Imperial Oil and Gas

EP 187

Appendix 03

Rehabilitation Management Plan

IMP 5-3

Document Control

Date	Rev	Description	Author(s)	Reviewed	Approved
05/02/24	1	Issued as an Appendix of EMP IMP 5-1	Trent S.	Vic F., Peter S., Jon B., Nick F., Kelvin W., Rachel L.	Robin P.
25/07/24	2	Issued as an Appendix of EMP IMP 5-2	inGauge Energy	Imperial Oil and Gas	Imperial Oil and Gas
12/11/24	3	Approved for use as an Appendix of EMP IMP 5-3	inGauge Energy	Imperial Oil and Gas	Imperial Oil and Gas

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1 Introduction

This Activity-specific Carpentaria Pilot Project Rehabilitation Plan (CPPRP) has been developed in accordance with the *Code of Practice: Onshore Petroleum Activities in the Northern Territory* (*the Code*) (Section A.3.9) [DENR 2019] using the *Rehabilitation Plan Guide for Surface Disturbance: Onshore Petroleum Disturbance* [DEPWS, 2020].

2 Scope

The CPPRP applies to the land disturbance associated with the Activity under IMP 5-3 within the CPP Area (**Figure 2—1**). Including:

- New well pads constructed, and those previously constructed (Carpentaria 1, 2/3; Carpentaria 4) under IMP 2-6 and 4-3 (including impact monitoring and control monitoring bores).
- New ground water extraction bores and those previously constructed under IMP 4-3.
- New gravel pits and those previously constructed under IMP 4-3.
- Access tracks, gas, and water flowlines.
- Carpentaria Gas Plant (including communication satellite dish).
- Water Handling Station.
- Campsite.
- Pipelines/pipe work.

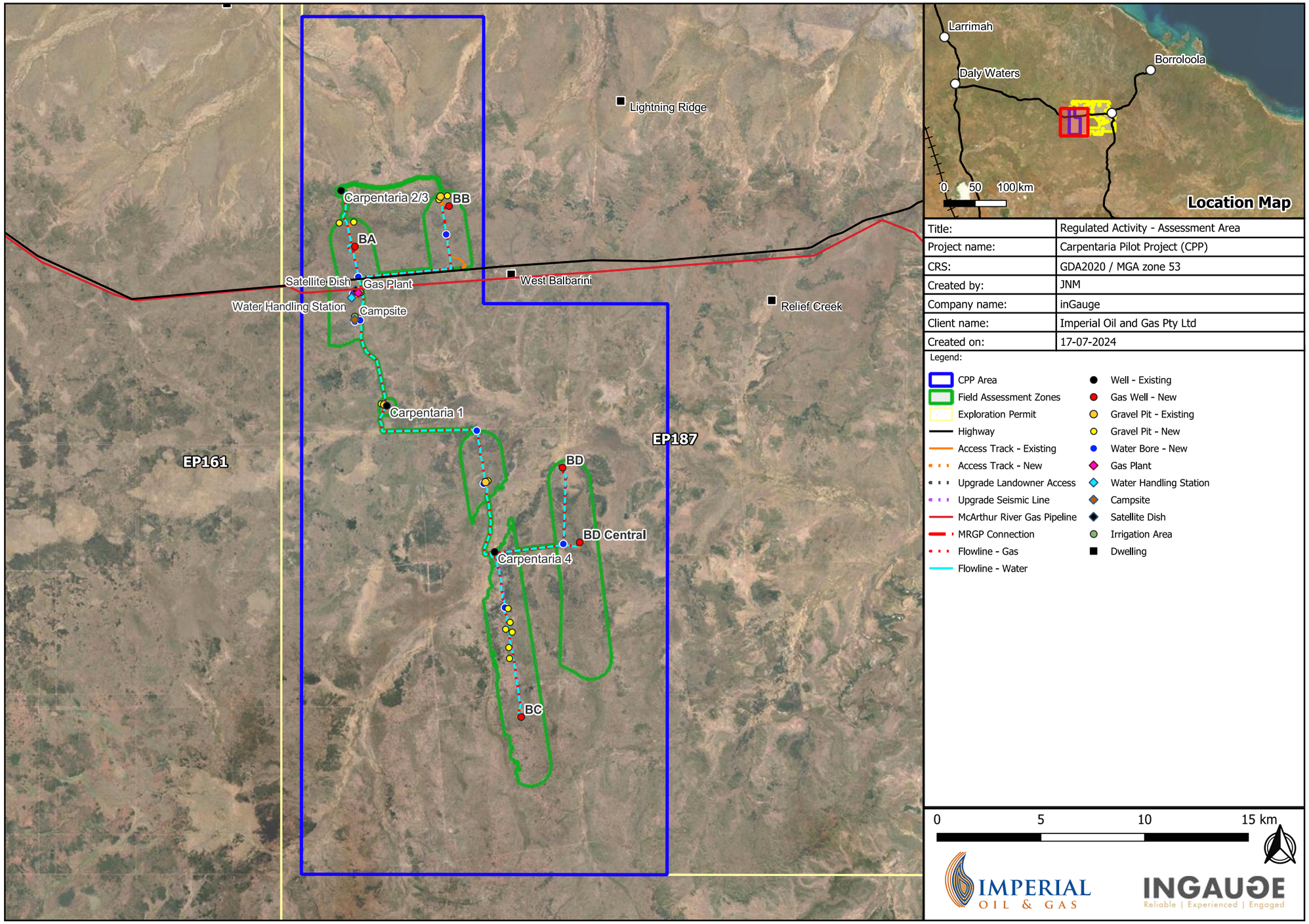

Figure 2—1 CPP Area and Location of the Activity

3 Environmental Description and Risks

The Description of the Environment (EMP - **Section 4**) provides a detailed description and assessment of the CPP Area and environs. The CPP is located north of the 600 mm continental rainfall contour in Australian tropical savannah grassland. This system extends from the Gulf of Carpentaria in north Queensland across the northern half of the Northern Territory and encompasses the Beetaloo basin. This is a tropical arid to semi-arid savannah biome of almost 2 million km^2, and it experiences one of the most seasonal of the world's savannah climates, with 90–95% of rainfall between November and April [M Hill et al., 2010].

The CPP Area is located on the eastern boundary of the Sturt Plateau bioregion on a land system of lateritic plains and rises characterised by high erosional stability and gently undulating plains and rises. The soils are predominantly neutral sandy clay red and yellow earths dominated by deep Red Kandosols, the iconic soil type in the Northern Territory [DEPWS, 2022]. Red Kandosol is the key soil that supports the vast savannah tussock grassland of the Sturt Plateau.

The soils result from prolonged, intense, deep weathering of parent rock material high in iron and/or aluminium oxides and kaolin clays, which gives them their characteristic profile Red Kandosol colour. This soil profile has primarily occurred as substrate weathering of laterites and sedimentation caused by overland flow and deposition of coarse bedload and finer colloids.

Savannah tussock grassland dominates the understorey vegetation in the Sturt Plateau bioregion, including in the CPP Area [DEPWS, 2022]. This vegetation is characterised by large perennial tussock grasses, broad-leaved and lilioid herbs in the inter tussock spaces and a sparse presence of woody plants. In localised areas of higher soil moisture, forbs may dominate over tussock grasses [DEPWS, 2022].

Savannah tussock grasses are considered resilient perennial vegetation that is relatively unproblematic to rehabilitate in CPP deep loam clay sand Red Kandosol soil, provided erosion control is managed. This is evidenced by Sturt Plateau savannah recovery after drought, fire, and overgrazing effects; as well as evidenced by the ongoing monitoring of the Imperial EP 187 seismic line rehabilitation [Imperial, 2023]. On average 6 - 8% of the Sturt Plateau bioregion area 98,500 km^2) is burned each year (**EMP - Section 4.1.9**).

The Carpentaria Highway bisects the CPP Area from east to west and is aligned generally following a topographic high point in the landscape, known locally as the Favenc Range, on the northern side of the Carpentaria Highway. Within the CPP Area, key CPP sites are in an elevation bandwidth of approximately 220 m to 270 m AHD; the latter elevation is the peak of the Favenc Range. The highest stream order (3) in the CPP Area occurs at the headwaters of Relief Creek and reflects the general site elevation at the top of two catchments, coinciding with the crest of the Favenc Range. CPP well pads and infrastructure facilities have been located above the 1/100-year flood inundation level (**EMP - Section 4**).

The Ecological Assessment (**Appendix 01**) has a complete description of the land types, relevant bioregions, and environmental features within the Project Area.

Environmental Risks and Mitigation Measures (**EMP - Section 6**) provides details of the results of the environmental risk analysis for the EMP. Environmental Performance Standards (EPS) were developed to address the key environmental factors and risk sources. Measurement criteria supported by record-keeping have been developed for each EPS.

Success criteria, detailed below in **Section 6**, have been developed for the CPP Area. The Environmental Risks, Controls and Mitigation Actions associated with rehabilitation are presented in **Table 3—1**.

Table 3—1 Environmental Risks, Controls and Mitigation Actions

Site-specific Environmental Risks	Controls and Mitigation Actions
Removed Topsoil Washed Away	• Removed topsoil (~ 100 mm) will be stockpiled away from water flow paths unless used as a diversion bund.
Removed Topsoil Does Not Maintain Seedbank	• Topsoil stockpiled in berms to be < 1.5 m in height to maintain a seed bank and high cation exchange capacity soil.
Presence of Weeds of Concern	• Baseline weed survey conducted in October 2023 (**Appendix 04**) did not identify any declared or priority weeds within the project area. Annual post-Wet Season weed surveys of access tracks, flowlines, well pads and facilities will determine whether any subsequent weed introductions have occurred. All personnel and contractors will be made aware of any identified weed infestations and to avoid travelling through infested areas until weeds have been treated. • Vehicles are required to complete weed self-declarations upon entering the CPP Area. • Vehicles will stay on cleared/formed access tracks post-civil construction works. • Identified weeds will be controlled in line with the *Northern Territory Weed Management Handbook* [Northern Territory Government, 2021].
Cattle Grazing (Post reinstatement of topsoil and disbursement of seed)	• At the time of rehabilitation, the CPP well pads and other CPP infrastructure areas (excluding access tracks, flowlines, pipelines, water bore pads, and gravel pits) will be fenced until vegetation is established.
Soil Compaction (From vehicle and machinery movements on access tracks and well pads as well as facility placement)	• At the time of rehabilitation, areas of compaction will be alleviated by mechanical means (ripping, scarifying, harrowing) to assist in vegetation regrowth.
Subsidence (From buried flowlines)	• Abandonment of flowlines in situ (left in trenches).
Erosion Risk (New clearing and exposed soil)	• The creation and implementation of a site-specific Erosion and Sediment Control Plan (ESC) (**Appendix 05**) that includes controls to divert water flow around the well pads and other infrastructure sites and control stormwater run-off. • Monitoring and maintenance of ESC measures until final rehabilitation is complete.
Contamination Risk	• Controls in place in accordance with the Spill Management Plan (**Appendix 07**) to minimise risk of spills and contamination to the environment. • If contamination occurs, remediation will commence immediately if safe and feasible.
Bush Fire Risk	• Controls in place in accordance with the Bush Fire Management Plan (**Appendix 12**).

4 Final Land Use

Progressive rehabilitation of significantly disturbed land, which is not required for the ongoing conduct of the Activity or future Activity, will commence no later than 12 months following the cessation of Activity on the land and progress until the Minister is satisfied the environmental outcomes and obligations under the EMP have been met.

Significantly disturbed land is defined as a) contaminated land; or b) has been disturbed and requires human intervention to rehabilitate it to the condition it was in immediately before the disturbance (e.g., land which is now more susceptible to erosion, reduced land use capability or reduced water quality downstream of the land).

Subject to the consideration in **Section 9**, all significantly disturbed land that is not required for ongoing or future Activity will be rehabilitated through assisted regeneration to a state as close as practicable to its pre-disturbed condition, consistent with final land use and ecological values compared to analogue sites.

5 Rehabilitation Works

To facilitate achieving rehabilitation success, the following works will be carried out:

- Analogue sites will be identified and surveyed adjacent to cleared areas.
- Photo monitoring points (may include drone use) will be established, and images will be captured at the clearing area and at the analogue site.
- Where vegetation is cleared, it will be stockpiled and stored separately to topsoil stockpiles or mulched and used as an ESC measure.
- Where topsoil stripping is required, topsoil will be stockpiled in piles no higher than 1.5 m to ensure that topsoil and the existing seed bank are maintained for rehabilitation.
- Where required, excavated subsoils are to be stockpiled separately from topsoil material.
- Topsoil stockpiles will be located away from water flow paths (unless used as water diversion bunds).
- To maintain a stable landform, ESC measures will be installed and maintained ESC Plan (**Appendix 05**).
- Identify and remediate any spills that may require action in addition to the initial spill response. **Appendix 07** (Spill Management Plan) applies.
- Stockpiled soil (where applicable) will be respread to return the site to contours similar to the surrounding area.
- Where cut and fill activities have been carried out, material will be respread to return the site to contours like the surrounding area.

- After the backfilling of flowline trenches, the excavation will be reinstated as soon as practicable, including pulling stockpiled timber back over the ROW to aid as a barrier for vehicle access.
- The extent of disturbance post or during clearing will be captured geospatially to help depict areas cleared.
- Gravel pits will be recontoured back to a stable, safe and non-polluting form. Batters will be flattened slightly without increasing the disturbed area.
- Disturbed area will be scarified across the contour to a depth of at least 50 mm prior to topsoil placement.
- Topsoil will be spread over the rehabilitated area to encourage natural regeneration.
- Topsoil to be left with a rough surface finish, e.g. track rolled up/down contours.
- To maintain a stable landform, ESC measures will be installed and maintained as per the ESC Plan (**Appendix 05**) until removal is deemed appropriate.
- Where available, stockpiled timber will be spread across the rehabilitated area.
- Visual inspections for ESC maintenance and weed control will occur annually at the end of the Wet Season until the Minister is satisfied the environmental outcomes and obligations under the EMP have been met.

5.1 Well Suspension and Decommissioning

Well heads removed at the time of abandonment and site left safe and free from contaminants.

5.2 Dismantling / Removal of Facilities

Infrastructure at the Carpentaria Gas Plant and Water Handling Station will be removed, and the site left safe and free of contaminants.

The Code's analytical methodology for Drilling Waste (DW) assessment is based on nationally used solid waste classification methods that utilise both Total Concentrations (TC) and Leachable Concentrations (LC) for specific COPC in the DW material (e.g. NEPM, 2011 [NEPC, 2011]; [Victorian Environment Protection Agency, 2021]). *The Code* specifies 80 analytes that are required to be measured in the DW assessment. *The NEPM Assessment of Site Contamination Measure (1999*) refers to the *Industrial Waste Resources Guideline* (IWRG) published by Victorina EPA. The total concentrations and leachable concentrations are compared to published solid waste classification screening criteria [Victorian Environment Protection Agency, 2021]) for leachable and total concentrations contaminants of Potential Concern (COPC) to determine the appropriate classification and methodology required for contamination assessment and associated containment of the soil material.

Table 5—1 provides the threshold total concentrations for COPC for fill material. Fill material is industrial waste, but not priority waste, with extremely low levels of contamination. It's

considered safe to use without containment. It has been selected because it is the most conservative solid waste classification criteria.

Drilling waste from the stockpile of DW at Carpentaria 1, Carpentaria 2/3, and Carpentaria 4 have been assessed. None of the COPC at the 95% upper confidence limit (UCL) exceeded the screening criteria listed in **Table 5—1**.

The screening criteria listed in **Table 5—1** also provide useful and specific measurement criteria for assessing potential Activity-attributable soil contamination resulting from spills or unintended releases and for assessing soil status during the rehabilitation of disturbed areas [C Richards et al., 2023].

Table 5—1 Fill Material Contamination Total Concentration Upper Limit for Industrial Waste that Is Soil ([VICTORIAN ENVIRONMENT PROTECTION AGENCY, 2021]).

Contaminant	Fill Material Upper Limit TC as Dry Weight (mg/kg)
Inorganic Species	
Arsenic	20
Cadmium	3
Chromium (VI)	1
Copper	100
Lead	300
Mercury	1
Molybdenum	40
Nickel	60
Tin	50
Selenium	10
Silver	10
Zinc	200
Anions	
Cyanide	50
Fluoride	450
Organic Species	
Phenols (halogenated)	1
Phenols (non-halogenated)	60
Monocyclic aromatic hydrocarbons	7
Benzene	1
Polycyclic aromatic hydrocarbons	20

Contaminant	Fill Material Upper Limit TC as Dry Weight (mg/kg)
Benzo(a)pyrene	1
C6-C9 petroleum hydrocarbons	100
C10-C36 petroleum hydrocarbons	1,000
Polychlorinated biphenyls	2
Chlorinated hydrocarbons	1
Pesticides	
Organochlorine pesticides	1

5.3 Flowline Abandonment

Decommissioned water/HF flowback or gas networks will be disconnected from all fluid sources, including tanks and other pipes, and flushed up to two times the pipeline volume using fresh bore water.

Water will be flushed to above ground tanks, fluid in the lines or fluids used to flush will be disposed of in accordance with the Waste and Wastewater Management Plan (**Appendix 06**).

Spot checks of the Electrical Conductivity (EC) of flushed water will be used to verify removal of contaminants by comparison to the fresh bore water used to flush the line.

Flowlines will be left in situ to prevent subsidence of the excavated trench and re-disturbance of the ground.

When a network is abandoned, the following work will be completed:

- The cutting and removal of all sections of buried lines that come to the surface:
    - At a minimum of 750 mm below the natural surface, or
    - At the line depth, whichever is the lesser.
- The entry and exit points to/from flowlines will be cut below ground and a pressure-rated cap welded on.
- The removal of all surface equipment.
- The removal of all signage associated with the network on completion of the rehabilitation.

Upon completion of the flowline abandonment, records identifying and locating sections of the abandoned network shall be prepared as part of the final rehabilitation report. These records will be made publicly available (e.g., dial before you dig) to prevent possible mistakes in identifying an abandoned flowline as an operational flowline.

6 Rehabilitation Success Criteria

6.1 Rehabilitation Success Criteria Overview

To assess rehabilitation progress in decommissioned, rehabilitated, and closed areas, annual ground and aerial survey imagery will be compared to analogue monitoring sites adjoining disturbance areas. Analogue sites chosen are adjoining or adjacent to cleared land that is representative of the landforms being rehabilitated.

Rehabilitation site success is determined by comparing the rehabilitated areas, with information obtained from pre-disturbance land condition assessment surveys to adjacent vegetation communities (analogue sites). This comparison exercise will combine ground assessment with image analysis from photo monitoring.

The maintenance of baseline fluvial geomorphic features at creek crossing trenching corridors can also be determined by comparing high-precision baseline surface elevation mapping and high-resolution orthophotography with respective rehabilitated creek crossing corridors.

Rehabilitation success measures are presented in **Table 6—1**.

Table 6—1 Rehabilitation Success Criteria

Objectives	Success Criteria
Areas used for the Activity are rehabilitated consistent with surrounding land uses and ecological values as compared to analogue sites.	• Final assessment report demonstrates that perennial groundcover and canopy-cover vegetation, as assessed between analogue sites and adjacent cleared area, is equivalent to 70% of the adjacent vegetation cover.
No priority or declared weeds in areas being rehabilitated.	• Final assessment report demonstrates that no priority or declared weeds are present.
No ongoing erosion from cleared areas used during the Activity.	• Inspection reports demonstrate that identified erosion issues are being remediated and sediment control measures in place. • Negligible erosion present on access tracks and cleared areas. • Final assessment report demonstrates no significant erosion attributable to the Activity.
Rehabilitated areas are safe for continued land use.	• Inspection and final assessment reports demonstrate no subsidence associated with flowlines.

Objectives	Success Criteria
	• Wells suspended and decommissioned. All above-ground equipment removed. • Incident reports demonstrate that all chemical, fuel, lubricant and wastewater spills were remediated as soon as practical after the spill.

7 Monitoring and Maintenance Program

7.1 Monitoring and Maintenance Program Overview

Imperial will inspect and maintain areas that are being progressively rehabilitated in line with **Table 7—1** (Inspection, Maintenance, and Reporting). All rehabilitation monitoring works are scheduled around the defined Wet Season; re-entry to the CPP will be subject to weather/road conditions.

A suitably qualified person will conduct the final rehabilitation assessment and prepare a report for inclusion with the submission to the Minister for approval.

A suitably qualified person is '*A person who has professional qualifications, training or skills or experience relevant to the nominated subject matters or tasks and can give authoritative assessment, advice and analysis about performance relevant to the subject matters using relevant protocols, standards, methods or literature or conduct tasks in accordance with requirements*' (p.118 of *the Code*).

Table 7—1 Inspection Maintenance and Reporting

Rehabilitation Phases	Rehabilitation Survey	Method	Measurable Attributes	Corrective Actions	Maintenance	Reporting
Planning and Design: No more than 12 months prior to construction	• Identify analogue sites and establish photo monitoring points. • Survey vegetation ground cover and canopy height at analogue sites for cleared areas.	• Desktop assessment geospatial assessment. • Ground and drone/aerial survey.	• Ground cover (%) • Canopy cover (%) • Erosion (qualitative – photo evidence of scarring, rill/sheet erosion).	N/A	N/A	• Pre-clearing baseline assessment report.
Stabilisation and Maintenance: Ongoing	• Inspect/monitor cleared areas and/or areas being progressively rehabilitated.	• Visual inspection of ESC measures and weed growth on access tracks, and locations of infrastructure and facilities.	• Any erosion is controlled, and site is stable. • No priority or declared weeds present.	• ESC measures cleaned/remediated. • Weed management conducted.	• Remove the sediment from fences/traps and re-contour banks. • Repair and reinstate ESC measures. • Remove or spray weeds.	• ESC and Weed inspection reports. • Incident reports.
Progressive Rehabilitation: Ongoing annual/post local Wet Season inspections until Success Criteria are met	• Inspect areas being progressively rehabilitated annually at the end of the defined Wet Season. • Assessments of fire frequency and intensity.	• Inspect ESC measures and weed growth. • Inspect for subsidence of flowline. • Survey (ground, air or drone imagery) to inspect re-growth in comparison to analogue sites if cleared land is being rehabilitated. • Photo monitoring, drone/aerial imagery. • Desktop assessment for fire management.	• Any erosion is controlled, and site is stable No priority or declared weeds present. • Re-growth on trajectory to meet 70% ground and vegetation cover at analogue site.	• ESC measures cleaned/remediated. • Weed management conducted. • Additional seeding. • Soil amelioration.	• Remove the sediment from fences/traps and re-contour banks. • Repair and reinstate ESC measures. • Remove or spray weeds.	• Annual inspection report. • Annual fire mapping.
Annual Rehabilitation Inspections: Starting twelve months after rehabilitation commences until Minister satisfied with rehabilitation outcomes	• Inspections by a suitably qualified person (SQP).	• Survey (ground, air or drone imagery) in comparison to analogue sites if cleared land being rehabilitated. • Photo monitoring, drone/aerial imagery. • Weed inspections.	• Re-growth on trajectory to meet 70% ground and vegetation cover analogue site. • No priority or declared weeds present.	• Weed management conducted. • Additional seeding. • Soil amelioration.	• Remove or spray weeds.	• Annual inspection report.

Rehabilitation Phases	Rehabilitation Survey	Method	Measurable Attributes	Corrective Actions	Maintenance	Reporting
Completion of Rehabilitation Subject to Minister being satisfied with rehabilitation outcomes	• Final inspection by SQP	• Site inspection by a third-party SQP.	• Ground and perennial cover on the trajectory to be the equivalent to 70% of the analogue site. • Negligible erosion present on rehabilitated land. • No subsidence-associated flowlines. • No established priority or declared weeds identified during monitoring events.	• Dependent upon a third-party report recommendation.	• Dependent upon a third-party report recommendation.	• Final report for Minster review and approval.

8 Relinquishment and Transfer of Liability to Leaseholders

The transfer of infrastructure to leaseholders should only be considered once all remediation and rehabilitation works have been carried out and the long-term stability of the infrastructure can be adequately demonstrated. If a leaseholder(s) requests access tracks or groundwater bores to be left on EP 187, several matters must be resolved, including:

- Written and signed evidence from the leaseholder outlining the access tracks and/or groundwater bores to be transferred (including maps of specific infrastructure), noting the leaseholder is required to accept liability for future management of transferred infrastructure.
- Evidence that any infrastructure intended for transfer to a leaseholder is acceptable to the Pastoral Land Board.
- Evidence demonstrating that tracks are in a suitable location and appropriately constructed to remain open, noting erosion and sediment controls may be required in some locations and evidence of the installation of control measures to provide for long-term stability.

Note: At the time of drafting this plan, it is mandatory, under *the Code*, to rehabilitate all areas not required for future use (in the conduct of a (future) Regulated Activity).

9 Annual Review

This CPPRP should be reviewed and updated annually, based on progressive rehabilitation activities, identification of reference sites or changes to the disturbance footprint that may have occurred during the previous year – for example, new disturbances (sites/linear infrastructure, erosion, fire or weed coverage).

This CPPRP may also be updated as risks change (e.g. additional land clearing, spill incidents requiring remediation, gravel pits or access tracks that are no longer required).

Performance against commitments made in this CPPRP is to be included as a component of the Annual Environment Performance Report for the EMP.

Annual reviews will cease once the Minister is satisfied with the rehabilitation outcomes.

10 Plan on a Page

Imperial has drafted an indicative one-page Rehabilitation Management Plan, shown in **Table 10—1**, to provide a quick reference summary of the Plan.

Table 10—1 One-Page Rehabilitation Management Plan

Draft One-Pager Rehabilitation Plan 2024	Contact Details			Project Area Details	
	Title of Responsible Person:	Role:	Civils & Construction Manager	Exploration Permit:	187
		Phone:	[redacted]	Total area of surface disturbance:	226 ha
		Email	[redacted]	Total area covered by this RP:	269 ha

Pre-disturbance Land Condition Summary, Land Uses, Rehabilitation Objectives & Risks

Pre-disturbance land condition summary: Imperial has conducted exploration in the CPP Area since 2019. The CPP Area is situated in the Australian tropical savannah grassland and features a landscape of lateritic plains and high erosional stability soils, primarily deep Red Kandosol. This region, part of the Sturt Plateau bioregion, is characterised by its seasonal climate and resilient savannah tussock grassland. The vegetation, adapted to recover from environmental stresses like drought and fire, thrives in this unique ecological setting influenced by the local topography, including the Favenc Range.

Land Uses:

- Cattle grazing and gas exploration.

Rehabilitation Objectives:

- Areas used for the Activity are rehabilitated consistent with surrounding land uses and ecological values as compared to analogue sites.
- No priority or declared weeds in areas being rehabilitated.
- No ongoing erosion from cleared areas used during the Activity.
- Rehabilitated areas are safe for continued land use.

Rehabilitation Risks:

- Soil compaction caused by vehicle traffic
- Increased weed proliferation and heightened fire intensity due to exposed land surfaces, potentially hampering revegetation efforts.
- Damage to immature vegetation or regeneration processes from extreme weather events such as floods, fires, cyclones, and droughts.
- Grazing by fauna on seedlings could impede the success of rehabilitation efforts.

Rehabilitation Management Zones

The CPP Area is shown in the figure below. Due to the spread of infrastructure and the flexibility in site selection, the rehabilitation management zones are based on the proportional presence of vegetation and soil types within the Infrastructure Movement Zone (IMZ). The table below provides a summary of the vegetation and soil that make up the area that could potentially be disturbed by the Activity.

Vegetation (SREBA) in IMZ	%	Soils in IMZ	%
Corymbia/Eucalyptus open woodland on sandy loam	36	Leptic Rudosols, Leptic Tenosols, Red & Yellow Kandosols	61
Snappy gum low open woodland	21	Shallow to moderately deep Ferric Yellow Kandasols	23
Lancewood forest	14	Leptic Rudosols & Leptic Tenosols	6
Eucalyptus chlorophylla low open woodland	11	Grey & Brown Vertosols	3
Corymbia/Eucalyptus woodland on sandstone	5	Leptic Rudosols	3
Track/Leaseholder	5	Aquic Vertosols, Red & Yellow Kandasols & Orthic Tenosols	2
Corymbia/Eucalyptus woodland (run-on areas and heavier soils)	2	Brown Vertosols, some Yellow Kandasols	1
Silver box low open woodland	2		
Melaleuca low open woodland on floodplains and drainage depressions	2		
Other Vegetation	2		

Estimated Potential Disturbance Areas

Infrastructure	Estimated Max Disturbance (ha)
Well pads (new and expansions)	62.1
Access tracks	24.2
Flowlines	60
Pipeline	3.2
Campsite	1.2
Gravel pits	56.7
Water bore pads	1.1
Comms. sat. dish	0.3
Compressor station	5.7
Water handling station	10.6
Existing disturbance being re-utilised	43.4

Rehabilitation Approach Summary

- Operate within an infrastructure movement zone to preferentially select the most environmentally friendly location for infrastructure.
- Establish analogue sites and photo monitoring points to capture images before and after clearing.
- Stockpile topsoil and cleared vegetation to preserve it for rehabilitation.
- Implement and maintain ESC measures as outlined in the ESC Plan (**Appendix 05**).
- Respread stockpiled soil and excavated subsoils to match the surrounding area's contours, ensuring landform stability.
- Reinstate excavation areas promptly after trench backfilling, using stockpiled timber to restrict vehicle access and aid rehabilitation.

Visual inspections for ESC maintenance and weed control will occur annually at the end of the Wet Season until the Minister is satisfied the environmental outcomes and obligations under the EMP have been met.

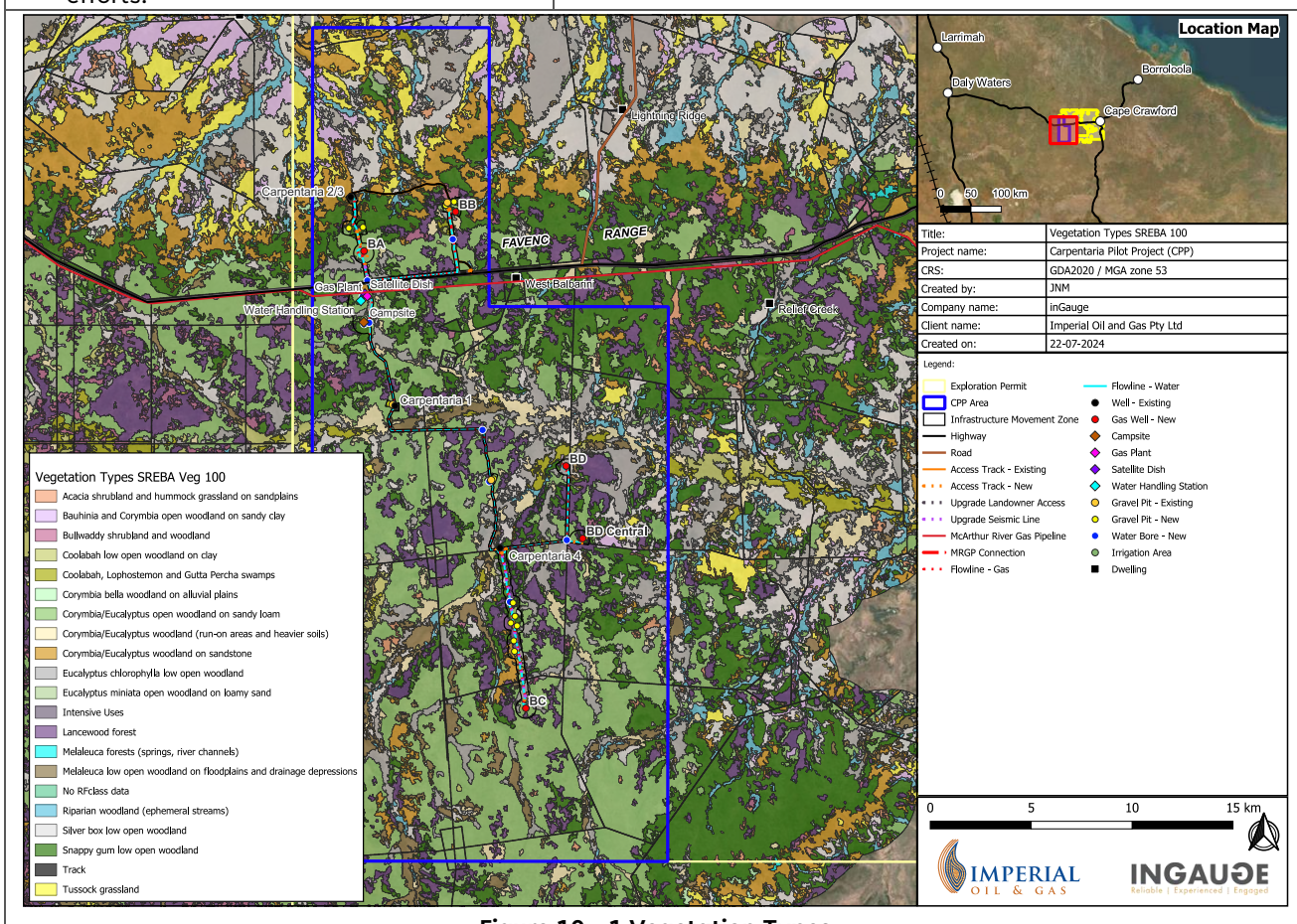

Figure 10—1 Vegetation Types

Rehabilitation Success Criteria

- Final assessment report demonstrates that perennial groundcover and canopy-cover vegetation, as assessed between analogue sites and adjacent cleared area, will be the equivalent of 70% of the adjacent vegetation cover.
- Final assessment report demonstrates that no priority or declared weeds are present.
- Inspection reports demonstrate that identified erosion issues are being remediated and sediment control measures in place; and
- Negligible erosion present on access tracks and cleared areas.
- Final assessment report demonstrates no significant erosion attributable to the Activity.
- Inspection and final assessment reports demonstrate no subsidence associated with flowlines.
- Wells suspended and decommissioned. All-above ground equipment removed.
- Incident reports demonstrate that all chemical, fuel, lubricant and wastewater spills were remediated as soon as practical after the spill.

Rehabilitation Management Plan Prepared by:	Trent Smith (HSE & Compliance Manager)

11 References

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Imperial Oil & Gas

EP 187

Appendix 04

Weed Management Plan

IMP 5-3

WEED MANAGEMENT PLAN
EP187

Client: Imperial Oil and Gas

STATUS: Final

REPORT No: IOG-08

ISSUE DATE: January 2024

FOX & CO
ENVIRONMENTAL

Important Note

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Version	Status	Author	Reviewer	Change from Previous Version	Authorised for Release (signed and dated)
Draft	-	P. Fox	A. F	N/A	
Final	A	P. Fox	R. Leembruggen, T. Smith	Minor edits	

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Rachel Leembruggen	

EXECUTIVE SUMMARY

Previous weed assessments have been undertaken on the Imperial Oil and Gas Limited (IOG) exploration tenement EP187 in relation to the 2021-2023 exploration program and the 2019-2020 seismic and drilling program. Previous pre-exploration weed surveys were undertaken in dry season conditions (October and November 2018 and September 2019) and post-wet season conditions (April 2019). A post-wet season / post-exploration activity weed survey was undertaken in June 2020, March 2021, March 2022 and March 2023. These historical weed assessments are incorporated into this Weed Management Plan to provide comprehensive baseline data of existing weed species surveyed within EP 187.

IOG proposes to undertake initial scope field assessment activities on EP187, described herein as the Carpentaria Pilot Project (CPP). A weed survey was undertaken in October 2023 over the field assessment zones.

This report consolidates all previous weed survey activities and data and includes new survey data for surveys undertaken in October 2023.

One weed species was recorded inside the IOG work area during the October 2023 field survey (*Bidens Pilosa* (Cobbler's Peg)) which is not a declared weed in the Northern Territory.

A range of mitigation measures and monitoring protocols have been recommended to reduce the risk and associated impacts of new weed introductions on the tenement.

Acronyms and Abbreviations

Acronyms/Abbreviation	Description
DEPWS	Department of Environment, Parks and Water Security (Formerly DENR)
IOG	Imperial Oil & Gas
LCP	IOG Land Clearing Permits
LCG	NT Land Clearing Guidelines LCG
WMP	Weed Management Plan
WONS	Weeds of National Significance

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APPENDICES

1. INTRODUCTION

Fox & Co Environmental Pty Ltd (Fox & Co) conducted pre and post-seismic weed surveys for Imperial Oil & Gas (IOG) exploration activities on EP187 between 2018 and 2023. This report consolidates all previous weed survey activities and data and includes new survey data for the Carpentaria Pilot Project (CPP) initial scope surveys undertaken in October 2023. The following programs are included in this Weed Management Plan (WMP):

- 2019 - 2020 Exploration Program
- 2021 – 2023 Exploration Program
- 2023 CPP Initial Scope

The following reports have been consolidated to inform preparation of this WMP:

- *Weed Management Plan, 2018 Seismic Program, EP187, Premise Environment, November 2018, Report # 1802587e*
- *EP187 Post-Wet Season Weed Survey, Fox & Co Environmental, June 2019, Report IG-01*
- *EP187 Post-Wet Season Weed Survey, Fox & Co Environmental, June 2020, Report IG-03*
- *Weed Management Plan EP187, Fox & Co Environmental, March 2023, Report IG-05*

In addition to the above reports, a desktop assessment and review was undertaken prior to all survey to familiarise with existing information and any changes (if any) of weed listing status. Literature reviewed included NT Department of Environment, Parks and Water Security (DEPWS) records and alerts:

- DEPWS known weed records;
- DEPWS information alerts.

Weeds considered prime concern in relation to IOG's proposed seismic and drilling operations, based on known occurrence and threat of introduction include:

Mesquite (*Prosopis spp.*), Prickly acacia (*Vachellia nilotica*), Parkinsonia (*Parkinsonia aculeata*), Chinee apple (*Ziziphus mauritiana*), Mimosa (*Mimosa pigra*), Bellyache bush (*Jatropha gossypiifolia*), Gamba grass (*Andropogon gayanus*), Neem (*Azadirachta indica*), Grader grass (*Themeda quadrivalvis*), Snake weed (*Stachytarpheta spp.*), Devils claw (*Martynia annua*), Hyptis (*Hyptis suaveolens*), Khaki weed (*Alternanthera pungens*), Sida (*Sida acuta, Sida cordifolia, Sida rhombifolia*), Lion's tail (*Leonotis nepetifolia*), Parthenium (*Parthenium hysterophorus*) and Rubber vine (*Cryptostegia spp.*).

A weed is defined as any plant that requires some form of action to reduce its harmful effects on the economy, the environment, human health and amenity. (Australian Government Department of Agriculture, Water and the Environment, 2017). There are two types of invasion: introduction of exotic plants and movement by native species into new areas well outside their native range. Weeds have an adverse effect on an area's environmental values and ecological functioning for the following reasons:

- Competition with native species;
- Change in the structure of a plant community through addition or removal of strata;
- Repress recruitment of native species;
- Change the natural fire fuel characteristics, which can change the natural fire regime to the detriment of native species, often resulting in the loss of native species;
- Change the food sources and habitat values available to native fauna, reducing some and increasing others;
- May change geomorphological processes such as erosion; and
- May lead to changes in the hydrological cycle.

Weed species considered to be of greatest threat to natural and economic values on a national basis have been ranked as Weeds of National Significance (WONS) (Thorp & Lynch, 2000). Weed significance at a national level was assessed using four major criteria:

- Invasiveness;
- Impacts;

- Potential for spread; and
- Socio-economic and environmental impacts.

At the Northern Territory level, the Weeds Management Act (the Act) (Northern Territory Government, 2001) identifies those weed species that represent a threat to primary industries, natural resources and the environment.

1.1 LOCATION

EP187 is situated in the upper reaches of the McArthur River in proximity to the Barkly Tablelands. The tenement lies to the west of the Tablelands Highway and is crossed east to west by the Carpentaria Highway. Figure 1 displays the location of the tenement area. Access within the tenement is along the Carpentaria Highway and Broadmere Road.

1.2 2023 CPP EMP INITIAL SCOPE FIELD ASSESMENT ZONES

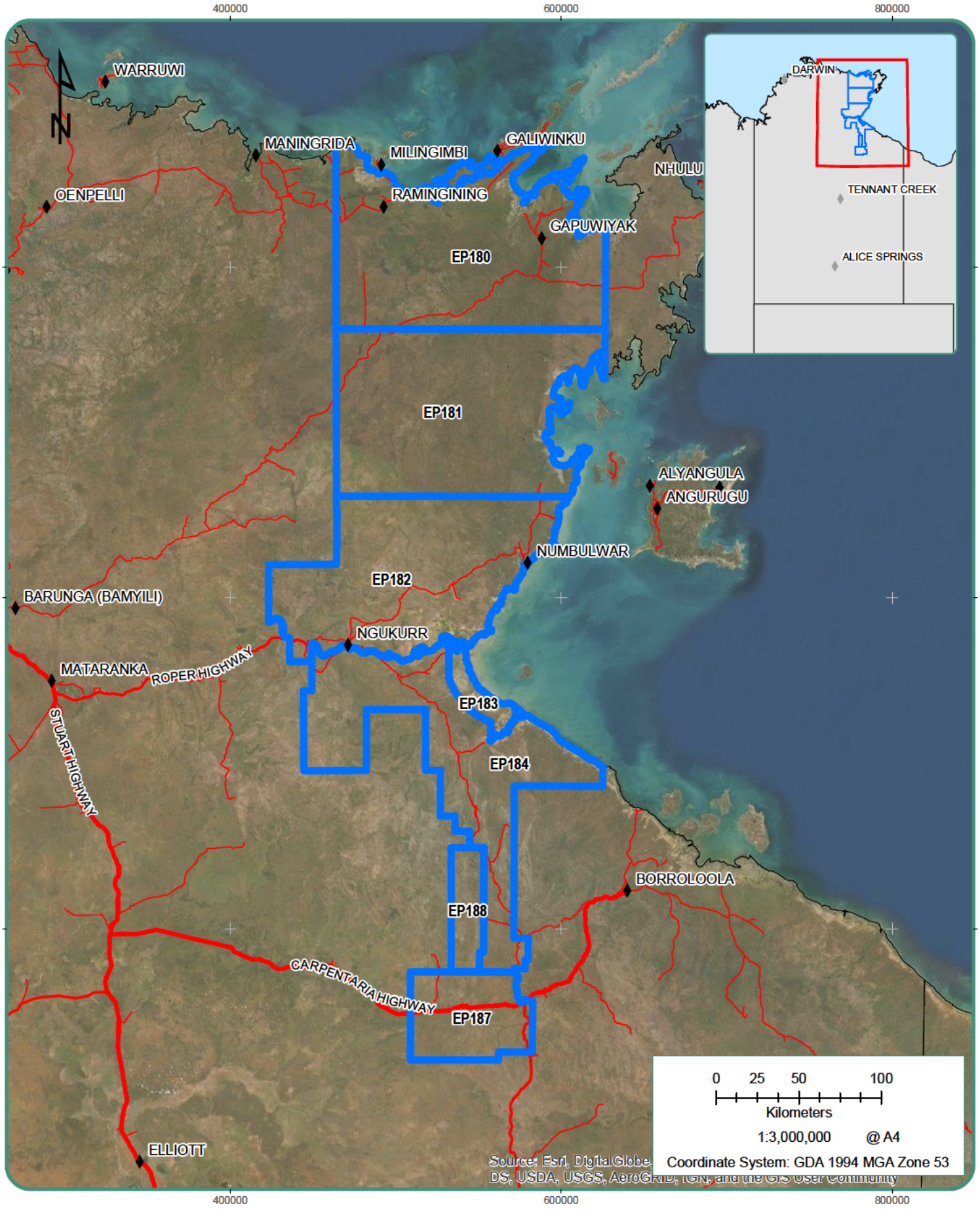
The proposed CPP initial scope areas include:

- Five new well locations (BA, BB, BC, BD and BD Central)
- Gas and wastewater flowlines
- Infrastructure area which includes gas plant, water handling station and campsite

Figure 10 shows the initial CPP assessment areas.

Table 1 Wellpad locations October 2023

SITE	Seismic Line	Easting	Northing
Wellpad			
BA	2019-04	511500	8150620
BB	IOG21-07	515907	8152050
BC	IOG21-07	519625	8128340
BD	2019-05	521830	8139805
BD(central)	2019-05	522265	8136350



TITLE:

Regional Location

MAP NO: Figure 1

PROJECT: Weed Management Plan (WMP)

LEGEND

- Populated places
- Australian State Boundaries
- Roads
- Tenements
- Principal Road
- Secondary Road
- Minor Road

FOX & CO ENVIRONMENTAL

Data Source:

Date: 22/03/2021

Document Path: C:\Users\greenvale\Documents\Fox & Co Environmental\Projects\Imperial oil and gas\2021\Maps\1. Weed Management Plan\1. IOG WMP_001 Figure 1 – Regional Location.mxd

1.3 LEGAL REQUIREMENTS

Of particular relevance to this WMP is the Northern Territory *Weeds Management Act 2001* (the Act) (as in force at 9 January 2023).

A project specific weed management plan must be developed as part of the EMP which meets the requirements of the NT Weed Management Planning Guide: Onshore Petroleum Projects (DENR, 2019) and it must provide at least for the following:

(a) baseline weed assessments prior to regulated activities being undertaken;

(b) ongoing weed monitoring;

(c) provision of a dedicated weed officer; and

(d) consistency with statutory requirements including any relevant threat abatement plans under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

1.3.1 Weeds Management Act

The purpose of the Act (as in force 9 January 2023) is:

- to prevent the spread of weeds in, into and out of the Territory; and
    - to minimise the impact of weeds in the Territory; and
    - to ensure that the management of the spread of weeds is an integral component of land management; and
    - to ensure that the management of the impact of weeds is an integral component of land management; and
- to ensure there is community consultation in the creation of weed management plans; and
- to ensure that there is community responsibility in implementing weed management plans.

Additionally, a declaration may classify a plant according to any of the following purposes:

- it is necessary to eradicate the plant;
- it is necessary to prevent the growing and spreading of the plant;
- it is necessary to prevent the introduction of the plant into the Territory or a part of the Territory;
- it is necessary to prevent the plant being spread by the actions of persons.

1.4 RECOMMENDATIONS FROM SCIENTIFIC ENQUIRY

1.4.1 Imperial Weed Officer

As per recommendation 8.3 of the Scientific Inquiry into Hydraulic Fracturing, gas companies must have a dedicated weed officer for each gas field. To ensure the required weed management outcomes, the weed officer must have relevant skills and experience and availability to successfully manage weed related issues for the project, including:

- Knowledge of the biology/ecology of local weeds including but not limited to gamba and grader grass
- Knowledge of relevant weed management frameworks including NT legislation and plans, the EPBC Act; and
- Understanding of existing weed management arrangements being undertaken by landholders As per Section 7 of the EMP, the Site Coordinator (SC) will be responsible for weed related issues.

Contact: Rachel Leembruggen

Title: Environmental Specialist

Location: Brisbane

Contact Details: [redacted] or [redacted]

1.4.2 DEPWS Weed Officer

Recommendation 8.3 of the Scientific Inquiry into Hydraulic Fracturing requires a dedicated Government weed officer who is responsible for:

- coordinating regional weed baseline assessments and subsequent weed surveillance; and
- overseeing strategic and effective management of any weed incursions by gas companies.
- This WMP has been prepared in consultation with the Northern Territory (DEPWS).

Contact: Nathan Mills

Title: DEPWS Onshore Petroleum Weed Management Officer

Location: 33 Leichhardt Street, Tennant Creek, NT, 0861

Contact Details: [redacted]

2. WEED INTRODUCTION AND RISKS

Section 1 of the EMP describes the exploration program and activities. In summary the exploration operation involves the following:

- Land clearing
- Earthworks
- Well construction
- Operation of Wells
- Flowlines, pipelines and facilities associated with the drilling and hydraulic fracturing of wells of appraisal gas production in the CGP area.

Table 2 Weed introduction risks and mitigation measures

Project Stage	Risk		Mitigation Measures
	Introduction of new weeds	Spread existing weeds	
Well construction and Operation (BA, BB, BC, BD, BD Central) Construction of gas and wastewater flowlines Construction of infrastructure areas which include gas plant, water handling station and campsite	Machinery and equipment sourced from other locations infested with weed species not found in or around EP area	Traversing of weed infested areas with machinery	Requirement that all equipment/machinery arrives on site clean of plant and soil matter. All vehicles to undertake and complete Weed Hygiene self-declaration prior to arriving onsite. Records will be retained. Require that all equipment/machinery is clean of plant and soil matter before demobilising from one site and working on another. Restrict movement of topsoil from sites where significant or declared weeds are known to exist to prevent the spread of weeds on the lot.

Project Stage	Risk		Mitigation Measures
	Introduction of new weeds	Spread existing weeds	
			Control declared weeds in accordance with NT Government's Weeds in the NT database. Mark no-go areas if infestations of WONS and/or Class A/C weeds are found within or adjacent to disturbance footprint.
	Personnel unable to identify weeds or unaware of weed species present in areas where machinery and equipment is sourced from.	Existing weed distribution not known due to: insufficient survey effort, survey effort conducted at wrong time of year, persons undertaking survey not familiar with / unable to identify declared weed species.	Develop weed identification material to be made available to staff and contractors while working on the lot. Problem weeds can be defined during pre-work toolboxes. Compulsory site inductions will present information to staff and contractors working on site on problem weed species and protocols to minimise risk of introduction including wash down locations and procedures, certification of plant and machinery before entering site, weed hygiene measures, non-compliance and reporting procedures.
	Construction of infrastructure area proximate to Carpentaria Highway.	Construction proximate to identified weed areas into clean weed free areas. Hyptis and grader grass observed in disturbed areas along Carpentaria Highway.	Use existing and designated tracks where possible. Restrict access to areas outside of the cleared footprint to limit the disturbance area to within the approved footprint. Conduct post-wet season weed surveys to determine whether any weed introductions have occurred and to monitor existing weed populations. Take the appropriate and government authority preferred corrective actions where necessary. Monitoring data of weed populations and also weed free areas based on pre-construction data.

3. WEED SPECIES

The DEPWS Natural Resource (NR) maps database was used to identify all introduced flora species that have previously been recorded within the area of the tenement associated with the proposed seismic program. Weeds along the Carpentaria Highway between Cape Crawford

(Heartbreak Hotel) were also identified as this is the road upon which contractors will be travelling each day.

Figure 2 shows the historical weed locations and weeds identified during the 2018 and 2019 surveys undertaken for the 2019/2020 exploration program.

Figure 3 shows the post-seismic weed survey undertaken in 2020 for the 2019/2020 exploration program.

Figure 4 shows the post-seismic weed survey undertaken in March 2021 for the 2019/2020 exploration program.

Figure 5 shows the pre-works weed survey undertaken for the 2021-2023 exploration program

Figure 6 shows the weeds identified during 2023 CPP initial weed survey. No weeds were reported other than Cobbler's peg (*Bidens pilosa*) in the proposed infrastructure area.

3.1 REGIONAL PRIORITIES

The DEPWS Katherine Regional Weed Strategy 2021-2026 has been developed in line with the DEPWS Strategic Plan 2021 – 2024 and the Australian Weeds Strategy 2017 – 2027. The Katherine Regional Weed Strategy identifies three (3) regional priorities to manage weeds. These are:

I. Priority weeds;

II. Priority landscape areas; and

III. Priority pathways of spread

Weed species that are listed as requiring priority management attention within the Region were determined by consensus during the Katherine Regional Weed Reference Group (KRWRG) meetings with input from the NT Weed Management Branch using one or more of the following criteria:

- subject to a statutory weed management plan.
- listed as a Weed of National Significance.
- weed risk assessment concluded the species to be a high or very high risk to the Northern Territory.
- weed risk at the regional level confirmed by local expert knowledge.
- strategic management of isolated or core infestations regarded as feasible by local expert knowledge.

The five (5) categories for priority management are:

1. Category 1 – Priority weeds for eradication
2. Category 2 – Priority weeds for strategic control (including eradication of outliers)
3. Category 3 – Weeds of concern
4. Category 4 – Hygiene and biosecurity weeds
5. Category 5 – 'Alert' weeds

The below table lists weeds that have previously been recorded in the area and also Category 1 weed species as per the Katherine Regional Weed Strategy 2021-2026 (Departmemt of Environment, Parks & Water Safety, 2021).

Table 3 Previously recorded and priority weed species

Scientific Name	Common Name	Declaration	Where located (e.g. on EP, machinery source location, extractive proppant/s, corridors)
*Prosopis spp.**	Mesquite*	Category 1, WONS, Class A	Not recorded. Priority weed
Vachellia nilotica *(previously Acacia nilotica)**	Prickly acacia	Category 1, WONS, Class A	Previous records (NR Maps, DEPWS). Refer Figure 3.
Parkinsonia aculeata	Parkinsonia	Category 3, WONS, Class B	Previous (NR Maps, DEPWS) and October 2018 survey records. Refer Figure 3.
*Ziziphus mauritiana**	Chinee apple	Category 2, Class A	Not recorded. Priority weed
*Mimosa pigra**	Mimosa	Category 1, WONS, Zone A	Not recorded. Priority weed
*Jatropha gossypiifolia**	Bellyache bush	Category 2, WONS, Class A/B	Previous records along Carpentaria Highway (NR Maps, DEPWS). Refer Figure 3
*Andropogon gayanus**	*Gamba grass*	Category 2, WONS, Class A/B	Not recorded. Priority weed
Azadirachta indica	Neem	Category 2, Class B	Not recorded. Priority weed
Themeda quadrivalvis	Grader grass	Category 2, Class B	June 2020 and March 2021 record (Fox & Co). Priority weed
Stachytarpheta spp	Snake weed	Category 4, Class B	Not recorded. Priority weed
Martynia annua	Devils claw	Category 2, Class A	Not recorded. Priority weed
Hyptis suaveolens	Hyptis	Category 4, Class B	Previous (NR Maps, DEPWS) and October 2018, April & Sept 2019, June 2020 & March 2021 survey records (Fox & Co) along Carpentaria Highway. Refer Figures 3, 4, 5 and 7

Scientific Name	Common Name	Declaration	Where located (e.g. on EP, machinery source location, extractive proppant/s, corridors)
Alternanthera pungens	Khaki weed	Class B	Previous records (NR Maps, DEPWS). Refer Figure 3.
Sida acuta, Sida cordifolia, Sida rhombifolia	Sida	Category 4, Class B	Previous records (NR Maps, DEPWS). Refer Figure 3.
Leonotis nepetifolia	Lion's tail	Category 3	Previous records (NR Maps, DEPWS).
Tribulus sp.	Caltrop	Class B	Recent record (Fox & Co, 2019)
Cryptostegia grandiflora	Rubber vine	Category 1, Class A	Not recorded. Priority weed
Salvinia molesta	Salvinia	Category 1, Class B	Not recorded. Priority weed
Cylindropuntia spp.	Rope cactus	Category 1, Class A	Not recorded. Priority weed
Hyparrhenia rufa	Thatch grass	Category 1, Class A	Not recorded. Priority weed
Sporobolus spp.	Giant rats tail grass	Category 1, not declared	Not recorded. Priority weed

Table 4 lists Category 2 weed species as per the Katherine Regional Weed Strategy 2021-2026. These species warrant strategic control across the Katherine Region due to their high impact on land managers, and other economic and environmental values.

Table 4 Category 2 Weed Species

Scientific Name	Common Name	Declaration
Ziziphus mauritiana	Chinee apple	Class A, Statutory Weed Management Plan
Jatropha gossypiifoli	Bellyache bush	WONS, Class A/B
Andropogon gayanus	Gamba grass	WONS, Class A/B, Statutory Weed Management Plan
Cryptostegia madagascariensis	Ornamental rubber vine	Class A

Scientific Name	Common Name	Declaration
Azadirachta indica	Neem	Class B, Statutory Weed Management Plan
Themeda quadrivalvis	Grader grass	Class B, Statutory Weed Management Plan
Tamarix aphylla	Athel pine	Class A, Statutory Weed Management Plan
Martynia annua	Devils claw	Class A

Parthenium hysterophorus (parthenium) (Category 1) and *Cryptostegia spp* (rubber vine) (Category 1) are of particular concern as they are considered to be a very high risk of introduction to this area of the Northern Territory. This area of the Northern Territory is often accessed from Queensland where these two (2) weed species are well established and have had detrimental impacts to the Queensland beef industry.

3.2 OCTOBER 2023 WEED SURVEY RESULTS

One weed species was recorded inside the IOG work area during the October 2023 field survey (*Bidens Pilosa* (Cobbler's Peg)) which is not a declared weed in the Northern Territory

Figure 10 shows the weed result recorded in October 2023 and the survey tracks.

Appendix A provides a table of the survey results for the October 2023 survey. These results were supplied to DEPWS in the required format within 7 days of undertaking the weed survey.

3.2.1 Previous Weed Survey Observations

Table 9 provides a summary of previous weed survey observations recorded during the pre-exploration weed surveys on EP187.

Table 5 Previous Weed Survey Observations

Weed	Details	Location	Plate
Weeds Observed During 2018 Dry Season Survey (Oct and Nov 2018)			
Hyptis suaveolens (Hyptis).	Hyptis was primarily recorded along the Carpentaria Highway (and also in some areas along Broadmere Road)	Carpentaria Highway	
Parkinsonia aculeata (Parkinsonia)	Parkinsonia was recorded at a stock water bore (No. 3 bore) north of the Carpentaria Highway.	No.3 Bore	
Weeds Observed During 2019 Weed Surveys (April and September 2019)			

Weed	Details	Location	Plate
Hyptis suaveolens (Hyptis). Class B herbaceous weed.	Hyptis was observed along the Carpentaria Highway in disturbed areas (ie. Truck rest stops) or drainage lines. It was also observed at the proposed camp location (which is a truck rest area).	Location: -16.710633, 135.349883	
Tribulus sp. (Caltrop). Class B herbaceous weed.	Caltrop was observed at the picnic area at the jump-up proximate to the eastern end of Seismic Line 1, just off the Carpentaria Highway.	Location: -16.703183, 135.366863	
Weeds Observed During 2020 Post Wet Season Survey			
Hyptis suaveolens (Hyptis). Class B herbaceous weed.	Hyptis was observed along the Carpentaria Highway and Broadmere Rd in disturbed areas (ie. Truck rest stops) or drainage lines.	Location: - -16.732533, 135.1994	
Themeda quadrivalvis (Grader grass).	Observed outside (east) of IOG work area, adjacent to the Carpentaria Highway.	Location: -16.71181, 135.4232	
Weeds Observed During 2021 Wet Season Survey (March 2021)			

Weed	Details	Location	Plate
Hyptis suaveolens (Hyptis).	Hyptis was primarily recorded along the Carpentaria Highway (and also in some areas along Broadmere Road)	135.2474039 -16.53130396 135.1991994 -16.73235367 135.0817638 -16.74155369 135.094250 -16.74059011 135.11648- -16.73876822 135.1164812 -16.73876822 135.1090543 -16.73967926 135.1607469 -16.7349109 135.3226097 -16.72085056	

4. ANNUAL ACTION PLAN

Control options will be undertaken in accordance with the species-specific Statutory Weed Management Plans, and the NT Government's Weeds in the NT" database (Northern Territory Government, 2020).

Table 6 Action Plan (2023 Carpentaria Pilot Project)

Weed Management Area	Weed Species	Management Objective	Survey Time/s	Treatment Time/s	Control Method/ s	Herbicide
Wells BA, BB, BC, BD, BD Central	None observed in October 2023	No introduction of new weed species.	End of wet season	Tba	Tba	Tba
Access tracks and flowlines	None observed in October 2023	No introduction of new weed species.	End of wet season	Tba	Tba	Tba
Infrastructure Area (e.g., gas plant, water handling station and campsite)	None observed in October 2023, other than small patch of Bidens pilosa (Cobbler's pegs)	No introduction of new weed species.	End of wet season	Tba	Tba	Tba

5. MITIGATION MONITORING

Field surveys were undertaken within the CPP EMP initial scope field assessment zones to determine weed species presence. Other information such as presence of feral animals and vegetation community / species were described along assessment zones.

Follow-up monitoring (e.g. timeframes following treatment) is species specific and will be undertaken in accordance with the species-specific Statutory Weed Management Plans for the priority weeds (if identified on site) listed in Table 6 and Table 7.

A post-wet season (2024) survey will be undertaken to actively determine weed presence (if any) within the proposed exploration areas.

All data will be supplied to DEPWS.

5.1 MITIGATION

Weed mitigation measures should include hygiene protocols to minimise the likelihood of introduction and spread of environmental, agricultural and declared weeds. These should include:

- Requirement that all equipment/machinery arrives on site clean of plant and soil matter. All vehicles to undertake and complete Weed Hygiene self-declaration prior to arriving onsite. Records will be retained.
- Require that all equipment/machinery is clean of plant and soil matter before demobilising from one site and working on another.
- Restrict movement of topsoil from sites where significant or declared weeds are known to exist to prevent the spread of weeds on the lot.
- Control declared weeds in accordance with NT Government's Weeds in the NT database.
- Develop weed identification material to be made available to staff and contractors while working on the lot. Problem weeds can be defined during pre-work toolboxes.
- Compulsory site inductions will present information to staff and contractors working on site on problem weed species and protocols to minimise risk of introduction including wash down locations and procedures, certification of plant and machinery before entering site, weed hygiene measures, non-compliance and reporting procedures
- Use existing and designated tracks where possible. Restrict access to areas outside of the cleared footprint to limit the disturbance area to within the approved footprint
- Conduct post-wet season weed surveys to determine whether any weed introductions have occurred and to monitor existing weed populations. Take the appropriate and government authority preferred corrective actions where necessary.
- Monitoring data of weed populations (and/or weed free areas) based on pre-construction data.

If weed monitoring indicates new introductions and/or detrimental changes in existing weed species density and abundance, the following should be undertaken:

- Notification to DEPWS
- Determine the cause of the incident and review the process to ensure that the incident does not re-occur.
- Assess and implement the appropriate course of action in consultation with relevant authorities and landholder

6. NOTIFICATION PROCEDURE

Should a new weed species in the project area be identified, the DEPWS Onshore Petroleum Weeds Officer (refer Section 1.4.2) will be contacted. Initial notification will be via telephone and subsequently followed up with an email (written notification) within seven (7) working days with details of species, location (latitude and longitude), abundance and any other relevant details such as life stage.

7. RECORDING

During weed surveys over the EP187 seismic lines and proposed exploration areas, weed data was collected using the Northern Territory Government WeedMate App as well as via Arc Collector in accordance with the DEPWS Weed Data Collection Field Guide.

All weed data was supplied to the DEPWS Onshore Petroleum Weed Management Branch.

8. REPORTING

Following the post-wet / post-exploration weed survey, an annual report will be submitted to DEPWS. The report will include the following:

- Details of activities implemented to address weed spread and introduction risks (e.g. examples of track construction from working from weed free areas into weed infested areas to reduce spread)
- Submission of all weed data collected
- Details of survey and monitoring events, including dates, personnel, maps and track data; and
- Overview of weed control events and success rates (weed control should be captured in detail through the data collection process and submitted as a component of (a)).

9. WORKS CITED AND RELEVANT REFERENCE LIST

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Northern Territory Government. (2020). *Weed Management Plan Gamba Grass 2020-2030.* Retrieved from A-Z list of weeds in the NT: https://nt.gov.au/__data/assets/pdf_file/0006/954789/weed-management-plan-for-gamba-grass-2020-2030.PDF

Thorp, J. R., & Lynch, R. (2000). *The Determination of Weeds of National Significance.* Canberra: National Weeds Strategy Executive Committee.

APPENDIX A WEED DATA

RECORDER:	Paul Fox			PROJECT:	Onshore Shale Gas Initial CPP Weed Survey						LOCALITY:	EP187 Imperial	
ORG_NAME:	Fox & Co Environmental			GPS NAME/MODEL:	iPad - Avenza						RECORDING METHOD :	Other digital device	
SITE_ID	DATE_REC	LAT_G94	LONG_G94	WEED_NAME	SIZE_DIA_M	DENS_CAT	SEEDLINGS	JUVENILES	ADULTS	SEED_PRES	PAST_TREAT	TREATMENT	HERBICIDE	COMMENTS
	24/10/2023	-16.74870	135.10870		20	3	Not recorded	Not recorded	Yes	Yes	No	Not recorded	Not applicable	Cobbler's peg (Bidens pilosa)

APPENDIX B FIGURES

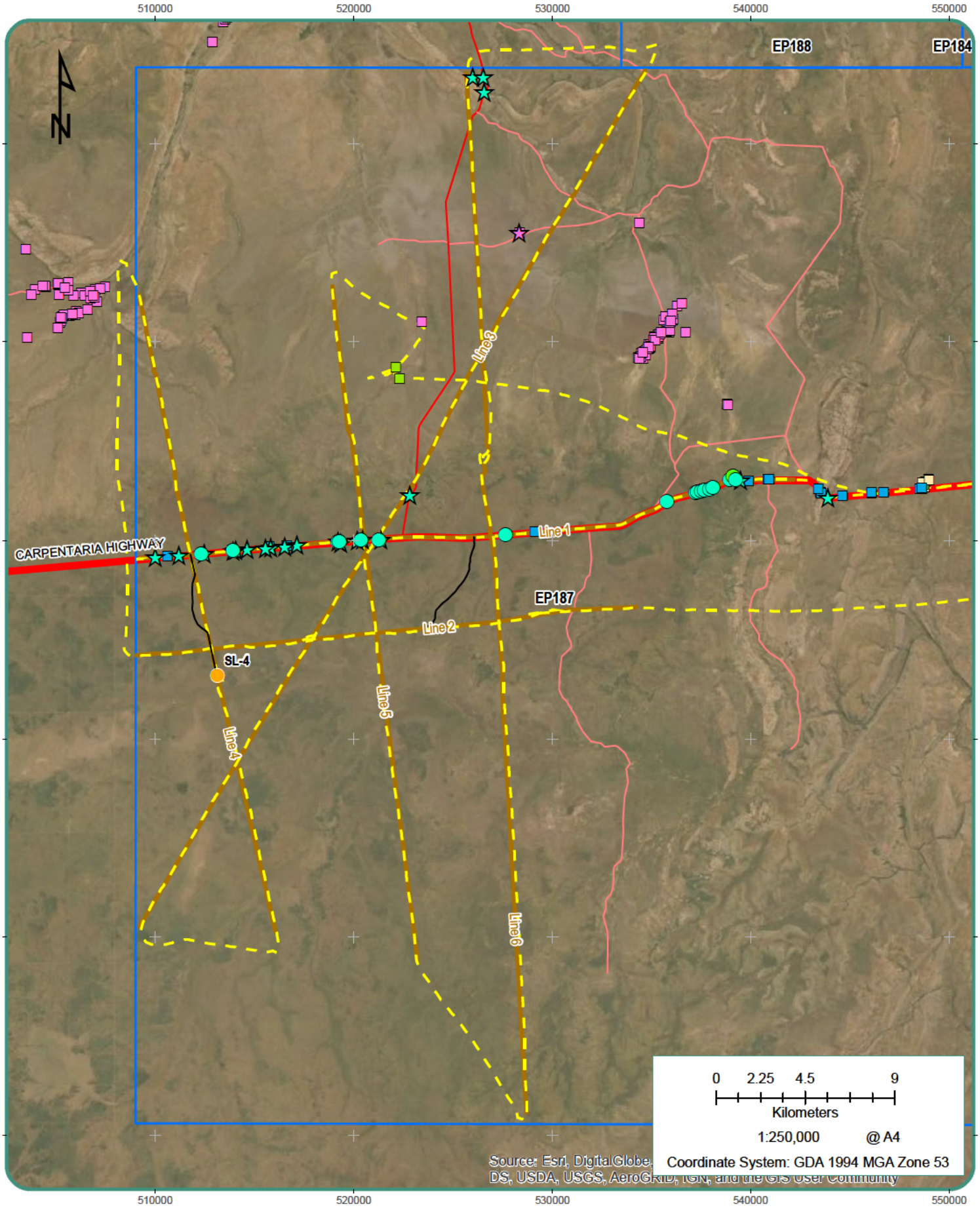
Figure 2 2019-2020 Exploration Program, pre-exploration weed survey (2018/2019)

Figure 3 2019-2020 Exploration Program, post-exploration weed survey (2020)

Figure 4 2019-2020 Exploration Program, post-exploration weed survey (2021)

Figure 5 2021-2023 Exploration Program, pre-exploration weed survey (March 2021)

Figure 6 October 2023 weed survey and track log



Document Path: C:\Users\greenvale\Documents\Fox & Co Environmental\Projects\Imperial oil and gas\2021\Maps\1. Weed Management Plan\3. IOG WMP_001 Figure 3 – 2019 Seismic Program – pre-seismic weed survey.mxd

TITLE:

2019/2020 Seismic Program – pre-seismic weed survey

MAP NO: Figure 2

PROJECT: Weed Management Plan (WMP)

LEGEND

Dry season (2018)
- Hyptis
- Parkinsonia

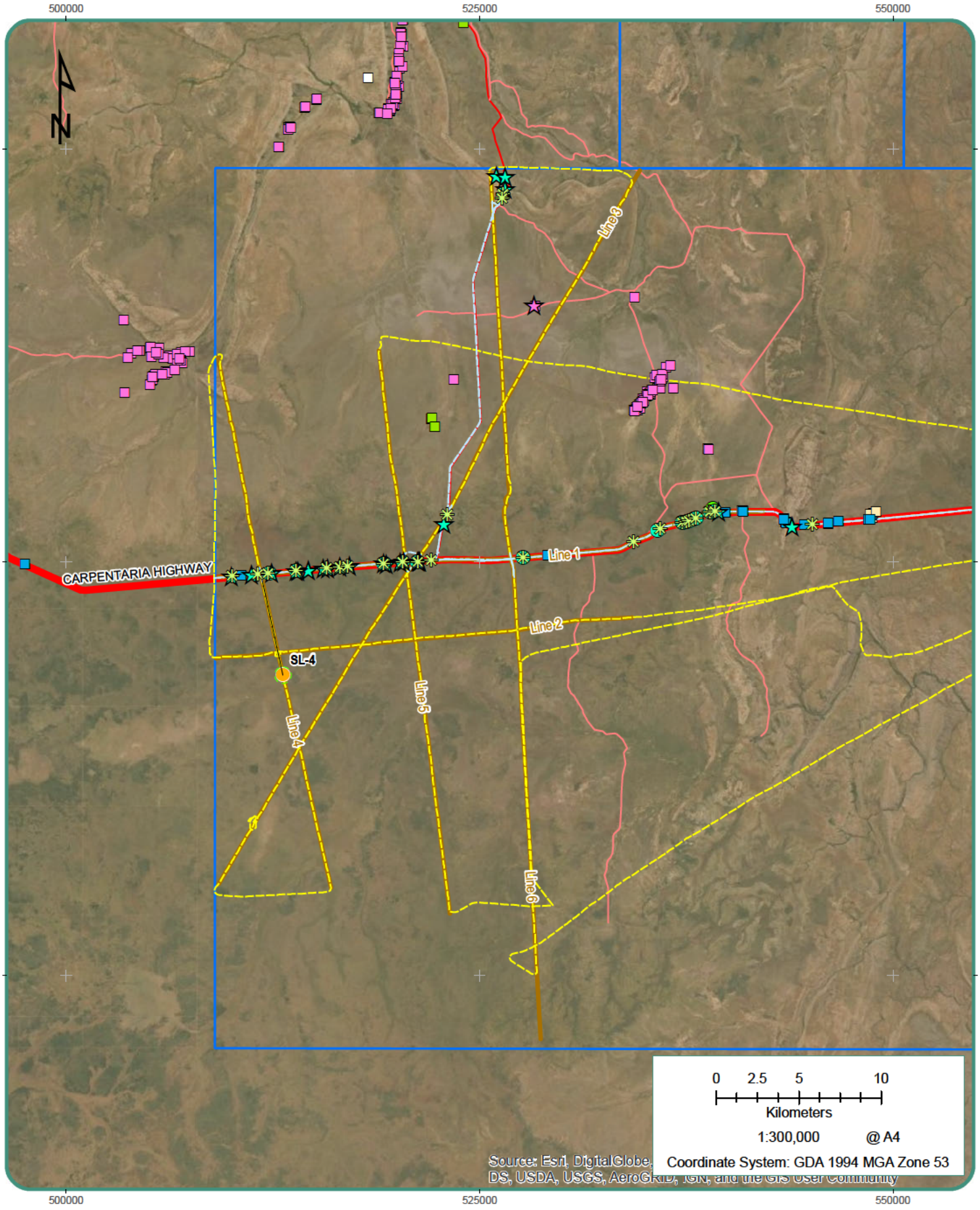
Post wet season (2019)
- Caltrope
- Hyptis
- Exploration bore SL-4

Weed name
- Bellyache bush
- Burr - Star
- Caltrop - terrestris
- Hyptis
- Khaki weed
- Neem
- Parkinsonia
- Prickly acacia
- Sida - Spiny head
- Sida sp
- GPS track log
- Proposed bore access
- 2019 Seismic lines
- Tenements

FOX & CO ENVIRONMENTAL

Data Source:

Date: 23/03/2021



TITLE:

2019/2020 Seismic Program – post-wet season, post-seismic weed survey (2020)

MAP NO: Figure 3

PROJECT: Weed Management Plan (WMP)

Dry season (2018)
- Hyptis
- Parkinsonia

Post wet season (2019)
- Caltrope
- Hyptis

Dry season (2019)
- Hyptis

Post wet season (2020)
- Hyptis
- Bore access track

Weed name
- Bellyache bush
- Burr - Star
- Caltrop - terrestris
- Hyptis
- Khaki weed
- Neem
- Parkinsonia
- Prickly acacia
- Sida - Spiny head
- Sida sp
- Exploration bore SL-4

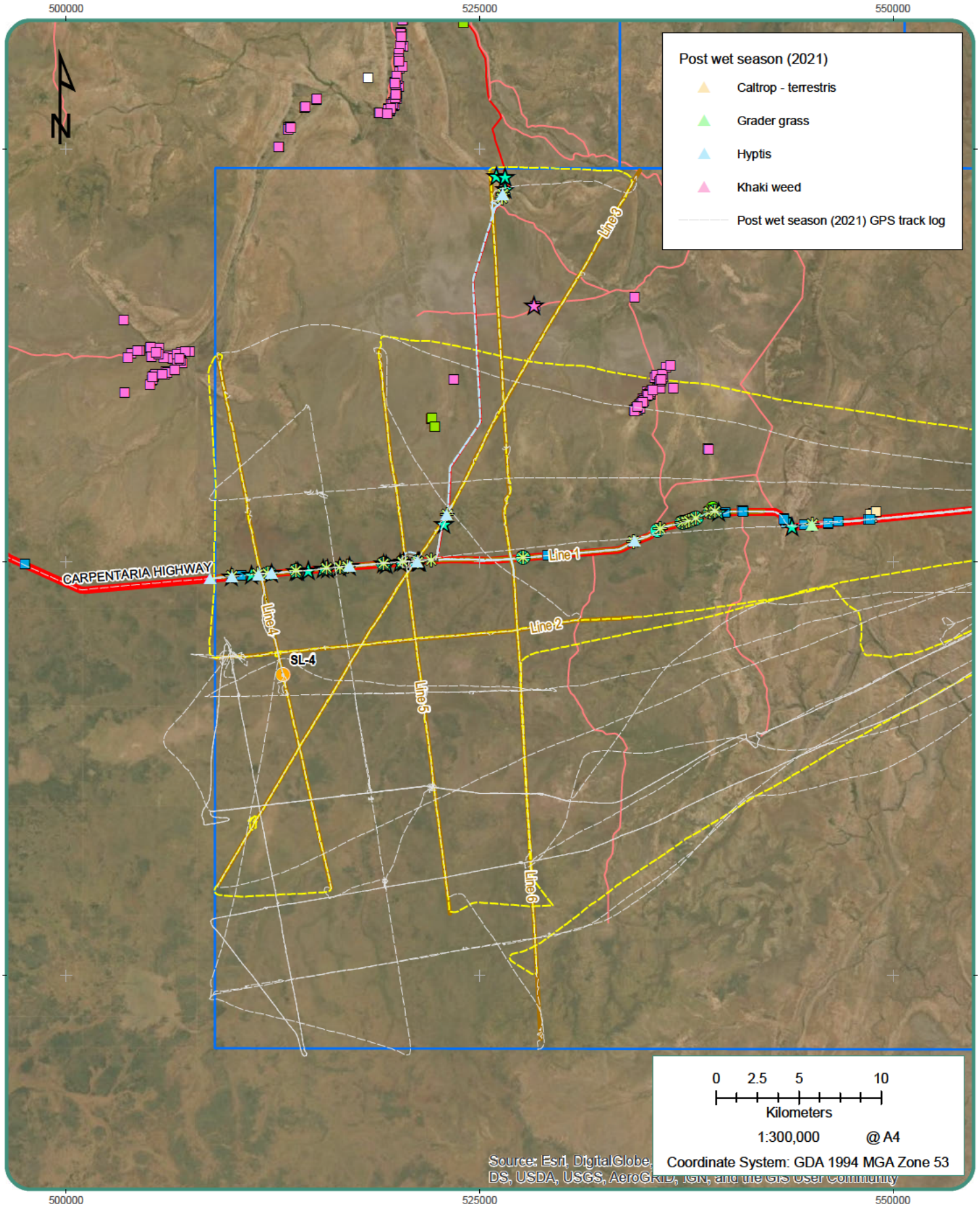
- On ground weed survey track log
- Aerial weed survey track log
- 2019 Seismic lines
- Tenements

FOX & CO ENVIRONMENTAL

Data Source:

Date: 23/03/2021

Document Path: C:\Users\greenvale\Documents\Fox & Co Environmental\Projects\Imperial oil and gas\2021\Maps\1. Weed Management Plan\4. IOG WMP_001 Figure 4 – 2019 Seismic Program – post-wet season, post-seismic weed survey (2020).mxd



TITLE:
2019/2020 Seismic Program – post-wet season, post-seismic weed survey (2021)

MAP NO: Figure 4

PROJECT: Weed Management Plan (WMP)

Dry season (2018)
- Hyptis
- Parkinsonia

Post wet season (2019)
- Caltrope
- Hyptis

Dry season (2019)
- Hyptis

Post wet season (2020)
- Hyptis
- Bore access track

Weed name
- Bellyache bush
- Burr - Star
- Caltrop - terrestris
- Hyptis
- Khaki weed
- Neem
- Parkinsonia
- Prickly acacia
- Sida - Spiny head
- Sida sp
- Exploration bore SL-4

- On ground weed survey track log
- Aerial weed survey track log
- 2019 Seismic lines
- Tenements

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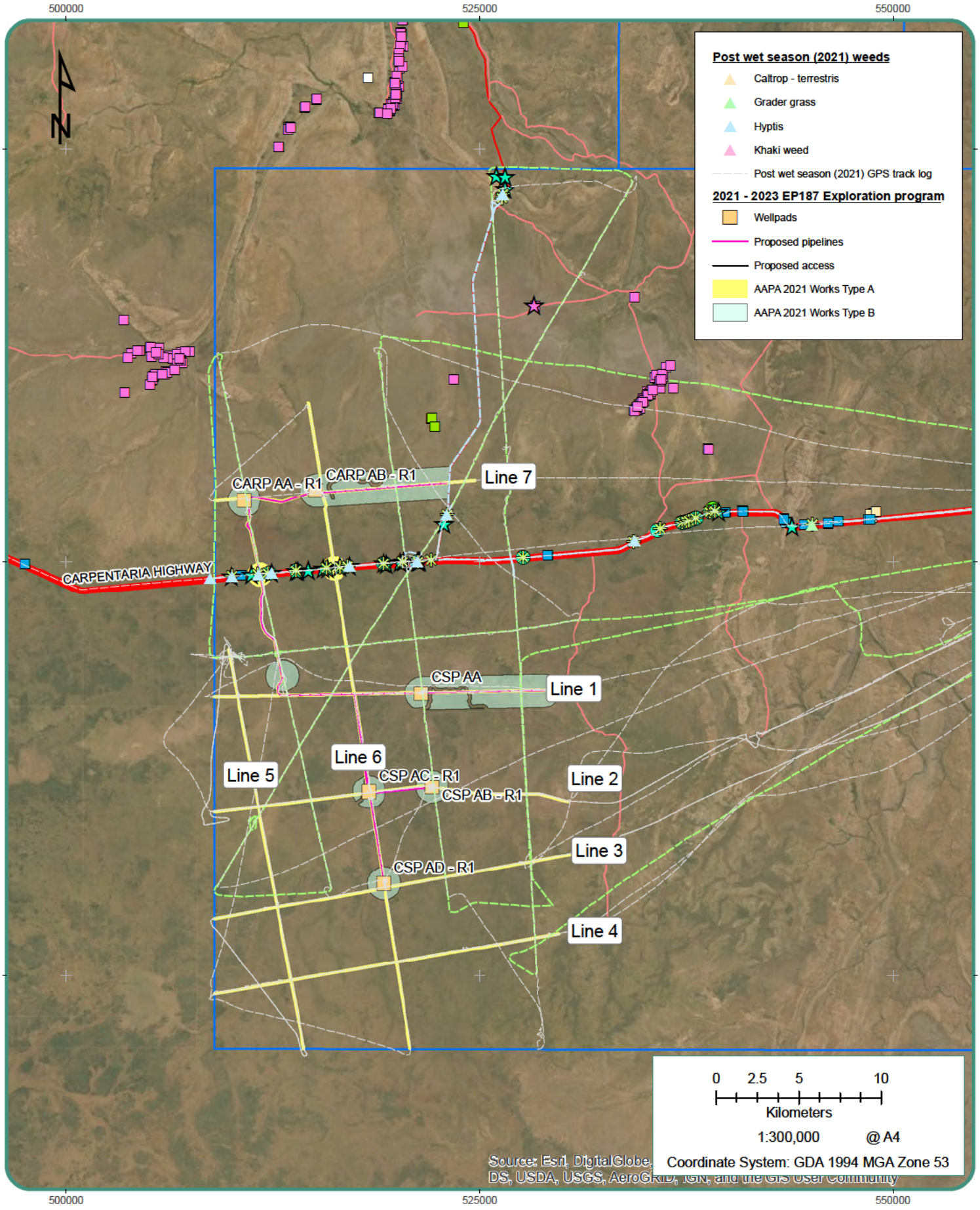
Data Source:

Date: 23/03/2021

Document Path: C:\Users\greenvale\Documents\Fox & Co Environmental\Projects\Imperial oil and gas\2021\Maps\1. Weed Management Plan\5. IOG WMP_001 Figure 5 – 2019 Seismic Program – post-wet season, post-seismic weed survey (2021).mxd



Document Path: C:\Users\greenvale\Documents\Fox & Co Environmental\Projects\Imperial oil and gas\2021\Maps\1. Weed Management Plan\7. IOG WMP_001 Figure 7 - 2021-2023 EP187 Exploration Program – pre-works weed survey.mxd

TITLE:

2021-2023 EP187 Exploration Program – pre-works weed survey

MAP NO: Figure 5

PROJECT: Weed Management Plan (WMP)

Dry season (2018)
- Hyptis
- Parkinsonia

Post wet season (2019)
- Caltrope
- Hyptis

Dry season (2019)
- Hyptis

Post wet season (2020)
- Hyptis

Weed name
- Bellyache bush
- Burr - Star
- Caltrop - terrestris
- Hyptis
- Khaki weed
- Neem
- Parkinsonia
- Prickly acacia
- Sida - Spiny head
- Sida sp

On ground weed survey track log
Aerial weed survey track log

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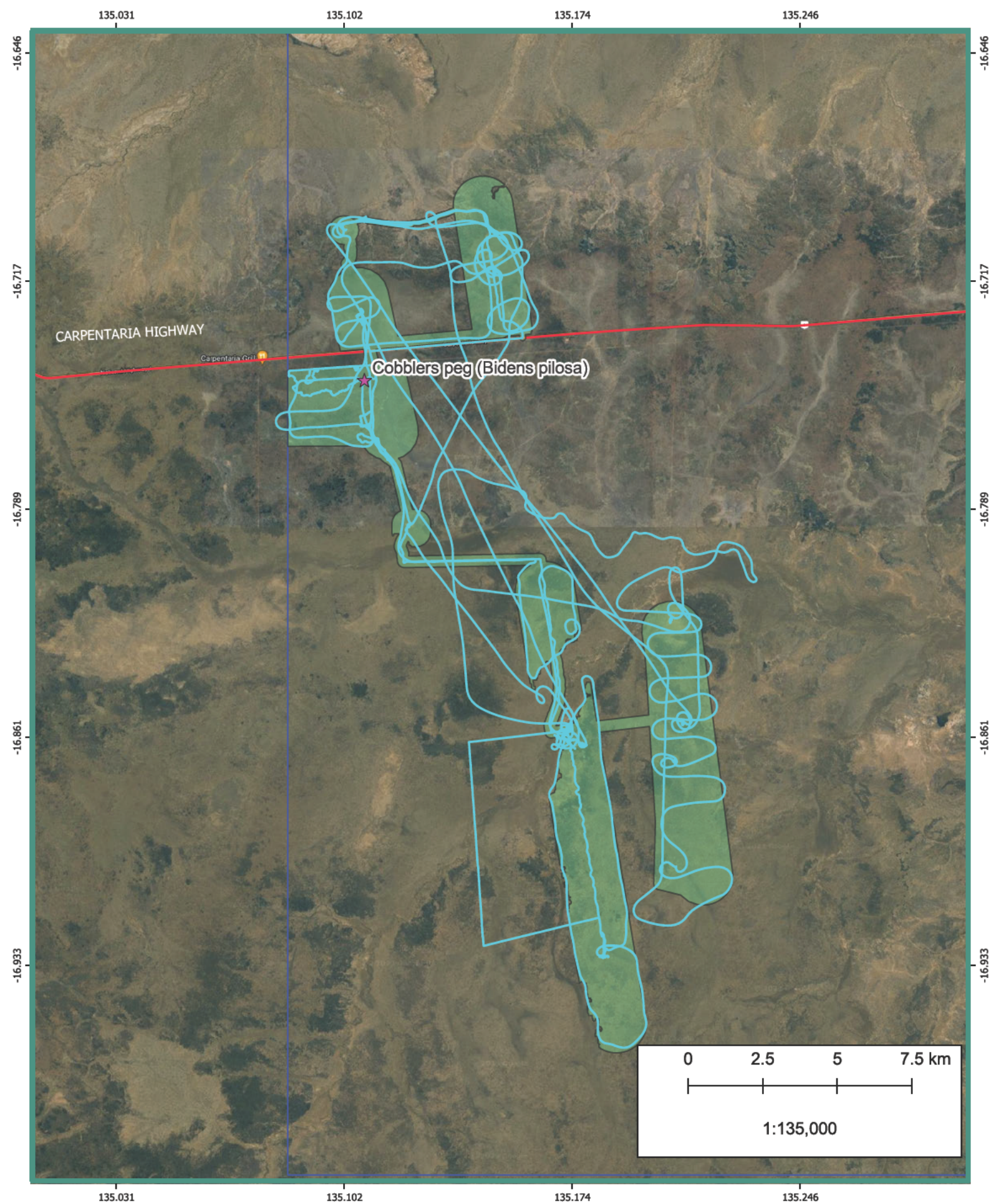
Data Source:

Date: 23/03/2021



TITLE October 2023 weed survey and track log

MAP NO. Figure 6

PROJECT EP187 Production EMP Initial Scope

LEGEND

- October 2023 Survey Tracks
- EP187 Production EMP Initial scope — Field assessment zones
- EP187
- Carpentaria Hwy

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Date: 07 11 2023 Base Imagery: Google Satellite. Created in QGIS.
Document Path: C:\Users\ecofo\OneDrive - Fox & Co Environmental\Clients\Imperial Oil & Gas\EP187 2023\4 Maps

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