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Response to Jupiter Windfarm Environmental Impact Statement

Regarding the Soil and Water Impacts sections of the statement.

This report has been prepared in response to the Jupiter Windfarm Environmental Impact Statement (EIS) that was prepared by ERM Pty. Ltd. on behalf of EPYC Pty. Ltd who is the proponent of the Windfarm Project.

This report was prepared by Wayne Cook, Environmental Consultant, Soil and Landscape Management, ABN 62517080748, at the request of the Nash Family.

This report discusses areas of the EIS pertaining to my field of expertise in soil and landscape management.

It is my opinion that the EIS does not adequately address environmental hazards associated with components of the project that relate to potential soil and water impacts of the project.

Issues will first be addressed at a general level regarding the project. I will then address the potential impacts to the Nash family property that includes areas of the Chain of Ponds Creek and the Mulwaree River upper catchments. Areas within the Nash property have the potential to be impacted upon by components of the project, proposed to be established in the neighbouring property.

Erosion Hazard of Soils in the Project Area

In section E.11 of the executive summary of the EIS (Water Supply, Water Quality and Hydrology), it is stated that;

> *"Overall constraints are relatively minor, with the erosion hazard rated as low over the majority of the P.A., and therefore a standard suite of erosion and sediment control measures can be adopted in most areas."*

As a soil scientist familiar with soils of the Project area (P.A.), I find this statement to be surprising if not misleading. It would not be unreasonable to consider the statement as incorrect.

For example, 49 of the 88 WTG's (56 %) will be located within the highly erodible Duckfield Hut Soil Landscape of Jenkins (1996) described below. Five (5) other proposed Wind Tower Generator (WTG) locations are located in areas clearly identifiable as subject to high erosion risk. I would consider that the majority of the project area therefore has a high erosion hazard.

Evidence available in the public domain and presented in this report suggests that a standard suite of erosion and sediment control measures can-not be adopted in most areas of the P.A. as stated in the EIS. Doing so may result in an unacceptable level of impact on soil and water systems.

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Soil Landscapes of the Braidwood 100k Topographic map Sheet (Jenkins 196)

There are 4 soil landscapes of the Braidwood 100k map-sheet as described by Jenkins (1996) relevant to the Jupiter project. They are discussed below.

Duckfield Hut Soil Landscape

The Duckfield hut Soil Landscape has significant erosion hazards associated with it as is evident from a cursory review of the Jenkins document and or viewing google earth or other imagery of the P.A.

Jenkins states that the Duckfield Hut Soil landscape has the following limitations;

- Seasonal waterlogging;
- Localised rock outcrop;
- Foundation hazard;
- Saline seepage and waterlogging;
- Infertile soils;
- Shallow and Hard-setting topsoils;
- Subsoils are highly erodible, sodic, hard-setting, have low wet bearing strength and have shrink swell properties:

Table 4.1 in Jenkins (1996) lists that subsoil erodibility and subsoil sodicity have a high occurrence in the Duckfield Hut soil landscape. In the existing land degradation section for Duckfield Hut Soil Landscape, Jenkins states, “Salinity is evident as scald erosion in many localities. Gully erosion and stream bank erosion are widespread”

As can be seen by the above details and the images below, the statement within the Executive summary section of the EIS that a *“standard suite of erosion control measures can be adopted in most areas”* indicates a lack of understanding of soils in the area or is deliberately misleading.

Soils with properties often resulting in soil erosion are common across many soil landscapes located in the region of the Jupiter project. Erodible soils are familiar to any soil and landscape managers who have worked in the region.

Of particular importance is the sodic nature of many of the soils found in this region. Without an understanding of the properties of sodic soils any engineering or other disturbance to soils can result in serious soil erosion and sedimentation and related water pollution hazards.

In Figures 1 and 2, severe soil erosion is clearly evident. Soil erosion is in the form of moderate to severe gully erosion and moderate to severe sheet and rill erosion. The majority of the soil erosion occurs within drainage lines however sheet and rill erosion is also evident on slopes and ridges. In general WTG’s will not be constructed within drainage lines however access tracks and transmission line trenching will traverse significant numbers of drainage lines.

Sight Hill Soil Landscape

As can be seen in Figure 1, the Sight Hill Soil Landscape is also erodible, especially when disturbed. Jenkins (1996) notes that minor sheet erosion is common and widespread in the Sight Hill Soil Landscape. Of note is the fact that the Sight Hill Soil Landscape contains erosive soils within the Jupiter P.A. in the vicinity of proposed WTG sites.

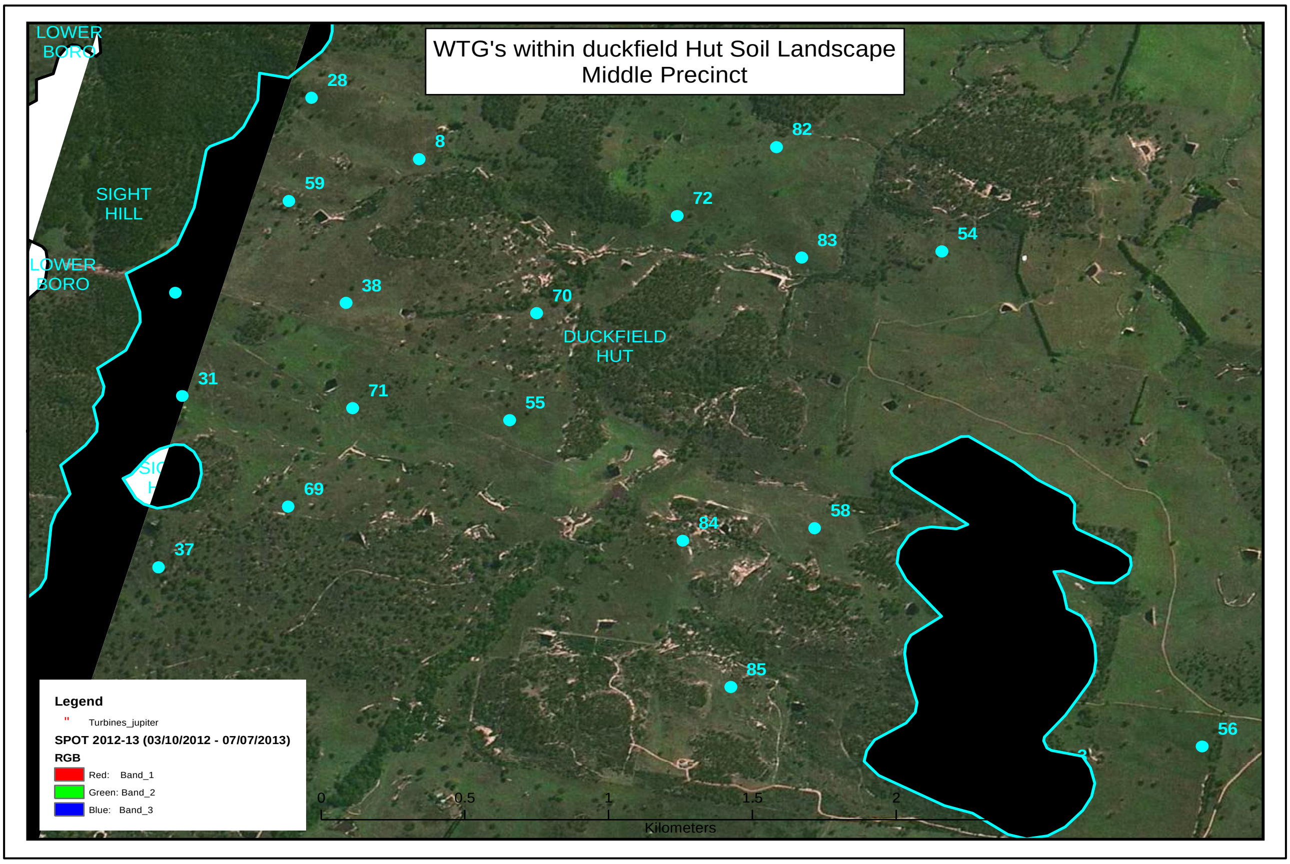

Figure 1. WTG's within Duckfield Hut Soil Landscape (Aqua circles). Note the significant sheet and gully erosion. Also note erosion visible in the Sight Hill soil landscape.

Sight Hill "Variant A" Soil Landscape

Three proposed WTG locations indicated in Figure 3, are located in the Sight Hill Soil Landscape "Variant a", Jenkins states that saline scalds are common in this Soil Landscape variant. As can be seen in Figure 3, severe soil erosion exists in the area of the 3 proposed WTG sites. Soil conservation works are evident in many of the drainage lines indicating soil salinity and possibly soil sodicity. A high risk of soil erosion is evidently present in areas that the Jupiter project will have an impact on in the form of access roads and trenches for power distribution.

The author suggests that due to existing erosion in this area, that these three WTG's as proposed may prevent unacceptable soil and water impacts. As can be seen in the Figure 3, even where soil conservation works have been installed, regrowth of vegetation has not occurred successfully on areas disturbed by machinery. Regeneration of disturbed soils in sodic and saline areas is difficult and unless the nature of the soils is understood and carefully managed, continued erosion will occur as evidenced in figure X.

Morass Soil Landscape

Two proposed WTG sites (77 and 49) are located within the Morass soil landscape. Jenkins states that "scald erosion and salinization are common, particularly on lower slopes and at margins to other soil landscapes. Minor sheet erosion occurs on steeper slopes."

The 2 WTG's located in the Morass Soil Landscape are likely to have a considerable impact on soil and water due to the highly erosive nature of these soils. Any impacts on soil and water will directly impact upon the Nash property as will be discussed further elsewhere in this report.

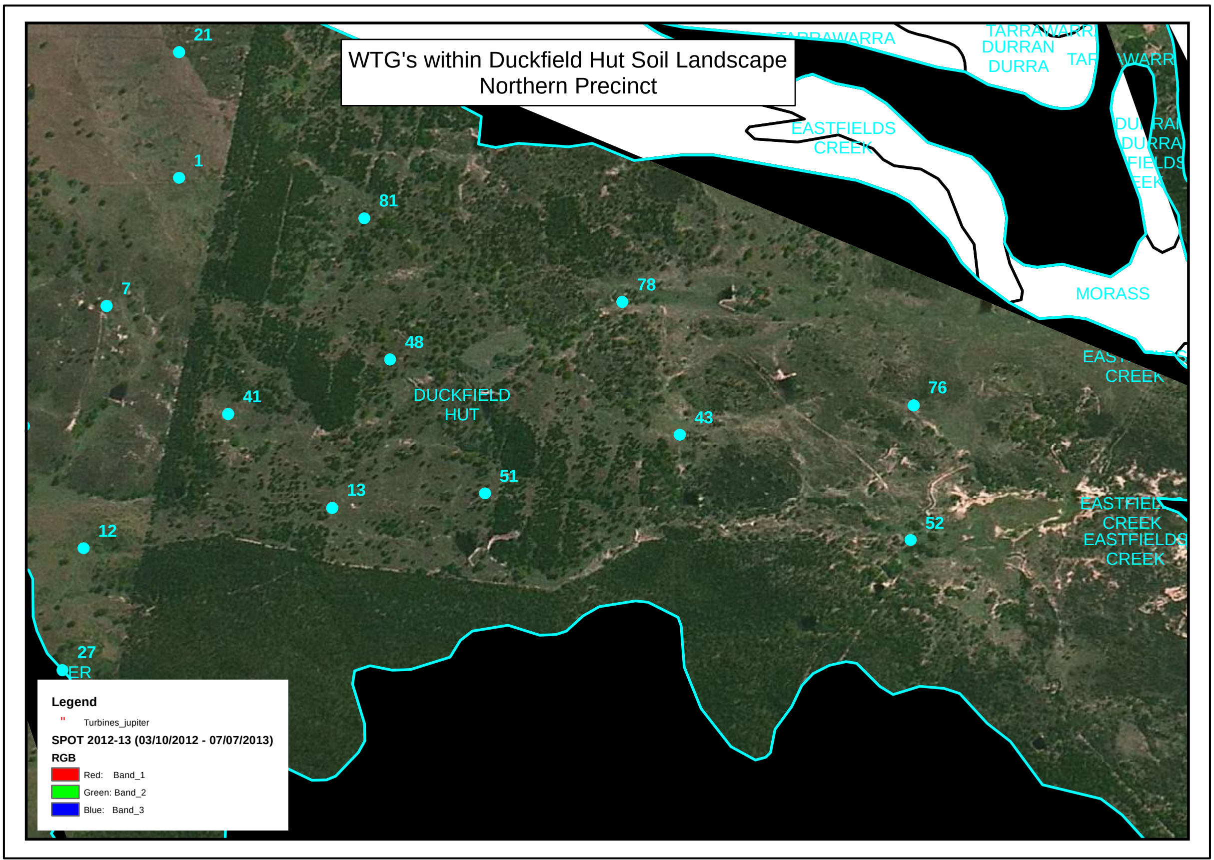

Figure 2. WTG's within Duckfield Hut Soil Landscape northern Precinct of P.A. Showing erosive nature of soils. Note the soil conservation works present in the eastern part of image.

Lower Boro Soil Landscape

Thirty three percent 33% (29 of 88) of WTG's will be located within the Lower Boro Soil Landscape. Although possibly the Soil Landscape with the lowest erosion risk in the P.A. it is not without inherent soil and water impact hazards. Jenkins lists several limitations for the Lower Boro Soil Landscape. Infertile, non-cohesive, shallow soils with low water holding capacity being the most relevant to the Jupiter project. The granite based soils are easily eroded when disturbed.

Vegetation is difficult to re-establish on these soils after disturbance. Although currently some of the better soils in the region due to high rainfall in the last few seasons, a remote sensing exercise reveals large areas of former soil conservation works indicating inherent erodibility of the soils.

Many of the proposed WTG sites located within the Lower Boro Soil Landscape, are near soil conservation works (see Figures 4 and 5). Considerable care will be required when conducting engineering works of any kind in the Lower Boro Soil Landscape, in order to avoid soil erosion impacts.

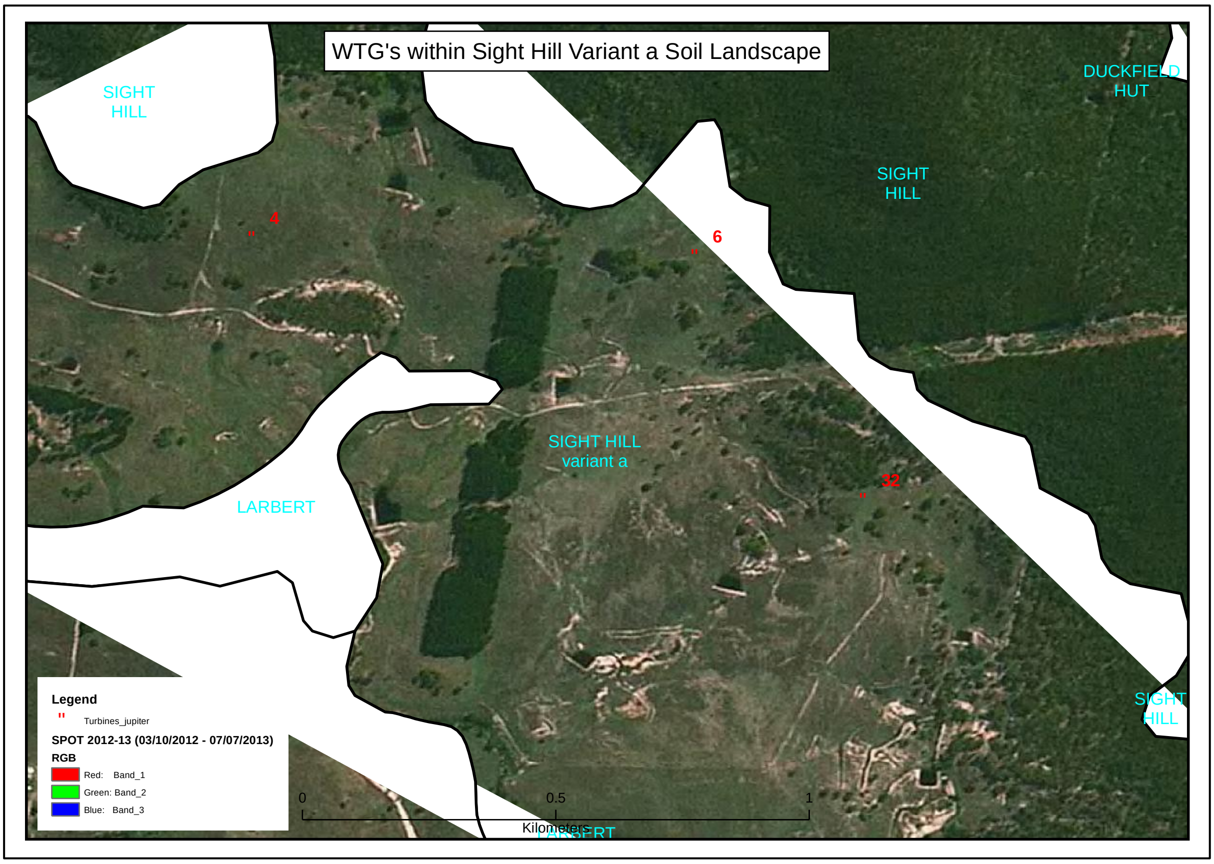

Figure 3. Sight Hill Variant A Soil Landscape showing WTG's 4, 6 and 32. Note the severe soil erosion evident in this area. Also note the high density of soil conservation works in the vicinity of the proposed WTG sites.

Summary of Soil Landscapes

Evidence presented in the Soil Landscape Mapping product of Jenkins (1996), suggests that the Jupiter EIS does not adequately address the highly fragile and erosive nature of soils found within the project area.

The majority of the Jupiter Project is located within soil landscapes that have moderate to high soil erosion hazard as defined by Jenkins (1996)

It is probable that with only a standard suite of soil conservation engineering practices as proposed in the EIS, that the Jupiter project is likely to have, more than a negligible overall impact on soil and water resources.

Successful soil conservation works and erosion control are possible in soils found within the project area, however, such works do not fit into the standard category. Engineering soil erosion control will require a thorough understanding of the nature of the soils, particularly the difficulties of saline and sodic soils that are found in the P.A.

Evidence presented in this report suggests that the EIS has considerably underestimated the potential for negative impacts on soil and water as a result of the project.

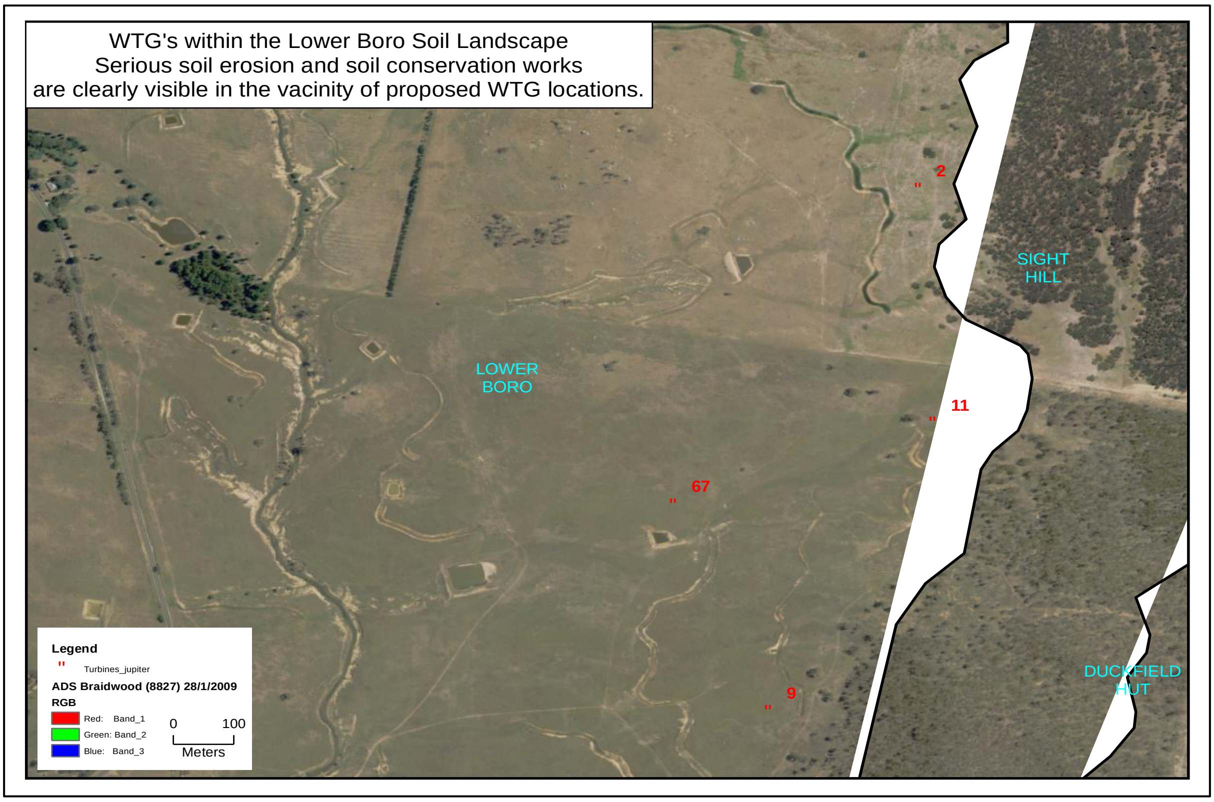

Figure 4. Lower Boro Soil Landscape showing serious gully erosion and significant areas of soil conservation works. Illustrating the high risk of soil erosion if disturbed. Soils tend to be sodic.

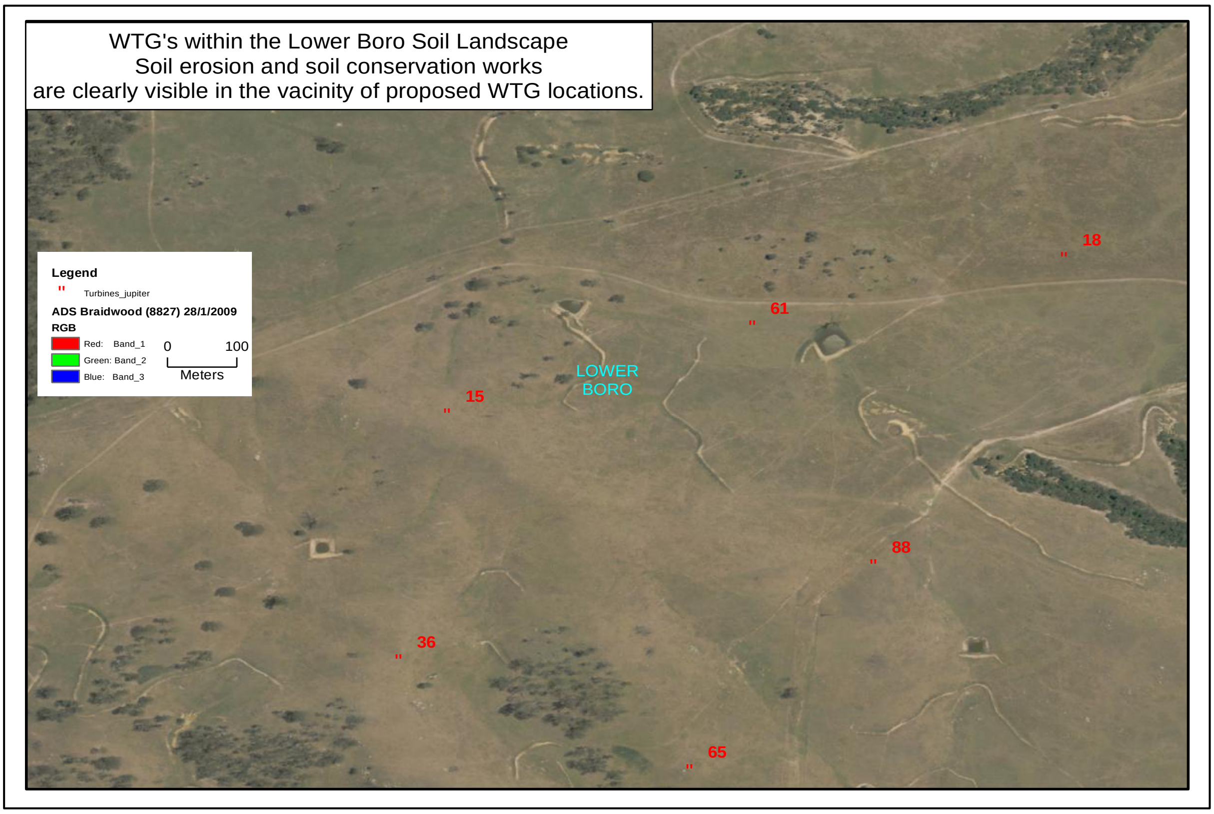

Figure 5. Lower Boro Soil Landscape showing soil conservation works indicating erosive nature of soils.

Assessment of Impacts, section 14.3 of EIS

The following table indicates potential impacts of the project on soil and water that were not mentioned or addressed in section 14.3 of the EIS. Each point is addressed in detail below the table.

Construction Activities	Potential Impacts not mentioned/addressed
Unsealed road network.	Additional surface flow to catchments from increase in impermeable surface soil.
Establishment of Pad Sites (e.g. substation site, tower foundation sites)	Additional surface flow to catchments from increase in impermeable surface soil. Potential impacts on groundwater systems of large in-ground structures.
Trenching	Tunnel erosion in susceptible soils after trench has been refilled.

The unsealed acess track network, by virtue of its impermeable nature will increase the surface water flowing at the soil surface. The EIS did mention suspended sediment as a potential impact but did not consider the impact of additional surface water and reduced infiltration into the soil that will be created by the development.

Inspection of proposed access track routing indicates many slopes are traversed across contour. There is no way that such access track routing will not lead to concentrated flows, especially during high intensity storms. Access tracks will require along contour routing to avoid the risk of concentrated flows

Natural rates of infiltration into the soil can-not occur through a compacted roadway or through the concrete of the WTG pads. Infiltration and surface flow characteristics will also be affected in areas subjected to trenching due to compaction and mechanical disturbance. Surface flow parameters of the catchment and soil through flow regimes will therefore be impacted upon.

Reduced infiltration has not been identified as a potential impact in the EIS

Additional surface flow has the potential to create increased erosion and suspended sediment outside of the immediate area impacted upon by roads, pads and trenches. Potential impacts include increased risk of erosion due to increased volume and increased velocity of surface waters. The risk is not confined to adjacent areas but could have a cumulative impact on drainage lines at some distance downstream especially in drainage sub-catchments catchments with a high concentration of WTG.

Additional surface water flow has not been identified as a potential impact in the EIS

With specific reference to the Chain of Ponds Creek Catchment, the Nash Family could be negatively affected by an increase in surface water flows. Of most concern is the potential contamination of stock water in ponds by additional suspended sediments due to increased flows. The area within the project area that includes the headwaters of the Chain of Ponds Creek consists of highly erodible soils at lower slopes and within the valley floor.

Increased surface water velocity within the project area of Chain of Ponds Creek is very likely to have a negative impact on the soil conservation works that are present in that areaTunnel erosion is a potential hazard in soils that are dispersive. Dispersive soils are found within the project area. Trenching through dispersive soils will increase the risk of tunnel erosion. Tunnel erosion can occur in refilled trenches constructed through dispersive soils several years after construction. Tunnel erosion can lead to gully erosion and damage to infrastructure.

Tunnel erosion has not been identified as a potential impact in the EIS.

Table 14.4. of the EIS - Mitigation measures

The first dot point in table 14.4 introduces an obvious issue affecting how the public or authorities may be able to assess the validity of the EIS as written. The point states that "a detailed Soil and Water Management Plan (SWMP) will be prepared prior to construction commencing."

How can a thorough assessment be made of the EIS, if details of how the proponent intends to address soil and water impacts are not included in the EIS. Professionals such as myself can only address generalised statement with similarly generalised responses. This is a statement somewhat outside the scope of this report, however I feel it is an appropriate statement to make.

As a soil science professional with considerable experience in the region surrounding and including the Jupiter P.A., I would like to be reassured that the detailed SWMP is assessed by a third party familiar with local soil conditions before final approval for operations be given.

I would suggest that a current government employee such as Mr Brian Jenkins may be a suitable candidate for such a review.

Identification of areas of soil sodicity and soil salinity would be a mitigation methodology that I consider necessary for any soil disturbing works in the region of the P.A. Areas subject to highly erosive soils have been identified in this report and by Jenkins (1996) that would allow focussed intensive investigations. The SWMP should specify that regular samples be taken for Emmerson aggregate testing to identify dispersive (sodic) soils and EC 1:5 testing to identify saline soils.

Intensive investigations including regular soil testing along the route of access tracks and at WTG foundation pads will be required to identify both broad and localised areas of soil sodicity and soil salinity that the EIS has not identified as being present within the P.A.

Annex I of the EIS - Water Supply, Water Quality and Hydrology Assessment Report

Table 2.1 Key Characteristics of Soil Landscapes over the proposed Jupiter Wind Farm

In table 2.1 of annex I, outlines soil characteristics found within the P.A. as described by Jenkins (1996). There are a few issues within this table where ERM has either misinterpreted the Jenkins product or not understood it.

These points of difference would only be obvious to a practitioner of soil science and are unlikely to be noticed by a non-expert. I feel these issues need to be pointed out as they could have an impact on how the EIS is assessed.

Within the table characteristics of the soil landscapes identified by Jenkins and described in this report are listed.

The table (Figure 6) shows that for the Duckfield hut Soil Landscape, Jenkins states topsoil erodibility is high to very high and that subsoil erodibility is moderate to high. Considering that the Duckfield Hut Sol landscape contains the majority of the WTG's in the project it is impossible to understand how the EIS comes to the conclusion and states several times that the erosion risk for the majority of the P.A. is low. As mentioned elsewhere in this report I find their statement to be untenable and inconsistent with the available evidence.

As can be seen from the table, all soil landscapes within the P.A. are considered to be moderately to very highly erosive. With the exception of the topsoil in the Morass Soil Landscape (2 WTG's) which is very low to moderately erosive. Jenkins finds all the soils to be moderately to very highly erosive in the area of the P.A.

Statements within the EIS consistently contradict the findings of Jenkins. Combined with image analysis of the area as shown in this report, I find the statements regarding a low soil erosion potential in the EIS to be unfounded and misleading.

Of further note is the way that other details are overlooked or misinterpreted. For example the Morass Soil Landscape within the P.A. is clearly a valley bottom. However ERM has stated that, "it *is noted that the works proposed will be undertaken on crests where topography is flatter rather than on side slopes, or occupy a relatively small area."* a statement they have inserted into the table for 3 out of the 4 landscapes in an attempt to negate the findings of Jenkins that suggest the soils have significant limitations for earthworks

Regarding the statement that the WTG's will be located on crests. A significant number of proposed WTG's are in fact not located on crests but instead are to be located on slopes. The statement is incorrect, especially if one considers access tracks and power reticulation network.

The network of tracks and trenches connecting the WTG's must cross drainage lines. A significant number of 1st and 2nd order drainage lines will be crossed. Each of the drainage lines and drainage depressions has the potential for soil erosion and water quality impacts.

ENVIRONMENTAL RESOURCES MANAGEMENT AUSTRALIA

Location	Southern Most Turbines[1]	Middle Turbines	Mid / Northern Turbines	Northern Most Turbines
Soil Type	Lower Boro (br)	Sight Hill (si)	Duckfield Hut (dh)	Morass (ms)
Existing Land Use	Cleared for cattle and sheep production often on improved pastures.	Predominately forest land grazing or unused. Gentle slopes cleared for grazing of sheep and some cattle.	Cleared for grazing of sheep on mainly unimproved pastures.	Cattle and sheep grazing on improved and some voluntary pastures. Occasional Lucerne crops.
Soil Erosion	Minor gully erosion is common, as is rill erosion on road batters. Small areas of salt erosion occur at granite margins.	Minor sheet erosion is common and widespread. Jenkins (1996) states this soil landscape is generally too steep for earth works – however it is noted that the works proposed will be undertaken on crests where topography is flatter rather than on side slopes, or occupy a relatively small area.	Gully erosion and stream bank erosion are widespread. Jenkins (1996) states this soil landscape generally has moderate to very high limitations for earthworks– however it is noted that the works proposed will be undertaken on crests where topography is flatter rather than on side slopes, or occupy a relatively small area.	Jenkins (1996) states this soil landscape generally has moderate to high limitations for earthworks– however it is noted that the works proposed will be undertaken on crests where topography is flatter rather than on side slopes, or occupy a relatively small area.
Erodibility (Topsoil)	Moderate to high	Moderate to high	High to very high	Very low to moderate
Erodibility (Subsoil)	Moderate to high	High	Moderate to high	Moderate
Highest K-factor (conservative estimate)	0.037	0.057	0.056	0.046

Source: Jenkins, 1996
Soil Landscapes are shown in *Figures 2.1, 2.2 and 2.3.*

Figure 6 Table extracted from EIS regarding soil landscape characteristics

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Revised Universal Soil Loss Equation

The EIS utilises the Revised Universal Soil Loss Equation as a basis for defining the overall soil erosion hazard for the project. Stated in the EIS as low. This finding can be questioned in several ways, in my opinion the RUSLE has been used incorrectly within the EIS to underestimate the erosion hazard pertaining to the majority of the Project Area.

The Revised Universal Soil Loss Equation estimates soil loss. It does not estimate overall erosion hazard.

Problems with the USLE are well known and include the following limitations as stated in the *Blue Book (Managing Urban Stormwater: Soils and Construction Landcom 2004).*

"*Because the RUSLE takes into consideration all major components likely to affect sheet erosion, it is the most widely used (and abused) soil loss equation available. While it does have great practical value, its limitations should be recognised and understood."*

The main limitations are;

1. *It only predicts sediment entrained in the erosion process and does not predict sediment yields into particular sediment basins;[2]*
2. *It predicts average annual soil loss and not that for a particular storm event;*
3. *It is effective for erosion through sheet and rill flow only on short slopes (<300m) and not for concentrated flow or long slopes; and*
4. *It does not adequately take into account soil dispersibility in assessment of the K-factor.*

Of most relevance and concern is the failure of the RUSLE to adequately account for sodic soils. Such soils are common in the P.A. Also, the RUSLE is only effective for sheet and rill erosion. Gully erosion is a common problem within the P.A. Excluding a major form of erosion found within the P.A., from soil loss calculations will result in an underestimated overall erosion hazard.

Use of the USLE, in the Jupiter EIS to define the soil erosion hazard as low, is misleading and technically flawed. No second opinion or third party review of the assumptions made by ERM in their calculations was conducted. No mention of known problems of the equation was offered.

Assumptions regarding parameters within the equation were not substantiated successfully. For example the EIS makes an assumption regarding the slope length component of the calculation that I find difficult to support.

Given that the EIS appears to underestimate some components of the RUSLE I prefer to use the higher calculated value of soil loss shown in the EIS, as I feel it is more valid. ERM states at A.2 in the EIS that "predicted annual soil loss is 262 tonnes/hectare/year which is Soil Loss Class 3 (226-350 tonnes/ha/yr) which is rated low to moderate. I suggest this is a more realistic measure of potential soil loss for the majority of the P.A.

Therefore a low to moderate soil loss class should be stated, as a result of calculating predicted soil loss by the RUSLE method. I reiterate that a soil loss category is not the same as an overall soil erosion hazard.

Combined with known erosion risks and factors such as sodicity and salinity that appear to have been ignored or underestimated in the EIS I can-not support the finding that erosion hazard for the majority of the P.A. is low.

I suggest further review of their findings of overall erosion risk based solely on calculation of soil loss utilising the RUSLE.

The RUSLE could be used to calculate potential soil transport out of the P.A. I could utilise the USLE to support an argument for risk to the Nash property. For example I could make the same assumption that ERM has made and state that the Jupiter Project has the potential to export 34,584 metric tons of soil onto the Nash property. Or using their lower estimated soil loss a mere 13,464 metric tons could be transported onto the Nash property in one year. These figure utilise ERM's RUSLE figures of 262 and 102 T/H/Y and my calculation of 132 Hectares of the P.A. draining directly to the Nash property. These figures could be disputed in the same way that conclusions regarding overall soil erosion risk claimed by ERM in the Jupiter EIS could be disputed.

Groundwater

It is noted here that there is a recently licenced stock and groundwater bore that has been approved since the EIS was written. The bore covered by licence 10WA115871 is on the Nash property located at Z55-742687E 6110630N. The Nash family is concerned that the Jupiter Project could have a negative impact upon their water rights. Any impact on the local groundwater quality or quantity caused by the project will have a significant impact on the Nash property operations.

The EIS states that no impact on groundwater is expected. This finding is based on extrapolation from a very limited number of bores. Further analysis of potential groundwater impacts should be conducted.

Much of the footprint of the project will be in the groundwater recharge zone. The projects impact on groundwater recharge was not investigated in the EIS. Extraction of water from any existing or constructed bores for the project, especially for the northern concrete batching plant, could have a significant impact on groundwater.

Secretary's Environmental Assessment Requirements

Revised SEARs were issued on 2 March2016 (Ref: SSD 13_6277)

One of the requirements that does not appear to have been met is the following,.

- identify how works within steep gradient land or highly erosive soil types will be managed during construction and operation, including in relation to access roads.

Apart from stating that "a detailed Soil and Water Management Plan should be prepared for the project prior to construction commencing," the EIS does not appear to address this requirement.

The EIS appears to indicate that no such landscape or soil conditions exist within the project area. Although the EIS outlines basic erosion control measures as described in Landcom 2004, the EIS does not appear to acknowledge that steep lands or highly erosive soils exist in the project area. No explanation of how it is intended to manage such conditions could be found in the EIS.

THE NASH FAMILY PROPERTY

The Nash family owns a 738 Hectare property that is adjacent to the Northern precinct of the Jupiter Project area. The property is a cattle grazing venture and is reliant upon high quality drinking water captured in farm dams. A significant proportion of the stock water captured in dams on the Nash property is reliant upon the Chain of Ponds Creek sub-catchment that is within the Jupiter project area.

Part of the northern sector of the Jupiter project incorporates the headwaters of the Chain of Ponds Creek and an unnamed sub-catchment of the Mulwaree River. The area within the P.A. that drains directly to the Nash property is calculated to be 132 Hectares (Figure 7).

The Jupiter project has the potential to have a negative environmental impact upon the Nash property. The potential for environmental impacts to the Nash Property is directly related to potential impacts to soil and water as a direct result of the construction and operation of the Jupiter windfarm Project.

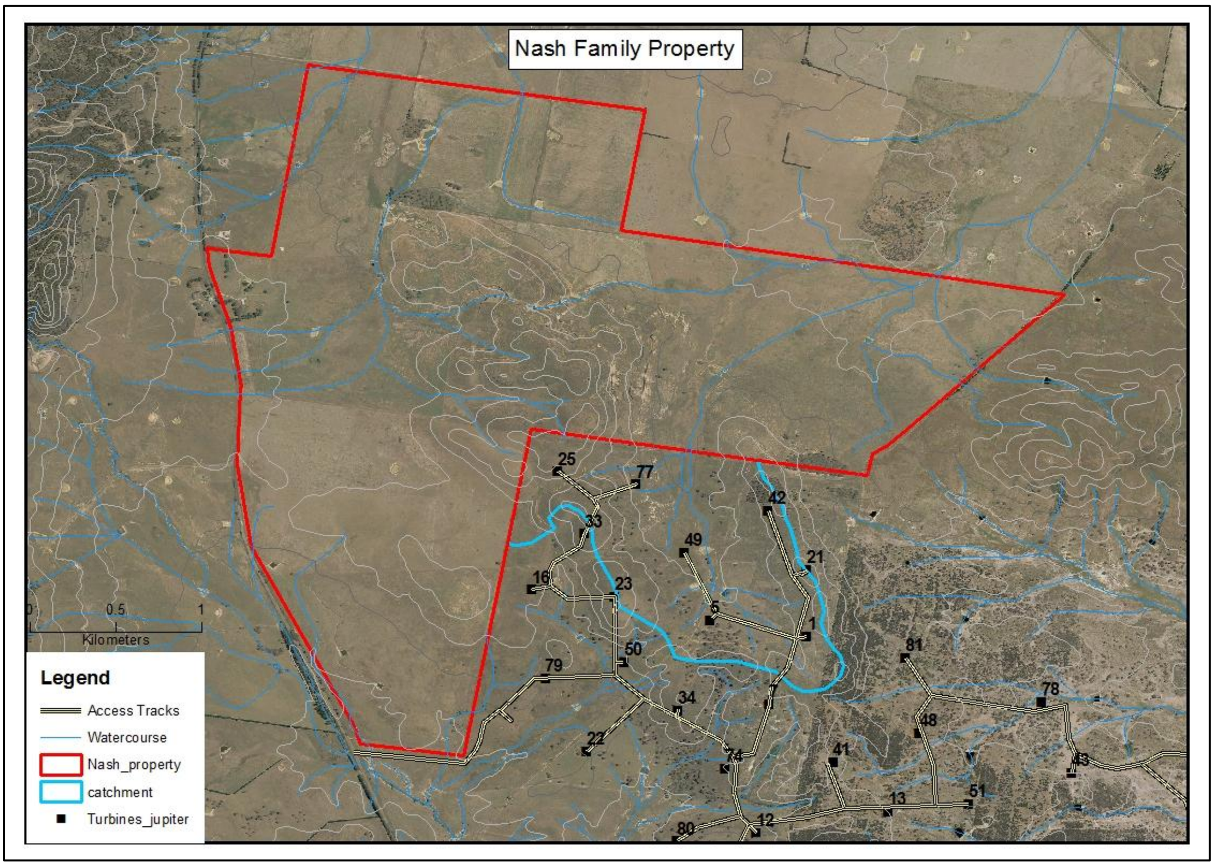

Figure 7. Illustration of the Nash Family Property showing property boundary in red. Aqua line is catchment draining to Nash Property from Jupiter project area. Access tracks and WTG sites are shown.

As mentioned earlier in this report two of the proposed WTG locations are located within the Morass Soil Landscape of Jenkins (1996). Both WTG 77 and WTG 49 are located on foot slopes and are very close to being within the actual drainage depression of the Chain of Ponds Creek. WTG 77 is within an area of soil conservation works where soil erosion is evidently a significant problem as shown in Figures 8, 9 and 10.

Disturbance to the existing soil conservation works will be unavoidable during the construction of WTG 77. The access road and power reticulation trench, would propose an extreme risk of concentrated storm water flow onto a site of existing soil erosion issues. It is evident that the proposed WTG 77 site is an unsuitable site for any major soil disturbing activity such as installation of WTG access tracks and the electricity reticulation trench network. The risk of negative soil and water impacts to the Nash property of constructing a WTG at site 77 is high.

Figure 8. Proposed location of WTG 77. The site is within existing soil conservation works.

WTG's 77, 49 and 5 are all located within the broad drainage depression of the Chain of Ponds Creek. These 3 WTG fall outside of the proponent's general WTG siting concept of locating WTG on upper slopes, crests and ridges as illustrated in Figure 9.

Foundation pads of all three WTG's (77, 49 and 5) are likely to intercept permanent groundwater, in my opinion, based on local experience and site assessment. This is in direct contradiction to statements in the EIS in section 14.2.4.indicating that at no location within the P.A. is groundwater likely to be intercepted by earthworks.

Due to potential impacts to the Nash property it is suggested here that these three WTG sites are not suitable sites for earthworks associated with WTG installation and operation.

Figure 9. Showing the location of proposed WTG's 77, 49 and 5.

Soil conditions in the lower slopes and drainage lines of the Morass and Duckfield Hut Soil Landscapes are likely to have a negative impact on the concrete used in WTG foundations. Soil salinity, soil sodicity and soil waterlogging are likely to be encountered at sites proposed for WTG's 77, 49 and 5.

Access roads and any soil conservation methods utilised will be in danger of ongoing erosion due to the sodic and saline nature of the soils found within the Morass soil landscape.

The proposed access road to WTG 77 is shown to go directly down slope and will cross existing soil conservation contour banks. Such a routing of the access track will lead to concentrated flows directly into an area already subject to extensive soil erosion issues.

Proposed routing of the access track to WTG 25 will also cross contours on 2 slopes and will when combined with added flow from the pad and crane hardstand, potentially add considerable flow to the drainage line flowing past WTG 77. As is shown in figure 10 the drainage line is already at risk of eroding through the existing soil conservation contour banking.

Figure 7 shows that there are 7 WTG sites located within the 132 Hectares of the Jupiter Project that will drain directly into the Nash property. Given that the proponent only has to indicate within 100 m actual site locations, there could actually be 8 WTG in the catchment. However calculations are based on 7. Combined with the access tracks and crane hardstands I calculate the footprint within the 132 hectares draining to the Nash property to be 3.58 hectares.

Therefore a total of 3.58 hectares of impermeable surface will be added to the catchment that drains to the Nash property. The additional impermeable surface created by the Jupiter Project could have a negative impact upon the water quality of the stock water dams, essential to the successful operation of the Nash cattle grazing enterprise.

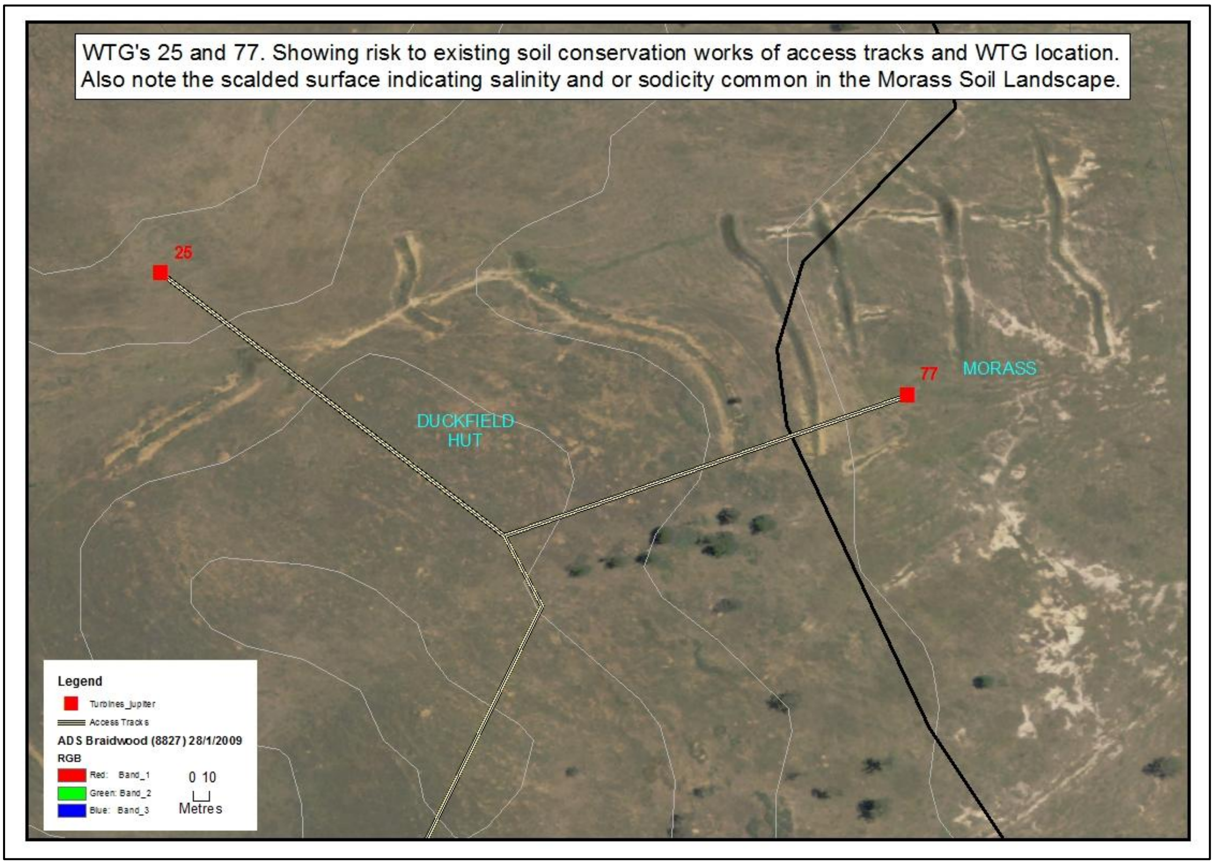

Figure 10. Image showing proposed access track routing across contour.

Conclusion

Aspects of the Jupiter Environmental Impact Statement that pertain to soil and water impacts are found to be questionable.

The proponent has failed to understand the local soil conditions found throughout the majority of the Project Area. The proponent consistently underestimates the soil erosion hazard for the majority of the project area, throughout the EIS.

The finding that the overall soil erosion hazard is “low” is proven in this report to be untenable based on publicly available evidence and personal experience of soils in the region.

The overall soil erosion risk for the majority of soils found within the project area is higher than “Low” and is found to be Moderate to High with some areas of Very High, by the author of this report. Support for this finding is available within the Soil Landscapes of the Braidwood 1:100 000 Map sheet, report produced by Brian Jenkins (1996) Department of Soil and Water Conservation.

Use of the Revised Universal Soil Loss Equation to support the claim of a low overall soil erosion risk is questionable. Known problems with the use of the RUSLE were not mentioned in the EIS and I question the validity of using the derived potential soil loss figures to define the overall soil erosion hazard.

Considerable risks to the Nash family property stock water quality and supply, as a result of the proposed Jupiter Project have been identified.

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Jenkins (1996) Braidwood 1:250 000 Soil Landscapes sheet report prepared by the Soil Conservation Service of NSW.

Landcom (2004) Managing Urban Stormwater: Soils and Construction, Volume 1, 4th edition.

Environmental Resources Management Australia Pty Ltd (october 2016) Jupiter Wind Farm Environmental Impact Statement