



22 December 2010

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Strategen
Level 2, 322 Hay Street, Subiaco WA 6008
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ATTENTION: BART DOWNE

Dear Bart

WESTNET RAIL UPGRADE – NARNGULU TO TILLEY (MORAWA) FLORA AND VEGETATION ASSESSMENT RECOMMENDATIONS

ENV.Australia Pty Ltd (ENV) was commissioned by Strategen in September 2010 to undertake a Level Two Flora and Vegetation Assessment of the rail corridor Narngulu to Tilley (approximately 2 km north of Morawa) ('the survey area'). The proposed Westnet Rail upgrade survey area is 1,081 hectares (ha) and extends approximately 190 kilometres (km) from Narngulu to Mullewa and Mullewa to Tilley, extending 30 metres (m) either side of the existing rail infrastructure.

The purpose of this letter is to provide recommendations resulting from the flora and vegetation assessment of the survey area.

A summary of the survey results that relate to the recommendations is provided below. For the complete survey results and discussion please refer to the report.

Flora

A total of 554 taxa (including species, subspecies and varieties), comprising 246 genera and 72 families, were recorded from the survey area. The average plant species richness was 28.8 taxa per quadrat \pm 8.6, from a total of 92 sites. The plant families most frequently recorded from the survey were, Myrtaceae (85 taxa), Fabaceae (74 taxa) and Proteaceae (50 taxa). The most frequently recorded genera were *Acacia* (45 taxa), *Grevillea* (20 taxa) and *Melaleuca* (17 taxa).

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Flora of Conservation Significance

Three species gazetted as Declared Rare Flora pursuant to the *Wildlife Conservation Act 1950* (WA), including one species listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) - *Caladenia wanosa* (Vulnerable, Rare), *Grevillea bracteosa* subsp. *howatharra* (Rare) and *Grevillea phanerophlebia* (Rare), were recorded within the survey area.

Twenty-seven Priority Flora, as listed by the Department of Environment and Conservation, were recorded within the survey area.

A search of DEC databases targeting the survey area with a 2 km search buffer (1 km either side of the rail line) identified 16 Declared Rare and 89 Priority Flora. Fourteen of the DEC database records are from within the survey area. Twenty two species from the DEC search were considered 'Likely', while a further 36 were considered 'Possible' to occur within the survey area.

Introduced Flora

Fifty-two introduced species were recorded within the survey area, forty-seven of which are environmental weeds as defined by the Environmental Weed Strategy for Western Australia (Department of Conservation and Land Management 1999). Seven of the introduced species recorded within the survey area have a high rating under the Environmental Weed Strategy for Western Australia: **Acetosa vesicaria*, **Brassica tournefortii*, **Bromus diandrus*, **Ehrharta calycina*, **Eragrostis curvula*, **Lupinus cosentinii* and **Lycium ferocissimum*. The most commonly recorded introduced species within the survey area were **Arctotheca calendula*, **Ehrharta longiflora* and **Monoculus monstrosus*.

One introduced species listed as a Declared Plant under the Agriculture and Related Resources Protection Act 1976 (WA), **Echium plantagineum* (Priority 1), was recorded within the survey area.

Vegetation

Eighty-eight vegetation associations were described in the survey area within thirty-four broad vegetation formations. Vegetation condition ranged from Completely Degraded to Excellent. Forty one hectares of vegetation was categorised as Excellent, 256 ha as Very Good, 218 ha as Good, 201 ha as Degraded and 364 ha as Completely Degraded. Disturbances to vegetation within the survey area include clearing, tracks and introduced species. The area of vegetation mapped as cleared for maintained tracks, exiting rail and infrastructure was 260.23 ha, which equates to approximately 24% of the survey area.

Vegetation of Conservation Significance

No vegetation associations recorded within the survey area are listed as Threatened Ecological Communities under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth); as Environmentally Sensitive Areas under the *Environmental Protection Act 1986* (WA); or as Priority Ecological Communities by the Department of Environment and Conservation.

Fifty-two vegetation associations are considered to be of conservation significance based on the presence of Declared Rare and Priority Flora.

Five vegetation associations corresponding with two Beard (1975) vegetation associations' a23Lc and e6MreaSi are considered to be 'Endangered' as defined by the Department of Natural Resources and Environment (2002).

Recommendations

Based on the results of the Flora and Vegetation Assessment, ENV.Australia makes the following recommendations:

- Prior to construction, further surveys be conducted at appropriate times of the year for the twenty two Declared Rare and Priority species from the DEC search considered 'Likely', and the 36 considered 'Possible' to occur within the survey area;
- Avoid impacts to all Declared Rare Flora within the survey area;
- Avoid impacts to Priority Flora located within the survey area, where practicable;
- Minimise impacts to vegetation categorised to be in Excellent condition by ENV, where practicable;
- Avoid impacts to ENV vegetation associations associated with Endangered Beard (1975) vegetation associations (a23Lc and e6MreaSi), where practicable;
- Avoid impacts to ENV vegetation associations associated with Vulnerable Beard (1975) vegetation associations (abSi; c3Sc; e6,8Mi; e6c5Mr a9,19Si; e6Mr a19Si; e6Mr a19Si/c3Sc; mhSc; and x4SZc), where practicable;
- The development and implementation of a weed management plan to prevent the spread of Declared Plants and species categorised as High threat under the Environmental Weed Strategy;
- Where possible, current tracks and cleared sections should be used for site access to minimise the impact on the area's flora and vegetation;

- Boundaries of areas to be disturbed should be clearly demarcated to prevent any erroneous damage to flora and vegetation; and
- Following construction, any impacted surrounding areas should be rehabilitated as soon as possible using stockpiled topsoil, vegetation and litter from the site.

Yours sincerely

ENV.Australia Pty Ltd



DR KELLIE MCMASTER
Senior Ecologist

STATEMENT OF LIMITATIONS

Scope of Services

This environmental site assessment report (“the report”) has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and ENV.Australia Pty Ltd (ENV) (“scope of services”). In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

Reliance on Data

In preparing the report, ENV has relied upon data, surveys, analyses, designs, plans and other information provided by the Client and other individuals and organisations, most of which are referred to in the report (“the data”). Except as otherwise stated in the report, ENV has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report (“conclusions”) are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. ENV will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to ENV.

Environmental Conclusions

In accordance with the scope of services, ENV has relied upon the data and has conducted environmental field monitoring and/or testing in the preparation of the report. The nature and extent of monitoring and/or testing conducted is described in the report.

On all sites, varying degrees of non-uniformity of the vertical and horizontal soil or groundwater conditions are encountered. Hence no monitoring, common testing or sampling technique can eliminate the possibility that monitoring or testing results/samples are not totally representative of soil and/or groundwater conditions encountered.

The conclusions are based upon the data and the environmental field monitoring and/or testing and are therefore merely indicative of the environmental condition of the site at the time of preparing the report, including the presence or otherwise of contaminants or emissions. Also it should be recognised that site conditions, including the extent and concentration of contaminants, can change with time.

Within the limitations imposed by the scope of services, the monitoring, testing, sampling and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, expressed or implied, is made.

Report for Benefit of Client

The report has been prepared for the benefit of the Client and no other party. ENV assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of ENV or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own enquiries and obtain independent advice in relation to such matters.

Other Limitations

ENV will not be liable to update or revise the report to take into account any events or emergent circumstances or facts occurring or becoming apparent after the date of the report.

The scope of services did not include any assessment of the title to or ownership of the properties, buildings and structures referred to in the report nor the application or interpretation of laws in the jurisdiction in which those properties, buildings and structures are located.