Good morning Commissioners and Councillors,

Thanks for taking the time to read our submission.

My parents (Gavin and Barbara) have already spoken on most of our submission.

What I wanted to speak on was a few technical points on the Physiographic zones and how they relate to our farm.

Physiographic Zoning as a Regulatory Tool

We oppose the use of Physiographic Zoning as a Regulatory Tool in our submission and still have this viewpoint.

While we agree with the concept of PZs these should remain outside of the plan due the large inaccuracies on individual farms.

This will allow for easier amendments without the need for large plan changes.

It is disappointing that this is not a recommendation in the Section 42A report.

Our Situation

This is an issue for our farm in particular.

83% Peat Wetland Zone

No surprise due to the soil types that have gone into determining our zones.

67% organic soils.

My investigation

I have:

- Taken photos of soil
    - Did not look like peat.
- Tested properties of soil (ASC, TC and OM)
    - High ASC, low to medium OM & TC.
- Had our farm soils remapped.
    - Supported by an expert statement from Jim Risk (Ballance Agri-Nutrients) who mapped the soil.

All of the information I have compiled can be found in the hearing evidence you have already read.

However, I wanted to highlight the results of this.

<Show slide> Photos of Soil Type Graphs

As you can see, there is a significant shift in the make up in the soils on our farm.

65/35 to 10/90 (Organic/Sedimentary)

And in a visual context here are some examples of soil that were previously mapped as Organic.

<Show slides> Photos of Soils

I am aware that soil type only makes up a part of the determination of a zone, in the case of Peat wetlands it is quite significant.

From what I have read about the zone is that an Organic soil automatically equals Peat Wetland Zone.

Furthermore, if the soil type of a mineral (sedimentary) origin then underlying geology and redox potential could also lean towards that of another zone.

Peat Wetland Zone Definition

We have also opposed the definition of the Peat Wetland Zone.

Because no account has been given to the development status of peat.

Developed peat has been lumped in with raw peat bogs.

P-retention will improve overtime on peat soil as it develops.

The P-retention figure is quite often used as a measure of development status of peat soil as it increases as the mineral content of the soil increases.

In some cases depending on other factors such as geology and redox potential there may be some areas of sedimentary (mineral) soils will be included in the Peat Wetland Zone.

It surprises me that there is no differentiation in the zone to account for this. Other zones have variants to account for various loss pathways.

This is especially important for P-retention (ASC) as they are likely to be quite different between organic and sedimentary soils.

- Organic = very Low (0 to 10%)
- Sedimentary = High (60 to 90%)

In the information provided by ES on the Peat Wetland Zone the leaching of P through the soil due to low P-retention is key loss pathway. This may happen on a peat soil but is unlikely on a Sedimentary soil where the P-retention is high.

I recommend that the definition of this zone be reviewed and a sedimentary soil variant be added to account for this.

This variant of the Peat Wetland could potentially be quite a favourable one if you take the denitrifying ability of the Peat Wetland zone and the lack of P leaching into account.

I strongly believe that it is critical that if PZs are to be used in anyway then they need to be correct.

The inaccuracies I have shown are just the ones we have found on our farm and from reading many other submissions there seems to be many other cases and I know of more that have not submitted on.

Overseer Nutrient Budget

I have taken the analysis of our situation a bit further and have done an Overseer Budget for both soil maps (nothing else changed except for soils).

With over 20 different blocks and a diverse range of stocks types on our farm, this was no easy feat.

The N Loss was essentially the same for both NBs (24 kg N/ha and 25 kg N/ha).

However, the P Loss showed some large differences.

<Show slide> P Loss Table

The remapping of the soil has greatly reduced total P Loss

Total: 409 to 252 kg P

Per ha: 1.1 to 0.7 kg P

When you drill down to losses at a block level such as Pasture or Young Grass you can see how important getting the soil types right are.

P Losses on Colac Soil which has a low ASC (P-retention) had a loss of 1.1 to 1.3 kg P/ha

P Losses on Colac Soil which has a medium to high ASC had a loss of 0.5 kg P/ha

I would like to emphasise my point again that information going into PZs need to be accurate to avoid undesirable outcomes such as incorrect zoning and focussing on mitigation that might not actually be an issue for that farm.

I would like to thank you again for reading our submission and letting me speak today.