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SPECIALISTS MANAGING THE EARTH

50 YEARS AN EXTRAORDINARY JOURNEY

PROPOSED WIND FARM CROOKWELL III, NSW

Preliminary Geotechnical Assessment
Crookwell Developments Pty Ltd

GEOTABTF7881AC-AC
11 May 2010

Coffey Geotechnics Pty Ltd ABN 93 056 929 483
126 Trenerry Crescent Abbotsford VIC 3067 Australia

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SPECIALISTS MANAGING THE EARTH

30 July 2010

Crookwell Development Pty Ltd
Level 5, 8 Help Street
Chatswood NSW 2067

Attention: Mr Shaq Mohajerani

Dear Shaq,

RE: Crookwell III Wind Farm Project, Crookwell, NSW

Revised page 1 of report GEOTABTF07881AC-AC dated 11 May 2010

Please find attached 3 copies of the revised page 1 from Coffey report GEOTABTF07881AC-AC dated 11 May 2010. The revisions relate to edits made at your request via email dated 26 July 2010.

We request that the original pages are removed from the report and replaced with the revised pages, or the original pages be clearly stamped as superseded.

Should you require further information, please do not hesitate to contact David Annan or the undersigned.

For and on behalf of Coffey Geotechnics Pty Ltd

Greg Anderson
Principal Geotechnical Engineer

Attachments: Revised page 1 of report GEOTABTF07881AC-AC

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SPECIALISTS MANAGING THE EARTH

50 YEARS AN EXTRAORDINARY JOURNEY

11 May 2010

Crookwell Developments Pty Ltd
Level 5, 8 Help Street,
Chatswood, NSW 2067

Attention: Shaq Mohajerani

Dear Sir,

RE: Crookwell III Wind Farm Project, Crookwell, NSW

Preliminary Geotechnical Assessment

This letter presents our revised report on a preliminary geotechnical assessment completed for the above project. Three copies of the report are presented for your information.

Should you have any queries or require clarification on any aspect of this report, please do not hesitate to contact the undersigned.

For and on behalf of Coffey Geotechnics Pty Ltd

Greg Anderson
Principal Geotechnical Engineer

Prepared by
David Annan
Geotechnical Engineer

Distribution:	Original:	Coffey Geotechnics Pty Ltd
	1 copy:	Coffey Geotechnics Pty Ltd Library
	3 copies:	Crookwell Developments Pty Ltd

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1 INTRODUCTION

Coffey Geotechnics Pty Ltd (Coffey) has undertaken a preliminary geotechnical assessment for the proposed Crookwell 3 Wind Farm in NSW.

The proposed Crookwell 3 Wind Farm is split into 2 main areas, the 'South' site located to the west of Crookwell Road approximately 15km south of the Crookwell township, and the 'East' site which is located on the east side of Woodhouselea Road about 18km south east of the Crookwell township. We understand that the proposed development will comprise of up to 33 wind turbine generators (WTGs) and is part of the portfolio of Wind Farm projects being developed by Union Fenosa Wind Australia (UFWA). We further understand that this report forms part of the submission made for the Planning Application for this site.

The aims of this preliminary geotechnical assessment were to:

- Provide a preliminary understanding of the geological setting and its potential impact on footing type and size for WTGs, monitoring towers, substations and transmission towers;
- Consider groundwater and slope stability issues and their implications for footing types, trenching and access tracks;
- Make a preliminary assessment of geotechnical constraints that could affect the construction of access roads, hardstand and lay down areas including the use of locally sourced materials;
- Provide preliminary indication regarding electrical resistivity and thermal conductivity of site soils; and
- Consider the potential for soil erosion and/or soil/groundwater contamination.

This study was commissioned by Andrea Jou Elena of Crookwell Developments Pty Ltd via email dated 15 February 2010. The scope and extent of the assessment were based on a proposal prepared by Coffey (reference GEOTABTF07881AC-AA, dated 12 February 2010).

This report describes the preliminary geotechnical assessment undertaken and summarises the subsurface conditions encountered. Preliminary recommendations relating to the key geotechnical issues affecting the development of the sites are presented in Sections 5, 6 and 7.

2 FIELDWORK

The fieldwork for this geotechnical assessment was carried out on 30 and 31 March 2010 and comprised the following:

- A site walkover / drive over of both the south and east sites.
- Excavating seven test pits at the east site (designated CTP A4, CTP A6, CTP A11, CTP A13, CTP A15, CTP A20, and LS1). The labelling of the test pits corresponds with the WTG alphanumeric identifications shown in Figure 1, with a prefix 'CTP' to indicate a test pit. The test pit LS1 was labelled to identify a test pit excavated at a possible landslide location.

Due to the consistent surface geology encountered at the south site and the variability of ground conditions found at the east site, it was considered that excavating the test pits at the east site would be more beneficial at this stage if the investigation, as such, no test pits were excavated at the south site at this stage.

2.1 Site Walk / Drive over

A geotechnical engineer conducted a walk/drive over which included:

- Field sketches and photographs of the site.
- Making notes regarding the nature of rock outcrop including information such as, rock type, degree of weathering, assessed rock strength, type and likely thickness of soil cover.
- Observations regarding evidence of existing instability and general geomorphology of the site.

2.2 Excavation of Test Pits

Seven test pits were excavated to aid preliminary assessment of the likely subsurface materials at the east site. Of particular interest is the excavatability of the soils and footing types for the proposed WTGs. These test pits were located at the sites of 6 of the proposed WTG's. The remaining pit was located at a possible landslide location. The test pitting program was undertaken on 31 March 2010.

The test pits were excavated using a Caterpillar 432D Backhoe supplied and operated by Divall's earthmoving and plant hire fitted with an interchangeable 450mm wide toothed bucket. The test pits were excavated to depths of between 1.4m and 3.0m. On completion each test pit was backfilled with the excavated spoil and tamped with the backhoe bucket, before being traversed with the backhoe tyres.

The subsurface conditions encountered in the test pits, were logged by a geotechnical engineer who also collected samples for visual assessment. The test pits locations are shown on Figure 1. The test pits were located using a handheld GPS unit. The GPS co-ordinates of the test pit locations in GDA94 coordinate system are recorded on the engineering logs.

Engineering logs for the test pits are presented in Appendix A, preceded by explanation sheets outlining the terms and symbols used in their preparation.

3 TOPOGRAPHY AND GEOLOGY SETTING

3.1 East Site

The east site of the proposed wind farm is located adjacent to Woodhouselea Road, approximately 18km south east of Crookwell and is approximately 1,100Ha in area and of irregular shape. Occupying the site are farms known as Hillview and Leeston, with farm houses and stock sheds present. The site is accessible via the farm entrance off Bolton Road which forms the north boundary of the site and a network of farmers tracks throughout the site. There is also access to the site off Woodhouselea Road immediately south of the Hillview farm house. However, this access was not available at the time of the site walkover. A high voltage transmission line bisects the central part of the site.

The proposed wind farm site is located in hilly topography consisting of grazing fields. The site forms a large gully that is bisected by Steeves Creek. The high points of the site are at about RL 940m at the south east corner of the site and RL 934m at the north east corner of the site. The low point of RL 828 is in the south west of the site where Steves Creek exits the site. Ground slopes vary greatly from flat up to about 30^{o} to the horizontal.

At the time of the assessment rain had recently fallen. The site was trafficable to a 4WD backhoe and a four wheel motor bike.

The Geological Survey of New South Wales (1973) 1:250,000 scale “Goulburn” map sheet indicates that the general geology of the east site comprises Ordovician siltstones, sandstones and shales with associated residual soils which are distributed over the southern part of the site and the areas of lower elevation. The northern part of the site is also underlain by Ordovician siltstones, sandstones and shales as well as Tertiary are basalt flows which form caps at the peaks of the areas of high elevation and are generally overlain by variable thicknesses of residual clayey soils.

3.2 South Site

The south site of the proposed wind farm is located adjacent to Crookwell Road, approximately 15km south of Crookwell and is approximately 400Ha in area and of irregular shape. Occupying the site is farm land known as Wollondilly with farm houses and stock sheds present. The site is accessible via the farm entrance off Crookwell Road and a network of farmer’s tracks throughout the site. A high voltage transmission line bisects the north western part of the site.

The proposed wind farm site is located in hilly topography consisting of grazing fields. The high point of the site is at about RL 849m at the north west corner of the site and the low point of RL 738 in the south east of the site, where First Creek exits the site to a small farm dam. Ground slopes vary greatly from flat up to about 40^{o} to the horizontal.

At the time of the assessment rain had recently fallen. The site was trafficable to a 2WD vehicle. It should be noted that the vehicle did not travel off the designated public roads or farmers tracks.

The Geological Survey of New South Wales (1973) 1:250,000 scale “Goulburn” map sheet indicates that the general geology of the site comprises Siluro-Devonian Granites with associated residual soils.

4 SUBSURFACE CONDITIONS

4.1 East Site

4.1.1 Stratigraphy

Our fieldwork findings were broadly consistent with the mapped geology. It should be noted that test pits were only excavated at the east site. Engineering logs of the test pits are presented in Appendix A and locations of the test pits are shown on Figure 1.

Test pits CTP A4, CTP A6, and CTP A11 were excavated in areas of Tertiary age volcanics. These test pits typically showed a layer of clayey silt topsoil 0.25m to 0.3m thick overlying residual clay soils to between 0.5m and 1.3m below the existing surface level. Underlying the residual soils was extremely to highly weathered basalt of very low to medium strength. Test Pit CTP A11 met refusal on high strength basalt at a depth of 1.4m below the existing surface level. Test Pit CTP A6 penetrated the extremely weathered basalt and encountered cemented sand which is inferred to be the top of the Ordovician age sedimentary deposits which are known to underlie the basalts.

Test pits CTP A13, CTP A15, and CTP A20 were excavated in areas of Ordovician age sedimentary deposits. These test pits typically showed a layer of sandy and clayey silt topsoil 0.2m to 0.3m thick overlying residual silty clay, sandy clay, and clayey sand soils to depths of between 0.9m and 1.4m below the existing surface level. Underlying the residual soils was extremely to slightly weathered siltstone, sandstone, and shale of very low to high strength. Bedding in these sedimentary rocks varied from indistinct in the sandstone, thinly bedded at about 70^{o} to 80^{o} in the siltstone to very thinly bedded at about 45^o in the shale. Test Pit CTP A15 met refusal on high strength sandstone at a depth of 1.5m below the existing surface level.

4.1.2 Rock Strength and Weathering

At this stage, there is limited information available regarding the condition of the rock below the depth of the test pits. During the site walkover and test pit investigation, highly or less weathered basalt was observed at a number of locations at the surface. The field assessment of rock mass strengths typically ranged from medium to very high in the moderately or less weathered basalt. Weaker zones are present such as encountered in CTP A6 where the basalt flow is relatively thin. Sandstone, siltstone and shale was also observed in outcrops at the surface. These materials were generally extremely to moderately weathered and of very low to medium strength. This is generally consistent with the rock strengths encountered in the test pits CTP A13, CTP A15, and CTP A20 with the exception of the high strength sandstone encountered in CTP A15.

4.1.3 Groundwater and Drainage

Due to the generally hilly topography of the site, drainage during rain events is expected to occur relatively quickly and the local creeks would be expected to rise rapidly. As a result, erosion of non vegetated surfaces is likely to occur.

No groundwater or evidence of surface springs were noted at the time of the fieldwork. The site was generally well vegetated which reflects the recent rains in the region. For most of the site the permanent groundwater is likely to be at least several metres below ground surface. Locally seasonal perched water tables can occur in the upper parts of the ground profile particularly in the alluvial soils surrounding creeks and drainage channels.

4.2 South Site

4.2.1 Stratigraphy

Our fieldwork findings were broadly consistent with the mapped geology. It should be noted that test pits were not excavated at the southern site of the proposed wind farm. It was considered that test pits would be concentrated at the east site due to the potential variability of ground conditions at the east site.

Based on the observations made during the site walk over, the surface soils at the site typically comprise silty sands, clayey sands and sandy clays. The thickness of these soils is likely to vary significantly across the site. There was a number of Granite outcrops observed across the site, particularly near the top of the hills. Given that the proposed locations of the turbines are typically near the top of the hills, the depth of residual soils is expected to be relatively thin.

4.2.2 Rock Strength and Weathering

At this stage, there is limited information available regarding the condition of the rock below the surface outcrop. Surface outcrop was typically moderately to slightly weathered granite or high to very high strength.

4.2.3 Groundwater and Drainage

Due to the generally hilly topography of the site, drainage during rain events is expected to occur relatively quickly and the local creeks would be expected to rise rapidly. As a result, erosion of non vegetated surfaces is likely to occur.

No groundwater or evidence of surface springs were noted at the time of the fieldwork. The site was generally well vegetated which reflects the recent rains in the region. For most of the site the permanent groundwater is likely to be at least several metres below ground surface. Locally seasonal perched water tables can occur in the upper parts of the ground profile particularly in the alluvial soils surrounding creeks and drainage channels.

5 FOOTING SYSTEMS

5.1 Wind Turbine Generators (WTG) footing systems

It is understood that WTGs are generally supported on large reinforced gravity footings or on smaller pad footings restrained by subsurface ground anchors.

5.1.1 Gravity Footings

Based on our experience, WTGs supported on reinforced concrete gravity footings are generally expected to be founded 1.5m to 3m below the existing ground surface.

Based on the observations made during the site walk over and the test pits completed to date at the east site, it is considered that excavations to a depth of about 2m to 3m depth are likely to encounter, highly or less weathered basalt rock, siltstone, sandstone and shale. It is possible that weaker materials (very low strength rock or soil strength materials) may be encountered locally within this depth range. The thickness of these materials at this stage is not known and will have to be assessed prior to final design.

At this stage no subsurface investigation has been undertaken at the south site. Based on the observations made during the site walkover and the location of the proposed WTG's (generally near the peaks of the hills), it is considered that footing excavations to a depth of about 2m to 3m depth are likely to encounter residual granitic soils and highly or less weathered granite rock.

5.1.2 Anchored Footings

The main parameter governing anchor design will be the allowable bond stress at the rock to grout interface. It would be expected (based on previous experience) that anchors may be constructed to a depth of about 12 m.

It is important to note that at this time, the thickness of the basalt unit beneath the east site is not known. It is possible that foundation anchors may penetrate the basalt into the underlying strata. Further geotechnical investigations at the WTG sites to depths of about 20m are recommended to allow footing designs.

On the basis of the limited available information, it is considered that anchors would extend into the basalt, siltstone, sandstone, shale and granite rock such that the tensile strength of the strand becomes the controlling design parameter for rock anchors. It should be noted that the orientation and frequency of defects would impact on the grout bond stress available in these materials.

5.2 Monitoring Towers, Overhead Power Lines & Substations

Monitoring towers, overhead power lines and associated substations would be required as part of the wind farm development.

It is expected that the monitoring towers, power poles, and substation infrastructure would generally be supported by near surface footings (pad or strip footings) founded in either residual soil or weathered bedrock or bored piles founded in weathered bedrock.

At the time of preparing this report, the location of the proposed substations was not known. Based on the subsurface conditions encountered in the test pits excavated at the east site and the observations made during the site walkover at both sites, for preliminary design purposes, it is considered that the proposed substation may be supported on spread footings founded beneath the topsoil and within the underlying stiff to hard silty clay, sandy clay, dense to very dense sand or highly or less weathered bedrock.

With regard to shallow footings supported on the natural silty clay, particularly in the north west of the east site where the surface soils comprise residual basaltic clays, it should be noted that these clays are typically of high plasticity and are generally considered to be highly reactive. Consideration would need to be given to the potential shrink swell movements when designing shallow footings supported on the natural high plasticity silty clays.

6 CONSTRUCTION CONSIDERATIONS

6.1 Excavation Conditions

Based on the subsurface conditions assessed from the test pits, excavations for access roads, construction platforms and foundations for the WTG are likely to encounter a variable thickness of silty clay, sandy clay, and sand soils with some basalt and granite boulders, and highly or less weathered basalt, siltstone, sandstone, shale and granite rock.

Excavations of the soil and extremely weathered materials should be able to be carried out using tracked excavators or bulldozers. Some basalt and granite boulders may be encountered when excavating soil strength materials. These may require larger plant and some over excavation to remove.

Bulk excavation in the highly or less weathered rock should generally be able to be carried out using large plant such as a heavy bulldozer or heavy hydraulic excavator, assisted by hydraulic breakers and ripper attachments. Blasting may be required if strong intact rock is encountered.

6.2 Excavation Batter Stability

The following general temporary batter slopes can be adopted for excavations which do not exceed 3m in depth and where no ground water is encountered.

- Sands, short term batters of 1.5H: 1 V.
- Clays, short term batters of 1H: 1 V.

The following general permanent batter slopes can be adopted for excavations which do not exceed 3m in depth and where no ground water is encountered.

- Sands, short term batters of 3H: 1 V.

- Clays, short term batters of 2.5H: 1 V.

Permanent batters should be protected from erosion by a vegetative cover or proprietary system. Further advice should be sought where higher batters are required in clay, sand or other soil strength materials.

The stability of batter slopes within the rock will depend on the orientation and spacing of joints and defects, which should be assessed once turbine locations are finalised. For preliminary design purposes only, batter slopes up to 3m high within the highly or less weathered rock should not be steeper than 1H:1V for the permanent case and 0.5H:1V for the temporary case.

6.3 Re-use of Site Materials for Engineered Fill

The following comments are provided on the potential reuse of excavated materials for engineered fill:

- The performance of the natural silty clay soils is likely to be sensitive to changes in moisture content and they may heave or be difficult to compact under adverse moisture conditions. Careful moisture conditioning and compaction will be required to compact these materials.
- The natural sandy soils may be able to be used as engineered fill.
- The highly and less weathered rock may be able to be used as engineered fill if, during excavation, handling and re-compaction, the rock breaks down to fragments in the order of 100mm or less. It is likely that there may be zones where the rock fragments are in general larger than 100mm. These materials may be used as engineered fill following a crushing process breaking the rock into a well graded aggregate of minimum particle size 100mm or less.

6.4 Re-use of Site Materials for Construction of Unbound Pavements

Based on the supplied information and discussion with the client it is understood that unsealed access roads will be constructed to allow access to the proposed WTG sites. It is also understood that regular maintenance and repairs will be undertaken along unsealed access roads during the construction phase, when heavy construction traffic is likely to degrade the pavement surface. Following construction, the access roads will only be trafficked by relatively light 4WD service vehicles.

It is considered that locally derived moderately to less weathered rock of high or greater strength could be used as pavement materials for the proposed unsealed pavements provided some processing is undertaken on site to provide a reasonably well graded material with a maximum particle size of about 50mm. Excessive fines should be avoided to provide adequate strength when wet. Based on our experience with similar soils on other sites, it is recommended that for preliminary purposes a CBR of 3% be adopted for pavements founded on a prepared subgrade of the natural soils and weathered rock. It is recommended that pavement surfacing materials be targeted to have grading and plasticity requirements as recommended in the Austroads “Unsealed Roads Manual”.

7 SLOPE STABILITY & EROSION

During the site walkover, a number of ancient landslides were noted at the east site. The landslips observed are expected to be generally associated with the contact between the Tertiary age basalts and the underlying Ordovician age sediments. The locations of the landslips observed during the site walkover are shown on Figure 1. No evidence of recent instability was observed. It is recommended that construction of WTG’s and related infrastructure avoid areas close to the contact between the

Tertiary age basalts and the underlying Ordovician age sediments and areas of steep topography. It is recommended that a detailed assessment of the potential landslips in the area be undertaken once further details regarding the proposed WTG and other infrastructure locations are known.

No evidence of natural slope instability was observed at the south site during the site walkover.

Evidence of severe erosion was observed along drainage channels at both the south and the east sites indicating that the surface soils are susceptible to erosion. Due to the hilly topography it is expected that water flows along these drainage channels would be fast and erosion is likely to result. It is recommended that measures to reduce clearing of natural vegetation and surface water runoff in the construction areas be taken to reduce the likelihood of erosion at the site. Drainage channels may require protection by rock beaching or similar.

8 THERMAL CONDUCTIVITY & ELECTRICAL RESISTIVITY

No thermal conductivity or electrical resistivity testing was conducted as part of this stage of the assessment. Coffey completed thermal conductivity and electrical resistivity tests at the nearby Crookwell II wind farm site. The geological profile at the Crookwell II site is similar to the anticipated geological profile at the Crookwell III site. For preliminary purposes, it is expected that the thermal conductivity and electricity values at the Crookwell III site should be similar to the values recorded from the testing at the Crookwell II site, as both sites are likely to have similar subsurface profiles. It is recommended that actual testing for thermal conductivity and electrical resistivity be undertaken during a geotechnical investigation.

9 GEOTECHNICAL INVESTIGATION

The findings in this report are based on the results of a site walkover and a limited number of test pits excavated at the east site. The contents of this report should be considered as a preliminary indication to provide an initial understanding of the geological setting and its impact on the proposed wind farm. It is recommended that geotechnical investigations be conducted to provide information for the design of footings, access roads and other infrastructure. Geotechnical investigation should include the excavation of test pits at all WTG locations, substation locations and along access track alignments, together with deeper boreholes at a number of the WTG locations. The actual number of boreholes depends on the location of the WTG site, type of footing system preferred and the potential variation in ground conditions between the WTG sites.

10 CLOSURE

This preliminary assessment has been undertaken to provide an initial understanding of the geological setting and its impact on the proposed wind farm. Subject to the result of further assessment of landslip risk on the steeper slopes of the east site, it is considered that there are no major geological issues that would prevent the construction of the Crookwell III Wind Farm, provided the recommendations of this study are followed and further investigation is undertaken at a later stage.

The attached document entitled “Important Information About Your Coffey Report” presents additional information on the uses and limitations of this report.

For and on behalf of COFFEY GEOTECHNICS PTY LTD

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SPECIALISTS MANAGING THE EARTH

Important information about your **Coffey** Report

As a client of Coffey you should know that site subsurface conditions cause more construction problems than any other factor. These notes have been prepared by Coffey to help you interpret and understand the limitations of your report.

Your report is based on project specific criteria

Your report has been developed on the basis of your unique project specific requirements as understood by Coffey and applies only to the site investigated. Project criteria typically include the general nature of the project; its size and configuration; the location of any structures on the site; other site improvements; the presence of underground utilities; and the additional risk imposed by scope-of-service limitations imposed by the client. Your report should not be used if there are any changes to the project without first asking Coffey to assess how factors that changed subsequent to the date of the report affect the report's recommendations. Coffey cannot accept responsibility for problems that may occur due to changed factors if they are not consulted.

Subsurface conditions can change

Subsurface conditions are created by natural processes and the activity of man. For example, water levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Because a report is based on conditions which existed at the time of subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time. Consult Coffey to be advised how time may have impacted on the project.

Interpretation of factual data

Site assessment identifies actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from literature and external data source review, sampling and subsequent laboratory testing are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact on the proposed development and recommended actions. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions. For this reason, owners should retain the services of Coffey through the development stage, to identify variances, conduct additional tests if required, and recommend solutions to problems encountered on site.

Your report will only give preliminary recommendations

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area. This assumption cannot be substantiated until project implementation has commenced and therefore your report recommendations can only be regarded as preliminary. Only Coffey, who prepared the report, is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered as the project develops. If another party undertakes the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and Coffey cannot be held responsible for such misinterpretation.

Your report is prepared for specific purposes and persons

To avoid misuse of the information contained in your report it is recommended that you confer with Coffey before passing your report on to another party who may not be familiar with the background and the purpose of the report. Your report should not be applied to any project other than that originally specified at the time the report was issued.

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Important information about your **Coffey** Report

Interpretation by other design professionals

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, retain Coffey to work with other project design professionals who are affected by the report. Have Coffey explain the report implications to design professionals affected by them and then review plans and specifications produced to see how they incorporate the report findings.

Data should not be separated from the report*

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way.

Logs, figures, drawings, etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel) and laboratory evaluation of field samples. These logs etc. should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Geoenvironmental concerns are not at issue

Your report is not likely to relate any findings, conclusions, or recommendations about the potential for hazardous materials existing at the site unless specifically required to do so by the client. Specialist equipment, techniques, and personnel are used to perform a geoenvironmental assessment.
Contamination can create major health, safety and environmental risks. If you have no information about the potential for your site to be contaminated or create an environmental hazard, you are advised to contact Coffey for information relating to geoenvironmental issues.

Rely on Coffey for additional assistance

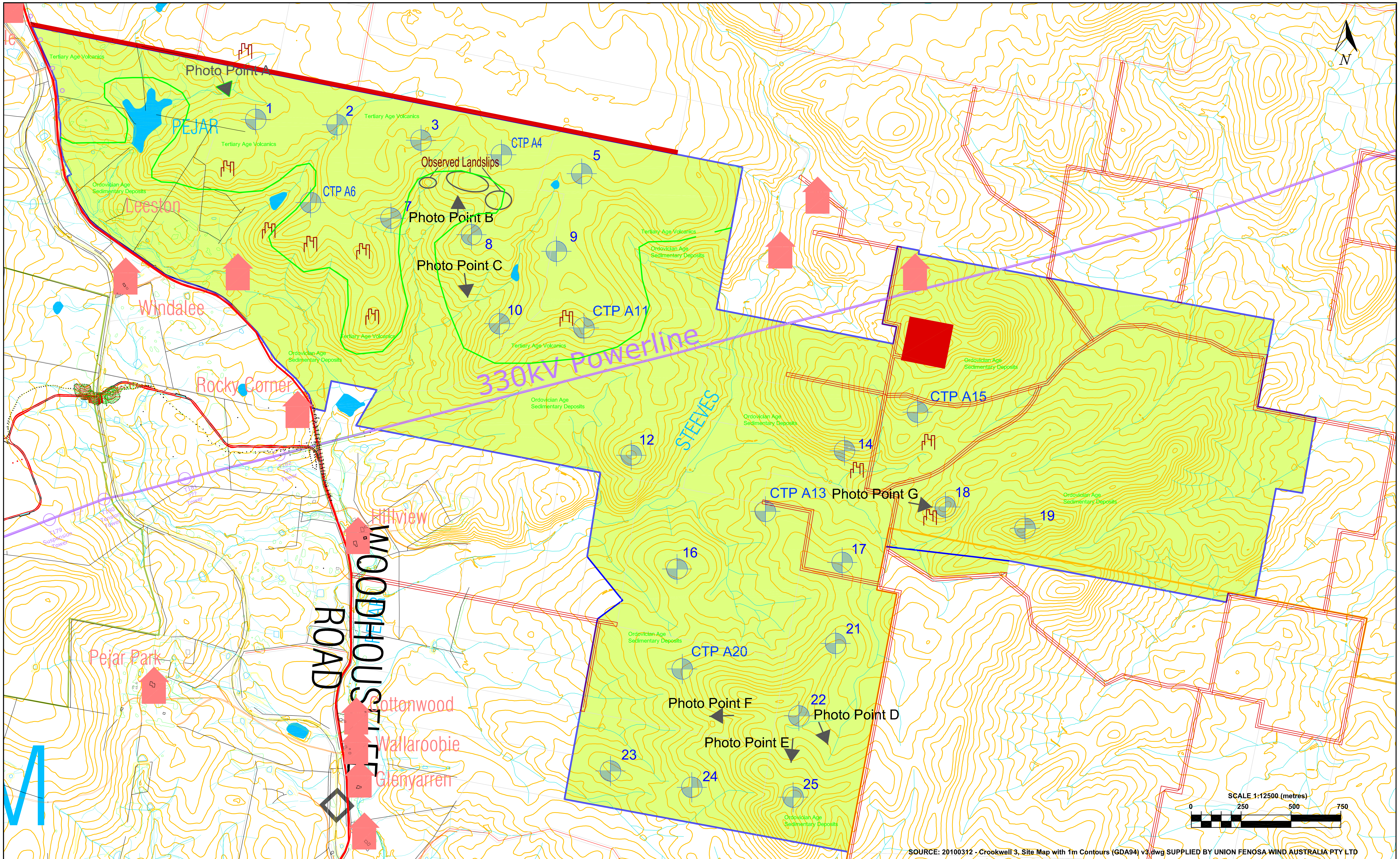
Coffey is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to a project, from design to construction. It is common that not all approaches will be necessarily dealt with in your site assessment report due to concepts proposed at that time. As the project progresses through design towards construction, speak with Coffey to develop alternative approaches to problems that may be of genuine benefit both in time and cost.

Responsibility

Reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than the design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, a number of clauses have been developed for use in contracts, reports and other documents. Responsibility clauses do not transfer appropriate liabilities from Coffey to other parties but are included to identify where Coffey's responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from Coffey closely and do not hesitate to ask any questions you may have.

* For further information on this aspect reference should be made to "Guidelines for the Provision of Geotechnical information in Construction Contracts" published by the Institution of Engineers Australia, National headquarters, Canberra, 1987.

Figures



SOURCE: 20100312 - Crookwell 3, Site Map with 1m Contours (GDA94) v3.dwg SUPPLIED BY UNION FENOSA WIND AUSTRALIA PTY LTD

revision	description	drawn	approved	date

LEGEND

- Inferred Geological Boundary (Approx)
- Photo Point
- Rock Outcrop
- 23 Proposed WTG Location
- CTP11 Test Pit Location

drawn	DBA/GG
approved	
date	10/05/2010
scale	AS SHOWN
original size	A2

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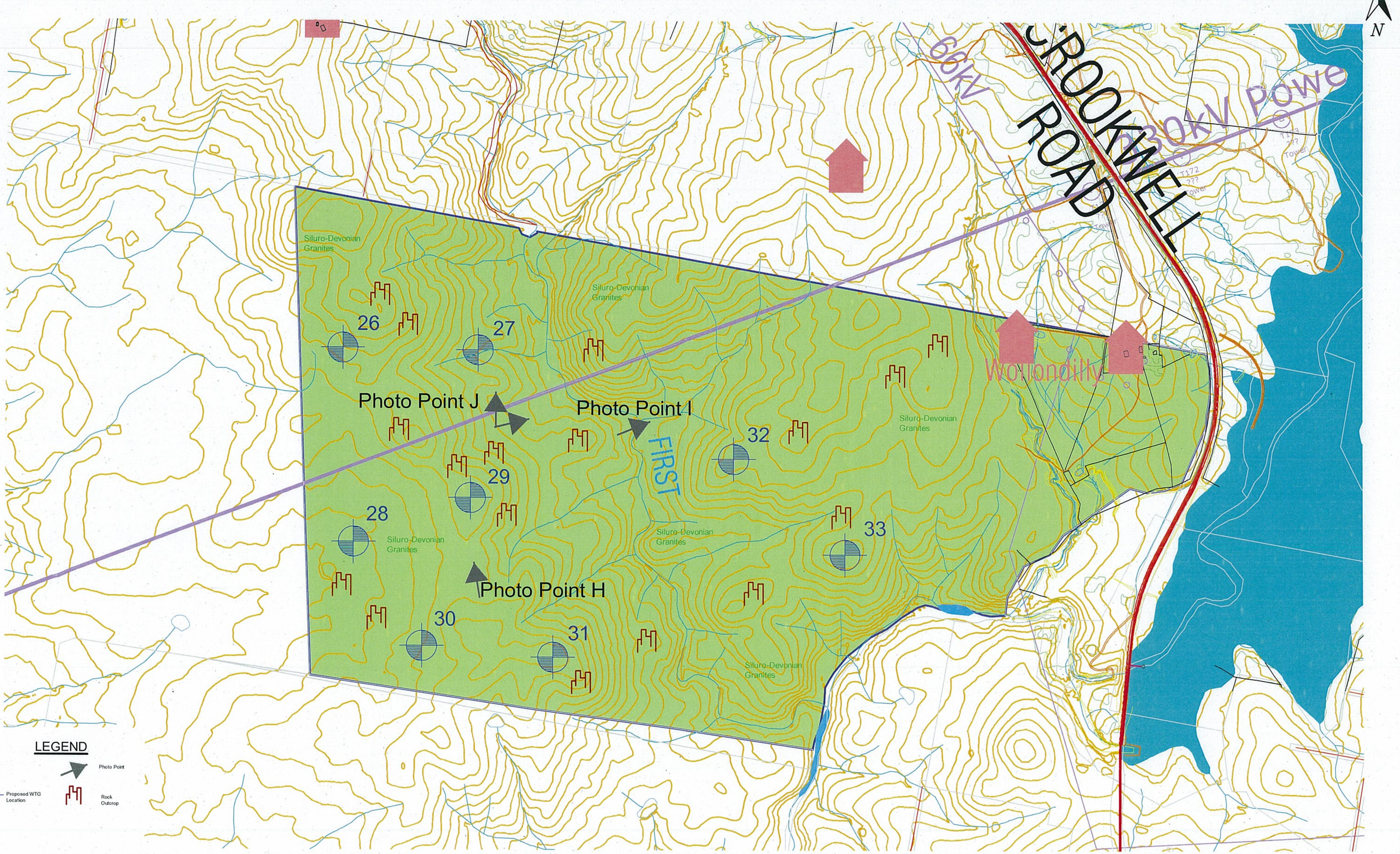
client: CROOKWELL DEVELOPMENTS PTY LTD

project: PRELIMINARY GEOTECHNICAL ASSESSMENT CROOKWELL III WIND FARM

title: LOCATION PLAN - EAST SITE

project no: GEOTABTF07881AC-AC

figure no: FIGURE 1



SOURCE: 20100312 - Crookwell 3, Site Map with 1m Contours (GDA94) v3.dwg SUPPLIED BY UNION FENOSA WIND AUSTRALIA PTY LTD

revision	description	drawn	approved	date

SCALE 1:12500 (metres)

0 250 500 750

drawn	DBA/GG
approved	[signature]
date	10/05/2010
scale	AS SHOWN
original size	A3

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SPECIALISTS MANAGING THE EARTH

client:	UNION FENOSA WIND AUSTRALIA PTY LTD
project:	PRELIMINARY GEOTECHNICAL ASSESSMENT CROOKWELL III WIND FARM, NSW
title:	
project no: GEOTABTF07881AC-AC	FIGURE 2