determine what actions are required to eliminate or minimise all hazards that could lead to an accident or environmental incident. Indicate who is to perform the action where applicable against each action	Risk Rating Re-rate the risk with controls in place. (Consequence x Likelihood)	Persons responsible for ensuring compliance with controls

SIGN OFF

We the undersigned, confirm that the SWMS nominated above has been explained and its contents are clearly understood and accepted. We also confirm that our required qualifications to undertake this activity are current. We also clearly understand the controls in this SWMS must be applied as documented; otherwise work is to cease immediately.

We acknowledge we have been provided the opportunity to ask questions and make suggestions about the work methods and where we have done so, our questions and suggestions have been considered

Name	Position	Signature	Date	Time	Employer



Name	Position	Signature	Date	Time	Employer

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 50 of 53

Appendix 11 – Incident Reporting Procedure



WASCO (AUSTRALIA) PTY LTD

INCIDENT REPORTING PROCEDURE

WAPL-SYS-PRC-002

<i>Document No.</i>	<i>Revision status</i>	<i>Issued By</i>	<i>Checked By</i>	<i>Approved By</i>	<i>Date</i>	<i>Comments</i>
WAPL-SYS-PRC-002	1	SJB	TGA	MPW 	28/06/18	Revised to Incorporate MyRapid Online Process
WAPL-SYS-PRC-002	0	JT	PM	MW 	22/1/14	Revised from previous IMS procedure

CONTENTS

1. PURPOSE	3
2. SCOPE.....	3
3. DEFINITIONS	3
4. RESPONSIBILITIES	5
4.1 Employee/Witness	5
4.2 Medic/Registered Medical Officer/First Aider	5
4.3 Supervisor	5
4.4 HSE Advisor	5
4.5 Relevant Manager	5
4.6 HSEQ Manager.....	6
5. INCIDENT MANAGEMENT & WITNESS STATEMENTS	6
5.1 Overview.....	6
5.2 Incident / Accident Scene Management	6
5.3 Establish who the witnesses are.....	6
5.4 Incident / Accident Site Investigation.....	7
6. INCIDENT REPORTING.....	7
6.1 Section 1 – Type of Incident	7
6.2 Section 2 – Employee Details (Persons Involved).....	8
6.3 Section 3 – Person Reporting the incident	8
6.4 Section 4 – Incident Reported To	8
6.5 Section 5 – Witness to the incident.....	8
6.6 Section 6 – Location Details.....	9
6.7 Section 7 – Incident Details	9
6.8 Section 8– Injured person details	9
6.9 Section 9 – Alcohol or Drug testing	10
6.10 Section 10 – Motor Vehicle Incident Details	10
6.11 Section 11 – Immediate Corrective Actions	11
6.12 Section 12 – Incident Severity	11
6.13 Section 13 – Distribution List.....	12
6.14 Notification to External Authorities.....	13
7. CLIENT’S FORMS AND PROCEDURES	16
8. REFERENCES	16
Table 1 - Injury Classifications MTI vs FAI	9
Table 2 - Incident Notification Matrix	12
Table 3 - Statutory Notifications – Petroleum & Gas (Production and Safety) Regn 2004	13
Table 4 - Statutory Notifications Work Health and Safety Act 2011	15
Table 5 – Statutory Notifiable Events - Environment.....	16

1. PURPOSE

The purpose of this procedure is to provide guidelines for the correct reporting of incidents and injuries to ensure prompt and effective investigation and remedial/preventive actions.

2. SCOPE

This procedure applies to all Wasco operations.

3. DEFINITIONS

Average Time Lost Rate (ATLR)	The average time lost per occurrence of injury/disease. i.e. total number of working days/number of LTIs
Days Lost	The total number of complete rostered working days or shifts lost from work as a result of the injury (commencing with the shift or day following the shift or day of the injury). The number of working days lost refers to the total number of working days, irrespective of the number of hours that would normally have been worked each day.
First Aid Injury FAI	Any once-off treatment and/or subsequent observation of minor scratches, cuts, burns, splinters, etc, which do not require professional medical treatment (however in some instances, a medical practitioner or registered professional, as the sole person on a project or available, may administer the First Aid). Refer to Table 1 for clarification.
Frequency Rate	the number of occurrences of incident or injury for each one million hours worked i.e. Number of occurrences in the period x 1,000,000/ Hours worked
Hours worked	The total number of all hours actually worked on site (including project office and contractors and subcontractors) under the control or direction of Wasco. (For partially owned entities or joint ventures, only the relevant proportion must be recorded).
Incident	An unplanned or uncontrolled event or chain of events that has resulted in a fatality, recordable injury, physical, environmental, financial damage.
Incidence Rate	The number of occurrences of injury or disease for each one hundred workers employed. i.e. Incidence Rate = No. of incidents/ No. of workers x 100
Near Miss	An unplanned or uncontrolled event or chain of events that has not resulted in recordable injury, physical damage, environmental damage but had the potential to do so in other circumstances.
Lost Time Injury (LTI)	A work related injury or illness, which results in time lost from work of one full day/shift or more.
Lost Time Injury Frequency Rate (LTIFR)	No. of LTI's x 1,000,000 hours worked
Material environmental harm (Statutory Definition)	EP Act - Environmental harm (other than environmental nuisance)— a) that is not trivial or negligible in nature, extent or context; or b) that causes actual or potential loss or damage to property of an amount of, or amounts totalling, more than \$5,000 but less than \$50,000; or c) that results in costs of more than \$5,000 but less than \$50,000 being incurred in taking appropriate action to— i. prevent or minimise the harm; and

	II. rehabilitate or restore the environment to its condition before the harm.
Mechanism of Injury	The action, exposure or event, which is the direct cause of the most serious injury or disease.
Medical Treatment Injury MTI	Any work-related injury or disease (including loss of consciousness) requiring the treatment of a medical practitioner (or registered medical personnel). Refer to Table 1 for clarification.
Notifiable Incident	An event requiring notification to a Statutory Authority as prescribed in the applicable Statutory Act or Legislation of the Country, State or Territory in which the work is being performed. See Tables 3, 4 and 5.
Nature of Injury	The most serious injury or disease sustained or suffered by the employee.
Restricted Work Injury (RWI)	Any work-related injury other than a fatality or LTI which results in a person being unfit for performance of the regular job on any day/shift after the occupational injury. Work performed might be; • an assignment to a temporary job • part-time work at the regular job • working full-time in the regular job but not performing all the usual duties of the job • Attending training course(s) applicable to their work Note: Any RWI must only be recorded where the above points are medically certified by the treating medical practitioner.
Total Recordable Injuries TRI	Number of • Fatalities + • Lost Time Injuries + • Restricted Work Injuries + • Medical Treatment Injuries
TRIFR	Total Recordable Injury Frequency Rate = (Fatalities + LTIs + RWIs + MTIs) * 1,000,000 / hours worked
Serious environmental harm (Statutory Definition)	EP Act - Environmental harm (other than environmental nuisance)— a) that is irreversible, of a high impact or widespread; or b) caused to an area of high conservation value or special significance; or c) that causes actual or potential loss or damage to property of an amount of, or amounts totalling, more than \$50,000; or d) that results in costs of more than \$50,000 being incurred in taking appropriate action to— I. prevent or minimise the harm; and II. rehabilitate or restore the environment to its condition before the harm.
Social Complaint	is "an expression of dissatisfaction" made by a member of the general public in relation Wasco's operations, conduct of employees to a responsible party
Statutory Authority	The authority prescribed in the applicable statutory act and legislation of the Country, State or Territory in which the work is being performed with the powers and function to regulate matters relating to occupation health and safety and the environment

Supervisor	The immediate nominated person responsible for ensuring the health, safety of employees the environment, contractors or subcontractor's employees working under their authority
Witness	A person who has observed (actual eyewitness) or person having knowledge (circumstantial witness) of the circumstances of a specific event or occurrence
Work-related	Any unplanned incident or injury arising out of or in the course of employment

4. RESPONSIBILITIES

4.1 *Employee/Witness*

- Report the incident, near miss or injury immediately to their Supervisor, Manager on site, and comply with recommended treatment;
- Complete the Incident / Near Miss Statement Form WAPL-HSS-FRM-033 in conjunction with their Supervisor / Site Safety Advisor

4.2 *Medic/Registered Medical Officer/First Aider*

- Assess, treat and/or refer injured persons for stabilisation and recovery immediately following the injury;
- Ensure all injuries are reported to line management and assist with injury detail input, in the Incident Report form.

4.3 *Supervisor*

- Initiate, and assist with the Incident Report Form in conjunction with the employee;
- Take immediate action to secure the scene and prevent recurrence;
- Complete the Incident / Near Miss Statement Form WAPL-HSS-FRM-033 in conjunction with the employee/witness
- Report the incident to line management (usually the person in charge);
- Provide feedback to injured employee/witness.
- Implement effective controls to reduce the risk of a repeated incident to ALARP

4.4 *HSE Advisor*

- Ensure MyRapid Incident Report Form has been correctly filled out;
- Assign investigation level according to the highest consequence column (incident/injury category).
- Ensure the Incident Report is distributed to the relevant persons according to Table 2 - Incident Notification Matrix within 24 hours of the injury/incident event;
- Ensure Superintendent/Construction Manager and Project Manager review, and make comments where applicable;
- Maintain confidentiality of all Incident records; and
- Provide technical advice and assistance to Supervisors as they conduct their investigations to identify contributing factors and ensure actions are recommended.

4.5 *Relevant Manager*

- Review all Incident Report forms and participate in the incident investigation process as soon as practical
- Report all relevant Incidents to the Client representative as stipulated in the Project Safety Management Plan;

- Report all notifiable incidents to the relevant statutory authority if applicable within the specified time frame nominated in the relevant legislation (refer to Tables 3, 4 and 5); and
- Review corrective actions made and ensure corrective actions are closed out in a timely manner.

4.6 HSEQ Manager

- Ensure all incidents are recorded in the Wasco MyRapid incident database;
- Ensure incident investigations are carried out;
- Support managers and supervisors to carry out incident investigations;
- Escalate and report significant¹ incidents to the President; and
- Produce regular Safety reports that include incident statistics, for management teams.

5. INCIDENT MANAGEMENT & WITNESS STATEMENTS

5.1 Overview

All incidents and near misses, regardless of how minor, must be reported immediately. It is essential that all incidents / near misses are actioned as soon as possible with accurate information gathering, recording and reporting.

5.2 Incident / Accident Scene Management

The treatment of any injured party shall be the first priority for all concerned. The emergency medical response to injured person is given in Appendix B.

The Site Construction Manager/Superintendent or a representative shall be immediately notified and mobilized to manage the victim and incident site Emergency Response Plan.

Unless required otherwise for the wellbeing of other people, safety of equipment, pollution to the environment or other similar impact, the area of occurrence shall be cordoned off by the HSE coordinator, or equivalent position. All evidence shall remain untouched pending the gathering of information and approval from Site Manager and/or the relevant authorities.

Statements shall be taken and clearly recorded and reconfirmed for verification.

5.3 Establish who the witnesses are

It is essential to gather witness statements as soon as practical after the incident. The witness statements should be taken away from other witnesses to ensure an accurate summary of events from that particular witness without other witness involvement. The witness statement shall be recorded on (WAPL-HSS-FRM-033)

- A witness is anyone who can provide relevant information regarding the incident. For example:
 - Employees who actually witnessed the incident.
- A person who saw the incident
- A person who heard the incident
- A person who was in the vicinity on the incident
- A person who was supervising the task, etc
- Employees who have knowledge of equipment, conditions and work practices associated with the incident.

These witness statements are valuable information sources for the incident investigation as they also provide suggested improvements.

The incident scene is to remain undisturbed until the preliminary investigation has been carried out. Regulatory reportable incidents require the approval of the related regulatory body before work can resume or effected equipment can be moved with priority given to personnel safety

5.4 Incident / Accident Site Investigation

The primary aim of the Site investigation is to establish how and why the incident occurred, gather as much information as possible;

- Photographs
- Measurements
- Sketches
- CCTV/Dash Cam footage, etc

This information will be used to report the incident accurately, and to assist the incident investigation to determine the root cause and the implementation of effective control measures to prevent a similar incident from occurring.

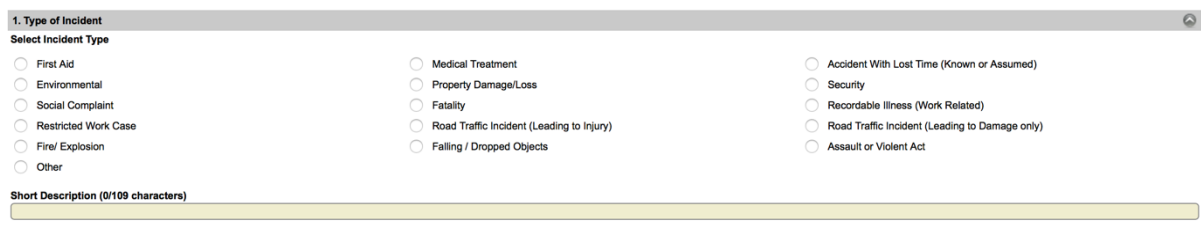
6. INCIDENT REPORTING

The My Rapid online Incident Report Form must be completed and distributed as soon as practicable. Details of the most serious injury sustained must be recorded for statistical purposes.

Online Form Is Available here: [Report New Incident](#) and Is also accessible on the Wasco Sharepoint Site

The prompt reporting, notification and investigation of incidents and injuries will allow immediate and underlying causes to be identified and actions taken to reduce future injuries and losses.

6.1 Section 1 – Type of Incident



Select the type of incident and add an accurate short description which best describes the incident.

Table 1 - Injury Classifications MTI vs FAI

Normally considered medical treatment	Normally considered first-aid treatment
Treatment of INFECTION	Application of ANTISEPTICS during first visit to medical personnel
Application of ANTISEPTICS during second or subsequent visit to medical personnel	Treatment of FIRST DEGREE BURN(S)
Treatment of SECOND OR THIRD-DEGREE BURN(S)	Application of BANDAGES(S) during any visit to medical personnel
Application of SUTURES (stitches) by a medical practitioner	Use of ELASTIC BANDAGE(S) during first visit to medical personnel
Application of BUTTERFLY ADHESIVE DRESSING(S) or STERI STRIP(S) in lieu of sutures by a medical practitioner	Removal of FOREIGN BODIES (NOT EMBEDDED) IN EYE if only irrigation is required
Removal of FOREIGN BODIES EMBEDDED IN EYE	Removal of FOREIGN BODIES FROM WOUND; if procedure is UNCOMPLICATED, and is, for example, by tweezers or other simple technique

Normally considered medical treatment	Normally considered first-aid treatment
Removal of FOREIGN BODIES FROM WOUND; if procedure is COMPLICATED because of depth of embedment, size or location	USE OF NON-PRESCRIPTION MEDICATIONS AND administration of single dose of PRESCRIPTION MEDICATION on first visit for minor injury or discomfort
Use of PRESCRIPTION MEDICATION (except a single dose administered on first visit for minor injury or discomfort).	SOAKING THERAPY on initial visit to medical personnel or removal of bandages by SOAKING
Use of hot or cold SOAKING THERAPY during second or subsequent visit to medical personnel	Application of hot or cold COMPRESS(ES) during first visit to medical personnel
Application of hot or cold COMPRESS(ES) during second or subsequent visit to medical personnel	Application of OINTMENTS to abrasions to prevent drying or cracking
CUTTING AWAY DEAD SKIN (surgical debridement)	Application of HEAT THERAPY during first visit to medical personnel
Application of HEAT THERAPY during second or subsequent visit to medical personnel	Use of WHIRLPOOL BATH THERAPY during first visit to medical personnel
Use of WHIRLPOOL BATH THERAPY during second or subsequent visit to medical personnel	NEGATIVE X-RAY taken to confirm the existence or otherwise of a DIAGNOSED condition
POSITIVE X-RAY DIAGNOSIS (fractures, broken bones, etc.)	OBSERVATION of injury during visit to medical personnel
ADMISSION TO A HOSPITAL or equivalent medical facility FOR TREATMENT	TETANUS INJECTION or PRECAUTIONARY antibiotics in case of infection

6.2 Section 2 – Employee Details (Persons Involved)

2. Person/s Involved in the Incident

Enter name 

Enter all persons involved in the incident.

6.3 Section 3 – Person Reporting the incident

3. Person Reporting the Incident

Select name: Enter name 

Enter the person who reported the incident

6.4 Section 4 – Incident Reported To

4. Incident Reported To

Enter name 

When was the incident reported?
 19-06-2018  13  12 

Enter who the incident was reported to, the date it was reported and the time.

6.5 Section 5 – Witness to the incident

5. Witness(es) to the Incident

Enter name 

Enter all of the witnesses of the incident.

6.6 Section 6 – Location Details

6. Location Details

Division:

Incident Date/Time: :

Exact location:

Select the division, location, date and time of the incident

6.7 Section 7 – Incident Details

7. Incident Details

Please describe the Incident (what happened just before, what was the incident, who did it happen to, who else was involved, how did it happen, why did it happen etc). Please ensure all information is factual and does not express any opinion about connected details.

Please upload any documents, photos or videos relating to the incident.

no file selected

Enter a detailed factual description of the incident, not to blame anyone.

Upload supporting documentation such as;

- WAP-SYS-FRM-033 Witness statements,
- Photographs
- Sketches, etc.

6.8 Section 8– Injured person details

8-1. Personal Details

Person Injured*:

Date of birth:

Sex: ☐ Male ☐ Female

If a person was injured, enter accurate information identifying what and where the injury was.

8-2. Injury Classification

Nature of injury

☐ Amputation & Eye Loss	☐ Burns	☐ Contused or Crushed
☐ Dislocation	☐ Effects of External Exposure	☐ Foreign Body
☐ Fracture	☐ Internal Chest, Abdomen, & Pelvis	☐ Internal Head Injury
☐ Multiple Injuries	☐ Nerve and Spinal Cord	☐ Open Wound
☐ Poison & Toxic Effect	☐ Spine Fracture	☐ Sprains & Strains
☐ Superficial Injury		
☐ Other injuries, please specify:		

Bodily location of injury (part of body injured)

Place red dot(s) on the human figure showing injury location(s)
Select the blue arrow to rotate the image

- | | |
|--------------------------------------|--|
| ☐ Eye | ☐ Ear |
| ☐ Nose | ☐ Mouth |
| ☐ Teeth | ☐ Face |
| ☐ Skull | ☐ Head |
| ☐ Neck | ☐ Shoulder & Arm |
| ☐ Wrist | ☐ Hand & Fingers |
| ☐ Trunk | ☐ Back |
| ☐ Hips & Legs | ☐ Ankle |
| ☐ Feet & Toes | ☐ Internal Organs |
| ☐ Left | ☐ Right |
| ☐ Hand | ☐ Elbow |
| ☐ Fingers | ☐ Knuckles |
| ☐ Knee | |

☐ Other injuries, please specify:

Injury Description

[Clear](#)
**Mechanism of injury (direct cause of injury)**

- | | | |
|--|---|---|
| ☐ Contact or exposure to biological factors | ☐ Contact with electricity | ☐ Exposure mental stress |
| ☐ Fall from height | ☐ Fall on same level | ☐ Heat & cold contact or exposure |
| ☐ Struck by | ☐ Hitting object with body | ☐ Long term contact with chemical or substance |
| ☐ Long term sound exposure | ☐ Mechanical vibration | ☐ Other contact with chemical or substance |
| ☐ Other muscle stress | ☐ Pressure changes | ☐ Radiation exposure |
| ☐ Repetitive movement with low muscle loading | ☐ Sharp sudden sounds | ☐ Single contact with chemical |
| ☐ Slide or cave in | ☐ Vehicle accident | ☐ Caught in, under or between |
| ☐ Overexertion, strain | ☐ Slips, trips | |
| ☐ Other or multiple mechanism: <input type="text"/> | | |

6.9 Section 9 – Alcohol or Drug testing

9. Alcohol or Drugs

Was testing undertaken? ☒ No ☐ Yes

Was alcohol or drug testing carried out with the worker involved after the incident to provide additional information regarding potential causal factors.

6.10 Section 10 – Motor Vehicle Incident Details

10. Motor Vehicle Incident Details

Is this a motor vehicle incident? ☐ No ☒ Yes

10-1. Driver Details

Driver

Address

Suburb

Post Code

State

Phone No Mobile No

Email

Date of birth

Sex ☐ Male ☐ Female

Licence No Expiry

Years held

Licence class State Reg

Number of years driving for Wasco (Australia) Pty Ltd

Has undertaken appropriate driver training as per company requirements ☐ No ☐ Yes

Previous

Next

10-2. Vehicle Details

Vehicle/Trailer Make

Vehicle Model

Colour

Reg Number

Fleet Number

Unit configuration:

-- SELECT ONE --

Registration Due Date:

Trip Type:

-- SELECT ONE --

Load Type:

-- SELECT ONE --

Add

Previous

Next

10-3. Third Party Details

Was a third party involved? ☒ No ☐ Yes

Previous

Next

10-4. Infringement

Has an infringement been issued? ☒ No ☐ Yes

Previous

Next

10-5. Police Involvement

Did police attend the collision scene? ☒ No ☐ Yes

If a motor vehicle was involved I the incident, complete section 10.

6.11 Section 11 – Immediate Corrective Actions

11. Immediate Corrective Actions

Enter details of corrective action

Assigned to

Due Date

Status

Open

Save

Identify what immediate corrective actions were implemented, who they were assigned to, the date and status.

6.12 Section 12 – Incident Severity

12. Incident Severity

Choose a severity and likelihood

What is the consequence of this incident?

- ☐ 1) **Insignificant** - Dealt with by in-house first aid etc.
- ☐ 2) **Minor** - Medical help needed. Treatment by medical professional/hospital outpatient etc.
- ☐ 3) **Moderate** - Significant non-permanent injury (e.g. Loss of finger). Extended hospitalisation (inpatient).
- ☐ 4) **Major** - Extensive permanent injury (e.g. Loss of finger). Extended hospitalisation.
- ☐ 5) **Catastrophic** - Permanent disabling injury (e.g. blindness, loss of hand, quadriplegia)

What is the likelihood of this incident?

- ☐ A) **Rare** - May occur but only in rare and exceptional circumstances
- ☐ B) **Unlikely** - Unlikely to occur but could happen
- ☐ C) **Possible** - Possible and likely to occur at some time
- ☐ D) **Likely** - Likely to occur frequently
- ☐ E) **Almost Certain** - Almost certain to occur in most circumstances

		Severity				
		1	2	3	4	5
Likelihood	A	Low (L)	Low (L)	Moderate (M)	High (H)	High (H)
	B	Low (L)	Low (L)	Moderate (M)	High (H)	Extreme (X)
	C	Low (L)	Moderate (M)	High (H)	Extreme (X)	Extreme (X)
	D	Moderate (M)	High (H)	High (H)	Extreme (X)	Extreme (X)
	E	High (H)	High (H)	Extreme (X)	Extreme (X)	Extreme (X)

Check the level of likelihood and severity of the incident outcome. The outcome is what actually happened, not what could have happened.

6.13 Section 13 – Distribution List

13. Distribution List		
Name Emily Guy	Job Title Project Administrator	Location Wasco Australia
Mel Whyte	Managing Director	Wasco Australia
Michael Butterworth	General Manager - EPC Services	State
Steve Bourke	HSEQ Manager	Wasco Australia
Tania Brown	Systems Administrator	Wasco Australia
Tegan Alexander	General Manager - Systems & Facilities	State
Enter name		Add

Enter Snr project personnel as required to the distribution list, Snr Corporate personnel will be entered automatically.

It is the responsibility of the site Senior Management personnel to assign an investigation level according to the highest consequence of incident/injury category.

Within 24 hours, the nominated Senior Manager shall complete and distribute a copy of the of the incident report to relevant persons according to the Notification Matrix (Table 2 - Incident Notification Matrix).

As soon as practicable after an incident event, the details shall be entered into the Incident Database where access to this system is available.

The Client representative must be notified within the time frame specified in the Contract and/or Project Safety or Environmental Management Plans.

Table 2 - Incident Notification Matrix

General Category	Catastrophic	Major	Moderate	Minor	Insignificant
Personnel	Fatality	RW1 or LTI	MTI	FAI	No Injury
Environment	Irreversible	Significant	Medium Term	Short Term	Minimal
Anticipated Cost	>\$3,000,000	\$1M-\$3M	\$100K -\$1M	\$10K -\$100K	<\$10K
Managing Director	✓	✓	✓		
General Manager - Operations	✓	✓	✓		
General Manager - Systems & Facilities	✓	✓	✓	✓	
HSEQ Manager	✓	✓	✓	✓	✓
Client*	As Per Client Requirements				
Statutory Authority**	✓	✓			
Wasco KL	✓	✓			
Project Manager	✓	✓	✓		
Construction Manager	✓	✓	✓	✓	
Superintendent	✓	✓	✓	✓	

Supervisor	✓	✓	✓	✓	✓
Site HSE Advisor	✓	✓	✓	✓	✓

* As stipulated in contract, plans and agreements

** Depending on local legislative requirements

6.14 Notification to External Authorities

The Project Manager or delegate (or Managing Director for non-Project related incidents) is responsible for the notification of reportable incidents and injuries to the relevant government and statutory authorities within the required time period as per the project contract. Specific obligations for reporting to government and statutory authorities and those of the client are detailed in the project contract. The timing of notification shall be carried out in accordance with the relevant Act or Legislation of the country, state or territory in which the work is being performed. Guidelines for notification of statutory authorities are given in Table 3 - Statutory Notifications – Petroleum & Gas (Production and Safety) Regulation 2004 and Table 4 - Statutory Notifications Work Health and Safety Act 2011.

Table 3 - Statutory Notifications – Petroleum & Gas (Production and Safety) Regulation 2004

Reported to the Office of the Chief Inspector - gassafe@dnrm.qld.gov.au 07 3199 8027		
Type of Incident	Way to be reported	Timeframe
an incident involving death of a person on Petroleum Authority	by telephone	immediately
	in writing	as soon as practicable
an incident involving injury to a person requiring medical treatment on Petroleum Authority	by telephone	immediately
	in writing	as soon as practicable
an emergency, including an emergency alarm activation other than as part of a routine test, at an operating plant that is a major hazard facility under the <i>Work Health and Safety Regulation 2011</i> - on Petroleum Authority	by telephone	immediately
	in writing	as soon as practicable
a fire at an Petroleum Authority operating plant	by telephone	immediately
	in writing	as soon as practicable
an unplanned or uncontrolled release of petroleum, fuel gas or prescribed storage gas, attended by emergency services	by telephone	immediately
	in writing	as soon as practicable
an unplanned or uncontrolled release of a gas that is petroleum or prescribed storage gas or fuel gas from an operating plant, at a concentration of more than the lower flammable alarm level for the gas stated in the safety management plan for the plant, not attended by emergency services	in writing	as soon as practicable
an incident with the potential to cause a general shortage of fuel gas in Queensland or an area of Queensland	by telephone	immediately
	in writing	as soon as practicable

Reported to the Office of the Chief Inspector - gassafe@dnrm.qld.gov.au 07 3199 8027		
Type of Incident	Way to be reported	Timeframe
an incident involving damage to property that substantially increases the risk of damage to plant or equipment or injury to persons	by telephone	immediately
	in writing	as soon as practicable
an incident involving coal mining operations at an operating plant in the area of a coal or oil shale mining lease	as required under the principal hazard management plan for the operating plant	
an incident at an operating plant to which the <i>Work Health and Safety Act 2011</i> does not apply, if the incident is not otherwise mentioned in this schedule	in writing	as soon as practicable but no later than 5 business days after the incident occurs
an incident that had the potential to, but did not, cause the death of, or injury to, a person or damage to plant or equipment	by telephone	immediately
	in writing	as soon as practicable but no later than 5 business days after the incident occurs
a work related illness of a person at an operating plant to which the <i>Work Health and Safety Act 2011</i> does not apply	in writing	as soon as practicable but no later than 5 business days after operator of the operating plant becomes aware or, ought reasonably to have been aware, of the illness

Table 4 - Statutory Notifications Work Health and Safety Act 2011

An incident is notifiable if it arises out of the conduct of a business or undertaking and results in the death, serious injury or serious illness of a person or involves a dangerous incident.	
Injuries and Illness	
an injury or illness requiring the person to have immediate treatment as an in-patient in a hospital	
- an injury or illness requiring the person to have immediate treatment for: - the amputation of any part of his or her body - a serious head injury - a serious eye injury - a serious burn - the separation of his or her skin from an underlying tissue (such as de-gloving or scalping) - a spinal injury - the loss of a bodily function - serious lacerations	
an injury or illness requiring the person to have medical treatment (treatment by a doctor) within 48 hours of exposure to a substance	
- any infection to which the carrying out of work is a significant contributing factor, including any infection that is reliably attributable to carrying out work: - with micro-organisms; or - that involves providing treatment or care to a person; or - that involves contact with human blood or body substances; or - that involves handling or contact with animals, animal hides, skins, wool or hair, animal carcasses or animal waste products.	
- the following occupational zoonoses contracted in the course of work involving the handling or contact with animals, animal hides, skins, wool or hair, animal carcasses or animal waste products: - Q fever - Anthrax - Leptospirosis - Brucellosis - Hendra virus - Avian influenza - Psittacosis. - Lyssavirus	
Dangerous Incidents - A dangerous incident is an incident in relation to a workplace that exposes a worker or any other person to a serious risk to a person's health or safety emanating from an immediate or imminent exposure to the following:	
an uncontrolled escape, spillage or leakage of a substance	
an uncontrolled implosion, explosion or fire	
an uncontrolled escape of gas or steam	
an uncontrolled escape of a pressurised substance	
electric shock	
the fall or release from a height of any plant, substance or thing	

the collapse, overturning, failure or malfunction of, or damage to, any plant that is required to be authorised for use in accordance with the regulations
the collapse or partial collapse of a structure
the collapse or failure of an excavation or of any shoring supporting an excavation
the inrush of water, mud or gas in workings, in an underground excavation or tunnel
the interruption of the main system of ventilation in an underground excavation or tunnel.

Table 5 – Statutory Notifiable Events - Environment

Description	Report to	By When
Duty to notify incidents that cause or threaten serious or material environmental harm	Administering authority – pollution hotline on 1300 130 372	within 24 hours of becoming aware of the event
Other environmental incidents as per clients' environmental authority conditions	Refer to Client Project Documentation	Refer to Client Project Documentation
Client requirements	Refer to Client Project Documentation	Refer to Client Project Documentation

7. CLIENT'S FORMS AND PROCEDURES

Where contractually required to use the Client's forms for recording incidents or injuries, the Project Manager shall review these forms for compatibility. Where the Client's forms are used, the Project's Safety and Environmental Management Plans shall indicate the forms to be used and any additional reporting requirements.

This may require that Wasco uses the Client's procedures and forms for reporting, but will still record incidents in the Wasco systems.

8. REFERENCES

WAPL-SYS-FRM-033 Witness Statement Form

WAPL-SYS-PRC-003 Incident Investigation Procedure

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 51 of 53

Appendix 12 – Quality Management Plan



WESTERN SYDNEY GREEN GAS PROJECT

QUALITY MANAGEMENT PLAN

Document Number			2018-QAS-PLN-001		
Revision	Issue	Date	By	Check	Approve
B	Issued for Client Review	23/09/2020	DP	AH	MW
A	Issued for Client Review	04/09/2020	AH	TGA	MW

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-QAS-PLN-001	QUALITY MANAGEMENT PLAN	Page 2 of 21

1. PURPOSE	4
2. SCOPE AND OBJECTIVES	4
2.1 SCOPE OF WORK	4
2.2 PROJECT QUALITY PLAN REVIEW AND REVISION	4
2.3 QUALITATIVE OBJECTIVES	5
2.4 QUANTITATIVE OBJECTIVES	5
3. DEFINITIONS	5
4. PROJECT DESCRIPTION	7
5. POLICY	7
6. RESPONSIBILITIES AND QUALITY ORGANISATION	7
7. QUALITY SYSTEM TRAINING	8
8. APPLICABLE LAWS, ACTS, REGULATION, STANDARDS, CODES & SPECIFICATIONS	9
9. PROJECT QUALITY PLANNING	9
10. COMMUNICATION.....	9
10.1 DOCUMENT MANAGEMENT	9
10.2 CHANGE MANAGEMENT.....	9
10.3 REQUEST FOR INFORMATION (RFI)	10
10.4 TECHNICAL QUERIES (TQ)	10
11. DESIGN AND DEVELOPMENT	10
12. QUALIFIED PERSONNEL	10
13. PROCUREMENT	11
14. INSPECTION AND TESTING.....	12
14.1 INSPECTION AND TEST PLANS (ITP)	12
14.2 INSPECTION TEST RECORDS (ITR) – ALSO REFERRED TO AS FIELD INSPECTION CHECKLISTS (FIC)	12
14.3 THIRD PARTY INSPECTION AND TESTING.....	12
15. COMPLETIONS MANAGEMENT	13
15.1 SCOPE AND ACTIVITY DEFINITION	13
15.2 COMPLETION VERIFICATION	15
15.3 WALKDOWN AND PUNCHLISTING	16
16. AS BUILT DRAWINGS	17
17. MECHANICAL COMPLETION.....	18
18. HANDOVER DOCUMENTATION.....	18
19. IDENTIFICATION AND TRACEABILITY	18
20. CONTROL OF INSPECTION, MEASURING AND TEST EQUIPMENT	19
21. PRESERVATION OF PRODUCT	19
22. CONTROL OF NON-CONFORMANCE AND CORRECTIVE ACTION	19

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-QAS-PLN-001	QUALITY MANAGEMENT PLAN	Page 3 of 21

23.

AUDITS

20

24.

CONTINUOUS IMPROVEMENT

20

25.

QUALITY REPORTING

21

26.

MANAGEMENT REVIEW

21

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-QAS-PLN-001	QUALITY MANAGEMENT PLAN	Page 4 of 21

1. PURPOSE

The purpose of this Quality Management Plan (QMP) is to establish the tools and procedures required by the project team to deliver a quality project that is compliant with the Contract, the design documents, relevant codes and standards. This document is a supporting document to the Project Execution Plan (2018-PRM-PLN-001) and is one of the key management plans for the project.

The QMP has been developed from the Wasco Australia Pty Ltd (WAPL) Integrated Management System (IMS) which is certified to the requirements of AS/NZS ISO 9001:2015.

This document describes and defines the following:

- WAPL Quality Policy, objectives and quality key performance indicators for the project;
- Quality requirements to be implemented;
- QA/QC Organisation and core roles, accountabilities of quality personnel;
- Verification activities related to procurement, fabrication, construction and installation;
- Quality requirements to be implemented by Vendors and Sub Contractors;
- Process for recording and closing out non-conformance (NCR)/corrective action and preventive actions;
- Action necessary to monitor, evaluate, measure compliance and improve processes within the Contractors Management System; and
- Supportive actions to other functions.

2. SCOPE AND OBJECTIVES

2.1 SCOPE OF WORK

The Western Sydney Green Gas (WSGG) Project involves the construction of a power to gas (P2G) hydrogen facility at the existing Horsley Park Trunk Receiving Station, located in Western Sydney. The facility will use renewable electricity to generate hydrogen, which can be injected into the natural gas network or used to generate electricity back to the grid by means of a hydrogen-powered micro-turbine or similar technology. In the future, hydrogen cylinder filling and vehicle re-fuelling facilities may also be installed at the facility (not in scope). The plant will also generate waste-water which will be used for local irrigation.

The scope encompasses Procurement and Construction to complete the detailed scope of work. Commissioning, shall be by the Client, with support provided for both pre-commissioning and commissioning.

Wasco Australia Pty Ltd (WAPL) has been engaged by the Client (Jemena) to execute the works.

2.2 PROJECT QUALITY PLAN REVIEW AND REVISION

Input document changes and subsequent impact on this QMP will be reviewed by the Wasco Systems Manager and revision of the Plan carried out as required and approved by the Project Manager.

Any revision to this document will be submitted to the Client representative for review and acceptance prior to implementation.

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-QAS-PLN-001	QUALITY MANAGEMENT PLAN	Page 5 of 21

2.3 QUALITATIVE OBJECTIVES

Objective	Performance Indicator
To have in place an effective, implemented management plan maintained and conforming to the requirements of the project, contractual and statutory requirements, and the requirements of WAPL and the Client and in accordance with the requirements of AS/NZS ISO 9001:2015 Quality Management.	- Project Specific Management System available via Wasco Sharepoint - Key Plans and project specific processes approved and available. - Compliance identified via internal audits as per project Audit Schedule. - Progress tracked and reported. - Successful audit outcomes.
To have Personnel trained in Quality processes e.g. Management System Induction with concepts clearly understood.	Implementation and compliance to the project training matrix.
Compliance with document deliverables and Establishment of a Manufacturers Data Report.	- Accuracy, completeness and control of documentation. - Index approved by all parties.

2.4 QUANTITATIVE OBJECTIVES

Objective	Performance Indicator
Number of NCRs that leads to rework	0
MDR finalised	28 days from handover
Specification compliance	100%
Quality Audit achievement	>98%
Number of Quality Audits over Project duration	1
Weld repair rate	0

3. DEFINITIONS

Abbreviation or Term	Description
AS/NZS	Australian Standards/New Zealand Standards
AINDT	Australian Institute of Non Destructive Testing

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-QAS-PLN-001	QUALITY MANAGEMENT PLAN	Page 6 of 21

Abbreviation or Term	Description
HSSE	Health Safety Security and Environment
HP	Hold Point
IMS	Integrated Management System
ISO	International Organisation for Standardisation
ITP	Inspection and Test Plan
ITR	Inspection Test Record
KPI	Key Performance Indicator
MDR	Manufacturer's Data Report
MPI	Magnetic Particle Inspection
NATA	National Association of Testing Authorities, Australia
NCR	Non-conformance Report
NDT / NDE	Non-Destructive Testing / Non-Destructive Examination
PMP	Project Management Plan
QA	Quality Assurance
QC	Quality Control
QMP	Quality Management Plan
SDS	Safety Data Sheet
TQ	Technical Queries
WP	Witness Point
WPS	Weld Procedure Specification
WPQR	Welding Procedure Qualification Record
Company	Jemena Northern Gas Pipeline Pty Ltd
The Client Representative	Person nominated with the Authority to make decisions on behalf of the Company Mark Rathbone
Contractor	Wasco Australia Pty Ltd
Vendor	A Company or organisation manufacturing equipment or supplying materials
Subcontractor	A Provider of major specialised works, procured equipment and provision of labour
Suppliers	Vendor and/or Subcontractor
Will	Mandatory requirement
Should	Recommended but not mandatory

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-QAS-PLN-001	QUALITY MANAGEMENT PLAN	Page 7 of 21

4. PROJECT DESCRIPTION

The Client:	Jemena Gas Networks (NSW) Ltd
Project Title:	Western Sydney Green Grass Project
Project Location:	Horsley Park, NSW
Project Number:	2018
Scope:	P2G-2099-SW-CN-001 – Construction Project Requirements

5. POLICY

WAPL's Quality Policy (WAPL-QAS-POL-001) can be found on the WAPL IMS. The quality policy will be available on site and be placed in locations visible to workers.

6. RESPONSIBILITIES AND QUALITY ORGANISATION

The Quality team consists of the Project Manager, the Wasco Quality Systems Coordinator, Construction Superintendent and the Project Engineer.

For welding activities, the project team shall be supplemented with a Qualified welding inspector to monitor and control welding and NDE activities.

The team's responsibilities include the following:

Project Manager:

- Managing, monitoring, controlling, verifying and providing assurance that the quality of supply and services comply with contractual and quality requirements.
- Training as required in quality processes e.g. auditing, vendor assessment and approval, scheduling of tests and inspection in accordance with applicable specifications and drawings, Inspection and Test Plans and other sound industry quality practices.
- Preparation and issue a project audit schedule to cover all related internal/external audit activities throughout the execution of the project;
- Organisation, coordination and performance of audits as per the approved audit schedule;
- Performance of quality assessments of potential suppliers and contractors in conjunction with supply chain management;
- Assistance in the evaluation of supplier/contractor quality systems and review/approval of supplier/contractor quality plans and inspection test plans (ITP).

Project Engineer:

- Developing and implementing this QMP and project specific quality processes and associated quality tools;
- Establishing detailed quality plans and procedures during project commencement phase;
- Provision of a quality scorecard to the client and WAPL Management to enable progress monitoring of quality requirements throughout the project;

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-QAS-PLN-001	QUALITY MANAGEMENT PLAN	Page 8 of 21

- Functional responsibility for both offsite and onsite inspection activities;
- Ensure compliance of materials and procured goods meet required specification;
- Ensure materials, including client free issued materials, are managed in accordance with the approved Material Management Plan 2018-PRM-PLN-004
- Input quality requirements in training of project personnel in the use of the project specific management systems, plans and processes;
- Manage external inspection agencies engaged to monitor equipment/material purchase activities for compliance to Company and Statutory requirements;
- Liaison with procurement personnel and engineers regarding specifications, requirements, inspection coordination, tracking and results;
- Management and maintenance of comprehensive records for all quality activities;
- Establishment and maintenance of relevant quality, records to facilitate handover at the end of the contract;
- Coordinate independent third-party bodies for verification/validation/certification requirements when required; and
- Coordinate the Client quality inspection requirements when requested.
- Management of Change for technical and design aspects

Construction Superintendent:

- Ensure all plant and equipment on site is compliant with all equipment specification and statutory/industry requirements;
- Assistance in the induction and development of project personnel in accordance with the training schedule;
- Assignment of required inspection resources employed as part of the construction phase;

Welding Inspector / Supervisor:

- Control of all aspects of welding performed on site, including NDE, in accordance with project specifications, procedures and ITPs;
- Control of welding consumables;
- Control and record all material identification and traceability

The Quality team has responsibility and authority to identify quality problems, issues and non-conformities, and to initiate, recommend and substantiate corrective and preventive action.

7. QUALITY SYSTEM TRAINING

All personnel on the Project will receive management system awareness training as part of the overall project induction in accordance with the Wasco Awareness and Competence Standard. Records of such induction and training will be maintained by the project.

The Management System training will specifically explain:

- The Project Management Systems;

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-QAS-PLN-001	QUALITY MANAGEMENT PLAN	Page 9 of 21

- Access of documents;
- Project specific processes, forms, templates and their locations;
- Control and maintenance of project records; and
- Correct reporting formats demonstrating the QA/QC principles.

8. APPLICABLE LAWS, ACTS, REGULATION, STANDARDS, CODES & SPECIFICATIONS

Works will be carried out in accordance with the specifications, drawings and appendices provided in the contract, and as provided by the Client.

Work will be completed in accordance with all applicable Australian Standards, and, any alternate standard specified in the contract documentation (i.e. ASME B31.12).

In the event, there is conflict between the Scope of Work and other technical documents, the WAPL Project Manager will notify the Client Representative in writing, in accordance with the Contract.

9. PROJECT QUALITY PLANNING

Resources will be provided for the management of quality that includes personnel, materials, specialist, equipment, audits and surveillance.

No work will commence without all the project quality documentation being in place (e.g. work packs, ITPs, FICs).

All documentation will be reviewed and approved. All documentation must meet all required standards and specifications.

10. COMMUNICATION

10.1 DOCUMENT MANAGEMENT

Documents that are generated for the project will be subject to quality assurance and control. WAPL will use Teambinder™ document control system as the main method of document control for the project. All construction records upon completion of the scope of work will be uploaded into Teambinder™.

In addition to Teambinder, all documentation and transmittals to / from the Client shall be via the Clients Aconex process.

WAPL will use its document control procedures to ensure that project communications are undertaken in compliance with contractual requirements. A project register will capture and catalogue all required documents as specified in this plan.

WAPL will provide the Client with a document register that identifies all of the deliverables to be provided by Wasco under the Contract.

WAPL will comply with the Client requirements for document management.

10.2 CHANGE MANAGEMENT

Any change that affects scope, cost and/or schedule of any part of the project will be formally managed and where applicable reported to the Project Manager. Change management is applicable at all stages of the

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-QAS-PLN-001	QUALITY MANAGEMENT PLAN	Page 10 of 21

project, including design, documentation, construction, fabrication, pre-commissioning and procured products and services.

All members of the project team are responsible for ensuring that any work undertaken is in accordance with the contract. If a request is received, or the need arises, to perform work that is outside the agreed scope of work, a variation notice will be raised. Work should not commence without formal approval or, in exceptional circumstances, the written consent of the Client Project Manager or the Client Site Representative. Refer to Change Management Procedure WAPL-SYS-PRC-005.

The site Project Engineer shall be responsible for managing any changes to technical aspects of the works (design, materials, specification etc) via the TQ and as built process.

The Project Manager shall be responsible for managing changes to cost and schedule, supported by the Construction Manager, Site Engineer and broader project team as applicable.

Variations will be submitted via The Clients Aconex process.

10.3 REQUEST FOR INFORMATION (RFI)

All requests for information queries will be submitted utilising a “Request for Information” form which will be agreed by WAPL & the Client. The Request for Information (RFI) queries raised will be managed through Document Control, and the Project Engineer or delegated person will control the RFI process.

RFI’s will be submitted via The Clients Aconex process.

10.4 TECHNICAL QUERIES (TQ)

Technical Queries (TQ) will all be formally submitted and closed out within the agreed timeframe. A register of TQs will be maintained, managed and used by the project team as a means of ensuring that TQ’s are actioned accordingly.

TQ’s will be submitted via The Clients Aconex process.

11. DESIGN AND DEVELOPMENT

Engineering and Design for this scope is by the Client and the Client’s contractors.

Wasco will be responsible for limited engineering scopes identified in the contract and Field and Construction Engineering, as arise.

Engineering will be managed in accordance with the Project Execution Plan.

12. QUALIFIED PERSONNEL

Where required by specification or regulation, works shall be completed only by appropriately trained, qualified experienced and (where necessary) licensed personnel.

In addition to the project skills / training matrix and general site access requirements, the following specialist qualifications are required for the project:

- Electrical installation and testing by Licensed Electricians.

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-QAS-PLN-001	QUALITY MANAGEMENT PLAN	Page 11 of 21

- Plumbing work shall be completed by Licensed Plumber/s
- Hazardous area inspectors shall be appropriately qualified, and meet or exceed the requirements stipulated in GTS-980-PR-TI-001, section 2.7
- PSV calibrations shall be completed by Nata accredited technicians
- NDE procedures shall be endorsed by an NDE level III for that method.

NDE technicians shall hold a Level II or Level III Certification to ISO 9712 for each inspection method.

Only personnel certified to Level II or III in the NDE method shall perform evaluation and report results

- Welding Inspectors shall hold minimum CSWIP 3.1 or equivalent certification
- Welders shall be qualified against an appropriately certified Welding Procedure.
- Coating inspectors shall hold minimum NACE II of equivalent certification.

13. PROCUREMENT

All quality processes will be applied in the procurement function in the way of purchase requisitions, specifications, assessments, and receipt of goods, assessment of performance, records maintained, inspections and QA/QC signoff.

The procurement of all project materials and bought in items will be managed by Wasco Procurement department.

As procurement is a critical part of the project, its success is very much affected by the Engineering activities which precede it.

WAPL recognises effective management of suppliers and subcontractors are critical to achieving project delivery. For this project, WAPL pre-qualifies its suppliers and subcontractors. WAPL'S prequalification process includes evaluation of quality, safety and environmental systems.

All sub-contractors will work under WAPL's quality management plan for the Project.

Project audits will include the evaluation of all subcontractor activities. WAPL will approve all subcontractors and suppliers used on the project in accordance with the Contract.

All requirements of this quality management plan shall apply equally to off-site fabrication and supply performed by subcontractors.

All off-site fabrications / constructions shall be subject to a release inspection prior to acceptance and release for transport to site. The release inspection shall verify the quality of the items, as well as verify that all necessary inspection and testing has been completed, the ITP is up to date and signed off, and all required documentation for the final MDR is present and available.

Release inspection shall be documented on 2018-QAS-FRM-001, and a copy of the completed and accepted release form shall be forwarded to site and the Client in conjunction with the delivery docket.

Where possible, WAPL shall be provide the client with 5 days notice of off site inspection / inspection release.

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-QAS-PLN-001	QUALITY MANAGEMENT PLAN	Page 12 of 21

14. INSPECTION AND TESTING

14.1 INSPECTION AND TEST PLANS (ITP)

Inspection and Test Plans will be prepared by WAPL and its subcontractors. The ITPs will be developed by WAPL prior to submission to the Client for review and acceptance. The ITPs will be in a format acceptable to the Client and approved for use prior to the commencement of works. The ITP's will be by discipline and specific to the works to be carried out, identifying the required tasks to be carried out in sequence, referencing the required method statements, work instructions, procedures and specifications to be followed to complete the activities. Verification requirements and the supporting records required will also be referenced in the ITP's. Supporting records may include, but not limited to the following:

- Test Reports
- Inspection Reports
- Inspection Checklists
- Material Certification

Each ITP shall detail the associated System / Sub-system.

ITPs shall be managed on an ITP Register with System / Subsystems allocated to each ITP.

Where possible, WAPL shall provide the client with 48 hours notice of significant on site inspection (Hold and Witness points) for significant activities, ie pressure testing, pour release, backfill release, compaction testing.

14.2 INSPECTION TEST RECORDS (ITR) – ALSO REFERRED TO AS FIELD INSPECTION CHECKLISTS (FIC)

FICs will be utilised to record each inspection and test carried out to verify compliance with the required specifications, codes and standards. The FICs will complement the ITP to reflect specific inspection and verification requirements specified in the relevant standards and specifications. The FICs will be completed each time the activity is performed as required by the ITP. The FICs will be referenced from the relevant ITP. Completed FICs will be progressively compiled in the relevant work packs on site and electronically compiled.

ITRs shall be tracked through a Completions Management Progress Tracker, and progress reported to Jemena on a weekly basis. The tracker will be made available to Jemena on request.

14.3 THIRD PARTY INSPECTION AND TESTING

Independent, accredited third party inspectors will be engaged for the necessary aspects of the work including following functions:

- a) Compressive testing of concrete samples and Slump testing of concrete batches
- b) Non-Destructive Examination of welding
- c) Repair, reset and re-calibration of Pressure Safety Valves (PSV's)
- d) Calibration of measurement and test equipment.
- e) Hydrostatic test witnessing and verification.

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-QAS-PLN-001	QUALITY MANAGEMENT PLAN	Page 13 of 21

15. COMPLETIONS MANAGEMENT

Completions management is critical to ensure the complete intended scope, and all checks, verifications and QC requirements, are completed and documented prior to ready for startup and handover. Completions management comprises two parts,

- a) Clear definition of the complete scope and required activities
- b) Clear system and process to verify the scope and activities have been completed and accepted, exceptions as arise documented and accepted as deferred post start up.

15.1 SCOPE AND ACTIVITY DEFINITION

WAPL will ensure clear definition and communication of the required scope and activities by preparing and/or maintaining the following documentation;

- a) Construction Work Packs:

Preparation, review, approval and client acceptance of a detailed construction Work Pack to an agreed work breakdown structure.

Work Pack structure shall be broken down by discipline and work area and shall contain sufficient detail to clearly define the individual activities (and/or quantities) and scope required to complete the Work Pack.

Work Pack breakdown shall be maintained in a Work Pack list, cross referenced to Client engineering Work Packs and scope documents to provide a complete list of the works to be executed.

Total Work Pack list shall be maintained in ITP/Work Pack Register, referencing the associated completions System / Subsystem for the work.

- b) Inspection and Test Plan

Preparation, review, approval and client acceptance of a detailed ITP for each construction Work Pack.

ITP shall list ALL major activities required to complete work, and clearly identify ALL inspection, test and FIC requirements.

Total ITP list shall be maintained in ITP/Work Pack Register, referencing the associated completions System / Subsystem for the work.

- c) Project Line List / Pressure Test Register

A full and detailed list of all pipelines required to be worked during execution of the project shall be prepared prior to commencing the works, traceable to process drawings, Work Packs and system / sub system.

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-QAS-PLN-001	QUALITY MANAGEMENT PLAN	Page 14 of 21

Register shall include clear definition of the extent of inspection and/or testing for each line, pertinent to the extent of work on each line, i.e.

- Line fabrication FICs
- Line assembly / bolt up FICs
- Pressure testing / drying FICs
- Completed line inspection FICs

Pressure test register shall include a list of all individual fabricated items requiring pressure testing. This list shall detail each individual spool and vessel, referencing the associated system / sub system and pressure test report number. The list shall have a sign-off for each spool by WAPL and Jemena representative signifying that the pressure test report has been reviewed and accepted.

d) Flange Management / Joint Integrity Register

A full and detailed flange management / joint integrity register shall be prepared prior to commencement of the works.

The register shall define ALL known joints to be made or re-made during completion of the project. Each joint shall be assigned a unique identifier, traceable to joint mapping drawing and associated Work Pack and system / sub system.

Register shall be supported by a complete joint mapping set of drawings, preferably, marked up on P&IDs

e) Field weld and NDE register

A full and detailed field weld register shall be prepared prior to commencement of the works.

The register shall define ALL known welds to be completed during completion of the project. Each weld shall be assigned a unique identifier, traceable to joint mapping drawing and associated Work Pack and system / sub system.

Register shall identify NDE requirements, and include provision to confirm NDE percentage requirements have been met.

f) Mechanical equipment list

Detailed list of all mechanical equipment / items to be installed during execution of the works shall be prepared prior to commenced of the works. List shall identify FICs for each equipment type (valve, PSV, skid, pump etc).

Equipment list shall include all items identified by unique equipment number on P&IDs, with the exception of piping (refer to line list).

Each equipment item shall be assigned to it's associated Work Pack and system / sub system.

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-QAS-PLN-001	QUALITY MANAGEMENT PLAN	Page 15 of 21

g) Electrical equipment list

Detailed list of all electrical equipment / items and instruments to be installed during execution of the works, and identified FICs for each equipment type (cabinet/enclosure, motor, instrument etc).

Equipment list shall include all items identified by unique equipment number on P&IDs and/or schematics, with the exception of cables (refer to cable schedule)

Each equipment item shall be assigned to it's associated Work Pack and system / sub system.

h) Cable schedule

Cable schedule shall be prepared for all cables to be installed or otherwise worked during execution or the project, and identified FICs for each cable type.

Each equipment item shall be assigned to it's associated Work Pack and system / sub system.

i) Drawing register

A drawing register shall be maintained through-out the project, periodically verified for latest Revision against Aconex. Register shall clearly define drawings required to be as-built prior to start-up, and shall be maintained up to date with latest status and revision up to and including as built.

Each drawing shall be assigned to it's associated Work Pack and system / sub system.

15.2 COMPLETION VERIFICATION

Each FIC shall be verified by the site engineer, and, at the client's discretion, the client's designated representative. FIC completion, verification, sign-off, scanning and filing shall be maintained up to date during execution of the works.

ITP review and signoff for each Work Pack shall be progressive, and in parallel with the works.

Completion verification shall be completed for each Work Pack, at completion of the works for that Work Pack.

Completion verification shall comprise full review of the Work Pack, verify completion and sign-off of the ITP and associated FICs and records, and review and update of the relevant tracking registers to ensure completion of all line items and associated documentation.

Once the Work Pack, and all associated documentation is considered complete, final verification shall be by walkdown and generation of an agreed punchlist. Thereafter, the punchlist shall be used to verify A and B items are closed prior to handover / start up, agree final outstanding punchlist at handover, and track completion of outstanding / minor punchlist items.

Completions status shall be summarised on an overall completions tracker. The completions tracker shall detail the full list of systems / sub systems, and report the status of FICs / ITRs by discipline. Progress reporting shall be in full numbers, i.e. 47 / 92 (rather than 51.1%).

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-QAS-PLN-001	QUALITY MANAGEMENT PLAN	Page 16 of 21

Tracker shall cross reference the associated construction Work Pack.

Where applicable, tracker shall be structured to reflect “readiness for handover / start-up”

15.3 WALKDOWN AND PUNCHLISTING

The Project Engineer will be responsible for co-ordinating and documenting punch listing of completed Work Packs prior to handover. Each Work Pack / system / subsystem shall be inspected and verified complete by WAPL prior to calling the walkdown.

Notification shall be by email to Clients designated representative for the Work Pack / system / subsystem.

Punchlisting shall generally be completed in a joint walkdown with the client. Known items shall be pre-recorded, however, shall still be discussed and categorised in conjunction with the client. It is recommended the client make available both Project and Operations personnel to complete the walkdown.

A walkdown pack will be prepared and verified by WASCO for review prior to the walkdown, comprising:

- Work Pack / System delineation
- As-built drawings
- A register of Technical Query’s relating to that system / sub system.
- A list of NCRs and their status for the applicable system / sub system.
- Copy of the signed off ITP for the applicable system / sub system.
- Copy of any pre-recorded punchlists for the applicable system / sub system.
- Copy of all registers (flange management / pressure testing / welding and NDE / equipment / cable etc) applicable for that system / sub system.
- Copy of the completions tracker and ITR status for the applicable system / sub system.

Hardcopy files of all completed ITR’s shall be available for review at walkdown.

Hardcopy of the in progress MDR, and soft copy of WASCO supplier / fabricator MDRs shall be available at the walkdown. WAPL supplier / fabricator MDRs shall be approved Code 1 or 2 through Aconex prior to walkdown.

All items listed above shall be progressively completed in-line with the progress of construction. Records shall be made available to Jemena at all times, and progressively reviewed by Jemena to facilitate an efficient final review prior to system/sub-system walkdown.

Punchlist items shall be categorised as follows, in agreement with the client representative/s”

- A: Safety / Safety related item – Will prevent energisation and/or following works
- B: Will prevent energisation
- C: Minor items that can be completed safely while the plant is running

All punchlist items will be recorded on a common register, categorised by Work Pack and responsibility. Descriptions shall clearly and succinctly define the action required to complete to the accepted standard.

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-QAS-PLN-001	QUALITY MANAGEMENT PLAN	Page 17 of 21

Unless otherwise agreed with the Client, WASCO punchlist will capture all items identified during walkdown / inspection, including items which are the responsibility of the Client or Clients contractor / supplier. Punchlist items will be recorded against the following discipline codes:

- CIV – WASCO civil, including earthworks and concrete
- SMP – WASCO structural, mechanical & piping
- E&I – WASCO electrical and instrumentation
- CLN – Client, including client vendors

Responsibility for completion shall be either WASCO or Client.

Completion of punchlist items shall be recorded on the master register, with wet signature verification by both the responsible organisation / discipline and the Client representative.

WASCO will issue verify that:

- all work under the contract (or part order) has been completed;
- all tests and inspections have been performed and accepted;
- all recorded punch list items are either cleared or accepted by the Client as carry over works to be completed by WASCO at an agreed date;
- all concessions/deviations from the specified requirements have been reconciled;
- documents required for the Manufacturer's Data Record (MDR) have been sighted and approved;

16. AS BUILT DRAWINGS

During construction a master set of drawings will be maintained in hard copy on site. All changes to the design will be documented in the design drawings. The changes will be marked up in red pen. Notes or clarifications, not intended for backdrafting, shall be made in green.

As built drawings will be completed walk downs. Where a complete drawing is not able to be as-built, a copy of the site master will be made and it will be identified as a "system copy" for the purposes of walkdown and MC application. Site Master P&IDs will be handed over as the complete master copies once they have been as-built.

All changes during commissioning will be made in blue. Where loops are changed during commissioning, the terminations will be updated in blue accordingly. The Masters will remain on site until start up.

Survey pick-ups will be performed as works are completed and will be issued to the Client in the form of a GIS/CAD file. Survey pick-ups of pipeline will include pipe EL and coordinates, location of fittings welds, branches and protection slabs.

The following deliverables will be "as-built" by WASCO:

- General Arrangements
- Process and Instrument Diagrams
- Electrical drawings
- Isometrics

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-QAS-PLN-001	QUALITY MANAGEMENT PLAN	Page 18 of 21

17. MECHANICAL COMPLETION

MC applications will be made by System after all the A and B punch items are closed out. Wasco will create system and overall MC application forms for approval by the Client.

For clarity, there will be a separate MC certificate for each of the Clients Engineering Work Packs. Each certificate shall cross reference the associated WAPL construction Work Pack/s applicable to that scope of work.

Each MC certificate shall be supported with copy of current punchlist for the associated works, showing current open punchlist items.

18. HANDOVER DOCUMENTATION

The Manufacturer's Data Book will compile all construction records that provides proof that construction meets all required specification and standards. The contents and layout of the MDR will be agreed between the Client & WAPL. The contents for MDR will include the following at a minimum;

- Concrete testing and traceability, including compressive strength testing, slump testing, delivery / batch traceability.
- Piping material traceability in a register, with maps and certificates as supporting information
- Structural fabrication & installation registers, with maps and certificates as supporting information
- Welding traceability in registers, with WPS, PQR, WQR, maps, NATA endorsed test reports, and certificates as supporting documentation
- Pressure testing register, with test packs & NATA endorsed test calibration reports as supporting documentation. Test packs will contain test records, P&IDs with test limits, piping isometrics with test limits, flange management, and reinstatement records.
- Signed as-built drawings
- Electrical installation registers and HA check sheet, with traceability test records, termination records and loops tested.
- HA Audit report

MDR contents will be as per approved MDR index

19. IDENTIFICATION AND TRACEABILITY

The Project Engineer for the Project will maintain materials and welding traceability, and all other required related records. Plant and materials will be positively identified at all times during the manufacture, delivery receipt, storage, handling, fabrication and transport.

Weld Maps are produced from this information and form part of the fabrication and installation packages.

This data, together with the isometric Material Take-Off (MTO), is captured in a database to aid identification, traceability, material management and progress reporting.

Heat Numbers will be cross-referenced to material certificates.

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-QAS-PLN-001	QUALITY MANAGEMENT PLAN	Page 19 of 21

The identification and traceability processes will be in accordance with Wasco's Procedure for Material Certification and Traceability.

20. CONTROL OF INSPECTION, MEASURING AND TEST EQUIPMENT

Where measurement and/or testing is required the equipment, owned by WAPL and/or its subcontractors, will be controlled and calibrated in accordance with the requirements of Procedure for Calibration Control to confirm conformity of product with specified requirements. Refer also to the Project Calibration Register.

21. PRESERVATION OF PRODUCT

Plant, equipment and materials will be stored, handled, preserved, and maintained in purchased condition. Records will be maintained of all maintenance and storage routines where applicable.

The Site Project Engineer shall be responsible for determining items requiring particular storage or preservation requirements (i.e. bearing rotations, cold storage). Where identified, requirements shall be detailed in associated ITP.

Storage/laydown areas (including a secure area for some goods) will be provided provision for:

- Access by trucks and mobile equipment;
- Fire protection;
- Security from damage, weather, theft and vandalism;
- Controlled distribution of stored materials and equipment;
- Separation of different types of materials to avoid contamination, e.g. carbon steel and stainless steel, and a grid system for spool yard etc.;
- Isolation of quarantined materials into a defined area where practicable; and
- Hazardous/dangerous materials.

Processes will be in accordance with WAPL procedure for Packing, Marking, Transport, Preservation and Control of Test Equipment Procedure.

22. CONTROL OF NON-CONFORMANCE AND CORRECTIVE ACTION

Identified non-conformances and corrective actions will be reported in accordance with the WAPL Process for Non-conformance and Reporting Process. A copy of the NCR and CAR report will be forwarded to The Client Project Manager without delay providing details of:

- Specific nature of the non-conformance;
- Proposed corrective action;
- Schedule to implement the corrective action; and
- Any potential impact on cost or schedule.
- Detail the impacted system / sub system.

Non-conforming product will be segregated and clearly identified until such time as a corrective action has been closed out and approved by The Client Representative.

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-QAS-PLN-001	QUALITY MANAGEMENT PLAN	Page 20 of 21

A non-conformance register will be maintained and remain a live document until project completion. Register shall reference the associated Work Pack and system / sub system impacted.

If a formal complaint from The Client is received it will be treated as an NCR. All NCRs will be registered in the Project NCR for tracking in accordance with Non-conformance and Reporting Process. The Client will be kept informed of progress and closure status of identified non-conformances.

23. AUDITS

An Audit Schedule will be developed for the Project by the Project Manager. The schedule will be based on the activity stage of the project and risk associated with these activities. The schedule will also cover as necessary external audits on Suppliers/Subcontractors. WAPL will consult with The Client on their audit requirements for this project.

Audit and review activities are the primary control and improvement process for the Project Management System. Wasco's Quality Systems Coordinator is responsible for implementation and management of the Audit and Review process. Suitably experienced personnel from within or external to the Project Team, will conduct audits and reviews.

Audits will be conducted on the Project Plans and procedures to verify compliance. If a non-conformity is identified during an audit, the necessary corrective and preventive actions will be taken to eliminate recurrence.

All actions arising from audits will be recorded and tracked until closure.

Actions identified during internal/external audits will be controlled and managed through issue of Action Requests. Auditors will ensure appropriate, effective corrective, preventative or Improvement Actions are identified and implemented to eliminate the cause of and prevent future recurrence of Non-conformance.

All issued Action Requests will be registered in the Project Action Tracking Register.

24. CONTINUOUS IMPROVEMENT

Improvement initiatives and plans for improvement of the Wasco Management System will be based on:

- Achievement of performance goals
- Performance measurement results
- Management review actions
- Audit results
- Marketing trends
- Lessons learnt from past projects.

Plans for operation and improvement will emerge from management reviews and development of annual business plans. There are several ways in which corrective, preventive, and improvement action may be addressed. They are as follows:

- Internal audits will contribute to corrective and preventive action through audit findings and subsequent corrective, preventive, and improvement activities.

	Jemena Gas Networks (NSW) Ltd Western Sydney Green Gas Project	
2018-QAS-PLN-001	QUALITY MANAGEMENT PLAN	Page 21 of 21

- Processes for reviewing and managing the system will form a loop for continuous improvement.

A lessons learnt exercise will be conducted upon completion of the Project. Lessons from this Project will be used to improve the Integrated Management System (IMS).

The Quality Team will maintain the Lessons Learnt register and assign and follow up any improvement actions as a result of the lessons learnt.

25. QUALITY REPORTING

WAPL will report its Quality performance to the Client during the course of the project as follows.

- a narrative summary of performance against the agreed KPI's;
- a narrative summary of First- and Second-Party Audits performed against the Quality Audit and Review Schedule;
- a listing of corrective and preventive actions for each audit, the current status and the planned dates for follow up and close out;
- details of any investigations into non-conformities and the actions undertaken to prevent recurrence of any QMS and QMP failures;
- a status summary of non-conformity and corrective action requests including a statistical trending analysis capable of driving improvement;
- summary of any customer complaints raised by the Client, in the preceding period including details of action taken to address the complaint and close out Verification;
- status of deployment of Quality discipline personnel; and
- status of action items from the Contract Action Tracking System
- completions management progress tracking
- Planned inspection release dates (off site)
- Planned pressure test dates (on site / off site)
- Planned inspection dates for major / critical activities (on site)

26. MANAGEMENT REVIEW

The Project Sponsor will meet with the Client and the Project Management Team, including support managers from Wasco, to review the Project performance, at least monthly. Minutes will be maintained, and all actions assigned dates.

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 52 of 53

Appendix 13 – Wasco CARE Plan



2018 - Jemena WSGGP C.A.R.E PERFORMANCE MONITORING 2020

Document No.	
Revision	
Effective Date	
No. of Pages	2

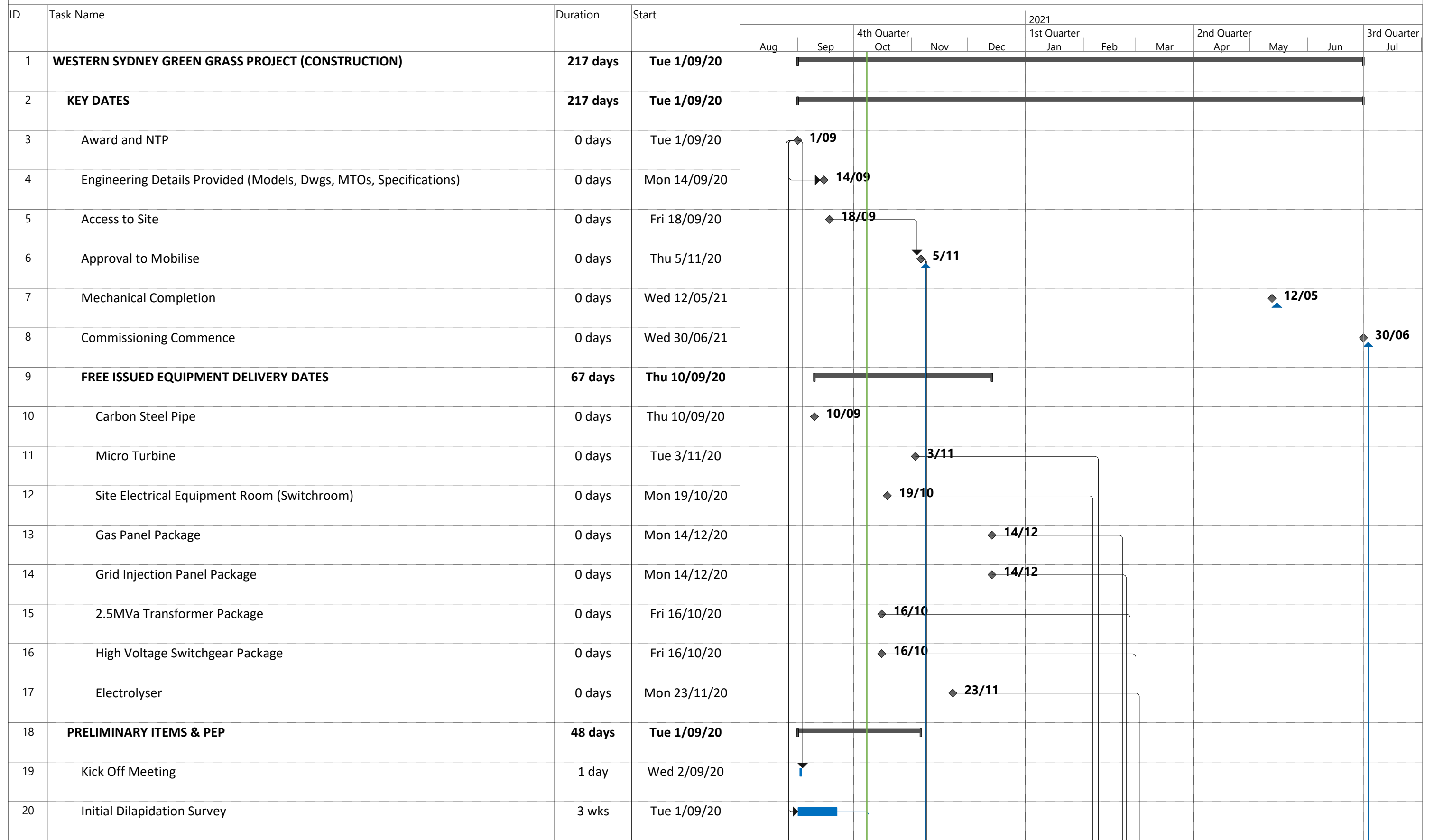
	Item No.	HSE Wasco C.A.R.E Program	Responsibility	Frequency	2020												Reference	Remarks
					Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Communication / Consultation	1	Snr Management Site Inspection	Operations Manager or Representative	Quarterly													Snr Mgt Site Inspection Form: WAPL-HSS-FRM-010	Performed by Operations Manager or Project Sponsor with Project Manager and Site Safety
	2	Site Management Site Inspection	Construction Superintendent / Project Manager	2/Rotation													Site Mgt Site Inspection Form: WAPL-HSS-FRM-038	Performed by Superintendent or Project Manager and Project Engineer
	3	Weekly Site Inspection	Construction Superintendent / Project Engineer	Weekly													WAPL-HSS-FRM-038	Performed by Superintendent or Project Engineer
		Enviromental Inspection	Construction Superintendent / Project Engineer	Weekly													WAPL-HSS-FRM-003	Performed by Superintendent or Project Engineer
	3	Monthly HSE Tool Box Talk	Construction Superintendent / Project Manager	1/Rotation													Tool Box Meeting Minutes Form: WAPL-HSS-FRM-036	Monthly safety meeting, statistics and shares
	4	Daily Pre-start Meeting	Construction Superintendent	Daily													Daily Pre-start Form: WAPL-HSS-FRM-015	Meeting to include entire crew
	5	HSE Bulletin Board	Project Engineer	Each Event / Continuous														Update bulletin board upon event/alert
	6	HSE Alert	HSEQ Manager	Each Significant Event													HSE Bulletin: WAPL-HSS-FRM-034	Post on noticeboard, communicate via daily and/or weekly meeting
	7	Hazard Observations	All	Each Event													Hazard observation cards	Observation cards, collection box in office, maintain register, HSE reward program incentives
	8	SWMS Review	All involved with the task	Start of Task and if there are any significant changes. If task is continuing after 6 months.													2018-HSS-REG-005_SWMS Register	Conducted and reviewed between supervisors and crew, collected and recorded by Project Engineer
Alignment	9	Take5	All	Daily/Each work Group													Take5 booklets	Work group may consist of 2 or more personnel and each person must participate.
	10	Hazard(Risk) Register	Project Manager	Quarterly													2018-HSS-REG-001	Reviewed between PM/PE and CS
	11	HSE Induction Program	HSEQ Manager	As Required / per Project														Site Induction Wasco online induction Central online Induction Central Induction Site Induction
	12	HSE Policies	HSEQ Manager	Yearly														Displayed on site, throughout the site offices
	13	12 Non-compromising Rules	Project Manager	Monthly														Review 1 topic each month
Responsibility	14	HSE Best Practices Sharing	HSE Manager	Monthly													Safer together bulliten	Review and disseminate through weekly meeting, safety alerts and/or SMP revisions
	15	Approved HSE Management Plan	Project Manager	Prior to mobilisation													HEALTH, SAFETY & MANAGEMENT PLAN JEMENA PCCS POWER UPGRADE PROJECT NO: 2018-HSS-PLN-001	Overall alignment between corporate, client and site requirements
	16	Position Descriptions	HR Management	Onboarding														Clearly communicate safety obligations and expectations coming to and on site
	17	Employment contract	HR Management	Onboarding														Clearly communicate safety obligations and expectations coming to and on site
	18	HSE Requirements on all supplier/Sub-contractor PO	Project Manager	per PO														Clearly communicate safety obligations and expectations coming to and on site
	19	Performance Review	Project Manager / Operations Manager	Monthly													WAPL-SYS-REP-002.01. Monthly HSE Report	Based on a weekly reporting particularly via KPIs To be submitted to Safety Manager
	20	Open/closed Hazard Observations /corrective actions register review	Project Engineer	Weekly													2018-HSS-REG-007 Corrective actions Register	Based on a weekly reporting particularly via KPIs
	21	Take 5 review	Construction Supervisor	Daily														Reviewed by Site Supervisor
	22	HSE Report/Statistics	Project Engineer	Weekly													WAPL-SYS-REP-002.01. Monthly HSE Report (Weekly Running Totals)	Send to PM for completion
	23	HSEMS Audits	HSE Manager	Six monthly													Internal IMS Audit Report WAPL-SYS-REP-003	One internal audit for project will be performed
	24	Training & competency	HR Management	Continuous													Project Training & Competency Register 2018-HRE-REG-002	Maintaining register, identify compliance gaps with SMP commitments

Effort	25	Electrical compliance	Project Engineer	3 Months													Electrical Test & Tag Register 2018-HSS-REG-002	Inspection and testing
	26	Lifting compliance	Construction Supervisor	3 Months													Lifting Test & Tag Register 2018-HSS-REG-004	Inspection and testing
	27	Fire extinguishers	Construction Supervisor	6 Monthly													Fire Extinguisher Test & Tag Register 2018-HSS-REG-007	Inspection and testing
	28	Vehicle Inspections	Operator	Weekly (when in use)													Plant and Equipment Register 2018-HSS-REG-010	Construction Supervisor to submit Maintenance issues to be tracked via register
	29	Daily Plant inspections	Operator	Daily													Plant and Equipment Register 2018-HSS-REG-010	Construction Supervisor to submit Maintenance issues to be tracked via register
	30	Risk register review	Project Manager	As Identified													Project Risk Register 2018-HSS-REG-001	Project risk register, add new risks, follow up on actions
	31	Emergency drill	Construction Manager	6 Monthly													WAPL-HSS-FRM-012 Emergency Response Drill Report Form	Drill to be conducted with Santos
	32	Incident action items review	Project Manager	Monthly													Rapid Incident Report	Between PM/PE and CS
	33	SDS Review	Project engineer	Annual													SDS Register 2018- HSS - REG-003	
	34	First Aid Kit	Project Engineer	6 monthly / after incident													First Aid Kit Register 2018-HSS-REG-006	

	Planned
	Completed
	Not undertaken

	JEMENA ASSET MANAGEMENT PTY LTD WESTERN SYDNEY GREEN GAS PROJECT	
2018-HSS-PLN-005	SAFETY STUDY REPORT	Page 53 of 53

Appendix 14 – Project Construction Schedule



ID	Task Name	Duration	Start	2021											
				Aug	Sep	4th Quarter Oct	Nov	Dec	1st Quarter Jan	Feb	Mar	2nd Quarter Apr	May	Jun	3rd Quarter Jul
21	Prepare and Submit PEP Main Components	28 days	Tue 1/09/20												
22	Items for Submission as Per Development Consent Conditions	28 days	Tue 1/09/20												
23	Construction Environmental Management Plan (CEMP)	20 days	Tue 1/09/20												
26	Traffic Management Plan (TMP)	2 wks	Tue 1/09/20												
27	Work Health & Safety Plan (WHSP)	4 wks	Tue 1/09/20												
28	Construction Management Plan (CMP)	20 days	Tue 1/09/20												
32	Quality Management Plan (including ITP/ITR)	4 wks	Tue 1/09/20												
33	Emergency Response Plan	4 wks	Tue 1/09/20												
34	Risk assessments and SWMS	4 wks	Tue 1/09/20												
35	Principals Acceptance of Construction Documentation & DPIE Approval	4 wks	Fri 9/10/20												
36	Prepare Supply and Construct Work Packs (Prepare, Review, Revise, Issue)	38 days	Tue 1/09/20												
71	Prepare Commissioning Work Packs	14 days	Fri 23/10/20												
74	PROCUREMENT	55 days	Tue 15/09/20												
75	Procure Materials and Equipment	48 days	Tue 22/09/20												
103	Procure Sub Contracts	50 days	Tue 22/09/20												
134	Procure Services and Rentals	35 days	Tue 15/09/20												
141	MOBILISATION	22 days	Mon 12/10/20												
142	Offsite Preparation for Mobilisation	20 days	Mon 12/10/20												
146	Onsite Mobilisation	2 days	Sat 7/11/20												
147	First Personnel to Site	0 days	Sat 7/11/20												

ID	Task Name	Duration	Start	2021											
				Aug	Sep	4th Quarter Oct	Nov	Dec	1st Quarter Jan	Feb	Mar	2nd Quarter Apr	May	Jun	3rd Quarter Jul
148	First Mobilisation - Site Establishment	2 days	Mon 9/11/20												
149	CONSTRUCTION	131 days	Mon 9/11/20												
150	Begin Set Out	0 days	Mon 9/11/20												
151	Pot Hole for Services	5 days	Mon 9/11/20												
152	CIVILS (PADS, PILES AND ROADS)	36 days	Mon 9/11/20												
153	Earthwork and Pavement	15 days	Mon 9/11/20												
159	Piling	9 days	Mon 23/11/20												
163	Concrete Items	11 days	Thu 26/11/20												
168	Underground Items	21 days	Thu 26/11/20												
172	PIPELINE INSTALLATION	31 days	Mon 21/12/20												
173	Load, Haul and String Linepipe and Bends	2 days	Mon 21/12/20												
174	DN500 East String 1	7 days	Wed 23/12/20												
179	DN500 West Strings 1 and 2	7 days	Thu 7/01/21												
184	DN500 Bends and Riser Legs	7 days	Tue 12/01/21												
189	DN50 Connection to Injection Facility	6 days	Tue 19/01/21												
192	Testing and Drying	9 days	Wed 27/01/21												
198	INSTALL EQUIPMENT & STRUCTURES	30 days	Sat 6/02/21												
199	Site Electrical Equipment Room (Switchroom)	2 days	Sat 6/02/21												
200	Micro Turbine	2 days	Tue 9/02/21												
201	Install Pipe and Cable Supports	4 days	Thu 11/02/21												

ID	Task Name	Duration	Start	2021											
				Aug	Sep	4th Quarter Oct	Nov	Dec	1st Quarter Jan	Feb	Mar	2nd Quarter Apr	May	Jun	3rd Quarter Jul
202	Gas Panel & Injection Panel Supports	2 days	Tue 16/02/21												
203	Light Poles	2 days	Thu 18/02/21												
204	N2 Cylinder Cage	1 day	Sat 20/02/21												
205	Gas Panel Package	2 days	Mon 22/02/21												
206	Grid Injection Panel Package	2 days	Wed 24/02/21												
207	2.5MVa Transformer Package	2 days	Fri 26/02/21												
208	High Voltage Switchgear Package	2 days	Mon 1/03/21												
209	Electrolyser (install Unit)	2 days	Wed 3/03/21												
210	Electrolyser (Connections by OEM)	7 days	Fri 5/03/21												
211	PIPING & PIPE SUPPORT INSTALLATION	24 days	Fri 12/02/21												
216	E&I INSTALLATION	35 days	Fri 12/03/21												
222	PRE-COMMISSIONING	18 days	Thu 22/04/21												
223	DPIE Approval	3 wks	Tue 18/05/21												
224	COMMISSIONING ASSISTANCE	21 days	Wed 2/06/21												