BOARD OF INQUIRY
Turitea Wind Farm Proposal

TRANSCRIPT OF PROCEEDINGS

BOARD OF INQUIRY

Turitea Wind Farm Proposal

Hearing

HEARING at PALMERSTON NORTH on 27 JULY 2009

BOARD OF INQUIRY:

Environment Court Judge S.E. Kenderdine
Mr D. Bunting
Mr R. Heerdegen
Mr J. Hudson
Mr C. Shenton

APPEARANCES

MS K.R. PRICE appeared on behalf of Mighty River Power Limited

MR K. JOHNSTON appeared on behalf of Ngawai Farm Limited, Mr J. Poff, Mr M. Alley and Mr and Mrs J. Love

MR J. MAASSEN and MR J. REARDON appeared on behalf of Palmerston North City Council

MR K. LOW appeared on behalf of Tararua-Aokautere Guardians Inc (TAG) and Friends of Turitea Reserve

MS A. MILDON appeared as a submitter

LIST OF WITNESSES

[9.58 am]

HER HONOUR: Good morning, ladies and gentlemen. Welcome to the second sitting of the Board of Inquiry into the Turitea wind farm. It is our pleasure to welcome you and, hopefully, this proceeding which is essentially about hot tubbing all the expert witnesses together, will clarify a lot of matters for particularly the residents at the back of the room.

We propose to call, first of all, all the expert witnesses to the front, they will be sworn in individually and individually will give an opening statement, then we will call the first – or recall the first witness and he will be or she will be cross-examined and re-examined by the lawyers.

At the end of that process will call the section 42A witness, who put in a report five days before the beginning of hearing, on any gaps that they perceived in the hearing and they will be questioned by any of the parties.

[10.00 am]

At the end of this process you, of course, will have opportunities to question as residents the expert witnesses after the experts have been cross-examined by the lawyers. And I think we put out an instruction that you were to identify your names to the team at the table so that we can get some order into this whole process.

So I would like to call, first of all, the series of witnesses who are involved in construction, construction engineering, geotechnical engineering, erosion and sediment. If you would like to come to the front and be sworn in please?

MS PRICE: Ma'am, this is what I would call the engineering suite of witnesses. We were proposing to do water and sediment quality slightly separately because those witnesses have done intense caucusing.

HER HONOUR: Yes.

MS PRICE: These engineering witnesses have not been involved in caucusing.

HER HONOUR: Right.

MS PRICE: And so have not effectively been hot tubbing, and in addition to that there has been a number of flight cancellations this morning, so some of our water quality/sediment witnesses are not yet arrived at the hearing. They will be here but they are driving from different parts of the country.

HER HONOUR: Yes, they are due tomorrow?

MS PRICE: They are due tomorrow and we do have one of them here, but one of them that was flying from Christchurch, his flight got cancelled and he is driving from Wellington as we speak. That is Mr Levy.

HER HONOUR: As I understand it, we have Mr James and Mr Vaughan, Mr Parsons, Mr Alexander and Mr Levy this morning, is that – or today?

MS PRICE: We have the first four here, right now. Mr Levy has not yet arrived, he is the sediment witness, if you like.

HER HONOUR: Yes.

MS PRICE: And he and Mr Watson have been caucusing quite a lot with the other parties' witnesses, so they are essentially the hot tub. This group of four engineers has not been hot tubbing, so I think we should, in the interests of working out what we do with the witness that is not yet here, hear from these four witnesses, and they can make a statement about what they have been doing since the evidence was filed, so that everyone is informed. And then perhaps, later in the day, we could call in all the water quality sediment witnesses from the different sides to be up there and do the same exercise, updating everyone.

HER HONOUR: Well, I would wish to do them in groups.

MS PRICE: Yes.

HER HONOUR: So I think we will just stick to this group at the moment.

MS PRICE: Okay.

HER HONOUR: If it takes all day, it takes all day, and then we will swear in the remainder.

MS PRICE: Okay, thank you, ma'am.

HER HONOUR: Would you like to come over here, gentlemen? It is easier for you to turn and face the representation.

The registrar, please come and swear these witnesses.

<SCOTT ANTHONY VAUGHAN, sworn [10.03 am]

HER HONOUR: There is no reason you cannot sit, I think, next to the – in the meantime, if that is helpful to you.

MR VAUGHAN: My full name is Scott Anthony Vaughan. I am a civil engineer and managing director of Riley Consultants, a firm based in Auckland.

[10.05 am]

I was engaged by Mighty River Power in May of this year to undertake a peer review of civil engineering and geotechnical aspects of the project.

Further to the preparation of my brief of evidence, I have undertaken a detailed inspection of the site and have visited, along with Mr Alexander from Beca, virtually every single turbine site over a period of three days. In that process I was able to look at the – obviously at the turbine sites and gain an understanding of where the roads would be going, where the fill disposal sites were and also to have a closer look at some of the geotechnical features that were mentioned in Mr Alexander's preliminary geotechnical report.

<THE WITNESS WITHDREW [10.06 am]

HER HONOUR: Thank you. If these experts have not been involved in hot tubbing then this witness is available for cross-examination, is that correct?

MS PRICE: Yes, ma'am. And the order of the witnesses that we would be calling would be Chris James and then Gavin Alexander, and then the two peer reviewing witnesses, so it is essentially that order.

HER HONOUR: Right. Well, Mr James is the first to be called. Joe, if you would like to swear him in please.

MS PRICE: Ma'am, I have a suggestion. We have a lot of visuals and overhead projections up and we thought – we have prepared maps for you which are large and we have got PDFs of them so that the public

can see them.

Mr James, when he is giving his answers in cross-examination, is likely to refer to these maps. We thought it might be useful for the hearing to have a presentation briefly overviewing the different maps so that everyone gets their bearings on the wind farm.

No doubt, you have had an opportunity to look at some of the maps in evidence, but we thought that the public might benefit from having the maps up on the overhead projection screens so that they could actually be with us as the cross-examination was occurring.

HER HONOUR: Yes, thank you. Does Mr James introduce these maps?

MS PRICE: He introduces a number of them and he, in fact, has a software programme which he will also give an overview of. The person that we think would be the best placed to do the overview is Mr Mark Henry who is an MRP witness.

HER HONOUR: Yes.

MS PRICE: And is the project manager.

HER HONOUR: Right.

MS PRICE: And can give a brief overview and explain the different layouts and how they work.

HER HONOUR: Well, when do you want this to happen?

MS PRICE: Ideally, I think we should do it right now, before Mr James gets going on his cross-examination. But he will put some software up and Mr Henry will also just briefly speak to that as part of his very brief presentation.

HIS HONOUR: I see. Well, I am sorry, gentlemen, you may have to move again. I do apologise, we were not warned of this. Mr James, if you would like to remain there - and if you would not mind going back to your place, it is simply because you will obscure the screen.

MS PRICE: Now, what we have here is some map books for the Board and there are map books available for everyone at the back of the room. It is the maps blown up out of the evidence so that everyone has very clear detail.

<MARK HENRY, sworn [10.10 am]

HER HONOUR: Yes, Mr Henry, good morning.

MR HENRY: Good morning, your Honour and members of the Board. My name is Mark Henry, I am the project manager for the Turitea project on behalf of Mighty River Power.

This morning I just wish to take the opportunity to I guess walk through some of the graphics and drawings that we now have available to the Board and certainly allow members of the audience to also understand I guess the layouts and some of the complexity of the wind farm design. Hopefully, if the support services are all working around us, on the big screen we have the first of the maps that are in your book, which is the proposed layout as at July 2009.

If I may refer quickly to some of the aspects of that map – I trust people in the back can see – it contains a lot of information. There is a fairly large site, therefore some complexity in it. We have a series of numbers that are in black which are, of course, the turbine zones and they should run from a number that starts 0001 through to 0127. For interest, the numbers that are 0001 through to 66 happen to be turbine zones that are inside the Turitea reserve and then the zones from 67 on are zones that are on private land holdings around the Turitea reserve.

The map is orientated to the north, so as you look at it north is at the top of the page. There are various access points to the Turitea site. From the north there is the Pahiatua Aokautere Road, otherwise you may hear it described as the Pahiatua track, and there are two access points; one either side of the saddle of that road. One is called the Harwood access point, the other is the Day access point. Also to the south-west, or perhaps west as we look at the map, there is another black dot that shows the other alternate access point from Greens Road.

Moving into the general layout of the site, you will see that there is a, I guess, purple colour, that defines some of the territorial authority boundaries, to the east Tararua District, to the west Palmerston North City and you do see bits of Manawatu and Horowhenua districts also appearing on the map that are outside the project site. There is also some light red lines which, of course, are the roads – local district roads. Around the Turitea Reserve and adjacent land there is, I guess, a light green/light blue sort of a colour which is intended to define the area within which the Turitea project sits, incorporating, of course, Turitea Reserve and some adjacent land around the edges.

Into the site I have talked about the black numbers being the turbine zones. There are also a number of red numbers which are the various

disposal sites for the soil disposal. Hopefully those are visible. To the sort of top of the page, but in the middle of the site there is a site called the plantation substation. That is one of two substation sites that are proposed inside the project. The other is called Browns Flat, just further to the west and slightly south and the blue square delineates that substation site.

[10.15 am]

At or about those same locations, and perhaps hard to see on maps of this scale, connecting the two substations there is a blue dashed line, in fact a corridor, if I may. The corridor is where the transmission line would connect the two substations and then from Browns Flat it leaves the wind farm site and heads out to the north, to a substation called Linton, which is owned by Transpower, and part of the existing 220 kV national grid network. So that is the proposed connection point.

If I may now just look at some of the detail of the zones, you will have heard discussion about a project of 126 turbine zones of which 121 would be built. Just to explain that briefly, there are in fact perhaps two layouts within the one that we have presented, recognising that there are different turbine variants that could be used on a site like this. One typically referred to as a three megawatt layout, has – the three megawatt turbine has a rotor diameter of approximately 90 metres. The second layout is a 2.3 megawatt layout which has a rotor diameter of approximately 82 metres, and with that in mind, it fits that you can put more of a smaller layout –smaller machine into the layout and less of the bigger machine into the same layout – just from a rotor diameter wingspan type approach, noting that there is a rule of thumb in terms of spacing of the turbines.

If I can illustrate that point slightly further, Mr James, if you could zoom in on an area just to describe perhaps, how the zones therefore work. And that is right behind me so that is going to be tricky to – Mr James has called up a close-up on his viewer just to give a quick illustration of how his viewer works, it allows us to obviously zoom in in much more detail into the layout into the layout and that will become, I believe, of assistance as we work through from the various discussions.

On that little section of the wind farm that is described there you can see three zones, numbers 46, 45 and in the middle, number 37. Now illustrating my point before about putting less of the big turbines and more of the small turbines, you can then say that on that little example there, number 45 would be a small turbine. When I say small – relative terms. And number 46 would be a small turbine.

MR .....: Excuse me, I cannot read the numbers.

MR HENRY: Indeed. On the – we are looking at 3 on the diagonal there – on the left hand side, that is number 46. The middle one is number 37, the other is number 45.

So again, just to illustrate my point, you could fit three of the smaller variant turbines, two on the outside and one in the middle of the elongated zone, whereas you would only fit two of the larger turbines, one at number 46 on the bottom left, and that one at 37 as shown.

Now, I guess for all of our assessments and considerations we have obviously had to assume 126 turbines would be built and have assumed a maximum envelope at that point in terms of the size of the turbine and so forth. So I hope that helps to illustrate that point.

Other information that is then in this booklet in front of you, if I may, turn to the next page, and in fact there are two layouts fit sideways on the page as you see it. The top is the layout that was lodged with our original applications for resource consent in August 2008. That contains a number of turbines that in January 2009, which is the bottom of those two maps, have now been deleted and they are indicated by the yellow crosses. Again that is just for completeness.

[10.20 am]

On the next two maps we do in fact here show the two layouts, one of which a – would accept the – I think the first is the three megawatt layout of which there should now be 111 locations shown. And over the page, again for completeness is the 2.3 megawatt variant of which there are 121 locations shown.

Beyond those maps, as we move through, there are then a number of other drawings and maps that other experts will rely on, and again presented here on a slightly larger scale.

MR HUDSON: Excuse me, can I just take you back to that map where the deletions are shown?

MR HENRY: Certainly.

MR HUDSON: Is number 55 deleted or not?

MR HENRY: Thank you, sir. On this drawing, as at January 2009, no, it is not deleted. That has been a more recent turn of events from the

January 2009 drawing that is shown here. So the yellow ones are the ones that were deleted prior to public notification of our applications.

MS PRICE: Mr Henry, before you go on, could I just ask that you refer to the map numbers as you are giving your narration, because that will assist the transcript.

MR HENRY: Indeed. I would if there was a map number on it. It has on the bottom left of the drawing a date stamp. One is January 2009 which Commissioner Hudson has just asked the question of. So, Ma'am, I don't proposed to perhaps talk through the other drawings that are here other than to introduce them to you in terms of being drawings that other witnesses will refer to. Indeed, various amounts of information there.

HER HONOUR: Yes.

MR HENRY: What I would like to take the opportunity to also, just in terms of introducing some of the graphic representations and so forth is a second computer assisted programme that can show where submitters are – where the various photo points are, relative to those submitters, and demonstrate how we can quickly call up a view that may be representative of that particular area.

I believe it is part of information that has already been provided to the Board, a programme called Memory-Map, and again just for the interests of the audience, if we may introduce that quickly as well.

HER HONOUR: Yes, thank you.

MR HENRY: Thank you. Okay, on the screen again to my left, what is being pulled up at this point is just a base map that has quite a lot of information on it on a scale that it is., and the blue dots are the proposed turbine locations. You will see that they are also showing the proposed turbine locations of the other adjacent wind farms, Motorimu to the south, Te Rere Hau to the north, and then onwards up to Tararua and Te Apiti.

Around the site there are, for ease of reference, some concentric circles, of course being – stepping out at kilometre distances away from the windfarm, and then possibly hard to see on this scale, but there are a number of reference points, RVP1, RVP2 etcetera, which are the various photo montage points that are taken.

So, I think, Mr Burge, if you could just click on one of the photo points – just indicate how that is intended to work. So it can show, on a plan

view, where that point was and then the view that then provides towards the windfarm from there, again, hopefully to allow us to navigate around for the various submitters in terms of where there locations and so forth are.

[10.25 am]

I think, Hayden, if you just go back to that base screen. Hayden, has that got all the submitters on it? It has, doesn't it?

So the – also on there, as Hayden comes in, are some little houses, symbols of houses that show where the various submitters. Now, it makes no comment on what their position was in terms of support or otherwise, other than to indicate, I guess, on a graphical sense where those locations are.

The computer programme allows us to perhaps look at that in a 3-D sense as well. Again, orientating to towards the proposed wind farm site from a particular viewpoint. Again, just approximating some of the terrain in the view towards the wind farm from that point. Now the turbines are simply represented by blue dots on the hills there, which are a little hard to see.

So, again Hayden, if you could just click on that viewpoint that is at the bottom of the screen there. Again it just shows where that is.

So hopefully that will assist the Board and members of the audience as we navigate through what is a fairly complex site. Again, just to reiterate that we have the viewpoints, the screen behind me; currently we can zoom in and out of the detail of the actual wind farm itself.

Obviously the other witnesses will talk more about some of the detail of that design. So unless there are any questions, that would be my presentation.

HER HONOUR: Any questions? Yes, Mr Hudson.

MR HUDSON: If we can go back to map 3 on the hard copy.

MR HENRY: Yes.

MR HUDSON: And it has got on the key – on the legend, one kilometre and three kilometre from nearest house?

MR HENRY: Yes.

MR HUDSON: Now I can see one dotted line. Is that the one kilometre or three kilometre boundary?

MR HENRY: No, I am fairly certain that would be the three kilometre – and following your point, I don't believe there is a one kilometre line on that particular map. So the key is incorrect.

MR HUDSON: Would you be able to get a replacement map with that shown for us?

MR HENRY: I am certain that we can.

MR HUDSON: That would be good. And the other – this has not come up yet, but I note in the noise caucusing there has been a 35 dBA line produced.

MR HENRY: Yes.

MR HUDSON: Is it possible to get that put onto one of these maps?

MR HENRY: If I may, sir, I believe map 17 and 18, 17 takes you to that point. In fact 17 and 18 refers to the noise contours.

MR HUDSON: That is great, thank you.

HER HONOUR: Well, thank you very much, Mr Henry.

<THE WITNESS WITHDREW [10.28 am]

MR HENRY: Thank you.

HER HONOUR: Mr James?

<CHRISTOPHER JAMES, sworn [10.29 am]

<EXAMINATION BY MS PRICE [10.29 am]

MS PRICE: Now, Mr James before we make you available for cross-examination, could you please just clarify whether you have any corrections to your evidence, and can you please explain your supplementary evidence that was recently filed, together with the appendices, which may need some clarification. Thank you.

[10.30 am]

MR JAMES: Certainly. The typical cross section shown in my evidence in

chief is diagram CDJ002, it has an error on it, in as much as the batter profile that is shown for the cuts is incorrect. That was the batter profile that we were using for the start of the project, not what is being used for these current zones. I have a dozen replacement copies available here.

Various parts of my evidence refer to the number of turbines and the number of turbine zones. But in my evidence in chief, that has changed very recently with the removal of the zone 55, so where my evidence talks of 127 zones, there are 126.

My supplementary evidence which outlined the additional data that was provided for section 42A request, has changed in the area of and I think you will find that that is on drawings 62 and 63, my supplementary evidence. The road in the area of zones 118 and 119 has been modified following a request from the landscape consultant to remove some fills. New copies of the drawings have been made available.

HER HONOUR: These numbered sheets?

MR JAMES: Yes, in the supplementary evidence under the heading of one to two thousand drawings, which is appendix A, thank you. On drawing 362, and 363, correction of the one above, 361 and 362. The road was originally shown as being predominantly on fills. The road is now predominantly on cuts. This road originally connected to a different location but it was changed during the preparation of the information for the section 42A report to remove the need for a large double culvert.

[10.35 am]

If you look at the overall plan once again, under supplementary evidence, appendix A, the very first sheet. The road connecting 117, 118 to the roading network originally had a connection between zone 115 and 117, which required a large double culvert. For environmental reasons it was decided to remove that culvert and make the connection directly onto the water catchment access road.

MS PRICE: And Mr James, if you could just finally clarify that the information that the Board has before it, is all the corrected version?

MR JAMES: That is correct.

MS PRICE: Thank you, Mr James.

HER HONOUR: Yes?

MR MAASSEN: Mr Reardon will cross-examine this witness, ma'am.

HER HONOUR: Yes, thank you.

<CROSS-EXAMINATION BY MR REARDON [10.36 am]

MR REARDON: Yes, good morning, Mr James.

MR JAMES: Morning.

MR REARDON: Now just to take you briefly through your background here so that everybody understands exactly who you are. You describe yourself as the lead wind farm civil designer?

MR JAMES: That is correct.

MR REARDON: And in that regard you have been involved in refining the construction area, and the area of vegetation to be removed?

MR JAMES: That was as a result of the civil designs, yes.

MR REARDON: And you have also been involved in developing the conditions for the draft resource consent?

MR JAMES: I had some input to those, yes.

MR REARDON: And in particular really, what you are responsible for is the construction and the upgrading of the roading. Is that correct?

MR JAMES: The bulk of it, the earthworks, the roading, and layout, correct.

MR REARDON: And then the platforms and the foundations, for the turbines?

MR JAMES: The construction areas for the turbines, yes, not the design of the foundations.

MR REARDON: Then just looking at paragraph 4.2 of your first evidence in chief. You turn to the topic of earthworks which I think is the main area that you are concerned with?

MR JAMES: Correct, yes.

MR REARDON: And you say that the majority of the fill will be sourced from greywacke profile?

MR JAMES: Yes.

MR REARDON: And is that term also used by some other of the MRP witnesses when they talk about weathered rock?

MR JAMES: Yes, that is correct.

MR REARDON: And if I understand some comments that Mr Levy has made in his further evidence, MRP now proposes only to use weathered rock in fill or roads and platforms?

MR JAMES: Not only weathered rock.

MR REARDON: Right. Well, can you perhaps expand on that because you will understand that, from the city council's point of view, it is very concerned about the issue of erosion and in sedimentation of the waterways - - -

MR JAMES: Certainly.

MR REARDON: - - - and if I understand the situation correctly, weathered rock is unlikely to produce much risk of erosion and hardly any risk of sedimentation.

MR JAMES: Those questions are better left to Mr Levy but where rock is available it will be used in preference to soils.

MR REARDON: But it will be you perhaps most of all who will be deciding what fill is used, is that right?

MR JAMES: No, not necessarily. It will depend on what materials are available in what parts of the site.

MR REARDON: Perhaps I did not ask that very well. Are you the person most likely to be making the decisions about what the fill is composed of?

MR JAMES: That will be myself and Mr Alexander, the chief geotechnical expert.

[10.40 am]

MR REARDON: Now, you gave a reasonably cagey answer to my question about whether the fill was going to be weathered rock and you said something like, "where it is available".

MR JAMES: Where it is available, certainly. It may not be available on all parts of the site.

MR REARDON: You do not therefore anticipate transporting fill from one area to another?

MR JAMES: I will certainly be transporting fill from one part to the other. In fact, the water catchment access road requires all of the excavation material to come out of there; it has to be hauled for the entire week for the road. And that material is anticipated to be mainly weathered rock, so that material will be used first for structural fills.

MR REARDON: Can I just summarise what I think you have said?

MR JAMES: Yes.

MR REARDON: You are saying that in regard to the water catchment area - - -

MR JAMES: Yes.

MR REARDON: The fill for the roading and the platforms will be weathered rock, except for a few exceptions?

MR JAMES: Well, firstly the crane pads and assembly areas are all in cut so there will be very, very little filling for those and the preference is to use weathered rock for all structural fills.

MR REARDON: Okay. Well, what the Board has to do, of course, eventually, is write some conditions for the resource consent and words like "preference" may not be sufficiently measurable to have any meaning in a resource consent condition. Do you understand - - -

MR JAMES: Yes, I can understand that.

MR REARDON: So are we able to put some kind of measurable features to this issue about what the fill will be composed of in the water catchment area?

MR JAMES: The preference is certainly to use weathered rock but, as I said, unless an extremely detailed evaluation of available materials and fill requirements is undertaken in more detail than what we have done now, I cannot categorically say that all structural fills will be built out of weathered rock. Weathered rock will not be disposed of if it can be used in a structural fill.

MR REARDON: Is there a draft condition in MRP's draft resource consent document, which you think adequately meets what you have just said?

MR JAMES: Yes, Mr Levy has drafted a condition along those lines, which says that weathered rock would be used.

MR REARDON: Do you know where that - - -

MR JAMES: I cannot remember the clause number, I am sorry, no.

MR REARDON: Is it possible that it is in the construction and environmental management Plan?

MR JAMES: Yes, certainly.

MR REARDON: Rather than the conditions?

MR JAMES: It would be in there as well, yes.

MR REARDON: Are you hinting - - -

MR JAMES: I will need to check that out for you.

MR REARDON: Are you hinting that I should be asking Mr Levy the questions about the content of the resource consent conditions?

MR JAMES: Exactly, but I will check that.

MR REARDON: Now, going to paragraph 4.5 of your first evidence in chief, and moving away from fill as such - - -

MR JAMES: 4.5.

MR REARDON: Moving away from fill as such to the cuts, you see there in the first two lines of paragraph 4.5 of your evidence that the majority of the cut slopes will be cut to a steepness of one horizontal to four vertical?

MR JAMES: That is correct.

[10.45 am]

MR REARDON: That is an extraordinarily steep slope, is it not?

MR JAMES: It is quite normal in greywacke material.

MR REARDON: Because, as I understand the land up there, the greywacke is actually very fractured and what some people call "rotten".

MR JAMES: Yes, rotten rock is a reference to the upper weathered layer.

MR REARDON: Yes. So you would agree that is a fair description of what you will encounter up there?

MR JAMES: That varies across the site but that is a geotech issue. I think you should take that up in more detail with Mr Alexander.

MR REARDON: But you would accept that a lot of that road cut is going to be in what is called "rotten rock".

MR JAMES: In weathered greywacke, yes, certainly; existing cuts around the area are in that material and are standing quite comfortably at that sort of banister.

MR REARDON: Yes. So are you able to assure the Board that you think that these cut slopes will not erode when they are at that steepness?

MR JAMES: I am comfortable with those batter slopes, yes, certainly. The majority of the batter slopes are not particularly high; there are some that are quite high but that is quite a comfortable slope for that material.

MR REARDON: Because those slopes will contain silt and clay as well as rock, won't they?

MR JAMES: The upper layers will, yes.

MR REARDON: And we can expect on a steep slope like that that the silt and clay is going to be washed off in heavy rain?

MR JAMES: The upper layer in some of those soils layers may have to be cut back at a flatter slope for the upper metre or whatever the depth happens to be. But that is also, once again, quite a normal practice and then steeper face in the weathered, sounder material.

MR REARDON: Yes. So you would see the slope as coming quite steep up out of the road and then perhaps bending to a flatter profile - - -

MR JAMES: Flattened off - - -

MR REARDON: - - - for the last metre or so?

MR JAMES: Flattened off or rounded off, yes.

MR REARDON: And presumably that then involves clearing more vegetation?

MR JAMES: A little extra, yes. Maybe a metre width in areas, maybe two.

MR REARDON: Although we are talking about building or redeveloping some 57 kilometres of road - - -

MR JAMES: That is correct.

MR REARDON: So those extra metres might add up?

MR JAMES: The vegetation clearance would be quite small. The majority of the vegetation clearance is along the water catchment access road inside the reserve. The materials in there are a lot sounder and the assessed soil layer, in fact, through that area is only in the order of 200-250 millimetres. So it is less likely that we will need to flatten off the top of those cut batters through the reserve.

MR REARDON: So you see most of the cut taking place in parts of the reserve where there is very little topsoil?

MR JAMES: Exactly.

MR REARDON: Now, in paragraph 4.9 of your first evidence-in-chief you turn then to turbine foundations. And I think you anticipate there might be two kind of foundation there, first of all what you call a spread foundation. Does that mean solid concrete?

MR JAMES: That is essentially a very large slab of concrete area.

MR REARDON: And then in areas where perhaps the underground is less certain and more alluvial, you are going to drive piles down?

MR JAMES: That was essentially there for – the point this evidence was written, when there were turbines down in Browns Flat, which are on alluvial materials and those turbines, of course, have now been removed. The need for the piling is unlikely.

[10.50 am]

MR REARDON: Do I infer from that answer that pretty much all of the turbine platforms will now be a solid concrete block?

MR JAMES: It is anticipated that all of the turbine foundations will be a spread pad foundation. Detailed geotechnical investigation will finally determine that.

MR REARDON: Just as a matter of interest, what happens at the end of the wind farm's life in 35 years time when the resource consent expires? Do you actually remove all of those concrete block?

MR JAMES: It would not be anticipated to remove the concrete foundation. What would be removed would be all above-ground structures and then the foundation pad, or the crane assembly and assembly area would be backfilled, topsoiled over and regrassed or vegetated as necessary. There would be nothing protruding above ground level.

MR REARDON: Now, the next topic you have in your evidence-in-chief is, just starting at paragraph 4.13, which you have headed up "Internal Access Road", do you see that?

MR JAMES: Yes.

MR REARDON: Now, just confirm for me what I think is the correct situation, all the turbine blades will be transported onto the site from the Pahiatua Track and along South Range Road and there onto that site? Is that correct?

MR JAMES: That is correct.

MR REARDON: There will be no turbine blades coming up from Greens Road?

MR JAMES: No.

MR REARDON: So the whole of the road, starting at the Pahiatua Track, has to be engineered all the way through, right to the bitter end, to comply with the requirements of the turbine trucks?

MR JAMES: That is correct.

MR REARDON: And presumably MRP is paying for all of that construction itself?

MR JAMES: Yes.

MR REARDON: And what about the maintenance of the road over the life of the resource consent? Who pays for that?

MR JAMES: I have to say I am not entirely sure on those financial arrangements.

MR REARDON: You are not sure if that is a condition in the resource consent?

MR JAMES: I am not sure of the financial arrangements for maintenance.

MR REARDON: Now, you say that there is a total of 57 kilometres of accessway required, of which 24 kilometres will be upgraded track. Is that correct?

MR JAMES: Yes.

MR REARDON: And obviously you have inspected the site many times?

MR JAMES: I have.

MR REARDON: It was my impression that the existing track is, in some areas, maybe four or five metres wide?

MR JAMES: It varies, but yes, it is four to five metres at its best probably.

MR REARDON: Yes. And what you are really then having to do is at least double the width of the accessway, where you have got an existing accessway?

MR JAMES: Yes.

MR REARDON: And presumably it will have to be a lot more stabilised at the edges because of the weight of the vehicles?

MR JAMES: The equipment that is driven through there, the actual wheel loads are not – individual wheel loads are not in fact excessively high. Apart from the crane, all of these trucks are in fact used on the public highways. So the wheel loads are not phenomenally high. The subgrade and the subbase to that road is very good anyway.

MR REARDON: Perhaps for everybody's benefit, could you take us through, on the map, what is the existing roadway and what are the new roadways?

MR JAMES: Yes, certainly.

MR REARDON: Could you start at the Pahiatua Track entrance please. We can follow the route of your turbine trucks.

[10.55 am]

MR JAMES: Where the pointer is at the moment is the area of the Pahiatua Track, where the site road currently comes in right about where the hand is now – South Range Road comes in through here, through the trees, and then follows down along the line of this upgraded road, in fact, which is referred to as South Range Road.

If I just stop there. The turbine components are anticipated to come in through this new entry here on the Day property – off the Pahiatua Track.

They will come up through this new road which also services three turbines – four tur-. South Range Road, the public road, currently stops at this point here where the boundary is for the Turitea Reserve.

MR REARDON: Yes, so that is currently a public road?

MR JAMES: That is currently a public road.

MR REARDON: Which stops at that point because there is a gate?

MR JAMES: There is a gate. The water catchment access road follows through this pine plantation which very larger portions of – that are shown in this imagery, aren't in fact there any more. This imagery was flown in 2006, I think it is, for this project.

The water catchment access road continues all the way through here.

MR REARDON: And you are going to build spoil lines off that road for those individual turbines – 39, 40 and 41?

MR JAMES: Correct. That is correct. As I move this, and the new road is removed, you can see the alignment of the existing water catchment access road, which winds it way right through along the ridgeline.

MR REARDON: And just staying there for a moment, because my impression on visiting the site, south of turbine 27, which is in the top right hand corner of your aerial photograph there.

MR JAMES: Yes.

MR REARDON: The road becomes much steeper, windier and narrower.

MR JAMES: That is correct.

MR REARDON: It is really hitting the top of the catchment of the water supply reserve, isn't it?

MR JAMES: It is. The catchment boundary, in fact, pretty well follows that road all the way through.

MR REARDON: So, can I infer that that is going to be the area where perhaps the most excavating and remodelling of the road is likely to take place?

MR JAMES: The earthworks volumes for the first third of the water catchment access road are fairly nominal. Two-thirds of the earthworks follow from there – oh, no, it is more than two-thirds. They are a little heavier in this area here, for excavation, but not dramatically so. They are reasonably uniform through the road. All this material will be excavated and taken out of the reserve.

MR REARDON: Yes. I understand you were originally intended to have some soil disposal sites inside the water catchment, but that you have changed your mind about that.

MR JAMES: On instructions from MRP we removed the spoil disposal sites that we had anticipated to be placed in the area of the old pine plantation at the northern end, and there were a number of spoil sites along the rim of Browns Flat that were also removed, yes.

MR REARDON: So that there are now no spoil disposal sites inside the water supply catchment area?

[11.00 am]

MR JAMES: That is correct.

MR REARDON: All right, well, carry on with your map, although I have to say I am surprised that you don't think there is a lot of engineering required.

MR JAMES: Oh, there is engineering required. But the earthworks volumes are no higher here than other parts of the site.

MR REARDON: There are going to be lot of cuts required, though, isn't there to reduce the gradients in this area?

MR JAMES: The area of - - -

MR REARDON: The 27 to 34.

MR JAMES: The biggest cuts through here are in fact around this general area here where we would need to build a new road around the side of the hill. It is on that side of the hill to keep it out of the catchment. And from 34 onwards, the terrain is not too bad.

MR REARDON: So, can I just ask between 32 and 34, is that the only area where MRP proposes to actually build a parallel road rather than use the existing track and upgrade?

MR JAMES: Within the reserve, yes. Just this section here, to achieve the grades we need for the transport.

MR REARDON: I see that you are avoiding a very hairpin bend?

MR JAMES: Yes. There was some difficulty getting the equipment around those corners.

MR REARDON: The hairpin bend I am talking about is directly in the middle of the photograph where your hand is.

MR JAMES: This one here, yes.

MR REARDON: All right, yes, well carry on, on your excursion through the site.

MR JAMES: Once the road hits the top here again, at turbine – at zone 34, the terrain becomes much easier – the road is, in fact, reasonably wide through here in comparison with other parts and the grades - existing grades are very satisfactory in fact. This is still within the water catchment and the boundary is where the hand is there at the moment, that purple line is in fact the reserve boundary line. The new road then diverts off onto the Love property - - -

MR REARDON: Now, the Love property is on the northern side where 47 is, is that right?

MR JAMES: No, 47 - this is the area referred to as Browns Flat.

MR REARDON: So 47 and 48, for example, are on Browns Flat?

MR JAMES: Yes, on the upper slopes of Browns Flat.

MR REARDON: And the purple line where 110 is, what boundary does that represent?

MR JAMES: This line around here?

MR REARDON: Yes.

MR JAMES: That is the reserve boundary.

MR REARDON: And what is south of that line?

MR JAMES: That is Love property.

MR REARDON: That is also Love?

MR JAMES: That is also Mr Love's property.

MR REARDON: And that land south of 110 falls into the Kahuterawa catchment?

MR JAMES: That is correct. This is the area that C4C is the culvert that we have removed and realigned that portion of road to make the connection up on this top corner, to avoid having to put a culvert across in that stream.

MR REARDON: Carry on.

MR JAMES: This is a new piece of road between the reserve and zone 111 on the Love property. It then joins on to an existing farm road - - -

MR REARDON: Just before you head off that map; the DO26, is that the spoil disposal site?

MR JAMES: That is a possible spoil disposal site.

MR REARDON: When you say "possible", have you not yet determined where they will be?

MR JAMES: All these sites have been inspected. If we do not have to use that one, we will not use that one. Preference is this one over here and this large one on this other site, because the terrain in there is better.

MR REARDON: So can I infer from what you are saying that the location of the spoil disposal sites will not change - - -

MR JAMES: No.

MR REARDON: - - - from what you are showing us?

MR JAMES: No.

MR REARDON: But you may not use all of them?

[11.05 am]

MR JAMES: We may not use them all. There is excessive capacity, intentionally at this point, with the areas that we have selected.

MR REARDON: What – just on the spoil disposal sites, while we are here, have you been following any goals or principles in making selections for those sites?

MR JAMES: Yes. There are a number of criteria, the first is to try and keep them as close as possible to the source of the surplus excavation, which has obviously not been possible through the reserve. The second is to select areas that require little or no vegetation removal, or has any other ecological effects, and then to select sites that can be engineered satisfactorily to make those fills stable long term.

MR REARDON: As a layman, if I was being asked to select a spoil disposal site I would want to know it was reasonably flat.

MR JAMES: Not necessarily. It is not necessarily the best location. One of the problems in selecting a flat site on a productive farm is that you are taking productive land out of use for a considerable period of time, probably up to 12 months. If we can select a site that is underdeveloped and then use it as a spoil disposal site and then return it back to the property owner in a better condition than we started with we have added something to his property and it has an added benefit.

Quite often gullies, in fact, are very satisfactory, providing the drainage and so on can be looked after, and at the upper end of a gully for those reasons that it produces a more productive farm at the end of the project.

MR REARDON: Well, I can assume, again as a layman, that the soil in a spoil disposal site is most likely to be silt and clay rather than rocks?

MR JAMES: It will be the silt, yes.

MR REARDON: Because you are going to try and use the rock?

MR JAMES: Exactly.

MR REARDON: For the roading and the platforms, are you not?

MR JAMES: We are.

MR REARDON: So the majority of what is going into these disposal sites will be silt and clay.

MR JAMES: Correct.

MR REARDON: And that is precisely the sort of material that erodes easily?

MR JAMES: Yes.

MR REARDON: And in turn is a problem with sedimentation and water?

MR JAMES: That is correct.

MR REARDON: So I am a little surprised if you are putting these spoil sites in a valley where I presume water naturally collects?

MR JAMES: No, these sites are at the top end of the valleys, the top of the catchment, in just about all cases there is very little or no catchment area above them so that there is little or no run-off from surrounding pasture running into those – across those sites. All of these sites will have controlled drainage around the perimeter of them before we start so that any overland flows will be diverted away from the spoil surface areas. And then there will be control devices at the base of the fill, in the form of settling ponds, which Mr Levy will talk about, to treat any run-off that does come off these surfaces.

The other aspect to the disposal sites that we have built into the design at this point in time is, in fact, bunding the outside upper edges of them so that we can control where that water is disposed of, in which direction, so that it does not run as a sheet, if you like, down the face of the batters.

MR REARDON: All right. Now, you have mentioned a lot of good engineering detail there. There should be able to be measurable conditions imposed to regulate those soil disposal sites?

MR JAMES: Yes.

MR REARDON: And have you had any input into those conditions?

[11.10 am]

MR JAMES: The conditions for silt and sediment control are being looked after by Mr Levy. I have had discussions with Mr Levy on methodologies that we will use for constructing these disposal sites, ie the bunding, protection of the surfaces with geotextiles if necessary, before the regrassing has been established. Mr Levy will be looking after the controls and consent for silt ponds and the like. The current proposal and in the conditions is the adoption of the greater Wellington Regional Council standards.

MR REARDON: All right, so am I to take it I should direct my further questions about - - -

MR JAMES: On silt and sedimentation to Mr Levy, certainly.

MR REARDON: Okay. All right, well, in that case we will continue our excursion around the road. Just to finish that off, you have got completely new roads going south in each case, on either side of the - - -

MR JAMES: No. This piece of road down here all the way down to about 115 is an existing farm road. There is a new length of road to get from 115 around to this turbine zone here. This alternative road follows a low grade existing farm track.

MR REARDON: And can I infer from those comments that you will not be using both of those roads?

MR JAMES: Not - - -

MR REARDON: But you have not decided which one, yet?

MR JAMES: The one that is shown in yellow services the turbine for the 2.3 megawatt layout. This road across the bottom services the three megawatt option. That is, we have shown two roads for this zone because there is a very large gully in the middle to have accessed this upper potential site in here from this road would have required another culvert and a large fill. It is a better proposition to, in fact, upgrade the existing farm track that comes down through here and then not build this road around here, at all.

MR REARDON: At the risk of being an ignorant layman; why have you not yet decided whether you were going to have a three megawatt or a 2.3 megawatt turbine?

MR JAMES: That is not my decision, but the tenders for the supply of the turbines obviously has not been let.

MR REARDON: So you mean it is a financial decision, not an engineering decision?

MR JAMES: That is something that you – it is not an engineering decision, no, certainly not.

MR REARDON: All right, well, let us travel - - -

MR JAMES: Right. From 117 we follow the existing farm road, on Mr Love's property which is currently already in very good condition. That follows all the way around the edge of Browns Flat to this point here.

MR REARDON: Now there is an existing road across Browns Flat?

MR JAMES: Yes, there is.

MR REARDON: At the moment, where is that in this?

MR JAMES: I have to zoom in to show you that. You can just see it in there.

MR REARDON: Right, very pale line.

MR JAMES: Yes.

MR REARDON: And this ground in here is all what is called alluvial, is that right?

MR JAMES: Yes.

MR REARDON: It is almost swampy?

MR JAMES: It is very wet in places, yes.

MR REARDON: So you are going to avoid the swampy ground?

MR JAMES: Yes.

MR REARDON: With all those little rivulets going across them, and follow what I presume is more likely to be reliable hard ground to the left there?

MR JAMES: That is correct, yes. You certainly would not want to transport equipment across the bottom of Browns Flat.

MR REARDON: So we come to some more spoil disposal sites?

MR JAMES: Yes.

HER HONOUR: I wonder Mr Reardon, if you could identify the sites as to which turbines they are adjacent to, because transcript needs to pick up the numbers. I am sorry, and the same applies to you, Mr James. Thank you.

MR REARDON: Right, well there is a disposal site DO28 next to turbine 122.

MR JAMES: Yes.

MR REARDON: And another one just north east of turbine 123.

[11.15 am]

MR JAMES: That is correct.

MR REARDON: And they are both quite substantial sites, aren't they?

MR JAMES: I would have to look up my table to see what the areas of those are, but they are reasonable size.

MR REARDON: And does the ground there drain away into the lower Turitea, have we changed catchment?

MR JAMES: No, this is drains - this area up in here for D28 and D29, drains away from the Turitea catchment.

MR REARDON: So it is going into the Kahuterawa catchment?

MR JAMES: Correct. The catchment line follows, nominally follows that farm road that goes around the rim.

MR REARDON: It looks to me as though D28 actually covers a valley in part?

MR JAMES: There is a small gully in there, yes, but as I said it is at the very top end of the catchment so that there is no catchment above that disposal site.

MR REARDON: One of the concerns that the city council's ecologist had was to keep spoil disposal sites at least 25 metres away from permanent water courses.

MR JAMES: Yes.

MR REARDON: But you are not agreeing with that concern?

MR JAMES: I agree with that concern. This is not a permanent water course. It is an ephemeral area.

MR REARDON: Because it is right at the top of the catchment?

MR JAMES: It is right at the top of the catchment. There is no catchment above that to supply it with water.

MR REARDON: So apart from being right at the top of the catchment where the water is ephemeral, have you in fact ensured that all spoil disposal sites are more than 25 metres from permanent water- - -

MR JAMES: That is in the conditions, we will certainly comply with that. Yes.

MR REARDON: But you have been involved in the selection - - -

MR JAMES: I have, yes.

MR REARDON: And have you had that in mind?

MR JAMES: Yes, certainly.

MR REARDON: Because that at least is a measurable condition?

MR JAMES: Yes.

MR REARDON: All right, carry on, Mr James.

MR JAMES: The main access road follows the existing Love property road to the corner of Browns Flat.

MR REARDON: And the hatched area that your hand is on at the moment, just south of the spoil disposal site, 030, what is that?

MR JAMES: That is the proposed Browns Flat substation site.

MR REARDON: So both of the internal transmission lines will come into that?

MR JAMES: The internal transmission line from the plantation substation will come across the valley and connect into this substation here.

MR REARDON: Yes. And isn't there another transmission line?

MR JAMES: Then there is a transmission line that goes from this substation out to Linton.

MR REARDON: An external?

MR JAMES: Yes, external.

MR REARDON: All right, carry on.

MR JAMES: The access road for heavy equipment and turbine components will stop basically adjacent to the zone 125. The road shown continuing north from there is essentially the Love property farm drive.

MR REARDON: That is a private road?

MR JAMES: It is a private farm access road, which will require some upgrading for construction vehicles to access the substation site.

MR REARDON: So you are intending to use the Greens Road access for ordinary sized trucks?

MR JAMES: Ordinary sized trucks.

MR REARDON: But those larger trucks that are required for the turbines will all come via the Pahiatua track?

MR JAMES: That is correct. At the corner of Browns Flat where the substation site is, there is a new road proposed to access the remainder of the turbine sites up on the western side of the Love property, Shilton property and what we have referred to as Western Ridge area. Essentially a new road.

[11.20 am]

MR REARDON: So that is pretty much all a new road from the substation?

MR JAMES: Correct. There are parts up on the Love property where we intersect with an existing farm road, but essentially it is a new road.

MR REARDON: There is 33 kilometres of new road altogether?

MR JAMES: Yes.

MR REARDON: And can you say what proportion of new road is represented by the road from the Browns Flat substation to cover Love ridge and - - -

MR JAMES: The western ridge and the Love property?

MR REARDON: Game ridge.

MR JAMES: No, I don't have that number at hand. I could work it out and come back to you with that.

MR REARDON: Yes, perhaps you could do that at the morning tea break.

MR JAMES: Yes, so you would like to know - - -

MR REARDON: So that we know what we are talking about. The ridge going from turbine 55 134, 135, 136, 127, 128, that is what I am calling Love ridge, because it is a ridge on the Love property, is it not?

MR JAMES: Yes, well this portion where 134, 135, 136 is in fact Mr Shilton's property, then it crosses at zone 127 onto the Love property. So you would like to know the length of that road?

MR REARDON: All the way from the substation to the end of the Love ridge turbines, and then the same to the end of the Game ridge turbines. I am assuming I am correct when I look at turbine 66 going south, that is inside the reserve on Game ridge?

MR JAMES: That is inside the reserve, 66, yes. All the way back to 56. And well, what was 55.

MR REARDON: Yes. So there are 11 turbines I think from 56 to 66 inclusive, on what might be called the Game ridge reserve. Game ridge group, which extends into the middle of the Turitea water supply catchment. Is that right?

MR JAMES: The- - -

MR REARDON: There should be 11 if there is 56 and 66.

MR JAMES: Well 54 is also inside the reserve. It is in the area known as Browns Flat up on the upper slopes.

MR REARDON: But it is outside the water supply catchment?

MR JAMES: No, it is inside the catchment.

MR REARDON: Is it?

MR JAMES: I have a line on here which depicts – that shading that has gone over the imagery highlights the water catchment itself.

MR REARDON: All right.

MR JAMES: So 54, 56, 57, 58 out to 66, are in the catchment.

MR REARDON: Well it is all of that roading that we are looking at there from the Browns Flat substation, going east and north from there. If you could measure roughly the extent of new road – because it is all new roading that we are looking at there, isn't it?

MR JAMES: Essentially, yes.

MR REARDON: Okay, and if we go to the end of the Love line of turbines you finish at 133?

MR JAMES: That is correct.

MR REARDON: Which is almost on the border with the water supply catchment?

MR JAMES: Yes.

MR REARDON: And very close to the lower – oh, and upper reservoirs?

MR JAMES: Yes.

MR REARDON: And is that 133 inside the water supply catchment itself, as distinct from inside the reserve? It is outside the reserve obviously.

MR JAMES: It is obviously outside the reserve. The catchment boundary from the contours is that – comes across there.

[11.25 am]

MR REARDON: Yes.

MR JAMES: At the moment that turbine pad can be made and that section of road right through there can in fact be made to drain away from the catchment.

MR REARDON: Yes. So all we can say is that the turbine zone potentially allows that turbine to be inside the edge of the catchment?

MR JAMES: Once the earthworks are completed it will be outside the catchment. The catchment will follow, in fact, the edge of the turbine pad and its earthworks, batters. It is in a cut. The pad is in a cut. So there is a ridgeline in fact in the design between the flat area for the turbine pad and the slopes down into the catchment.

MR REARDON: So, are you telling me it will be engineered, no matter what, to ensure that it falls outside the water supply catchment?

MR JAMES: It can drain away from the reserve catchment.

MR REARDON: What does the white line indicate?

MR JAMES: This white line?

MR REARDON: Yes.

MR JAMES: That is the zone inside which the turbine would be permitted to move. Obviously you cannot put it down in there – the valley.

MR REARDON: Why has the white line been drawn so widely if you do not intend to - - - ?

MR JAMES: It is only a 50 metre radius in fact, about – oh, it is on a private land – it will be 75 metres. Started it as a 75 metre radius about the initial starting point for the turbine, which would be there.

MR REARDON: So, can we ignore the white line for present and future purposes? Is that just historic? Is that what that is - - -

MR JAMES: No, that is not historic. A zone has been sought around all turbines. Some turbines it is in fact will be very difficult to move them from where they are currently shown, which is why such a small zone has been shown in the first place.

MR REARDON: So the yellow line with the green line running around it as well, that is not the confines of where the turbine platform building - - -

MR JAMES: No, that is the proposal earthworks, for the design as it is at the moment.

MR REARDON: And you are saying you could shift that platform anywhere inside the white line?

MR JAMES: The yellow line is the edge of the formation. The cyan coloured line outside that is the invert of the side drain – all roads and pads have a side drain to them. And the red line is the extent of the earthworks, whether it be the top of a cut or a toe of fill.

MR REARDON: Well, what I am asking though, is, you are saying well, that is where you propose to do it at the moment - - -

MR JAMES: Exactly.

MR REARDON: But you are, I think, reserving to yourself, the right to move that platform anywhere inside that white line?

MR JAMES: Within that – correct.

MR REARDON: Which could have a significant impact then on whether the turbine finishes up inside the water supply catchment?

MR JAMES: In this particular instance, yes.

HER HONOUR: Mr Reardon, Mr James, it is 11.30. I think we will take the morning adjournment.

ADJOURNED [11.29 am]

RESUMED [11.53 am]

MR REARDON: Mr James, just arising out of the questions and answers before the morning adjournment and looking at the white circle area around turbine 133, are you suggesting that MRP could move the turbine site anywhere that white circle in the case of any of the turbines?

MR JAMES: That is the intention of the zone outlines, yes. There are obviously places within those broad zones where it is not practicable or feasible to actually construct a turbine because of the terrain. Example – the very centre of that zone there which is obviously - - -

MR REARDON: The bottom of a gully.

MR JAMES: There is a gully in it. But the other side of that zone, yes.

[11.55 am]

MR REARDON: So, what I draw from that comment, is that all of the earthworks estimates you have given us could change quite significantly from what we have seen so far.

MR JAMES: I would not say significantly. Certainly there could be some changes. It is my expectation that, move a pad from one location to another, the earthworks would not change substantially, and in some areas they may go down. Other areas they may go up. The roads would change in a similar vein. The only reason for moving them would be for wind resource at this point.

MR REARDON: Yes, I am not challenging the motive.

MR JAMES: Yes.

MR REARDON: Simply expressing a concern about the accuracy of the earthworks estimates that you have given us to date.

MR JAMES: I would not expect the volumes to change significantly. As I have said, there would be areas where they will go up; other areas they would come down.

MR REARDON: You have put in a lot of additional material very recently, and in fact we were sent some annexures to your supplementary evidence only last Friday, and – sorry, ma'am, I was looking for a map that was given to us but I am not sure that it is within the supplementary material now. May I have a moment to talk to - - -

HER HONOUR: Yes.

MR REARDON: While they look for that I will go onto another topic. Just go to clause 7.17 of your original evidence-in-chief. That deals with the internal reticulation.

MR JAMES: Yes.

MR REARDON: And some of it is underground and some of it is overhead, as I understand it?

MR JAMES: That is correct. That is the intention.

MR REARDON: When you talk in 7.17 about cutting trenches, does that mean an open trench is cut?

MR JAMES: Yes. These cables are laid typically with a single piece of equipment, which is a chain digger, digs a trench, a narrow trench, lays the cable, puts the backfill material in, bedding material, the plastic overlay, and then compacts the remainder with onsite material as it moves down the road.

MR REARDON: So that process, I infer, involves clearing the vegetation?

[12.00 pm]

MR JAMES: No, these are laid in the road. These cables are laid in the road.

MR REARDON: So the internal cables will all be along roadway?

MR JAMES: The internal 33 kV reticulation, yes, they are all in the roads.

MR REARDON: All right. And then the overhead lines, you have mentioned those internal connections at paragraphs 4.32 and onwards, the internal transmission overhead, and it - - -

MR JAMES: That is the 220 kV?

MR REARDON: Yes.

MR JAMES: Yes.

MR REARDON: And at the end of paragraph 4.33 you have said that it is anticipated up to four towers will require the use of a helicopter during construction? Do you see that?

MR JAMES: Yes.

MR REARDON: And it is some time since I have read this, but as I recall, looking at the map that you have provided, there are in fact six towers in the reserve and five of them have no road access.

MR JAMES: There are a number of towers that are in very close proximity to proposed turbine access roads, access for those pylon locations would be from those existing – the turbine access roads. But there is definitely four that will – it is anticipated to build with a helicopter, to avoid building roads at all.

MR REARDON: So there are six towers in the reserve. Is that part right?

MR JAMES: Well, there is more than six, in fact, inside the reserve. They are all inside the reserve for the internal transmission work. For those that it is not practical or would require clearance of vegetation to build a road, the proposal is to build those with a helicopter.

MR REARDON: Right. So as far as you understand it, there will be four towers accessed by - - -

MR JAMES: As I understand it at the moment, yes.

MR REARDON: And the others will not require any additional road access construction?

MR JAMES: Not that I am currently aware of, no.

MR REARDON: All right. Now, in June, in fact on the 18th of June 2009, you have prepared some preliminary earthworks volumes and you also supplied everyone with a contour map. I am not sure if the Board will have it.

MS PRICE: It was document number 3, introduced in the earlier sitting.

[12.05 pm]

MR REARDON: There is a contour map - - -

MR JAMES: Yes.

MR REARDON: - - - with the road numbers.

MR JAMES: That has got the road names and numbers on them, yes.

MR REARDON: Yes. And if you read the schedule of estimated earthworks volumes, that relates to the same road proposed that is on the map - - -

MR JAMES: It does. The roads are broken down into six zones, yes.

MR REARDON: So the road codes on the map are the same as in the earthworks volumes?

MR JAMES: The earthworks volume in that summary page list road 1000 but that does in fact covers all of the roads that start with the one, that is, the 1000 series roads, yes.

MR REARDON: So road 1000 appears to start at or near the Pahiatua Track?

MR JAMES: That is correct.

MR REARDON: And runs westward on private land?

MR JAMES: Yes.

MR REARDON: To the north of the Turitea Reserve?

MR JAMES: That is correct; out to the waters block.

MR REARDON: Yes. And then road 2000 is what we are otherwise calling South Range Road?

MR JAMES: That is correct.

MR REARDON: And then at a point somewhere around turbine 015, is it?

MR JAMES: Yes, it basically - - -

MR REARDON: We change to road 3000.

MR JAMES: Basically at the start of the Turitea Reserve.

MR REARDON: And road 3000 takes us around to - - -

MR JAMES: The junction with the existing Love property farm road.

MR REARDON: Yes.

MR JAMES: And all the roads that feed off that. 4000 goes from that junction, which is at zone 111 and heads south - - -

MR REARDON: Yes, that is the blue line, yes.

MR JAMES: Yes.

MR REARDON: And then road 5000 runs from that junction northwards - - -

MR JAMES: Right through to zone 125 and includes around to zone 54.

MR REARDON: Yes.

MR JAMES: And then zone 6 is the remainder. The Love property, Shilton property and the western ridgeline.

MR REARDON: And the western ridge you are talking about is sometimes referred to as Game Ridge.

MR JAMES: I am not familiar with the term Game Ridge, but if you refer - - -

MR REARDON: Well, at turbines 56 to 66 - - -

MR JAMES: 56 onwards, yes, correct.

MR REARDON: You call it the western ridge - - -

MR JAMES: Western ridge.

MR REARDON: And other people have called it the Game Ridge. And that is the ridge that extends right into the middle of the Turitea Forest?

MR JAMES: Correct.

MR REARDON: Now, in that preliminary earthworks volume document, dated the 18th of June, you anticipate a total volume of disposal of 1,442,800 cubic metres - - -

MR JAMES: No. No, I might need to clarify that. That disposal site's total volume is the total volume we expect the spoil disposal sites we have identified to be able to contain.

MR REARDON: Right, so that is their capacity - - -

MR JAMES: That is their capacity.

MR REARDON: As distinct from what you might put in there.

MR JAMES: Yes, exactly.

MR REARDON: Okay. So do we know on this page what you were anticipating to put in those soil disposal sites?

MR JAMES: Yes, it was the difference, in fact, between the cut volume above and the fill volume. It is in the order of – it is just over 900,000.

MR REARDON: All right. Okay. When you first made your application for a resource consent, I think you said 740,000 was - - -

MR JAMES: 770, I think was the number.

MR REARDON: Was the anticipated amount of soil to be disposed of?

MR JAMES: Correct.

MR REARDON: And that then has gone up in this scenario - - -

MR JAMES: Yes.

MR REARDON: - - - to 940,000?

MR JAMES: Yes.

MR REARDON: As at the 18th of June.

MR JAMES: Yes.

[12.10 pm]

MR REARDON: And then last week you put in another estimate, I think?

MR JAMES: Yes.

MR REARDON: And is that estimate at appendix D of your supplementary evidence filed last week?

MR JAMES: It is appendix D.

MR REARDON: And is that best – or perhaps the best page to look at there is the first page under the cover sheet - - -

MR JAMES: The summary page.

MR REARDON: And that is headed "Turitea Wind Farm earthworks volumes summary". And looking at the spoil sites heading, halfway down that page, you have got "spoil sites cubic metres 1,413,595".

MR JAMES: Yes.

MR REARDON: Now, is that the capacity?

MR JAMES: That is the capacity of the spoil disposal sites we have identified.

MR REARDON: And how do we calculate then the amount of spoil that you currently anticipate will be disposed of to those sites?

MR JAMES: That is the number, the very last number: Disposal to spoil sites.

MR REARDON: In the shadowed - - - -

MR JAMES: In the shadowed - - -

MR REARDON: - - - area of the page there is a figure at the bottom right, "Disposal to spoil sites 1,072,032 cubic metres.

MR JAMES: Correct.

MR REARDON: And that is what you currently estimate will be disposed of?

MR JAMES: Yes.

MR REARDON: To the spoil disposal sites. So are you anticipating to reduce the amount of fill on the roads as a result of some re-engineering work you have done?

MR JAMES: What has happened in the last week is consultation with the landscape consultant for the project with MRP being not particularly thrilled with the – maybe if I go back.

As a result of pulling the spoil disposal sites out of the reserve, we needed to find additional capacity to get rid of that material that would have otherwise gone in - the spoil disposal sites close to South Range Road and the water catchment access road are fairly limited, we took the opportunity, because we had removed those spoil sites, and because this culvert was not well received, to realign and re-grade this road through here to connect it into this part of the water catchment access road and to utilise this corner in here as a spoil disposal site and to in fact construct some reasonable sized fills along this road to cross these gullies as a means of getting rid of that surplus material that would otherwise have gone into the original spoil sites through here.

The landscape consultant was not too keen on having those fills through here so at the end of last week they were removed. That is now, as a necessity, increased the volume of surplus material and the need to find homes for it elsewhere. The only alternative home was way around in this corner over here, so hence that cut to waste volume has increased by the volume that we have taken out of those structural fills.

MR REARDON: Again, forgive me for being a layman - - -

MR JAMES: Yes.

MR REARDON: - - - but if you do not have the fill, does the road become steeper?

MR JAMES: No, the road is not steeper, it is just a bit more undulating than it was before.

MR REARDON: It has got more steep bits in it?

MR JAMES: We've got more grades in it where we had some flatter sections under the previous design. We have lowered the road into the ground to hide it from views from up in the Hardings Park.

[12.15 pm]

MR REARDON: So there is more cut?

MR JAMES: There is more cut.

MR REARDON: And more gradients?

MR JAMES: Yes.

MR REARDON: And what was the landscape advisor's concern with the fill there?

MR JAMES: Not wanting to see fills basically from within Hardings Park walking track.

MR REARDON: Hardings Park being the bushed area - - -

MR JAMES: This area in here.

MR REARDON: - - - immediately to the right?

MR JAMES: Yes, immediately behind it.

MR REARDON: And that is a scenic reserve?

MR JAMES: Yes.

MR REARDON: All right. Just one other area. At paragraph 7.34 of your original evidence in chief you suggest that the Greater Wellington

Regional Council Guidelines 2002 are the appropriate standard for this job?

MR JAMES: Yes.

MR REARDON: And I just wanted to question you about that point. This particular site is more sensitive than most, wouldn't you agree?

MR JAMES: Sensitive?

MR REARDON: Well, it - - -

MR JAMES: It is certainly sensitive - - -

MR REARDON: Let me put some flesh on that comment. It is unusual to build a wind farm in a reserve, is it not?

MR JAMES: I just have to think about this. I am not aware of others being built inside a reserve.

MR REARDON: And it is particularly unusual, I would suggest, to build a wind farm inside a water supply catchment?

MR JAMES: It is unusual, yes.

MR REARDON: I would suggest to you it is unique in New Zealand?

MR JAMES: Probably, yes.

MR REARDON: And both of those comments mean that this site is rather more sensitive than the general run of wind farms, which are placed on pastoral land.

MR JAMES: Yes, that would be correct.

MR REARDON: And I am just asking you whether you are satisfied, as an experienced engineer, that the Greater Wellington Regional Council Guidelines are adequate here to meet that increased sensitivity?

MR JAMES: That really is a question that you are better directed to Mr Levy, who is the expert on silt and sediment control. But I - - -

MR REARDON: But? You were going to - - -

MR JAMES: No, I think you should direct that to Mr Levy, he deals with that in some detail.

MR REARDON: All right. Thank you, Mr James.

HER HONOUR: Any further questioning? Yes, Mr Low?

<CROSS-EXAMINATION BY MR LOW [12.18 pm]

MR LOW: Mr James, you have given us quite a lot more information. Can I ask you, Mr James, if the new information has meant that there is more or less native vegetation to be destroyed in the reserve?

MR JAMES: The amount of vegetation clearance has not changed, it is as I stated in my original evidence, up to a maximum of 25 hectares.

MR LOW: Sir, can we just unpack that a little bit?

MR JAMES: Yes.

MR LOW: And can I ask you to give us an indication of how much of that 25 hectares is going to be taken from existing road widening?

[12.20 pm]

MR JAMES: The percentage as a result of widening the water catchment access road?

MR LOW: Indeed, yes.

MR JAMES: No, I cannot give you that number; I have not broken it down at that level. Mr Shaw may have broken it down to that level.

MR LOW: Right. I think I am extrapolating from the exhibit on your evidence-in-chief marked CJD02 – CDJ, I am sorry, 02, which doing some calculations it does seem it is possible to get to an indication of how much - - -

MR JAMES: I could produce that number. The clearance along the edge of the water catchment access road for the new road, very large portions of vegetation clearance along there are, in fact, in rank grasses and similar material.

MR LOW: But they are inside the reserve?

MR JAMES: But inside the reserve. The grasses have not been measured as native vegetation clearance.

MR LOW: Is it possible I could ask that we have a breakdown of the amount of clearance by existing roads, new roads, pylons and turbines? Is that something that you could provide us?

MR JAMES: Mr Shaw may have that information for you at his fingertips. He has definitely gone into the clearance required by the earthworks in a great deal of detail, it is my understanding, down to species and type.

MR LOW: Okay, thank you very much.

MR REARDON: Ma'am, if I may pray your indulgence, there was one question which I had asked Mr James to think about over the morning tea break.

HER HONOUR: Yes.

MR REARDON: About road length, and then I forgot to ask him that question. Perhaps I might put that to him now?

<FURTHER CROSS-EXAMINATION BY MR REARDON [12.22 pm]

MR REARDON: Mr James, before the break we were asking you to estimate the distance or the length of the new roading to cover the Love property and the Game Ridge from the substation in Browns Flat. Are you able to -?

MR JAMES: Yes. I measured those road lengths, started at the intersection by turbine, or zone 124, all the way out to zone 66 plus the two branch roads that feed off it, that is 5.9 kilometres; and the length of road from what was zone 55 out to zone 133 is 2.9 kilometres.

MR REARDON: So 5.9 plus 2.9?

MR JAMES: Yes.

MR REARDON: Thank you. Thank you, ma'am.

HER HONOUR: Any questions from residents? Any re-examination?

<RE-EXAMINATION BY MS PRICE [12.23 pm]

MS PRICE: Mr James, towards the end of your cross-examination then Mr Reardon took you to appendix D of your supplementary evidence on earthworks?

MR JAMES: Yes.

MS PRICE: And you discussed with him the total soil disposal that you have presently calculated in that grey shaded box?

MR JAMES: Correct.

MS PRICE: Could you please explain for the hearing how that amount is calculated, and you may draw on the narration on that page, if you would like, to explain why you have that figure and how it relates to the two layouts? Thank you.

MR JAMES: These calculations were carried out as a result of a question posed to Mr Wong Too during his examination relating to road lengths, incremental volumes between turbines.

[12.25 pm]

As a result of that question we undertook an extremely detailed analysis of the site volumes. I, in fact, broke the site down into – there is a series of plans that go with those in that appendix – broke the entire site down into some 297 individual components, each component being either a length of road between a turbine and a road intersection, or between two road intersections. And we calculated the volumes for each segment individually and put that together in the spreadsheet that is also attached in that appendix.

That spreadsheet in that volume is for a combined project, it is a road and pad to all - what is now 126 turbine pads. It is an overall total, as I said, for 126 turbine pads. So it is very much on the high side because it, in fact, gives volumes for a number of pads that would not be built. Under one proposal there is 111, under the other there is 121. This is for a total of 126 zones.

MS PRICE: Thank you, Mr James, that answers all my questions. Thank you.

HER HONOUR: Mr Heerdegen?

MR HEERDEGEN: Mr James, some points of clarification. 4.5 in your evidence, you say that the proposed approach for the majority of cut slopes will be to cut the batters steep and to clean up any drop-outs that occur during the construction phase.

My question is, what is the process when drop-outs are significant and take place in sensitive areas? How are they dealt with?

MR JAMES: Well, normally, the drop-out would be a fall of rock and material onto the road itself, given that these roads are mainly in cuts - a cut batter on each side – the material would be contained within the road. That would be during the construction period, that would obviously just be cleared up and taken away to one of the disposal sites.

MR HEERDEGEN: Right, so in effect the issue of drop-outs does not raise any environmental concerns because it is going to fall out onto the roadway - - -

MR JAMES: It is going to fall out onto the road and be cleaned up.

MR HEERDEGEN: That is fine, thank you. You make mention of the batter slope as being one to four, which by my calculations is a 25 percent or about a 22 and a half degree slope or thereabouts?

MR JAMES: No, it is about 76 percent slope, it is one horizontal, four vertical.

MR HEERDEGEN: Right, okay. So that being the case, how does that relate to the sort of typical slope angles within the Turitea catchment?

MR JAMES: It is very much steeper than the natural terrain in there.

MR HEERDEGEN: Mm, is it?

MR JAMES: Yes.

MR HEERDEGEN: By a factor of?

MR JAMES: There are existing side slopes in there of 45 degrees. There are places where it is, in fact, very much steeper than that down off the ridgeline. It is near sheer cliffs in there, in fact, in places.

MR HEERDEGEN: Okay. On 416, just on the top of page 10, you have mentioned that considerable effort has been made to minimise general earthworks and hence vegetation clearance?

MR JAMES: Yes.

MR HEERDEGEN: And I understand that there are erosion control plans and vegetation – all those sorts of plans have been put in place.

[12.30 pm]

The question though is that when you have got plans like this that are doing this – controlling this sort of thing - how are the decisions made as to what happens? How is it monitored and mitigated in terms of each site?

MR JAMES: During construction?

MR HEERDEGEN: Well, let us say that, initially, anyway.

MR JAMES: Well, under normal circumstances on a construction site like this there would be – a number of engineers would be permanently onsite to monitor the performance and behaviour of the contractor.

Other experts will be available for consultation, silt and sediment control, geotechnical and so on. All of these silt control and sediment control measures will be monitored on a daily basis via record sheets, check sheets; both by the contractor and by the site engineers.

MR HEERDEGEN: So as a - - -

MR JAMES: I think this is dealt with in quite some detail in the proposed CEMP that has been put together.

MR HEERDEGEN: Sure. And as a professional, you have every confidence that that process works?

MR JAMES: Certainly, yes.

MR HEERDEGEN: Sorry, some of the questions have been answered. Page 21, turbine platforms and foundations; the first query is what is the typical depth for a foundation – you know, for one of these concrete pads – and what is the depth to the finished top of the pad? So basically, how think is the concrete? How far down does it go?

MR JAMES: A typical concrete foundation would be in the order of one and a half metres at its outer edge, it will slop up towards the centre, where it may be two and a half metres deep. These are normally cast in the bottom of a nominally three metre deep excavation and then it is backfilled overtop.

What is seen at the surface will be, before the tower is erected, is a small concrete plinth in the order of 200 millimetres high above ground level and nominally, sort of, four metres in diameter, to which the steel tower is bolted.

So once the tower is erected the only thing you see normally is the tower and a small section of concrete protruding from the ground.

MR HEERDEGEN: My second question was about the decommissioning which is not part of the consent, but just out of interest, I take it from your answer then that effectively once the tower is removed, all that will be seen is this plinth of concrete?

MR JAMES: No, you won't even see that because the area would be filled. It can be covered, and then topsoiled and revegetated. So upon decommissioning there would be no signs of any of the structures at all.

MR HEERDEGEN: So you would fill over the top of what has already been filled, because at the point in time when the turbine is finished, it is grassed – it is filled and grassed up basically to the edge of the turbine, isn't it?

MR JAMES: Yes, but I mean you could, if required you could bury that small piece of concrete or that shallow piece of concrete that protrudes from the ground as well.

MR HEERDEGEN: All right. And there is question somewhere else, but it follows on from this. Whereabouts is the fill likely to come from for this sort of situation. So, in the event of a turbine being decommissioned, where would this fill come from?

MR JAMES: There are several options. Providing you are not having to remove vegetation you could in fact – and there were cut batters around the turbine pad – you could in fact pull some of the batters – flatten off the batter that forms the turbine pad to provide the material to cover it. Alternatively we could return to one of our long decommissioned spoil sites and recover some material from there.

MR HEERDEGEN: Right, okay, thank you. Now, Mr Reardon asked you some questions about cable laying.

MR JAMES: Yes.

MR HEERDEGEN: One thing that was unclear to me when I was reading this is at what stage in the process are cables laid?

[12.35 pm]

MR JAMES: There are two choices here. One is to excavate and lay the cables as soon as the subgrade – that is the bulk excavation is completed, and then build the road pavement over top of that. What has

happened on a number of the wind farms, for example West Wind and Te Apiti is that the cabling contractor has come along after the roads have been completed and dug his trenches and then reinstated the roads.

It follows on very closely behind the earthworks to get the cables in the ground before the turbines components has been delivered.

MR HEERDEGEN: The reason for my questions really is trying to establish what sort of environmental risks there are associated with cable laying, because your first answer would suggest that if they are put down at the stage when the road is being built, then they are minimal.

MR JAMES: Yes.

MR HEERDEGEN: But if they are not put down when the road is built - - -

MR JAMES: Well, there is minimal risk. These trenches are excavated and backfilled in a single operation. A trench is normally only open for a matter of a few hours. The trench is dug, the cable is laid and backfilled all in one operation and surplus material from the excavation hauled away at the same time.

MR HEERDEGEN: Turning now to some of these aspects associated with the upper reaches of catchments – page 25 – you have identified now in your evidence that no disposal sites are going to take place within the Turitea water catchment.

MR JAMES: Correct.

MR HEERDEGEN: But you have identified these other sites which are in the upper reaches of other catchments and some of the submitters' evidence suggests that whilst – that this process may well be shifting the issue of sediment, or potential sediment transfer, from the Turitea catchment into other catchments and I just wondered what your feelings are about that perspective.

MR JAMES: Yes, it has certainly shifted it from one catchment to the other, but as I stated earlier, all of these disposal sites are at the very upper reaches of these gullies, so that there is very little or no catchment above the sites for runoff. So the only runoff from the disposal sites will be from the surface that we are actually constructing, and I believe that the measures that we are proposing, ie the bunds around the front edges of these disposal sites, cut-off drains, and the silt and sediment controls that Mr Levy is proposing, will more than adequately look after any runoff from these sites until such time as the batters and the top surfaces have been grassed or topsoiled and grassed.

There are other mechanical means we can use such as the geotech styles that are sometimes placed over large surfaces to protect them in case of rain, and to stop the erosion.

MR HEERDEGEN: Thank you. Page 28, you talk about concrete batching plants, and I was just wondering if you could outline why it was proposed that concrete be batched onsite rather than transported to the site.

MR JAMES: It is principally a question of distance from batching plant to the foundation. The greater the distance, especially with these very large pours – these are large concrete pours – the greater the distance the greater the number of trucks that you have to be able to put on the road to be able to pour these in a single day, preferably six to eight hours.

[12.40 pm]

So if we were to have the concrete delivered from Palmerston, for example, it would add some – I am not sure what a concrete would take – what, nearly half an hour additional travel time to get to the site. That means you would have to double the number of trucks to service a single foundation pour. That could require in the order of 20-25 trucks for a single pour. There are times when getting hold of 25 trucks for a day is a problem. It is certainly far more convenient to batch it on site – shorter hauls, faster turnaround for pouring the concrete.

MR HEERDEGEN: Thank you. In your summary, on page 40, 12.2, you say that the process of managing the area will be by minimising earthworks, minimising vegetation clearance, and then "adopting a collaborative approach for the selection and treatment of spoil sites" and my question really is, who gets the final say? I mean, it is all very well to say it is collaboration, but if somebody puts their hand up and says, "This is a bad site" do you walk away and find another one?

I mean, I am just saying that in a jesting way, but basically somebody has to make a decision and so it is the evidence that you are using collaboratively to make a decision, or is the decision made collaboratively?

MR JAMES: If any one of the experts, the geotechnical expert or the ecologist, was to put their hand up and say, "No" then the answer would have to be "No".

MR HEERDEGEN: All right.

MR JAMES: If everybody is in general agreement, then site would be used.

MR HEERDEGEN: Thank you. That concludes my questions, thank you.

HER HONOUR: Mr Bunting?

MR BUNTING: I had a couple of questions, if I can. Can I turn you to your exhibit CDJ04, some cross-sections.

MR JAMES: Yes.

MR BUNTING: Can you explain the difference between the cross-sections during construction and post-construction?

MR JAMES: It was suggested that the road should be narrowed down after construction from – it is nominally, at the moment it is designed at 10 metres wide to cope with the very large crane. A number of wind farms have required the roads to be narrowed to nominally five-six-seven metres wide upon completion, which is the reason for putting that section in.

But if the roads were to be closed down, they would be closed down by – there are several options in fact, several ways to do it. One is to in fact just grass the berm, the additional width and only maintain the central three to five metres, and just let nature take over the sides. The other options is to, in fact, infill those areas.

MR BUNTING: Any who will make that decision? What is it likely to be?

MR JAMES: My preference is to just let nature take over and not maintain them, not to place that material in the corners.

MR BUNTING: Because it has some real implications, doesn't it?

MR JAMES: Yes, it does.

MR BUNTING: For instance, for access for maintenance. If you had to - - -

MR JAMES: That is the issue, if you physically narrow the roads down, that if you have to get any of the large equipment back in at some point in time, mechanical failure or something like that and a cell has to be taken down, that you have to then go back and re-excavate that material.

MR BUNTING: And now, sort of a related question – you know, you have given us earthwork volumes, cut to fill and that sort of thing, if they

were constructed as proposed on that post-construction would you need temporary stockpiles, or where would you take the material to the main stockpiles and bring them all the way back?

MR JAMES: You would have to take them all the way back from the closest disposal sites.

MR BUNTING: So you would not be talking about temporary stockpiles?

[12.45 pm]

MR JAMES: No, I mean, temporary stockpile runs a risk. You are better to treat it and cover it up. Yes, than leave it exposed for 12 months, 15 months, two years.

MR BUNTING: So there would be no temporary stockpiles?

MR JAMES: No.

MR BUNTING: So, this decision – how is it going to be taken? I mean it is quite a significant decision that has effects that need to be considered.

MR JAMES: Yes. As I said, my preference is to leave the road the width it is. They are in cuts. They are not – and let the – maybe even hydro- and hydroseed the side or grass the edges so that you are in fact – what you maintain long term is a running surface, that is the six metres wide for the normal maintenance traffic to use.

MR BUNTING: So has there been any discussion on which option might go ahead?

MR JAMES: No, not a great deal at this point.

MR BUNTING: It seems very significant to have got to this point and not reached a decision on that. I have one other question, all the volumes you have shown, they are presumably solid volumes?

MR JAMES: Correct.

MR BUNTING: Does this therefore mean that the stockpile sites have got to be compacted at least to the compaction of the solid volume that the material is taken from?

MR JAMES: No, I mean that is one of the reasons why we have got a 40 percent excess capacity in those spoil sites as opposed to what we are anticipating to need to get rid of.

MR BUNTING: So what will the standard of compaction of the disposal sites be?

MR JAMES: I think if you were wanting a compaction – the standard – that you would direct that to Mr Alexander. But it would be a reasonable level. I am not sure what Mr Alexander, at the moment, is currently proposing.

MR BUNTING: Oh, well, I can ask him then. That is all, thank you.

HER HONOUR: Mr Shenton?

MR SHENTON: I have no questions.

HER HONOUR: Mr Hudson?

MR HUDSON: Mr James, firstly whoever has been responsible for these volumes, thank you very much. If it is a combined effort, then thank you. They are very helpful. There are a number of things I was wanting to ask you about, but I thought it might be helpful first, is that able to be looked at in 3-D?

MR JAMES: No. This is just a 2-D display for CAD drawings, GIS layers and the like.

MR HUDSON: Right. Secondly, I want to talk to the right person in terms of overall design and layout. Now, we have heard from Dr Heffernan that he has a high level view of things and leaves that to other people. Are you the person who has been responsible for these things?

MR JAMES: For the layout, no. Turbine locations selected by the wind resource engineers to start with, picking the best locations for wind resource. I went through iterations with them and with the ecologist and other people on no-go areas to define those; get those out of the equation; areas of terrain that were unsuitable for trying to build roads in or construct crane pads on; reduce the area even further. My role was given these locations, move them around, put them in a slightly better location from an earthworks point of view, and then to connect those locations up with the roads.

I guess there is really no one person that said, "this is the layout"; it has been a joint thing between civil engineering ecology, wind resource, geo technical, landscape.

MR HUDSON: But it would sound like you were the one who has taken those different constraints into account and manipulated the layout. Would that be fair?

[12.50 pm]

MR JAMES: Yes, that is probably fair.

MR HUDSON: Right. So you are the man I can talk to.

MR JAMES: As far as being able to – being physically able to build roads and crane pads at the selected locations, yes.

MR HUDSON: Good. Well, then, we have, which we will hear in time from the mayor, a statement which says that he is concerned that the site selection meets the spirit and intent of the council's decision. What is your view on that?

MR JAMES: I am not in a position to be able to answer that, I am sorry. I am just thinking who you should direct that to. I think probably Mr Henry.

MR HUDSON: I do not want to have to come back to you, Mr James, so are you sure?

MR JAMES: Yes.

MR HUDSON: It was not you that would have been responsible for selecting a layout which met the intent of the council - - -

MR JAMES: No, certainly not. No.

MR HUDSON: Were you aware of that?

MR JAMES: The council intent? No.

MR HUDSON: I can read it to you.

MR JAMES: Might need to refresh – I have read a large number of documents but - - -

MR HUDSON: Yes, we all have, Mr James. It is in Mr Naylor's statement at paragraph 23 and what he says is, "I note that a number of turbines on private land are close to adjoining properties. I have some doubts as to whether the site selection of these turbines meets the spirit and intent of the resolution of council in its October decision 2006", which reads

that, "the council direct the chief executive to advise Mighty River Power that the council expects that, in selecting the location and number of turbines on any private land outside the reserve, Mighty River Power will ensure that adjoining land owners' enjoyment of their properties is not unreasonably adversely affected."

Were you aware of that?

MR JAMES: Only in as much as keeping turbine locations away from adjoining land owners wherever possible, that were not part of the project as a stakeholder and providing clearances to those boundaries so those clearances were given to me as one of the criteria, yes.

MR HUDSON: And can you tell me what those were?

MR JAMES: The criteria was I think it is half a rotor diameter. I mean, so that no part of the turbine would cross the boundary.

MR HUDSON: Right. But the effect in the wider sense of those turbines, was that considered in relation to this direction?

MR JAMES: Not – that does not really pose an issue as far as the earthworks and civils were concerned. I would have expected that concerns relating to proximity to the boundary would be questions that would be addressed by the visuals and people in others - in consultation.

MR HUDSON: But aren't you the person who brought those concerns together?

MR JAMES: I did not personally bring them all together. This information was fed in at a number of discussion groups where these turbine locations were all considered one at a time with input from all the consultants, all the experts as to whether this type of turbine was acceptable in its location or unacceptable. Those were the meetings at which a number of turbines were removed.

I am not aware of being asked to move any turbines further away from a boundary because the adjoining landowner was not part of the scheme. They were placed at the provided – at least the clearance so that no part of the turbine blade would go over the boundary during its normal rotation.

[12.55 pm]

MR HUDSON: Yes, I understand that physical relationship to a boundary but it is the effects one I am concerned about. Perhaps Mr Henry will - - -

MR JAMES: Yes, I cannot answer that for you.

MR HUDSON: - - - be able to help us on that. Would you describe this as an integrated approach to the design of the wind farm?

MR JAMES: Yes, certainly. I mean, everybody was talking to each other. As I said, we had a number of round table meetings where each turbine was discussed individually and each piece of road looked at.

MR HUDSON: So when the application was lodged and the AEE made available, which I think was January, was that - - -

MR JAMES: Yes.

MR HUDSON: Correct?

MS PRICE: August.

MR JAMES: August. January was **(INDISTINCT 12.56.00)**.

MR HUDSON: Sorry, which?

MS ……..: The AEE was lodged in August 2008.

MR HUDSON: Right. You had taken all of those concerns into account and were happy that they had been satisfied?

MR JAMES: From my perspective, yes. I was not aware of any concerns that would need me to shift a road or a turbine.

MR HUDSON: And all of the other experts that you refer to were equally happy?

MR JAMES: As far as I am aware, yes.

MR HUDSON: I will ask them when they come - - -

MR JAMES: Yes.

MR HUDSON: - - - but it appears to me you are the one who has got the overall vision, if I can put it that way.

MR JAMES: Well, it might be elevating me slightly too far up the tree.

MR HUDSON: Enjoy it! Well, what then was the reason for removing nine turbines subsequent to that if you were satisfied at that point that they were all acceptable?

MR JAMES: That was a decision that was made by Mighty River Power at Christmas last year, was to remove those turbines.

MR HUDSON: Well, as the expert advising Mighty River Power, would they have referred to your advisors?

MR JAMES: They obviously had advice that they should take those turbines out.

MR HUDSON: Were you directed?

MR JAMES: Sorry?

MR HUDSON: Were you directed?

MR JAMES: I was directed – asked to take those turbines out and all of their connecting roads.

MR HUDSON: And who were you directed by?

MR JAMES: Mr Henry.

MR HUDSON: I will look forward to another discussion with Mr Henry. Right. Some of the engineering aspects in the – you referred to the example here just recently where the landscape consultant had asked that you do not do some fill in that access road area?

MR JAMES: Yes.

MR HUDSON: Had he been advising you throughout on the effects related to the earthworks and civil work?

MR JAMES: He had not advised – when I gave him the designs for him to do his work and his visualisations he certainly did not advise me that any of the roads at that point in time were difficult for him to accept and that I should be looking at changing anything. It was only my subsequent inclusion of the fills across the front of the site there between 117 and 118 that he was not particularly keen on.

MR HUDSON: And can you tell me when it was that you gave him all that information for him to comment on?

MR JAMES: I would have to go back to the records to find out what – how long ago that was.

MR HUDSON: Would you be able to do that for us?

MR JAMES: Yes.

MR HUDSON: And maybe come back through counsel?

MR JAMES: Yes.

MR HUDSON: But he has come back in relation to this one, was it last week?

MR JAMES: Yes, this was a very recent change that had been made to remove the need for that culvert and as a means – and subsequent, and the removal of the spoil sites within the reserve, required some 120,000 cubic metres of material to be disposed of somewhere else. A convenient engineering method was to put that piece of road mainly into a fill and utilise that structural fill and a dead corner as a disposal site.

[1.00 pm]

MR HUDSON: Would it be unfair to suggest that actually the whole layout has been driven by a reasonable engineering approach and then reacted to and adjusted by subsequent experts?

MR JAMES: First approach for me is to find the level at which and the orientation at which each of these crane pads can be built most economically earthworks-wise, to minimise the volume, and then to connect a road between those pads – once again, minimising vegetation clearance, earthworks, although those two are at times at cross purposes with each other. To avoid vegetation is sometimes necessary to do larger earthworks somewhere else.

Then that is the first cut that is then reviewed by the ecologist, he tells me that there is a stand of trees there that I need to avoid, or it is acceptable. Geotechnical input, archaeological input – although in this project, very little archaeological features – and the roads are adjusted from time to time, almost continuously to try and satisfy all of those demands. It is not always possible to satisfy everybody's demands.

There have been turbines that have been removed along the way because of concerns raised by some of the experts. There were additional turbines inside the reserve that had been pulled out at fairly

early stages because of the vegetation that had to be cleared to get to them. Some that have been adjusted; there is an old quarry, for example, that gates to the Turitea reserve, it has some significance. A turbine was shifted there to avoid having to touch that area with a road. Turbine 55 was – or zone 55 has been removed to satisfy local iwi and some of their concerns.

MR HUDSON: But all of those events, have they all happened subsequent to the application?

MR JAMES: No, no. This is - - -

MR HUDSON: That is in the process?

MR JAMES: This has been going on since 2006.

MR HUDSON: So you are illustrating the collaborative refinement process before lodgement?

MR JAMES: Yes, yes.

MR HUDSON: Right. Now, there are two that you mention there that I would like to get a bit more detail on.

HER HONOUR: John, I wonder as it is lunchtime, whether -?

MR HUDSON: Yes, of course.

HER HONOUR: We will take the luncheon adjournment now and return at quarter past 2. Thank you.

ADJOURNED **[1.03 pm]**

RESUMED **[2.19 pm]**

HER HONOUR: Yes, Mr Hudson?

MR HUDSON: Mr James, I asked you before whether that could be seen in 3-D, and you said no, it was a tab file.

MR JAMES: Yes.

MR HUDSON: The Memory Map is capable of being seen in 3-D, is that on the other machine?

[2.20 pm]

Right, thank you. I wonder if you could go to the overlay, which is the virtual image, virtual groundcover?

Now, while he is finding that – Mr Maassen, if I could ask you? I see that Mr John van der Leden is a witness?

MR MAASSEN: Yes.

MR HUDSON: Is he going to be making K2Vi available?

MR MAASSEN: Yes, he is.

MR HUDSON: And we will be able to see it as a 3-D image?

MR MAASSEN: Correct.

MR HUDSON: And when does that come?

MR MAASSEN: Can I just have a look at the sheet?

MR HUDSON: Well, sorry, I can see from the schedule – I just wonder if we need to wait until then to actually get the benefit of that great technology?

MR MAASSEN: Well, I would need to take instructions as to if he would be available earlier, if that is your wish. Our council planner is currently away with the flu, so I do not have him to immediately ask that question, and he has the context. But if you have some requests, we can at least identify whether we can meet them?

MR HUDSON: No, well, let us just leave it until he comes in that week of the landscape people.

MR MAASSEN: Would you prefer Mr van der Leden before Mr Wyatt, or?

MR HUDSON: Well, I am aware, I do not want to hold Mr van der Leden here for two weeks, but I am in the dilemma that his imagery is particularly useful because it also has the turbines in 3-D, which Memory Map does not. But at this stage leave it as it is.

MR MAASSEN: Thank you.

MR HUDSON: Thank you, are you able to go to the layer which has got the colour aerial photograph? Well, it is not actually the aerial, it is a virtual.

MR JAMES: It is not a coloured photograph, it is black and white.

MR HUDSON: Yes, so it is – I have not got my machine here. I forget the name of the overlay, it is not the aerial photograph, it is the colour imagery which has got the land use – that is the one. Thank you.

And can that go into 3-D?

MR JAMES: Yes.

MR HUDSON: Could you look at turbine numbers – up at the – just off the track, numbers 106, something like that, looking in from the east.

MR .....: Chris, can you guide me as to which turbine - - -

MR HUDSON: They are on the northern end.

MR JAMES: Yes, 106 – they are down the - - -

MR HUDSON: 103, that sort of area.

MR JAMES: 103, they are down the side of South Range Road. It is these ones. If you can see my display, it is these ones; 103, 4, 5, 6, 7, down the eastern side of South Range Road.

MR .....: **(INDISTINCT 2.23.34)**

MR JAMES: Yes.

MR HUDSON: Are we looking in from the east?

MR .....: No, we are looking at them from the west.

MR JAMES: You are looking from the west.

MR .....: Do you want to look at them from that angle?

MR HUDSON: From the east, if you could? Rise up a bit so it is a bit more aerial. Okay, and a wee bit – yes, okay. 103 is in that grass area there, is in the pasture rather than the - - -

MR JAMES: Yes.

MR HUDSON: Yes, can you go and just centre that please. And zoom in a bit. Now, Mr James, can you turn on the catchment layer, the red

catchment layer on this one please? Right, now getting back to you, Mr James, is the 103-4-5-6-7 – all draining east?

MR JAMES: Correct. Yes, they are.

MR HUDSON: Right, and they are all pasture cover?

MR JAMES: Yes.

MR HUDSON: And is that terrain generally flattish?

[2.25 pm]

MR JAMES: The areas where the turbines are and the roads, yes it is generally – it is rolling to flat.

MR HUDSON: Right.

MR JAMES: It has got some quite deep gullies that run across it, for example down there, another one running here.

MR HUDSON: Right.

MR JAMES: That is quite steep down in there.

MR HUDSON: And 109 – sorry, 99, 100, that area – similar?

MR JAMES: The top? Oh, yes. That is out on the Day property.

MR HUDSON: Right, okay. How many soil disposal sites currently are there, did you say?

MR JAMES: The total number?

MR HUDSON: Did you say – was it 38?

MR JAMES: I will have to have a look. It is in that order. It is numbered to 33 – one has been removed, so it is 32.

MR HUDSON: 32? And I know that you said before that you have been at some pains to place them in ephemeral stream.

MR JAMES: Correct, yes.

MR HUDSON: And at least 25 metres away from running streams?

MR JAMES: Yes.

MR HUDSON: But an ephemeral stream would become a stream when it rains, wouldn't it?

MR JAMES: If it had an upper catchment, yes.

MR HUDSON: And do these have enough of a catchment to form a waterway?

MR JAMES: No. For example, 19, the water supply catchment boundary is basically along the existing South Range Road, on the middle of South Range Road. So we are proposing to use that whole area in there, which is right up to the ridgeline, as the disposal site.

MR HUDSON: And when it does rain, particularly in a major event, would it be reasonable to expect silt runoff from a soil disposal site?

MR JAMES: There will be runoff from the surface of the soil disposal site, yes.

MR HUDSON: And therefore, with 32 of them would there be potentially 32 areas being affected by that type of runoff?

MR JAMES: They won't necessarily all be open at the same time.

MR HUDSON: Right. How many are likely to be open?

MR JAMES: There could be a dozen or so open at a time.

MR HUDSON: In the planning of these I notice that there is a lot of good practical considerations given to them and you cover those at 415 of your evidence-in-chief, dictated by three – sorry, that is road widths – where are we – 731 – "Disposal site locations have been located as close as possible to the areas of excess excavation whilst being outside the catchment. Minimised haul length from the disposal site, thereby increasing efficiency and also reduces the amount of wear on the roads".

Were there landscape considerations in the location of these?

MR JAMES: There was no specific landscape input to them. The intention is that these disposal sites will just end up as pasture on the completion. Certainly the nature of the paddock that they are in will change from being a gully or an incised area to a flatter more rolling shape, but landscape considerations and landscaping and shaping of their final

form will all be considered during the design of the finished surface for all of these sites.

MR HUDSON: Now, you said just before that they don't actually have a catchment. How would the topography with that indented ephemeral stream layout have occurred?

[2.30 pm]

MR JAMES: There is obviously – at the moment it has a surface area that is draining down towards where the hand is shown at the moment, because that is the base of the gully. I am not familiar with the geological history of this particular site, as to what would have formed that depression in the first place, but it is at the very top of the catchment.

MR HUDSON: Well it appears, that looking at each one of those fill sites, that there is that type of indentation.

MR JAMES: Yes.

MR HUDSON: Could it be that they actually are acting as a catchment and gathering water and that has eroded that formation over time?

MR JAMES: They will collect some water at the moment. For example, this area where the hand is now, drains down into the bottom there. So there is runoff there at the moment which follows that course, obviously during periods of high rainfall. By filling that area the runoff will occur elsewhere.

MR HUDSON: But it may occur into the adjacent catchment?

MR JAMES: No, it won't necessarily occur into the adjacent catchment, not unless that is mounded to the point that is actually slopes from what is currently a gully.

MR HUDSON: So it would keep going into the current catchment?

MR JAMES: Yes.

MR HUDSON: It must go into one or the other?

MR JAMES: It goes into one or other.

MR HUDSON: It can't go nowhere.

MR JAMES: No. But these will all be bounded by cut-off drains during construction to stop any runoff that does occur going onto the exposed soil surfaces.

MR HUDSON: But as I understand it, the main worry with runoff is in a larger event.

MR JAMES: Yes.

MR HUDSON: And that is when the sediment washes downstream and has the flow-on effects that it does have. Is that correct?

MR JAMES: That is correct.

MR HUDSON: Right. So, would it be the case then that there will be, in that type of situation, runoff from the fill in these - - -

MR JAMES: Yes, there will be runoff, hence the silt and sediment control measures that will be placed downstream of the disposal sites.

MR HUDSON: Right. And if there are 12 open at a time, then it limits the number of catchments that are affected?

MR JAMES: Correct.

MR HUDSON: But collectively 32 will be affected over the whole construction period?

MR JAMES: If all 32 sites are used, yes.

MR HUDSON: Right. Would it be beyond possibility to reduce the number of fill disposal sites and thereby reduce the number of downstream ephemeral or running streams that are affected and put more fill into a smaller number of locations?

MR JAMES: There are a limited number of possible sites available to us on this project. If you enlarge the surface area of the disposal site then you have to place far larger silt control measures downstream. Smaller sites are probably preferable.

MR HUDSON: But smaller sites have a wider dispersed effect, wouldn't they?

MR JAMES: Overall, but the total surface area is probably likely to be the same.

MR HUDSON: Of the surface area, yes.

MR JAMES: Yes.

MR HUDSON: But would it be possible, say, to combine the 18, 17 and 19 into one larger one and still affect the same catchment area?

MR JAMES: It would be possible to combine those three into one very large disposal site.

MR HUDSON: And still just affect the same number of downstream areas?

MR JAMES: Yes.

MR HUDSON: And what about taking that a little bit further. Can you just zoom out a little bit and combining up to – where is the next one? There is one up the top right – by turbine 102.

MR JAMES: 102 – the problem with combining them is that you are starting to now move them away from where they are most required, and makes haul distances and so on greater.

MR HUDSON: Which is why I looked at paragraph 731 and would appear that the criteria that you have selected there are fairly much engineering and economy driven. Would that be fair?

[2.35 pm]

MR JAMES: Engineering driven, yes.

MR HUDSON: And cost driven, minimise length of haul etcetera?

MR JAMES: Quite often with civil engineering minimum cost is also the minimum effect.

MR HUDSON: Well, it depends on the values we are looking at possibly. Say there was a large disposal site put in covering the entire area between 98, 102, 101 and that one – 99.

MR JAMES: This large area in here?

MR HUDSON: No, up to the north.

MR JAMES: Up in here?

MR HUDSON: Yes, that big – right out to 102.

MR JAMES: Yes.

MR HUDSON: Keep going, yes, that is a big area.

MR JAMES: That is a huge area.

MR HUDSON: That is a huge area. Would that take care of quite a bit of the fill?

MR JAMES: Yes.

MR HUDSON: And it is a flat terrain surrounding it?

MR JAMES: I can turn the contours on.

MR HUDSON: It is relatively flat along that ridge where the road is.

MR JAMES: Along where the road is, yes.

MR HUDSON: And if you filled - - -

MR JAMES: There is a very steep, very deep gully in there which - - -

MR HUDSON: Yes. And if that entire gully was filled and the one up beside 98.

MR JAMES: Yes.

MR HUDSON: Have these possibilities been explored?

MR JAMES: I have to say I have not considered building a disposal site of quite that magnitude, no.

MR HUDSON: It would affect how many catchments, how many?

MR JAMES: That currently drains into – there is one catchment stream down there – the second one down here.

MR HUDSON: And I know you cannot give me the figure, but would that absorb quite a number of smaller disposal sites?

MR JAMES: Definitely.

MR HUDSON: Is that something which an integrated approach to planning would have expected to look at?

MR JAMES: Not a single site of that size, no, because it is further away from where the material is being excavated.

MR HUDSON: Yes, I appreciate that.

MR JAMES: Yes.

MR HUDSON: But you also say in your evidence that there is considerable haulage from the turbines – I think it is numbers 27 onwards - - -

MR JAMES: Yes.

MR HUDSON: Because they are in the reserve.

MR JAMES: In the middle of the reserve, yes.

MR HUDSON: So you are accepting haulage as a factor in some situations.

MR JAMES: Yes.

MR HUDSON: Because you don't want it in the reserve. What about in other situations? Is it possible?

MR JAMES: Yes, it is possible. The current proposal is that the material from within the reserve will obviously go to the closest disposal sites. There is a site that we have identified in here close to – well, at the substation site. The material from within the reserve will go to these sites first, because it is also required for the structural fill for the platform for the substation. As we move out of there the volumes decrease so the need through here is not quite as great. There is the smaller sites.

MR HUDSON: Mr Shaw says that the ecological impacts of widening the water catchment access road along this stretch –and he is referring to that within a reserve, will be substantial. And the other ecologists may have a view about the impacts of the fill on these catchments.

Would that be a factor which you could consider along with your criteria in 731, in considering an alternative scheme designed to 32 small but widely spread fill disposal areas?

MR JAMES: You mean constructing fills, structural fills within the reserve?

MR HUDSON: No, sorry. At the moment you have told me that the haulage is a factor and that factor has been accepted as a restraint within the reserve?

MR JAMES: Yes.

MR HUDSON: You have also agreed that each of those fill disposal areas in an event will have downstream effects?

MR JAMES: Yes.

MR HUDSON: And what I am asking is, if it was more concentrated, would the effects be reduced and, from what I understand you are saying, is it is reduced in the – it is only affecting two catchments?

MR JAMES: Yes, that is correct.

MR HUDSON: Is that right?

MR JAMES: Yes, but they are harder to manage when they become too large.

MR HUDSON: And then I am asking, is that something which could be considered?

[2.40 pm]

MR JAMES: Yes, it could be considered.

MR HUDSON: And it hasn't been yet?

MR JAMES: No, we have not. No.

MR HUDSON: Right. And I will be asking the ecologists their views on 32 dispersed disposal areas as opposed to a smaller number of larger ones.

MR JAMES: I had, in fact, I had a disposal site originally in the upper reaches of this gully here, which was taken out because the ecologist was not happy with it.

MR HUDSON: Do you know the particular reasons for that, because I can see some vegetation there?

MR JAMES: Because of the vegetation that would be required to be removed in there. There is also, through here, a historically significant - in places, old logging roads I believe they are, that we have attempted – we have had to avoid as well.

MR HUDSON: So that is some of the constraints that you have been given?

MR JAMES: Yes.

MR HUDSON: Right. Okay, well, I will look forward to having that discussion with the ecologists. But from your viewpoint, from an engineering viewpoint, is that a feasible approach?

MR JAMES: Yes, it is feasible. Yes.

MR HUDSON: And from a topographical viewpoint, it would simply be extending the amount of flat area which is in keeping with that setting?

MR JAMES: Yes.

MR HUDSON: And it could be restored to farm land?

MR JAMES: Yes, definitely. The aim with all of these sites is to, in fact, improve the long term farm use by selecting some of these sites and the locations we have got.

MR HUDSON: Right.

MR JAMES: The gullies and so on.

MR HUDSON: And there would be more haulage required?

MR JAMES: There would be more haulage.

MR HUDSON: And that would then become a trade-off with the other benefits?

MR JAMES: Yes.

MR HUDSON: Right. Can I just move on to another topic now? The width of the road, it needs to be 10 metres wide to take the large equipment?

MR JAMES: The large crane that we have used as the basis for these designs is 8.7 metres, I think it is, across the tracks so it needs a running surface of 10 metres to accommodate it.

MR HUDSON: Right. Now Commissioner Bunting was asking you about the restoration works on there.

MR JAMES: Yes.

MR HUDSON: And that cross section which shows material put back on after construction as mounds to reduce the width of the road. What happens when you have to come back?

MR JAMES: You have to re-excavate – you have to get another resource consent and re-excavate that material.

MR HUDSON: And is turbine 133 possibly the one at the end of the line?

MR JAMES: 133, I am just trying to refresh my memory as to where 133 is.

MR HUDSON: Just on the southern side of the Turitea dam.

MR JAMES: Yes, it is. Right out at the end of John Love property, yes. Yes.

MR HUDSON: Yes. So if that gets a squeaky bearing?

MR JAMES: We will have to re-excavate and re-establish the road right through.

MR HUDSON: Every time it gets a squeaky bearing?

MR JAMES: Not necessarily every time it gets a squeaky bearing. Any time it needs a crane of sufficient capacity to probably take down in the nacelle. I think smaller cranes can lift the componentry out of the cells and take blades off. It depends on the size of the lift that has to be made.

MR HUDSON: So I know that you expressed in reply to questions earlier, you had some concern about this mounding.

MR JAMES: Yes.

MR HUDSON: And said that from your viewpoint you would be better to leave it flat?

MR JAMES: Yes.

MR HUDSON: Can you just expand on that for me?

MR JAMES: There is no need to maintain the pavement width in a metal running surface over the full 10 metres for the duration and in fact the outer edges of it can be lightly soiled and in fact vegetated with things like grasses, toi tois, that sort of growth. It then leaves the side drain intact as well and if it is necessary at any point to come with a very large piece of equipment, a crane, then that lighter material can be

easily removed to allow access.

[2.45 pm]

MR HUDSON: And if that had to happen, where does all the bunding go in the meantime?

MR JAMES: That would have to go to a stock pile and then be replaced later.

MR HUDSON: And that has got a lot of the - I forget the term - the relocated shrubs in it that have been taken out and carefully stored and then put back again, has it not?

MR JAMES: No, not necessarily I mean the intention with that material is to replant batters, edges of the road that are being revegetated from the existing road, places like that.

MR HUDSON: So the figures that you have got in your supplementary, it was just over a million cubic metres of fill disposal - - -

MR JAMES: Yes.

MR HUDSON: - - - does that include all the material which is going to be used on the bunding?

MR JAMES: To put back in?

MR HUDSON: Alongside the roads?

MR JAMES: We have not specifically measured that volume of material but that would have to come out of those disposal areas. Some of it would be normal excavation material and some would be - a large portion of it would be top soils and the like to get the growth.

MR HUDSON: But in terms of volumes, that million cubic metres, thereabouts - - -

MR JAMES: Yes.

MR HUDSON: - - - that does include all the material which goes back along the sides of the roads?

MR JAMES: Yes, it does, yes.

MR HUDSON: Right, so it will not actually be a million cubic metres going into disposal sites?

MR JAMES: No.

MR HUDSON: All right.

MR JAMES: And that million also includes the whole 126 turbine zone.

MR HUDSON: Right. So there is a bit of a trade off then between the engineering preference to keep the sides of it flat?

MR JAMES: Yes.

MR HUDSON: So you can go there again, go back for maintenance and what are the others - what were the pressures on you to not do that, because that is clearly your preference?

MR JAMES: It is my preference. There were concerns with other wind farms leaving these 10 metre wide roads open long term and it had been placed as a condition for example on Te Apiti to close them down. Te Apiti in fact had to go and reopen a large number of their roads some time after commissioning to in fact remove the cells. I guess that was the reasoning - that had been asked for before was the reasoning it was suggested here. These roads though, although mainly in cut, I personally do not think that the visual aspect of a 10 metre wide road will be noticeable, but Mr Wyatt could probably answer that for you better.

MR HUDSON: So was it Mr Wyatt that said you wanted it done?

MR JAMES: No, it was a decision in fact by Mighty River that we should be offering to close these roads down.

MR HUDSON: Mr Henry?

MR JAMES: Yes.

MR HUDSON: Well, I will have a nice chat with him. Now, Te Apiti is in pasture country, is it not?

MR JAMES: Yes.

MR HUDSON: So when you say they have to reopen them, what does that involve?

MR JAMES: I was not involved in that work but my understanding of it would be that they would have had to have gone back and remove the

material that had been placed along the edges of the road, stock piled it, taken the crane into the site and then replaced it possibly on completion.

MR HUDSON: Right. But the hard formed road would still be underneath?

MR JAMES: Yes.

MR HUDSON: And it would be the same here?

MR JAMES: Yes, it would.

MR HUDSON: So your preference is to keep it in low growing vegetation which would still need to be removed, would it, or would you just drive over it?

MR JAMES: Depending on how far along the growth had come. You could in fact drive over it.

MR HUDSON: All right. So something like brown top over the whole thing - - -

[2.50 pm]

MR JAMES: Or toi toi.

MR HUDSON: Well, yes. Right - - -

MR JAMES: And then just maintain the central five/six metres as a metal running road.

MR HUDSON: So it was a direction from Mighty River rather than from one of the other - rather than the ecologist or the landscape architect?

MR JAMES: Yes.

MR HUDSON: All right, well one final thing. If you can take the contours down to Browns Flat, now there are four turbines being taken out from there?

MR JAMES: Yes, I believe it is four if I remember correctly.

MR HUDSON: And how did that - that was what you told me before lunch of being directed to remove them?

MR JAMES: Yes.

MR HUDSON: It was not one of your team?

MR JAMES: No it was a direction from Mighty River to remove those turbines.

MR HUDSON: And the access from say 54 up to, I think it was referred to as, Loveridge?

MR JAMES: Yes, this road up here?

MR HUDSON: That is right.

MR JAMES: Yes.

MR HUDSON: Where was number 55?

MR JAMES: 55, well it is still actually shown on there.

MR HUDSON: Sorry, it is still there.

MR JAMES: Yes.

MR HUDSON: That is on the hilltop, is it?

MR JAMES: It is.

MR HUDSON: Now, on this - I did not print it off the website, I waited to be given it. This little bundle you have given us this morning here - - -

MR JAMES: My apologies.

MR HUDSON: No, you are very thorough. Could you take me to the cross section - I think you might find it - well, you will know your way through here better than I do. Will you take me to the cross section which shows coming around that U bend?

MR JAMES: This one up the top here.

MR HUDSON: Yes.

MR JAMES: The plan may not necessarily be a cross section through there. We were asked for a selection of typical type cross sections. Let's see what detail sheet that is on. Sheet 75. There are long sections through all of the main roads but not necessarily the branch roads.

MR HUDSON: Well, the long section will be - - -

MR JAMES: Yes.

MR HUDSON: - - - fairly consistent because of the required gradient. Can we get an indicative cross off an adjacent one?

MR JAMES: Well, there is a section on sheet 5.48 of the cross section.

MR HUDSON: Yes.

MR JAMES: The last one on that page at drainage 700.

MR HUDSON: Bottom right?

MR JAMES: Bottom right and that is in fact a cross section through the centre right where the hand is.

MR HUDSON: At 700?

MR JAMES: Yes.

MR HUDSON: Is that 3-700?

MR JAMES: These cross sections are split off into road series 1,000, 2,000, so that is drawing number RK 548, it is the plan of the last sheet of - - -

MR HUDSON: No, I have got that. I am just wondering what the chainage reference was?

MR JAMES: It is distance 700.

MR HUDSON: Okay. Now these are just computer calculations so that - I am wondering would there be that type of cross section actually appear in that location?

[2.55 pm]

MR JAMES: Yes, these are through the ground model we have for the whole project which is the map from the aerial photography, it has got sufficient ground points in there to produce the one to two metre contours. So that is the cross section through the ground at that point and the proposed road.

MR HUDSON: In that sort of situation where you have got, what is the height of the cut on the uphill side?

MR JAMES: On the uphill side. Actually the heights of the cuts are noted on those plans, there are some numbers like at chainage 700 on the left hand side there is a 3.3, that is the height of the cut batter at that point.

MR HUDSON: 3.3 on the left.

MR JAMES: Yes.

MR HUDSON: And on the right?

MR JAMES: It will be somewhere between 6.9 and 6.8 metres.

MR HUDSON: Now in that type of situation there is the road coming around the front of the ridge?

MR JAMES: It is in a box cut all the way around there.

MR HUDSON: Would that high batter on the left hand side, the 3.3 metre one?

MR JAMES: Yes.

MR HUDSON: Would that be left - - -

MR JAMES: Definitely.

MR HUDSON: - - - or would you roll it out?

MR JAMES: No. My design philosophy here is in fact to leave a bundle batter on the outside of edges of all roads so that they are not daylighted.

MR HUDSON: And the same on the one above, the 800?

MR JAMES: Yes.

MR HUDSON: And Mr Wyatt has reviewed all of these?

MR JAMES: Yes, he is happy with that approach as it helps to screen the road from below and it also lets us control the stormwater runoff better.

MR HUDSON: Now, you were going to find a date for when he was given all of these, have you found that?

MR JAMES: Yes, no I have not got it on my computer. I will have to get that

from the office records and - - -

MS PRICE: I can assist? I looked for that over the luncheon period.

MR JAMES: Thank you.

MS PRICE: And Mr Wyatt was engaged in April and the sessions that occurred between Mr James and Mr Wyatt occurred in May of 2008 and Mr James may be able to answer your queries on the exchange that happened there. There was a particular philosophy or criteria that Mr James had for designing the roads which Mr Wyatt found acceptable. The reason the issue came up in the most recent weeks was because there was a difference from that philosophy which is why Mr James had to redesign that road around by the Love property.

MR HUDSON: Can you tell us about the philosophies?

MR JAMES: The philosophy is to make sure we leave, and it is in my evidence, leave a bund either from natural terrain when we are putting in a cut as in those cross sections that we have just looked at or where we have the major fills, we cannot unfortunately do in all situations because some of the little fills are too short, is to actually construct a bund within the fill on the outside edges of the road, as indicated on those cross sections that were handed out this morning, the typical cross sections.

The philosophy behind that being that it allows us to better control the point of discharge for the stormwater, for the runoff on the road, it provides a safety barrier for the equipment for people using the road, given some of this terrain is fairly steep and it has that - it is a visual barrier to these roads when viewed from below that it, in fact, hides the height of the cut on the opposite side of the road.

Now, these aspects, in particular the visual ones, were discussed with Mr Wyatt when he came over initially, when we provided him with the ground models and the design models at that point.

MR HUDSON: Right. And the last question, Mr James, is the different experts, which have contributed to your job of weighing up all of these different influencing factors, was the planner included in that?

MR JAMES: Yes. Planning input as to such matters as distances from boundaries, subdivisional rights, that sort of information was all conveyed to me, which restricted some of these roads in some areas very early on.

[3.00 pm]

MR HUDSON: Did the planner give you advice in terms of some of the provisions of the plan, all the relevant plans?

MR JAMES: Yes. I mean, I have been through the aspects of the one plan, for example, that related to construction works and streams, disposal of material, discharges to land and discharges to waterways, etcetera.

MR HUDSON: And what about some of the broader scale provisions such as the status of ridge lines?

MR JAMES: They were discussed. Because these roads are basically in-cuts, the ridgelines are not significantly changed.

MR HUDSON: Rather than just the roads, the turbines itself.

MR JAMES: The turbines? No, well, the location of the turbines – the final location of the turbines was not my sphere; that comes down to a wind resource.

MR HUDSON: No further questions.

HER HONOUR: Mr James, you have said this is a sensitive catchment and I think you went on to say it is a very sensitive catchment.

MR JAMES: Definitely a sensitive catchment, yes, your Honour.

HER HONOUR: Very sensitive catchment?

MR JAMES: Yes.

HER HONOUR: Did you consider helicoptering in any of these turbines? I noted that you are going to helicopter in the transmission facilities.

MR JAMES: The major – the towers and the nacelles for these turbines are beyond the lifting capabilities of any helicopters. We did, in fact, look at the use of a helicopter for the blades as a means of being able to tighten up the radius on some of the corners and therefore reduce earthworks and effects. But even the blades at nine to 10 tonnes are beyond the lifting capabilities of any of the helicopters available in New Zealand.

We did look at the potential to get a helicopter from elsewhere. There are certainly helicopters within the world that can lift these blades but their availability is so uncertain, most of them, the ones that we tracked

down were in fact detached as fire fighting appliances as a primary role, as water carriers. And then no one, unfortunately, was able to tell us what the aerodynamics effects would be of transporting a turbine blade under a helicopter and the safety of that.

But it was investigated. It was not - - -

HER HONOUR: And if you reduced the size of both the turbines and the nacelles, would that assist that?

MR JAMES: No, the nacelles – any nacelle would be far too heavy for a helicopter. Nacelles weigh between 65 to 85 tonnes, which is way beyond the capacity of any commercial helicopter that we are aware of.

HER HONOUR: And did you, when you were looking at this issue of – which has arisen from Mr Hudson's questioning of closing the road - - -

MR JAMES: Yes.

HER HONOUR: And then re-opening it when you have to – and then some of these – or fix some of these nacelles and the product, if you like, did you look at the efficiency of this kind of system in this terrain?

MR JAMES: The efficiency of having to go back in and remove all that material? It was considered, yes. I mean, it is obviously hoped that the next time a crane goes back in is when the turbine is decommissioned. But I cannot put a time span on it, unfortunately, as to the chances of having to go back in.

HER HONOUR: Have you been around turbines for a long time?

[3.05 pm]

MR JAMES: I have been working on wind farms since the start of the construction at Te Apiti.

HER HONOUR: So you will have seen from time to time the number of cranes that are on some of those sites?

MR JAMES: Yes. Now, Te Apiti has had some mechanical problems and has had to have cranes back in. There are quite frequently cranes up at T3 area but I am not sure whether that is for maintenance or for ongoing construction.

HER HONOUR: Yes. Certainly my experience is it has been for maintenance rather than ongoing construction.

MR JAMES: Right.

HER HONOUR: Thank you. Could you remain there? Ms Mildon, Alison Mildon has asked to question you. Her questions did not come in, I am sorry, first because she did not seem to realise that we were channelling questions through the support team.

MR JAMES: Right.

HER HONOUR: So if you do not mind staying there and answering those, thank you. Mr Low, did you put your questions through?

MR LOW: May I be permitted to ask this witness one question, please?

HER HONOUR: Well, after Ms Mildon. Thank you.

<QUESTIONING BY MS MILDON [3.06 pm]

MS MILDON: Thank you, Ma'am. It could be that Mr Hudson's last question might have answered some of this. I am a submitter and a lay person but I look at the Tararua Range from the western side on a daily basis and not from a static viewpoint as I travel many times in a week between my home at Milrick Line and Palmerston North and family on the Kairanga Plains and on Mount Stewart in the Manawatu District. So I am pretty familiar, over 60 years with this view.

Some public viewing maps have been supplied at the back of the room this morning and I see – I think it is maps 1(c) and 1(d) that seems to indicate that roads to turbine sites off the main roads are down ridges. Is that correct?

MR JAMES: Most of the roads are down ridgelines, yes.

MS MILDON: Okay. Now, I am not an engineer but I am really interested in what I can see and what I see is going to be the results of engineering decisions.

MR JAMES: Yes.

MS MILDON: Whether they are turbines, pylons, roads, overhead transmission lines, whatever. You indicated to one of the questions that you did not think the main roads would be visible, I guess from an elevation perspective, is that correct?

MR JAMES: Yes.

MS MILDON: Can you tell me those secondary roads to turbines whether they will be visible?

MR JAMES: I am not sure – can you see that on the screen over there?

MS MILDON: Yes.

MR JAMES: I assume it is these turbines down here that you are referring to, the access roads to them?

MS MILDON: Yes, I guess, and it would apply also to people on the eastern side, so it is basically anything that the public might see from public viewpoints or from private viewpoints.

MR JAMES: I think this question might be better directed at the landscape witness who will have done views from both sides to look back at the farm.

MS MILDON: The problem is that none of those visuals include roading, pylons, transmission lines. They are just turbines.

MR JAMES: I believe the roads are in fact included in the model that Mr Wyatt is working with.

MS MILDON: Those visuals, yes, then I haven't seen it perhaps. And so then I should ask Mr Wyatt - - -

MR JAMES: Yes.

MS MILDON: If they are not visible from Mt Stewart, which is an elevated terrain, or a building that is elevated, that it is a question for Mr Wyatt.

MR JAMES: Yes, it is. I do not have that information at my fingertips to be able to - - -

MS MILDON: So, in your sort of coordinated comprehensive design process that you talked about this morning, that was not - - -

[3.10 pm]

MR JAMES: That was not raised as an issue, no.

MS MILDON: Right, okay. I guess from an engineering point then, are you aware that the smallest farm tracks on these hills can be seen from miles away for years. They don't seem to regenerate or recover on their

own.

MR JAMES: A lot of farms tracks are cut as sidling tracks, ie they go around the side of a hill rather than down a ridgeline, and yes, certainly, earthworks, when they are initially undertaken will be seen but the revegetation and regrassing of the cut batters, in particular, and the fill batters will, over time, blend those back in again.

MS MILDON: But you seem to have just indicated that these tracks could be revisited.

MR JAMES: Not at a regular interval we would hope, no. But the batters themselves won't need to be cut. If the roads were closed down, physically closed down, then what would need to be reopened would be the pavement surface, not the batters on the sides of the road, which is generally what people see.

MS MILDON: Okay, so I think you also stated this morning that you preferred an approach that let nature takes it course. Was that right in terms of the big roads reducing back to a - - -

MR JAMES: Yes, that is the alternative option to close the roads down – is to in fact let the grass and toi toi and that type of plant material grow in from the edges as any unmaintained road will do is, over a period of time, the vegetation comes and grows out of the road surfacing material.

MS MILDON: Well, given that, am I correct in thinking, will there be any roading material brought in?

MR JAMES: The roads will all be surfaced with metal, yes.

MS MILDON: And roadside verges don't grow toi toi and etcetera. They generally seem to grow weeds.

MR JAMES: They will grow if it is planted. I mean it can be hydroseeded. It can be sprayed on the same as you do with cut batters. You can include grasses and things like toi toi seed within the mix.

MS MILDON: And you are confident that in an area of high rainfall and extreme weather conditions that that reseeding or regrassing will be fully effective?

MR JAMES: Yes. It will be effective.

MS MILDON: Because even roadside cuts from Palmerston North to where I live at this elevation were not successful. They slipped in in the last winter – but you are confident that it will be okay.

MR JAMES: They won't – no, the cut batters in rock material won't necessarily get 100 percent coverage of vegetation. But what we are talking about here is the edges of the metal roads – they would certainly grow.

MS MILDON: Okay, so I can be pretty confident I am not going to see - - -

MR JAMES: No, I wouldn't – no, you will see the roads. We cannot hide them completely. They will still be there, but to what extent – you would have to – we will have to see if Mr Wyatt has done some views from that location – from those locations.

MS MILDON: Okay, thank you ma'am. Thank you, Mr James.

HER HONOUR: Mr Low.

<FURTHER CROSS-EXAMINATION BY MR LOW [3.14 pm]

MR LOW: Mr James, can I get you to zero in on turbine 90 please. I just want to take you back to an earlier part of your evidence. It is towards the lower Pahiatua Track.

[3.15 pm]

MR JAMES: Oh, yes, thank you.

MR LOW: Can you go right in, and can you pull in the boundaries please.

MR JAMES: Land parcels.

MR LOW: Is that a boundary you have there in red?

MR JAMES: Yes. I will change its colour if you like so it is a little more visible.

MR LOW: Okay.

MR JAMES: All right?

MR LOW: In your evidence earlier today you said you were instructed to put the turbines further than 45 metres away from boundaries.

MR JAMES: Yes.

MR LOW: Can you assure us that that is 45 metres from that boundary please?

MR JAMES: Anywhere within that circle. I mean that is the indicative position at the moment. The final turbine position can be moved, but I can check what that distance is. Yes, at the moment that is only shown as 28, but that turbine can move to back here.

MR LOW: Would you care to change your evidence of this morning where you said that.

MR JAMES: I would move that turbine.

MR LOW: It is not the only one that is wrong, sir.

MR JAMES: I would be reasonably confident that they are in the right locations.

MR LOW: It is not 45 metres from a private boundary.

MR JAMES: No, that one, right. It is not. That turbine, as I have just said, will be 45 metres from the boundary, which is there – 41 – 48.

MR LOW: I will move on.

MR JAMES: Yes.

HER HONOUR: Just one question, I think, you said, Mr Low.

MR LOW: There is just one more supplementary question, if I may, your Honour.

HER HONOUR: Well, yes, but we did make a ruling very early on in this hearing that you were to put the questions through the support team so that we could organise the system more efficiently that we are doing right now. So, I will allow it this once, but from here on in I am afraid it is going to be much more ruthless.

MR LOW: I appreciate that, thank you. I note that each of the turbine manufacturers has a safe distance recommendation for their turbines. Are you familiar with those?

MR JAMES: No, I am not.

MR LOW: So, in planning the turbine locations, you have not taken any account of the safe distance recommendations provided by any of the turbine manufacturers?

MR JAMES: No. I do not plan the turbine's locations. They are initially – as I said earlier – they are initially planned by the wind resource engineer. I look at those positions to make sure we can get a road and a turbine pad at those locations. If I feel that where the wind engineer has positioned it is not suitable from a civil's point of view I will suggest to him that he shifts it. If I can get a road and platform at the location he has indicated, there is no point in me looking at alternative sites. He has selected the best location from a wind resource point of view.

MR LOW: Thank you. Thank you, your Honour.

HER HONOUR: Thank you, Mr James.

MR JAMES: Thank you.

HER HONOUR: Mr Baynes?

MS PRICE: Ma'am, I would like to ask Mr James to stay up there, not as a witness in the witness box, but we think that the next engineer, Mr Alexander, may be assisted by having Mr James to demonstrate on Tatuk any detailed questions that he receives.

[3.20 pm]

HIS HONOUR: So, you have changed the order?

MS PRICE: We think that from the questioning that we have had, that it may be better to have the geotech witness now and then the peer reviewers. But if you would like to stick with the order, that is fine. It is just that we think that the geotech engineer can assist with some of the questioning that was coming.

HER HONOUR: Mr Maassen?

MR MAASSEN: Well, a logical order seems to me that Mr Parsons, who peer reviewed Mr James' evidence comes next, and my questions drilled down a little bit on the topics that we are on at the moment, and so from a subject point of view it makes more sense to start with Mr Parsons in my opinion.

HER HONOUR: Yes.

MS PRICE: That is fine with us, we – you know - - -

HER HONOUR: Thank you. Mr Parsons.

MS PRICE: Mr James, could you stay there with Tatuk?

<ANTHONY JOHN PARSONS, sworn [3.21 pm]

<EXAMINATION BY MS PRICE [3.21 pm]

MS PRICE: Welcome, Mr Parsons.

MR PARSONS: Your Honour, Commissioners. I have got a lot of paper here so bear with me for a moment.

My name is Anthony John Parsons. I am a BE Civil Qualified Engineer. I am a Member of the Institution of Civil Engineers, and the Institution of Engineers, Australia. I have had some experience with the development of the wind farm, having been employed on a fixed term contract in 2005 to implement the requirements of the contract with PNCC from Mighty River Power's point of view.

I have prepared some rebuttal evidence. I guess, is it take as read, or do you want me to - - - ?

HER HONOUR: Yes, it is taken as read. If you would just like to give us a very brief summary of where you have got to, Mr Parsons. Thank you.

MR PARSONS: Okay. The documentation that I reported on is Mr James' initial evidence. Also Mr Graham Levy's initial evidence, and I was also involved in reviewing drafts of the construction environment management plan. Subsequently I have been able to review the detailed plans prepared by Mr James as a result of further work he was requested to do in respect of preparing layout plans and drawings.

And I have also read the supplementary evidence from Mr Levy and Mr James and also Mr Alexander, and I have reviewed the final draft construction environment management plan. In my view, the work carried out by Mr James and the design team from Beca's is of a high standard in relation to the status of this development, which is still going through resource consent process.

I have familiarised myself with the methodology that is used and obviously have been working closely with them in the early days, anyway, in respect of that. I believe that the project is constructible and

I consider that the approach taken to management of environment effects is good engineering practice.

I guess that summarises my position vis-à-vis the peer review.

HER HONOUR: Thank you.

MR PARSONS: Your Honour.

HER HONOUR: Yes.

<CROSS-EXAMINATION BY MR MAASSEN [3.25 pm]

MR MAASSEN: Mr Parsons, you will need a bundle of material in front of you as I go through this, so I am going to warn you about that and arrange for that material to come in front of you. The first is another bundle which the council has produced and which the Board has copies of and it is called document bundle "PNCC Document Bundle Three". And if you have not got that in front of you, I will arrange for a copy to be put in front of you. And I would like you please to refer to tab 4 and have that open please.

MR PARSONS: Tab 4?

MR MAASSEN: Tab 4 of the green volume about to be put in front of you. So briefly orientate yourself to this document. I am not asking you to verify it or anything yet, but just have a quick look at it.

MR PARSONS: Obviously there are a few names here I am not that familiar with, so we might have to correlate that.

MR MAASSEN: - - - I just want you to get a sense of the document, first.

HER HONOUR: Mr James, do you have a copy of this in front of you, too?

MR JAMES: No, I do not.

MR .....: Tab 4, Mr James.

MR MAASSEN: The document you are now on is actually part of the material prepared by Mr James, which has got coloured columns. Do you recognise that?

MR PARSONS: Yes, I do.

MR MAASSEN: All right. So just put that document to one side for the moment and I will return to it. Do you also have in front of you Mr James's calculations, the earthworks calculations and diagrams, the supplementary appendices which he produced last week?

MR PARSONS: I do not have those totally in front of me. I have seen them.

MR MAASSEN: Well, can you have please a complete set of the – at least the one and two thousand drawings?

MR PARSONS: I do have those.

MR MAASSEN: You do have those? And just have in front of you, particularly the drawing which is site layout and sheet layout that is at the front of the one and two thousand drawings and shows the roads, turbines, disposal areas and then the sub sheets to which they relate; do you have that?

MR PARSONS: Yes, I do have that.

HER HONOUR: That is sheet number?

MR MAASSEN: 300.

MR PARSONS: It is 300, yes.

MR MAASSEN: Called geospatial site layout, sheet layout. So have that handy. I think I asked you before lunch if you could quickly look at Mr Shaw's evidence and have that in front of you and available to you, as well?

MR PARSONS: I do have that. The look has been quite brief though.

MR MAASSEN: Yes, all right. And what I particularly wanted you to do was have out in front of you the sheets called figures 4A and 4B.

[3.30 pm]

MR PARSONS: In Mr Shaw's?

MR MAASSEN: Shaw's evidence.

MR PARSONS: Okay, that might be something I will need to look at.

MR MAASSEN: Figures 4A and 4B in William Shaw's evidence.

MR PARSONS: Yes.

MR MAASSEN: Have you got those?

MR PARSONS: I do have 4A, I presume this is 4B – yes.

MR MAASSEN: Excellent. Finally, you have just been provided with a folio which is called "Turitea Wind Farm Proposed Site" and for some peculiar reason called "Site Visit 2009", and I want you to turn please to map 3.

MR PARSONS: Yes.

MR MAASSEN: And we will work through these documents as logically as we can. If you turn to tab 4 - - -

MR PARSONS: Tab 4, yes.

MR MAASSEN: - - - of volume 3 of the council bundle, you will recall a spreadsheet with blue headings?

MR PARSONS: Summary table?

MR MAASSEN: Yes.

MR PARSONS: Okay.

MR MAASSEN: Can you correct the column "area per turbine", which I think is the 5th column, to metres squared as opposed to metres cubed?

MR PARSONS: Yes.

MR MAASSEN: What the council has done is try and understand the significance of the conglomeration of earthworks figures that have been supplied by Beca's and break them down into some logical areas – at least logical from the council's perspective – and I am going to take you through these components and identify them with also reference to overhead material such as the Tatuk model.

The first I am going to refer to is what is called Isings **(PH 3.32.56)** Road spurs, which is the second to last road, which refers to turbines 38 to 43, a total of six turbines. Can I ask Mr James please to bring up on Tatuk turbines 38 to 43? And also ask the gentleman from Melbourne – sorry, I have forgotten your name – to also give us a 3-D view of

those turbines which I think we are pretty close to – if you just come down a bit. Perhaps if you see them - - -

MR PARSONS: 38 to 43?

MR MAASSEN: Yes, so you will have to go slightly further north, just pull it down a bit that, that is it keep going, that is it, whoa. Yes, that is correct.

MR PARSONS: Okay. So you might be missing one or two numbers in that sequence because I think the numbering grid line.

MR MAASSEN: Well, if you look at 38 it is on a spur, is it not?

MR PARSONS: Correct.

MR MAASSEN: And 39 is the same?

MR PARSONS: Correct.

MR MAASSEN: 40 is the same, 41 is the same and 42 is the same and 43 will also be the same. So these are turbine locations linked of the main ridgeline road and penetrating into what is plainly indigenous vegetation?

MR PARSONS: Correct.

[3.35 pm]

MR MAASSEN: And I understand from Mr Shaw's evidence and I am referring specifically to the table at paragraph 108 that at table seven, he is talking about effects and describes the 25 hectare clearance, this is at page 39 of his statement of evidence.

MR PARSONS: His original one?

MR MAASSEN: Yes.

MR PARSONS: Okay.

MR MAASSEN: Table seven is at page 39, part of paragraph 108 and the second row of that table talks about horopito dominant forest and scrub in Turitea Reserve, relative significance moderate, effects more than minor and it says effects depend in part on the formation of new roads particularly on steep terrain, there is limited potential for hedge effects. Do you see that?

MR PARSONS: I do see it, yes.

MR MAASSEN: Yes. If we turn to figure 4B of Mr Shaw's statement of evidence.

MR JAMES: 4B.

MR MAASSEN: Figure 4B, in the top left hand corner you see the sequence of 39, 40, 41, 42 and 43. Do you see those?

MR JAMES: Top right hand?

MR MAASSEN: Top left hand corner.

MR JAMES: 39, 40, 41, 42 and 43, I certainly see those numbers - - -

MR MAASSEN: Yes.

MR JAMES: - - - but they are transposed perhaps on this particular print because they are on the right hand side.

MR MAASSEN: Well they are at the - so what are you suggesting?

MR JAMES: Well, looking at it in plan - - -

MR MAASSEN: Yes.

MR JAMES: They are on - that is left and that is right.

MR MAASSEN: Oh I see. In the plan view you would prefer to go that way on the right hand side?

MR JAMES: Well, that is what is not this print, that is all.

MR MAASSEN: That is fine. And turbine 43 I think is actually within, if not within is certainly on the edge of secondary broad leaved forest according to the legend and the remainder of the class that I have described, not all of which are shown there of course, are on the edges of the broad leaved forest in what on the legend is horopito dominant forest, correct?

MR JAMES: The legend. Yes, horopito is the one with the speckles on it, according to this legend.

MR MAASSEN: Correct.

MR JAMES: Yes. It would seem that most of those spurs are in that, yes.

MR MAASSEN: Yes. So not necessarily the most sensitive location in the reserve, but certainly from our ecologist's, the council's ecologist's point of view, a sensitive area.

On the table, which is the table in tab 4, the calculation is that in respect of those six turbines a total of in excess of five hectares of area will be disturbed and that the area per turbine, if one does it as a per turbine basis, is 8,379,000 metres squared or 8.3 hectares. Sorry, 0.8 of a hectare

[3.40 pm]

Have you considered – I mean, obviously you have not done these sorts of calculations, but did you consider the areas that were likely to be impacted where there was indigenous vegetation of significance?

MR PARSONS: The measures that were taken were plan areas of indigenous vegetation, I presume. Mr Jones might be able to confirm that. They would have definitely been measured in the totals, but whether there is a differentiation I cannot comment on.

MR MAASSEN: And if you compare the – let us move then onto a different area which is also ecologically significant, which is Game Ridge which is the fourth item in the row – sorry, the fourth row in that table. Game Ridge is I think turbines – if one looks at the Beca site layout, sheet layout plan, turbines 56, 57, 58, 59, 60, 61, 62, 63, 64, 65 and 66; you may also refer to that as Western Ridge. Are you familiar with the Western Ridge?

MR PARSONS: Yes.

MR MAASSEN: If one looks at this plan, map 3 in the council folio, do you see the turbine numbers that I referred to and which form part of what are Game Ridge?

MR PARSONS: I do.

MR MAASSEN: Namely, 56, 57, 58, 59, 60 and so forth to 66?

MR PARSONS: I do.

MR MAASSEN: You do. Looking at Mr Shaw's evidence – I will just find the location - figure 4B, the turbine numbers that I have given as Game

Ridge move through Horopito dominated forest and scrub on that legend through into ultimately at 66, sparse remnant emergent podocarps and mixed secondary forest; do you see that?

MR PARSONS: I do.

MR MAASSEN: And turbines 61 through to 66 are within tens of metres of the outer perimeter of that podocarp emergent forest?

MR PARSONS: Well, I cannot comment from this scale obviously as to whether that is a fact, but it could be demonstrated, I guess.

MR MAASSEN: Would you like to use a scale or would you be able to -?

HER HONOUR: Mr Maassen, this might be a good opportunity to break for the afternoon adjournment, it is quarter to 4.

MR MAASSEN: Yes, thank you, your Honour.

ADJOURNED **[3.45 pm]**

RESUMED **[4.12 pm]**

HIS HONOUR: Yes, Mr Maassen?

MR MAASSEN: Thank you, your Honour. Mr Parsons, we are on Game Ridge or Western Ridge and the roading layout is shown in Tatuk behind you and the three dimensional view using the Wyatt technology is on the other screen over here, so it is those turbines. Are you orientated as to where we are now?

MR PARSONS: Yes, I know where you are in respect of that.

MR MAASSEN: Okay. Now, what I want to ask you to look back is the summary table.

MR PARSONS: Your one? The council's one?

MR MAASSEN: Headed 1, in from tab 4.

MR PARSONS: Right.

MR MAASSEN: And I probably did not make this plain enough earlier, but this is a table which has been prepared using the Beca data and if I ask you to turn into the table at the last page, Game Ridge area earthworks calculations, you will see that in each row there is a turbine number and

then a value for whether it is an access or a pad and then a reference to a segment number. It is the last page in that group. Do you see those columns? Turbine number, whether it is an access or a pad and the segment number?

MR PARSONS: Correct, yes, I do.

MR MAASSEN: Now, the segment numbers mirror the methodology with Mr James outlined, which is that each accessway or pad is given a segment number?

MR PARSONS: Correct.

MR MAASSEN: Do you recall that?

MR PARSONS: Yes.

MR MAASSEN: And it is either one of two things; it is either an accessway or it is a pad?

MR PARSONS: Correct.

[4.15 pm]

MR MAASSEN: And sometimes as we can see for T57, there is both an access and an access and a pad, so there are two accesses which just simply indicates that on the line diagram attached to Mr James' evidence sometimes you have more than one segment accessway, or accessway to get to the turbine, all right?

MR PARSONS: Correct.

MR MAASSEN: So in relation to particular areas, the Board is in a position to calculate from the conglomerate figures the elements that make up the earthworks for a particular component of the development, are they not?

MR PARSONS: They are. Yes, they are. Yes.

MR MAASSEN: Yes. And the council has done for its own analysis purposes precisely that in this table, by calculating – assuming T56 is the first turbine in what could be called the Game Ridge area and then calculated the values for each individual item and then totalled them. Can you see that?

MR PARSONS: Yes. And I presume that correlates with the Beca data as it is based on that?

MAASSEN: Yes, yes. So have you ever done, or are you aware of Mighty River Power ever doing a calculation of what area was involved in the establishment of what I will call the Game Ridge link in the chain?

MR PARSONS: As an independent evaluation, you are talking about?

MR MAASSEN: As an analysis of the appropriateness of that link in the total chain, to your knowledge has Mighty River Power calculated the area and volume of earthworks involved?

MR PARSONS: Not to my knowledge. That is not to say they haven't, subsequent to my involvement. But certainly in my peer review I have not been asked to look at that as a separate -.

MR MAASSEN: And to your knowledge, until the council asked the question of Mr Phillip Wong Too two weeks ago, about the running totals for earthworks volumes and cumulative totals, were you aware of any work that had been done by Beca to calculate these values?

MR PARSONS: Again I have to answer I personally was not aware.

MR MAASSEN: And so both in -, if it is true that in fact these values were not known, then some reasonably significant assumptions would have to have been made by other witnesses as to those matters, wouldn't they?

MR PARSONS: I would say that to my knowledge, every area was calculated, but you are talking about has an individual analysis been done. That is the bit I am not aware of in terms of Mighty River Power's evaluation subsequent to my involvement. But we were looking at gross areas at my time, and they were done and they were done to cover that layout. They could have been desegregated. I am not sure.

MR MAASSEN: So to your knowledge, what additional work was required of Beca to produce what is now the supplementary appendices since two weeks ago? They simply put that on the drawing computers and had them drawn off, or did they have to do calculations?

MR PARSONS: My understanding of the process is that they could have taken that off their calculations and probably did just that.

MR MAASSEN: I received a communication and I am sure my learned friend won't disagree with this communication, but the reason we received it late as opposed to the promised date was that Beca had produced the figures on the basis of an average calculation as opposed to the worst case calculation. How much work do you think, how much detailed work do you think Beca had done as of two weeks ago, in calculating the earthworks for each link in the chain?

[4.20 pm]

MR PARSONS: As I understand it, Beca's had based their calculations on one turbine layout knowing it was zonal. Our view of that was that it wouldn't be much difference between the two. Instead of giving you a combined layout I would expect it to be a little higher, but then that is not what is going to be built, according to what Mr James said. So I presume that is where it is at.

MR MAASSEN: So, if Mr Shaw was interesting in knowing what areas were affected in terms of Game Ridge, that answer could have been provided to him at the time he prepared his evidence?

MS PRICE: Ma'am, I have risen to take the point here, that Mr Parsons is here to give evidence as a peer reviewer, and a lot of the questions that are coming are relating to the work that Beca have done and we indeed have a room full of Beca people who have been involved in this exercise in a way that Mr Parsons was not. His brief as a peer reviewer was to, if you like, audit the calculations that were done, and he was not intimately involved in the processes that have been occurring to get the earthwork calculations done, and indeed we do have a witness still sitting out there who was the person doing those calculations. It would seem more proper for these questions to be directed to the Beca witnesses rather than to Mr Parsons.

HER HONOUR: Yes, one of the problems, of course, without even listening to Mr Maassen in reply is that just the kind of issue that he raised in his memoranda some time ago about peer reviewers, that you open the door and all sorts of things fly out that maybe they shouldn't. And they get addressed to the wrong witnesses as a result. Mr Maassen, have you got -?

MR MAASSEN: I think I calculated at last count, 67 witnesses in this case. So we have had to try and work out who to direct questions to. And my understanding of Mr Parsons is that he actually was employed by Mighty River Power and therefore would have had a reasonably good appreciation of the engineering work that was being undertaken on behalf of that company. If that is not the case, then we misunderstood

that position, and we are content to deal with it by inviting Mr James to answer those questions where they are properly directed to him.

The only thing is that we will need to make sure that the transcript understands who has been answering the question so there is no confusion. But that is the reason why we are asking these questions of this witness. So perhaps if I invite Mr Parsons when he feels that he is asked a question that he cannot answer but is better directed to Mr James to state that, and I will then indicate and make that question to Mr James for the record, so that that change is registered. Is that convenient?

HER HONOUR: Yes, that is very convenient.

MR MAASSEN: So, we were on a topic of the stated information and who had it. And your answer I think indicates that you prefer me to ask that question of Mr James?

MR PARSONS: That is correct, Mr Maassen, thank you.

MR MAASSEN: Mr James, this is a question for you. As of two weeks ago, how detailed was Beca's knowledge of the volumes of earthworks involved in each of the links in the chain of this proposal?

MR JAMES: After your questions to Mr Wong Too when he was on the stand, we undertook a more slightly more detailed breakdown, as you asked, for a section of road and every pad. We had previously undertaken a similar exercise ourselves which was provided to Mighty River Power and this goes back probably just after Mr Parsons left Mighty River to their wind engineer for his analysis to do a similar exercise.

[4.25 pm]

At that point, the design was sitting at - I can't remember the exact figure, a total of probably 1.4, 5 million cubic metres of earthworks. That is increased slightly at this current level. So yes, that level of detail has always been available.

MR MAASSEN: In the, still this question to you, Mr James, in the specific plans the geo spatial plans that have been attached to your supplementary statement, and the cross sections, were they in existence prior to two weeks ago?

MR JAMES: In hard copy form, no. But because this work is all done on a computer the detailed design even from the very first consideration

back in 2006 was able to be produced at that level and that level of detail.

MR MAASSEN: So do I take it Mr Shaw, when he prepared his statement of evidence, if he asked the question how much earthworks and what area is affected in the Game Ridge link, he could have had that information provided to us?

MR JAMES: He had the footprint in the evidence.

MR MAASSEN: Right. Mr James, does it sound to you close to correct, that about 8.8 hectares is involved in this link, in terms of area covered?

MR JAMES: You are talking Western Ridge at the moment?

MR MAASSEN: Yes.

MR JAMES: I would have to go back to my computer model of that to actually determine what area is inside that boundary. It has been broken down to vegetation clearance for various sections of the road, but I would have to go back and interrogate the model to see what area was involved in that. But if this number that you have here is from my spreadsheet, that is the footprint of the earthworks.

MR MAASSEN: Yes. So what I would invite you to do is through – after you have completed your evidence, speak to your counsel and check these figures and, if you have any queries, come back to us because this documentation will go before the Board. But I take it from your answer that you have not specifically done an analysis of the link that I have just gone through, but if the data is based on your model, then that would be a correct figure?

MR JAMES: I will need to check that.

MR MAASSEN: Yes. Thank you.

Now, returning to Mr Parsons. Again, Mr Parsons, you are welcome to direct this question to Mr James if you wish, but I want to understand a little bit more about the engineering that is involved in the area of Western Ridge, Game Ridge, extending from turbine 56. And if you look at the site layout, sheet layout plan, which is the master A3 plan that explains the material below that from Mr James, it gives you the sheet numbers.

And I just want to walk through this area because it is one of the areas of great significance to the council and I think it starts at sheet 84.

Well, actually, if I get you to turn to sheet 82, as the starting point, there is a property boundary at approximately a 45 degree angle. Do you see that?

MR PARSONS: Yes.

MR MAASSEN: And the 56 pad is pretty much just inside the reserve area.

MR PARSONS: That would be correct, yes.

MR MAASSEN: And we are effectively heading to the right hand side of the page, heading up the ridgeline as shown in that 3-D diagram, aren't we? We are heading from the pasture land up from – do you see 56 mentioned – identified there?

MR PARSONS: Yes. Well, it is difficult to see from this angle but I can see it from there.

MR MAASSEN: Yes, and we are rising in, I think, a reasonably steep incline up the hill. Is that correct? And there is a bit of fill as we move along and that is indicated by the minus 3.4 figure on sheet 82 approximately east of the pad. Do you see that?

[4.30 pm]

MR PARSONS: It is what we would call a sidling cut and fill where there is a cut on one side and a fill on the other.

MR MAASSEN: Yes.

MR PARSONS: So that is shown there.

MR MAASSEN: Yes. And you head up further east, you can see a junction with one part extending up to turbine 57 and the other one up to 59. Is that right?

MR PARSONS: Correct, yes.

MR MAASSEN: If we go to sheet 84, a reasonably clean cut, as it seems to me, up to 57 but going up in elevation. Is that true?

MR PARSONS: I will just check the contours. Actually going down in elevation, I would say.

MR MAASSEN: Going down, is it?

MR PARSONS: Yes.

MR MAASSEN: All right. Turning to the other line in the tramway, as I call it, it seems to me that leading to 59 there are quite a lot of areas of fill.

MR PARSONS: Correct.

MR MAASSEN: And, indeed, if one looks at a point east of turbine 59, the area of fill extends beyond the page to – if one looks at sheet 86, approximately three and a half centimetres into the left hand side of that page.

MR PARSONS: It does.

MR MAASSEN: Does that indicate to you a very substantial amount of fill in that connection?

MR PARSONS: What it says to me is there is fill, but it does not necessarily mean substantial.

MR MAASSEN: Okay. But one would be able to calculate, based on the segments, what sort of volumes one was dealing with?

MR PARSONS: One could and it probably has been.

MR MAASSEN: Yes, all right. And still looking at sheet 86, this in itself leads to a fork in the line and one is heading to turbine 60 and the other to 62?

MR PARSONS: Correct.

MR MAASSEN: As I understood Mr James' answer to a question, some of the cross sections for that area are in geospatial 548 in the cross sections. Do you recall that answer?

MR PARSONS: Not particularly, no.

MR MAASSEN: No. Well, perhaps I can direct this to Mr James. Mr James, could you please look at the sample cross sections 548.

MR JAMES: Yes.

MR MAASSEN: Now, you will recall that you have been asked a question by Commissioner Hudson about road 6000 and I think this is included in Western Ridge, is that right?

MR JAMES: Yes, it is.

MR MAASSEN: So some of these cross sections are obtained from locations in Western Ridge, or Game Ridge?

MR JAMES: Yes, they are. The last one is at chainage 800.

MR MAASSEN: Yes. Now, if one looks at that cross section, it indicates a reasonably sizeable cut into the spur or the ridge?

MR JAMES: Correct.

MR MAASSEN: Presumably the cut is into rock?

MR JAMES: At that depth we would expect so, yes.

MR MAASSEN: And the height of the cut, or the batter – I will use this term; I am not sure if it is the - - -

[4.35 pm]

MR JAMES: That is correct.

MR MAASSEN: - - - technical term, but the batter for the higher slope sits above the lower slope?

MR JAMES: Yes, it does.

MR MAASSEN: That would indicate from certain perspectives a visual effect, as it were?

MR JAMES: That would depend on the elevation of the eye at the time.

MR MAASSEN: Yes. But at certain elevations one would expect the visibility of that cut?

MR JAMES: I would have to go away and do some numbers to give you an answer on that.

MR MAASSEN: Well, you do not have the answer to that question at this stage, is that your position?

MR JAMES: I do not have it at my fingertips, no.

MR MAASSEN: If it is cut into rock, then it cannot be easily re-vegetated, correct?

MR JAMES: It can be hydroseeded with – made of seed, but whether - percentage of take is something that is unknown at this point.

MR MAASSEN: Have you received any advice as to the capacity to hydroseed rock formations of this type at that angle?

MR JAMES: I do not have any personal knowledge of it, no.

MR MAASSEN: So why would you mention it as a possibility if you have no knowledge of it?

MR JAMES: Because it has been discussed during the course of the project to date of hydroseeding these batters. There has been some success on other projects of hydroseeding batters like these.

MR MAASSEN: What we are talking about is a batter at approximately one to four?

MR JAMES: Correct.

MR MAASSEN: At an elevation where wind speeds, mean wind speeds, are about 11 metres per second?

MR JAMES: In that order.

MR MAASSEN: And there is very high rainfall.

MR JAMES: Yes.

MR MAASSEN: Where is the technical evidence that you say the Board should rely on to believe that there might be a possibility of hydroseeding in this area?

MR JAMES: I think you would best direct those questions on re-vegetation to Mr Shaw. He discusses these - - -

MR MAASSEN: All right. Well, we will direct them to him but I am not sure he has covered that either. But we will address it to him.

Would you agree, would you, that Game Ridge – or, first of all, do you have an appreciation of where Game Ridge is when viewed from the Manawatu Plains?

MR JAMES: I would say it is very hard to identify, unless there is something standing on there to identify it from the plains. I have tried.

MR MAASSEN: Okay. Well, I will show you a photograph. Could we please pull up, Aiden, RVP24? Can that be enlarged? That is exactly right, thank you very much.

You see Tirohanga on the right hand side and you can see Game Ridge in approximately two-thirds along from the left hand side. Can you see Game Ridge there?

MR JAMES: Yes.

MR MAASSEN: Have you had difficulty identifying - - -

MR JAMES: No - - -

MR MAASSEN: I **(INDISTINCT 4.39.02)** this feature.

MR JAMES: Which particular point on that are you looking at and referring me to, please.

MR MAASSEN: I will just approach it.

MR JAMES: Yes, okay.

MR MAASSEN: Does that orientate you?

MR JAMES: Yes, it does. Yes.

MR MAASSEN: Now, that is not necessarily a particularly good photograph but – or indeed one that the council would say would be distinctly well representing the visibility of that ridge from Palmerston North, but it is the one that we can get up on the screen.

MR JAMES: Yes.

MR MAASSEN: And what I am suggesting to you is that, in answer to some questions from my friend, Mr Reardon, about visual effects, you said, "I would rather leave those questions to Mr Wyatt".

MR JAMES: Yes.

MR MAASSEN: And I understand the reasons for that but – as in terms of magnitude. But my questions to you are as a practical engineer.

[4.40 pm]

MR JAMES: Yes.

MR MAASSEN: The sort of volumes of works and the nature of the cuts that are involved are practically going to leave a visible imprint in parts of Game Ridge when viewed from locations in Palmerston North.

MR JAMES: As I said, I would need to do some calculations because, whether you can see the backside of that cutting depends on the height difference between the slope in the front, the one at the back and the angle at which it is being viewed. So I cannot give you that answer, I am sorry.

MR MAASSEN: Okay, that is fine. What I presume, when we look at cross section for chain 800, is that you are not proposing a bund in that area that would go to the same height as the batter for the higher slope?

MR JAMES: No, well, we can't because the natural ground is not at that height.

MR MAASSEN: Yes, I just wanted to get that clear because everyone is talking about bunding but, practically speaking, that is not practical in some of these areas.

MR JAMES: It is practical; it still works; it still reduces the – if a cut is to be visible it still reduces the visible height of that cut when viewed from below.

MR MAASSEN: Yes, but then you have got lines of bunds visible through the landscape, haven't you?

MR JAMES: That has got vegetation growing on it; you do not see the top of the cut.

MR MAASSEN: Well, how long would that vegetation take to establish?

MR JAMES: Well, the vegetation is there already.

MR MAASSEN: You would use that stuff and put it on?

MR JAMES: No, the vegetation is already there on the ridgeline.

MR MAASSEN: I see. Well in those calculations that you are referring to, did Mr Wyatt do those calculations or did he just listen to your methodology and assume that that would work?

MR JAMES: He has listened to my methodology. He also has the three-dimensional design model that we have done for the project, which he has used in his software.

MR MAASSEN: So if we ask Mr Wyatt to use that three-dimensional software and model the visual impacts of roading, he would be able to show us?

MR JAMES: Yes.

MR MAASSEN: And he would be a better person than you, because you would have to go and get the calculations and then describe the - - -

MR JAMES: Yes.

MR MAASSEN: All right. Thank you for that. I still would like Mr Parsons to go through some of these areas to give the Board an appreciation of the volumes of material.

One area which has been discussed, and it is the last row in the table which is in tab 4, is the volumes of earthworks from Marama to Browns Flat, which equates to T28 to T37. Now if we could get T28 to 37 roughly on your Tatuk model. You will recall that Mr James described this as slightly steeper and more difficult country in terms of earthworks?

MR PARSONS: I would agree with him, what he has given there.

MR MAASSEN: Yes. I think you described your roading treatment on the ridgeline as involving gabion baskets in your evidence – do you want me to refer you to the relevant page in your evidence?

MR PARSONS: That actually was taken from Mr James' evidence as well.

MR MAASSEN: Yes. Well, I just might, for the record, indicate where that is. Can you just open to - - -

[4.45 pm]

MR PARSONS: Yes, it is section 2.3.

MR MAASSEN: Section 2.3 of your statement of evidence. And you say that the fills will be supported by gabion rock fill baskets retaining structures as described by Mr James in section 4.21. Do we know what sort of number of gabion baskets will be required and what sort of heights we are talking about?

MR PARSONS: It is related to the height of fill that Mr James shows on his drawings, but without looking at that I can't tell you in absolute detail.

MR MAASSEN: Yes. Do you have an estimation of the number we are talking about?

MR PARSONS: No, I would have to work that out, Mr Maassen, but we could.

MR MAASSEN: Yes.

MR PARSONS: It depends on the type of basket and there are alternatives to gabions as well that one can use.

MR MAASSEN: And did I take it from your answer that what is proposed is also hydroseeding of those gabion baskets?

MR PARSONS: I would agree with that. Yes, with native seed, and by their very nature they are quite amenable to accepting growth.

MR MAASSEN: In some of these areas, when viewed from the west, the impression I have had, and it may be something that other witnesses, sorry, other people have noticed, is a very – the landscape appears very rocky in parts of that location and has a distinctive quality, a visual quality about it.

MR PARSONS: Well it has got its own quality.

MR MAASSEN: Yes.

MR PARSONS: Again, you might say that it is distinctive.

MR MAASSEN: Would vegetation fit in with the qualities that you saw in that location, the rock location?

MR PARSONS: I think so.

MR MAASSEN: And to your knowledge has Mr Wyatt been aware of the proposal for gabion baskets in this location?

MR PARSONS: I cannot answer for Mr Wyatt and I wasn't present when he gave his evidence.

MR MAASSEN: Right. Thank you. If one looks at the summary table from tab 4 of the council's bundle, there is a very large volume of earth

moved for a comparatively small number of turbines – 13 in total – you have to move 231,170 cubic metres. Was that, Mr Parsons, something that you appreciated from your engineering review, that in fact the order of magnitude of earthworks beyond Marama was going to be significantly greater per turbine than was the case north of Marama?

MR PARSONS: My answer to that is yes. I know there is a lot of earthworks there, but I think applying it to those few numbers of turbines is perhaps not the right approach in that that access road is built to cover all of the windfarm to the south of that area.

MR MAASSEN: Yes. Well, I appreciate that that is the case, but that section indicates a very substantial volume of earthworks, doesn't it?

MR PARSONS: It has to by its nature.

MR MAASSEN: Yes. Thank you. I now want to look at Pahiatua Hill, Bryant's Hill, and Tirohanga and just to orientate you and the Board, I have referred you to map 3 in the council's folio, do you recall that? That is this folio here.

MR PARSONS: This one, yes.

[4.50 pm]

MR MAASSEN: And there are many ways to dissect this proposal, and certainly the council has felt the need to dissect it in a number of ways, but you will see that there are three areas which are identified by – the boundaries of which are identified by yellow dots, and they are described as area 2, area 3 and area 4 respectively?

MR PARSONS: Yes, I see that on that plan.

MR MAASSEN: And this plan also shows in relation to each of those areas the two axes – the first is an axis running broadly north-south showing the spatial extent of the turbines in that area, and the other axis which is from west to east showing the distance from the nearest turbine in the reserve to the turbine on the outer edge, the western edge, of that area. Can you see that? And those calculations will come out on due course in other evidence.

But I want to talk about these three areas, Pahiatua Hill, Bryant's Hill, and Tirohanga, and for the purposes of this map Tirohanga is all of the Love property which is area 3, Bryant's Hill is area 2 and incorporates turbines on broadly what we would describe as the natural features called Bryant's Hill, and area 4 is Pahiatua Hill. You see that?

First of all, if I can turn to area 2, which is Bryant's Hill. Just to orientate ourselves a little bit further in terms of that feature, if we can bring up from the Wyatt model some representative pictures – just a moment.

Perhaps if we could bring up RVP4, 12 and 13? All right, just leave it on that one. In the background is Bryant's Hill, do you remember that feature, or are you not particularly - - -

MR PARSONS: Yes, I am aware of where you are talking about.

MR MAASSEN: This viewpoint is taken from 39 Guyland Drive, which is part of Ngahere Park. Orientated?

MR PARSONS: Yes. I am aware of - - -

MR MAASSEN: And there are a lot – one of the features, would you agree, with Ngahere Park and the Turitea Valley generally is that there are a lot of houses with lateral views along the ranges?

MR PARSONS: I was not present in the evidence relating to views and - - -

MR MAASSEN: Okay.

MR PARSONS: I have not really looked at that.

MR MAASSEN: All right. The reason I am taking you through the earthworks is because – I will explain it to you.

MR PARSONS: Mm.

[4.55 pm]

MR MAASSEN: Is because of the degree of lateral views in these locations of features such as Bryant's Hill. So I am dealing with area 2, and for the purposes of the summary table earthworks calculations, Bryant's Hill, which is the second on the row comprises area 2?

MR PARSONS: Yes, I understand that.

MR MAASSEN: All right. And I think there are a total of 19 turbines in that location and the total area which is disturbed is approximately 9.5 hectares?

MR PARSONS: Well, if you say that is taken from the Beca summaries?

MR MAASSEN: Yes.

MR PARSONS: Then that is what is says.

MR MAASSEN: All right.

MR PARSONS: And that is in farm land, however.

MR MAASSEN: That is farm land. Have you done an analysis of what volume or what degree cuts which are involved in forming or carrying out these earthworks will sit proud of the cuts, the elevation for cuts on the lower slopes. In other words, an appreciation of the visibility of the cuts?

MR PARSONS: I have not personally looked at that aspect of it, but I will say that in respect of some of your earlier questioning, we did talk to the viewer people – the people that prepare the, is it Truescape, I think?

MR MAASSEN: Yes.

MR PARSONS: And in the scale of putting maps on, you could not detect any of the roading works from the viewpoints that are used, so it was a little bit difficult to actually define much impact.

MR MAASSEN: Right. And is this Truescape that was the company which does modelling, computer modelling?

MR PARSONS: That is correct. I am not sure if it is used by Mighty River Power for this particular exercise, but we did have a look at that in the early days.

MR MAASSEN: Would you agree that to the extent that there are lateral views, the methodology which Mr James describes of bunding and so forth will not mean that lateral views are – sorry, that the views will be obscured from lateral positions. In other words, people looking in that direction will still see elements of roading in their view?

MR PARSONS: Without studying it in detail it is hard to say, but it might be true that there could be elements of roading you would see, but in effect in that area would they be any different to existing logging and the farm tracks. I cannot comment without doing some study.

MR MAASSEN: Right. If we look at, for example, viewpoint 24B this is a viewpoint from Kingsdale Park. You can see turbines on I think Bryant's Hill on its eastern flanks. And if you move the picture further

to the left, that is it, there. The turbines in the centre of that diagram are in fact running along what is called Love Ridge, do you see that?

MR PARSONS: The ones towards that end?

MR MAASSEN: Yes.

MR PARSONS: Not that I can see it very well. No, I - - -

[5.00 pm]

MR MAASSEN: It is the set of turbines in the centre. Take your time. And do you think as an engineer familiar with these plans that this sort of lateral viewpoint will not register significant amounts of roading?

MR PARSONS: Well, as I said, I think the scale effect has to be taken into account when you are looking at it from those viewpoints. If there is bunding it will definitely hide it. If it is in cut, unless you are looking straight along an alignment of a road, you will not see anything. And that area will be revegetated to look pretty much like surrounding farm lands. But, you know, obviously I am not – I am commenting as an engineer, not as a landscape expert.

MR MAASSEN: That is fine, thank you. I am just about to finish, and perhaps it is fair to this witness that we do finish him off, if your Honour pleases, so to speak?

HER HONOUR: I hope you are not finished off actually Mr Parsons.

MR PARSONS: That is very nice of you, your Honour.

MR MAASSEN: No, that is, I think, all. Thank you, your Honour. Thank you, Mr Parsons and Mr James.

MR PARSONS: Thank you.

HER HONOUR: Are there any questions from anyone else? Any re-examination? Sorry, I keep getting the order slightly wrong.

<RE-EXAMINATION BY MS PRICE **[5.02 pm]**

MS PRICE: Just briefly your Honour. Mr Parsons, you were provided with a new earthworks calculation table by Mr Maassen. What do you understand the figures represent?

MR PARSONS: What I understand is that PNCC's people have taken segments from Mr James' calculations and aggregated them against notional turbine blocks. I can only assume that they have been taken from Mr James' calculations but that could be subject to cross checking, and it is attempting to, if you like, scale turbines against earthworks.

MS PRICE: Thank you.

MR PARSONS: I think over any wind farm you are going to get variations in that quantity.

MS PRICE: Thank you. Mr Maassen then asked you some questions about vegetation clearance as they related to the earthworks. What do you understand that table to represent? Gross clearance or net clearance?

MR PARSONS: My understanding is that it is gross clearance but I should really defer to Mr James who prepared it.

MS PRICE: Mr James, can I ask that question of you?

MR JAMES: Certainly. The areas provided in my spreadsheet and summary totals is the net footprint of the earthworks. It is not the vegetation clearance.

MS PRICE: Can you explain some of the factors that you would need to exclude out of those figures?

MR JAMES: For example the water catchment access road, you would need to remove from the numbers through, there the area of rank grass and the existing road formation, which is quite considerable.

MS PRICE: Thank you. Mr Parsons, you were then taken to some questions by Mr Maassen relating to some of the turbines on the eastern side of the main ridge line. He specifically took you to turbine 43 and noted that the council was concerned at the native vegetation clearance occurring there. Can I get you to look at the map that he took you to, which was Mr Shaw's vegetation clearance map, and if you look at turbine 46, can you indicate to us what Mr Shaw has used to indicate the turbine there?

MR PARSONS: Which turbine was that?

MS PRICE: 43 sorry.

MR PARSONS: Well, he cited it in an area which is shaded green.

MS PRICE: Correct. What has he used to indicate the turbine that would be located there?

[5.05 pm]

MR PARSONS: If I can interpret his scale from this print, it is indigenous shrubs and gorse, rank grassland, shrub land.

MS PRICE: Put another way, what is the marking that Mr Shaw has used on his map?

MR PARSONS: I am sorry, I can't answer that question.

MS PRICE: Is it a turbine zone used by Mr James to indicate the turbine zones in the layout as you know it?

MR PARSONS: It looks consistent with the map.

MS PRICE: Is it oval or is it a circle?

MR PARSONS: Well, that I would have to, I am not sure if that is the same map that I am looking at to be honest. The ones that I have got here have got - - -

MS PRICE: Mr Shaw's map, which are these ones here of the vegetation colours, how has he indicated a turbine on that? Describe the marking.

MR PARSONS: He has just used a cross hatch, if you want to call it that one.

MS PRICE: Thank you. Can you explain how Mr James has marked the turbine zones on his maps?

MR PARSONS: Well in ovals or circles or- - -

MS PRICE: And what do you understand those ovals or circles allow the engineering design team to do as they get to detailed design?

MR PARSONS: They allow them to microsite the turbine within that zone as being a consented zone.

MS PRICE: And what would be some of the factors that the engineering team look to do with micrositing within that zone?

MR PARSONS: They would look at a number of things. They would look at the wind characteristics, which obviously have been developed from the wind testing that has been going on in the reserve for some time. That has an impact I would think on things such as turbulence, longevity of a turbine, output of a turbine. So that would be one factor.

MS PRICE: What would be the factor important to Mr Shaw in respect to turbine 43?

MR PARSONS: It would be whether there is an impact on the, you know, important vegetation and that would be taken into account.

MS PRICE: Thank you. Similarly, the roading out to turbine 43. Is not shown on Mr Willy Shaw's map.

MR PARSONS: It is not, but it is interpreted if you like.

MS PRICE: But without even taking you to the roading maps that have been provided by Mr James, what would you anticipate they would do, looking at that vegetation map with Mr Shaw, that Mr Shaw has provided?

MR PARSONS: Take the shortest route, or the shortest practicable route, I should say, and that will depend on the earthworks volumes and cuts.

MS PRICE: So the road running out- - -

MR PARSONS: And minor fills.

MS PRICE: The road running out to turbine 43, do you think that will be in the green Horopito? Or in the pine plantation that is sparsely planted?

MR PARSONS: I would have to correlate that with the plans to answer that properly, but if possible, and on an engineering approach, if that was a practicable solution, then I think it would be given priority.

MS PRICE: Thank you. Later Mr Maassen took you to the western ridge turbines, as he said council was concerned at the level of fills on the roads here, and he took you up through some of those maps attached as an appendix to Mr James evidence.

MR PARSONS: He did.

MS PRICE: To your knowledge, was the council involved in the process of selecting wind turbine locations in the reserve and in particular on the western ridge?

MR PARSONS: Well, again I have to relate to my time in the project. I am not sure what has happened subsequently, but the way that was developed was that there was a tender which gave some indicative turbine sites. They were then confirmed subsequently by the wind engineers. They were discussed with PNC people at regular meetings.

[5.10 pm]

They were the subject of an ecological survey and I think it is fair to say that in discussions mutually between ourselves and PNCC, some turbines from that first pass were deleted for ecological reasons.

So you know, that is I guess my answer to that. But the decision at the end of the day because Mighty River as a proponent has to rest with them in terms of what it put forward.

MS PRICE: Do you think the council was consulted as a result of those meetings and would have knowledge of the western ridge turbines?

MR PARSONS: Western ridge being in the catchment?

MS PRICE: In the catchment, yes.

MR PARSONS: Yes, because they were tabled along with the environmental reports and other reports at the reserve plan change hearing.

MS PRICE: Thank you, Mr Parsons. Finally, one re-examination question for Mr James. You answered a question about hydro seeding from Mr Maassen on the cut face of the road, and you briefly mentioned that there had been success on other projects although you hadn't been personally involved. Is there anything more you can explain to us about this?

MR JAMES: I am aware that Mighty River personnel have had discussions with a contractor in the area and I am - unfortunately, the contractor's name escapes me at the moment. Who has had, who was extremely experienced in the area of reselling batters and sowing native plant material, using the hydro seed method. My recollection is that he was very optimistic about the results for this project.

MS PRICE: Thank you, Mr James. Thank you, your Honour.

MR JOHNSTON: If your Honour pleases, perhaps before the members of the Board ask any questions, there is one matter that I should have raised on behalf of my clients with Mr Parsons, but I was not quick enough

onto my feet. Will your Honour give me leave to ask a question or two, which will just take two or three minutes?

HER HONOUR: Well, how do you feel?

MS PRICE: Your Honour, I am happy with that.

HER HONOUR: Thank you. Mr Maassen?

MR MAASSEN: I do not have a problem with that, your Honour.

<CROSS-EXAMINATION BY MR JOHNSTON [5.13 pm]

MR JOHNSTON: My friends, of course, can come back if they need to.

Mr Parsons, just so that you know my name is Johnston, I am appearing for four of the local landowners whose properties are affected peripherally by this proposed development.

Did I understand you correctly to say that you were involved with Mighty River Power in relation to the planning of this project in 2005? Was that the correct year?

MR PARSONS: It commenced in 2005 and ended early 2007.

MR JOHNSTON: So for about two years, is that right? During that two year period there were, I expect, discussions between Mighty River Power and the council about how this project might proceed?

MR PARSONS: Consistently, I would say.

MR JOHNSTON: And are those discussions in which you were involved?

MR PARSONS: For the most part, yes.

MR JOHNSTON: Now, if you are not the right person to answer this question just let me know. But to what extent did those discussions cover the prospect of turbines on private property outside the reserve area?

MR PARSONS: Well, initially the contract with Mighty River Power requires us to consult with – or required them to consult with adjacent land owners for all manner of things, including access, transmission and wind turbines. So it was certainly on the table from day one and, in fact, a lot of the work carried out by out team was in liaison with adjacent land owners.

[5.15 pm]

At the early stages of development of the wind farm significant access requirements were perceived to require access through Mr Love's property, for argument's sake, and so that was always tabled. The approach and feedback from land owner discussions was tabled at regular liaison meetings with the council liaison people that we were dealing with and my impression is that that was progressive as agreements were negotiated with land owners, but they were kept informed.

MR JOHNSTON: Yes. You see, the reason that I asked the question is that when you were cross-examined by Mr Maassen there seemed to be a suggestion that the notion of extensive or numerous turbines on private land came as something of a surprise to the council when this application was made. Is that something you can comment on?

MR PARSONS: Well, it is probably not something I can comment on, in terms of not having been, well, around when that might have been expressed. However, it is fair to say that the contract with PNCC was for turbines in the reserve. It required us, obliged Mighty River Power to deal with adjacent landowners. There was negotiation about revenue sharing for certain turbines adjacent to the reserve which was settled and agreed. But in terms of public presentation of the wider farm, when we had to go through the reserve plan change process the decision was made and strongly supported by PNCC that we should stick to the reserve turbines. I know that we had some concern that might affect consultation in the future, because at that time we were well aware and, by communication at our regular meetings, council staff were aware that it was a bigger wind farm. So that was really the background during my time. Yes.

MR JOHNSTON: Yes, thank you, Mr Parsons.

HER HONOUR: Mr Heerdegen? Mr Hudson?

I wonder please if I can ask you a question, Mr James, arising out of previous cross-examination from Ms Price? This relates to gabion baskets again.

MR PARSONS: Yes.

HER HONOUR: And you were asked your experience, and you had talked to a contractor who - you did not actually mention the word gabion baskets again?

MR PARSONS: Gabion baskets?

HER HONOUR: Yes, you said some kind of restitution in this area that he had been able to - - -

MR PARSONS: My answer was in relation to hydroseeding of the batters.

HER HONOUR: I thought it was the gabion baskets?

MR PARSONS: No, the batters.

HER HONOUR: Oh, Mr Parsons, I am sorry if I muddled up - - -

MR PARSONS: Sorry, if I had not answered that fully, the gabion baskets are wire cages that are filled with rock so they naturally collect soils and seed and will vegetate naturally, anyway.

HER HONOUR: And this gentleman - - -

MR PARSONS: That is a very well used practice and happens quite regularly, the vegetation in the gabion baskets.

HER HONOUR: For this kind of construction?

MR PARSONS: Yes, certainly.

HER HONOUR: Yes.

MR JAMES: Your Honour, may I - - -

HER HONOUR: Yes.

MR JAMES: I was associated with the construction of Otira Viaduct.

HER HONOUR: I saw that, yes.

[5.20 pm]

MR JAMES: And national park. And the approach bridge to that, which was designed by Beca's, I must say, had gabion baskets on a virtual half to one – or how would you say that? Virtually vertically embankment pinned by rock anchors into that embankment to actually form the formation of the road between the viaduct itself and the downstream bridge, if you want to put it that way. So my view is if you can build them there they are a very good engineering tool and certainly would be useful here.

HER HONOUR: Yes, well, thank you. Thank you very much, Mr James.

<THE WITNESSES WITHDREW [5.21 pm]

HER HONOUR: Well, thank you very much for an interesting day. I am sorry that we have run so late. I wonder if in the morning I could just see counsel for about five minutes to have a look at the transcript from the last hearing, just to amend it - I have two things to amend – and then we will resume at 9 o'clock in the morning. Thank you.

MATTER ADJOURNED AT 5.21 PM UNTIL
TUESDAY, 28 JULY 2009