

okay welcome good afternoon welcome to this online information session to discuss the results of stage one post construction noise testing on the Elaine and yendon sites my name is war HBY I'm a senior consultant with a company called Alchemy we've been asked to facilitate this session today uh we'll start with a brief introduction then um we've got our acoustic consultant who I'm going to introduce shortly he's going to take us through I guess a presentation and a bit of a bit of a talk we'll then have a fairly brief Q&A session and at this stage we're looking to close the session around 4:40 maybe a little bit later um so when we just to let everyone know when we open the Q&A we have already received some questions in advance of this session so we'll ask our acoustic consultant to address these and and he'll address some of them or he might address most of them um for the Q&A there will be a limitation as to how much detail gustaff will be able to go into um it is provided ided only to answer questions that directly relate to stage one post construction noise testing so acoustic consultant let me introduce you his name is gustaff royard and I have been practicing his name and I'm hoping I got it uh I won't say right but close to right um gustaff is a technical director in Acoustics he's employed by SLR Consulting Australia proprietary limited or SLR uh he's the manager of the SLR office SLR has been working on noise assessment work for laow windfarm since 2019 uh gustaff has you know around about 28 years experience as an acoustic consultant his academic qualifications include a bachelor of mechanical engineering with honors in brackets I notice so he's not just got a bachelor but he's got a he's done very well when he did it he's also a member of the Australian acoustical Society or the m and he's been on the execu committee as Vice chairman of the association of of austral Asian acoustical Consultants again I'm hoping I'm pronouncing that right or theacc since 2013 so gustaff over to you thanks bark and uh afternoon everybody I'm glad you could make it um oops brief outline introductions we've sort of gone through um we'll go through the planning condition requirements the summary of um bit of an overview of the monitoring and uh method assessment methodology um it's a very very technical area so I apologize now but it is quite technical schol um then we'll go over Elaine windfarm and yenen windfarm assessment summaries separately um a bit of the auditor review and submission process uh what our next steps and then we'll open up for a Q&A so I guess uh in terms of the planning condition requirements um

conditions 22 through to 27 I guess relate to La wind Farm's consent um and all the no related um requirements for the operation of the wind farm and I've highlighted condition 24 which is the one that required a noise compliance test plan to be prepared uh and then and and actually ended up being signed off by the minister of planning uh the noise compliance test plan or nctp which you may see reference to it or have heard of it um it's the endorse condition 24 and 25 um it basically um you could think of it as a as a the rest recipe book um as I said it's Windam noise assessments highly technical there are lots of different uh noise um standards guidelines legislation Etc um and this sort of recipe book if you like um strings together all of the all of those documents and requirements and even adds to them in areas where there might have been you know an uncertainty or ambiguity just sort of highlights this is the process by which um you know the assessment process will be undertaken um follow the recipe so to speak um so it sets out the the operational noise limits as well that applied to the project and I make one comment because it's relevant to our work that we've that we've done we didn't author this document by the way but um there was indeed a transcription error uh unfortunately in the actual noise limits table um which meant that some of the I guess noise limits were uh misapplied um or erroneously applied to the to the wrong location um we identified that and in fact we rectified that and that's carried through the stage one reports um notwithstanding that we've also done the evaluation against the as um as uh the noise limits as identified incorrectly in the noise compliance test plan uh the other thing to note was this noise compliance test plan at the time didn't have uh a reference uh didn't include a noise limit for one of the reference locations K15 AA um that subsequent to that document SLR in fact monitored um and derived a noise limit uh for K15 AA um I guess in in summary what this what the assessment you know process and procedures that this this you know this recipe document if you like includes um fundamentally we're following New Zealand standard 6808 the 2010 version um we use um uh in of Acoustics which is a UK Acoustics Institute um produced a good practice guide for wind farm noise uh prediction and measurement and assessment so it picks up on a lot of those practices um when it comes to objective evaluation of special audible character for instance it it advocates for which standards for instance in tonality um the the latest standard is isop pass 20065 likewise amplitude modulation advocates for use of UK Institute of Acoustics am procedures so it's really just um picking what was is best best practice other documents um and it also adds to it um in terms of some of the the valid data screening um it it set out methodologies if if you like to be adopted so one for example uh was screening out of periods that have been adversely affected by extraneous noise um things like insects and frogs um has a has a meth a technical methodology to screen out that data and reject that data that's been overly influenced by extraneous noise um we found that that's actually works okay but it's not perfect

um there are definitely still periods uh of valid data that hasn't I data that hasn't been rejected that's been still included so it potentially skews the results we we we'll come to that later in the presentation um and the other thing that's and and relevant um and for those that might have read the stage one reports um the the uh the document sets out a I guess a process for evaluating when the wind farm is you know typically operating um and it it adopts a uh a method of you know what they call relevant turbines list so certain turbines have to be operating for the period to be deemed uh valid um and indeed every property or reference receptor has has a unique set of relevant turbines because they're uniquely positioned to different turbines um the methodology adopted in the nctp is very conservative um effectively uh it means like if One Singular turbine happens to not be operating um and that could be any turbine anywhere on Elaine or any turbine anywhere on yenen depending on where your receptor is if it's aane or a yendon receptor um it the it becomes invalid so it's it's just overly conservative it basically is filtering out uh periods only when every turbine is operating um and if anyone knows how wind fums typically operate uh it's it's actually you know it's it's it's more common that some turbines aren't operating for various reasons maintenance and outages and so forth so um to overcome I guess uh a problem of not Gathering sufficient data sometimes we've also adopted a um defined and and adopted a slightly less conservative we call it a 0.5 DB um screening method um and that's and we've gone in through all the technical merits and arguments of that and it's been been been also deemed acceptable so we've we we've it adds another layer of complexity so but we we'll effectively as you'll see we'll do the assessment to both screening methods as well um noting that obviously the most conservative screening method ends up with less valid data and therefore um you know you you you don't have as as as robust a data set to to derive your statistical regression lines from um a very quick overview and trying to simplify what we're trying to achieve in in a windfarm noise assessment and this is this is I guess the the fundamentals of New Zealand standard 6808 um we go out and measure the L90 statistic in 10-minute intervals um L90 the 90 stands for 90th percentile um it's noise is constantly varying so we we talk about percentiles in in noise the easiest way to consider the 90 percentile it's the it's the quietest 10% so in fact what we're measuring is how quiet the background gets it's the noise that doesn't sort of go away that's sort of always prevalent there so it's it's um that's the statistic we measure um we also simultaneously are gathering data that's being measured of for wind speed up at HUB height uh we then plot that wind versus L90 background you know in a in a plot similar to this where we have wind speed and and and background noise and you're using a polinomial regression to come up with with a you know statistical average if you like of the data um the process really is sort of a

you measure before and you measure after so you measure preconstruction Baseline background conditions um in this case that blue curve represents what the Baseline background would have been pre pre-construction the noise is defined as uh by that it's the noise limit is 40 DBA or background plus 5 which is now represented in this red line so 40 DBA or background plus 5 that follows if you like the the gradient of the blue curve um we go then up once the wind farms up and operating we go out and do Post construction noise monitoring which is the reason we're here to talk about um effectively replicating the same process of measuring these same statistics plus a lot of extra stuff um but then you're subtracting the post construction from the preconstruction um to give you um you know background corrected Wind Farm noise um noting that this subtraction is a logarithmic subtraction because decibels add up and subtract logarithmically not arithmetically but if you want to look at the picture um you know effectively what we're doing is the yellow line minus the blue line is giving us the green line and then you're comparing that against the noise limit so that's that's that's kind of the fundamental of of of the noise assessment process by 6808 um what's involved in monitoring uh and and assessments um you know we needed to use you know low noise floor class one noise instruments we're measuring our 10 l9s as as as we say a requirement of um of the nctp we're also measuring 100 millisecond sampled third octave band sound pressure level which we will'll use if for other analysis if required uh we're also recording 2 minutes of uncompressed wave audio in each interval so we can actually listen to uh a sample of every of every interval interval being uh monitored and apply if we need to do any analysis of that audio we can do so postprocess uh enhanced wind socks we used 150 mil wind socks uh and we've also deployed local weather stations at every at every monitoring site gives us an IDE IDE you know if and when it's rained also local local wind speed for example um we meant to do more than four weeks of continuous monitoring to get a broad representative range of conditions and in fact we've we've always um almost almost always gone well over that four weeks uh extend the survey duration of insufficient data and that's usually the reason we've gone over is because we realize we've got insufficient data primarily because there's been turbine outages is probably the biggest driver um also during the survey periods um or part of the survey I guess we we have a a process of um taking attended subjective listening tests um the main purpose of the listening tests is to understand if there's any particular character of of the noise characteristic of the noise that makes it stand out is more prominent um and you know if if one were to to to pick up if you like that that a particular characteristic of noise is more prominent um um be it tonal or or modulating or impulsive or whatever then that would be the trigger uh to go and do uh quite detailed objective analysis on the full data set of which a lot of

this extra data that's being recorded has been recorded for that process so um the listening test is I said suppose the the Gateway if you like to further analysis um and of course the Hub height winds speed data um is being collected from metm that has also been what they call dewed uh through a process which is to say um the the wind speed is best meant to be representative of what would the wind speed have been with the with no influence of turbin so if the Met m is downwind of the wind farm and the wind farms actually extracted energy and lowered the wind speeds so there's a process there where um where where uh statistically we can um uh evaluate uh and that's done by the wind Engineers um to provide a weight equivalent wind speed um that's what's used in the assessment process so let's jump into the actual uh monitoring campaigns which have which have I guess ultimately ended up or resulted in the in the compliance reports which we which is the subject of today so Elaine windfarm um was uh the monitoring was done over about a 54-day period between uh March and May of 2021 we monitored at three reference receptor sites um indicated here by the yellow triangles h8a um which is off horsehill road L 18aa off Settlement Road K15 AA off Midland Highway um that 54 days represents something like 7,800 total 10minute uh intervals so that's a lot of data but as I men as I mentioned we start culling all that data if there's turbines out if it's extraneous noise if it's raining all those sorts of things um when we applied that as I mentioned the Fairly conservative nctp screening method for Relevant turbines um what we found was because of turbine outages um we were getting something like approximately 800 valid data points only out of a total of 7,800 so we threw you end up throwing most of it away um 800 data points is actually slightly less than what is a recommendation um under 6808 and it's again it's it's not a hard and fast rule but there's a recommendation of a certain monitoring period which would yield you 1440 data points as being typically okay so we we we slightly less than that and that was that was I guess one of the um drivers if you like saying well this this this uh nctp screening method for for typical windfarm operation is just way too conservative we we could be monitoring for for years to get enough data um so we did this we did our slightly relaxed if you like um less conservative I should say relevant turbine screening method um bearing in mind this this this still means that all the nearest and most um dominant wind turbines to a particular location all have to be operating it just means that there's there's an opportunity that some of some some turbines which are on the opposite end of the wind farm that aren't really influencing noise level at a particular receptor could be off and it still counts as valid um so to give an idea of of of how much extra data we've gain you know by by relaxing by relaxing this screening um marginally we we get something like 3 and a half thousand valid data points um so we we get out our data we've analyzed them in the way I've described with regressions and curves um uh and then REM removing if you like the influence of background um from the from the Baseline monitoring to come up with a uh Wind Farm only curve um I'll go through uh the process of special audible characteristics um that's a fairly important part so I'm as I mentioned the we did these attended listening surveys um and we've we the purpose of those uh listening surveys is

to basically listen to The Wind Farm um in in a variety of different conditions
so the idea is you know you measure it you you go and listen to it different times of the
day different conditions um
and and you and you're listening to the character of of of the Wind Farm noise
um you're doing this at receptor locations but equally you you can also be doing it at
other locations that
aren't right beside receptor locations in fact fact it also wants you know the nctp requires
that you go and listen to
wind farm noise quite close to turbines in order to say if you were to hear
something you know in the distance when you weren't quite sure what the source is
because often that's the case we're
not the noise that if we hear windfarm sound it's usually not that dominant it's sort of a
very very faint thing
that's in the background quite often you need to know that what you're hearing in those
sorts of distances is actually a
turbine so of course you can go up and um listen and measure if you like closer
to turbines to get an understanding that yep what you're hearing back there is actually
coming from from these turbines
over here um so we've we've done those listening tests um I'll make a note here
that in fact there were some surveys um that we conducted um that that in fact
weren't even documented in the report um one of the primary reasons is um after
the fact we've determined that we were able to see after the fact that the wind farm
wasn't actually producing
electricity um I guess people that are familiar with wind farms will you know maybe not
surprised but wind turbines
start spinning um you know in their sort of pre-cut in their cut in Phase uh before they're
generating electricity to
sort of they're hunting for I suppose you know a condition for them to start operating uh
in fact so they're working
and most and in fact they're even admitting emitting noise but they're not actually
generating so we we did have
some circumstances of that in one of one of our surveys um and we've we elected not to
count that as as uh as surveys um
on the basis that you know they they they were at that transient cut in phase and perhaps
not producing
electricity um but the important thing I guess in summary some of the at some of
these listening um surveys so at some times and at some locations certainly
not all locations and certainly not all the times um but we did pick up that there was um I
guess an audible or
faintly audible hum character as it we've we've we've characterized it to um
it and and and confirmed um via measurement you know at closer to
turbines that yeah in fact some of these tone tones that we all hums that we can pick up
are definitely from
turbines um we did that through you know intermediary listening positions um
spectrograms um which show I guess the frequency component of of of what we're
actually experiencing um and so yeah we did find
occasionally we did find that there was some slightly discernable hum character at
reference receptors typically around
that sort of 3 to 400 Hertz range depending on uh and it was very variable
depended on um wind speed and and and presumably by wind rotor
RPM um so the the nctp process that

Gateway process process that I explained before where if something was subjectively evaluated or heard then that would lead to the objective screening so yes it was picked up uh and therefore we we've we've gone and done all of the objective quantitative um analysis um we chose to do it at all Sites um irrespective of whether some of the reference receptors uh had not uh objectively obser we' been if there were sites where we hadn't objectively observed tonality it didn't matter the fact that we picked it up um at some sites we deemed that you know given given the uh you know the still relatively modest number of attended listening tests that are required by the nctp we picked it up so all Sites all data was all screened um it's a really detailed narrow band um uh assessment process this ISO past 22 65 um it comes out with a tonal audibility um um score if you like for every single uh interval uh and and then there's a a sliding scale penalty scheme applied so we went through that that process for every site um and applied penalties where it was identified um I guess I mean it really depends as we've got so many different ways to cut the data and the and the tables are in in the report reports but I guess the headline the headline I guess take home would have been that you know if you look at when the wind Farm's fully operating which is to say it's the nctp relevant turbine screening so it's kind of literally is where everything is you know operating at a maximum um we you know typically between n depending on the site of course between 90 and 95% of the alltime data uh doesn't have any tonal tonal penalty and that sort of lines up with what we've what we've experienced too because we certainly didn't pick up this hum at every location and every time but we did pick it up in some and that was the trigger if you like the Gateway trigger to do the objective evaluation um so we come to perhaps just a I guess a summary or conclusion summary around Elaine um I've split this and I'll have to split this into into two um I guess SE two separate summaries of course as I mentioned we had the NCT P um the 0.1 dbel relevant turbine screening and then we had our 0.5 DB relevant turbine screening um obviously remembering that this is a much uh much larger data set but um I guess the conclusion from this one um which obviously would be even more like greater number of turbines operating in each valid period um not reducing the not withstanding the fact that it was a reduced data set um the result shows compliance to the New Zealand standard 6808 limits at all three locations in both time periods and that's being the alltime period And this is our night only period and you can sort of see the the decibel margins of compliance across the wind speed range there um where we go to the 0.5 DB relevant turbine screening obviously we have a much larger U valid data set as we discussed um um but effectively the same conclusion shows that we we meet the 6808 noise limits at all locations uh in both those alltime and night only times um and I guess a final conclusion here you know these These are assessed against the technically correct limits but not withstanding that we also

achieved compliance against the incorrect noise limits that were presented in the nctp again all locations and all time and all time periods um so that was Elaine okay so moving on to yenen um I guess the first to point out and the reason we've separated them we we indeed monitored yenen um at the same time as we did Elaine between March and May 2021 um we even went out and did it again for a couple of months between September and October 2021 um but both of those rounds of compliance monitoring were effectively inconclusive um as we just didn't get enough valid um during that that period that whole or you know lot of 2021 um there was a I guess a fairly protracted period of U blade rectification Works which was going on so you know put in context that the wind farm had only just been commissioned was still going through testing there was a bunch of things that needed to be fixed it resulted in you know often times a number of turbines being out for long periods and that was enough to not collect uh enough valid data and that and that included that's for both the nctp screening method as well as our um slightly less conservative 0.5 we just even with the 0.5 we weren't going to get enough data so weren't able to get a result um so subsequently uh once I guess those blade replication Works were sort of completed we ended up um being able to uh for I guess third time's lucky get out and do some monitoring uh sort of between May and August 2022 uh approximately 67 odd days worth of monitoring um something like 90 9500 total um data points um similar to before when we applied the nctp you know more more conservative screening method we got somewhere between 1800 8304 1460 valid data points which is actually getting close or actually exceeds the recommended New Zealand standard amount so with the longer period and the Lesser number of turbines out we we would have actually perhaps got a result even just with the uh nctp screening method notwithstanding that but for the purposes of I guess transparency if nothing else um we also did the 0.5 DB methodology so that it we could compare it or it be similar or anous to what was done on a lane previously whereas obviously remember we'd probably had to rely on the 0 five because there wasn't enough data as the as the 0.1 so we've we've again uh produced I guess an assess against both of these screening methods U mainly I guess with transparency and consistency um another point to note out uh in this survey period um it was particularly wet around that that sort of you know winter period um you know late Autumn winter of of 2022 um our surveys identified that you know there was widespread and pretty large frog populations um evident at really almost all of our monitoring sites um I I I was I I was quite amazed I was standing in the middle of paddocks with no water courses around me and there were frogs everywhere on the ground right not even in a pond or a ditch or somewhere so it was really quite obvious that we act you know the frogs are really it was a good time to be a frog um going through the listening test similar similar process to what we did for a lane uh we did it at multiple multiple locations multiple times near receptors intermediate locations closer to

turbines uh not surprisingly picked up the same sort of uh that they are the same turbines operating in effectively the same sort of condition so not surprisingly Y at some of the survey sites and sometimes yet picked up a faint but audible hum character um attributed to turbines um in the same way we we then went and analyzed using the uh objective um screening code for 20 isop pass 2065 uh for for all the data um it's also perhaps important to note that this screening method which is going off and screening all the audio and and highlighting anything that's I give giving giving us some tonal energy um it is right for getting false positives I mean it's not only wind turbines that make tones in fact a lot of noise sources make tones and there's no way we can sift through tens of thousands of you know of of positive hits or or you know of data to to to clarify but we certainly found examples or evidence that you know airplanes or some traffic would definitely give us a false positive but in the interest we weren't a we weren't going to go through and try and eliminate those so they're in the mix as well anything that was identified as a tone uh in in our in our frequency ranges of interest uh was was was we we penalized it irrespective of whether it was actually the wi tur b or some other source um just simply because it would be too too complicated to go through every single one to to confirm um so we applied the tone penalties were identified um similar results to last time basically when the wind Farm's fully operating somewhere between 89 and 96% of the alltime data um was found to have no tone um I said we'd come back to the to the to the issue of the frogs um and I guess for the yenen report it's it's all containing a sort of an informative appendix um but we had this particularly wet season with with large frog populations um our surveys our attended surveys and listening tests had noted that that was um they were prevalent just about everywhere in fact they were quite often the dominant noise Source um at some of our sites um the noise compliance test plan screening algorithm for extraneous noise um rejection you know it's it is it is successful in uh identifying and rejecting some periods of insects and frog noise um but really when we dug into it um and looked more closely it was quite obvious that it wasn't detecting all of it um there's definitely periods where where frog noise is quite prevalent and influencing the noise level you know quite significantly and it's not being rejected and an example of that is in the graphic uh that we've got here what we're seeing here are 10 minute 10 minute interval data and these are basically third octave bands in frequency with low frequencies down here getting higher and they're sort of color coded so you can sort of see this area here which we've identified and we've listened to the data and can confirm that yeah there's frogs right and you can sort of see you know it goes from sort of no frogs and the frogs start and the frogs continue right through it's quite clear and evident that you know that's a feature of the noise but when you actually have a look at through and

this this one here is the I guess the after you apply all of the the screening algorithms for extraneous noise these are the ones that decided to get rejected they you know this is a the screening algorithm it's just it's a black or white you know it's a pass or fail type criteria once it's been set um and so you can sort of clearly see that whilst it does identify and reject some of the Frog noise there there was actually still quite a bit that wasn't uh identified or rejected uh um and when we went back and had a look at some of these periods if we sum up the periods that were past if you like um that still had that but still had frog influence you know we were typically seeing that the noise level uh might have actually been picked up by three or four dbel as a result of the frogs now the consequence of this is that starts to change the the picture in terms of how we do the assessment because if we still got um extraneous noise influence in there that's you know by frogs then when we do the the post construction minus the Baseline effectively the change in noise levels attributed to the wind farm so um you know there's a caveat I suppose on some of the monitoring that was the monitoring result certainly um that this sort of high level of frog noise activity during that survey could easily have elevated um the background noise at some sites notwithstanding it had some screening but there's still some I guess residual um you know influence in the data set um and that net result leads ultimately uh to an overestimating of wind farm noise because it it's included in the result so yend and windfarm um assessment conclusion um the nctp the conservative the conservative uh I guess relevant turbine screening uh algorithm we basically generally have sufficient data size I think we had at two of the sites we had more than enough data one of the sites was margin under the recommended amount but in all honestly it would have in any other in any other jurisdiction it would have counted uh as as acceptable amount um the result for for that so this is like in strict accordance with the nctp um shows compliance at all three sites uh for both the all time and the nighttime when we come to the 0.5 DB method um of screening which as you as you recall opens up to a much bigger data set um um which which if theoretically if the noise was related to windfarm noise the bigger data set that you're introducing is actually you're introducing data that has slightly lesser number of turbines um um operating then you would have think that that potentially would have the noise would have gone down but the actually the opposite is true we've opened up to a bigger noise set a bigger data set effectively the regression curves went up um I and I've I've concluding they've gone up largely because they've included the influence of frog noise more so um not withstanding that we've we've basically got to a situation where you know we're not able to demonstrate compliance with the nighttime noise limit at two of the sites um but that's really not an indication of non-compliance um it it def it certainly is likely a result of the influence of um the the adversely affected influence of frog noise um

um um and recalling that we actually had sufficient data for the nctp method and we were really just doing the 0.5db method for transparency consistency Etc from aame um a note at the bottom oops
sorry a note at the bottom just as previous um ignoring that these are these are the assessments against the correct 6808 limits um if we had to compare them to the incorrect limits in the nctp um they would pass um you know all screening methods would pass all Sites all times all time and nighttime so that would be the uh I guess the general synopsis or conclusion for yandan um so then there's a process I guess um to explain to to those on the line you know it's it's not just about our work um our assessment analysis and our conclusion um the process um the statut process that's required is it actually goes through a an external or independent environmental auditor um and the independent auditor has also a I guess a technical expert in windfarm noise it's also um I guess assisting them with uh understanding you know a highly highly technical field um the process for Elaine and yenen um was obviously split into to two as I've explained and the reasons for but um
both Elaine uh and then subsequently yenen have been through that environmental auditor review and verification process um and the auditor um has has provided a verification statement uh on the 28th of June 22 for elain and on the 7th of December 23 for yenen uh and it's min understand that both Elane and Yen and windfarm uh reports uh final compliance reports post construction compliance reports as well as the um the auditor verification statements have been submitted to Department of Transport and planning and all of those documents are available to everybody uh in the public via the website
um uh I guess a quick summary of next steps um really both we've got a couple of I guess noise monitoring um campaigns and processes in underway at the moment um stage two noise testing um is still currently ongoing we've had we've had uh a number of sites with some with some challenges um which which which have just presented us require us to to extend noise monitoring surveys and the like so I guess there there's no no conclusions around that other than that's currently on going uh and some of you might be aware as well uh in attendance today um that there is also a process of onoff uh testing uh taking place uh as we speak at the moment um which uh not really the subject of today but um a process to I guess establish Wind Farm noise levels at um at non-reference receptor locations where there was no I guess um historical uh Baseline background noise monitoring so they are currently uh un underway and ongoing ah and we finally got to the uh the the Q&A um section of the info session so um gusoff firstly thank you for your presentation so far um you've got some questions which already come through so you I'll I'll ask you in a moment to maybe address those first but for anyone listening if we have time for any questions after that we might you might want to type them in before gusta finishes answering the questions that he's already got in order to do that on the teams platform you're on if you go up to the top bar there's a Q&A tab you see the little tab called Q&A and if you click on that it it opens a panel so if you do have a question and you want to type that in we'll look to select questions um assuming we have a little

bit of time at the end once you've answered the first batch of questions you've got Gustaf over to

you thanks War um look I've got I got forwarded uh a number of a number of queries and um and questions some sort of more Broad in general some quite specific um I'll start by sort of I guess just reading through and going see

if I can expand on some of the broader ones um so one was can you explain the peer review uh process of post construction noise reports do they get reviewed by independent Auditors um yeah

I I think I touched upon that um so there is a I guess a a regulatory process where uh where environmental Auditors and they are accredited environmental Auditors um and there's a

you there's a limited number of at listed uh professionals that that practice as environmental Auditors um that um I guess fully review um the the process as well as the you know the the the steps um and you know and and are able to test if you like any of the any of the um you know they able

to I guess test any of the the the things that we've that we've you know we've that we've had to derive live um or our for instance our alternative our alternative interpretation from something from the nctp um you know the auditor's role is

to evaluate whether or not you know that's uh still is a legitimate and Justified interpretation um given the circumstances um so the in the the environmental AUD auditor for these reports is uh David um he's assisted by a technical um expert um as I said it's a very very technical area you probably gathered um so somebody with with a lot of experience in

Acoustics and windfarm noise so uh David's I um technical expert advisor is Dr Kim bergmeister from araps um the process um look that we we the process we've we've we've done we've done some sort of like where where there was where there was a requirement for um

for effectively uh um you know if it came down to the way we've had to reinterpret you know the nctp screening method it was we we we've done like a mini Workshop if you like where we're able to to show exactly the reasons why we've needed to do that um and and and work out you know that we got to an outcome that was that was uh that was acceptable um not withstanding that it's it's not a it's it's it's a pretty detailed uh process the whole auditing and review process um you know there's a

if you look at the dates there's there's often you know a good year between uh when the when this monitoring was done

uh if not more and and you know when the report and then our final sign off so unfortunately that's perhaps one of the reasons what we're we're talking about stage one uh compliance now in 2024 for monitoring that happened you know quite some time ago um so yes it it is reviewed by indep

dependent Auditors um if I jump to the next general sort of query uh can you explain how attended listening Works what's the process yeah um so the attended listening or subjective evaluation um it's it's it's really I

guess a I called it a I guess a Gateway it's it's sort of a it's a check if you like of noise emissions um the thing is

your your ears and your brain are remarkable acoustic instruments um you know in in many ways far more

sophisticated than the best equipment that we can that we can get um and and you know that's we we're basically listening for and trying to identify if you're like first of all if windfarm noise is even Audible and certainly there's a number of sites under certain conditions where where you know windfarm noise is inaudible um even though we might be standing at a reference receptor location um but then where it's audible you know what what is the character of that noise um and if there's anything in that in the character of that noise that you know warrants uh I guess further investigation um that's sort of that's the gateways then that you that you know if it's identified uh subjectively through these listening tests then then that would lead to the objective screening noting the objective screening it's it's it's certainly not uh not necessarily A straightforward process we're talking about often times you know beyond gigabytes worth of data and you know we would have collected terabytes worth of data on some of these surveys that go on for a long time um and you know there's a lot of I guess a lot of code a lot of results everything has to be compiled so it's it's not straightforward um and even those real you know even those sophisticated um objective screening methods as we discussed um they aren't able to differentiate the difference between you know a wind farm the wind turbine making a tone and some other some other uh noise source that might have also scored a positive hit so it's I guess there's um there's there's limitations of of the objective but that's perhaps partly why there's a I guess a subjective screening process um the second part was oh then what's the yeah um so in terms of the the listening you know the requirements I think in the nctp are you know suitably qualified and experienced acoustical consultant um so in in in our circumstance it's it would be me and some and my uh some of my work colleagues um that have have have a assisted in the in the um in the in the in the noise monitoring campaign um they're all like myself um you know suitable qualifications member of the Australian acoustical Society um and have you know and have now you know many years of experience in doing doing these assessment Works um that perhaps the best way to describe the I guess the pro the process of the subjective um listening um obviously you are using your ears um I can maybe flash up you know the we're effectively noting down um all the all the sort of prominent noise sources including all of the extraneous sort of ambient sources be they be they traffic or birds or wind in trees or insects um and turbines if they are audible um a description of what they look like um we're taking we're typically taking a noise noise measurements at the same time so that you know not only can we use our ears uh and our brain but we can also see uh and note down anything of use about you know if if there actually you know if we needed to note down what the actual noise level was when we're when we're actually making that observation as that that too might be

relevant um I'm just lost where my main screen is um and I guess in terms of we received a number of specific questions um and notably some specific questions from Owen Lewis um and I shall try and go through those they're all quite detailed questions and I shall try and answer them [Applause] um there was some questions around the subjective attended listening listening tests at Elaine um and uh the requirements of the nctp um one part A of question one was related to why the monitoring locations for yenen have been included in the Elaine report um

and but the yenen report does not include the Elane monitoring location so it's a fair question um you might recall the time that the monitoring surveys were being done uh that the very first the March till May um surveys which ultimately became the Elane uh windfarm compliance report um we were simultaneously monitoring enden um it was for both wind farms were being were being evaluated at the same time um it was obviously the the wind farm the the I guess the the data that was collected around yenen Wind Farm compliance W really wasn't ended up being utilized for for the compliance assessment purposes for these you know these blade rectification works as I said rendered you know a lot of the turbines out which meant to low data yield and therefore an inconclusive results so not withstanding the fact that we didn't end up producing a post uh construction compliance report for that reason the all the surveys were occurring and certainly all of the subjective listening attests were occurring um the opposite or the flip side of that um why weren't the lane monitoring locations done when we did yenen well that was because we were only doing yenen at that stage so that was that Third Time Lucky uh monitoring campaign where we finally had uh all of the the blade rectification work sorted out so that we were getting good data capture but yeah that would explain why there was there was the survey listening positions were sort of limited to to just yenen for that for the yenen report um I guess I guess I I'm I'm sort of reading uh the following sort of questions to um you know the relevance of those uh of yenen listening test to Elaine um I I deem them very relevant you know it's the same turbines effectively operating in the in the same or very similar conditions so um noting that the the subjective listening tests are really just sort of the Gateway test to then go on and do the objective screen um yeah the listing tests at yenen I think are very relevant because you know in the case of the tonality identified you know if we had have picked it up at at at yenen and and not a lane uh would that mean that they're they're quite different I I don't think so if they're the same sort of turbines we pick ultimately picked the same sort of things up at both both sites so I think they are relevant um so would and and of course the fact that we actually you know did pick up a faint hum at both and both in both circumstances we've led to the full objective tonality screening at at both

sites um Part B of Owen's question related to some specifics attended listening on 10th of March and 31st of March 2021 and he had an attachment um which I think it pulled from a memo that uh and and he'd overlaid some times on there relating to showing that the wind farm was you producing little or no power um I can say that um certainly at the 10th of March uh example and and I've and I've gone back and looked at our 10th of March uh 5:30 to 7 a.m. survey period um and to be fully transparent we said you know the the comments even there say Wind Farm seems to be low cutting wind speed uh all turbines are Lanes slow rotation some faint hum just discernable so we I guess we acknowledged the fact that you know that we we seem to be at that cut in transition wind speed um we acknowledge in the survey in fact it was probably the reason why we spent one and a half hours early early on the in a March morning um waiting for waiting for the wind farm to start up um but with no further surveys and then later 31st of March um yeah it was a it was a pretty low uh low winds speed period of those surveys and that's acknowledged in the in the um in the observations with Hub height wind speeds around 2.9 to 3.6 m a second um I I just will hasten that it you can't really make any conclusions based um between the survey times or you know strictly make serve um strictly make any conclusions around the survey times the aimo um there there almost certainly is a discrepancy in the time datum used our survey times being in March um would have been with Australian um with daylight savings time and I suspect you'll find the aimo uh times are probably just Australian eastern standard times so they don't have to deal with daylight saving so there's probably an hour hour out difference um so I guess there's no no conspiracy there it's other it's it's likely that it was in one of the periods when it was operating albeit at a low level which was acknowledged in the servo um part C of question one uh 10ed listening why okay so we there was some some listening tests conducted 11th of June 2021 applicable to the noise assessment monitoring period between March and May so there was there was some Elaine surveys completed in June 2021 which was outside the march to May remembering that we actually did go back and do surveys trying to get yend in a second time I guess the real point is that the surveys are are there to try and better evaluate you know the prevalence of possible special audible character um and specifically is to cover a range of of conditions um so those additional surveys that we were done in June I guess that that it's recognition that some of the previous surveys were covered in low wind speed um or cut during that Cuttin transition wind speed um I I can't control the weather um and it's and it's notoriously difficult to try and schedule to be at a particular location particularly when it's you know all the logistics involved around access and driving and all those sorts of things to be there for a specific condition um we happened to be there in June it happened to be windy we we we you know we we acknowledge that we perhaps didn't get a lot of really windy

survey work uh done at Elaine in the first step simply because there was no wind often when we're up there or a little wind um so hence so hence the June times to to supplement that uh there's a question around attended listening so gusta we're very close to our um okay Krist hang on a sec sorry to bother mate we we we're very close to our hard finish at 5 o'clock uh so you've only got a couple of minutes so you you might want to maybe just if if you've got time select the the last question we hav had any other questions come come through so maybe if you just pick a final one and then um then we're going to run out of time yeah okay look I'll jump to perhaps the last one I think um number five um uh why was oricon requested to supply wind data for the dates 30th of the 10th 2020 to 1st of the 12th 20 when stage one monitoring took place in March 2021 well look the explanatory letter from oricon which formed a pending e in post construction uh report um which was to request for this DW met data and that was actually also that we did the same process when we did previous or earlier what we called complaint-based interim compliance in fact um some of that monitoring was done at owens's property which occurred between the 30th of the 10th and the 1st of the 12th so um and then oricon actually then went subsequently on to provide the same or you know go through the same Pro process to provide DW data for the stage one testing um you know in between March and may 2021 so the same process was done by oricon um we just included the original memo in the appendix to the report um basically because it provides that technical context as to what they've done in the daking process albe it that memo was was was provided back in uh back in 2020 um for for the original interim uh monitoring so I hope that's explained that um that concern and um 459 I I I apologize for dragging dragging it out I was trying to trying to condense my responses as as much as possible so thank you that's going to conclude our session but firstly gustaff really want to thank you um again for the presentation you gave and answering the questions as best as you could in this time frame thank you for everyone who attended we hope you have a pleasant evening um have a good night bye-bye thank