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*This manuscript has been previously reviewed at another Nature Research journal. This document only contains reviewer comments and rebuttal letters for versions considered at Communications Earth & Environment.*

15th Dec 20

Dear Ms Mason,

Your manuscript titled "Rapid metal pollutant deposition from the volcanic plume of Kīlauea, Hawai'i" has now been seen by our reviewers, whose comments appear below. In light of their advice I am delighted to say that we are happy, in principle, to publish a suitably revised version in Communications Earth & Environment under the open access CC BY license (Creative Commons Attribution v4.0 International License).

We therefore invite you to revise your paper one last time to address the remaining concerns of our reviewers. At the same time we ask that you edit your manuscript to comply with our format requirements and to maximise the accessibility and therefore the impact of your work.

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We hope to hear from you within two weeks; please let us know if you need more time.

Best regards,

Joe Aslin

Associate Editor,  
Communications Earth & Environment  
<https://www.nature.com/commsenv/>  
Twitter: @CommsEarth

#### REVIEWERS' COMMENTS:

Reviewer #1 (Remarks to the Author):

I think the authors responded well to all comments raised in my review and those of the two other reviewers. I would thus suggest accepting the paper without further changes.

Celine Mandon

Reviewer #3 (Remarks to the Author):

I recommend that this paper be published. It is well written and organised by a skilled internationally-recognized team of researchers in the field of volcanic plume analysis. It records a well

conducted study during an intense eruptive phase and should serve as a guide for future studies on other volcanoes in both the methodology and the analysis of data. I made similar comment on the original version of this paper and noted at that time that it suffered from jargonism. This is now all gone and the paper reads well as both a report and a scientific narrative.

My only minor comments are;

line 158. Delete the phrase 'Given the redox state of

159 Kīlauea melt'. This is unnecessary and potentially controversial given some recent unpublished synchrotron data. I think that the statement is true but why bring it in to this story anyway. Also be careful of the Gerlach summary of analyses (44) because he uses 'correspondence temperatures' for recalculation of primary analyses. It would be appropriate for you to cite his later papers on Hawaii gas emissions (Hager et al, 2008, Sutton 2001).

line 177 - edit 'are have'

I was pleased to review this revised manuscript - richard w henley

REVIEWERS' COMMENTS:

Reviewer #1 (Remarks to the Author):

I think the authors responded well to all comments raised in my review and those of the two other reviewers. I would thus suggest accepting the paper without further changes.

Celine Mandon

Many thanks to Celine for her thorough review of this work, which improved the manuscript greatly.

Reviewer #3 (Remarks to the Author):

I recommend that this paper be published. It is well written and organised by a skilled internationally-recognized team of researchers in the field of volcanic plume analysis. It records a well conducted study during an intense eruptive phase and should serve as a guide for future studies on other volcanoes in both the methodology and the analysis of data. I made similar comment on the original version of this paper and noted at that time that it suffered from jargonism. This is now all gone and the paper reads well as both a report and a scientific narrative.

Many thanks to Richard for his detailed review of this work, which also helped to greatly improve the manuscript.

My only minor comments are;

line 158. Delete the phrase 'Given the redox state of 159 Kīlauea melt'. This is unnecessary and potentially controversial given some recent unpublished synchrotron data. I think that the statement is true but why bring it in to this story anyway.

We have removed this part of the sentence as suggested.

Also be careful of the Gerlach summary of analyses (44) because he uses 'correspondence temperatures' for recalculation of primary analyses. It would be appropriate for you to cite his later papers on Hawaii gas emissions (Hager et al, 2008, Sutton 2001).

We have removed the Gerlach reference here and have replaced it with Kroll et al. (2015) who demonstrate the statement to be true using direct measurements at Kīlauea.

line 177 - edit 'are have'

Thank you for spotting this – now corrected.

I was pleased to review this revised manuscript - richard w henley