Figure F1. Bruker Tracer 5 pXRF instrument setup (A) during Expedition 393 and (B) at Texas A&M University following Expedition 390. C. Internal rock surface standards. D. Prolene film-capped polymer holders used to mount international powder reference materials for pXRF secondary calibration.

Figure F2. Representative examples of sawed SAT core surfaces and areas that would be designated as background or altered for pXRF analysis, Expedition 390. Features that would be avoided, such as glass, large phenocrysts, and veins, are noted. The ellipses are approximately the same size as the pXRF detection window.

Figure F3. Secondary calibration plots with linear and polynomial regressions for powder reference materials measured alongside Expedition 390 drill cores. Equations shown were applied to the pXRF data output (*x*) to give a calibrated value (*y*).

Figure F4. Secondary calibration plots with linear and polynomial regressions for powder reference materials measured alongside Expedition 393 drill cores. Equations shown were applied to the pXRF data output (*x*) to give a calibrated value (*y*).

Figure F5. Core mean ICP-AES corrections for TiO_2, Y, and Zr, Expedition 390. Mean ICP-AES values are shown for each core versus pXRF values for the same core following secondary calibration (see Figure F3). Regressions are applied to Expedition 390 pXRF data to correct residual errors and force alignment with the ICP-AES data set.

Figure F6. Drift assessment and Zr drift correction, Expedition 390. Core mean pXRF data for (A) TiO_2 and (B) Y showing excellent correspondence to ICP-AES data and no drift following corrections shown in Figure F5. C. Zr ICP-AES/pXRF core mean data showing residual drift following global corrections. Fourth-order polynomial fit through ICP-AES/pXRF ratios versus campaign analysis number gives Zr drift correction function. D. Drift-corrected Zr pXRF values scatter with ±20% of ICP-AES, with residual underestimates in lowermost Hole U1556B.

Figure F7. Precision, accuracy, and drift assessment. Expedition 390: (A) rock surface standard RS-5R and (B) BHVO-2 powder mount. Expedition 393: (C) RS-5R and (D) BHVO-2 powder mount. The measured/reference value ratio has been reversed compared to Figure F6. Expedition 390 and 393 analyses have differing *x*-axes due to the different campaign time frames.

Figure F8. Fully calibrated and corrected pXRF compositions versus shipboard ICP-AES for discrete samples, Hole U1560B. Good correspondence between data sets for fluid-mobile elements K, Cu, and Zn indicates excellent accuracy despite inconclusive rock surface standard assessments.