



Hovea Production Facility, Woodada Gas Field & Mount Horner Oil Field Care & Maintenance Environment Plan Summary

Upstream PS Controlled Document

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1 References

Document code	Title
21RSKENVPL002	Hovea Production Facility, Woodada Gas Field & Mount Horner Oil Field Care & Maintenance Environment Plan
21RSKHASPL002	Perth Basin Operations Oil Spill Contingency Plan

2 Term definitions and abbreviations

Term or abbreviation	Definition
AIEA	Annual Internal Environmental Audit
ALARP	As Low As Reasonably Practicable
AWE	AWE Limited
C&M	Care and Maintenance
CP	Cathodic Protection
DER	Department of Environment Regulation
DMP	Department of Mines and Petroleum
DoW	Department of Water
DPaW	Department of Parks and Wildlife
EP	Environment Plan
ESD	Emergency Shutdown
HPF	Hovea Production Facility
MHOF	Mount Horner Oil Field
OSCP	Oil Spill Contingency Plan
PEB	Petroleum Environment Branch
Upstream PS	Upstream Production Solutions Pty Ltd
WGF	Woodada Gas Field
WIA	Well Intervention Activities

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4 Introduction

AWE Perth Pty Ltd is a wholly owned subsidiary of AWE Limited (AWE). AWE is an Australian based oil and gas exploration and production company.

Upstream Production Solutions Pty Ltd (Upstream PS) operates AWE's Perth Basin Facilities (Figure 1). The scope of activities covered under the Care and Maintenance (C&M) Environment Plan (EP) [21RSKENVPL002] includes all well sites under the custody of Upstream PS for C&M purposes.

5 Location

Facilities under C&M are presented in Figure 1 and Figure 2 and Table 1.

6 Timeframe

C&M activities are ongoing.

7 Oil Spill Contingency Plan

The preparedness planning and management of a spill associated with C&M is in accordance with the Oil Spill Contingency Plan (OSCP) [21RSKHASPL002]. The OSCP defines how field and Perth office teams would respond to a liquid spill incident in a manner which minimises the impact on the environment.

Figure 1 - AWE North Perth Basin Production Facilities

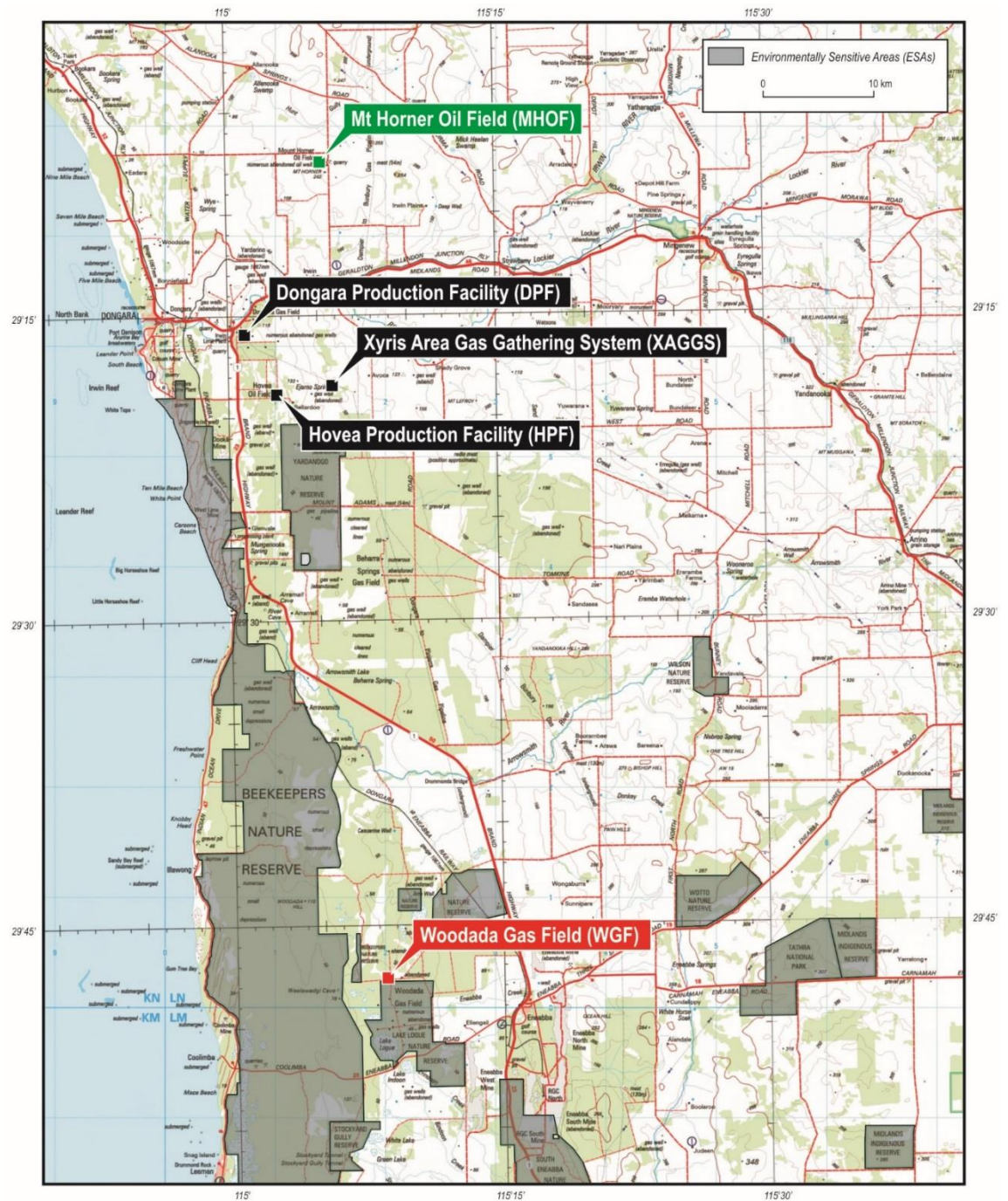


Figure 2 - AWE North Perth Basin Permits

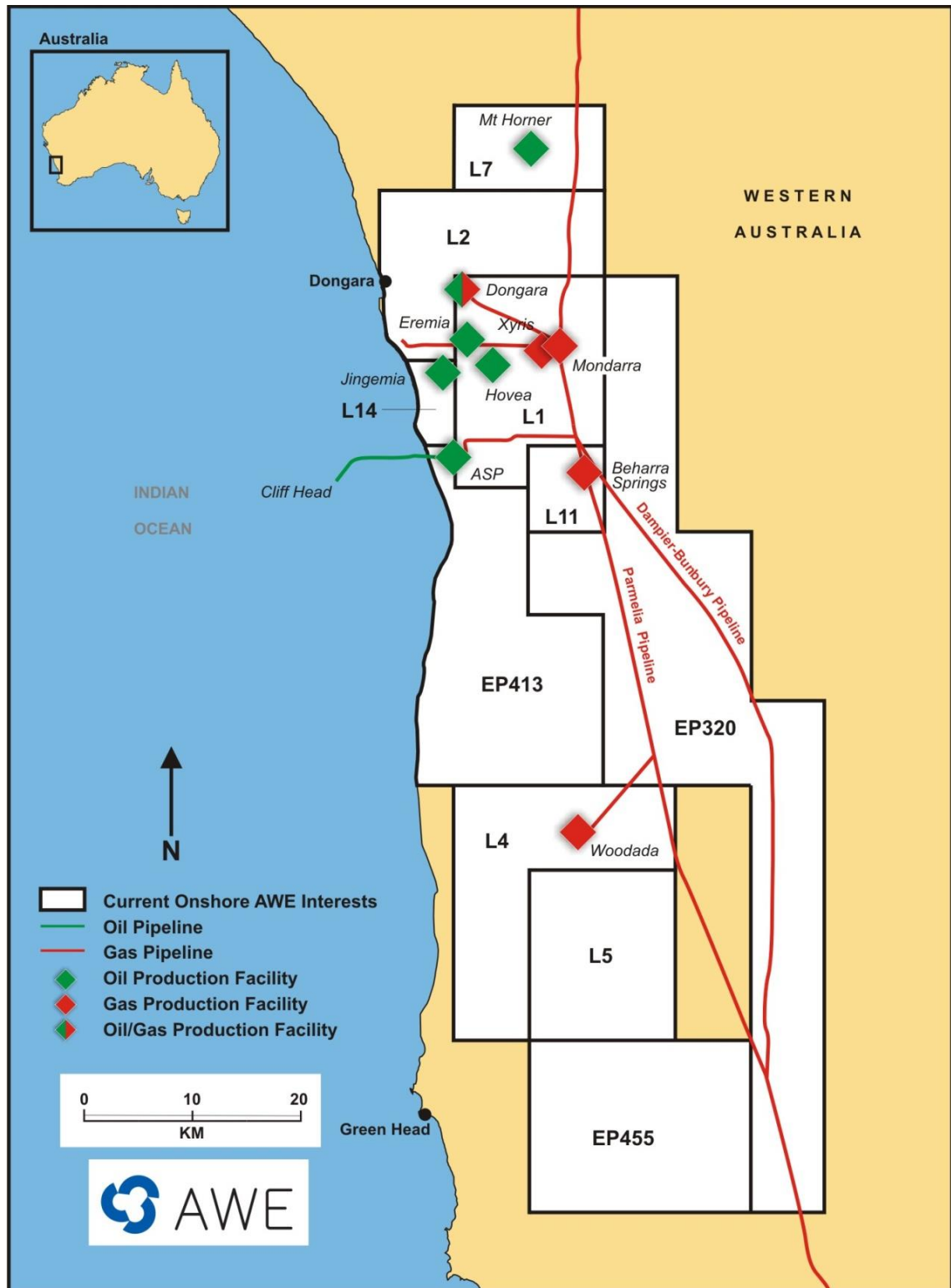


Table 1 - Care and Maintenance Locations

Permit	Wells	Location	Construction	Placed under C&M	C&M Activities
L1/L2	Apium-02 Centella-01 Drakea-02 Eremia-01, 02, 04 & 07 Hovea-02, 03, 04, 07, 08, 10, 11, 12 & 13 Senecio-02 Snottygobble-01 Waitsia-02, 03 and 04 Xyris-01 Xyris South-01	360 km from Perth and 15 km southeast of Dongara township, Shire of Irwin	2003	2012	<ul style="list-style-type: none"> • Routine inspections • Facility, fence, building, CCTV, security checks • Firebreak maintenance (mowing, weed spraying) • Weed control • Diesel fuel power generation (to supply power when required at site) • Chemical storage (at HPF only) • Possible biocide batch dosing for tanks • Wellhead pressure monitoring and bleed off • Low pressure methane gas blanket in place to protect vessels and tanks (<7 sm³/day) • Load out liquid crude oil in storage tanks; sludge may remain • Routine maintenance to preserve equipment: <ul style="list-style-type: none"> – Turn over rotating equipment – Flowline and wellhead cathodic protection (CP) function test – Pipeline route survey – Cycle wellhead emergency shut down (ESD) valves – Cycle gathering line isolation valves – Change desiccant bags in electrical enclosures, junction boxes and panels • Solar powered lighting is in place at HPF • Generally, no other lighting during C&M unless rare night time activities are required • Underground flowlines protected by cathodic protection • Annual CP survey will continue to be conducted
L4/L5	East Lake Logue 01 & 02 Indoon-01 Woodada-02, 05, 06, 08, 10,	280 km north of Perth and 13 km west of Eneabba, Shire of Carnamah	1982	2011	Conducting activities outlined in the WGF C&M Strategy to preserve WGF assets during C&M: <ul style="list-style-type: none"> • Flushing of piping • Depressurising and maintenance of CP system for gathering lines and licenced pipelines

Permit	Wells	Location	Construction	Placed under C&M	C&M Activities
	11, 12, 14, 15, 16, 18 & 19 Woodada Deep-01				<ul style="list-style-type: none"> Preserving insulation, process vessels and columns, coolers and heat exchangers, rotating equipment, fired heaters and diesel and petrol engines Maintain tracks (as required) in February or up until onset of wet areas each year Injection of C&M preservation products Routine inspections (monthly) Wellhead pressure monitoring and bleed off Six monthly water sampling Annual photo monitoring of well sites and gravel pits Environmental management (rehabilitation, weed and dieback management) Operation of the water bore powered via the diesel generator to top-up the anode pond Weed spraying Potential for clearing to maintain access to WGF (tracks and wellpads) under clearing permit CPS3318/3 Woodada Deep-01 activities (covered under WIA EP)
Production Licence L7	Mount Horner-01, 03, 04, 04A, 05, 05A, 07, 08, 09, 12, 13 & 14	350 km north of Perth and 20 km north east of Dongara, Shire of Irwin	1982 and rebuilt in 2000	2011	<ul style="list-style-type: none"> Facility, fence, building, security checks Routine inspections Checks for liquid level on storm drainage Weed control Quarterly water bore sampling Possible biocide batch dosing for tanks Storage tanks may have sludge left in the bottom

8 Description of the Environment

C&M will be conducted on existing areas and will not have additional impacts on the environment to those associated with production activities.

A summary of the environmental aspects that could be affected during C&M relevant to Hovea Production Facility (HPF), Woodada Gas Field (WGF) and Mt Horner Oil Field (MHOF) are presented in Table 2.

Table 2 - Description of the Environment

Aspect	Descriptor
Climate	Windy region with hot dry summers and mild wet winters
Soil	Soils within the Perth Basin are light and sandy and well drained
Groundwater	Ground water flow direction is generally westward. Groundwater at WGF is near or at the surface in the lakes and low lying areas
Surface Water	Surface water includes: <ul style="list-style-type: none"> • Ejarno Spring (XPF) • Lake Logue (WGF) • Eneabba Creek (WGF) • Stockyard Gully (WGF)
Flora	Vegetation at WGF within existing and proposed conservation estate. HPF and MHOF on cleared farmland.
Weeds	Small infestations of introduced species on existing well pads at WGF; eradication program in place. Infestations at HPF and MHOF are managed to keep weeds away from hazardous areas
Fauna	Predominantly introduced mammals (stock, rabbits and foxes) and native animals (reptiles and kangaroos) at HPF and MHOF. Kangaroos, emus, echidnas, reptiles and native birds known to occur at WGF.
Conservation Estate	WGF is within Lake Logue Nature Reserve

9 Environmental Impacts and Risks

The environmental risks and management identified for the commissioning and operations activities ranked medium or above are presented in Table 3.

Table 3 - C&M Environmental Risk Assessment

Aspect	Event	Impact	Consequence	Likelihood	Risk Ranking	Safeguards / Management Methods
Dieback	Movement of vehicles, equipment, vegetation or soil in WGF	Dieback spread would result in vegetation death impacting species richness	3	C	Medium	Hygiene procedures and clean-down station in place (WGF) Access tracks maintained to minimise the potential for dieback spread (WGF) Third party monitoring program in place (WGF); annually by Botanist and 3 yearly by dieback specialist (if required) AIEA
Fire	Bushfire encroachment on fields Bushfire generated at facility	Facility damage Environmental damage (flora, fauna) Impact on Landowners, Nature Reserve	2	C	Medium	Maintenance of required fire breaks No Hot Works during restricted burning period without a permit All access associated with C&M is on designated roads and gravel tracks Maintenance vehicles are cleaned regularly by operators
Security	Third party access Sabotage	Theft Destruction of Property Locked out equipment tampered with (possible spill source)	1	E	Medium	Main plant access gates closed and locked All wellheads fenced or within securely fenced areas Increased security put in place at HPF carpark (CCTV) Minimal portable equipment left on site At least monthly site inspections (HPF at least once a week) AIEA

10 Implementation Strategy

The objective of the implementation strategy below is to describe how all aspects of the activity will be directed, reviewed and managed to ensure that all potential impacts and risks are continuously reduced to as low as reasonably practicable (ALARP):

- (1) Ensure that the agreed environmental performance objectives and standards are met
- (2) Identify specific systems, practices and procedures to be used to ensure that environmental risks and effects are reduced to ALARP
- (3) Establish a commitment to the protection of the environment
- (4) Establish a clear chain of command that sets out the roles and responsibilities of Personnel in relation to the implementation, management and review of the EP
- (5) Ensure that each Employee or Contractor working on, or in connection with C&M has the appropriate skills and training
- (6) Monitor, audit and review environmental performance and the Implementation Strategy
- (7) Maintain quantitative records
- (8) Develop and implement emergency and spill preparedness planning and response capability
- (9) Report on environmental performance
- (10) Provide for appropriate consultation with relevant government authorities and other interested persons or organisations

Details of AWE and Upstream PS's systems, practices and procedures relating to the management of all potential impacts and risks of the activity are included in Table 4. The objective of these systems, practices and procedures is to continuously reduce the potential impacts and risks of the activity to ALARP.

Table 4 - Systems, Practices and Procedures in place during C&M

Title	Document code	Environmental Features
Upstream PS Health Safety, Environmental and Quality Policy	00CMTPOLPY002 00CMTPOLPY003 00CMTPOLPY004	Code of Practice for Upstream PS Field Operations to outline the main HSEQ criteria to be observed at Upstream PS Field Operations
DGF EP	21RSKENVPL001	Documents the environmental management of DGF operations
AWE/Upstream PS Perth Basin Operations OSCP	21RSKHASPL002	Documentation of required response for spill events to ensure timely response and clean-up of spills to minimise/mitigate impact on the environment
AWE/Upstream PS ERP	21RSKHASPL001	Documentation to ensure that AWE/Upstream PS have an effective emergency response management and recovery system (includes environmental emergencies)
HPF C&M Strategy	4811-ON-M0002	Document outlining the proposed actions taken at HPF with respect to C&M
Woodada Gas Field C&M Strategy	4811-ON-M0001	Documentation on the proposed actions taken at WGF with respect to C&M
Upstream PS Management System Standards	00ARIQUASD001	Provides a framework for the management of aspects and impacts at Upstream PS activities
Upstream PS Risk Ranking Matrix	00RSKRIMMA001FM002	Tool to aid assessment of risk (including environmental risks)

Title	Document code	Environmental Features
Upstream PS Inspection Procedure and Checklist	21RSKHASPR002	Provides guidance for monthly inspections (includes environmental elements)
Upstream PS Hygiene Procedure	21RSKENVPL002WI001	Procedure outlining hygiene requirements when working in the WGF
Upstream PS Incident Reporting Procedure	00RSKHASPR003	Documentation of the system which exists for all employees to report all HSEQ Incidents and ensure incidents are investigated to an appropriate level
AWE Land Access Policy Statement, Protocol and Procedure	CP-PM-001,002&003	Documentation on access to land and communication with landowners

11 Consultation

Consultation with regulators and stakeholders will be ongoing during C&M activities.

Stakeholders consulted with during the preparation of this revised C&M EP include:

- Department of Mines, Industry Regulation and Safety (DMIRS PEB)
- Department of Water and Environment Regulation (DWER) Part V Licensing
- Department of Water and Environment Regulation (DWER) Contaminated Sites Branch
- Department of Biodiversity, Conservation Attractions and (PaWs)
- Landowners