This **Supplemental Material** accompanies McGregor, M., McFarlane, C.R.M., and Spray, J.G., 2021, U-Pb geochronology of apatite crystallized within a terrestrial impact melt sheet: Manicouagan as a geochronometer test site, *in* Reimold, W.U., and Koeberl, C., eds., Large Meteorite Impacts and Planetary Evolution VI: Geological Society of America Special Paper 550, https://doi.org/10.1130/2021.2550(22).

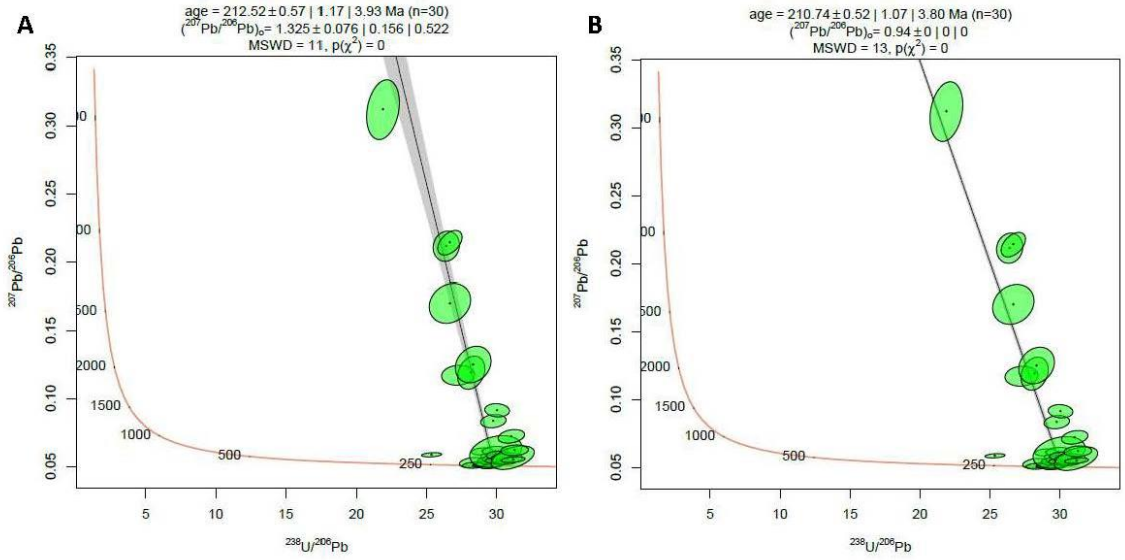

Figure S1. IsoplotR inverse concordia diagrams and age calculations of all zircon data as discussed in the main text (Table S1). **A)** Unanchored, free regression with a lower intercept age of 212.5 ± 1.2 Ma (MSWD = 11, n = 30) and a y-intercept $^{207}Pb/^{206}Pb$ value of 1.35. **B)** The same dataset used in A) but with the regression anchored using a $^{207}Pb/^{206}Pb$ value of 0.941 from O'Connell-Cooper et al. (2012) yielding a lower intercept age of 210.7 ± 1.1 Ma (MSWD = 13, n = 30) (see Fig. 4a, black crosses).

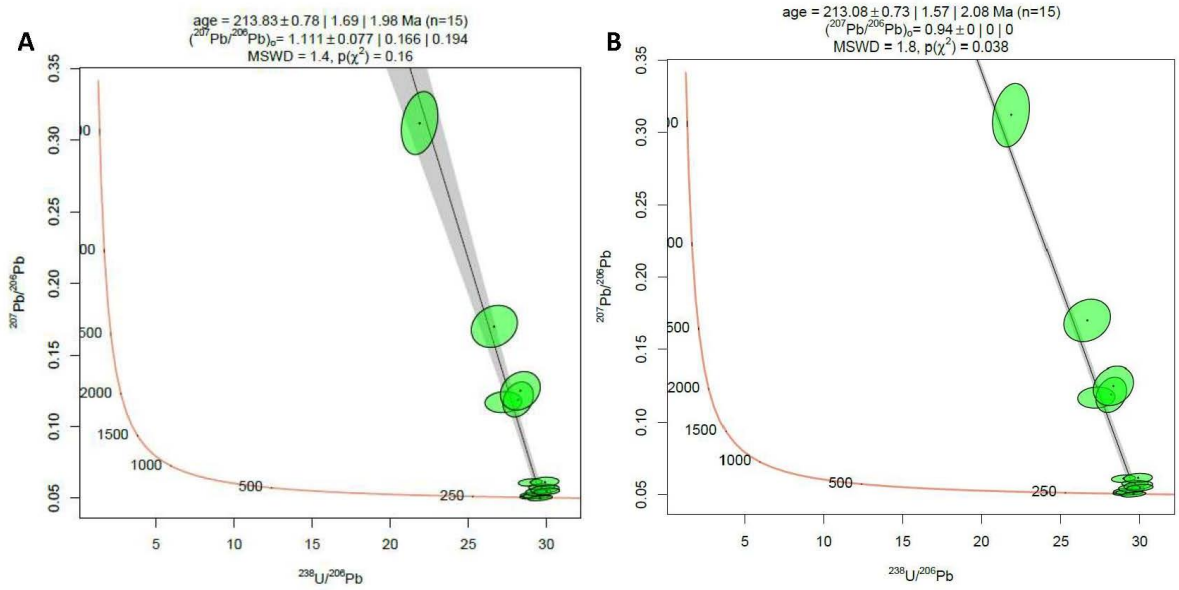

Figure S2. IsoplotR inverse concordia diagrams and age calculations of the zircon data subset as discussed in the main text (Table S1). **A)** Unanchored, free regression with a lower intercept age of 213.8 ± 1.7 Ma (MSWD = 1.4, n = 15) and a y-intercept $^{207}Pb/^{206}Pb$ value of 1.11. **B)** Regression through same subset as in A) but anchored using a $^{207}Pb/^{206}Pb$ value of 0.941 from O'Connell-Cooper et al. (2012) yielding a lower intercept age of 213.1 ± 1.6 Ma (MSWD = 1.8; n = 15) (see Fig. 4a, red ellipses).

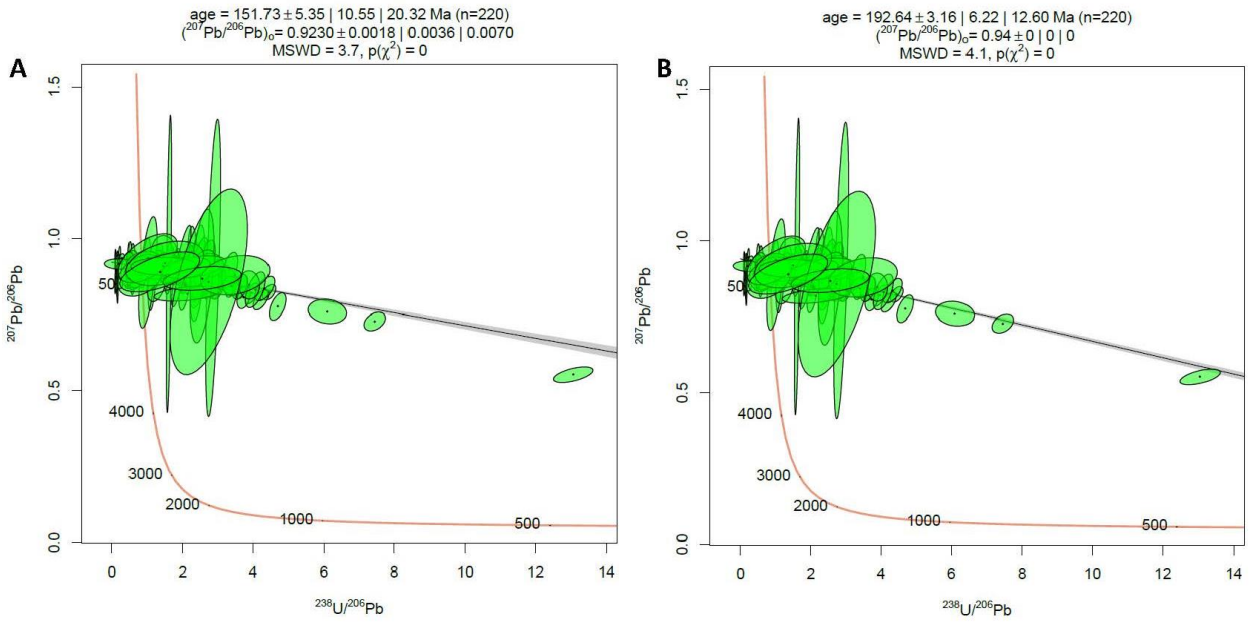

Figure S3. IsoplotR inverse concordia diagrams and age calculations of all apatite data (excluding points with $^{206}Pb/^{238}U$ and $^{207}Pb/^{206}Pb > \pm 1.0$) as discussed in the main text (Table S2). **A)** Free, unanchored regression with a lower intercept age of 151.7 ± 10.5 Ma (MSWD = 3.7, n = 220). **B)** Anchored regression using a $^{207}Pb/^{206}Pb$ value 0.941 from O'Connell-Cooper et al. (2012) yielding a lower intercept age of 192.6 ± 6.2 Ma (MSWD = 4.1, n = 220) (see Fig. 4b, black crosses).

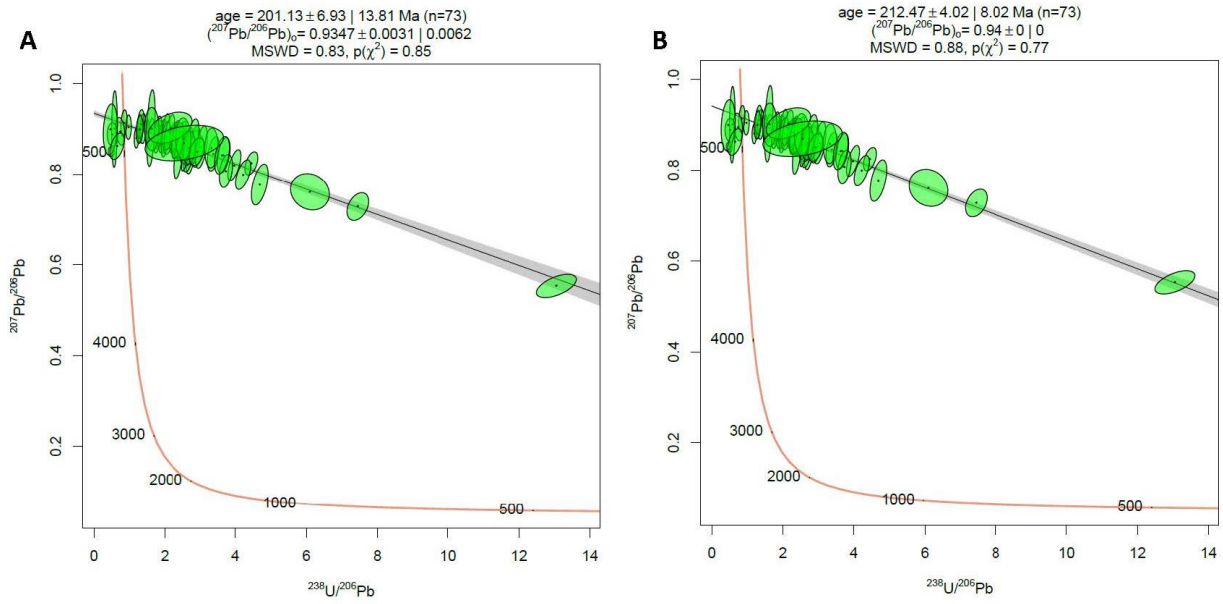

Figure S4. IsoplotR inverse concordia diagrams and age calculations of the apatite data subset (see text for refinement protocol) (see Fig. 4b; Table S2). **A)** Free, unanchored regression with a lower intercept age of 201.1 ± 13.8 Ma (MSWD = 0.83, n = 73) and a y-intercept $^{207}Pb/^{206}Pb$ value of 0.9347. **B)** Regression anchored using a $^{207}Pb/^{206}Pb$ value 0.941 from O'Connell-Cooper et al. (2012) yielding a lower intercept age of 212.5 ± 8 Ma (MSWD = 0.88) (see Fig. 4b; red ellipse).

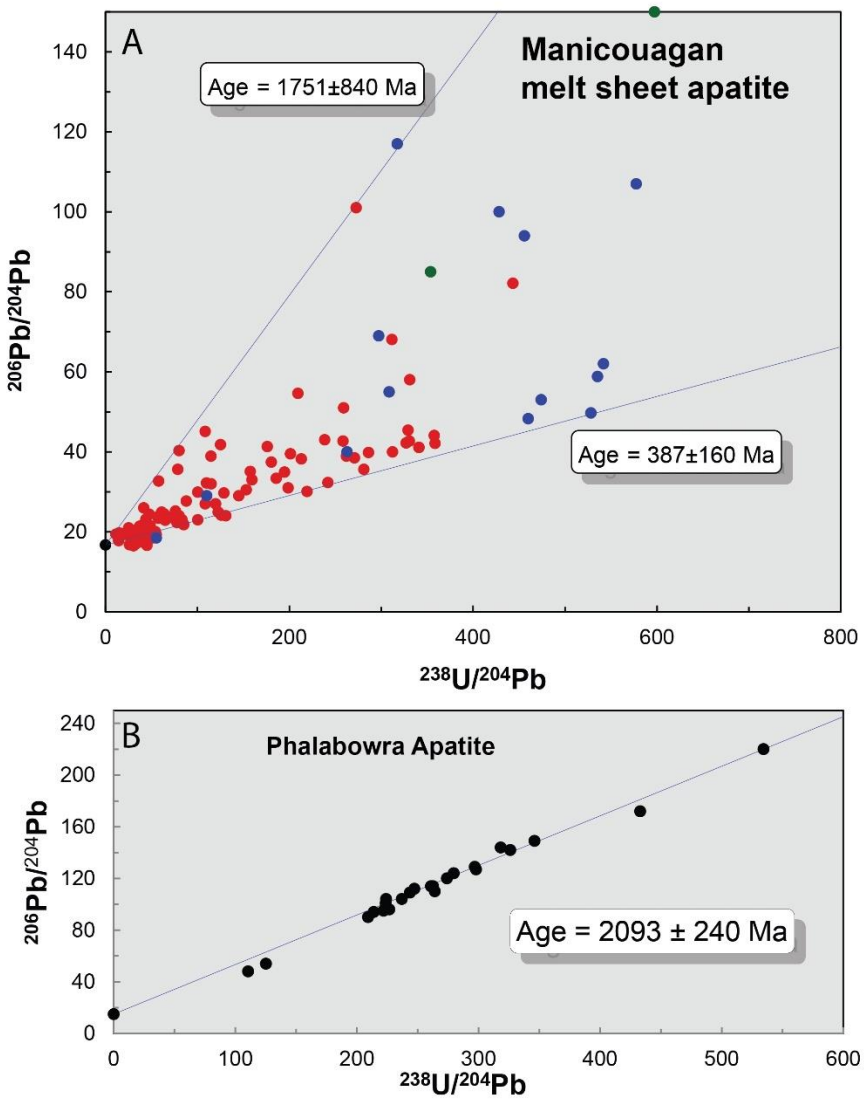

Figure S5. A) All apatite data plotted in $^{206}Pb/^{204}Pb$ versus $^{238}U/^{204}Pb$ space showing variation in the recorded Pb*/PbC within triangular area defined by two end-member populations; 1751 ± 840 Ma corresponds to the age of the basement, while 387 ± 160 Ma corresponds to the age of impact event. Red dots indicate data points with the smallest error, followed by blue and green with increasing error size. **B)** $^{206}Pb/^{204}Pb$ versus $^{238}U/^{204}Pb$ for our in-house Phalabowra apatite showing a linear isochron that is indicative of a single common Pb composition upon crystallization.