We appreciate the constructive criticism provided by David Chanasyk. In many ways, these more moderate views have enabled us to further account for commentary outlined by Reviewers 1 and 3 ultimately leading to a much improved manuscript. Track-changes are highlighted in the revised manuscript.

1. The paper's title "Climate suitability estimates offer insight into fundamental revegetation challenges" entices one to read more. It is unfortunate that the authors used the word 'estimates' because the parameters they used (rainfall metrics as they call them) in their analyses are not 'estimates' at all. A much better word to have used would have been 'indices' as that word more accurately reflects the analyses the authors have conducted. And that word more accurately would indicate the uniqueness of the analyses the authors have conducted.

Based on these comments and those of the other reviewers, we fully recognise the semantic problems associated with the 'suitability-susceptibility' terms used throughout the original manuscript – this has been outlined in response to Reviewer 1. Consequently, we've carefully amended the terminology by replacing them with 'climate patterns' and 'site sensitivity to climatic factors' while also including precisions to the terminology where required. This has led to necessary changes to the Title, Introduction, Methods, and Discussion sections. Likewise, and where appropriate, we've also amended usage of the terms metrics, estimates and indices throughout as prescribed.

2. The major value of creating an index is to somehow collectively, and hopefully simply, capture information that a large suite of parameters provides. So instead of having many numbers, an index provides us with a single one. Hence the attraction for indices, at least in my opinion. Then, unfortunately, comes the details. Firstly how does one choose which parameters to include in the aggregation? Then, how does one 'aggregate' those various parameters into a single index, and how sensitive is the index to how those parameters are aggregated?

In fact, the impetus for creating the rainfall index was to emphasise site sensitivity to climatic factors and to draw attention to further climatic and rainfall metrics (other than simply mean annual rainfall) having potential influence toward land rehabilitation among semi-arid environments (pg.2, ln.14-21):

"In our experience assessing post-mining land rehabilitation across a climatically diverse eastern Australian landscape, climatic factors such as the regional seasonality, and frequency of extreme rainfall and drought events appear to represent inextricably interwoven components of landscape complexity which influence the development and survival of post-disturbance ecosystems at all stages of recovery. Still, specific metrics of site climate or seasonality are seldom accounted for in mined land rehabilitation design. Meanwhile, when climate factors are taken into consideration, the selected parameters (e.g., typically surrounding mean annual rainfall) tend to over-simplify any assessment of regional climatic obstacles."

To this effect, our study has arguably provided a thought-provoking position-point variously criticised by all three reviewers. In the Discussion, we've now stated explicitly that (pg.9, ln.23-27):

"The importance of these rainfall factors could appear somewhat trivial for land planners and rehabilitation practitioners assessing potential boundaries to rehabilitation in temperate environments. However, in eastern Australia and other semi-arid locations, these factors form a narrow window of challenge and opportunity, which could determine the range of achievable outcomes in certain environments. "

As for the 'details' regarding metric aggregation, these have been clarified in the Methods and Table 2 (pg.5, ln.2-20):

“Site specific values of long-term rainfall parameters and vegetation density are shown in Table 3. From these data, each of the sites' climate parameters was scored qualitatively − i.e., being either less sensitive [ideal], moderately sensitive [adequate], or highly sensitive [potentially problematic] − in relation to a series of rainfall criteria which also included a description of the given parameter's indication of biological significance (Table 2). These criteria and range values were selected according to a review of the literature and expert opinion based on available agricultural and environmental management assessments to provide arbitrary classification thresholds relevant to both short- and long-term vegetation development (derived according to DERM (2010) and Fraser et al. (2010)). [...] From these climate scores, a quantitative sensitivity index (SI) was determined based on the sum of favourable rainfall values – i.e., both less sensitive (Sh) and moderately sensitive (Sm) – and a similar index (SP) was determined based on the sum of highly sensitive criteria for each site. These values were then combined to determine an aggregated and later weighted index [...]”

Use of differently weighted values (described by eq. 1a-d) showed that each permutation of the sensitivity index provided a similar outcome and site ranking.

3. For the paper under discussion, the authors have chosen rainfall parameters for inclusion in their index. They have chosen two rainfall thresholds (25 mm and 3 mm) for analysis, but provide no justification as to how these values were chosen. Was it ‘a review of the literature and expert opinion’ referred to on page 18550? ‘Daily rainfall intensity’ is a key parameter but that has not been defined: is it an average, and if so, of what?

[Likewise] The value of using a rainfall intensity factor in susceptibility is clearly related to erosion hazard, but using annual rainfall alone can be extremely misleading, as it is the water balance (precipitation – evapotranspiration) that is a much better indicator of the likelihood of revegetation.

This is a critical point. Hence, we've replaced these values with Average Recurrence Intervals (ARI). ARI much better represents the frequency of selected rainfall events (characterised by rainfall intensity and duration). Consequently, it is much more convenient to determine the frequency of three rainfall events, all of which deem to be critical for initial ecosystem establishment (pg.5, ln.2-16):

"Site specific values of long-term rainfall parameters and vegetation density are shown in Table 3. From these data, each of the sites' climate parameters was scored qualitatively − i.e., being either less sensitive [ideal], moderately sensitive [adequate], or highly sensitive [potentially problematic] − in relation to a series of rainfall criteria which also included a description of the given parameter's indication of biological significance (Table 2). [...] For example, annual rainfall depth (Rd) and average recurrence interval of prolonged events with low intensity (ARIrehab) were deemed to be indicators of the sites' general level of water availability. Contrary, the average recurrence intervals of short (ARIstorm) and prolonged events with high intensity (ARIcyclo) – representing storm and cyclone events, respectively – indicate problems of erosion or inundation, respectively."

Ultimately, the inclusion of these more appropriate and more precise metrics did not change the order of site sensitivity to climate patterns described in the original manuscript, therefore the main thrust of our arguments largely holdfast – of course, being mindful of other commentary.

4. The authors should choose one of either suitability or susceptibility as using both is

redundant (compare Fig 2a and 2b).

Amended throughout. Refer to response #1 above.

5. Lastly after reading the paper one is left with the nagging question whether or not one could have come to the same conclusion/observations without having used the index method. And the answer is yes as the authors acknowledge. So where lies the value of the index touted in the introduction? What missing piece of information does an index provide? Figure 5a is an interesting synthesis of the topic of the paper. Could the authors not have in essence used it as the hypothesis for their paper instead of the synthesis? So coming back to the title: what new insights did the analyses provide?

We disagree that the Title and primary study outcomes are circular in their approach since, as stated in the Introduction and then re-emphasised in the Discussion, assessments of site sensitivity to climate are seldom (if at all) accounted for in mine closure planning even though water availability/intensity/etc. are obvious determinants of 'natural' bioregionalisation vegetation patterns (pg.11, ln.12-23):

“A main consideration of our analysis is that the regional intensity, seasonality, and extremity of rainfall should represent a primary determinant of rehabilitation success among post-disturbance landscapes. Based on the common rainfall criteria used here, the strategy of identifying a given site's characteristic regarding rainfall availability and temporal distribution could be readily applied to other locations which are similarly affected by climate/rainfall extremes and used to guide rehabilitation planning while adding no significant additional time or costs to rehabilitation design. It is our view that rehabilitation expectations and the amount of investment required for rehabilitation of sites within different climatic zones should, in part, be driven by an understanding of potential climate boundaries (not limited to rainfall). Since these components are generally lacking from most planning assessments, we believe that our current study represents a necessary starting point for further experimental investigations, which could then feedback and improve upon current monitoring activities (such as bioregional climate and vegetation modelling).”

In following from response #2, our intention was/is equally to draw attention to rainfall metrics (or lack thereof) in mining assessments and then identify their utility in describing potential obstacles to rehabilitation (e.g., erosion, seasonality). Ultimately, the index (itself) and survey approach (in general) serve as a hypothesis-building strategy – which was not possible at the onset of the study. Hence, we consider that the present study represents a necessary step underpinning changes to future mine closure planning to better account for climatic variability.