Department of Energy, Mines, Industry Regulation and Safety

GOVERNMENT OF WESTERN AUSTRALIA

Clearing Permit Decision Report

1. Application details and outcomes

1.1. Permit application details

Permit number:	10508/1
Permit type:	Purpose Permit
Applicant name:	97992001 Pty Ltd
Application received:	31 January 2024
Application area:	14 hectares
Purpose of clearing:	Mineral Exploration and Associated Activities
Method of clearing:	Mechanical Removal
Tenure:	Exploration Licences 69/3401 and 69/3552
Location (LGA area/s):	Shire of Ngaanyatjarraku
Colloquial name:	Dante Project

1.2. Description of clearing activities

97992001 Pty Ltd proposes to clear up to 14 hectares of native vegetation within a boundary of approximately 10,432 hectares, for the purpose of mineral exploration and associated activities (97992001 Pty Ltd, 2024). The project is located approximately 600 kilometres northwest of Laverton, within the Shire of Ngaanyatjarraku (GIS Database).

The application is to allow for mineral exploration and associated activities including:

- 80 drill holes (each with a 25 metre x 25 metre pad); and
- 50 kilometres of access tracks (approximately 3 metre wide), of which 20 km has been previously cleared (Aurecon, 2024).

1.3. Decision on application and key considerations

Decision:	Grant
Decision date:	14 March 2024
Decision area:	14 hectares of native vegetation

1.4. Reasons for decision

This clearing permit application was made in accordance with section 51E of the *Environmental Protection Act 1986* (EP Act) and was received by the Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) on 31 January 2024. DEMIRS advertised the application for a public comment for a period of 21 days, and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (Appendix A), relevant datasets (Appendix C), supporting information provided by the applicant, including the results of a fauna, flora and vegetation survey, the clearing principles set out in Schedule 5 of the EP Act (Appendix A), proposed avoidance and minimisation measures (Section 3.1), relevant planning instruments and any other matters considered relevant to the assessment (Section 3.3).

The assessment identified that the proposed clearing may result in:

- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values;
- impacts to conservation significant flora;
- impacts to conservation signifciant fauna;
- the loss of native vegetation that is suitable habitat for malleefowl (*Leipoa ocellata*); and
- potential impacts to surface water and riparian vegetation.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing can be minimised and managed to be unlikely to lead to an unacceptable risk to environmental values.

The Delegated Officer decided to grant a clearing permit subject to conditions to:

- Avoid, minimise to reduce the impacts and extent of clearing;

- Take hygiene steps to minimise the risk of the introduction and spread of weeds;
- Undertake slow, progressive one-directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity;
- A flora management condition where no clearing of identified *Euphorbia parvicaruncula* within 10 metres is permitted, unless first approved by the CEO;
- Pre-clearance targeted surveys for priority and threatened flora prior to clearing native vegetation within the areas cross hatched in red;
- A vegetation management condition to avoid clearing riparian vegetation where practicable, and maintain existing surface water flow;
- Pre-clearance inspections for the brush-tailed mulgara (*Dasycercus blythi*), greater bilby (*Macrotis lagotis*), great desert skink (*Liopholis kintorei*) and greater stick-nest rat (*Leporillus conditor*) prior to clearing within the areas cross hatched in red; and
- Pre-clearance inspection for active Malleefowl mounds and placement of appropriate buffers.

1.5. Site map

A site map of proposed clearing is provided in Figure 1 below.

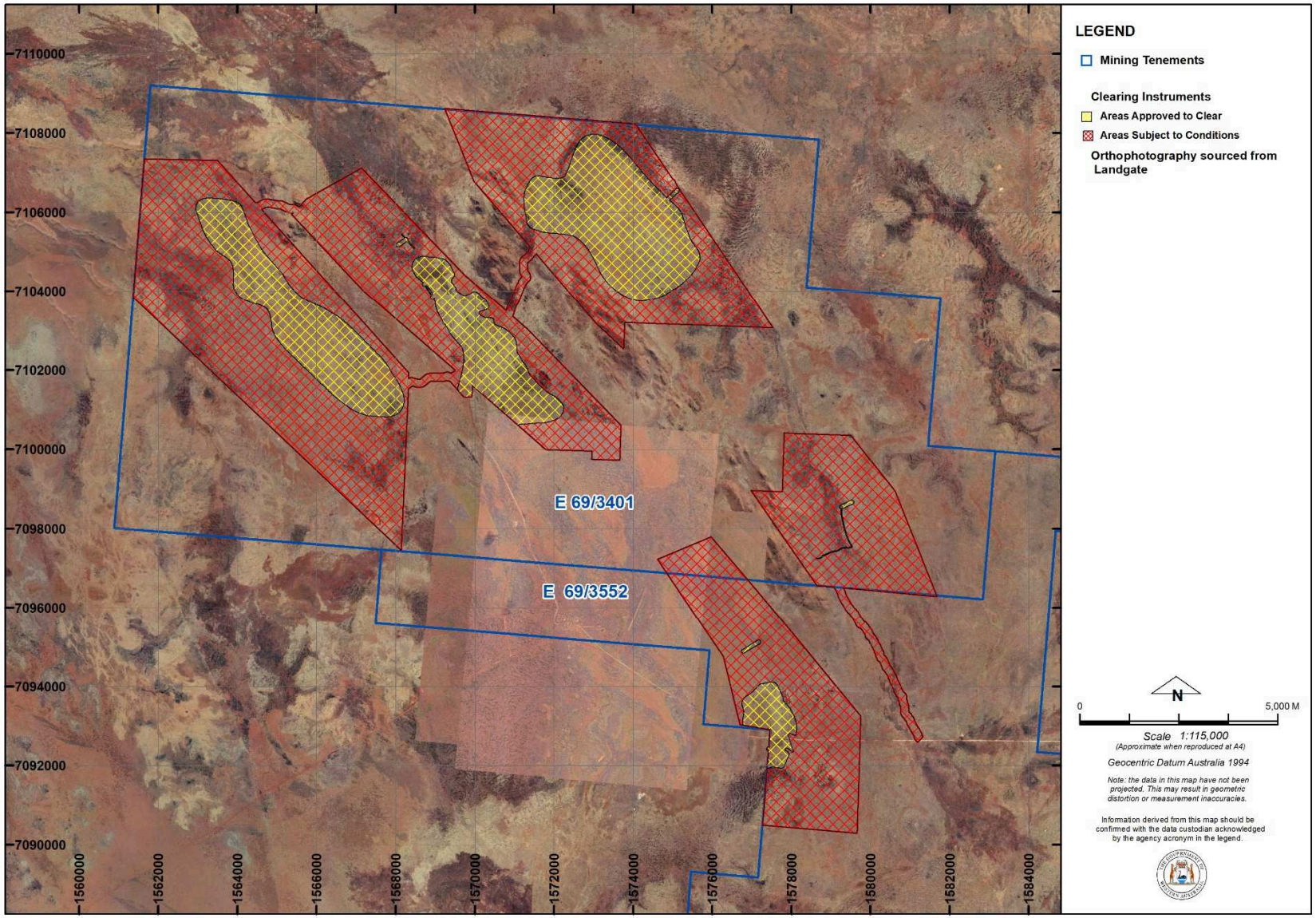

Figure 1. Map of the application area. The yellow area indicates the area within which conditional authorised clearing can occur under the granted clearing permit. The red areas indicates the area which is subject to further conditions.

2. Legislative context

The clearing of native vegetation in Western Australia is regulated under the EP Act and the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (Clearing Regulations).

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.4), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

- the precautionary principle
- the principle of intergenerational equity
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Mining Act 1978* (WA)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2014)
- *Procedure: Native vegetation clearing permits* (DWER, October 2021)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2020)

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

Aurecon (2024) have outlined they maintain but not limited to the following internal databases, and avoidance and mitigation measures:

- Disturbance areas will be kept to the minimum required and existing disturbance used where possible;
- Where practicable, recorded locations for Priority 1-listed *Euphorbia parvicaruncula* will be avoided when developing an exploration management plan for the Project;
- All areas proposed to be cleared will be subject to pre-clearance flora survey by a suitably qualified and experienced botanist;
- Clearing areas will be clearly demarcated prior to clearing or machines will be led by a spotter with a GPS;
- When clearing tracks and drill lines, the path of least resistance through the vegetation will be chosen to minimise disturbance;
- Cutting of branches will be favoured over removing entire trees;
- Designated access routes to clearing areas will be used;
- Raised-blade clearing will be used wherever practicable;
- Vegetation will be cleared and stockpiled for use in rehabilitation;
- Where raised-blade clearing is not practicable, topsoil will be removed and stockpiled for future rehabilitation;
- A toolbox meeting will be held between the supervising geologist/field assistant and the clearing contractor to ensure that the operator is aware of the approved clearing areas, traffic management measures and any areas that need to be avoided;
- All topsoil removed will be separately stockpiled for replacement after backfilling. Locations of stockpiles will be recorded using GPS;
- Service logs to be maintained. All vehicles coming to site be checked for hydrocarbon leaks;
- As per exploration licence conditions, all disturbed areas will be backfilled and rehabilitated within six months after excavation; and
- A suitable experienced fauna spotter / handler will be present during exploration works to relocate fauna if deemed necessary.

The Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid and minimise potential impacts of the proposed clearing on environmental values.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix A) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles identified that the impacts of the proposed clearing present a risk to biological values (flora, vegetation and fauna). The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

3.2.1. Biological values (vegetation and flora) - Clearing Principles (a) and (c)

Assessment

A targeted flora and vegetation assessment was undertaken within part of the application area in Spring of 2023 (approximately 3,381 hectares surveyed within the permit boundary of 10,432 hectares) (Western Botanical, 2023b). No Threatened flora species were recorded, however one Priority 1 flora species was identified within the application area (Western Botanical, 2023b).

Euphorbia parvicaruncula, Priority 1, is a short-lived annual or perennial herb growing up to 0.2 metres high (Western Australian Herbarium, 1998-). This species has been recorded from only two other locations within the Central Ranges and Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) bioregions (Western Australian Herbarium, 1998-). Although this species is poorly collected in Western Australia and its preferred habitat is not confirmed, Western Botanical suggest that this species is a claypan-specific annual species which likely is only present in years of suitable rainfall quantity and temporal pattern within its preferred habitat (Western Botanical, 2023b). The flora survey identified 319 individuals of this species within the application area and three individuals adjacent to the application area (Western Botanical, 2023b). As this species is poorly known and has few records, any removal of this species would result in a significant impact at a local and regional level.

An additional eight Priority flora species, all poorly collected within Western Australia, have been recorded within 40 kilometres of the application area (GIS Database). The application area may provide habitat for these species and therefore could possibly occur (Western Australian Herbarium, 1998-). As only part of the application area was surveyed, a targeted flora survey is recommended.

The flora and vegetation survey recorded three vegetation associations within the application area: Claypan, Grassy; Hardpan Mulga Shrubland; and Magnetite Hill Mulga Shrubland (Western Botanical, 2023b). The deficiency in biological survey data from the area, both supplied by the applicant and available from other sources, brings a level of uncertainty when assessing the level of biological diversity of the application area.

Conclusion

For the reasons set out above, it is considered that the impacts of the proposed clearing on conservation significant flora can be managed by avoiding and minimising disturbance, by taking steps to minimise the risk of the introduction and spread of weeds and further flora management conditions.

Conditions

To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- Avoid, minimise to reduce the impacts and extent of clearing;
- Take hygiene steps to minimise the risk of the introduction and spread of weeds;
- A flora management condition where no clearing of identified *Euphorbia parvicaruncula* within 10 metres is permitted, unless first approved by the CEO;
- Pre-clearance targeted surveys for priority and threatened flora will be required prior to clearing native vegetation within the areas cross hatched in red, and no clearing of conservation significant flora species identified, or within their appropriate buffers.

3.2.2. Biological values (fauna) - Clearing Principle (b)

Assessment

A basic and targeted fauna assessment was undertaken within part of the application area in October of 2023 (approximately 211 hectares surveyed within the permit boundary of 10,432 hectares) (Terrestrial Ecosystems, 2023). Within this survey area, 144 habitat assessments were completed, the following four habitat types were identified:

- Disturbed area;
- Grass Plain;
- Low shrubs over grass on plains;
- Low stoney ridges; and
- Shrubs over spinifex (Terrestrial Ecosystems, 2023).

No Threatened or Priority fauna species were recorded within the area surveyed, however a large majority of the application area remains unsurveyed (Terrestrial Ecosystems, 2023). Ten conservation significant fauna species have been recorded within 40 kilometres of the application area, of these, seven species have the potential to occur within the application area based on suitable habitat present (GIS Database).

Amytornis striatus striatus (striated grasswren (sandplain)), Priority 4, are known to inhabit areas of open mallee over a sparse layer of shrubs and a ground layer dominated by spinifex (*Triodia* spp.) (DCCEEW, 2024). As suitable habitat is present within the application area and the species has been recorded within 25 kilometres, it is considered that this species may be present within the application area. However, the proposed clearing of 14 hectares for exploration activities within 10,432 hectares is not considered to significantly impact this species as suitable habitat is present within the surrounding environments and the area is not considered critical to the species.

Dasycercus blythi (brush-tailed mulgara), Priority 4, are mostly found in areas with mature hummock (spinifex) grasslands (DCCEEW, 2024). They also use other vegetation types next to hummock grasslands, or paleo-drainage systems or drainage lines in sandplain or sand dune habitats (DCCEEW, 2024). As suitable habitat is present within the application area and the species has been recorded within 25 kilometres, it is considered that this fauna species may be present within the application area. As this species is a ground-dwelling conservation significant fauna with limited dispersal abilities and are more likely to be impacted on by any development, any core habitat, such as burrows, could be considered significant and should be avoided.

Falco peregrinus (peregrine falcon), Other Specially Protected, lives mostly along mountain ranges, river valleys, coastlines, and increasingly in cities (DCCEEW, 2024). This species may use the application area as a wider home range, however the area is not considered critical habitat.

Leipoa ocellata (malleefowl), Vulnerable, are found in semi-arid to arid shrubland and lowlands, especially those dominated by mallee and/or acacias (DCCEEW, 2024). This species requires sandy substrates and an abundance of leaf litter to breed (DCCEEW, 2023). The application area may contain suitable foraging habitat for this species.

Leporillus conditor (greater stick-nest rat), Conservation Dependent, inhabits perennial shrublands, especially of succulent and semi succulent plant species and has also been found using the dense shrubs, as well as short tailed shearwater (*Puffinus tenuirostris*) nesting burrows and crevices among rocks, for shelter (DCCEEW, 2024). This species, once found across much of the semi-arid and southern arid zone of Australia, now experiences a more limited dispersal and is involved in re-introduction into conservation reserves (DCCEEW, 2024). Historical records have been identified within 20 kilometres of the application area, and as suitable habitat may be present within the application area any impacts to this species following clearing would be considered significant as this species is dependent on conservation programs and any wild populations would be considered of high value (GIS Database).

Liopholis kintorei (great desert skink), Vulnerable, generally occurs on red sandplains and sand ridges within vegetation usually consisting of hummock grassland (*Triodia basedowii, Triodia pungens* and *Triodia schinzii*), with some scattered shrubs and occasional trees (*e.g. Acacia* spp., *Eucalyptus* spp., *Hakea* spp., *Grevillea* spp. and *Allocasuarina decaisneana*) (DCCEEW, 2024). As suitable habitat is present within the application area and the species has been recorded within 25 kilometres, *Liopholis kintorei* can be considered to potentially occur (GIS Database).

Macrotis lagotis (greater bilby), Vulnerable, are a solitary species that shelters in burrows during daylight (and intermittently during the night) (DCCEEW, 2024). The remaining populations of the greater bilby occupy three main habitats: open tussock grassland on uplands and hills, *Acacia aneura* (mulga) woodland/shrubland growing on ridges and rises, and hummock grassland in plains and alluvial areas (DCCEEW, 2024). This species has been recorded within 25 kilometres of the application area and suitable habitat is present (GIS Database).

Conclusion

The deficiency in biological survey data from the area, both supplied by the applicant and available from other sources, brings a level of uncertainty when assessing the level of biological risk of the proposed activities. For the reasons set out above, it is considered that the impacts of the proposed clearing on conservation significant fauna can be managed by implementing the conditions below.

Conditions

To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- Undertake slow, progressive one-directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity;
- A vegetation management condition to avoid clearing riparian vegetation where practicable, and maintain existing surface water flow;
- Pre-clearance inspection for active Malleefowl mounds and placement of appropriate buffers; and
- Pre-clearance inspections for the brush-tailed mulgara (*Dasycercus blythi*), greater bilby (*Macrotis lagotis*), great desert skink (*Liopholis kintorei*) and greater stick-nest rat (*Leporillus conditor*) within the areas cross hatched in red.

3.3. Relevant planning instruments and other matters

The clearing permit application was advertised on 13 February 2024 by the Department of Energy, Mines, Industry Regulation and Safety inviting submissions from the public. No submissions were received in relation to this application.

There is one native title claim over the area under application (Ngaanyatjarra Lands (Part A) - WAD6004/2004) (DPLH, 2024). This claim has been determined by the Federal Court on behalf of the claimant group. However, the exploration tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are no registered Aboriginal Sites of Significance within the application area (DPLH, 2024). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

Other relevant authorisations required for the proposed land use include:

- A Programme of Work approved under the *Mining Act 1978*.

It is the proponent's responsibility to liaise with the Department of Water and Environmental Regulation and the Department of Biodiversity, Conservation and Attractions, to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

End

Appendix A. Site characteristics

A.1. Site characteristics

Characteristic	Details
Local context	The area proposed to be cleared is part of an expansive tract of native vegetation in the extensive land use zone of Western Australia (GIS Database). The area is located within the Mann-Musgrave Block subregion of the Central Ranges Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). The dominant land uses in this IBRA subregion and in the Western Australian section are Aboriginal Reserve (94.33% of subregion area), grazing – freehold (0.03%), grazing – leasehold (1.36%), unallocated crown land and crown reserves (4.28%) (Terrestrial Ecosystems, 2023; GIS Database). A large BHP West Musgrave nickel-copper mine is in early stages of development to the south of the project area (Terrestrial Ecosystems, 2023; GIS Database).
Ecological linkage	The application area is not known to be an important ecological linkage (GIS Database).
Conservation areas	The proposed clearing is not located within a DBCA managed conservation reserve (GIS Database). The nearest conservation reserve is Gibson Desert Nature Reserve, which is located approximately 127 kilometres north-west of the application area (GIS Database). The application area is located within an Environmentally Sensitive Area as it lies within an area known as the Ranges of the Western Desert, which is listed on the Register of the National Estate as having Indigenous values of National Estate significance and is approximately 8,016,568 ha in size (Western Botanical, 2023a; GIS Database).
Vegetation description	The vegetation of the application area is broadly mapped as the following Beard vegetation associations: • 18: Low woodland; mulga (*Acacia aneura*); • 39: Shrublands; mulga scrub; and • 95: Hummock grasslands, shrub steppe; acacia & grevillea over *Triodia basedowii* (GIS Database). A flora and vegetation survey was conducted over part of the application area by Western Botanical during August and November, 2023. The following vegetation associations were recorded within the application area (Western Botanical, 2023b): • CPNG: Claypan, Grassy – Grassland with *Aristida inaequiglumis, Eragrostis setifolia*, occasional *Eragrostis xerophila*; • HPMS: Hardpan Mulga Shrubland – *Acacia aptaneura, A. kempeana* open low woodlands with scattered Senna species mid shrubs over Aristida contorta bunch grasses and Sclerolaena spp. herbs; and • MHMS: Magnetite Hill Mulga Shrubland – *Acacia aptaneura* open low woodlands with scattered midstorey of *Eremophila latrobei* subsp. *glabra* and patches of *Eriachne mucronata* (desert form glabrous).
Vegetation condition	The vegetation survey (Western Botanical, 2023b) indicate the vegetation within the proposed clearing area is in Good to Excellent (Trudgen, 1991) condition, described as: • Excellent: Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement. • Very good: Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks. • Good: More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds. The full Trudgen (1991) condition rating scale is provided in Appendix B.
Climate and landform	The climate of the Mann-Musgrave Block subregion is characterised as arid (Graham, G. & Cowan, M., 2011). The area experiences an average annual rainfall of 200 mm from both summer and winter rain (Graham, G. & Cowan, M., 2011).
Soil description and Land degradation risk	The soils within the application area are mapped as: • Atlas System (My112): Extensive plains with numerous dunes which are often short and of irregular shape and orientation; • Atlas System (My109): Outwash plains and dissected fan and terrace formations flanking ranges of sedimentary and some metamorphic, volcanic, and granitic rocks; and • Atlas System (BA21): Steep hills and ranges on sedimentary and some metamorphic, volcanic, and granitic rocks; bare rock outcrop is common; some gorges (DPIRD, 2024). Based on the sandy composition of many areas within the Mann-Musgrave Block subregion, the proposed clearing may exacerbate erosion in some areas (Graham, G. & Cowan, M., 2011).
Waterbodies	There are no permanent waterbodies or watercourses within the application area, however, there are several minor non-perennial watercourses present (GIS Database).

Characteristic	Details
Hydrogeography	The application area is not mapped within a proclaimed public drinking water area (GIS Database). The area is mapped within the East Murchison Groundwater Area, proclaimed under the Rights in Water Irrigation (RIWI) Act (GIS Database).
Flora	Nine Priority flora species have been recorded within 40 kilometres of the application area (GIS Database). One of these species was recorded within the application area during the flora survey (Western Botanical, 2023a; 2023b; GIS Database).
Ecological communities	The application area is not located within any known or mapped Threatened Ecological Community (TEC) (Western Botanical, 2023a; 2023b; GIS Database).
Fauna	Ten conservation significant fauna species have been recorded within 40 kilometres of the application area (GIS Database). No conservation significant fauna were recorded within the survey area (~212 hectares of the 10,432 application area) during the fauna and habitat assessment (Terrestrial Ecosystems, 2023).
Fauna habitat	One hundred and forty-four habitat assessments were completed within part of the application area, the following four habitat types were identified: • Disturbed area; • Grass Plain; • Low shrubs over grass on plains; • Low stoney ridges; and • Shrubs over spinifex (Terrestrial Ecosystems, 2023).

A.2. Vegetation extent

	Pre-European area (ha)	Current extent (ha)	Extent Remaining %	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA Managed Lands
IBRA Bioregion Central Ranges	4,701,519.37	4,700,206.00	99.97	0.00	0.00
Beard vegetation associations - State					
Veg Assoc No. 18	19,892,306.46	19,843,148.07	99.75	1,317,179.00	6.62
Veg Assoc No. 39	6,613,567.48	6,602,578.44	99.83	795,070.69	12.02
Veg Assoc No. 95	1,224,626.57	1,223,593.74	99.92	49,325.70	4.03
Beard vegetation associations - Bioregion					
Veg Assoc No. 18	1,075,927.72	1,075,162.33	99.93	0.00	0.00
Veg Assoc No. 39	404,689.10	404,689.10	100.00	0.00	0.00
Veg Assoc No. 95	47,953.38	47,953.38	100.00	0.00	0.00

Government of Western Australia (2019)

A.3. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix C.1), and biological survey information (Terrestrial Ecosystems, 2023; Western Australian Herbarium, 1998-; Western Botanical, 2023a; 2023b; GIS Database), impacts to the following conservation significant flora and fauna required further consideration.

Species name	Conservation status	Suitable habitat features? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)
Amaranthus centralis	P3	Y	~33	7
Euphorbia parvicaruncula	P1	Y	0	2
Goodenia asteriscus	P3	Y	~24	4
Goodenia hirsuta	P3	Y	~12	1
Indigofera warburtonensis	P1	Y	~24	6

Species name	Conservation status	Suitable habitat features? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)
Menkea lutea	P1	Y	~38	5
Neurachne lanigera	P1	Y	~33	17
Stackhousia clementii	P3	Y	~18	22
Thryptomene sp. Warburton (M. Henson & M. Hannart 32433)	P1	Y	~26	1

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

A.4. Fauna analysis table

Species name	Common Name	Conservation status	Distance of closest record to application area (km)	Suitable habitat features? [Y/N]
Amytornis striatus striatus	striated grasswren (sandplain)	P4	~22	Y
Dasycercus blythi	brush-tailed mulgara	P4	~22	Y
Falco peregrinus	peregrine falcon	OS	~30	Y
Leipoa ocellata	malleefowl	VU	~34	Y
Leporillus conditor	greater stick-nest rat, wopilkara	CD	~20	Y
Liopholis kintorei	great desert skink	VU	~22	Y
Macrotis lagotis	bilby, dalgyte, ninu	VU	~22	Y
Onychogalea lunata	crescent nailtail wallaby, tjawalpa	EX	~39	N
Petrogale lateralis centralis	Central Australian rock-wallaby	VU	~18	N
Petrogale lateralis lateralis	black-flanked rock-wallaby, black-footed rock-wallaby, moororong	EN	~18	N

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority; OS: other specially protected

Appendix A. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: The area proposed to be cleared may contain significant flora, fauna, habitats, assemblages of plants. The deficiency in biological survey data from the area, both supplied by the applicant and available from other sources, brings a level of uncertainty when assessing the level of biological diversity of the application area. However, the broad-scale vegetation types and fauna habitat types are common and widespread both locally and regionally.	May be at variance	Yes *Refer to Section 3.2.1, above.*
Principle (b): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna."* Assessment: The area proposed to be cleared may contain foraging habitat for several conservation significant fauna species (Terrestrial Ecosystems, 2023; GIS Database).	May be at variance	Yes *Refer to Section 3.2.2, above.*
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment:	May be at variance	Yes *Refer to Section 3.2.1, above.*

Assessment against the clearing principles	Variance level	Is further consideration required?
There are no known records of Threatened flora within the application area (GIS Database). The flora survey which was undertaken in part of the application area did not record any species of Threatened flora (Western Botanical, 2023a; 2023b).		
Principle (d): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community."* Assessment: There are no known Threatened Ecological Communities (TECs) located within the application area and the flora and vegetation survey did not identify any TECs (Western Botanica, 2023a; 2023b; GIS Database).	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		
Principle (e): *"Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared."* Assessment: The extent of the native vegetation in the local area is consistent with the national objectives and targets for biodiversity conservation in Australia (Commonwealth of Australia, 2001). The vegetation proposed to be cleared is not considered to be part of a significant ecological linkage in the local area.	Not at variance	No
Principle (h): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area."* Assessment: Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas (GIS Database).	Not likely to be at variance	No
Environmental value: land and water resources		
Principle (f): *"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."* Assessment: The application area has several minor ephemeral drainage lines (GIS Database). Drainage lines within the application area are only likely to flow following major rainfall events (Aurecon, 2024). As the vegetation associated with these ephemeral drainage lines may be cleared, it is recommended to maintain surface water flow or reinstate downstream into existing natural drainage lines. Potential impacts to watercourses can be managed through the implementation of a vegetation management condition, which includes avoiding clearing riparian vegetation and maintaining surface water flow.	May be at variance	No
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: Based on the sandy composition of many areas within the Mann-Musgrave Block subregion, the proposed clearing may exacerbate erosion in some areas (Graham, G. & Cowan, M., 2011). The proposed clearing includes a disturbance of 14 hectares within 10,432 hectares for access tracks and drill pads using machinery with the blade up to ensure soil is not removed where practicable (Aurecon, 2024). The proposed clearing activities are not likely to result in large areas of disturbed or open land. Given the small size of the proposed activities, the clearing is not likely to result in appreciable land degradation.	Not likely to be at variance	No
Principle (i): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water."* Assessment: The application area is not mapped within any legislated Country Areas Water Supply area or Public Drinking Water Source Area (GIS Database). The application area is located within the East Murchison Groundwater Area proclaimed under the *Rights in Water and Irrigation Act 1914* (GIS Database).	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
Given the relatively low amount of clearing (14 hectares) for mineral exploration and associated activities, the removal of native vegetation is unlikely to have a significant impact on surface or underground water. The vegetation management condition will also assist in mitigating any potential impacts to surface water by minimising clearing riparian vegetation where practicable.		
Principle (j): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."* Assessment: There are no permanent water courses or waterbodies within the application area (GIS Database). Seasonal drainage lines are common in the region and temporary localised flooding may occur briefly following heavy rainfall events. However, the proposed clearing is unlikely to increase the incidence or intensity of natural flooding events.	Not likely to be at variance	No

Appendix B. Vegetation condition rating scale

Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present in relation to undisturbed vegetation of the same type. The degree of disturbance impacts upon the vegetation's ability to regenerate. Disturbance at a site can be a cumulative effect from a number of interacting disturbance types.

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Trudgen, M.E. (1991) *Vegetation condition scale* in National Trust (WA) 1993 Urban Bushland Policy. National Trust of Australia (WA), Wildflower Society of WA (Inc.), and the Tree Society (Inc.), Perth.

Measuring vegetation condition for the Eremaean and Northern Botanical Provinces (Trudgen, 1991)

Condition	Description
Excellent	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very good	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor	Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Very poor	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely degraded	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

Appendix C. Sources of information

C.1. GIS databases

Publicly available GIS Databases used (sourced from www.data.wa.gov.au):

- Aboriginal Heritage Places (DPLH-001)
- Contours (DPIRD-073)
- Clearing Regulations – Schedule One Areas (DWER-057)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrographic Catchments – Catchments (DWER-028)
- Hydrography – Inland Waters – Waterlines
- Hydrography, Linear (DWER-031)
- IBRA Vegetation Statistics
- Native Title (ILUA) (LGATE-067)

- Pre-European Vegetation Statistics
- Interim Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Mapping – Best Available (DPIRD-027)
- Soil Landscape Mapping – Rangelands (DPIRD-064)
- WA Now Aerial Imagery

Restricted GIS Databases used:

- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

C.2. References

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4. Glossary

Acronyms:

BC Act	*Biodiversity Conservation Act 2016,* Western Australia
BoM	Bureau of Meteorology, Australian Government
DAA	Department of Aboriginal Affairs, Western Australia (now DPLH)
DAFWA	Department of Agriculture and Food, Western Australia (now DPIRD)

DCCEEW	Department of Climate Change, Energy, the Environment and Water, Australian Government
DBCA	Department of Biodiversity, Conservation and Attractions, Western Australia
DEMIRS	Department of Energy, Mines, Industry Regulation and Safety
DER	Department of Environment Regulation, Western Australia (now DWER)
DMIRS	Department of Mines, Industry Regulation and Safety, Western Australia (now DEMIRS)
DMP	Department of Mines and Petroleum, Western Australia (now DEMIRS)
DoEE	Department of the Environment and Energy (now DCCEEW)
DoW	Department of Water, Western Australia (now DWER)
DPaW	Department of Parks and Wildlife, Western Australia (now DBCA)
DPIRD	Department of Primary Industries and Regional Development, Western Australia
DPLH	Department of Planning, Lands and Heritage, Western Australia
DRF	Declared Rare Flora (now known as Threatened Flora)
DWER	Department of Water and Environmental Regulation, Western Australia
EP Act	*Environmental Protection Act 1986*, Western Australia
EPA	Environmental Protection Authority, Western Australia
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
PEC	Priority Ecological Community, Western Australia
RIWI Act	*Rights in Water and Irrigation Act 1914*, Western Australia
TEC	Threatened Ecological Community

Definitions:

{DBCA (2019) Conservation Codes for Western Australian Flora and Fauna. Department of Biodiversity, Conservation and Attractions, Western Australia}:-

T **Threatened species:**

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.

Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

CR **Critically endangered species**
Threatened species considered to be "*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

EN **Endangered species**
Threatened species considered to be "*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

VU **Vulnerable species**
Threatened species considered to be "*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

Extinct Species:

EX **Extinct species**
Species where "*there is no reasonable doubt that the last member of the species has died*", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

EW **Extinct in the wild species**
Species that *"is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species:

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI **Migratory species**
Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

CD **Species of special conservation interest (conservation dependent fauna)**
Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

OS **Other specially protected species**
Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

P **Priority species:**

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

P1 **Priority One - Poorly-known species**

Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

P2 **Priority Two - Poorly-known species**
Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

P3 **Priority Three - Poorly-known species**
Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

P4 **Priority Four - Rare, Near Threatened and other species in need of monitoring**
(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.
(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.
(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

Principles for clearing native vegetation:

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna.

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

(j) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.