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Anthony Yeates
RATCH-Australia Corporation Limited
Level 7, 111 Pacific Highway
North Sydney
NSW 2060

Dear Anthony

Addendum to Collector Wind Farm - Traffic and Transport Assessment

1.0 Introduction

RATCH-Australia is seeking to develop a wind energy facility (the "Project") north west of Collector Village, within the Upper Lachlan Shire Council Local Government Area. In February 2012, AECOM (commissioned by RATCH-Australia) prepared *Collector Wind Farm - Traffic and Transport Assessment* (the "Original Assessment"). This document was submitted to the NSW Department of Planning & Infrastructure as part of the Development Application and Environmental Assessment Report in July 2012. Development approval for the project was granted in December 2013.

RATCH-Australia now proposes minor modifications to the Project. This letter serves as an Addendum to the original *Collector Wind Farm - Traffic and Transport Assessment* and addresses any changes that the Project modifications would have on traffic and transport issues.

2.0 Summary of key changes to the Project

The Original Assessment was prepared on the basis of the Project comprising 68 wind turbine generators ("WTGs"). The number of WTGs was reduced during the approval process and the Project Approval allows for 55 WTGs.

RATCH-Australia has proposed the following key project modifications from what was previously assessed by AECOM:

- WTG blade length of up to 57.2 metres (previously assessed at 56m) (refer to Note 1 below).
- WTG tower height of up 92 metres to be delivered in up to four sections per tower (previously assessed at 80 to 90 metres to be delivered in three sections per tower).

Note 1: It is envisaged that the WTG will have a swept diameter of up to 117 metres. Each blade's length is slightly shorter than half the diameter because it is mounted onto the WTG's hub, which itself has a width of two to three metres).

RATCH-Australia has also undertaken additional planning and has modified the approved site road design as a result of feedback from Upper Lachlan Shire Council and based on additional site engineering analysis. These changes and additional analysis have an impact on the traffic generated by the Project during construction.

3.0 Changes in background traffic

Background traffic levels were originally assessed in Section 3.3 of the Original Assessment.

Since that was produced in 2012, the data on the existing traffic conditions has been updated, and **Table 1** presents the Annual Average Daily Traffic (AADT) experienced on the major project transport corridors.

Table 1 Annual Average Daily Traffic (2007 to 2012)

Site	Location	2002	2003	2004	2005	2006	2007	2012
94.047**	Hume Highway (west of Federal Hwy)	6,873	7,543	7,565	7,502	7,312	7,431	8,000
07.352**	Hume Hwy (south of Illawarra Hwy)	19,835	20,250	20,772	20,105	20,235	20,846	23,300

** Permanent Count Stations

Source: Roads and Maritime Services Traffic Volume Data

On the Hume Highway (south of the Illawarra Highway), the previous data (2002-2007) showed growth in traffic of approximately one per cent per annum. In the subsequent five year period (2007-2012), there was increased annual growth of approximately 2.3 per cent per annum.

However, on the Hume Highway (west of the Federal Highway), for both five-year periods (2002-2007 and 2007-2012) annual growth in traffic volume was steady at about 1.5 per cent per annum. These increases will have only minor impacts on traffic flow for these roads. Thus, the growth in traffic volumes is expected to have a negligible effect on the findings and recommendations of the Original Assessment.

4.0 Changes in traffic and transport impacts

This section discusses the changes in traffic and transport impacts as a result of the modifications to the development during the construction and the operational phases of the development.

4.1 Construction phases

This was originally outlined in Section 5.1 of the Original Assessment. Construction traffic can be divided into the following main categories:

- Site earthworks for the establishment of site roads and compounds, and excavation of turbine foundations
- Concrete pouring for turbine foundations
- Wind turbine components and tower deliveries
- Sundry truck movements and deliveries
- Construction workforce traffic

4.1.1 Traffic generation

Site earthworks

This was originally assessed in section 5.1.4 of the Original Assessment.

The Original Assessment included an estimate that 60,000 m³ of gravel to be transported to the site during the construction phase for construction of the internal roads. Subsequent analysis based on the refined road and site design suggests that the net cut / fill balance associated with site earthworks would be approximately 45,000 m³ of net fill requirement. It is likely that not all of the cut material from the site would be reusable, and that some compaction will occur, resulting in a greater net fill requirement than this estimate, and thus the original estimate of 60,000m³ is still considered appropriate.

The assumptions presented in the Original Estimate regarding truck sizing and road transportation remain valid. Thus, the conclusions that during the site earthworks phase of construction a total of 6,000 trucks or an average of approximately 20 per day would be generated.

It is important to note that until detailed design of the site earthworks has been completed and a detailed geotechnical assessment of the site has been undertaken, it is not possible to precisely define the net cut or fill

requirement of the site earthworks, and not possible to accurately estimate what amount of cut site material will be able to be re-used on the site.

Concrete pouring for turbine foundations

This was originally included within section 5.1.1 of the Original Assessment.

At the time of the Original Assessment, it had not yet been decided whether there would be an on-site concrete batching plant. RATCH-Australia advises that it is not proposed to have any on-site concrete batching. Thus, concrete required for the construction of the turbine foundations would be delivered from an off-site source. Deliveries are likely to be via conventional three or four axle concrete mixer trucks, most likely from existing concrete production facilities in Goulburn.

The main assumptions regarding traffic generation from concrete pouring as presented in the Original Assessment are unchanged, although the number of WTGs has been reduced from 68 to 55 WTGs. Using the same assumptions as the Original Assessment, a total of approximately 3,095 concrete deliveries will be required for the concrete for all 55 WTGs.

All the concrete for a single WTG needs to be poured within a single day. It is unlikely that more than one footing would be poured in a single day, thus the concrete pouring phase would encompass 55 work days with about 56 concrete deliveries per day generated.

The footings also require steel reinforcing. About six conventional delivery trucks per footing would be required and so there would be a total of 330 trucks delivering steel reinforcing. It is likely that the delivery of steel reinforcing would involve 30 to 50 truck movements per day over an approximately three-week period. Steel delivery would occur prior to the concrete delivery phase of works.

Wind turbine components and tower deliveries

This was originally included within section 5.1.1 of the Original Assessment.

The deliveries would include the tower sections, blades, nacelles, hubs and sundry components. Each is described below and the required number of trucks presented in **Table 2**. Key changes since the Original Assessment include:

- Reduction in number of WTGs from 68 to 55
- Increase in blade length – which is unlikely to change the type or number of trucks required or the proposed transport route, given the small nature of the change and conservatism built into the Original Assessment
- Possible increase in number of sections that the tower will be transported in (up from three sections per WTG to four sections)

Table 2 Wind turbine components and tower deliveries: Required trucks

Description	Required trucks per WTG	Total trucks required
Tower sections: The towers will be delivered in four sections (as opposed to three sections as described in the Original Assessment) transported on extended articulated trucks.	4	220
Blades: Each turbine has three blades, with each blade transported on its own truck. The increase in blade length from 56 metres to 57.2 metres is unlikely to change the type of truck required.	3	165
Hub: One hub per truck	1	55
Nacelle: One nacelle per truck	1	55
Sundry components: Delivered in containers. The sundry components for approximately two WTGs will be delivered per container.	0.5	28
TOTAL	9.5	Approx. 525

Only one over-dimensioned truck would arrive at site at one time, with loads to be stockpiled at laydown areas established within the Project site.

Delivery of the WTG components is likely to occur over a four or five month period, subsequent to the establishment of site roads and turbine foundations. Construction scheduling is likely to result in deliveries equivalent to two WTGs per week arriving at site during that phase of construction. This equates to an average of three or four deliveries per day during that phase of construction, although on key delivery days there may be up to 10 deliveries occurring

Sundry truck movements

This was originally included within section 5.1.1 of the Original Assessment.

Only water delivery for dust suppression was included in the Original Assessment. Greater detail can now be provided about sundry truck deliveries than was available at the time the Original Assessment was done. These are presented in **Table 3**. Sundry truck movements will be required for a range of other purposes, including:

Table 3 Sundry deliveries

Description	Total vehicles
Water delivery (for dust suppression)	240
Delivery of earthmoving and rock crushing plant for road construction, foundation excavation and cable trenching	120
Electrical cabling deliveries and sand delivery for cable bedding	200
Delivery of major components for the substation	50
Temporary building deliveries (for the construction compound) plus building material deliveries (for the permanent O&M building)	40
Delivery of the permanent meteorological masts	10
Allowance for other general and sundry deliveries	420
TOTAL	Approx. 1,080

Of these truck movements, less than 50 would be oversized loads. The majority of these deliveries would be in standard delivery trucks or light commercial vehicles.

Construction workforce

This was originally included within section 5.1.1 of the Original Assessment. The expectations regarding construction workforce have not changed from the Original Assessment and no update is required in this addendum.

4.1.2 Summary of total traffic generation

The total number of vehicles generated during the construction stage is outlined in **Table 4**.

Table 4 Total number of construction vehicles generated

Phase	Total number of vehicles	
	Original Assessment	Modified development
Site earthworks	6,000	6,000
Concrete pouring for turbine foundations (including steel reinforcing delivery)	3,880	3,425
Wind turbine components and tower deliveries	544	525
Sundry truck movements	306	1,080
TOTAL	10,730	11,030
CHANGE	-	Increase of 300 vehicles (up ~3%)
Construction workforce vehicles (daily maximum)	110	110

The construction phase of the project is expected to generate approximately 11,300 vehicle deliveries, an increase of approximately three per cent or 300 vehicles from the Original Assessment. The main reasons for the change are:

- A reduction in turbine numbers from 68 to 55 WTGs, which reduces traffic generation in relation to the concrete pouring for foundations and wind turbine component and tower deliveries.
- An increase in the possible number of deliveries required per turbine tower (up from three sections per WTG to four sections).
- Additional planning has been undertaken regarding sundry deliveries, and more vehicle movements have been identified than were previously considered in the Original Assessment. An allowance of 420 “general and other deliveries” has been included in this addendum (approximately four per week) that was not included in the Original Assessment.
- Other small changes which arise as a consequence of additional levels of planning and design being undertaken.

4.1.3 Summary of maximum traffic generation

Maximum daily traffic generation would occur during the concrete pouring for the turbine foundations. As a worst case scenario, we have assumed that this phase coincides with the maximum construction workforce being present on site. On days when a footing is being poured, about 170 vehicles per day (56 mixer trucks + 110 staff vehicles + four sundry deliveries) would be generated. This remains consistent with the maximum daily traffic impacts outlined in the Original Assessment.

4.1.4 Traffic distribution

This was originally assessed in Section 5.1.2 of the Original Assessment.

There is not expected to be a change in the transport route or traffic distribution as outlined in the Original Assessment.

Trucks bringing materials to the site would most likely come from sites originating to the east of the site – large turbine parts would most likely be shipped to Port Kembla and trucked to the site. Concrete mixer trucks would be coming from the Goulburn area along the Hume Highway to site. Quarry material for site earthworks will arrive at the site along the Hume Highway. Employee traffic would come from the region surrounding the Project, including Canberra and the ACT, Goulburn, and other surrounding towns.

4.1.5 Impact of construction traffic

As described in the Original Assessment, the entire route consists of four-lane, two-way roads on most of the sections except for the 27km long Picton Road section from the Hume Highway to Mount Ousley Road / Southern Freeway, which is a two-lane, two-way road with frequent overtaking lanes in either directions.

Transporting the WTG materials from Port Kembla is expected to generate about 525 trucks (those carrying the tower sections, blades, nacelles, hubs and sundry components) over the course of the construction stage. This is a reduction from the 544 trucks estimated in the Original Assessment. As noted before, only one over dimensioned (OD) truck is planned to arrive at site at one time. Therefore, the trucks are not expected to have a significant impact on operations along Picton Road. The OD vehicles would be accompanied by pilot vehicles and scheduled to impact the least amount of vehicles as possible.

Based on the updated traffic data, the combined generated daily traffic movement of 340 vehicle movements (170 to the site and 170 from the site) is approximately four per cent of the total daily volume on Hume Highway (about 8,000 vehicle movements per day). The Hume Highway would be able to absorb the increase in traffic during the construction phase without any significant impact on operation.

4.2 Roads and Maritime Services submission to the Department of Planning during Public Exhibition of the Project's EAR

Roads and Maritime made a submission to the Department of Planning during the Public Exhibition of the Project's EAR (dated 27/9/2012, RMS ref STH10/00195). Points raised included:

- No widening of the intersections of Hume Highway / Lerida Rd South, Hume Highway / Picton Rd and Picton Rd / Mt Ousley Rd.
- No right turns out of Lerida Rd South onto Hume Highway (underpass at the Collector-Gunning Rd intersection to be used).
- No right turns off Hume Highway (when headed east) into Lerida Rd South (no turn around location identified by Roads and Maritime).

RATCH-Australia has noted all of the points raised by Roads and Maritime, and is able to comply with these points.

Further investigation of the intersection of Hume Highway and Lerida Rd South has revealed that some temporary modifications to this intersection will be required to accommodate the over length loads (especially the blades). These temporary modifications include relocation of road signage at the intersection and pruning or removal of several trees and shrubs located within the turning arc.

These temporary modifications will be described in detail in a separate application covering the upgrade to Lerida Rd South that is being prepared by RATCH-Australia for submission to Upper Lachlan Shire Council.

4.3 Upgrades to Lerida Rd South

Upgrades to Lerida Rd South have not been addressed in this addendum. Upgrades to Lerida Rd South (including temporary modifications to the intersection of Lerida Rd South / Hume Highway) are to be described in a separate application that is being prepared by RATCH-Australia for submission to Upper Lachlan Shire Council.

5.0 Operational phase impacts

There is not expected to be any change, as a result of the project modification, to operational traffic generated by the Project from that outlined in the Original Assessment. Operational traffic will comprise almost exclusively of daily arrival and departure of the Project's workforce of 10 to 15 employees, who would arrive via light vehicle.

6.0 Conclusion

The change in the traffic and transport impacts in the modified proposal compared to that considered in the Original Assessment is expected to be minimal. A more detailed assessment of traffic generation has been undertaken since the Original Assessment and identified an increase of approximately 300 vehicle movements (or about four per cent) over the course of the construction phase compared to that originally assessed. Construction phase impacts are likely to be unchanged.

The increase in blade length is unlikely to have any impact on road transport or route selection. The increase in blade length is unlikely to require different trucks to be used from that originally assessed and the original route identified remains suitable.

There is no change to the expected maximum daily traffic generation during construction (which would occur during the concrete pouring phase of construction) and is still estimated at 170 vehicles per day (56 concrete trucks, 110 workforce vehicles and four sundry deliveries). Existing traffic levels on the Hume Highway have increased since the Original Assessment so this maximum daily traffic generated by the Project represents a lower per cent of overall traffic on the Hume Highway and remains easily accommodated by that road network.

There is no change to any operational phase traffic or transport impacts from that considered in the Original Assessment.

Yours sincerely



Nick Bernard

Principal Transport Planner
nick.bernard@aecom.com

Direct Dial: +61 2 8934 0069
Direct Fax: +61 2 8934 0001