Characterization of the MAX porphyry Mo deposit using trace element geochemistry in hydrothermal alteration minerals, Trout Lake, B.C.

Ayat Baig

Submitted in partial fulfillment of the requirements for the degree of

Master of Science – Geology

Supervisors: Dr. Peter Hollings (Lakehead University)

and Dr. David R. Cooke (CODES – University of Tasmania)

ABSTRACT

Over the last few decades it has become increasingly difficult to discover new ore deposits and as existing deposits are exhausted, techniques for improving exploration success are becoming vital. In this study I investigated the application of trace element mineral geochemistry, in the context of well-defined petrology and field mapping, to the identification and characterization of hydrothermal alteration of a small porphyry Mo deposit located in southeastern B.C., Canada. Detailed geochemical analysis of the MAX Mo-porphyry deposit was undertaken and the use of trace element geochemistry signatures of hydrothermal alteration minerals were established. Ninety-six samples were collected from surface, underground and drill core and graphic core logging was carried out on five holes. Whole rock geochemistry was obtained for all samples in order to observe any general alteration trends. The trace element concentrations of quartz, chlorite and epidote were analysed using laser ablation inductively-coupled plasma mass spectrometry. Cathodoluminescence was used to show textural differences and growth zoning in quartz and to observe different generations of quartz. The results indicated that in hydrothermal quartz Ti, Al and Li showed systematic increases in concentration towards the porphyry center and could be used to infer the temperature of formation. The concentrations of Ti, Al, Li, Ge, Mg and Fe could be used to distinguish between different types of quartz. Hydrothermal quartz showed the most variance when it came to concentrations of individual trace elements, whereas regional metamorphic quartz that was unaffected by hydrothermal alteration had the lowest concentration of trace elements and a uniform trace element chemistry regardless of proximity to the deposit center. Igneous quartz was depleted in Ge relative to hydrothermal and metamorphic quartz.

For chlorite it was found that Ti, V and Sr concentrations varied depending on distance from the porphyry center. Both Ti and V decreased in concentration away from the deposit center, whereas Sr peaked around 350 – 400 meters and then decreased away from the deposit center. The trace element alteration vectors identified in this study combined with subtle, but identifiable, field criteria may assist exploration companies in the search for hidden deposits.

ACKNOWLEDGMENTS

I would foremost like to thank Dr. Peter Hollings for his help and support, keeping me on track and motivated to see this study through till the end. I learned and accomplished so much under his supervision, and it was an honor to have him as a supervisor. I would also like to thank Dr. David R. Cooke who shared his experience and knowledge with me and provided me with helpful feedback when it came to presentations and on my writing. Dr. Cooke and the team based out of CODES – Tasmania, Mike Baker, Lejun Zhang, Carlos Jiminez, Joshua Phillips, Nathan Fox and Nic Jansen, were very patient hosts and aided me with my analytical work while I was visiting. I would further like to thank the faculty and my friends at Lakehead University who supported me and made my time at Lakehead University very enjoyable. The Amira International P1060 industry sponsors: AngloGold, Ashanti, Anglo American, Barrick, BHP Billiton, Buenaventura, CODELCO, Eldorado Gold, First Quantum, Freeport-McMoran, Gold Fields, G-Resources, Inmet Mining, Intrepid Mines, Lundin Mining, MMG, Newcrest, Newmont, Rio Tinto, Teck, Vale and Xstrata (Glencore), who funded my study. I would like to thank Scott Broughton and Roca Mines Inc. for allowing me to use their facilities and conduct research on their premises. I would also like to thank my friend Julius Duku, who provided assistance in the field; his positive attitude and diligence made work easy, efficient and enjoyable. I would like to thank Melissa Anderson who helped me throughout my undergrad and is always there to answer any questions I may have with a thoughtful and sometimes even correct answer. I would like to thank my uncle Dr. Hamid Mumin for his support throughout the years with his knowledge and advice. I would further like to thank my family and particularly my mother who always supported me no matter what I did and that is probably why it took me so long to find a profession.

Table of Contents

Chapter 1 : Introduction 1

1.1 Overview 1

1.2 Porphyry Mo deposits 3

1.3 Previous Research 5

1.4 Mining History 6

1.5 Purpose of Study 8

Chapter 2 : Regional Geology and Geologic Setting 9

2.1 Regional Geology 9

2.2 Structural Features 17

Chapter 3 : Local Geology and Mineralogy 19

3.1 Introduction and Methodology 19

3.2 Hydrothermal alteration 21

3.3 Results 27

3.3.1 Mineralogy by rock type: Igneous Intrusive Phases 27

3.3.2 Mineralogy by rock type: Paleozoic Lardeau Group metasedimentary rocks 36

3.3.3 Hydrothermal rocks and veins 41

Chapter 4 : Whole rock geochemistry 46

4.1 Introduction 46

4.2 Methodology 46

4.3 Results 47

Chapter 5 : Trace Element Geochemistry of Quartz, Chlorite and Epidote 53

5.1 Introduction 53

5.2 Methodology 56

5.3 Quartz analysis 62

5.3.1 Quartz cathodoluminescence 64

5.4 Chlorite and epidote analyses by LA-ICP-MS 66

5.4 Results: Trace element analysis of quartz, chlorite and epidote 66

5.5.1 Trace element analysis of quartz 66

5.6.1 Trace element analysis of epidote and chlorite 101

Chapter 6 : Discussion and Conclusions 110

6.1 Discussion 110

6.1.1 Quartz Mineral Chemistry 110
6.1.2 Chlorite and Epidote Mineral Chemistry 122
6.2 Recommendations 125
6.3 Conclusions 125
References 127
Appendices 139

List of Figures

Figure 1.1.1 Map showing location of Trout Lake (A), and map showing terranes of British Columbia, Canada (B). Image B Modified from Tusk (2008). 1
Figure 1.2 Molybdenite mineralization in micro-fractures within granodiorite, also showing quartz vein stockwork. 2
Figure 1.3 Granodiorite dyke with disseminated Mo, also showing quartz vein stockwork and contact with metasedimentary rocks. 3
Figure 2.1 Map showing location of Trout Lake within Southeastern British Columbia, Canada. B Google Earth image showing mine site, mill and tailing pond. 10
Figure 2.2 Map showing the five major geomorphological belts within British, Columbia. Also shows location of the Trout Lake mine within the Omineca Belt (modified from Tusk, 2008). 11
Figure 2.3 Stratigraphic column showing the dominant geology in the Kootenay terrane, British Columbia, with specific attention to the Lardeau Group which hosts the Trout Lake mine. Relative thickness is not to scale. (Modified from Logan and Drobe, 1993). 14
Figure 2.4 (A) Map view showing groups and exposed formations, also location of Kuskanax Batholith in relation to Trout Lake deposit (MAX mine). (B) Cross-section from A – A', showing thrust fault as well as axis of the Trout Lake syncline. (C) Stratigraphic column showing thrust fault and the Lardeau Group in relation to the Millford and Kaslo Group. (Kraft et al. 2007) 16
Figure 3.1 Geology map of the Trout Lake mine area showing sample locations at surface, as well as the currently identified extent of the alteration halo surrounding the Trout Lake granodiorite stock as identified by Read et al. (2009). 20
Figure 3.2 Graphic log of drillhole 05-01, showing lithology, relative Mo content, quartz vein %, chlorite modal % and sample locations. Minor lithologies (> 30cm wide) not shown. Collar location: NAD83 457387.8E, 5609573.6N, azimuth 251.08, dip -14.7. 23
Figure 3.3 Graphic log of drillhole 07-03, showing lithology, Mo wt %, Qz vein %, and sample locations. Minor lithologies (> 30cm wide) not shown. Collar location: NAD83 457317.6E, 5609481.6N, azimuth 259.5, dip -74. 24
Figure 3.4a Graphic log of drill hole 07-04, showing lithology, Mo wt %, Fe %, and sample locations. Minor lithologies (> 30cm wide) not shown. Collar location: NAD83 457359.5E, 5609586.25N, azimuth 240, dip -57. 25

Figure 3.5 Sample MX12AB096. Photomicrograph in cross-polarized light showing polysynthetic twinning and sericitization of feldspars. Also showing larger plagioclase grains surrounded by smaller quartz grains. F.O.V. = 3.15mm x 2.15mm. 27
Figure 3.6 Sample MX12AB027. Photomicrograph in cross-polarized light (A) and plain polarized light (B) showing plagioclase that has been locally altered to clinozoisite and muscovite. The clinozoisite appears blue in cross-polarized light and has high relief in plain polarized light. F.O.V. = 1.0mm x 0.51mm. 28
Figure 3.7 Sample MX12AB079. Back scattered electron image showing fine-grained epidote and potassium feldspar altered from plagioclase. 29
Figure 3.8 Sample MX12AB096. Photomicrograph in cross-polarized light showing tartan twinning and carlsbad twinning in potassium feldspars. Polysynthetic twinning can be seen in plagioclase. F.O.V. = 3.15mm x 2.15mm. 29
Figure 3.9 Sample MX12AB027. Photomicrograph in cross-polarized light showing compositional growth zoning within plagioclase. F.O.V. = 3.15mm x 2.15mm. 29
Figure 3.10 Sample MX12AB096. Photomicrograph in plain polarized light (A) and cross-polarized light (B) of same location. Biotite has been altered to chlorite, titanite and muscovite. Bird's eye texture can be seen in biotite. Also triple junction grain boundaries of quartz may be observed, suggesting dissolution and recrystallization. F.O.V = 1.55mm x 1.05mm. 30
Figure 3.11 Sample MX12AB096. Photomicrograph in reflected light showing anhedral pyrite associated with finer grained chalcopyrite and fibrous molybdenite with kink banding located in quartz veinlet that crosscuts granodiorite. F.O.V = 1.55mm x 1.05mm. 30
Figure 3.12 Sample MX12AB088. Photomicrograph in cross-polarized light showing simple twinning in plagioclase. Also shows moderate sericitization of plagioclase and anomalous blue birefringence of chlorite. F.O.V = 1.55mm x 1.05mm. 31
Figure 3.13 Sample MX12AB088. Photomicrograph in cross-polarized light showing polysynthetic twinning in medium-grained plagioclase surrounded by fine-grained quartz. F.O.V = 1.55mm x 1.05mm. 31
Figure 3.14 Sample MX12AB088. Photomicrograph in cross-polarized light showing quartz phenocrysts surrounded by chlorite and equigranular quartz with triple junction grain boundaries. F.O.V = 1.55mm x 1.05mm. 31
Figure 3.15 Sample MX12AB088. Photomicrograph in cross-polarized light showing compositional growth zoning in plagioclase. Also shows sericitization of plagioclase along fractures. F.O.V = 1.55mm x 1.05mm. 31
Figure 3.16 Sample MX12AB088. Photomicrograph in plain polarized light showing chlorite and sphene altered from biotite. Also shows moderate sericitization of plagioclase. F.O.V = 1.55mm x 1.05mm. 32
Figure 3.17 Sample MX12AB086. Photomicrographs in cross-polarized light showing graphic and myrmekitic intergrowths of quartz and microcline in aplite. F.O.V. = 3.15mm x 2.15mm. 33
Figure 3.18 Sample MX12AB086. Photomicrograph in cross-polarized light showing tartan twinning of microcline and polysynthetic twinning of albite in aplite. Both feldspars have quartz intergrowths and inclusions of muscovite. F.O.V. = 3.15mm x 2.15mm. 33
Figure 3.19 Sample MX12AB086. Photomicrograph in reflected light showing bladed molybdenite intergrown with radiating muscovite in aplite. F.O.V. = 3.15mm x 2.15mm. 33

Figure 3.20 Sample MX12AB083. Photomicrographs in plain and cross-polarized light showing sericite alteration of feldspars. Feldspars are surrounded by finer grained quartz. F.O.V. = 3.15mm x 2.15mm... 34
Figure 3.21 Sample MX12AB083**.** Photomicrograph in plain polarized light (A) and cross-polarized light (B) showing chlorite, sphene, muscovite, and magnetite altered from biotite, surrounded by fine-grained quartz; F.O.V. = 3.15mm x 2.15mm. Photomicrograph in reflected light (C) showing fine-grained magnetite altered from biotite. Along the margin there is pyrite with finer grained chalcopyrite; F.O.V = 1.55mm x 1.05mm. 35
Figure 3.22 Sample MX12AB025. Photomicrograph in cross polarized light showing decussate texture of mica, having no preferred orientation, in the mica hornfels. F.O.V. = 3.15mm x 2.15mm. 37
Figure 3.23 Sample MX12AB023. Photomicrograph in plain polarized light showing decussate texture of biotite, having no preferred orientation, in the mica hornfels. F.O.V. = 3.15mm x 2.15mm. 37
Figure 3.24 Sample MX12AB012. Photomicrograph in cross polarized light showing asymmetrical crenulation of muscovite in mica schist. F.O.V. = 3.15mm x 2.15mm. 37
Figure 3.25 Sample MX12AB024. Photomicrograph in cross polarized light showing sericite alteration of feldspars in mica hornfels. F.O.V. = 3.15mm x 2.15mm. 37
Figure 3.26 Sample MX12AB017. Photomicrograph in reflected light showing pyrite and lesser magnetite aligned with mica in the mica schist. F.O.V. = 3.15mm x 2.15mm. 38
Figure 3.27 Sample MX12AB011. Photomicrograph in cross polarized light showing asymmetrical crenulation of muscovite. F.O.V. = 3.15mm x 2.15mm. 39
Figure 3.28 Sample MX12AB011. Photomicrograph in cross polarized light showing granoblastic quartz with seriate grain boundaries and undulatory extinction. F.O.V. = 3.15mm x 2.15mm. 39
Figure 3.29 Sample MX12AB011. Photomicrograph in reflected light showing medium-grained pyrite and fine-grained magnetite laths disseminated and following crenulation of micaceous layers. Also chalcopyrite can be seen associated with the pyrite. F.O.V. = 1.55mm x 1.05mm. 39
Figure 3.30 Sample MX12AB068. Photomicrograph in cross polarized light showing subgrains and sutured grain boundaries in quartz with undulatory extinction. Also shows asymmetrical crenulation of muscovite and chlorite. 40
Figure 3.31 Sample MX12AB022. Photomicrographs in plain polarized light (A) and cross polarized light (B) showing fractured epidote with quartz between bands of aligned chlorite. Perpendicular to foliation there is acicular needle like crystals of actinolite. F.O.V. = 3.15mm x 2.15mm. 41
Figure 3.32 Sample MX12AB018. Photomicrographs in plain polarized light (A) and cross polarized light (B) showing chlorite along the margin of a quartz vein and mica schist. Cross polarized light image shows quartz with triple junction grain boundaries. F.O.V. = 3.15mm x 2.15mm. 42
Figure 3.33 Sample MX12AB023. Photomicrograph in cross polarized light showing sericite alteration of feldspar in mica hornfels. F.O.V. = 3.15mm x 2.15mm. 42
Figure 3.34 Sample MX12AB017. Photomicrograph in plain polarized light showing biotite increasing in abundance and grain size with proximity to quartz vein. F.O.V. = 3.15mm x 2.15mm. 42
Figure 3.35 Sample MX12AB023. Photomicrograph in reflected light showing medium-grained pyrite with fine- grained chalcopyrite along margin of quartz vein and hornfels. F.O.V. = 3.15mm x 2.15mm.. 43
Figure 3.36 Sample MX12AB096. Photomicrograph in reflected light showing subhedral pyrite with chalcopyrite and molybdenite in quartz veinlet within granodiorite. F.O.V. = 1.0mm x 0.51mm. 43
Figure 3.37 Sample MX12AB023. Photomicrograph in reflected light showing radiating molybdenite along margin of quartz vein and hornfels. F.O.V. = 3.15mm x 2.15mm. 43

Figure 3.38 Sample MX12AB023. Photomicrograph in reflected light showing radiating molybdenite within quartz vein. F.O.V. = 3.15mm x 2.15mm. 43
Figure 3.39 Sample MX12AB004. Photomicrograph in cross polarized light showing diopside and recrystallized calcite. F.O.V. = 3.15mm x 2.15mm. 44
Figure 3.40 Sample MX12AB004. Photomicrograph in cross polarized light showing tremolite vein with clinozoisite along margin. F.O.V. = 3.15mm x 2.15mm. 44
Figure 3.41 Sample MX12AB022. Photomicrographs in plain polarized light (A) and cross polarized light (B) showing brecciated epidote with fine-grained quartz and calcite along fractures. F.O.V. = 3.45mm x 3.2mm. 45
Figure 4.1 TAS diagram for samples taken from the granodioritic phase. After Middlemost (1994). 48
Figure 4.2 Primitive mantle normalized spider plots of granodiorite samples. Normalising values from Sun and McDonough (1989). 49
Figure 4.3 Primitive mantle normalized spider plots showing diorite samples. Normalising values from Sun and McDonough (1989). 50
Figure 4.4 Primitive mantle normalized spider plots showing tonalite samples. Normalising values from Sun and McDonough (1989). 51
Figure 4.5 Primitive mantle normalized spider plots showing trondhjemite sample. Normalising values from Sun and McDonough (1989). 52
Figure 5.1 Geological map of the MAX deposit area showing sample locations. The red dashed line is the extent of diopside alteration surrounding the Trout Lake granodiorite stock, as identified by Read et al. (2009). 54
Figure 5.2 Quartz major and trace element data by LA-ICP-MS, showing time in seconds *versus* number of counts of selected isotopes of interest. Counts are converted into concentration by using known quartz elemental stoichiometry and comparison to the known concentration of a silica standard. 56
Figure 5.3 Quartz LA-ICP-MS analysis shown graphically with the Sills program, used for data reduction. Selected intervals are shown shaded in blue. Example (A) shows a quartz grain boundary being breached and ablation of neighboring orthoclase. A total of 27.93 seconds of background data and 13.61 seconds of integrated quartz ablation were acquired, giving this analysis a quality ranking of 1.. (B) shows quartz with an aluminum, strontium inclusion. A total of 25.06 seconds of background data is integrated, as well as 22.91 seconds of integrated quartz ablation data, giving (B) a quality ranking of 2. Example (C) shows quartz with a chromium inclusion and a zircon inclusion. A total of 27.92 seconds of background data is integrated, as well as 24.34 seconds of integrated quartz ablation data, giving (C) a quality ranking of 2. (D) shows quartz with a stable spectrum and high Li. A total of 27.21 seconds of background data is integrated, as well as 49.40 seconds of integrated quartz ablation data, giving (D) a quality ranking of 4. 61
Figure 5.4 Tetrahedral quartz molecular structure showing types of elemental substitution that can occur. 63
Figure 5.5 Reflected light image (A) and CL image (B) of the same location in a quartz grain. Here compositional zoning is observed in the CL image. Images used in conjunction with SEM-EDS results to select locations for ablation. Sample number MX12AB057. NAD83 457183.5E, 5609380N. 65
Figure 5.6 Cathodoluminescence image of metamorphic quartz with Ti and Al concentrations for two locations. Luminescence is uniform throughout with ± 5 ppm variance in Al content and Ti below detection limits. Sample MX12AB046, circle 2. NAD83 459862E, 5612284N. 67

Figure 5.7 Cathodoluminescence image of hydrothermal quartz showing alteration along fractures with lighter and darker zones. Also showing Ti and Al concentrations for two locations. Higher luminescence corresponds with higher Ti and Al concentration. Sample MX12AB043, circle 2. NAD83 457370E, 5609567.4N. 67
Figure 5.8 Cathodoluminescence image of igneous quartz revealing banding, and Ti and Al concentrations for two locations. Aluminum and Ti are higher in the brighter, more luminescent band. Sample MX12AB057, circle 1. NAD83 457183.5E, 5609380N. 68
Figure 5.9 Cathodoluminescence image of metamorphic quartz with Ti and Al concentrations for three locations. Luminescence is uniform throughout with ± 3 ppm variance in Al content and Ti below detection limits. Sample MX12AB015, circle 3. NAD83 458085E, 5610337N. 68
Figure 5.10 Cathodoluminescence image of hydrothermal quartz revealing banding, and Ti and Al concentrations for three locations within bands. Aluminum and Ti are higher in the brighter, more luminescent bands. Sample MX12AB009, circle 4. NAD83 457460E , 5609712N. 68
Figure 5.11 Cathodoluminescence image of igneous quartz revealing banding, and Ti and Al concentrations for three locations within bands. Luminescence appears to increases with increasing Aluminum and Ti content. Sample MX12AB076, circle1. NAD83 457407.5E, 5609573.9N. 68
Figure 5.12 Quartz phenocryst in granodiorite (A). Cathodoluminescence images (B, C) shows differing bands of luminescence. White streaks (B, C) and dark crosshair (B) are artifacts. Sample MX12AB055, circle 2. NAD83 457508E, 5609672N. 70
Figure 5.13 Quartz phenocryst in quartz altered granodiorite. Crystals display tonal variation which correspond to growth zones. White streaks (C) and dark crosshair (B) are artifacts. Sample MX12AB076, circle 1. NAD83 457507E, 5609672N. 71
Figure 5.14 Quartz phenocryst in potassic altered granodiorite (A). Crystals display tonal variation caused by compositional zoning and dissolution along grain boundaries and fractures (B,C). Sample MX12AB028, circle 4. NAD83 457801E, 5609853N. 72
Figure 5.15 Box and whisker plot showing trace element concentrations in primary igneous quartz. Concentrations obtained from 103 LA-ICP-MS spot analyses taken from eleven samples from the MAX deposit. 73
Figure 5.16 Photomicrograph in cross-polarized transmitted light showing quartz subgrains and sutured grain boundaries as well as asymmetrical crenulation of biotite and muscovite in chlorite mica schist. Sample MX12AB068. 75
Figure 5.17 Photograph of silicified biotite schist showing deformed granoblastic quartz layers parallel to foliation (green line). Schist is cross-cut by hydrothermal quartz veins, some of which are sub-parallel to foliation (blue line). 75
Figure 5.18 Fabric parallel quartz vein in mica schist (A). Regionally metamorphosed quartz is monochromatic under SEM-CL displaying triple junction and sutured grain boundaries (B, C). Sample MX12AB011, circle 2. NAD83 457741E, 5610261N. 76
Figure 5.19 Quartz pod in silicified biotite schist. Regionally metamorphosed quartz is monochromatic under SEM-CL displaying triple junction and sutured grain boundaries due to recrystallization. Also showing subgrains. Sample MX12AB046, circle 2. NAD83 459862E, 5612284N. 77

Figure 5.20 Box and whisker plot showing trace element concentrations in regional metamorphic quartz. Concentrations obtained from 77 LA-ICP-MS spot analyses taken from nine samples from the MAX deposit (Table 5.2). Blue line is maximum concentrations for hydrothermal quartz. 78
Figure 5.21 Quartz lenses in a silicified phyllite. Darker quartz contrasting lighter nucleus caused by compositional variance within the crystal. Otherwise crystals show typical regional metamorphic textures (i.e. triple junction and sutured grain boundaries). Dark crosshair (B) is an artifact, dark line (C) is outline of circle drawn in black marker. Sample MX12AB047, circle 1. NAD83 459865E, 5612284N. 81
Figure 5.22 Quartz + calcite + epidote vein in chlorite schist. CL image displaying variation in luminescence in quartz caused by compositional zoning. Also shows triple junction grain boundaries produced by metamorphic recrystallization. Sample MX12AB022, circle 1. NAD83 459830E, 5611023N. 82
Figure 5.23 Quartz veins in biotite schist. Zones of differing luminescence may be seen within individual crystals. Relict triple junction grain boundaries are present but dissolution has occurred along these boundaries. Sample MX12AB024, circle 1. NAD83 457801E, 5609853N. 83
Figure 5.24 Quartz vein in silicified mica schist (A). Crystals display tonal variation – darker nucleus surrounded by zones of higher luminescence (B,C). Crystals are sub to anhedral and locally show dissolution along grain boundaries and fractures. Sample MX12AB074, circle 1. NAD83 457500.1E, 5609665.5N. 84
Figure 5.25 Box and whisker plot showing trace element concentrations in hydrothermally altered quartz. Concentrations obtained from 14 LA-ICP-MS spot analyses taken from three samples from the MAX deposit. Green outlines maximum metamorphic concentration. 85
Figure 5.26 Quartz vein in biotite mica schist (A). Cathodoluminescence images reveal lamellae, veinlets, and mottled pattern (B, C). Sample MX12AB012, circle 3. NAD83 458298E, 5610550N. 88
Figure 5.27 Hydrothermal quartz vein containing molybdenite, pyrite, and pyrrhotite (A). Quartz displays cellular porous texture with inclusions of bladed elongate crystals of molybdenite (B, C). Sample MX12AB023, circle 2. NAD83 457801E, 5609953N. 89
Figure 5.28 Hydrothermal quartz vein (A). Cathodoluminescence image displays irregular tonal variation in quartz (B, C). Sample MX12AB089, circle 2. NAD83 457363.9E, 5609519.3N. 90
Figure 5.29 Box and whisker plot showing trace element concentrations in hydrothermal quartz. Concentrations obtained from 273 LA-ICP-MS spot analyses from 34 samples from the MAX mine. n = number of analyses. 91
Figure 5.30 Ternary plot showing Li (x10) *versus* Al (/5) *versus* Ge (x10) for all LA-ICP-MS quartz spot data. Igneous quartz is distinguished by relatively high Li and low Ge (red oval - 86% of data), and metamorphic quartz by relatively high Ge (x10) and low Al/5 and Li (x10) (green rectangle - 93% of data). Hydrothermal quartz has the highest variation in Li, Al and Ge (blue rectangle - 65% of data) 93
Figure 5.31 Geological map showing the trace element concentration of Al (ppm) in quartz. Alteration isograd (red dashed line from Read et al., 2009) outlines the extent of diopside alteration and all known Mo mineralization. 95
Figure 5.32 Cross-section showing trace element concentration of Al (ppm) in quartz approaching the Trout Lake stock from adit. Data from within 50 meters of the section is projected onto the cross-section. Cross-section modified from Lawley et al. (2010). 96

Figure 5.33 Geological map showing the trace element concentration of Ti (ppm) in quartz. Alteration isograd (red dashed line from Read et al., 2009) outlines the extent of diopside alteration and all known Mo mineralization. 96
Figure 5.34 Cross-section showing trace element concentration of Ti (ppm) in quartz approaching the Trout lake stock from adit. Data from within 50 meters of the section is projected onto the cross-section. Cross-section modified from Lawley et al. (2010). 97
Figure 5.35 Scatter plot displaying distance from center of deposit *versus* Ti (ppm) for hydrothermal quartz. Regression line shows overall trend of Ti increasing with proximity to the deposit center. n = number of analyses. 98
Figure 5.36 Geological map showing the trace element concentration of Li (ppm) in quartz. Alteration isograd (red dashed line from Read et al., 2009) outlines the extent of diopside alteration and all known Mo mineralization. 99
Figure 5.37 Cross-section showing trace element concentration of Li (ppm) in quartz approaching the Trout lake stock from adit. Data from within 50 meters of the section is projected onto the cross-section. Cross-section modified from Lawley et al. (2010). 99
Figure 5.38 Scatter plots displaying distance from center of deposit *versus* Ge (ppm) for hydrothermal and regional metamorphic quartz. Regression lines shows overall trend of Ge decreasing with proximity to the deposit center, having an inverse relationship to Ge in metamorphic quartz. n = number of analyses. ... 100
Figure 5.39 Scatter plots displaying distance from center of deposit *versus* Ti and Li (ppm) for hydrothermal (right) and regional metamorphic quartz (left). Regression lines shows overall trend of elements increasing with proximity to the deposit center in hydrothermal quartz, and remaining relatively constant in regional metamorphic quartz. 100
Figure 5.40 Scatter plot showing distance from center (m) *versus* Ti (ppm) in chlorite. Titanium increases in concentration with proximity to the deposit center in chlorite. n = number of analyses. 102
Figure 5.41 Scatter plot showing distance from center of deposit (m) *versus* V (ppm) in chlorite. Vanadium increases in concentration with proximity to the deposit. n = number of analyses. 102
Figure 5.42 Scatter plot showing distance from center of deposit (m) *versus* Sr (ppm) in chlorite. Strontium concentrations peak around 400 meters and then decreases away from the deposit. n = number of analyses..... 103
Figure 5.43 Scatter plot showing distance from center of deposit (m) *versus* Eu (ppm) in epidote. There is a general increase in the maximum value of Eu concentration with proximity to the deposit center as shown by regression line. There is greater variation in concentration closest to the center of deposit. n = number of analyses. 106
Figure 5.44 Scatter plot showing distance from center of deposit (m) *versus* Sb (ppm) in epidote. There is a general increase in Sb concentration with proximity to the deposit center as shown by regression line. n = number of analyses. 106
Figure 5.45 Scatter plot showing distance from center of deposit (m) vs. Sr (ppm) in epidote. There is an overall increase in Sr concentration with proximity to the deposit center as shown by regression line. n = number of analyses. 107
Figure 5.46 Scatter plot showing distance from center of deposit (m) vs. Ce (ppm) in epidote. There is an overall increase in Ce concentration with proximity to the deposit center as shown by regression line. n = number of analysis. 107

Figure 5.47 Scatter plot showing distance from center of deposit (m) vs. Sn (ppm) in epidote. There is an overall increase in concentration of Sn with distance from the deposit center. n = number of analyses. . 108
Figure 6.1 SEM-CL image of hydrothermally altered metamorphic quartz showing compositional growth banding and variation in Al and Ti concentrations at specific locations. Bands of higher luminescence have higher concentrations of Al and Ti than bands with relatively lower luminescence. Sample MX12AB074, circle 5. 112
Figure 6.2 Probability plots for Ti, Al and Li showing mineral chemistry data for regional metamorphic quartz (green) and igneous quartz (red). The elements are stable and in low concentrations in the metamorphic quartz where igneous quartz shows a range in concentration having higher concentrations than metamorphic quartz. 113
Figure 6.3 SEM-CL image of hydrothermal quartz showing compositional growth banding and variation in Al and Ti concentrations at specific locations. Sample MX12AB076, circle 1. 115
Figure 6.4 Scatter plot showing distance from center (m) *versus* Ti (ppm) with calculated peak temperatures at certain locations using Wark and Watson (2006) TitaniQ calculation. 117
Figure 6.5 Scatter plot showing distance from center (m) of deposit Vs. Ti (ppm) for mineral chemistry (A) and whole rock data (B). 120
Figure 6.6 Scatter plot showing distance from center (m) *versus* Ti/Al, for both mineral chemistry data (black) and whole rock data (green). The mineral chemistry data shows an increase with proximity to the deposit center while the whole rock data is relatively constant. 121
Figure 6.7 Scatter plot showing radial distance from the center of deposit (m) *versus* Ti LOG (ppm), for both mineral chemistry data (black) and whole rock data (green). The mineral chemistry data shows a gradual increase with proximity to the deposit center while the whole rock data is relatively constant. . 121
Figure 6.8 Scatter plot showing radial distance from the center of deposit (m) *versus* Li/Al, for both mineral chemistry data (black) and whole rock data (green). The mineral chemistry data shows an increase with proximity to the deposit center while the whole rock data is relatively constant. 122
Figure 6.9 Scatter plots showing radial distance from the Batu Hijau center versus elemental concentrations of Ti (A) and V (B) for the different igneous phases recognized at Batu Hijau. From Wilkinson et al. (2015). 124

List of Tables

Table 5.1 Primary igneous quartz LA-ICP-MS results, MAX 74
Table 5.2 Regional metamorphic quartz LA-ICP-MS results, MAX 79
Table 5.3 Hydrothermal alteration LA-ICP-MS results, MAX 86
Table 5.4 Hydrothermal vein quartz LA-ICP-MS results, MAX 92
Table 5.5 Average trace element concentrations in quartz 93
Table 5.6 Chlorite LA-ICP-MS results, MAX 104
Table 5.7 Epidote LA-ICP-MS results, MAX 108

Chapter 1 - Introduction

1.1 Overview

Located in southeastern British Columbia, Canada, the Trout Lake deposit (MAX) is a small, Late Cretaceous porphyry Mo deposit, situated 45 km southeast of Revelstoke, in the Northern end of the Kootenay Arc and the Southern end of the Omineca Belt (Fig. 1.1). The Kootenay Arc is a northeast trending structural zone of tightly folded Precambrian to Triassic sedimentary rocks. It is part of the Selkirk allochthon, a composite tectonic slice comprised of paleocontinental-margin deposits and marginal-basin type deposits (Brown and Lane, 1988). The docking of at least two allochthonous terranes in the Middle Jurassic to Middle Cretaceous, and Early Cretaceous to Late Cretaceous resulted in the Columbia Mountains; the range that hosts the MAX deposit (Linnen and William-Jones, 1987). The Trout Lake stock was emplaced near the end of a major post-collisional plutonic event during the Late Cretaceous period (Linnen and Williams, 1987).

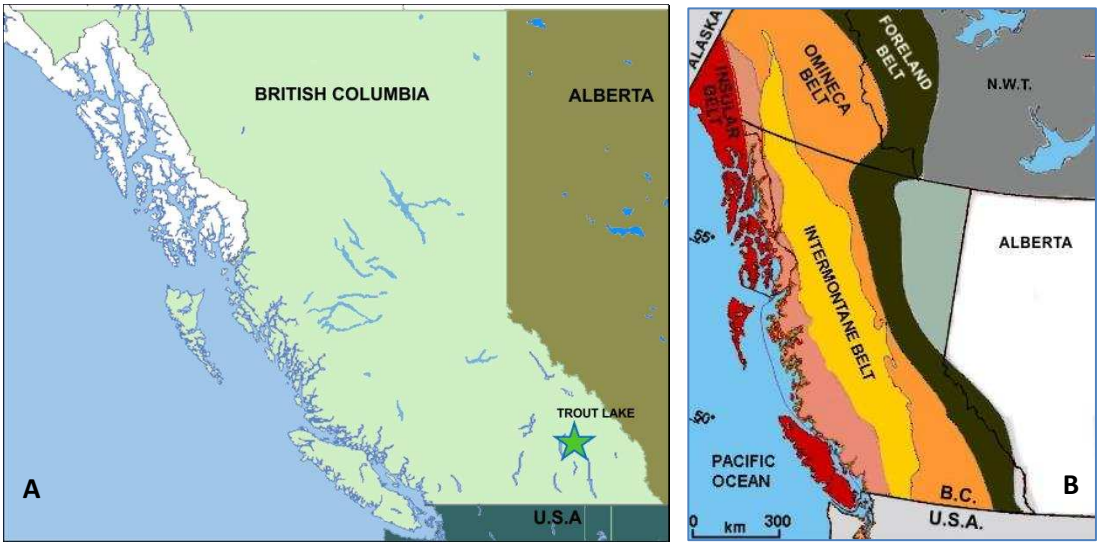


Figure 1.1 Map showing location of Trout Lake (A), and map showing terranes of British Columbia, Canada (B). Image B modified from Tusk (2008).

Molybdenum mineralization at MAX is hosted by the Late Cretaceous Trout Lake stock, and has a Re-Os molybdenite age of 80.2 ± 1.0 Ma (Lawley et al., 2010). Mineralization is structurally controlled in veins, fractures, stockworks and breccias associated with the Trout Lake stock (Linnen and William-Jones, 1987; Lawley et al., 2010; Fig. 1.2). The deposit has a reported resource of 42.9 million tonnes grading 0.2% MoS_2, with 0.92 million tonnes of Mo at a target grade of 0.5% and a high grade Mo zone of 0.28 million tonnes at a target grade of 1.95% MoS_2 (Macauley, 2004; Lawley et al., 2010; Britton et al., 2011). The Mo mineralization occurs as molybdenite (MoS_2), is disseminated and commonly coarse-grained (Linnen and William-Jones, 1987; Lawley et al., 2010) and is less commonly found as pyrrhotite-molybdenite intergrowths and stringers. Within the well-developed quartz stockwork (Fig. 1.3), there is typically low grade Mo mineralization (Linnen and William-Jones, 1987; Lawley et al., 2010).

Figure 1.2 Molybdenite mineralization in micro-fractures within granodiorite, also showing quartz vein stockwork.

Figure 1.3 Granodiorite dyke with disseminated Mo, also showing quartz vein stockwork and contact with metasedimentary rocks.

Regional metamorphic assemblages ranging up to greenschist facies are overprinted by contact metamorphic biotite mica hornfels and diopside zones related to the Trout Lake magmatic intrusion. A 1.2 by 2.0 km diopside isograd exists that defines the limit of the contact aureole hornfels and known Mo mineralization (Lawley et al., 2010). The hornfels is overprinted by potassic (K-feldspar + biotite), phyllic (sericite + quartz), silicic (quartz and increased quartz vein concentration) and propylitic alteration (chlorite + albite + epidote + titanite + carbonate). Propylitic alteration, which is only observed under the microscope, overprints other alteration assemblages (Lawley et al., 2010).

1.2 Porphyry Mo deposits

Porphyry deposits are the world's primary source for Mo and Cu and a major source for Au (Sinclair, 2007). They are typically large, low- to medium-grade, intermediate to felsic

intrusion-related deposits where hypogene mineralization is dominantly structurally controlled (Kirkham, 1972; Sinclair, 2007). Porphyry type deposits produce 95% of the world's Mo (Sinclair, 2007). Molybdenum is mined as both a by-product (Cu ±Au, Mo, Ag, Re, PGE; Au ±Ag, Cu, Mo; Sn ±W, Mo, Ag, Bi, Cu, Zn, In; Sn-Ag ±W, Cu, Zn, Mo, Bi) and as the main economic metal recovered from solely porphyry Mo deposits (Kirkham and Sinclair, 1995). There are two subtypes of porphyry Mo deposits 1) high grade deposits (generally 0.1 – 0.3% Mo) associated with fluorine-rich (generally >1%) extension-related, highly evolved granitic magmas (e.g., Climax, Henderson) that are also known as Climax-type deposits (Ludington and Plumlee, 2009) and 2) low grade deposits (generally <0.15% Mo) associated with fluorine-poor subduction related calc-alkaline magmas, also referred to as Endako-type deposits (e.g., Endako, MAX; Sillitoe, 1980; Kirkham and Sinclair, 1995; Sinclair, 2007).

Climax-type deposits typically range in age from the Late Cretaceous to Tertiary and are very rare with only thirteen known deposits worldwide, all of which are found in North America (Ludington and Plumlee, 2009). They are interpreted to have been emplaced post-subduction during regional extension (Ludington and Plumlee, 2009). Climax-type deposits are hosted in highly evolved granitic intrusions, with 72-77 wt.% SiO_2, commonly displaying strong differentiation (Mutschler et al., 1981; Sinclair, 2007; Ludington and Plumlee, 2009). Fluid inclusions from Climax-type deposits are typically hypersaline, which is rare in Endako-type porphyry Mo deposits (Linnen and William-Jones, 1990). Climax-type porphyry deposits have also been referred to as fluorine-enriched (Theodore and Menzie, 1984), or granite-type porphyry Mo deposits (Mutschler et al., 1981).

MAX is an Endako-type porphyry Mo deposit. These deposits are more varied in composition than the Climax-type, with associated intrusions ranging from intermediate to felsic

compositions with SiO_2 ranging from 65-72 wt.% (Sinclair, 2007). Fluid inclusions from this subtype commonly contain CO_2 and are typically low to moderately saline (Blake et al., 1979; Burrows and Spooner, 1987; Linnen and William-Jones, 1990). This subtype of porphyry has also been referred to as fluorine deficient (Theodore and Menzie, 1984), and granodiorite type porphyry Mo deposits (Mutschler et al., 1981; Linnen and William-Jones, 1990). MAX is typical of this subtype being related to a granodiorite intrusion, associated with convergent tectonic processes, with weak to moderate saline fluid inclusions containing CO_2 and fluids that were deficient in fluorine (Linnen and William-Jones, 1990).

1.3 Previous Research

The earliest written descriptions of the Trout Lake area geology were generated by Dawson in 1889, and later by Brock in 1903. The area was first mapped in 1929 (Walker at al., 1929), then in the 1960s (Fyles and Eastwood, 1962), and more recently the Geological Survey of British Columbia mapped the area as part of the 'Targeted Geoscience Initiative' in 2009 (Read et al., 2009). Furthermore, Boyle and Leitch mapped the area in 1983 focusing on alteration assemblages.

Linnen and William-Jones (1987) studied quartz vein orientations and relationships to investigate the structural evolution and controls on mineralization. They identified five main quartz vein trends at MAX. Trend 1 is parallel to foliation at 135° ± 15°, trend 2 is 045° ± 15°, trend 3 is 005° ± 15°, trend 4 was found to be the youngest and are sub-horizontal, and trend 5 is 095° ± 15° (Linnen and William-Jones, 1987). Vein trends 1 and 2 were observed to have the highest Mo grades out of the five trends (Linnen and William-Jones, 1987). All veins crosscut one another and regionally deformed quartz (Linnen and William-Jones, 1987). All trends are

interpreted to be broadly coeval, being related to a latent stress field produced from the collisions of allochthonous terranes with North America (Linnen and Williams-Jones, 1987).

Linnen and William-Jones (1990) completed a fluid inclusion study of the Trout Lake MAX deposit, which indicated that fluids were derived from fluorine-deficient, subduction-related calc-alkaline porphyry and related this evolution to the molybdenite mineralization. Lawley et al. (2010) undertook a study of the geochronology of the igneous phases, alteration, and mineralization at MAX (Lawley et al., 2010). Uranium/lead dates on zircon from within the granodiorite intrusion (80.2 ± 1.0 Ma) and Re/Os dates on Mo mineralization (early 80.5 ± 0.4 Ma, late 80.1 ± 0.4 Ma) were found to be within error of each other, indicating that crystallization of the stock and hydrothermal Mo mineralization were coeval and likely cogenetic (Lawley et al., 2010). A fluid inclusion study conducted by Lawley et al. (2010) showed that proximal Pb-Zn-Ag quartz veins represented a late stage hydrothermal event linked to the Trout Lake intrusion.

1.4 Mining History

The establishment of the Revelstoke smelter in 1890 led to an increase in exploration in the Trout Lake area (Lawley et al., 2009). Primary metals of interest were gold, silver, lead and copper. Also aiding in ramping up exploration, particularly for silver was the founding of the Silver Cup mine, located 16 km east of Trout Lake. Mining operations started in 1895 and continued for twenty years concluding operations in 1915. During that time the Silver Cup mine produced 1.5 million ounces of silver, along with lead, copper and lesser gold (Trettin, 1952; Walker et al., 1929).

The Lucky Boy Pb-Zn-Ag claim, located on Trout Mountain, was staked in 1897. The ore is hosted in quartz veins within the Paleozoic Lardeau group. The mineralization was found in lenses and disseminated throughout the quartz. The minerals of interest were galena, tetrahedrite, sphalerite, chalcopyrite and lesser native silver (Walker et al., 1929). Mining at Lucky Boy began in 1900 and continued sporadically until 1917 (Walker et al., 1929; Lawley et al., 2009). The Copper Chief claim is southwest of the Lucky Boy claim and has a similar economic mineralogy to the Lucky Boy claim (Brock, 1904). The Copper Chief mine was worked for a year by the Copper Chief Mining Syndicate commencing December 1916 and concluding operations in November 1917 (Brock, 1904). Three kilometers south of MAX is the Ethel mine which also began operations in the early 1900's. It was mined for Pb, Zn and Ag similar to the Lucky Boy mine. Minerals of interest were galena, copper, sphalerite and pyrite that were associated with silver (Emmens, 1915; Walker et al., 1929).

In the late 1970s a joint venture with Newmont and Esso Minerals Ltd. conducted an extensive exploration program of the Trout Lake property. Activities concluded in 1982 when Mo prices dropped. During this time an exploration drilling program was carried out by Newmont which identified a significant Mo ore zone that displayed potential for underground mining (Macauley, 2004; Pelletier, 2009). Also, a 1500 m exploration adit was developed for bulk sampling and potential future production. In 2005, 42 Metals, a wholly owned subsidiary of Roca mines, acquired the Trout Lake property (MAX). Initial production began in April 2008, using an onsite mill processing roughly 500 tonnes per day. Production ended in November 2011 with a total of 430 000 tonnes at 0.5% Mo mined to date.

1.5 Purpose of Study

It is becoming increasingly difficult to discover new ore deposits, and as existing deposits are exhausted, techniques for improving exploration success are very important. Porphyry Mo deposits are spatially, temporally and genetically associated with subvolcanic porphyritic intrusive complexes. Extensive hypogene mineralization and hydrothermal alteration minerals occur in and around these complexes. The spatial extent of the surface expression of alteration varies greatly depending on the size of the intrusion, intensity of the system, and chemical and physical properties of the host rocks. This study explored the application of trace element geochemistry, in the context of well-defined petrology for the identification and characterization of hydrothermal alteration, and the implications for exploration of these deposits. The purpose of this study was to use trace element geochemistry of hydrothermal alteration minerals (quartz, epidote, and chlorite) and their spatial relationships to identify trends that may be used to vector towards mineralization. The trace element geochemistry of igneous, metamorphic and hydrothermal quartz was analysed to see if trace element concentration could be used as a reliable method to distinguish between the different varieties of quartz.

Chapter 2 : Regional Geology and Geologic Setting

2.1 Regional Geology

MAX is located in the Canadian Cordillera, a transpressional orogen that formed via the docking of at least two allocthonous terranes, the Intermontane and Insular terranes, with the western boundary of the North American continent (Monger et al., 1972; Lawley et al., 2010). MAX is hosted within the Omineca Belt of the Columbia Mountains (Fig. 2.1). The Columbia Mountains were formed as a result of southwest to northeast compression, during the Middle Jurassic to Middle Cretaceous (docking of the Intermontane terrane), and Early Cretaceous to Late Cretaceous (docking of the Insular terrane). There was extensive up-thrusting of the basement in the Columbia Mountains as indicated by the presence of basement gneiss at surface (Evenchick et al., 2007). The Columbia Mountains host younger granitic rocks and gneiss with the Omineca magmatic belt, believed to be the result of these collisional mountain building events (Lawley et al., 2010).

There are five geomorphological belts within the Canadian Cordillera of British Columbia, the borders of which are defined by the boundaries of various allocthonous terranes that have accreted to the western coast of North America (Fig. 2.2; Evenchick et al., 2007; Garber, 2011). As these allochthonous terranes accreted they induced a compressive regime that created collisional mountain belts (Lawley et al., 2010). These belts underwent differential regional metamorphism due to the compressive stress regime from the subsequent collisions (Gabrielse et al., 1991). The Cordillera has been further subdivided into four paleogeographic realms (Ancestral North America, Peri-Laurentian, Arctic-Northeast Pacific and Coastal), comprised of groups of terranes with similar histories (Colpron and Nelson, 2007). From west to

east these geomorphological belts include: (1) the Insular Belt, (2) the Coast Belt, (3) the Intermontane Belt, (4) the Omineca Belt and (5) the Foreland Belt.

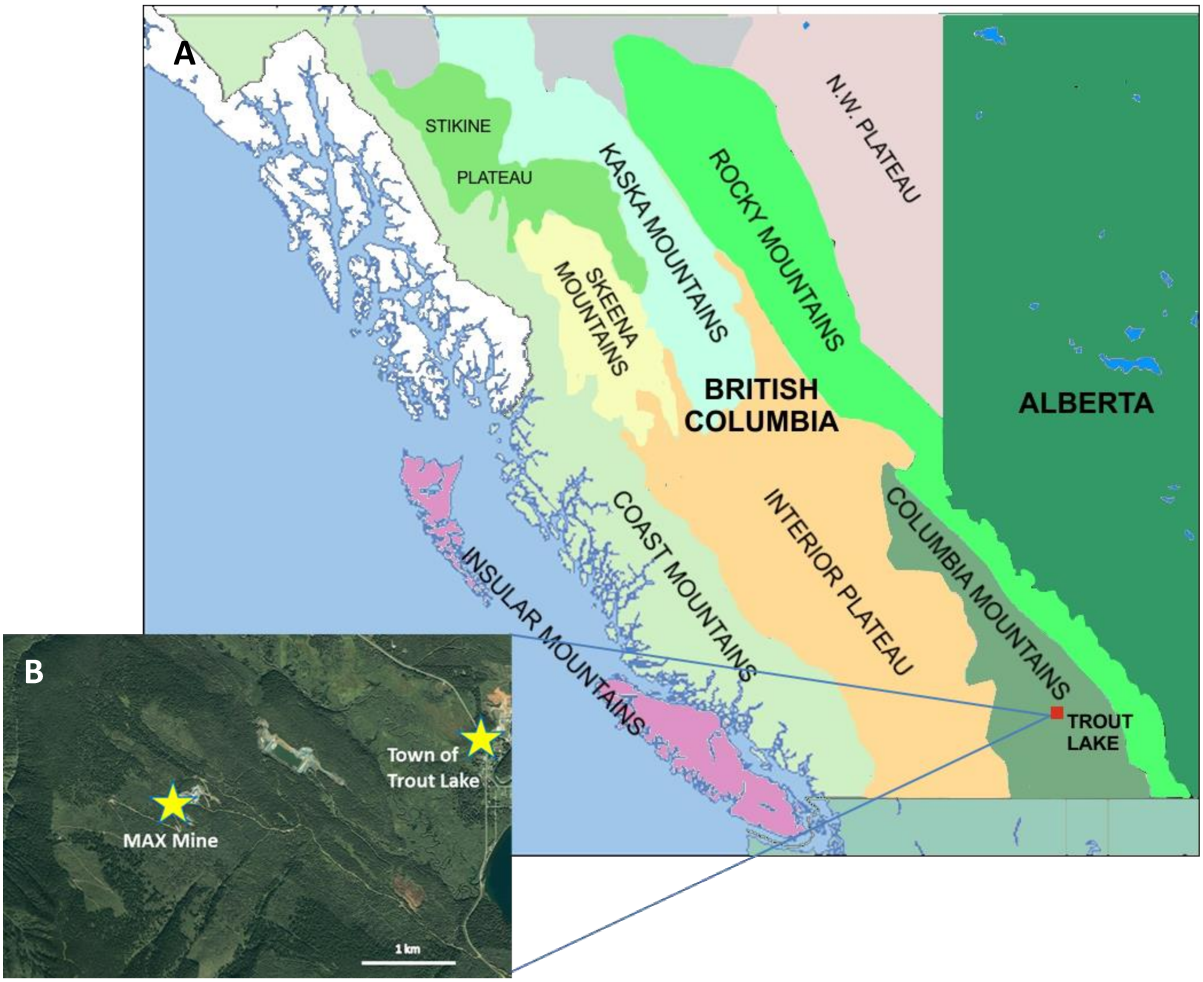


Figure 2.1 Map showing location of Trout Lake within Southeastern British Columbia, Canada. B Google Earth image showing mine site, mill and tailing pond.

The Insular Belt, which includes the islands off the coast of British Columbia, consists of Lower Paleozoic sedimentary and volcanic rocks, Permian limestones, Late Triassic marine flood basalts as well as Jurassic calc-alkaline intermediate plutons and volcanic rocks (Monger and Price, 2002, Mathews and Monger, 2005; Hamilton, 2012). The Insular Belt is interpreted to

have resulted from the accretion of island arc systems during the Late Cretaceous (Evenchick et al., 2007; Hamilton, 2012).

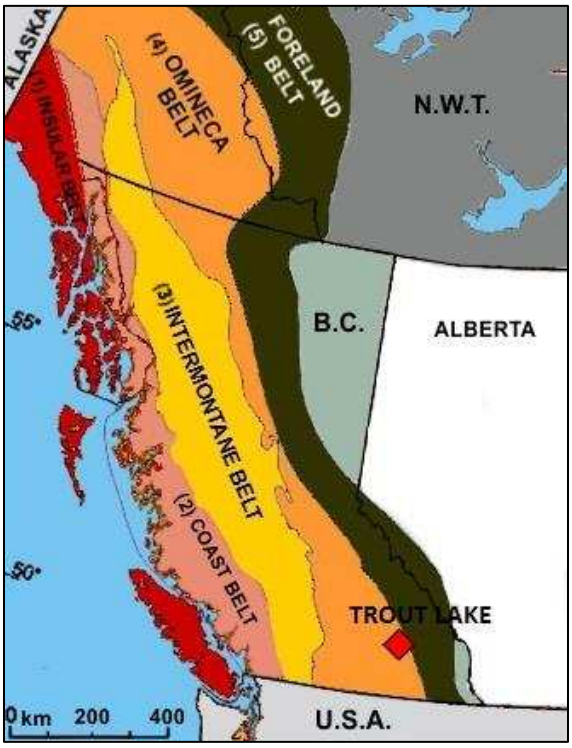


Figure 2.2 Map showing the five major geomorphological belts within British, Columbia. Also shows location of the Trout Lake mine within the Omineca Belt (modified from Tusk, 2008).

The Coast Belt is dominated by the Coast Mountains and consists of an uplifted granitoid complex and metamorphic assemblages that are interpreted to be associated with the accretion of terranes emplaced onto the continent during the Late Cretaceous (Crawford et al., 2005; Evenchick et al., 2007; Mathews and Monger, 2005). Rocks of this belt consist of granites, granodiorites, diorites and Permian to Jurassic oceanic sedimentary rocks (Haggart and Richstad, 1998). Metamorphic rocks include greenschist, amphibolite and granulite facies (Evenchick et al., 2007). The age of emplacement, crystallization, and subsequent metamorphism was

determined by Woodsworth et al. (2000) using U-Pb dating from post-kinematic and syn-kinematic plutonic rocks within the Coast Belt.

The Intermontane Belt lies to the east of the Coast Belt (Fig. 2.2) and is made up of accreted island arcs and ocean basins that were thrust onto the continent during the Middle Jurassic. The geology of the Intermontane Belt consists of Upper Triassic to Lower Jurassic volcanic arc rocks, as well as homogenous argillite, laminated argillite and siltstones, sandstone and limestones (Haggart and Richstad, 1998). A period of flood basalt volcanism took place during the Miocene around 10 Ma (Mathews and Monger, 2005).

The Omineca Belt is dominated by metasedimentary rocks originally formed on or adjacent to the North American craton margin during the Proterozoic to Paleozoic, that have undergone regional metamorphism due to mountain building events during the Mesozoic, followed by extensional tectonics and crustal stretching during the Late Paleocene around 55 Ma (Mathews and Monger, 2005; Evenchick et al., 2007). Throughout the belt the metamorphic grade ranges from greenschist to upper amphibolite facies with peak metamorphasim being reached during the Middle Jurassic (Mathews and Monger, 2005; Evenchick et al., 2007). The tectonostratigraphic terranes that make up the Omineca Belt include the Yukon-Tanana and Slide Mountain terranes in the north, and the Kootenay terrane in the south, which hosts the MAX deposit.

The Foreland Belt is the most eastward geomorphological belt made up of continental margin strata of Proterozoic to Early Mesozoic age and of Mesozoic syn-orogenic strata which represent the part of the Western Canada sedimentary basin comprised predominantly of material from the uplifting Cordillera (Fig. 2.2; Evenchick et al., 2007). Along with the eastern part of the

Omineca Belt it comprises the thickest and most stratigraphically complete portion of the supracrustal wedge within the Cordillera (Bally et al., 1966; Price and Mountjoy, 1970; Thompson, 1979; Price, 1981). The Foreland Belt consists predominantly of weakly metamorphosed sedimentary continental margin deposits that have been folded and faulted as they were thrust above the western margin of the continent from 100 to 60 Ma (Mathews and Monger, 2005, Evenchick et al., 2007; Price, 2012).

The Trout Lake mine is situated within the Kootenay arc, a northeast trending structural zone of tightly folded Precambrian to Triassic sedimentary rocks within the Omineca Belt (Fig. 2.2). The terrane is flanked by the Shushwap metamorphic complex to the west and the Purcell Anticlinorium to the east (Linnen, 1985). The Kootenay arc is part of the Selkirk allochthon, a composite tectonic slice composed of paleocontinental-margin deposits and more distal, marginal-basin type deposits (Brown and Lane, 1988).

The basal section of the Kootenay arc stratigraphy consists of Eocambrian quartzites of the Hamill Group (Fig. 2.3). They are overlain by the fossil bearing carbonates of the Badshot Formation, which have been determined to be Lower Cambrian in age based on the presence of Archaeocyathid fossils (Fig. 2.3; Colpron and Price, 1995). The next unit in the Lardeau Group, a metasedimentary unit composed of phyllites, schists, carbonates, calcareous rocks, quartzites, sandstones and mafic igneous rocks (Linnen, 1985; Colpron and Price, 1995). The Lardeau Group is Late Cambrian/Early Ordovician to pre-Upper Mississippian in age, based on fossils from the base of the Milford Group, which overlies the Lardeau Group (Fyles and Eastwood, 1962; Linnen, 1985). The boundary between the Lardeau and the Milford Groups is unconformable and is marked by a basal conglomerate, which is overlain by argilites, limestones and tholeiitic volcanic rocks (Fyles and Eastwood, 1962; Read and Wheeler, 1976; Colpron and

Price, 1995). Based on paleontological evidence, the Milford Group is thought to have been deposited in the Triassic (Little, 1960). Overlying the Milford Group is the Kaslo Group which consists of volcanic breccias and tuffs, intermediate plutonic rocks, and locally some carbonates (Little, 1960).

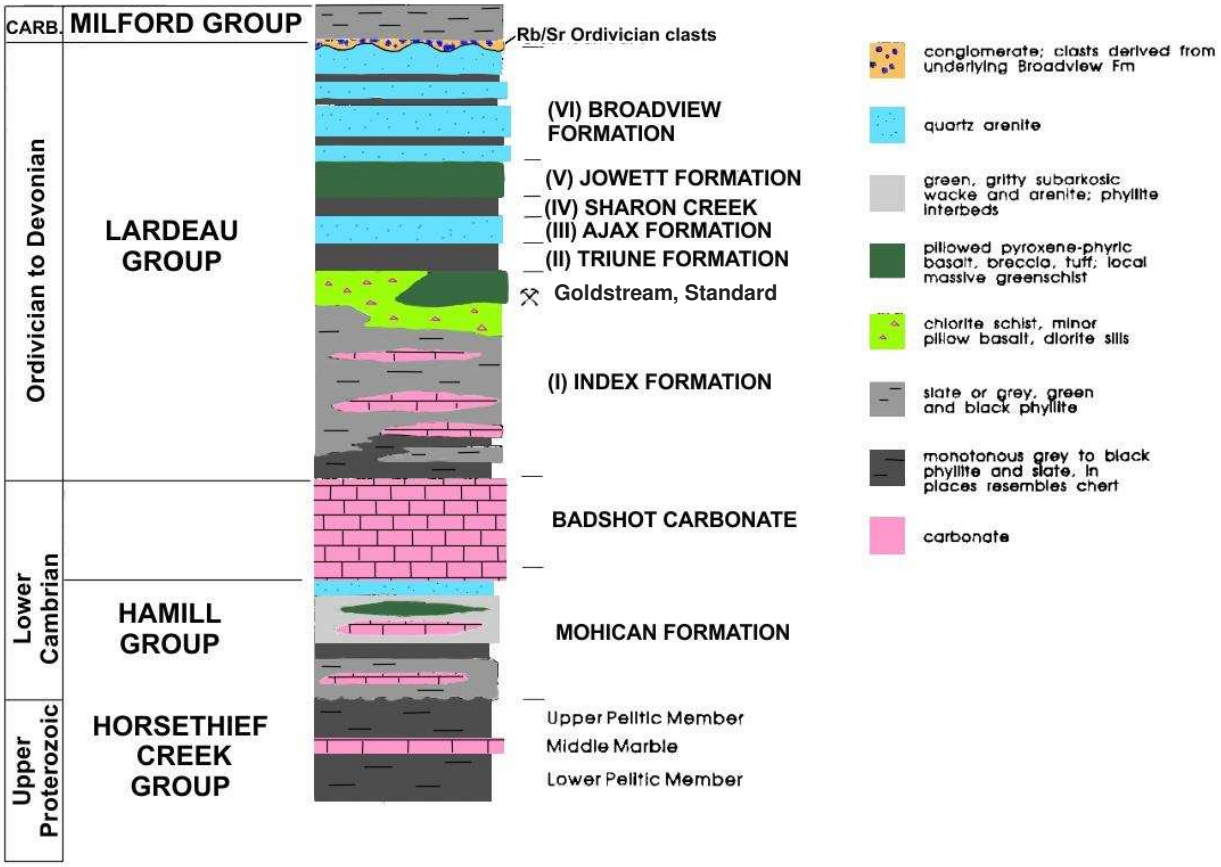


Figure 2.3 Stratigraphic column showing the dominant geology in the Kootenay terrane, British Columbia, with specific attention to the Lardeau Group which hosts the Trout Lake mine. Relative thickness is not to scale. Modified from Logan and Drobe (1993).

The Lardeau Group hosts the MAX deposit and is flanked by the Kaslo and Milford Groups (Fig. 2.4). The Lardeau Group consists of the following formations from oldest to youngest: (I) The Index Formation: phyllites, schists, argillites and calcareous rocks, with minor

quartzites and mafic volcanic rocks; (II) the Triune Formation: siliceous argillites, cherts and phyllites; (III) the Ajax Formation: massive quartzites, siliceous argillites, and cherts; (IV) the Sharon Creek Formation: predominantly phyllites and slate; (V) the Jowett Formation: mafic volcanic rocks, metabasalts, tuffs, and phyllites; and (VI) the Broadview Formation: phyllites, limestones, siliceous argillites, sandstones, and mafic volcanic rocks (Fig. 2.3; Pinset, 2004). These formations are interpreted to represent a conformable upright stratigraphic section (Fyles and Eastwood, 1962; Colpron and Price, 1995; Lawley et al., 2010), but some researchers have questioned this due to the folded nature of the rocks along with repetition of certain units (e.g., Pinsent, 2004). Other authors have suggested that the Lardeau group represents an allochthonous terrane that has been structurally inverted and juxtaposed onto the shallow marine sedimentary rocks deposited on the margin of the continent (e.g., Wheeler, 1966; Smith and Gerhels, 1992). The rocks of the Lardeau Group have undergone both regional deformation and metamorphism related to the compressive stress regime. During the Jurassic, regional metamorphism attained a maximum grade of lower amphibolite facies (Read and Brown, 1981).

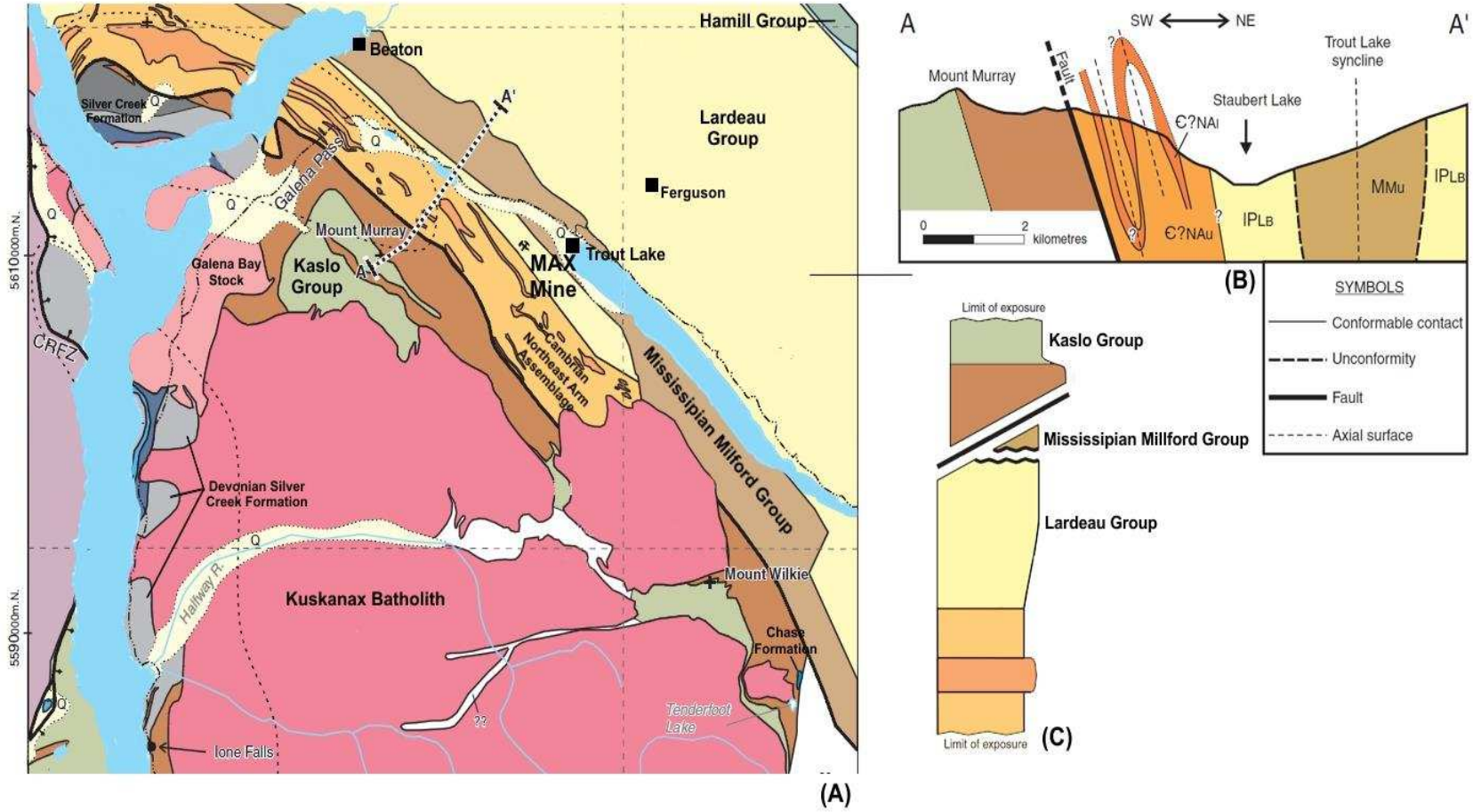


Figure 2.4 (A) Map view showing groups and exposed formations, also location of Kuskanax Batholith in relation to Trout Lake deposit (MAX mine). (B) Cross-section from A – A', showing thrust fault as well as axis of the Trout Lake syncline. (C) Stratigraphic column showing thrust fault and the Lardeau Group in relation to the Millford and Kaslo Group. From Kraft et al. (2007).

The Kootenay Arc has been subject to several episodes of calc-alkaline plutonism during the Mesozoic (Linnen and Williams-Jones, 1987). The Mid-Jurassic Kuskanax batholith lies five km south of the Trout Lake stock (Fig. 2.4). It is a clinopyroxene-amphibole bearing quartz monzonite which has yielded a U-Pb zircon age of 173 ± 5 Ma (Parrish and Wheeler, 1983; Lawley et al., 2010), which is within error of earlier K-Ar dating of hornblende which yielded an age of 182 ± 6 Ma (Armstrong, 1988). Approximately 35 km north of the Trout Lake stock is the syn-kinematic Battle Range pluton which was emplaced during the Cretaceous (Fingler and Turner, 2010). About 55 km to the east of Trout Lake is the Cretaceous Bugaboo batholith which is divided into two distinct units, a granodiorite in the west and quartz monzonite in the east (Cui et al., 2015). Approximately 10 km east of the Bugaboo batholith lies the Horsethief Creek Batholith, a porphyritic biotite quartz monzonite (Cui et al., 2015). The Horsethief Creek Batholith, along with the Bugaboo Batholith and the Battle Range Pluton, forms part of the Bayone Plutonic Suite and are included within the Mo-W±Sn metallogenic province (Logan, 2002). The Trout Lake Stock was emplaced towards the end of this post-kinematic, major plutonic event (Linnen and Williams-Jones, 1987). The Bugaboo Batholith, Horsethief Batholith and Trout Lake stock are also interpreted to be post-kinematic due to the absence of regional metamorphic fabric within the stocks, map patterns, and overprinting of regional metamorphism with contact metamorphism in surrounding host rocks (Linnen, 1985; Lawley et al., 2010).

2.2 Structural Features

The country rocks of the Lardeau group are separated into large ~600 meter wide sections or panels due to strong sub-vertical north and northwest trending faults. The Trout Lake stock is bound and cut by the north trending Z fault to the east and the Ethel fault to the west. Both faults

are normal faults and appear to have influenced the location of the stock and its apophyses as well as on the subsequent mineralization. At depth, map patterns show horizontal right lateral strike-slip movement along the Z fault (Lawley et al., 2009) and there is evidence of post mineral movement and displacement of the stock along the Z fault, suggesting that movement along the Z fault was both syn- and post-magmatism (Psutka et al., 1982). At depth there are many small conjugate and splay faults, but displacement along these faults is generally less than 10 meters.

Chapter 3 - Local geology and mineralogy

3.1 Introduction and Methodology

A sampling program was carried out at MAX during the summer of 2012 at the MAX deposit. This included surface sampling up to 6 km away from the mine, underground sampling along the adits and drill core sampling (Fig. 3.1). Graphic core logging was undertaken on drill holes that spanned the length of the deposit and any hole that was sampled for petrographic and geochemical analysis. Samples were split, with one piece for whole rock geochemistry and one for petrographic analysis and when applicable, laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS). Polished thin sections were prepared for petrographic analyses at the Lakehead University Lapidary facility. The thin sections were examined by transmitted and reflected light microscopy at the Lakehead University Microanalytical facility. Mineralogy, mineral modal abundances, textures and grain size were documented. Photomicrographs were taken of mineral textures, mineralisation, mineral relationships and any alteration observed. Unknown minerals were analysed at the Lakehead University Center for Analytical Services using the Hitachi SU70 Analytical FE-SEM with Oxford Aztec SDD XMax Premium EDX detector. Quartz, alkali feldspar and plagioclase mineral modes were normalized and used to classify rock types for the most pristine intrusive igneous samples using the IUGS classification scheme (Le Maitre et al., 1989).

All igneous phases were sampled; this included from oldest to youngest: granodiorite, tonalite, quartz diorite, trondhjemite (timing uncertain), and aplite. Igneous phases were found as dikes that crosscut and are crosscut by quartz veins, which along with previous geochronology data, indicates a coeval relationship between magmatism and the mineralizing hydrothermal fluids. The igneous phases have been subjected to varying degrees of hydrothermal alteration

where propylitic alteration, when present, overprints phyllic and potassic assemblages. For this study, least altered, as well as altered samples (with a preference for propylitic alteration) were examined.

Samples of the country rocks examined were from the Paleozoic Lardeau Group and included biotite hornfels, biotite schist, phyllite, and chlorite schist. Hydrothermal rocks examined included skarn, whereas veins include carbonate and quartz veins related to the Trout Lake stock.

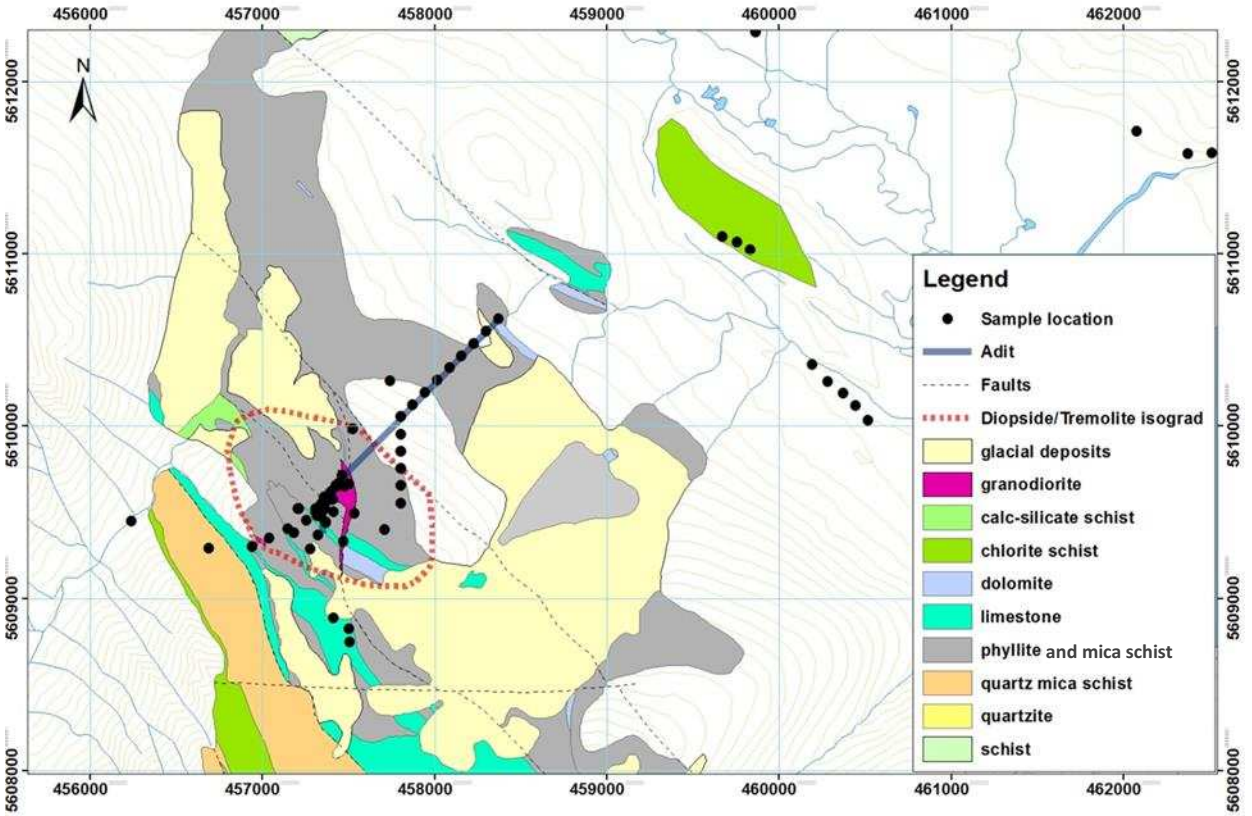


Figure 3.1 Geology map of the Trout Lake mine area showing sample locations at surface, as well as the currently identified extent of the alteration halo surrounding the Trout Lake granodiorite stock as identified by Read et al. (2009).

The International Union of Geological Sciences (IUGS) nomenclature and rock classification was used. Standardized grain size classification is as follows: vfg = crystals too small to see by naked eye, fg - <1mm, mg - 1-5mm, cg - >5mm, vcg - > 50mm.

Mineral abbreviations (International Mineral Association):

Act = actinolite, Bt = biotite, Cal = calcite, Ccp = chalcopyrite, Chl = chlorite, Czo = clinozoisite, Di =diopside, Ep = epidote, Fsp = feldspar, Hbl = hornblende, Kfs = K-feldspar, Mag = magnetite, Mc = microcline, Mol = molybdenite, Ms/Mu = muscovite, Or = orthoclase, Pl = plagioclase, Py = pyrite, Qz = quartz, Ttn = titanite, Tr = tremolite, Wo = wollastonite.

3.2 Hydrothermal Alteration

As well as aiding in underground mapping, core logging was used to investigate the extent of hydrothermal alteration and the intense quartz vein stockwork underground (Figs. 3.2-3.4b). The metasedimentary rocks in direct proximity to the Trout Lake stock have undergone thermal metamorphism and metasomatism and there is a biotite hornfels alteration halo around the stock. There is a central zone that has undergone potassic alteration defined by potassium feldspar and biotite. In this zone plagioclase is partially altered to potassium feldspar with relict polysynthetic twinning visible under transmitted light microscopy. The potassic alteration has been overprinted by a later stage of phyllic alteration of quartz-sericite and pyrite which accompanied Mo mineralization, where muscovite was observed intergrown with molybdenite along quartz veinlets and biotite is altered to muscovite and pyrite. In this zone the feldspars

show varying degrees of sericite alteration. Silica flooding along micro-fractures with sericitic alteration halos are common and also along the quartz vein stockwork within the intrusive phases. Strong muscovite alteration is observed along the quartz stockwork in the host rocks and within the biotite hornfels, where up to 95 % of the biotite is replaced by muscovite. Weak to moderate propylitic alteration at MAX consisting of chlorite-epidote-titanite-calcite is pervasive and observed in all the igneous phases where biotite is altered to chlorite, titanite and minor magnetite. Feldspars are weakly altered to epidote and calcite. The propylitic alteration overprints all other alteration observed. There is evidence of retrograde alteration in the skarns where diopside altered to tremolite as the system cooled.

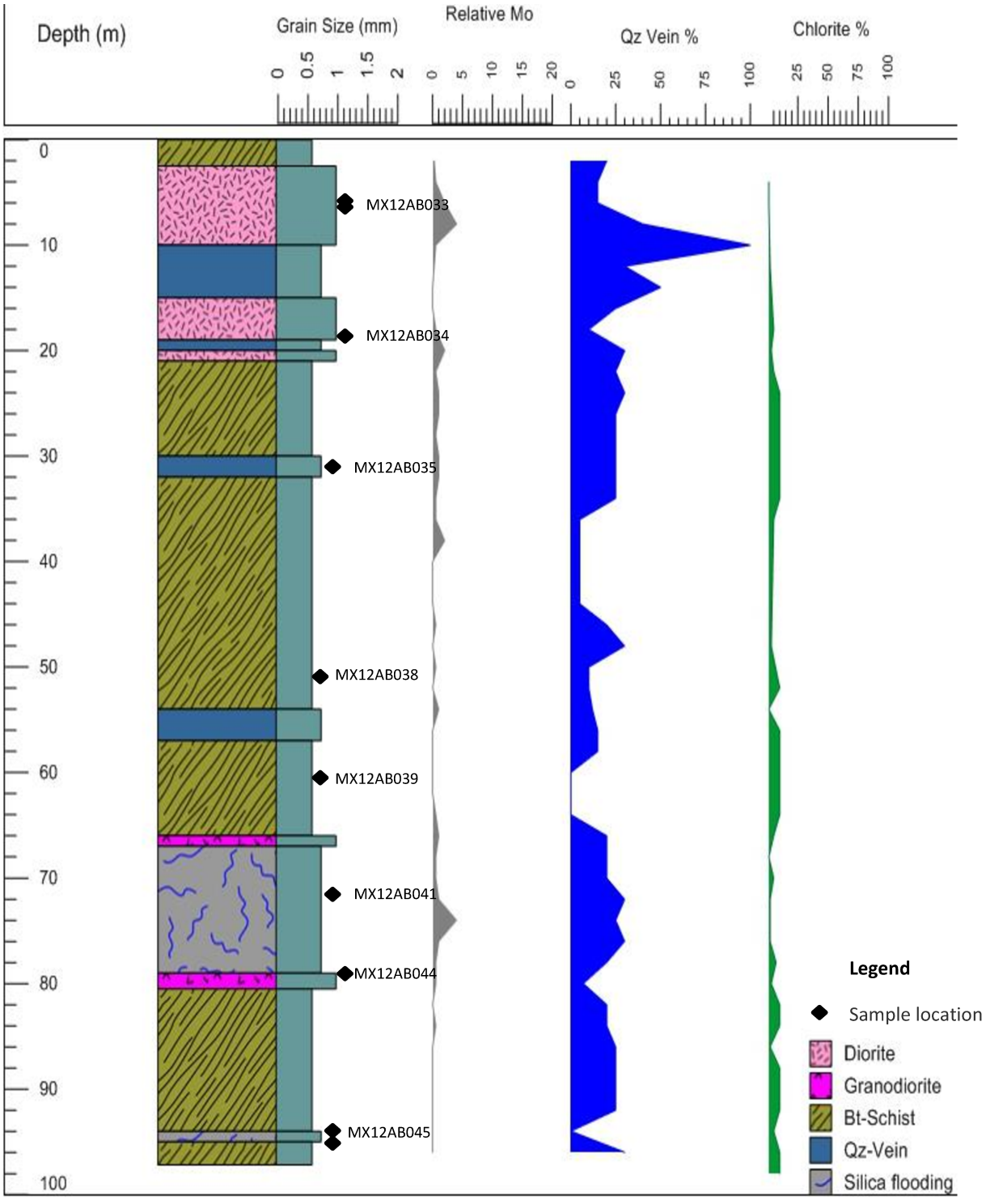


Figure 3.2 Graphic log of drillhole 05-01, showing lithology, relative Mo content, quartz vein %, chlorite modal % and sample locations. Minor lithologies (> 30cm wide) not shown. Collar location: NAD83 457387.8E, 5609573.6N, azimuth 251.08, dip -14.7.

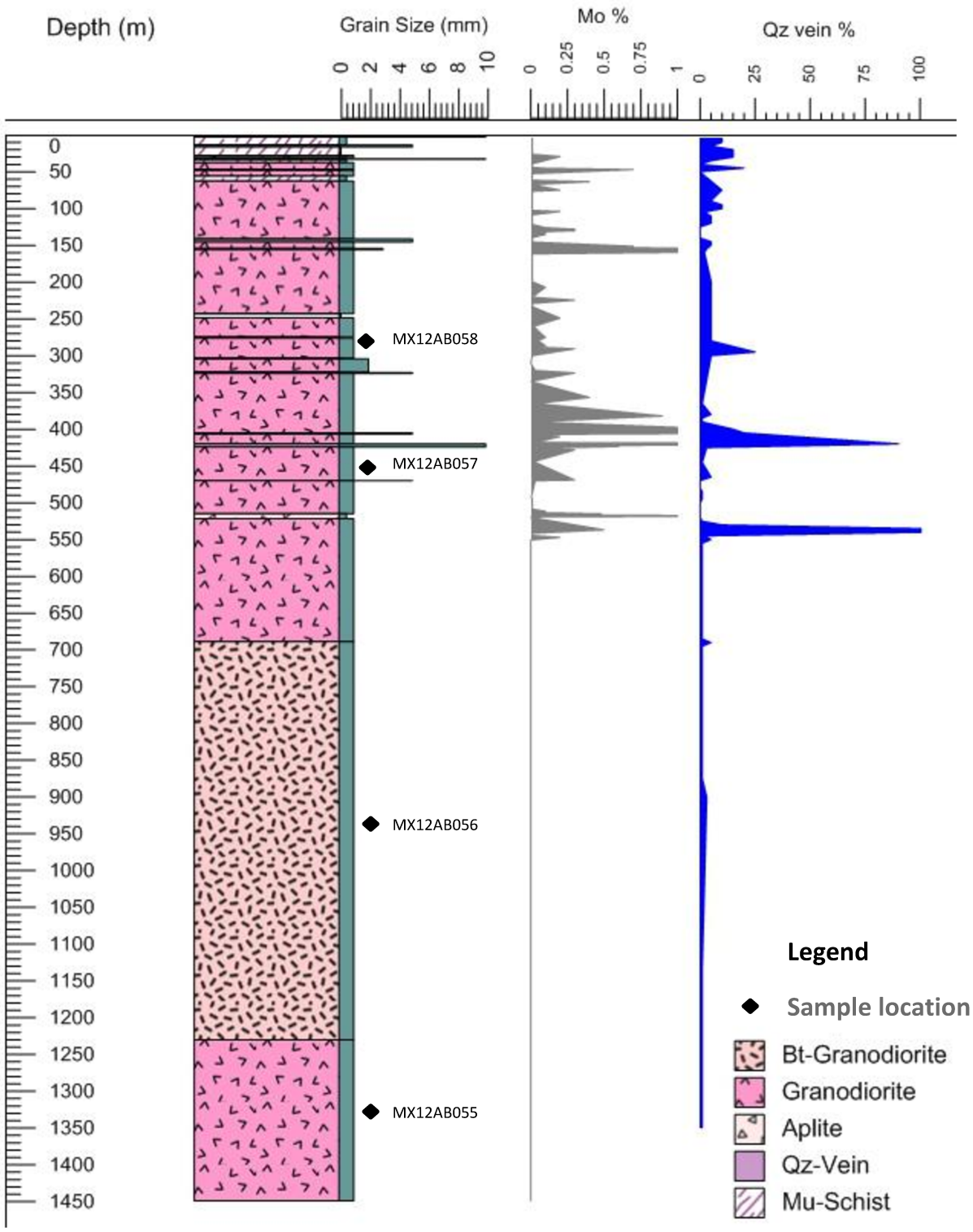


Figure 3.3 Graphic log of drillhole 07-03, showing lithology, Mo wt %, Qz vein %, and sample locations. Minor lithologies (> 30cm wide) not shown. Collar location: NAD83 457317.6E, 5609481.6N, azimuth 259.5, dip -74.

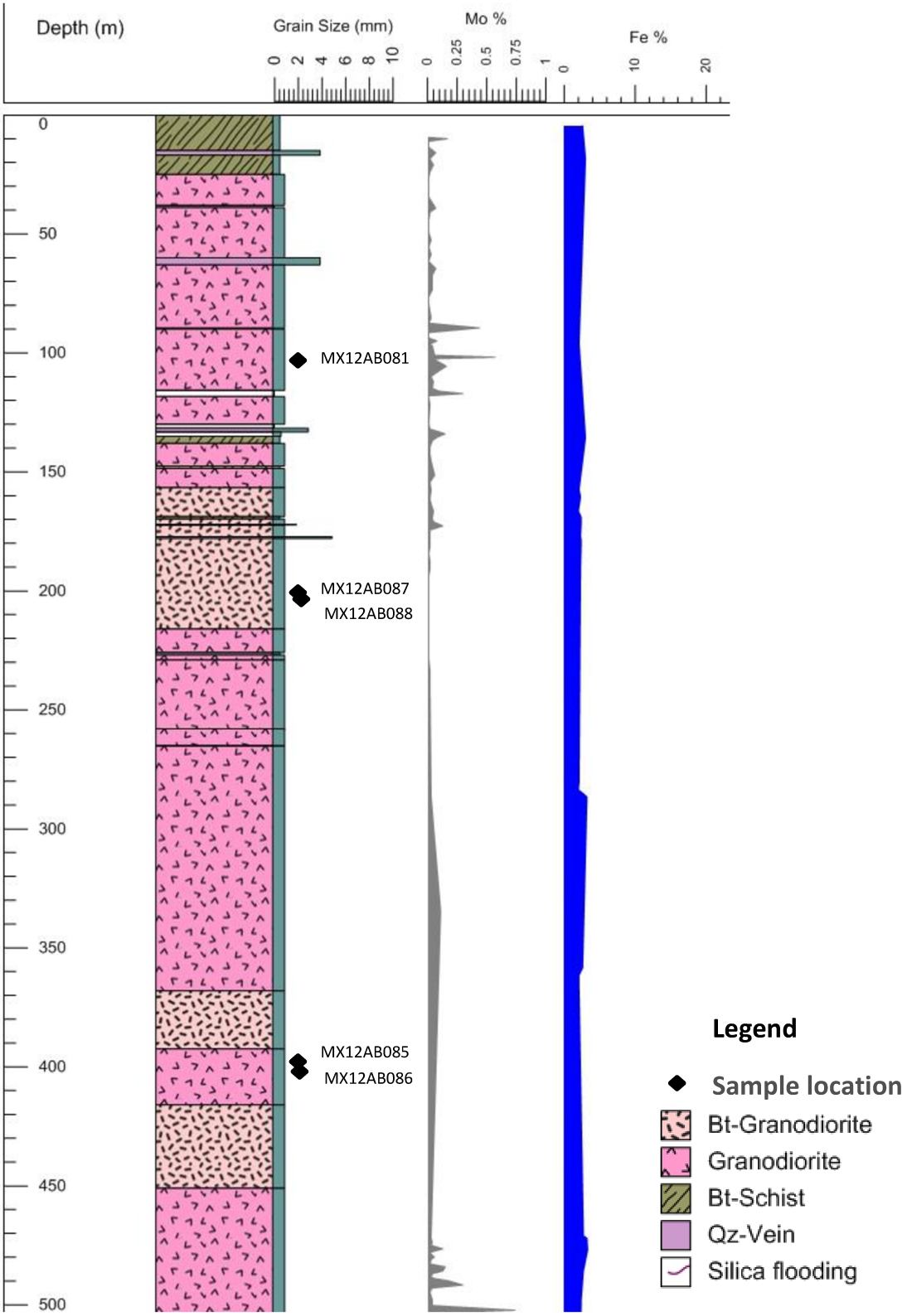


Figure 3.4a Graphic log of drill hole 07-04, showing lithology, Mo wt %, Fe %, and sample locations. Minor lithologies (> 30cm wide) not shown. Collar location: NAD83 457359.5E, 5609586.25N, azimuth 240, dip -57.

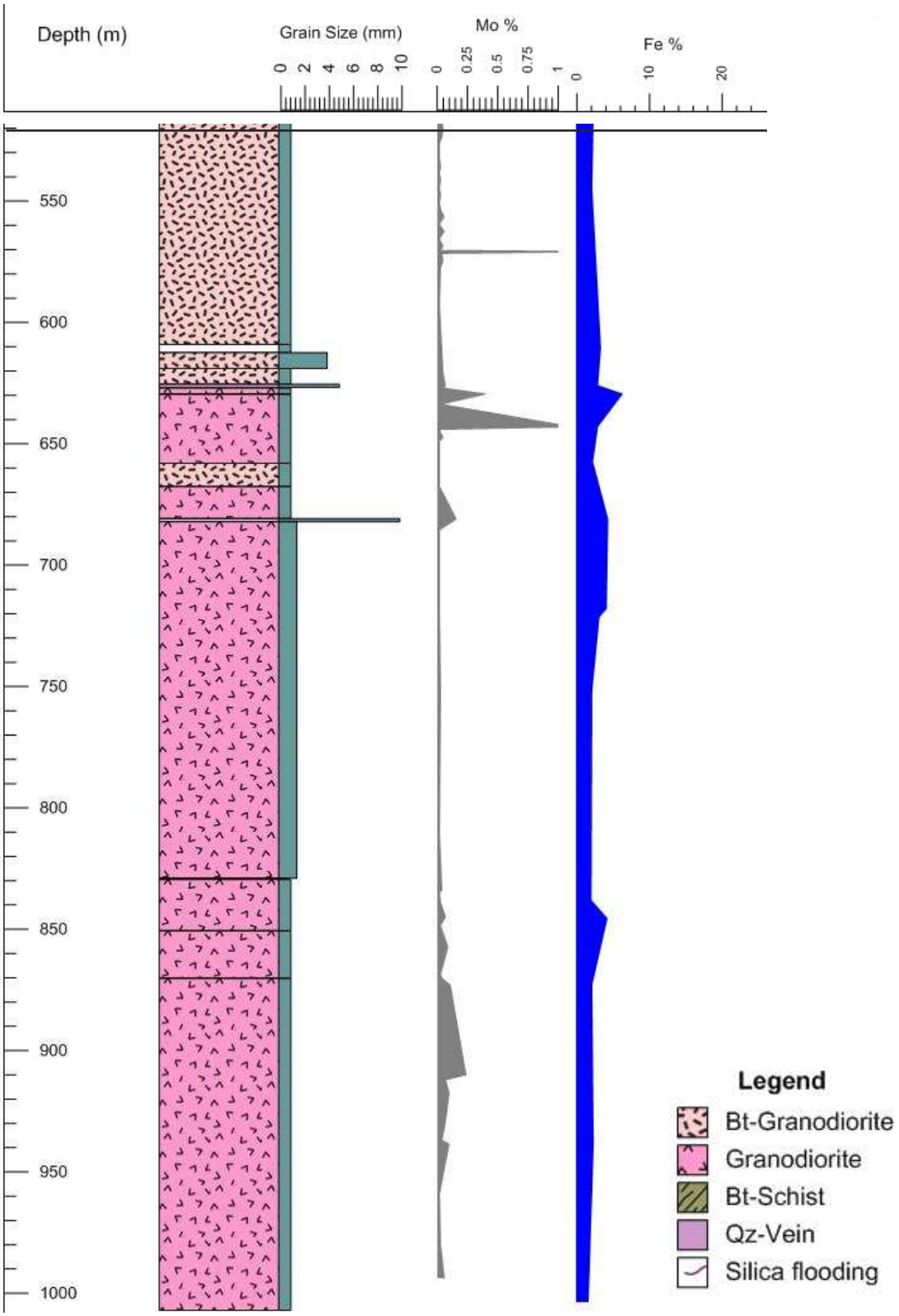


Figure 3.4b Graphic log of drillhole 07-04, showing lithology, Mo wt %, Fe %, and sample locations. Collar location: NAD83 457359.5E, 5609586.25N, azimuth 240, dip -57.

3.3 Results

3.3.1 Mineralogy by rock type: Igneous intrusive phases

3.3.1.1 Granodiorite

The most common igneous phase at MAX is granodiorite. The mineral assemblages of these rocks are plagioclase – quartz – potassium feldspar – biotite ± chlorite ± muscovite, where potassium feldspar is ≤15 modal % and chlorite and muscovite are secondary. In most cases plagioclase (45-55 modal %) is subhedral, displays polysynthetic twinning (Figs. 3.5, 3.8), is poikilitic and depending on alteration may display varying degrees of sericitization (Fig. 3.5). Locally plagioclase is altered to fine-grained clinozoisite (Fig. 3.6), which is commonly only observable under the SEM due to its small size (Fig. 3.7). Plagioclase grains average 0.5 mm in size and are typically larger than other minerals present. Quartz (15-20 modal %) crystals are typically 0.05 mm, with smaller quartz crystals often surrounding larger plagioclase crystals (Fig. 3.5).

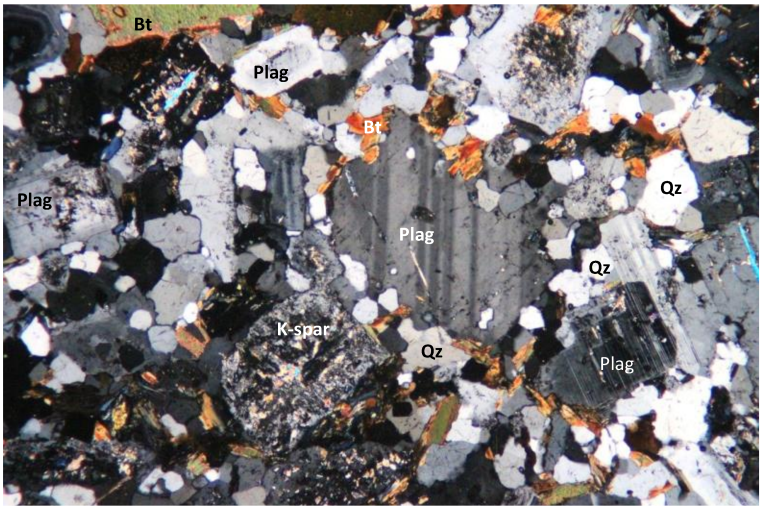


Figure 3.5 Sample MX12AB096. Photomicrograph in cross-polarized light showing polysynthetic twinning and sericitization of feldspars. Also showing larger plagioclase grains surrounded by smaller quartz grains. F.O.V. = 3.15mm x 2.15mm.

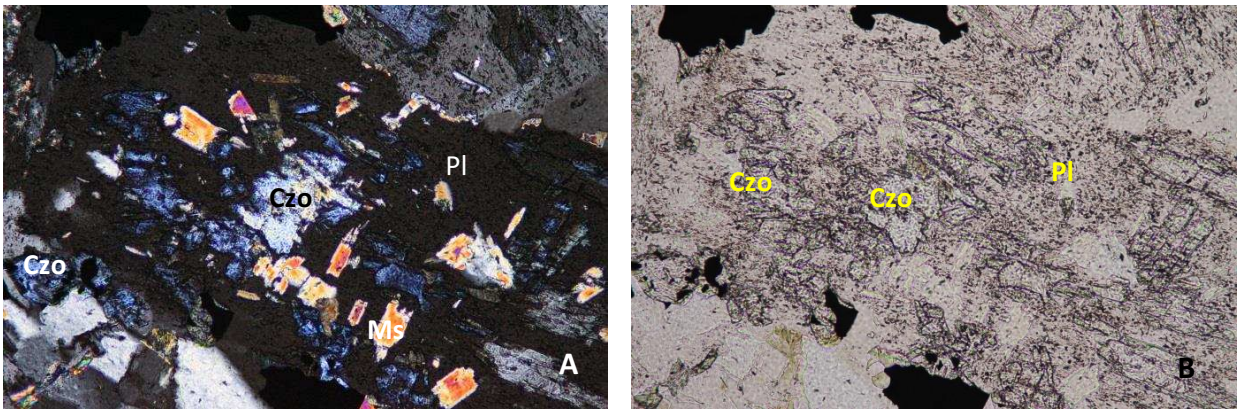


Figure 3.6 Sample MX12AB027. Photomicrograph in cross-polarized light (A) and plain polarized light (B) showing plagioclase that has been locally altered to clinozoisite and muscovite. The clinozoisite appears blue in cross-polarized light and has high relief in plain polarized light. F.O.V. = 1.0mm x 0.51mm.

Potassium feldspar (Figs. 3.7, 3.9) ranges from 10-15 modal % and often occurs as inclusions within larger plagioclase crystals, and locally is altered from plagioclase (Fig. 3.7). In the high grade zone there is pervasive K-feldspar alteration of plagioclase (Lawley et al., 2010), and relict polysynthetic twinning was observed. Biotite in the granodiorite ranges from 5-10 modal % and is subhedral averaging 0.3 mm in size. It displays bird's eye extinction and is commonly altered to chlorite, lesser muscovite, and titanite (Fig. 3.10). Pyrite and lesser pyrrhotite are commonly observed in the granodiorite. There is also trace fine-grained chalcopyrite typically associated with the pyrite (Fig. 3.11). Molybdenite is also present and may range up to 3 modal %. Dikes occur with coarse-grained molybdenite and pyrrhotite-molybdenite intergrowths. The molybdenite is typically euhedral, and may form radiating rosettes, or may be lath like with kink banding or fibrous (Fig. 3.11).

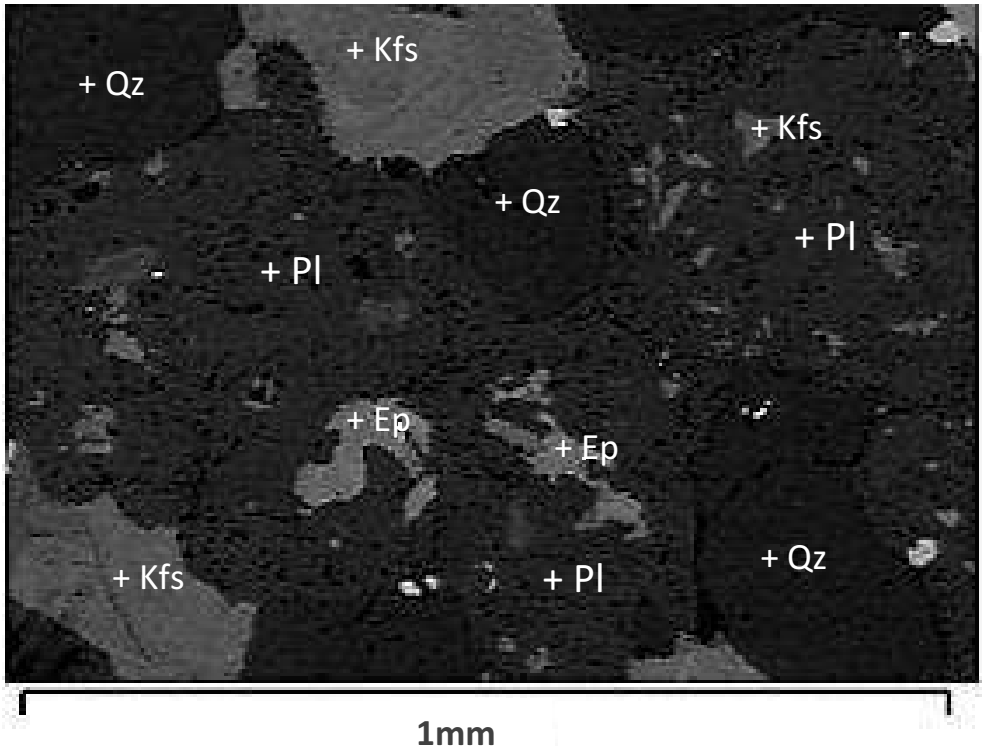


Figure 3.7 Sample MX12AB079. Back scattered electron image showing fine-grained epidote and potassium feldspar altered from plagioclase.

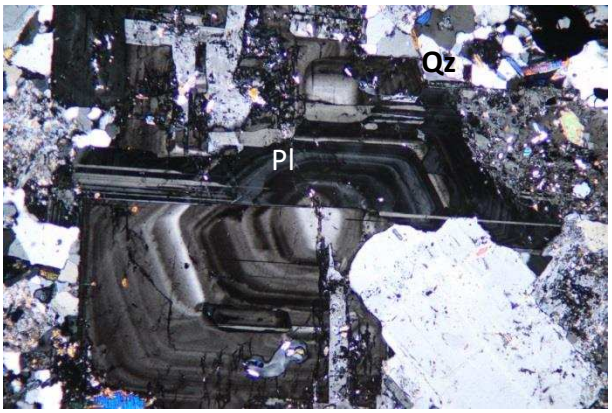


Figure 3.9 Sample MX12AB027. Photomicrograph in cross-polarized light showing compositional growth zoning within plagioclase. F.O.V. = 3.15mm x 2.15mm.

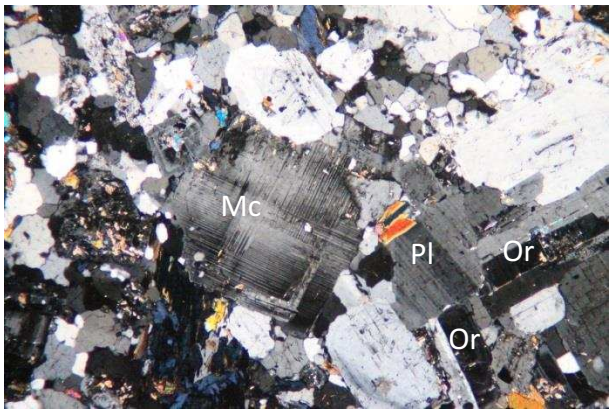


Figure 3.8 Sample MX12AB096. Photomicrograph in cross-polarized light showing tartan twinning and carlsbad twinning in potassium feldspars. Polysynthetic twinning can be seen in plagioclase. F.O.V. = 3.15mm x 2.15mm.

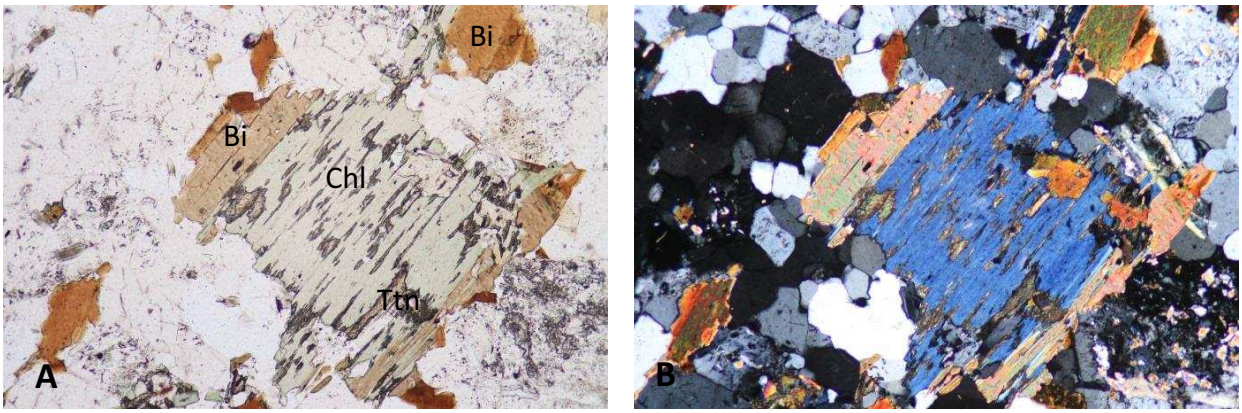


Figure 3.10 Sample MX12AB096. Photomicrograph in plain polarized light (A) and cross-polarized light (B) of same location. Biotite has been altered to chlorite, titanite and muscovite. Bird's eye texture can be seen in biotite. Also triple junction grain boundaries of quartz may be observed, suggesting dissolution and recrystallization. F.O.V = 1.55mm x 1.05mm.

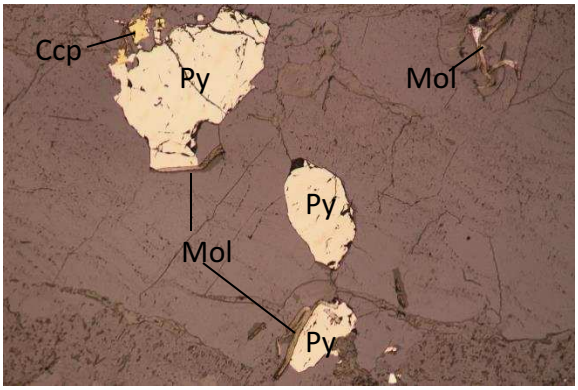


Figure 3.11 Sample MX12AB096. Photomicrograph in reflected light showing anhedral pyrite associated with finer grained chalcopyrite and fibrous molybdenite with kink banding located in quartz veinlet that crosscuts granodiorite. F.O.V = 1.55mm x 1.05mm.

3.3.1.2 Tonalite

Tonalite is the second most abundant igneous phase found at MAX after granodiorite and consists of plagioclase-quartz-biotite-chlorite-muscovite, where chlorite and muscovite are secondary. Plagioclase comprises 40-45 modal %, is typically euhedral and larger than other minerals present, averaging 0.8 mm in size. Plagioclase crystals show both polysynthetic (Fig. 3.12) and simple twinning (Fig. 3.13) and are commonly poikilitic (Fig. 3.13). Compositional

growth zoning is commonly observed within the plagioclase (Fig. 3.14). Quartz ranges from 35-40 modal %, is anhedral and finer grained than the plagioclase averaging 0.2 mm. The finer quartz crystals surround coarser plagioclase crystals (Fig. 3.12). Larger 2.0 mm phenocrysts of quartz are common. The biotite ranges from 10-15 modal % and is commonly altered to chlorite and lesser muscovite and sphene (Fig. 3.16). Biotite ranges from 0.1-1.0 mm and is typically subhedral with bird's eye extinction. There is also trace subhedral interstitial rutile within the tonalite. The rutile exhibits very fine exsolution lamellae as well as larger intergrowths of ilmenite.

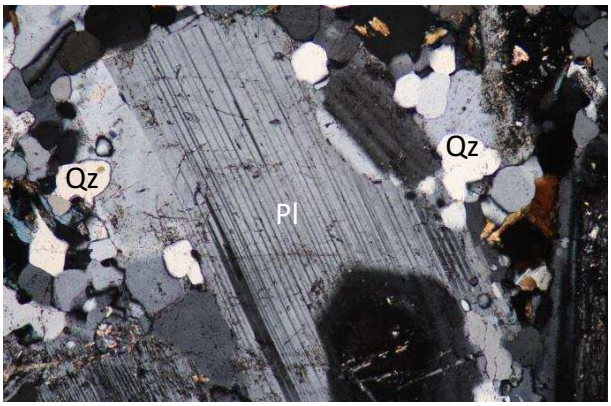


Figure 3.13 Sample MX12AB088. Photomicrograph in cross-polarized light showing polysynthetic twinning in medium-grained plagioclase surrounded by fine-grained quartz. F.O.V = 1.55mm x 1.05mm.

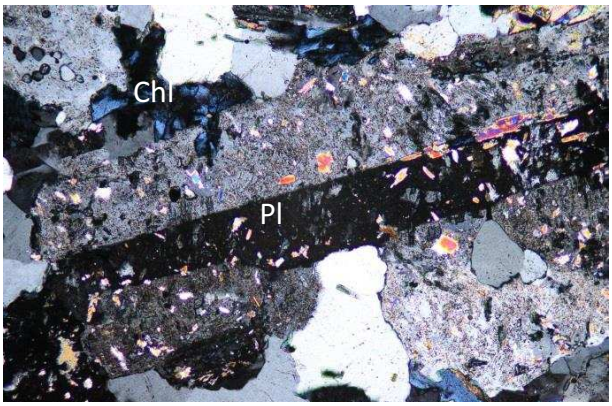


Figure 3.12 Sample MX12AB088. Photomicrograph in cross-polarized light showing simple twinning in plagioclase. Also shows moderate sericitization of plagioclase and anomalous blue birefringence of chlorite. F.O.V = 1.55mm x 1.05mm.

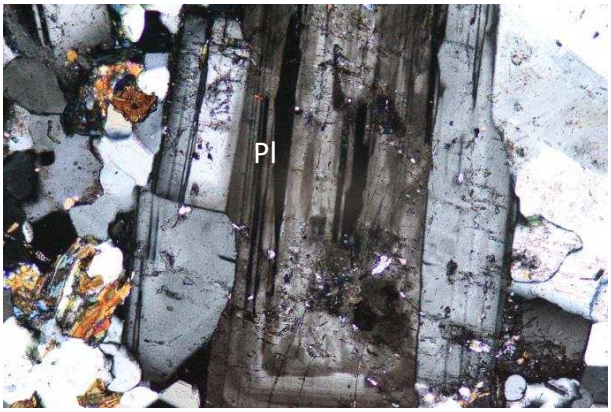


Figure 3.15 Sample MX12AB088. Photomicrograph in cross-polarized light showing compositional growth zoning in plagioclase. Also shows sericitization of plagioclase along fractures. F.O.V = 1.55mm x 1.05mm.

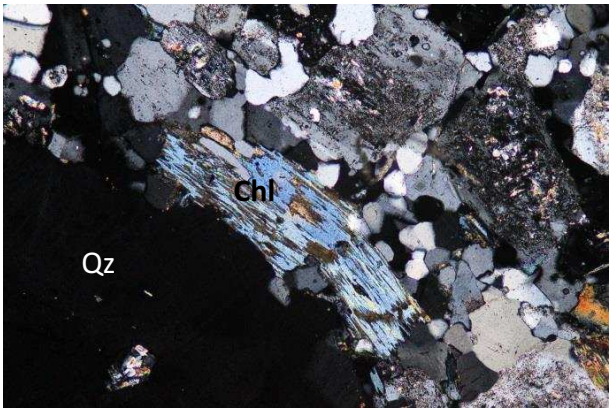


Figure 3.14 Sample MX12AB088. Photomicrograph in cross-polarized light showing quartz phenocrysts surrounded by chlorite and equigranular quartz with triple junction grain boundaries. F.O.V = 1.55mm x 1.05mm.

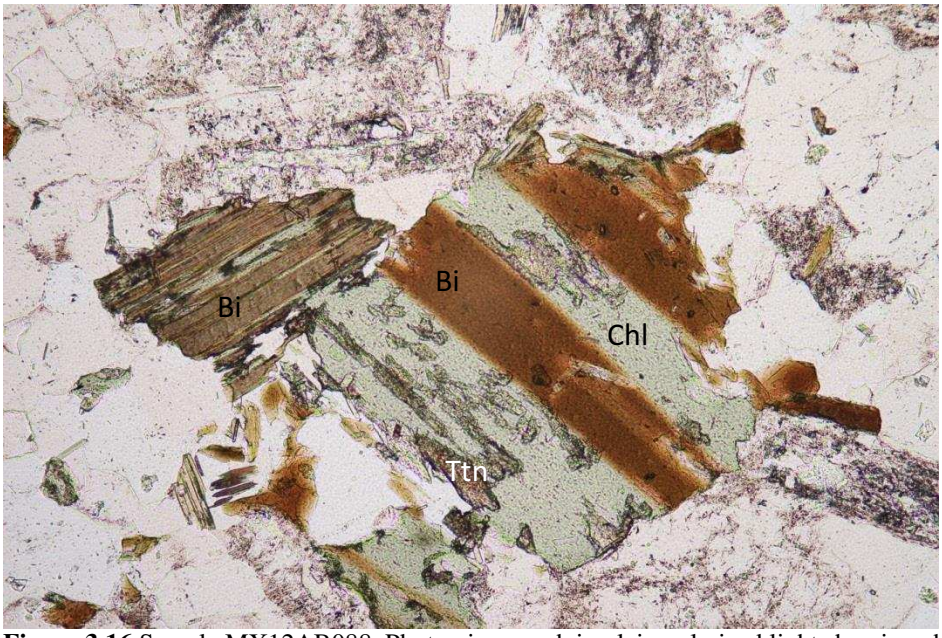


Figure 3.16 Sample MX12AB088. Photomicrograph in plain polarized light showing chlorite and sphene altered from biotite. Also shows moderate sericitization of plagioclase. F.O.V = 1.55mm x 1.05mm.

3.3.1.3 Aplite

Aplite is the most evolved igneous phase observed at MAX. It consists almost entirely of feldspar, quartz and muscovite and is white in hand sample. The aplitic dikes range in size from very fine-grained to a medium-grained granitic phase and form dikes <1 meter in width (Lawley et al., 2010). The aplite consists of microcline-quartz-plagioclase±muscovite. Quartz and feldspar are intergrown with graphic and myrmekitic textures (Fig. 3.17). Microcline ranges in abundance from 40-45 modal %, is typically anhedral and exhibits tartan twinning (Fig. 3.18). The crystals range in size from fine-grained to <2.0 mm. The microcline is poikilitic with inclusions of quartz, muscovite and trace pyrite. Quartz is typically anhedral and ranges in abundance from 35-40 modal %. In the granitic phase, quartz crystals average 0.5 mm in size. Plagioclase in these rocks ranges in abundance from 10-15 modal %, with an average grain size

of 0.5 mm. The plagioclase exhibits imperfect and polysynthetic twins (Fig. 3.18), and is poikilitic with inclusions of quartz and muscovite (Fig. 3.18). The muscovite ranges up to 5%, is euhedral, radiating and may be found intergrown with molybdenite (Fig. 3.19). There is trace subhedral pyrite which range in size from very fine-grained to 3.0 mm.

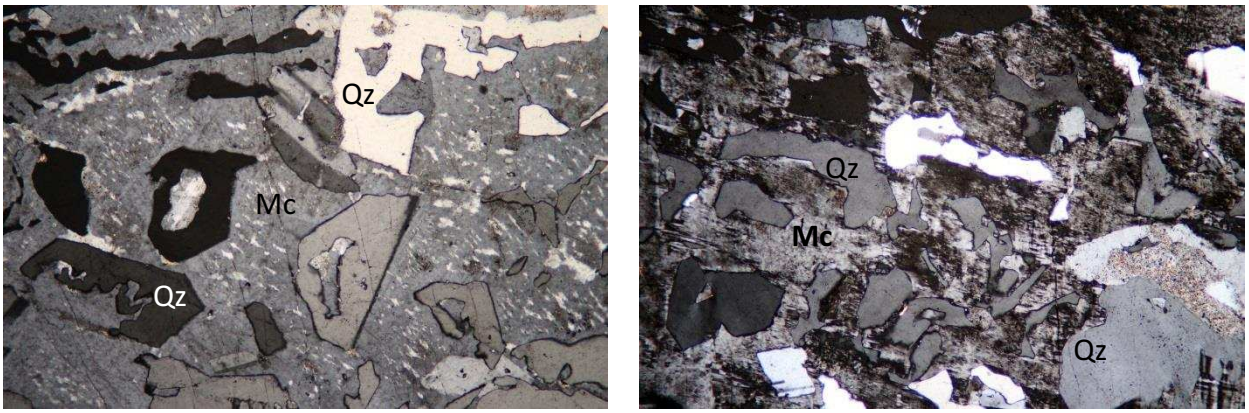


Figure 3.17 Sample MX12AB086. Photomicrographs in cross-polarized light showing graphic and myrmekitic intergrowths of quartz and microcline in aplite. F.O.V. = 3.15mm x 2.15mm.

Figure 3.18 Sample MX12AB086. Photomicrograph in cross-polarized light showing tartan twinning of microcline and polysynthetic twinning of albite in aplite. Both feldspars have quartz intergrowths and inclusions of muscovite. F.O.V. = 3.15mm x 2.15mm.

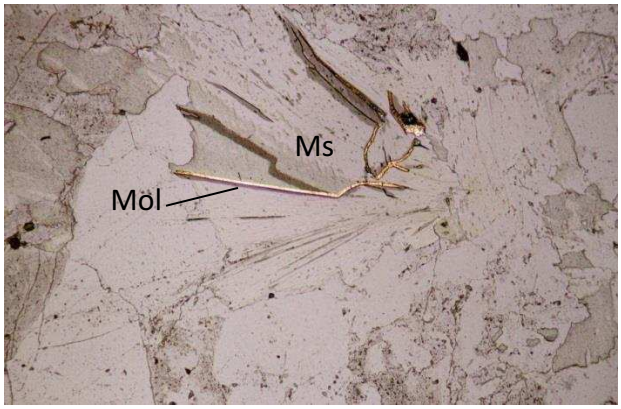


Figure 3.19 Sample MX12AB086. Photomicrograph in reflected light showing bladed molybdenite intergrown with radiating muscovite in aplite. F.O.V. = 3.15mm x 2.15mm.

3.3.3.4 Trondhjemite

The trondhjemite occurs as narrow dikes of less than one meter thickness. The timing in relation to the other igneous phases found at MAX is uncertain. The mineral assemblage of these rocks is quartz-plagioclase-biotite-muscovite-chlorite, where chlorite is an alteration product of biotite. Anhedral quartz comprises 45 modal % of the rock with an average grain size of 0.2 mm and equigranular crystals surround larger (avg. 1 mm) plagioclase crystals (Fig. 3.20). One to two millimeter quartz phenocrysts that contain inclusions of chlorite, plagioclase and magnetite are also found. Plagioclase crystals are euhedral and comprise 40 modal % of the rock. It was difficult to find unaltered samples of trondhjemite and the samples examined exhibit strong sericite alteration of feldspars (Fig. 3.20). The biotite has an average size of 0.3 mm and has mostly been altered to chlorite, lesser muscovite and sphene (Fig. 3.21). There is trace 0.3 mm euhedral pyrite disseminated throughout, which contain inclusions of magnetite and quartz. Anhedral pyrite is also observed associated with fine-grained chalcopyrite (Fig. 3.21). The magnetite is very fine-grained, trace, and a product of the alteration of biotite (Fig. 3.21).

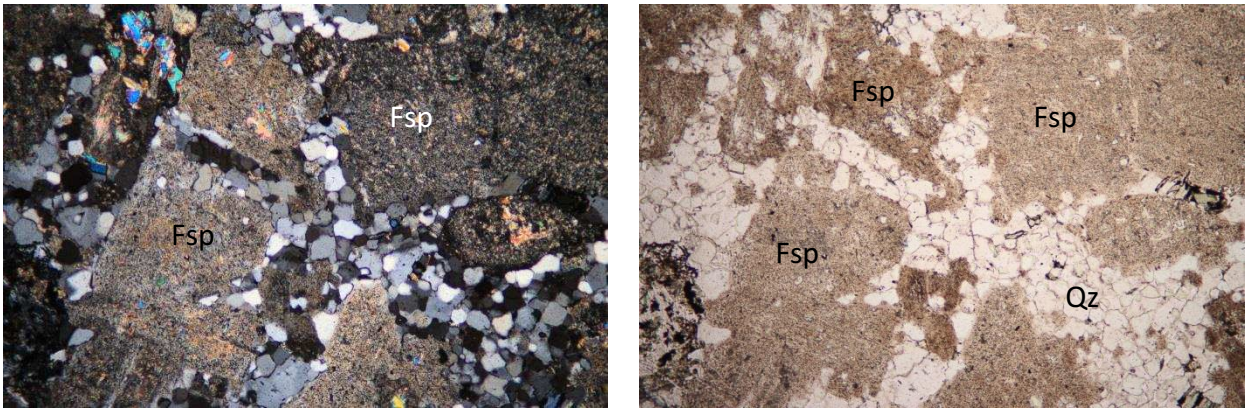


Figure 3.20 Sample MX12AB083. Photomicrographs in plain and cross-polarized light showing sericite alteration of feldspars. Feldspars are surrounded by finer grained quartz. F.O.V. = 3.15mm x 2.15mm.

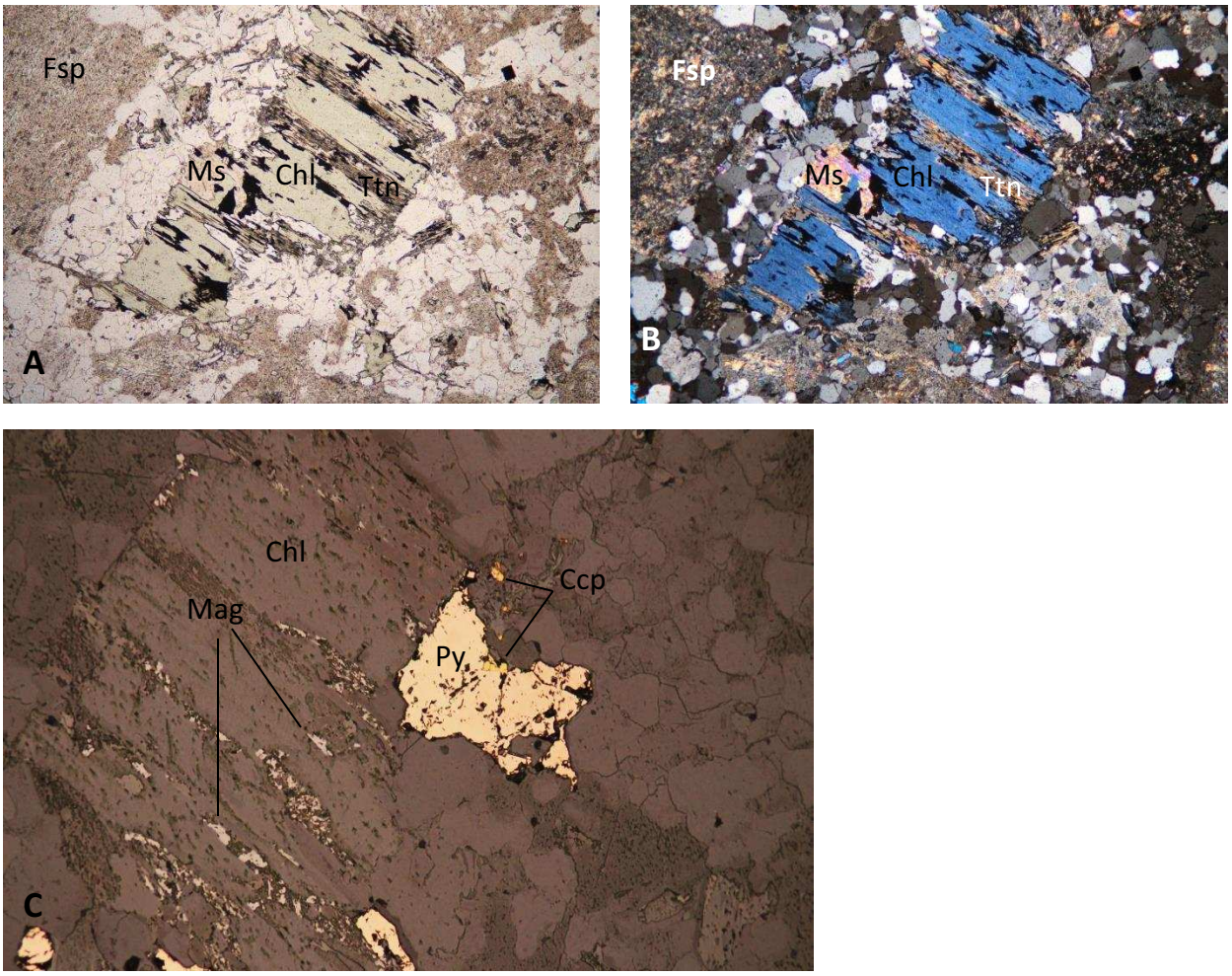


Figure 3.21 Sample MX12AB083**.** Photomicrograph in plain polarized light (A) and cross-polarized light (B) showing chlorite, sphene, muscovite, and magnetite altered from biotite, surrounded by fine-grained quartz; F.O.V. = 3.15mm x 2.15mm. Photomicrograph in reflected light (C) showing fine-grained magnetite altered from biotite. Along the margin there is pyrite with finer grained chalcopyrite; F.O.V = 1.55mm x 1.05mm.

3.3.1.5 Quartz diorite

Quartz diorite is the least abundant igneous phase observed at MAX. The mineral assemblage of the diorite dikes is plagioclase-quartz-biotite-muscovite-chlorite, where quartz is <20 modal % and chlorite is secondary. Plagioclase comprises approximately 60 modal % with an average grain size of 0.7 mm. They display polysynthetic twinning as well as offset twins and concentric growth zoning. The crystals are decussate, poikilitic and have moderate to strong sericite alteration where almost entire crystals have been altered to muscovite. The quartz is

anhedral, poikilitic and has undulatory extinction. Anhedral biotite comprises 10-15 modal % with an average grain size of 0.1 mm. The biotite exhibits bird's eye extinction and is commonly altering to chlorite, muscovite and sphene. Disseminated pyrite ranges from 1-5 modal % with an average grain size of 0.1 mm. There is trace amorphous very fine-grained chalcopyrite associated with and observed as inclusions within the pyrite. Trace molybdenite also occurs in the diorite where it is subhedral and exhibits a fibrous texture.

3.3.2 Mineralogy by Rock Type: Paleozoic Lardeau Group metasedimentary rocks

3.3.2.1 Mica Schist and Mica Hornfels

Mica schist is the dominant country rock within the contact metamorphic aureole of the Trout Lake igneous complex. In proximity to the intrusive complex the schist is metamorphosed to hornfels. The schists commonly contain lenses and irregular shaped veins of dolomite. Mineral assemblages of these rocks are quartz-biotite-muscovite-albite-pyrite-chlorite±epidote, where chlorite is an alteration product from biotite and epidote is an alteration product from plagioclase. The quartz comprises 55-60 modal % is anhedral and averages 0.1 mm in size. They exhibit sutured grain boundaries and are locally poikilitic containing inclusions of apatite, biotite and chlorite. Euhedral biotite comprises 15-25 modal % and exhibit bird's eye extinction. There is no preferred orientation in the hornfels (Figs. 3.22, 3.23) whereas in the schists foliation is sub-vertical. Muscovite is very fine-grained, euhedral and comprises 15-25 modal %. There is very strong phyllic alteration within the hornfels and feldspars show strong sericitization (Fig. 3.24). Asymmetrical crenulation is also common within the schists (Fig. 3.25). Albite comprises 5 modal % and is commonly larger than the other minerals having an average grain size of 0.3 mm. They display twinning and locally exhibit strain with offset and imperfect twins. Chlorite ranges from 1-5 modal %, with an average grain size of 0.1 mm. The chlorite is subhedral and

an alteration product of biotite, it is also found as inclusions within quartz. The epidote ranges from 1-3 modal %, and are an alteration product of the albite. Fine-grained, subhedral pyrite is commonly disseminated in these rocks and may range up to 8 modal % (Fig. 3.26).

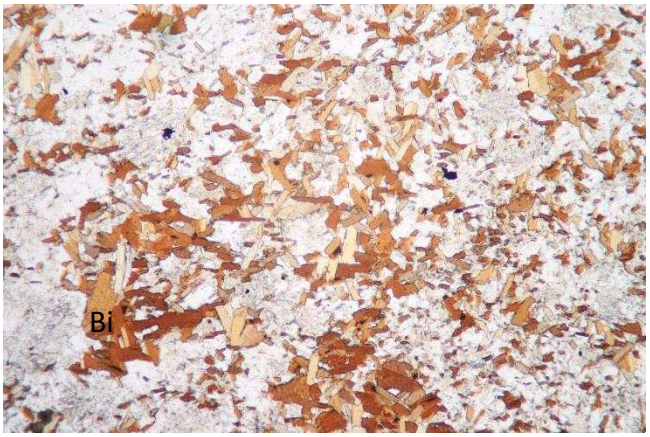


Figure 3.23 Sample MX12AB023. Photomicrograph in plain polarized light showing decussate texture of biotite, having no preferred orientation, in the mica hornfels. F.O.V. = 3.15mm x 2.15mm.

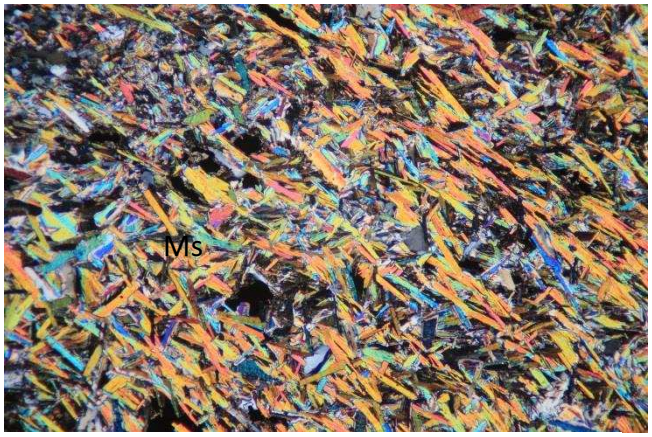


Figure 3.22 Sample MX12AB025. Photomicrograph in cross polarized light showing decussate texture of mica, having no preferred orientation, in the mica hornfels. F.O.V. = 3.15mm x 2.15mm.

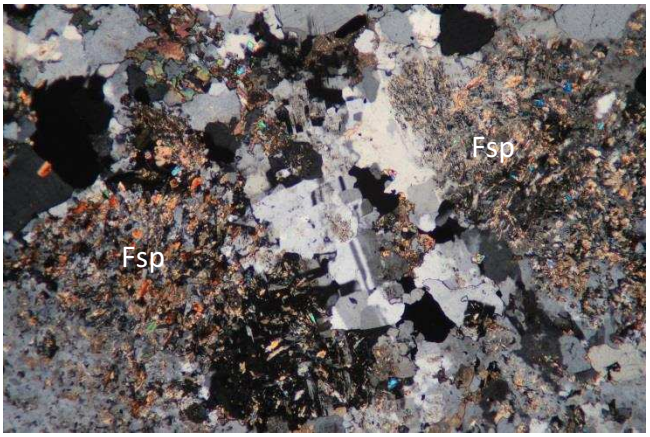


Figure 3.25 Sample MX12AB024. Photomicrograph in cross polarized light showing sericite alteration of feldspars in mica hornfels. F.O.V. = 3.15mm x 2.15mm.

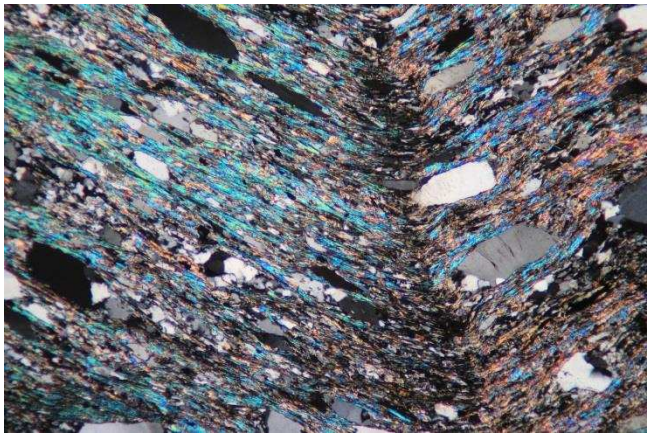


Figure 3.24 Sample MX12AB012. Photomicrograph in cross polarized light showing asymmetrical crenulation of muscovite in mica schist. F.O.V. = 3.15mm x 2.15mm.

Figure 3.26 Sample MX12AB017. Photomicrograph in reflected light showing pyrite and lesser magnetite aligned with mica in the mica schist. F.O.V. = 3.15mm x 2.15mm.

3.3.2.2 Phyllite

Phyllite is the second most abundant country rock within the contact metamorphic aureole of the MAX deposit. Mineral assemblages of these rocks are quartz-muscovite-chlorite-pyrite±epidote. The quartz ranges in size from <0.1 mm to 0.5 mm and comprises 55-60 modal % of the rock. The quartz is granoblastic between bands of aligned mica and exhibits undulatory extinction, with seriate and sutured grain boundaries suggesting recrystallization (Fig. 3.27). Fine-grained, euhedral muscovite is the most common mica in these rocks comprising 30-35 modal %. It is typically bladed and aligned in foliated bands with chlorite, showing asymmetrical crenulation (Fig. 3.28). Muscovite was frequently observed as inclusions within granoblastic quartz. Subhedral, bladed, fine-grained chlorite comprises 10-20 modal % of the rock. Fine-grained lath shaped magnetite occurs aligned with the mica and fine- to coarse-grained subhedral pyrite disseminated throughout the phyllites (Fig. 3.29). Trace fine-grained chalcopyrite was observed in association with the pyrite (Fig. 3.29).

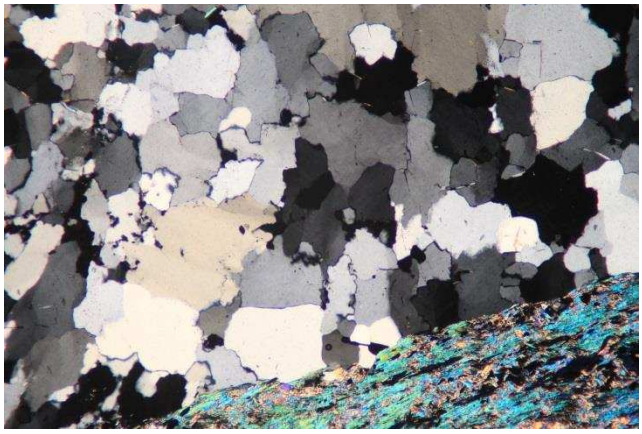


Figure 3.28 Sample MX12AB011. Photomicrograph in cross polarized light showing granoblastic quartz with seriate grain boundaries and undulatory extinction. F.O.V. = 3.15mm x 2.15mm.

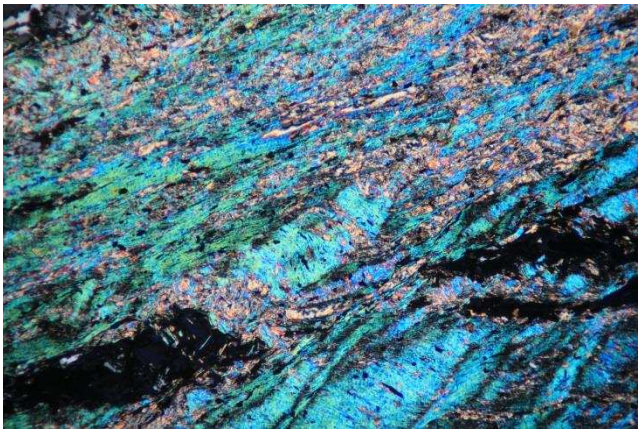


Figure 3.27 Sample MX12AB011. Photomicrograph in cross polarized light showing asymmetrical crenulation of muscovite. F.O.V. = 3.15mm x 2.15mm.

Figure 3.29 Sample MX12AB011. Photomicrograph in reflected light showing medium-grained pyrite and fine-grained magnetite laths disseminated and following crenulation of micaceous layers. Also chalcopyrite can be seen associated with the pyrite. F.O.V. = 1.55mm x 1.05mm.

3.3.2.3 Chlorite-schist

Chlorite schist is exposed at surface for approximately 1 km in an outcrop that runs northwest-southeast, located 2 km northeast from the Trout Lake stock (Fig. 3.1). The chlorite-schist contains quartz-carbonate-epidote veins which range in width from 2 mm to greater than 10 cm. The schist is comprised of quartz-chlorite-epidote-actinolite-muscovite-calcite, all of which are fine-grained. The quartz comprises 40-45 modal % of the rock and is anhedral with seriate grain boundaries and subgrains are also observed (Fig. 3.30). Fine-grained, subhedral

chlorite ranges in abundance from 30-35 modal % and is aligned in foliated bands with muscovite which commonly display asymmetrical crenulation (Figs. 3.30, 3.31). Locally chlorite is observed along fractures in the quartz-carbonate veins and occurs as radiating crystals within the veins. Chlorite is also observed as inclusions within the calcite. Euhedral muscovite ranges in abundance from 20-25 modal %. Highly fractured epidote ranging up to 10 modal % is observed with quartz in between foliated bands of mica (Fig. 3.31). Euhedral needle-like radiating actinolite ranges from 10-15 modal %. The actinolite typically grows perpendicular to foliation (Fig. 3.31). Subhedral calcite comprises 5-10 modal %, with triple junction grain boundaries and is interstitial between quartz crystals. Within the quartz-carbonate-epidote veins minerals are medium-grained, compared to the fine-grained schistose host.

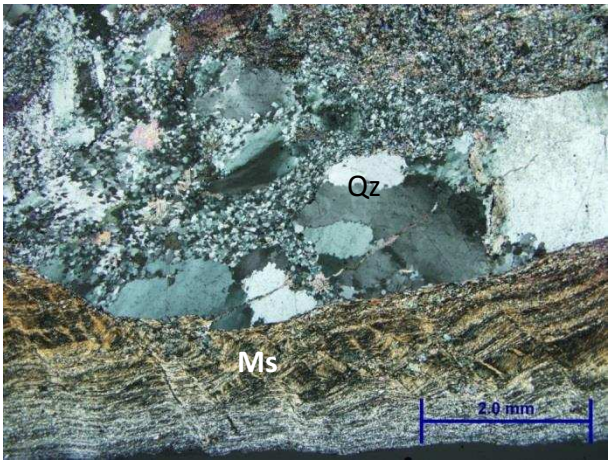


Figure 3.30 Sample MX12AB068. Photomicrograph in cross polarized light showing subgrains and sutured grain boundaries in quartz with undulatory extinction. Also shows asymmetrical crenulation of muscovite and chlorite.

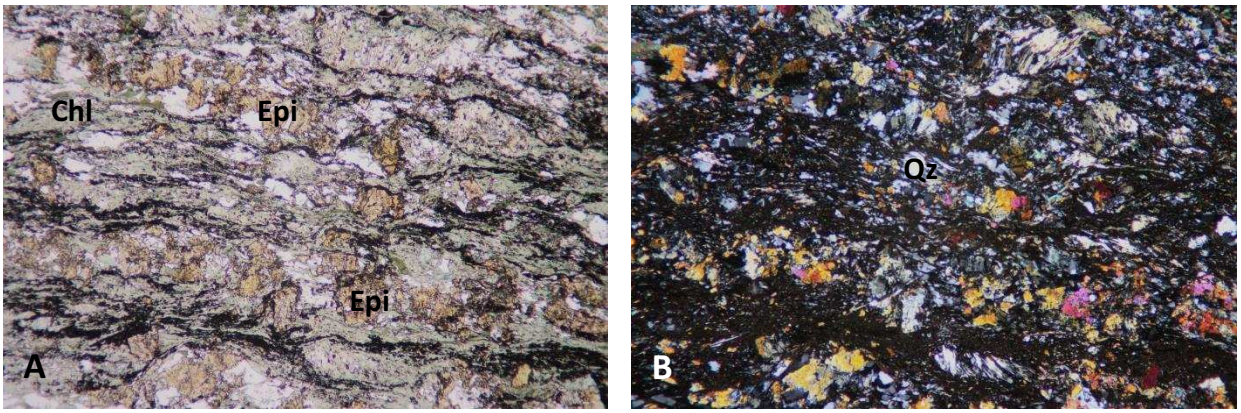


Figure 3.31 Sample MX12AB022. Photomicrographs in plain polarized light (A) and cross polarized light (B) showing fractured epidote with quartz between bands of aligned chlorite. Perpendicular to foliation there is acicular needle like crystals of actinolite. F.O.V. = 3.15mm x 2.15mm.

3.3.3 Hydrothermal rocks and veins

3.3.3.1 Quartz Veins

There is a well-defined quartz vein stockwork at MAX, in which five main quartz vein trends have been identified (Linnen and Williams-Jones, 1987). They are interpreted to be coeval and related to the Trout Lake stock, demonstrated by cross-cutting relationships and previous age dating on igneous phases and mineralization within the veins (Lawley et al., 2010). Mineral assemblages of the quartz veins are quartz ± muscovite ± chlorite ± pyrite ± pyrrhotite ± molybdenite. Average grain size of the quartz is 0.7 mm and comprises ≥ 80 modal % of the vein. The crystals are anhedral and the coarser grains are often associated with interstitial pyrite and molybdenite. If quartz vein is hosted in intrusive igneous rocks, grain size within the host commonly increases with proximity to the veins. Chlorite and biotite are observed locally along the margins of quartz veins (Figs. 3.32, 3.33). When present in the country rock feldspars have typically undergone varying degrees of sericite alteration with the strongest alteration observed along quartz veins (Figs. 3.34). Amorphous to subhedral pyrite makes up trace to 15 modal %,

and is often associated with fine-grained chalcopyrite and molybdenite mineralization (Figs. 3.35, 3.36). Pyrite is interstitial between quartz crystals and also commonly occurs along margins of quartz veins (Fig. 3.36). Molybdenite is often radiating and euhedral, appearing fibrous and may display kink banding (Figs. 3.37, 3.38). Molybdenite mineralization is commonly observed along contact of quartz veins with granodiorite, biotite mica schists and hornfels (Fig. 3.38).

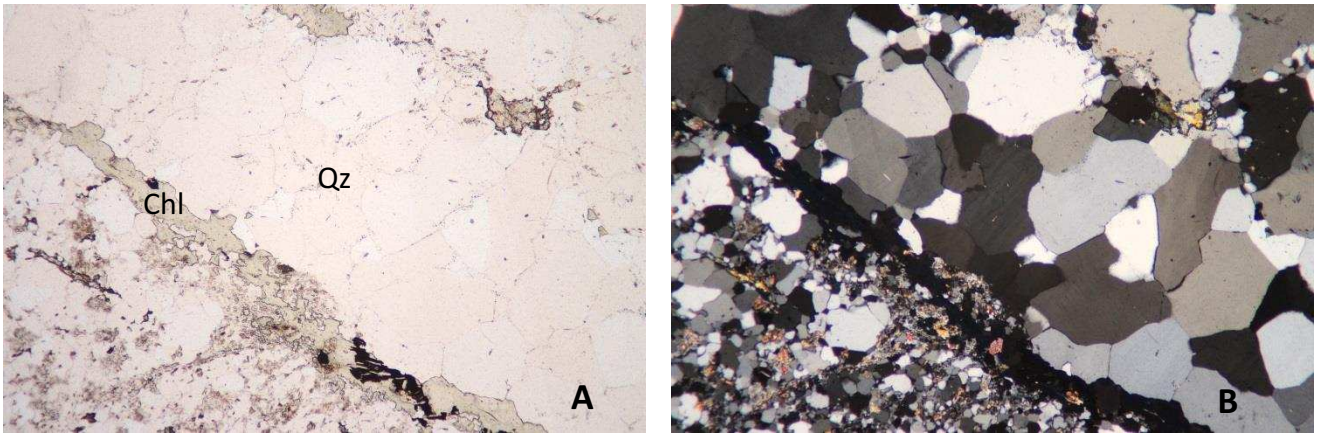


Figure 3.32 Sample MX12AB018. Photomicrographs in plain polarized light (A) and cross polarized light (B) showing chlorite along the margin of a quartz vein and mica schist. Cross polarized light image shows quartz with triple junction grain boundaries. F.O.V. = 3.15mm x 2.15mm.

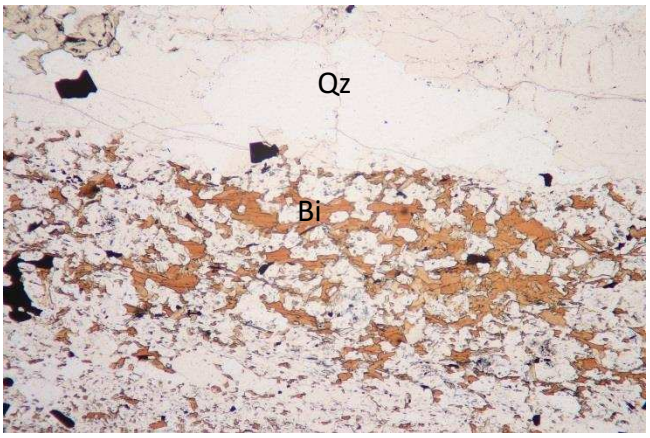


Figure 3.34 Sample MX12AB017. Photomicrograph in plain polarized light showing biotite increasing in abundance and grain size with proximity to quartz vein. F.O.V. = 3.15mm x 2.15mm.

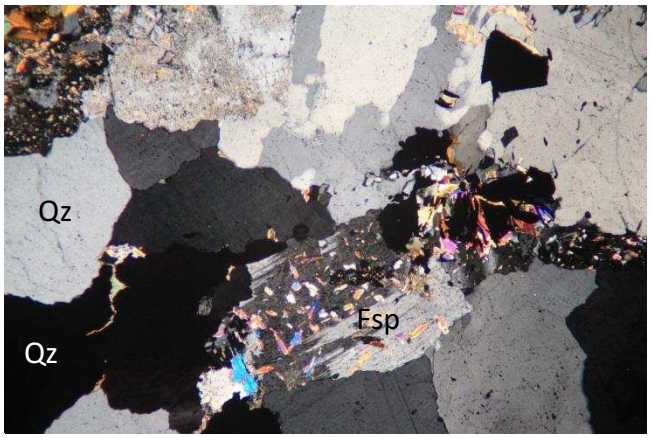


Figure 3.33 Sample MX12AB023. Photomicrograph in cross polarized light showing sericite alteration of feldspar in mica hornfels. F.O.V. = 3.15mm x 2.15mm.

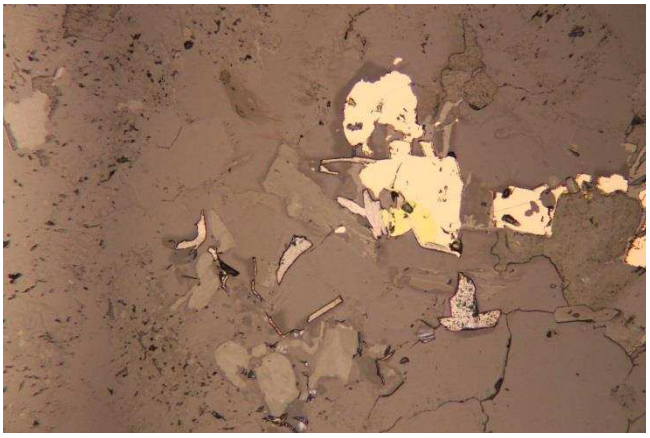


Figure 3.36 Sample MX12AB096. Photomicrograph in reflected light showing subhedral pyrite with chalcopyrite and molybdenite in quartz veinlet within granodiorite. F.O.V. = 1.0mm x 0.51mm.

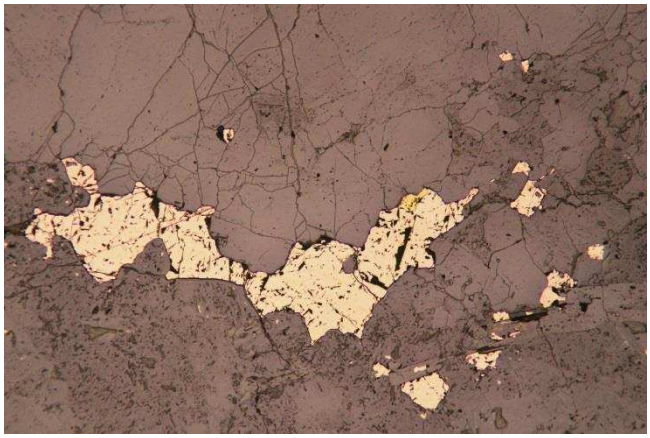


Figure 3.35 Sample MX12AB023. Photomicrograph in reflected light showing medium-grained pyrite with fine-grained chalcopyrite along margin of quartz vein and hornfels. F.O.V. = 3.15mm x 2.15mm.

Figure 3.38 Sample MX12AB023. Photomicrograph in reflected light showing radiating molybdenite within quartz vein. F.O.V. = 3.15mm x 2.15mm.

Figure 3.37 Sample MX12AB023. Photomicrograph in reflected light showing radiating molybdenite along margin of quartz vein and hornfels. F.O.V. = 3.15mm x 2.15mm.

3.3.3.2 Skarn

The skarns at the MAX deposit are the result of metamorphism of carbonate rich country rocks in proximity to the Trout Lake stock. These rocks are fine- to coarse-grained and contain 1 mm thick quartz veins throughout. The mineral assemblage of the skarns is calcite-diopside-garnet-tremolite-clinozoisite with lesser sulfides. The calcite comprises up to 85 modal % and average size is 0.1 mm. The calcite has been recrystallized and displays triple junction grain boundaries. The tremolite is fibrous, radiating and typically fine-grained comprising 1-2 mm

veins (Fig. 3.39). On the margins of these veins there is fine-grained amorphous clinozoisite (Fig. 3.39). Diopside averages 0.1 mm in size and comprises 5 – 15 modal % of the rock (Fig. 3.40). The sulfides in the skarn range from 1-3 modal %. Subhedral to amorphous pyrite, molybdenite, and trace galena was observed. Late quartz-carbonate veins that crosscut the molybdenite stockworks may host rare galena and sphalerite.

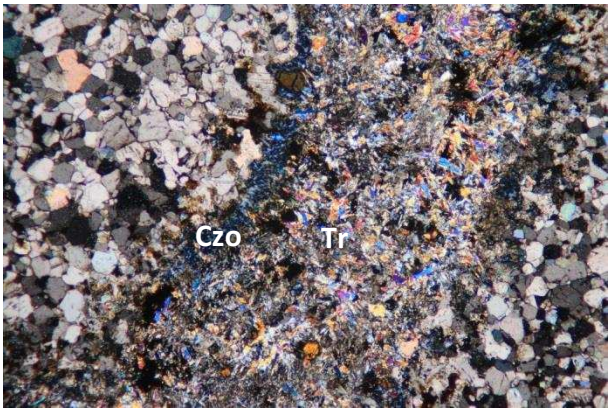


Figure 3.40 Sample MX12AB004. Photomicrograph in cross polarized light showing tremolite vein with clinozoisite along margin. F.O.V. = 3.15mm x 2.15mm.

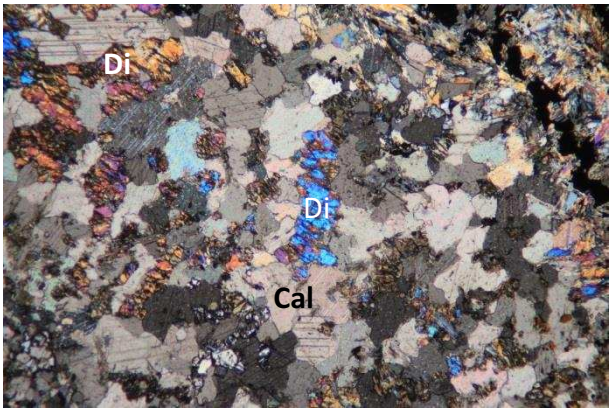


Figure 3.39 Sample MX12AB004. Photomicrograph in cross polarized light showing diopside and recrystallized calcite. F.O.V. = 3.15mm x 2.15mm.

3.3.3.3 Epidote Carbonate Quartz Veins

Epidote-carbonate-quartz veins occur throughout the chlorite schist often parallel to regional foliation. The mineral assemblage of these veins are epidote-calcite-quartz±chlorite. The epidote ranges from 25-40 modal % and is characterized by coarser crystals (0.5-2.0 mm) that are highly fractured with finer quartz, calcite and chlorite along these fractures (Fig. 3.41). The epidote exhibits undulatory extinction and is locally replacing calcite. Subhedral calcite comprises 30 modal % having an average grain size of 0.25 mm and typically displays triple junction grain boundaries. The calcite is interstitial between quartz grains and contains inclusions of quartz. The quartz is anhedral and comprises 25-30 modal % with an average grain size of 0.2

mm. The quartz has triple junction grain boundaries and commonly displays subgrains. Also within the veins there is trace disseminated fine-grained pyrite and magnetite.

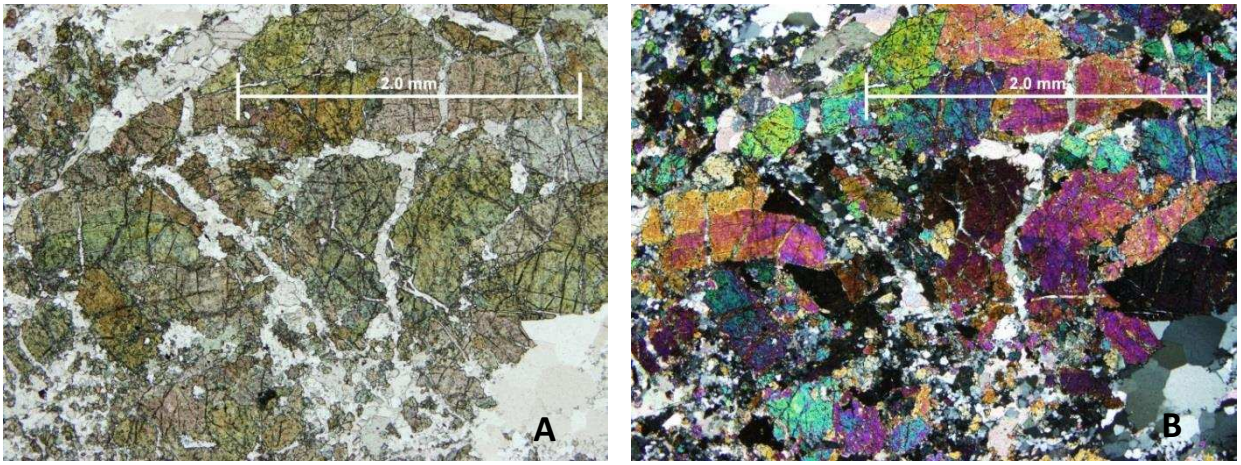


Figure 3.41 Sample MX12AB022. Photomicrographs in plain polarized light (A) and cross polarized light (B) showing brecciated epidote with fine-grained quartz and calcite along fractures. F.O.V. = 3.45mm x 3.2mm.

Chapter 4 - Whole rock geochemistry

4.1 Introduction

Whole rock geochemistry was conducted on samples that were also used for quartz, epidote and chlorite mineral chemistry. This was undertaken to see if there were any general trends pertaining to alteration and mineralization and if whole rock trace element geochemistry would reveal potential pathfinder elements that could be used to vector towards the deposit. Elemental ratios were used to compare whole rock and mineral chemistry data. The whole rock geochemistry data generated in this study was also used for rock classification and construction of variation diagrams that were used in combination with mineralogical studies and petrography to properly classify the rocks from MAX. This ensured that petrographic studies of rocks and resultant nomenclature corresponded with the geochemistry.

4.2 Methodology

Eighty-four representative samples from MAX were sent to Acme Laboratories Ltd. in Vancouver, Canada for whole rock analysis (See Chapter 3: Fig. 3.1 for sample locations). Samples were prepared by washing, drying and undergoing particle size reduction in order to produce a subsample that was homogenous and representative of the original sample. Calibration standards, verification standards and reagent blanks were used to ensure precision, accuracy and resultant data quality. For particle reduction, samples were first jaw crushed to 70 %, producing particles < 2mm in size passing through 10 wire mesh. A 250g representative portion was then riffle split and pulverized using a mild-steel ring-and-puck mill to 95%, producing < 100μm particles passing through a 150 wire mesh. A graphite crucible was used to fuse 0.2-g of representative homogenous powdered sample with 1.5g of $LiBO_2/LiB_4O_7$ flux at 980°C for 30 minutes. The fused mixture was then dissolved in 5% HNO_3. A Jarrel Ash AtomComp Model

975/Spectro Ciros Vision inductively coupled emission spectrograph was used to determine major element concentrations. A Perkin-Elmer Elan 6000 or 9000 inductively coupled plasma mass spectrometer was used for trace element analysis. The lower detection limit for the major elements was <0.04 wt.%. For the majority of the trace elements analysed the detection limit was <0.5 ppm, however for the rare earth elements analysed it was <0.05 ppm.

4.3 Results

Granodiorite

The granodiorite, the most common igneous phase at the MAX deposit, is characterized as having 69 – 73 wt.% SiO_2, Al_2O_3 values of 14 – 15 wt.%, Na_2O values of 3 – 4 wt.%, Fe_2O_3 values of 2 – 3 wt.%, CaO values of 1 – 3 wt.%, K_2O values of 2 – 4 wt.% and MgO values of 0.5 – 0.6 wt.%. The granodiorite had undergone differing degrees of phyllic, potassic, propylitic and silicic alteration after emplacement but only the most pristine samples were used for whole rock geochemistry calculations. Plotted on a TAS (total alkali-silica) diagram samples fell within the granodiorite field (Fig. 4.1). The granodiorite displays fractionated HREEs, with Gd/Yb_{cn} values of 1.9 – 3.7; and LREE enrichment, having La/Sm_{cn} values ranging from 5.2 – 6.7, and negative Nb and Ti anomalies (Fig. 4.2).

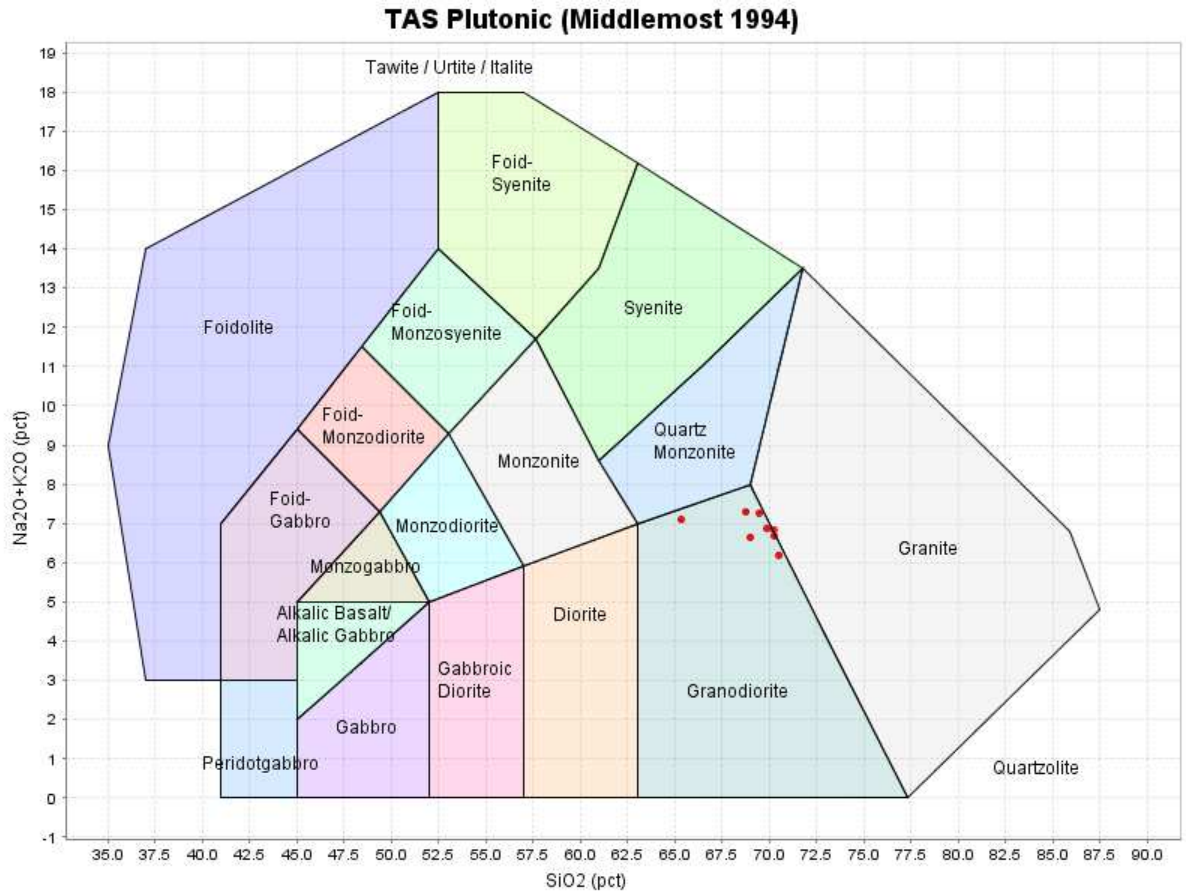


Figure 4.1 TAS diagram for samples taken from the granodioritic phase. After Middlemost (1994).

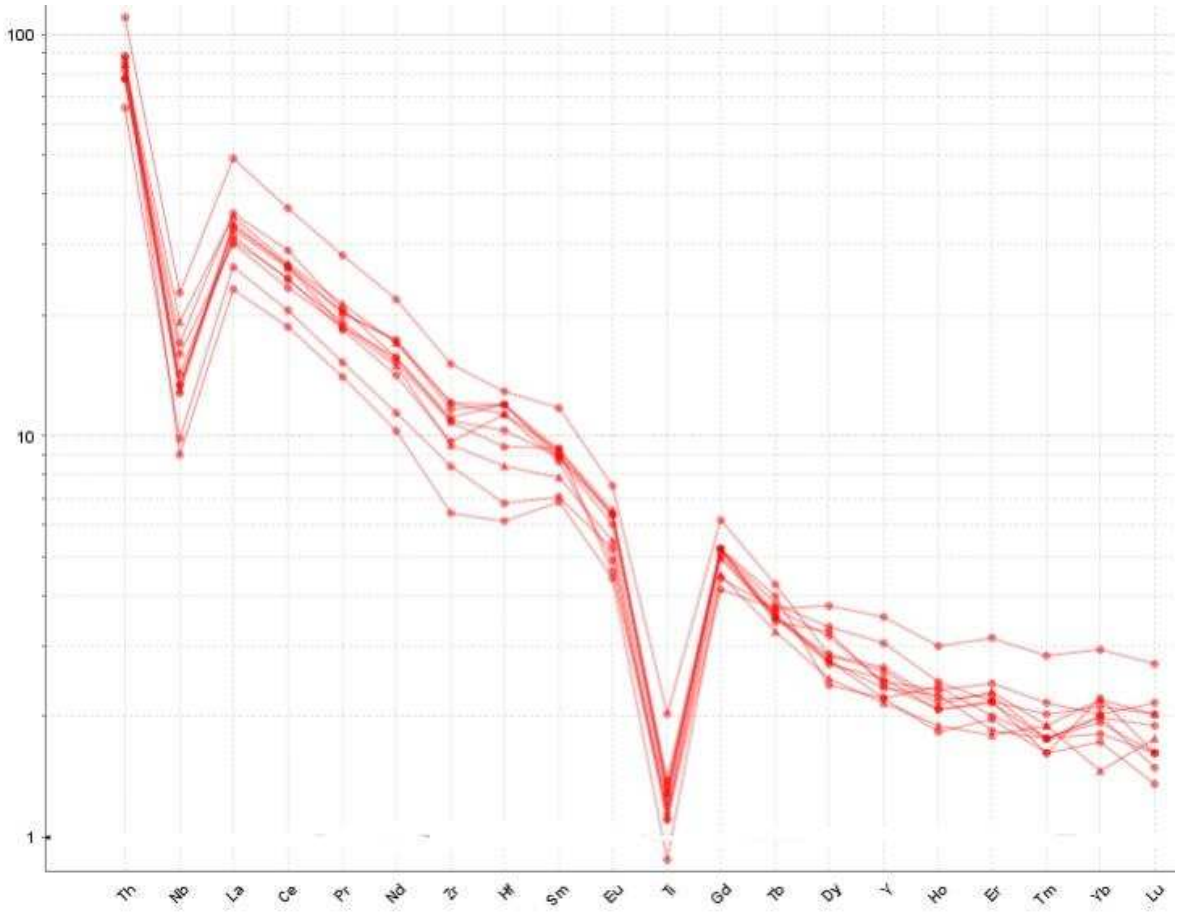


Figure 4.2 Primitive mantle normalized spider plots of granodiorite samples. Normalising values from Sun and McDonough (1989).

Diorite

The diorite is characterized as having 66.2 – 68.2 wt.% SiO_2, Al_2O_3 values of 15.9 – 16.9 wt.%, Na_2O values of 3.8 – 4 wt.%, Fe_2O_3 values of 3.3 – 4.6 wt.%, CaO values of 3.3 – 4.5 wt.%, K_2O values of 1.7 – 2.6 wt.% and MgO values of 0.7 – 1.2 wt.%. The diorite displays well fractionated HREEs, with Gd/Yb_{cn} values of 3.0 – 4.1; and LREE enrichment, having La/Sm_{cn} values ranging from 5.0 – 5.7 (Fig. 4.3). The diorite has negative Nb and Ti anomalies. When compared to the granodioritic phase the diorite has higher concentrations of Al, Na, Fe and Ca

and lower Si and K, though even less altered samples showed evidence of silicic and phyllic alteration.

Figure 4.3 Primitive mantle normalized spider plots showing diorite samples. Normalising values from Sun and McDonough (1989).

Tonalite

The tonalite is characterized as having 67.7 – 69.0 wt.% SiO_2, Al_2O_3 values of 15.4 wt.%, Na_2O values of 3.7 wt.%, Fe_2O_3 values of 2.9 – 3.3 wt.%, CaO values of 2.9 – 3.1 wt.%, K_2O values of 2.6 – 3.5 wt.% and MgO values of 0.7 – 0.8 wt.%. Similar to the other igneous phases the tonalite displays fractionated HREEs, with Gd/Yb_{cn} values of 3.1; and LREE enrichment, with La/Sm_{cn} values ranging from 5.5 and has negative Nb and Ti anomalies (Fig. 4.4). The samples

have undergone potassic, silicic and propylitic alteration and a pristine sample was not available for whole rock geochemistry, however the samples show smooth primitive mantle normalised patterns suggesting that the trace elements have not been mobilized as a result of alteration.

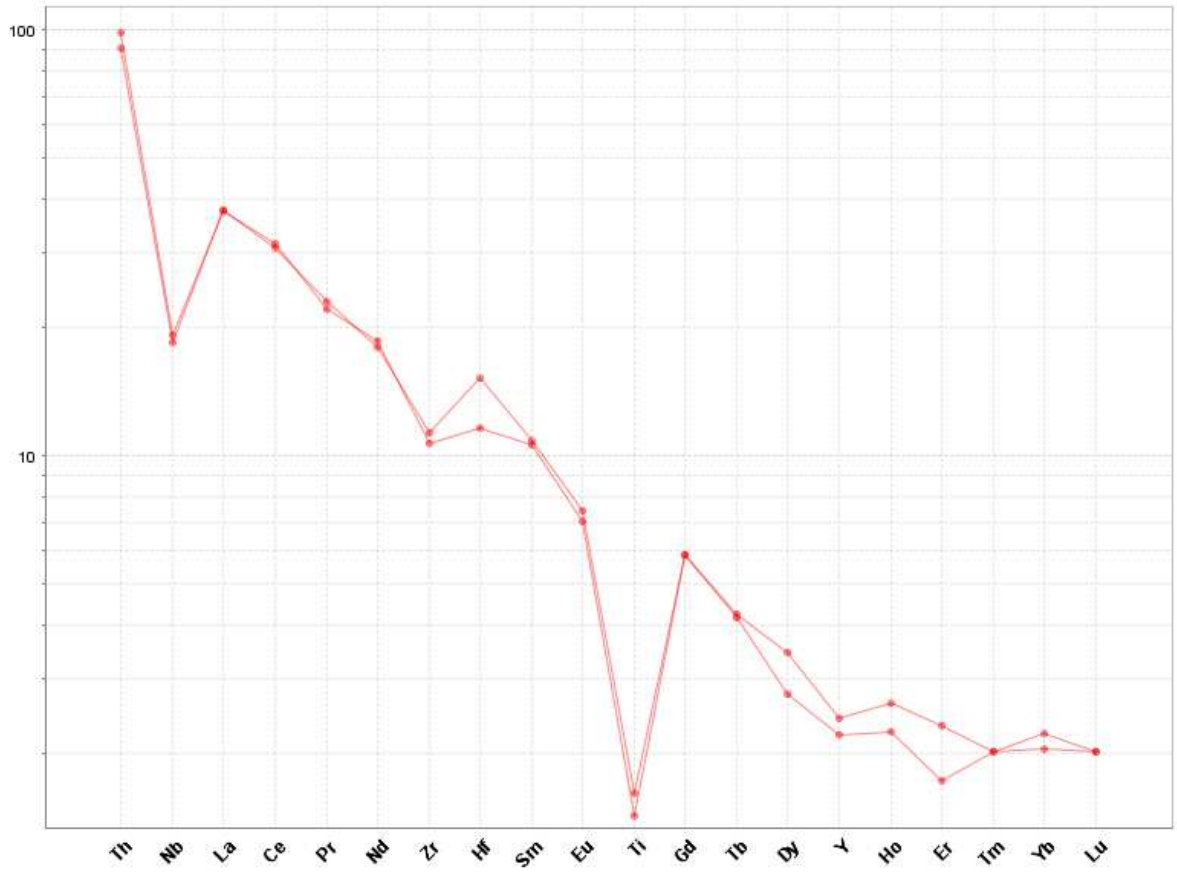


Figure 4.4 Primitive mantle normalized spider plots showing tonalite samples. Normalising values from Sun and McDonough (1989).

Trondhjemite

The trondhjemite is characterized as having 67.8 wt.% SiO_2, Al_2O_3 values of 15.4 wt.%, Na_2O values of 3.7 wt.%, Fe_2O_3 values of 3.2 wt.%, CaO values of 2.9 wt.%, K_2O values of 3.3 wt.% and MgO values of 0.7 wt.%. The trondhjemite displays well fractionated HREEs, with Gd/Yb_{cn} values of 4.2; and LREE enrichment, having La/Sm_{cn} values ranging from 5.9 (Fig. 4.5). The

trondhjemite has negative Nb and Ti anomalies. The trondhjemite sample has undergone potassic, propylitic and silicic alteration and a pristine sample was not available for whole rock geochemistry.

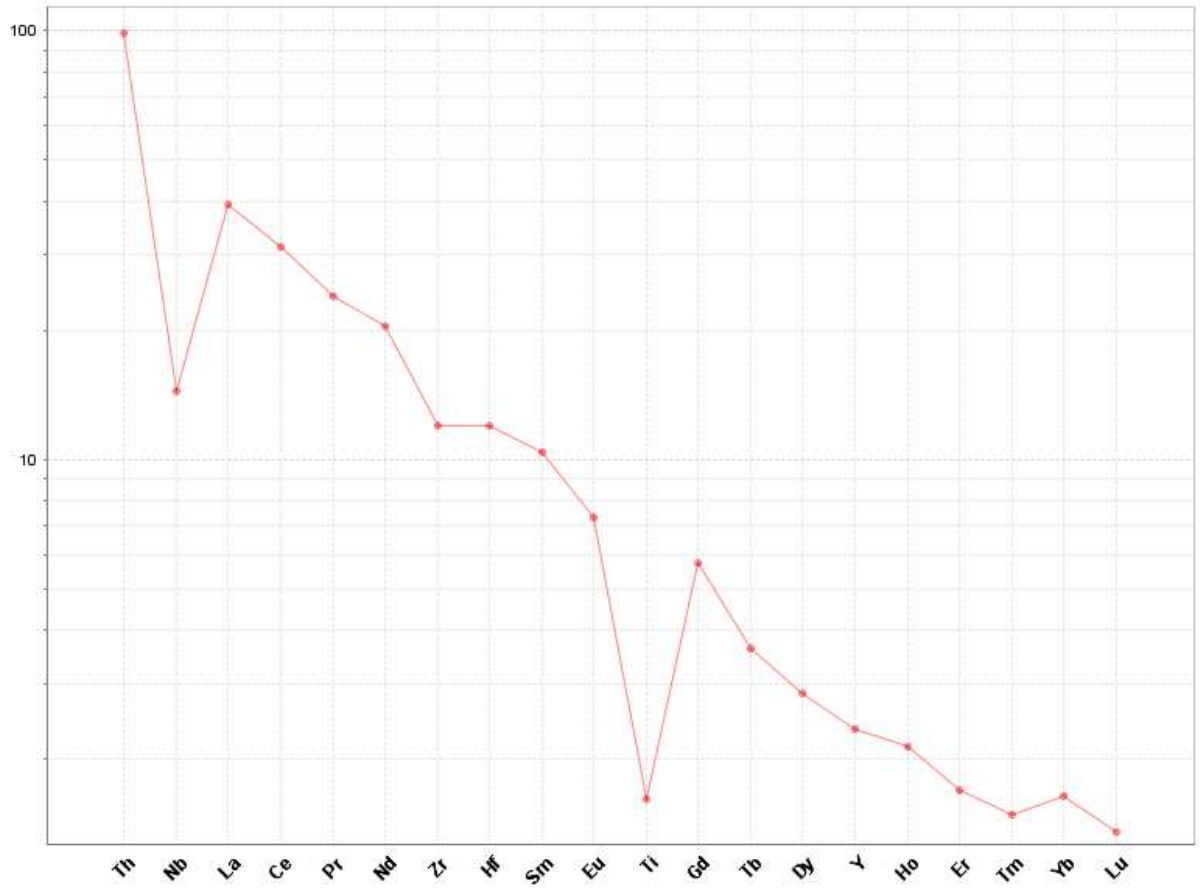


Figure 4.5 Primitive mantle normalized spider plots showing trondhjemite sample. Normalising values from Sun and McDonough (1989).

Chapter 5 –Mineral chemistry of Quartz, Chlorite and Epidote

5.1 Introduction

Laser ablation ICP-MS analysis was carried out in order to document variations in the trace element geochemistry of selected hydrothermal alteration minerals from the MAX deposit, as well as to compare their trace element geochemistry with non-hydrothermal variants of the same mineral species. The minerals analysed were quartz, chlorite and epidote, with emphasis on the products of hydrothermal alteration.

Of particular interest are changes in concentrations of trace elements that occur as a function of distance from the center of the deposit, as these may provide a useful indication of proximity to economic mineralization. These changes in concentration can help to define distal and proximal pathfinder elements. A good distal indicator will have high solubility in magmatic-hydrothermal fluids, whereas a proximal indicator increases in concentration towards the center of the deposit due to its comparatively low solubility in the fluid. This contrasts with trace element concentrations in minerals that formed due to isochemical regional metamorphism, which should remain constant, possibly rock-buffered, and not change as a function of distance to ore. Sample locations are shown in Figure 5.1.

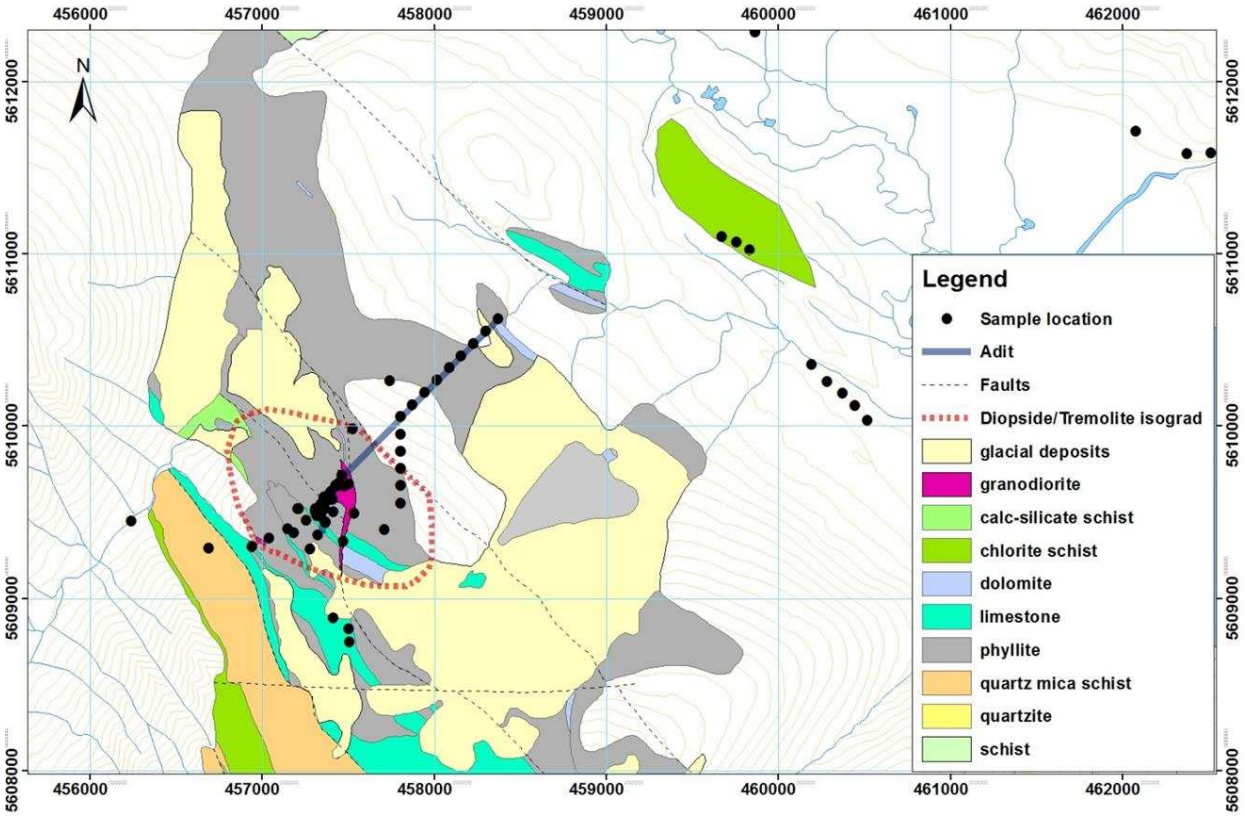


Figure 5.1 Geological map of the MAX deposit area showing sample locations. The red dashed line is the extent of diopside alteration surrounding the Trout Lake granodiorite stock, as identified by Read et al. (2009).

The trace element and isotope geochemistry of hydrothermal, igneous and regional metamorphic minerals can be distinct, with significant differences that may be detected by analyses of certain trace elements (Cooke et al., 2014; Wilkinson et al., 2015). These differences can be used together with macroscopic and microscopic textures, cathodoluminescence (when applicable), and mineral associations, in order to distinguish the origin of the mineral.

Laser ablation ICP-MS is the preferred method for analysing the elements of interest, as it has both low detection limits and good precision over several orders of magnitude. Elements were measured rapidly and sequentially and a complete analysis was made in 90 seconds; 30 seconds of background acquisition followed by 60 seconds of sample ablation (Fig. 5.2).

A laser beam was concentrated on the surface of a sample, ablating it and producing fine particles. The spot size (μm), frequency (Hz), fluence (J/cm^2), energy (mJ), and the locations for ablation were chosen based on mineral grain size, in order to ensure that only the desired mineral was ablated for optimal results. The ablated particles were then transported through an interface via Ar, He, and/or Ne carrier gases from the sample cell to the mass-spectrometer for rapid elemental and isotopic analysis. Helium gas flows continuously through the sample cell through the interface and to the mass spectrometer.

Inductively coupled plasma mass spectrometry (ICP-MS) provides a secondary excitation source for digestion and ionization of the particles ablated by the laser. The particles are introduced into the nebulizer with argon plasma, which is heated up to 10,000 K. Depending on the mineral to be analysed, individual isotopes were pre-selected for analysis (e.g., Fig. 5.2). Individual isotopes are resolved and counted sequentially by the detector according to their mass. The length of time each element is measured by the ICP-MS directly correlates with the amount of elements being analysed.

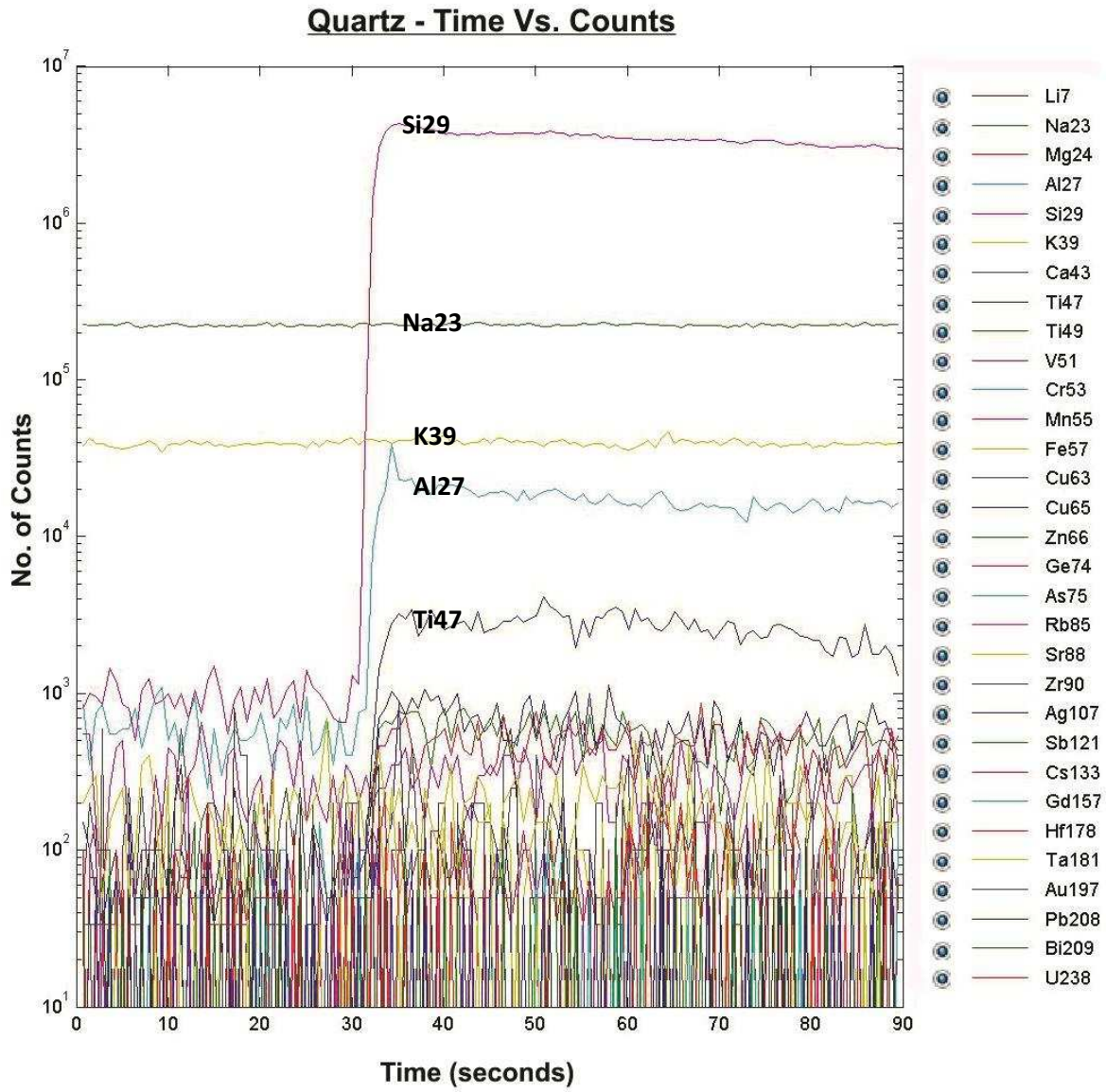


Figure 5.2 Quartz major and trace element data by LA-ICP-MS, showing time in seconds *versus* number of counts of selected isotopes of interest. Counts are converted into concentration by using known quartz elemental stoichiometry and comparison to the known concentration of a silica standard.

5.2 Methodology

Eighty-three polished thin sections were prepared at the Lakehead University Lapidary Laboratory from the 96 samples collected from the MAX Porphyry Mo deposit. The polished thin sections were examined using transmitted light microscopy at the Microanalytical

Laboratory at Lakehead University. Alteration mineral assemblages were documented and sample sites were selected for LA-ICP-MS based on mineral grain size, type (replacement, vein, primary igneous), and sample location from the deposit center. Samples were then prepared as pucks for LA-ICP-MS analyses at the Lakehead University Lapidary Laboratory.

The polished pucks were examined under reflected light at the Microanalytical Laboratory at the Center of Excellence in Ore Deposit Research, University of Tasmania (CODES, UTAS) in order to mark potential sites for ablation. The selected sites containing epidote and/or chlorite were analysed with a Hitachi SU-70 Field Emission Scanning Electron Microscope by Electron Dispersive X-ray Spectroscopy for quantitative elemental analysis.

Sites containing quartz were analysed at the UTAS – CODES Electron Microscopy and X-ray Microanalytical Facility with the FEI Quanta 600 Environmental SEM in conjunction with the GatanPanaCLF panchromatic CL detector. Brightness, contrast, and intensity were adjusted and grayscale images were taken of quartz with an average of six CL images to spatially cover each site location. Corel Draw Graphic Suite 6 was used to stitch the images together and reduce noise and moire and enhance the images for analysis. In total 1611 SEM-CL images were taken of the selected sites.

Laser ablation ICP-MS was conducted at CODES using the 1093 Eximer Laser in the LA-ICP MS analytical laboratory. A minimum of 10 spots per sample were selected for ablation. For most minerals at least three LA-ICP-MS analyses were conducted per grain to test for any chemical variation. However, as the epidote was typically a fine-grained alteration product, most grains were too small for ablation (<50 μm) and most ablated grains did not allow for more than

one analysis. In this case a smaller spot size was used and all grains that were coarse enough were ablated.

For quartz ablation, the spot size was set to 47 µm, frequency 10 Hz, energy 85 mJ and fluence 14 J/cm^2. For epidote, the spot size was 23 µm, frequency 10 Hz, energy 68 mJ and fluence 3.5 J/cm^2. The spot size for chlorite was set to 32 µm, frequency to 10 Hz, energy 68 mJ and fluence 3.5 J/cm^2. National Institute of Standards and Technology standard NIST612 was used as the primary external calibration standard and was run every 25 analyses. General Scientific Division secondary standards (GSD-1g) were run at the beginning and end of every session to account for drift and to ensure optimal instrument conditions. The primary standard was run at 80 microns and 10 Hz, and the secondary standard was run at the same conditions set up for mineral ablation. Additionally, silica blanks were ablated directly after primary standards for quartz.

For chlorite and epidote, element concentrations were acquired using Scanning Electron Microscope Energy Dispersive Spectrometry (SEM EDS). This was conducted in order to obtain elemental abundances in atomic percent as well as to analyze small micron-sized grains. These elemental abundances were used as an internal standard to convert the isotopic counts given by ICP-MS to elemental concentrations. Aluminum and calcium concentrations were used as internal standards for data reduction of chlorite and epidote, respectively.

For quartz, silica was used to convert isotopic counts given by ICP-MS to elemental concentrations, which has a known fixed elemental stoichiometry. Scanning Electron Microscope Cathodoluminescence (SEM-CL) was used in order to select sites for quartz ablation. Variations of CL response in quartz helped to identify growth zoning which were

ablated when possible, to aid in identifying chemical differences that may cause the variation in luminescence, and to ensure that chemical variations within single grains were evaluated.

To ensure that only representative mineral analyses were used, a defined Amira P1060 procedure was followed during data reduction and quality control. The Sills program, initially designed at Leeds University (Allan et al., 2005; Allan et al., 2010), was used to select intervals from the LA-ICP-MS data that were inclusion free and to ensure only data from the mineral of interest was analysed (Fig. 5.3). General guidelines followed when selecting signal integration intervals were: 1) do not integrate inclusions (Fig. 5.3c) or other neighboring minerals that may have been ablated when grain boundaries were breached (Fig. 5.3a), 2) omit the first few seconds of analysis to avoid surface contamination and 3) for minerals similar to quartz that may have growth zones, the whole composite signal was integrated and flagged in order to potentially provide insight into mineral evolution during the data interpretation stage.

Relative raw count intensities for chlorite, epidote, and quartz were used to ensure that only valid applicable data were selected.

1. Raw count intensity in chlorite:

   Mg > Al > Fe >Mn> Si > Na (at background) > K (around background) > Li, V, Co, Zn etc.

2. Raw count intensity in epidote:

   Al > Sr, Fe, Mn > V > Ca > Na (at background) > (Pb - variable) > Mg > K (at background)

3. Raw count intensity in quartz:

Si > Al > Na (at background) > 47Ti > 49Ti > Li > K (at background) > Mg > Mn

Background levels were measured before the samples were ablated by the laser within the sample chamber (Fig. 5.3). Careful attention was paid to Ti and Zr bearing inclusions as well as elevated K content when reducing data from chlorite, as most of the analysed chlorite formed by the replacement of biotite. Special attention was given to high Na counts when analysing epidote, as the epidote was commonly an alteration product of albite, and Na should be around background levels. Rare earth elements are common minor constituents of epidote (Cooke et al., 2014) but can also occur as mineral inclusions. When reducing epidote data, inclusions were avoided, whereas compositional zoning was integrated and an average taken. If gold was detected above background levels when analyzing quartz, ^{181}TaO, ^{180}HfOH, and ^{157}GdAr were examined to make sure that these isotopes were not abnormally high, as they all interfere with ^{197}Au, and may cause anomalously high Au values. Copper and titanium isotopes were valid only when ^{63}Cu and ^{65}Cu were the same intensity, and ^{47}Ti and ^{49}Ti were the same intensity. Notes were taken for each analysis pertaining to selected and discarded intervals.

A quality ranking system was used for all analyses. Each analysis was given a quality ranking from 1 to 4, 1 being the lowest and 4 being the highest quality data (Fig. 5.3). The ranking system is based on the time in seconds that the mineral was integrated and a stable spectrum acquired; 10 – 19 seconds of acquired data have a quality ranking of 1, 20 – 29 seconds have a quality ranking of 2, 30 – 39 seconds have a ranking of 3 and 40 – 60 seconds have a quality ranking of 4.

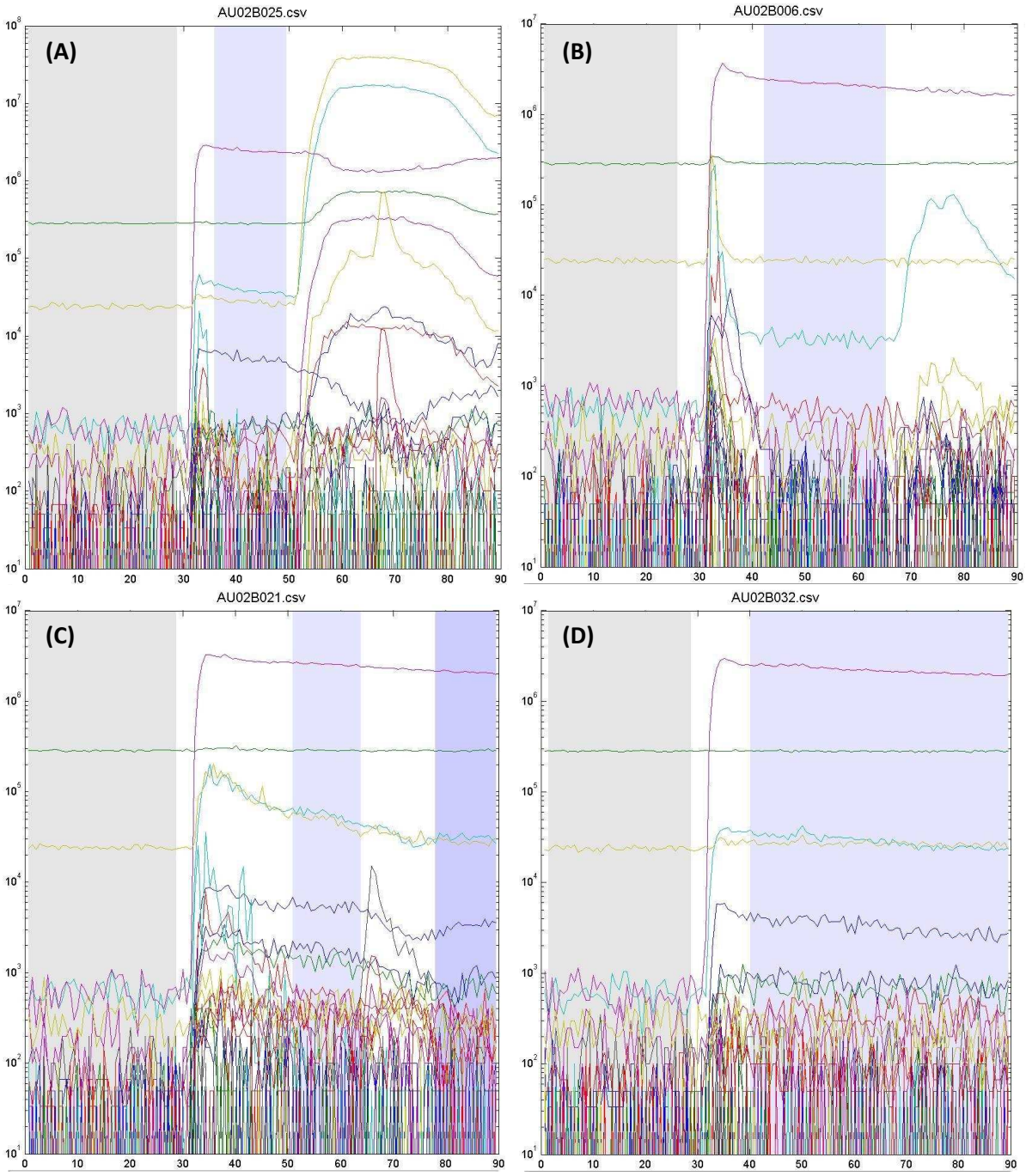


Figure 5.3 Quartz LA-ICP-MS analysis shown graphically with the Sills program, used for data reduction. Selected intervals are shown shaded in blue. Example (A) shows a quartz grain boundary being breached and ablation of neighboring orthoclase. A total of 27.93 seconds of background data and 13.61 seconds of integrated quartz ablation were acquired, giving this analysis a quality ranking of 1. (B) shows quartz with an aluminum, strontium inclusion. A total of 25.06 seconds of background data is integrated, as well as 22.91 seconds of integrated quartz ablation data, giving (B) a quality ranking of 2. Example (C) shows quartz with a chromium inclusion and a zircon inclusion. A total of 27.92 seconds of background data is integrated, as well as 24.34 seconds of integrated quartz ablation data, giving (C) a quality ranking of 2. (D) shows quartz with a stable spectrum and high Li. A total of 27.21 seconds of background data is integrated, as well as 49.40 seconds of integrated quartz ablation data, giving (D) a quality ranking of 4.

5.3 Quartz analysis

Trace-element concentrations in quartz can be used as essential petrogeochemical indicators for the interpretation of the environment of formation, and in the case of hydrothermal quartz, for the evolution of the fluid. The behaviour of trace elements in metamorphic and hydrothermal fluids has been the subject of extensive research, leading to new insights into the origin and the environment of crystallization, and subsequent alteration of quartz (e.g., Heynke et al., 1992; Rusk et al., 2008; Götze and Möckel, 2012). The absolute abundances of trace elements in quartz may be used to distinguish between metamorphic quartz, igneous quartz and hydrothermal vein quartz (Monecke et al., 2002). Further, the trace element concentrations in hydrothermal quartz may be used to vector towards the origin of mineralizing fluids by establishing trends of changing trace element concentrations. For example Ti, one of the few elements that readily substitutes for silicon in quartz, can be used as a geothermometer, giving an indication as to the temperature of formation (Wark and Watson, 2006). Aluminum behaves in the same manner as Ti, substituting for silicon in quartz, and can also be used as a geothermometer to vector toward a potential heat source (Perry, 1963; Dennen et al., 1970). Other isotopes analysed in quartz are shown in Figure 5.2.

Quartz elemental substitutions are as follows:

1. Simple substitutions: Ions of similar charge and ionic radius substitute for each other.
   $Si^{4+} \leftrightarrow Ti^{4+}, Ge^{4}$
2. Coupled substitutions: Substitution of two elements requires an additional substitution in order to maintain a neutral charge.
   $2\ Si^{4+} \leftrightarrow 2Al^{3+} + P^{5+}$
   $Si^{4+} \leftrightarrow Fe^{3+} + Li^{+}$

3. Compensated substitutions: Interstitial elements and compounds that serve to balance the charge when substitution occurs (e.g., Bambauer, 1961; Dennen et al., 1970; Lehmann and Bambauer, 1973; Weil, 1984; Müller et al., 2002).

   $Si^{4+} \leftrightarrow Al^{3+} + H^{+}$ (Fig. 5.4)

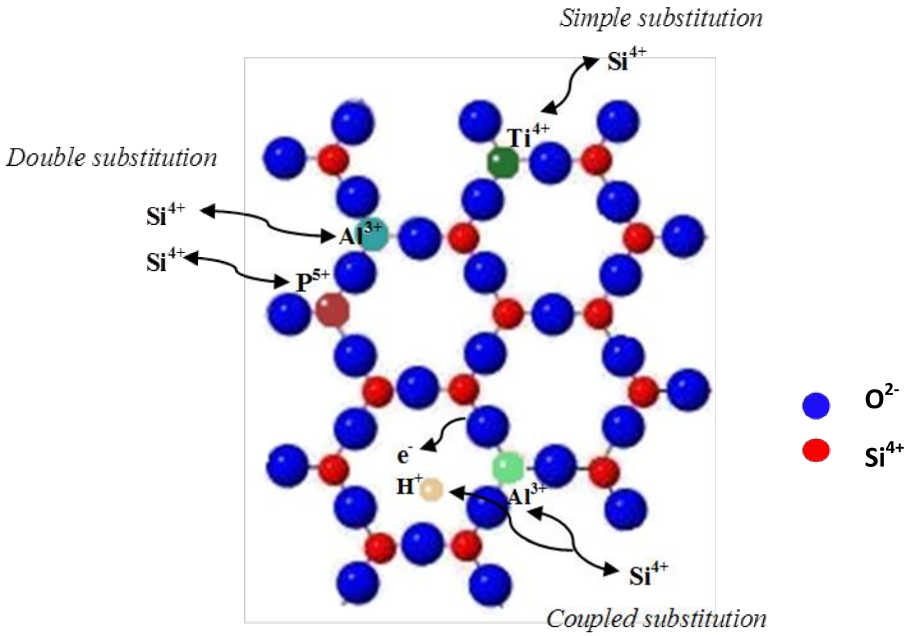


Figure 5.4 Tetrahedral quartz molecular structure showing types of elemental substitution that can occur.

Four distinct types of quartz were analysed by LA-ICP-MS: primary igneous quartz, regional metamorphic quartz and hydrothermal quartz. Hydrothermal quartz can be divided into two sub-types, hydrothermal vein quartz and quartz that have undergone hydrothermal alteration. Regional metamorphic quartz is the oldest, igneous is intermediate and hydrothermal and alteration quartz are the youngest. Hydrothermal vein quartz was precipitated from fluids associated with the post-kinematic Trout Lake stock, from which the samples of igneous quartz were also obtained. A multidisciplinary approach was used to differentiate quartz on the basis of

macroscopic textures, transmitted light microscopy, cathodoluminescence, and trace element geochemistry.

5.3.1 Quartz cathodoluminescence

Cathodoluminescence is the illumination of a material as a result of electron bombardment. The surface of the sample material is exposed to cathode rays that produce incident photons of characteristic wavelengths in the visible spectrum. High resolution digital CL images are commonly captured by using a CL detector attached to a Scanning Electron Microscope (SEM), Field Emission Microscope (FEM) or an Electron Microprobe (EPMA). Cathodoluminescent emissions can provide qualitative identifications of trace elements in crystals, or mechanically induced defects in the crystal structure (Boggs and Krinsley, 2006; Stevens-Kalceff, 2009). The incorporation of Li^{3+}, Ge^{4+}, Al^{3+}, Ti^{4+} or Fe^{3+} replacing Si^{4+} will change the cathodoluminescence emission bands observed (Stevens-Kalceff, 2009; Götze and Möckel, 2012). In addition, neutral oxygen vacancies and several types of non-bridging oxygen hole centers cause emissions at lower (290 nm) and higher (635 – 650 nm) bands. Interstitial molecular oxygen (1280 nm), and cations (505 nm) can further cause changes in the cathodoluminescence emission observed (Ramseyer et al., 1988; Ramseyer and Mullis, 1990; Götze et al., 1999).

In the current study, scanning electron microscope – CL was used to observe all sixty-two quartz samples that would be analysed for mineral chemistry. This was undertaken to aid in selecting locations for laser ablation (in conjunction with reflected light microscopy; Figs. 5.5, 5.6), ensuring any heterogeneity within crystals was taken into account, to distinguish multiple generations of quartz and to observe tonal variation that may be evidence of varying trace element chemistry and metasomatic alteration. The tonal variations observed were not

discernable in transmitted and reflected light and were tested using LA-ICP-MS to see if luminosity corresponded with changes in mineral chemistry.

Macroscopic methods, as well as transmitted, reflected and scanning electron microscopy were used prior to SEM-CL analysis. One of the aims of documenting textures observed under SEM-CL was to distinguish between metamorphic, igneous, hydrothermal and hydrothermally altered quartz (i.e., primary or metamorphic quartz which was then subjected to metasomatism by hydrothermal fluids). Hydrothermal and igneous quartz were also examined to identify growth zones. Subsequently, LA-ICP-MS was used to document compositional variations. The geochemical analyses were combined with CL imagery to identify the elements that play key roles in differing luminescence of the quartz. Once calibrated, cathode ray reflectance may be used to discriminate between different generations of quartz by reference to the trace element composition.

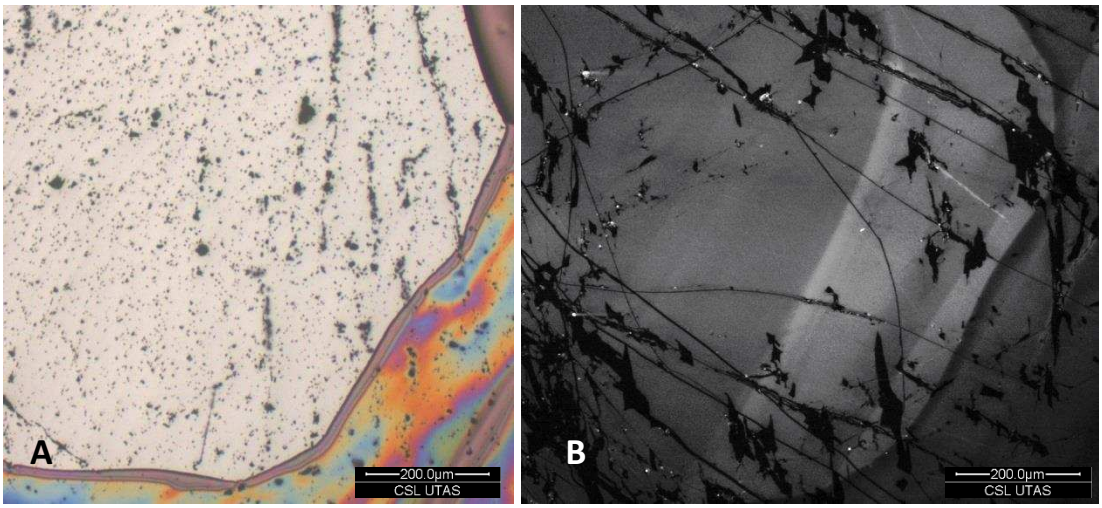


Figure 5.5 Reflected light image (A) and CL image (B) of the same location in a quartz grain. Here compositional zoning is observed in the CL image. Images used in conjunction with SEM-EDS results to select locations for ablation. Sample number MX12AB057. NAD83 457183.5E, 5609380N.

5.4 Chlorite and epidote analyses by LA-ICP-MS

A supplementary study was conducted on elemental concentrations in chlorite and epidote. Both chlorite and epidote are secondary aluminosilcate alteration minerals that can form in the propylitic alteration halo around porphyry type deposits. Chlorite and epidote were not visible with the naked eye within the propylitic halo at the MAX deposit; however, they were observed under transmitted light microscopy as alteration products after biotite and plagioclase. Detailed imaging has shown that biotite and plagioclase from the granodioritic intrusion typically altered to chlorite, titanite, muscovite, epidote and quartz. This may be written as:

1 biotite + 0.21 anorthite + 1.64 H_2O + 1.46H^+ + 0.08 O_2→

0.46 chlorite + 0.11 titanite + 0.10 epidote + 0.56 muscovite + 0.63 quartz + 0.02 magnetite + 1.46 K^+

(Eggleton and Banfield, 1985)

5.5 Results: Trace element analysis of quartz, chlorite and epidote

5.5.1 Trace element analysis of quartz

5.5.1-I - Geochemical analysis of cathodoluminescence variance in quartz

The quartz crystals examined displayed multiple generations of growth indicated by bands of varying luminescence. Some quartz has visibly lighter or darker cores (Fig. 5.24). Other crystals have fine lamellae (Fig. 5.12). Some are massive with no tonal variation (Fig. 5.8). In some cases, a complex growth history including dissolution and reprecipitation and compositional growth banding has been discovered (Fig. 5.23). Correlations have been identified between luminescence and trace element concentrations, specifically pertaining to Ti and Al

concentrations (Figs. 5.6, 5.7, 5.8, 5.9, 5.10, 5.11). Other elements analysed did not seem to have any effect on the greyscale cathodoluminescence. Areas of higher luminescence (i.e. brighter) had relatively higher levels of Ti and Al than areas of lower luminescence (Figs. 5.6, 5.9, 5.10, 5.11). Whereas crystals that showed no variation in luminescence were found to have relatively homogenous chemistry (Figs. 5.7, 5.8). This was the case for all quartz examined regardless of the condition of formation. Lamellae and mottled patterns/textures that were observed in some hydrothermal samples were too fine to analyze with precision and accuracy by LA-ICP-MS, as a much smaller spot size would have to be used which would reduce the quality of the data.

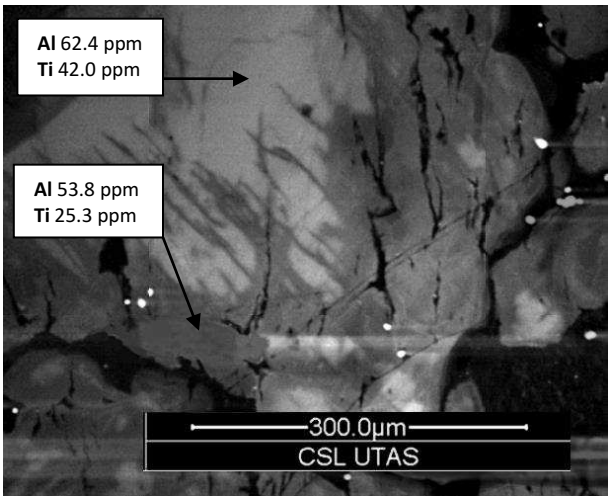


Figure 5.7 Cathodoluminescence image of hydrothermal quartz showing alteration along fractures with lighter and darker zones. Also showing Ti and Al concentrations for two locations. Higher luminescence corresponds with higher Ti and Al concentration. Sample MX12AB043, circle 2. NAD83 457370E, 5609567.4N.

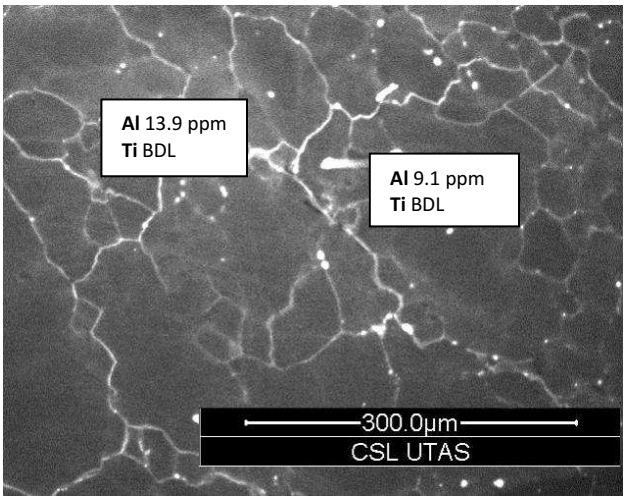


Figure 5.6 Cathodoluminescence image of metamorphic quartz with Ti and Al concentrations for two locations. Luminescence is uniform throughout with ± 5 ppm variance in Al content and Ti below detection limits. Sample MX12AB046, circle 2. NAD83 459862E, 5612284N.

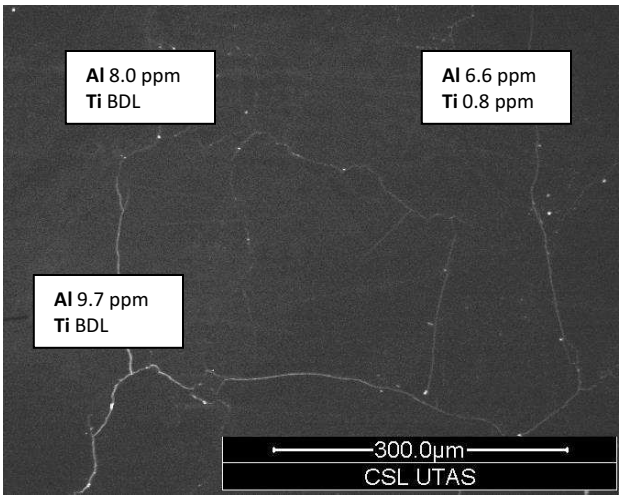


Figure 5.9 Cathodoluminescence image of metamorphic quartz with Ti and Al concentrations for three locations. Luminescence is uniform throughout with ± 3 ppm variance in Al content and Ti below detection limits. Sample MX12AB015, circle 3. NAD83 458085E, 5610337N.

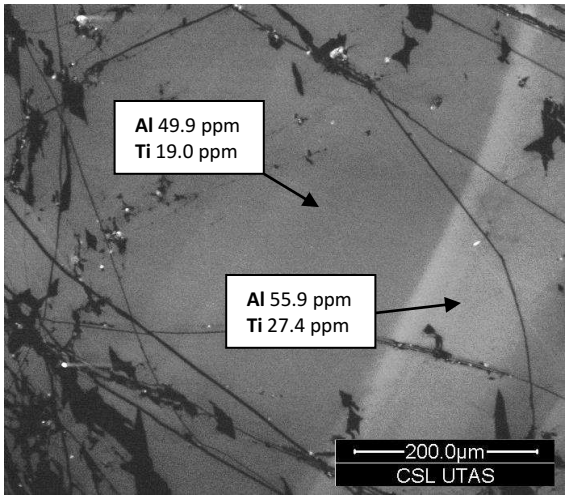


Figure 5.8 Cathodoluminescence image of igneous quartz revealing banding, and Ti and Al concentrations for two locations. Aluminum and Ti are higher in the brighter, more luminescent band. Sample MX12AB057, circle 1. NAD83 457183.5E, 5609380N.

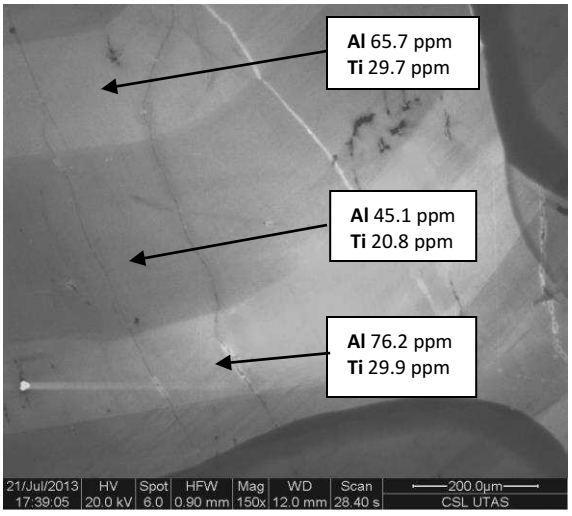


Figure 5.11 Cathodoluminescence image of igneous quartz revealing banding, and Ti and Al concentrations for three locations within bands. Luminescence appears to increases with increasing Aluminum and Ti content. Sample MX12AB076, circle1. NAD83 457407.5E, 5609573.9N.

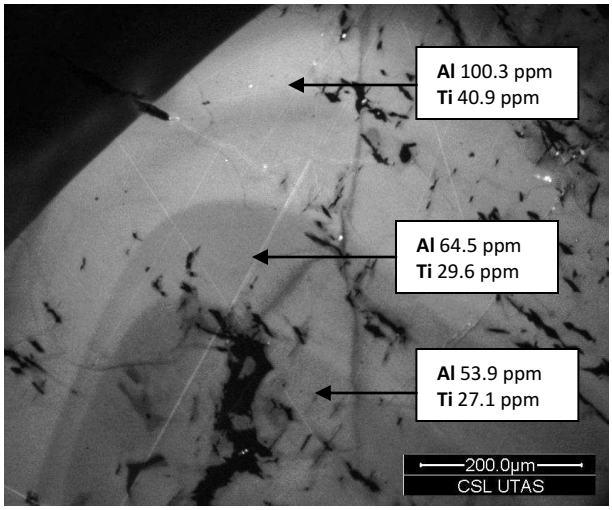


Figure 5.10 Cathodoluminescence image of hydrothermal quartz revealing banding, and Ti and Al concentrations for three locations within bands. Aluminum and Ti are higher in the brighter, more luminescent bands. Sample MX12AB009, circle 4. NAD83 457460E, 5609712N.

5.5.1-II Differentiating between quartz types

Various types of quartz were analysed by LA-ICP-MS in order to determine if trace element concentrations could be used to distinguish between regional metamorphic, hydrothermal precipitated, hydrothermally altered (altered igneous or metamorphic quartz) or primary igneous quartz crystallization. This was completed in order to characterize the quartz and to aid in distinguishing the varieties of quartz. Six hundred and seventeen spot analyses were taken from 220 grains in 63 samples. One hundred and fifty analyses were discarded during the data reduction and quality control process, as they did not meet the necessary standards (quality ranking <1).

Primary igneous quartz

The igneous quartz examined under CL was typically porphyritic, coarser grained and more euhedral than either metamorphic or hydrothermal quartz. Cathodoluminescence revealed alternating bands of lighter and darker zones which followed crystal planes (Figs. 5.12, 5.14). There is local evidence of dissolution of the primary igneous quartz along small fractures and voids in otherwise pristine quartz crystals (Figs. 5.12, 5.14). Tonal variations were only observed along these fractures using CL (Figs. 5.13, 5.14), and are interpreted to be the product of chemical changes due to hydrothermal alteration. The areas that have undergone hydrothermal alteration have dull luminescence compared to unaltered igneous quartz. Dull luminescence has also been observed around some grain boundaries, providing evidence for hydrothermal fluid flow along grain boundaries (Fig. 5.14).

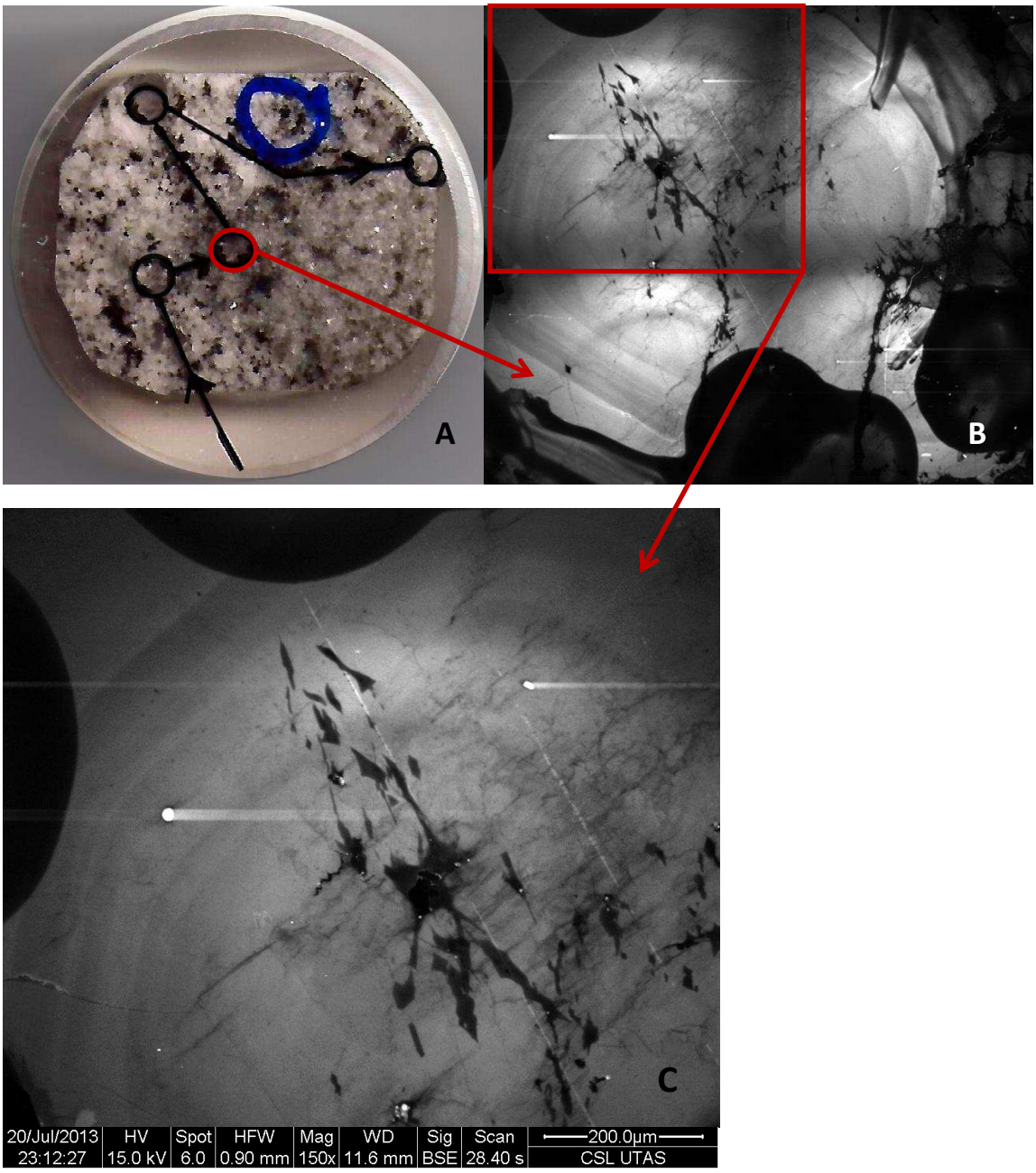


Figure 5.12 Quartz phenocryst in granodiorite (A). Cathodoluminescence images (B, C) shows differing bands of luminescence. White streaks (B, C) and dark crosshair (B) are artifacts. Sample MX12AB055, circle 2. NAD83 457508E, 5609672N.

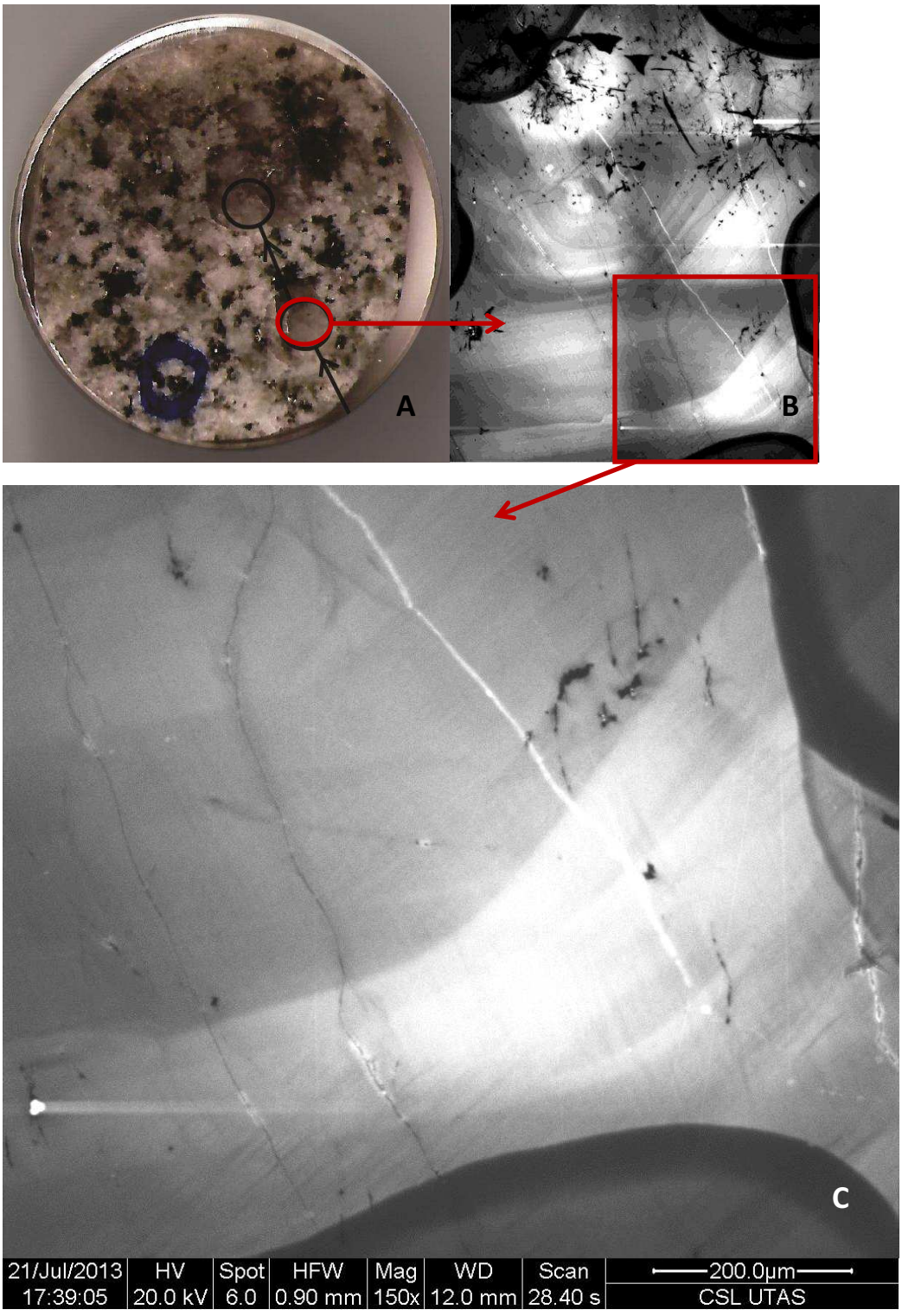


Figure 5.13 Quartz phenocryst in quartz altered granodiorite. Crystals display tonal variation which correspond to growth zones. White streaks (C) and dark crosshair (B) are artifacts. Sample MX12AB076, circle 1. NAD83 457507E, 5609672N.

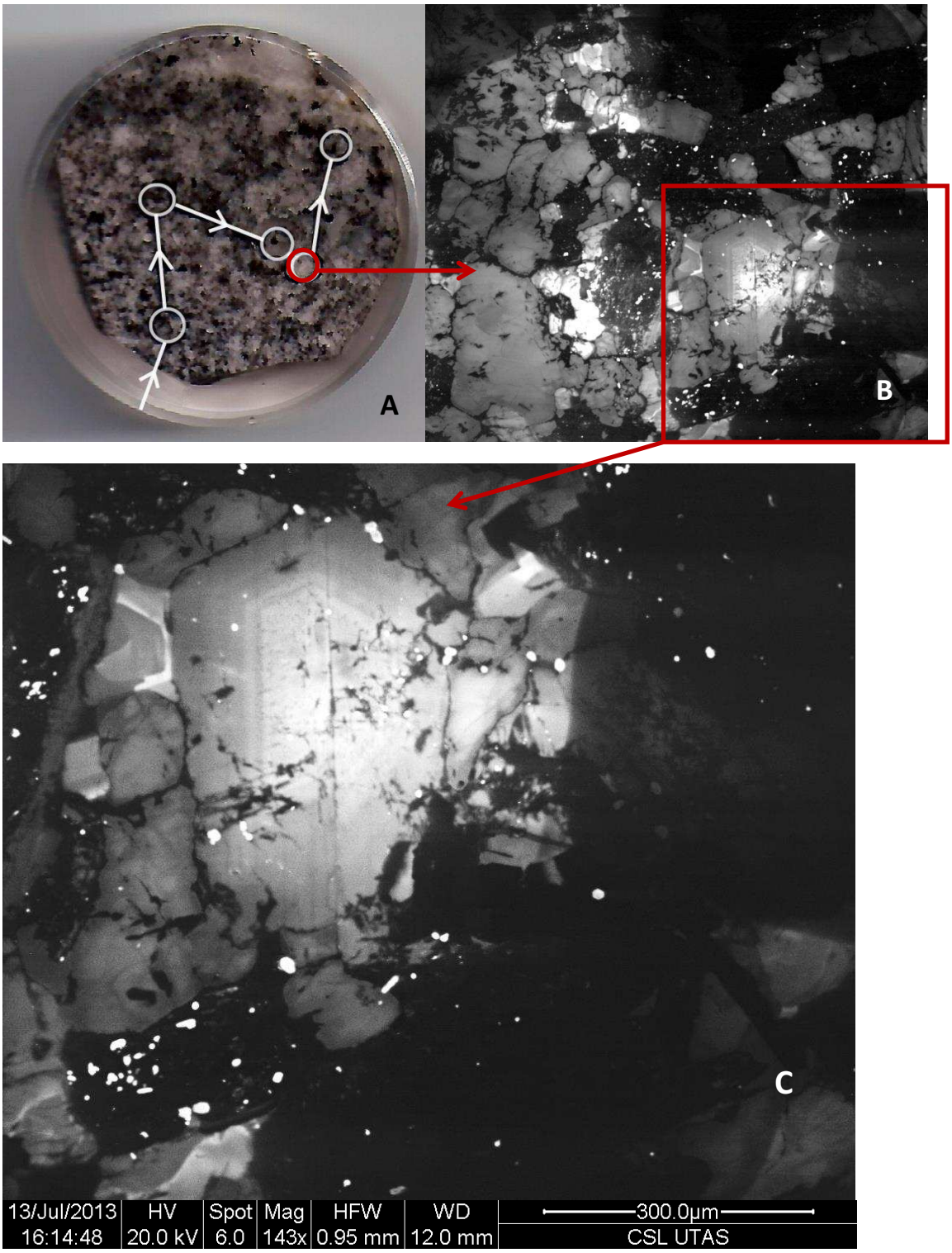


Figure 5.14 Quartz phenocryst in potassic altered granodiorite (A). Crystals display tonal variation caused by compositional zoning and dissolution along grain boundaries and fractures (B,C). Sample MX12AB028, circle 4. NAD83 457801E, 5609853N.

Trace element concentrations for igneous quartz were obtained from 103 spot analyses from 11 samples. Primary igneous quartz was found to contain relatively high levels of Al with an average concentration of 76 ppm (Table 5.1; Fig. 5.15), the second highest aluminum concentration in quartz after hydrothermally altered metamorphic quartz. The next most abundant trace element within primary igneous quartz is Ti (average concentration = 26 ppm). Germanium values were on average lower in igneous quartz than regional metamorphic and hydrothermal quartz (Table 5.5; Fig. 5.29).

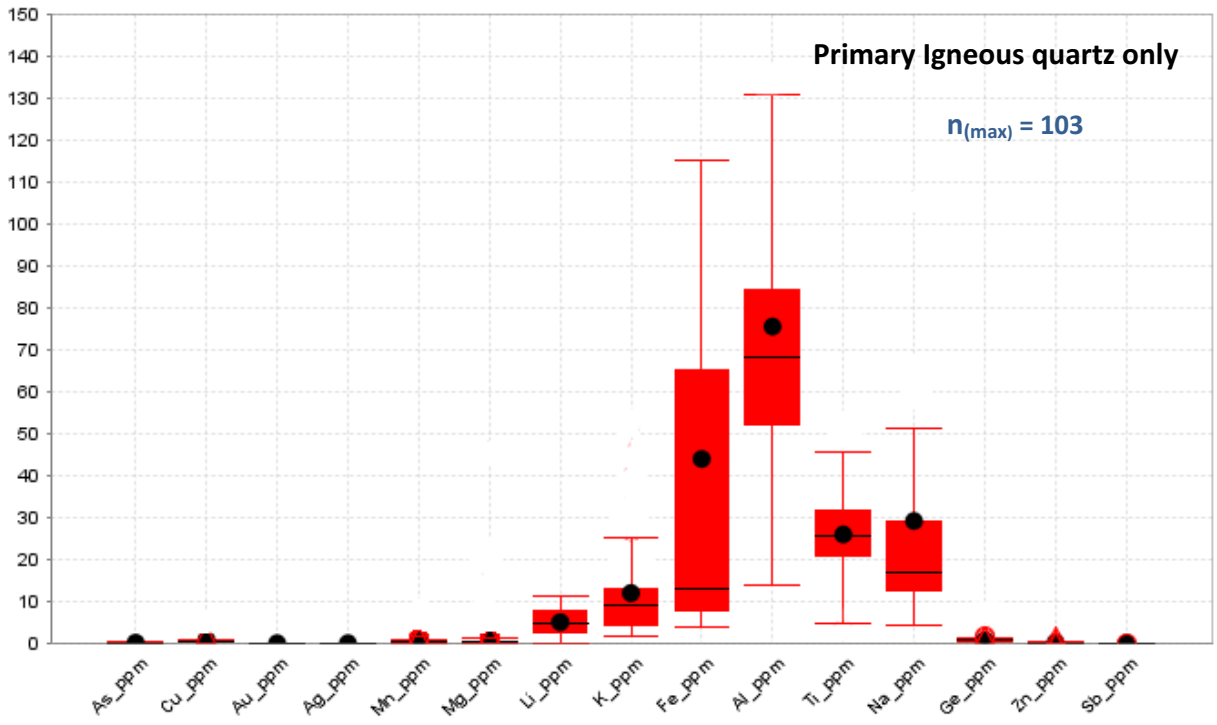


Figure 5.15 Box and whisker plot showing trace element concentrations in primary igneous quartz. Concentrations obtained from 103 LA-ICP-MS spot analyses taken from eleven samples from the MAX deposit.

Table 5.1 Primary igneous quartz LA-ICP-MS results, MAX

Element	n.N	n.BDL	Min.	Max.	Mean	Median	σ
Li	103	0	0.0869	11.33	5.049	4.554	3.025
Na	54	49	4.251	166.5	29.18	17.05	32.40
Mg	72	31	0.1030	45.97	2.105	0.2587	6.539
Al	103	0	13.93	305.3	75.58	68.24	37.14
K	77	26	1.665	52.90	11.98	9.1608	11.39
Ti	103	0	3.288	51.19	25.97	25.57	8.791
V	10	93	0.0250	0.6525	0.1939	0.1192	0.1901
Cr	24	79	0.2028	2.939	1.2721	1.045	0.7857
Mn	56	47	0.0882	6.472	0.6335	0.2454	1.157
Fe	20	83	3.972	220.6	43.98	12.84	60.10
Cu	12	91	0.1891	4.995	0.8761	0.3299	1.346
Cu	13	90	0.1926	5.864	0.9579	0.3539	1.511
Zn	34	69	0.0933	1.919	0.2300	0.1435	0.3185
Ge	103	0	0.3990	7.766	0.7940	0.6209	0.7398
As	15	88	0.0713	0.3303	0.1543	0.1311	0.0699
Rb	68	35	0.0112	0.4056	0.0845	0.0573	0.0805
Sr	101	2	0.0122	3.366	0.2146	0.1250	0.3630
Zr	32	71	0.0084	3.215	0.2367	0.0246	0.5934
Ag	4	99	0.0127	0.0173	0.0153	0.0156	0.0018
Sb	14	89	0.0132	0.0397	0.0242	0.0245	0.0074
Cs	94	9	0.0037	0.4465	0.0832	0.0543	0.0875
Gd	13	90	0.0090	1.293	0.1791	0.0544	0.3334
Hf	6	97	0.0043	0.0906	0.0300	0.0230	0.0291
Ta	9	94	0.0018	0.0209	0.0066	0.0035	0.0059
Au	6	97	0.0053	0.0094	0.0078	0.0081	0.0014
Pb	60	43	0.0059	0.1743	0.0312	0.0189	0.0329
Bi	10	93	0.0023	0.0169	0.0058	0.0036	0.0050
U	33	70	0.0016	0.3048	0.0294	0.0095	0.0564

n.N = number of analyses within detection limit; n.BDL = number of analyses below detection limit; Min = minimum value acquired; Max = maximum value acquired; Mean = mean value; Median = median value. Mean and median values do not take into account analyses that are below the detection limit. Concentrations are ppm except for Au, and Ag which is ppb.

Quartz formed by regional metamorphism

The regional metamorphic quartz samples were taken from samples of silicified biotite schists, most of which were taken from within a 1500 meter radius of the MAX deposit (Fig. 5.2). The metamorphic quartz in these samples display undulose extinction, sutured grain boundaries, and subgrains indicative of dissolution glide and creep (e.g., Fig. 5.16). Some grains display a granoblastic texture with triple junction grain boundaries indicative of recrystallization (Fig. 5.18). These metamorphic quartz layers are parallel to regional foliation in alternating bands between foliated micaceous layers (Figs. 5.16, 5.17).

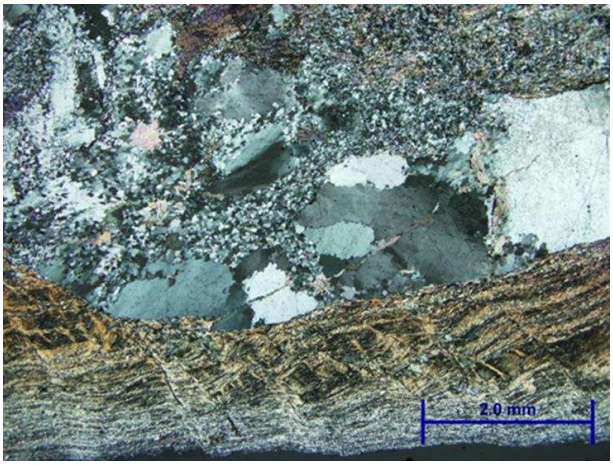


Figure 5.16 Photomicrograph in cross-polarized transmitted light showing quartz subgrains and sutured grain boundaries as well as asymmetrical crenulation of biotite and muscovite in chlorite mica schist. Sample MX12AB068.

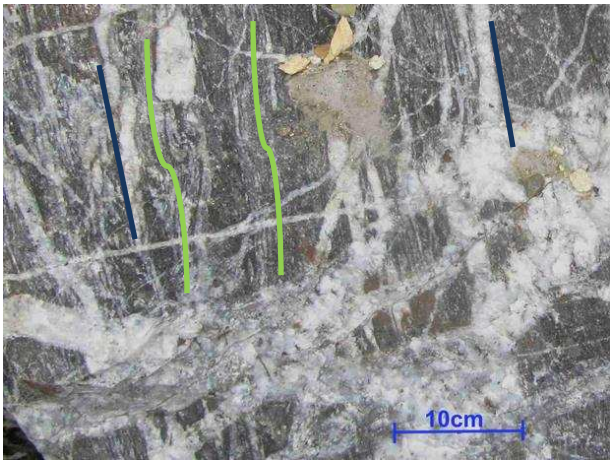


Figure 5.17 Photograph of silicified biotite schist showing deformed granoblastic quartz layers parallel to foliation (green line). Schist is cross-cut by hydrothermal quartz veins, some of which are sub-parallel to foliation (blue line).

Metamorphic quartz under CL is relatively monochromatic when compared to hydrothermal and igneous quartz (Figs. 5.18, 5.19). Tonal variations in the quartz crystals from the core to the grain boundaries are minimal. Sutured grain boundaries are void of pores and spaces (Figs. 5.18, 5.19) due to recrystallization and the stress regime during formation resulting

in more compact crystals. Subhedral to euhedral crystals with triple junction and/or seriate grain boundaries and subgrains are obvious when viewed under CL (Figs. 5.18, 5.19).

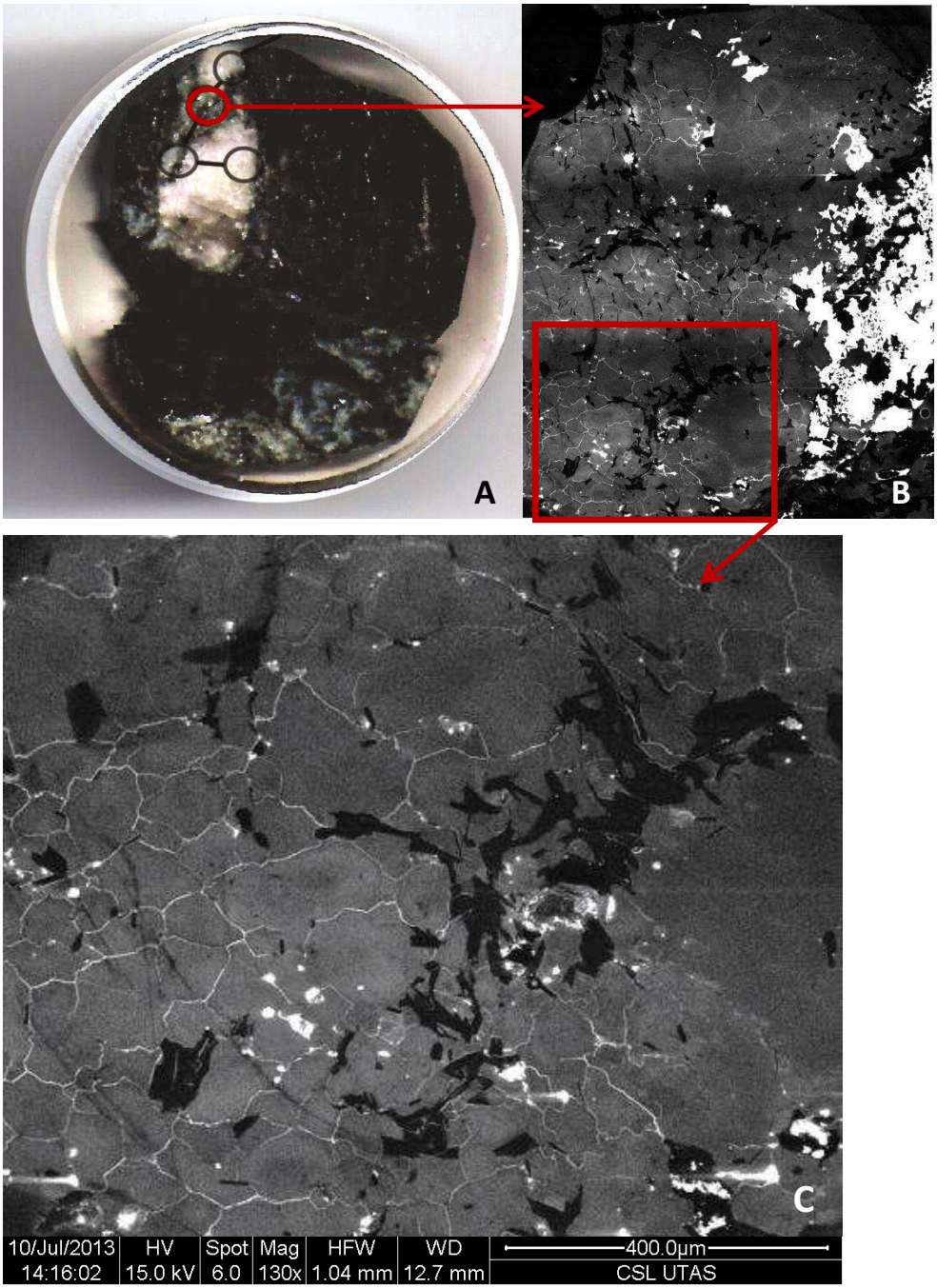


Figure 5.18 Fabric parallel quartz vein in mica schist (A). Regionally metamorphosed quartz is monochromatic under SEM-CL displaying triple junction and sutured grain boundaries (B, C). Sample MX12AB011, circle 2. NAD83 457741E, 5610261N.

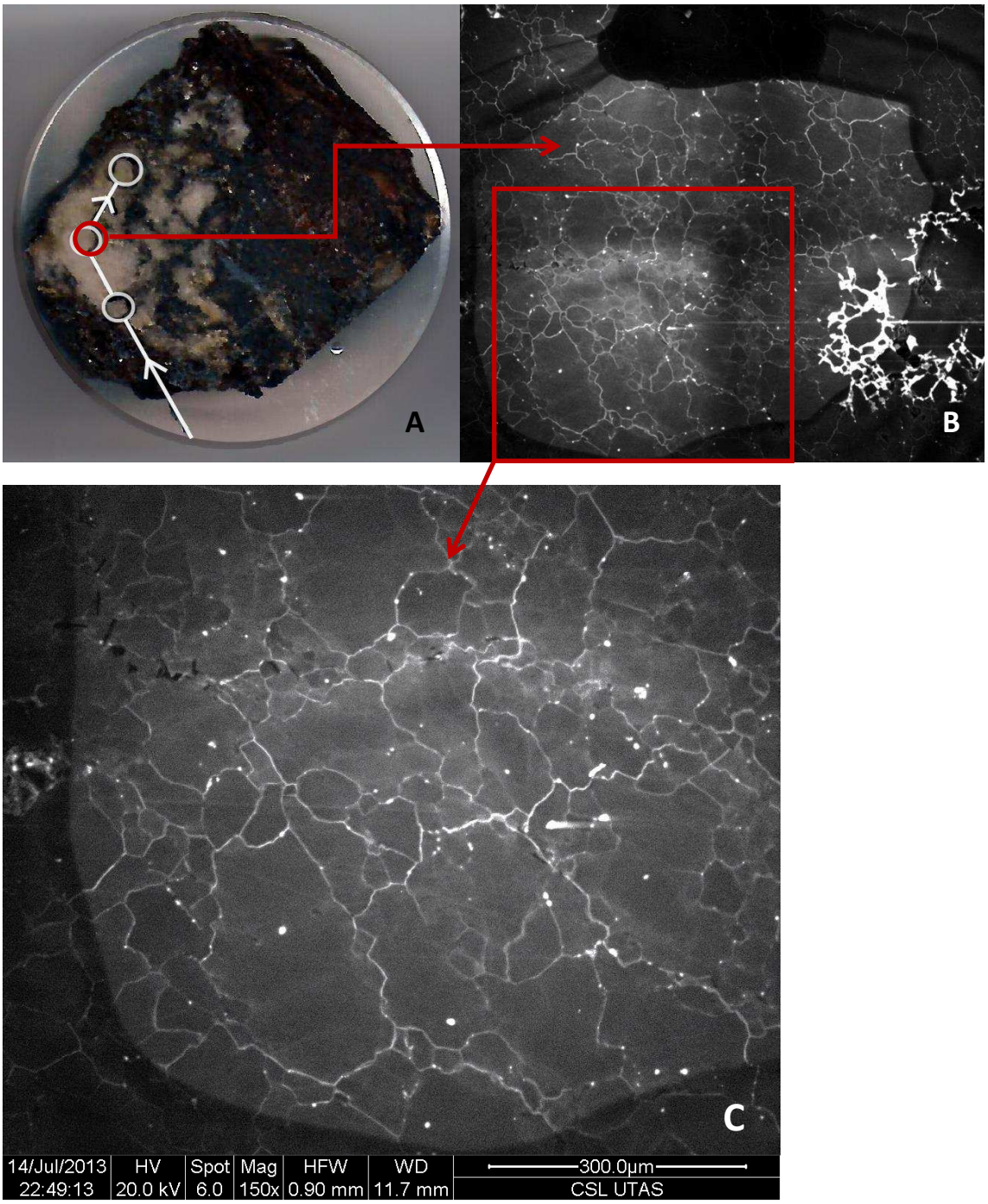


Figure 5.19 Quartz pod in silicified biotite schist. Regionally metamorphosed quartz is monochromatic under SEM-CL displaying triple junction and sutured grain boundaries due to recrystallization. Also showing subgrains. Sample MX12AB046, circle 2. NAD83 459862E, 5612284N.

Sixty-nine LA-ICP-MS spot analyses were obtained from nine samples that contained metamorphic quartz (Table 5.2). Trace element concentrations were relatively low when compared to the other quartz types and most analyses were below the detection limits (Table 5.5; Fig 5.20). However, metamorphic quartz was found to have the highest levels of Fe (average Fe = 18 ppm). Average Al concentration in regional metamorphic quartz was considerably lower than the other types of quartz analysed (average Al = 15 ppm). Aluminum was the second most abundant trace element in metamorphic quartz followed by Na at an average concentration of 4 ppm. Titanium (<1 ppm) was also significantly lower than the other types of quartz examined (Tables 5.2, 5.5). Mean Li concentrations were found to be significantly lower in metamorphic quartz than the other types of quartz analysed (Fig. 5.29; Table 5.5).

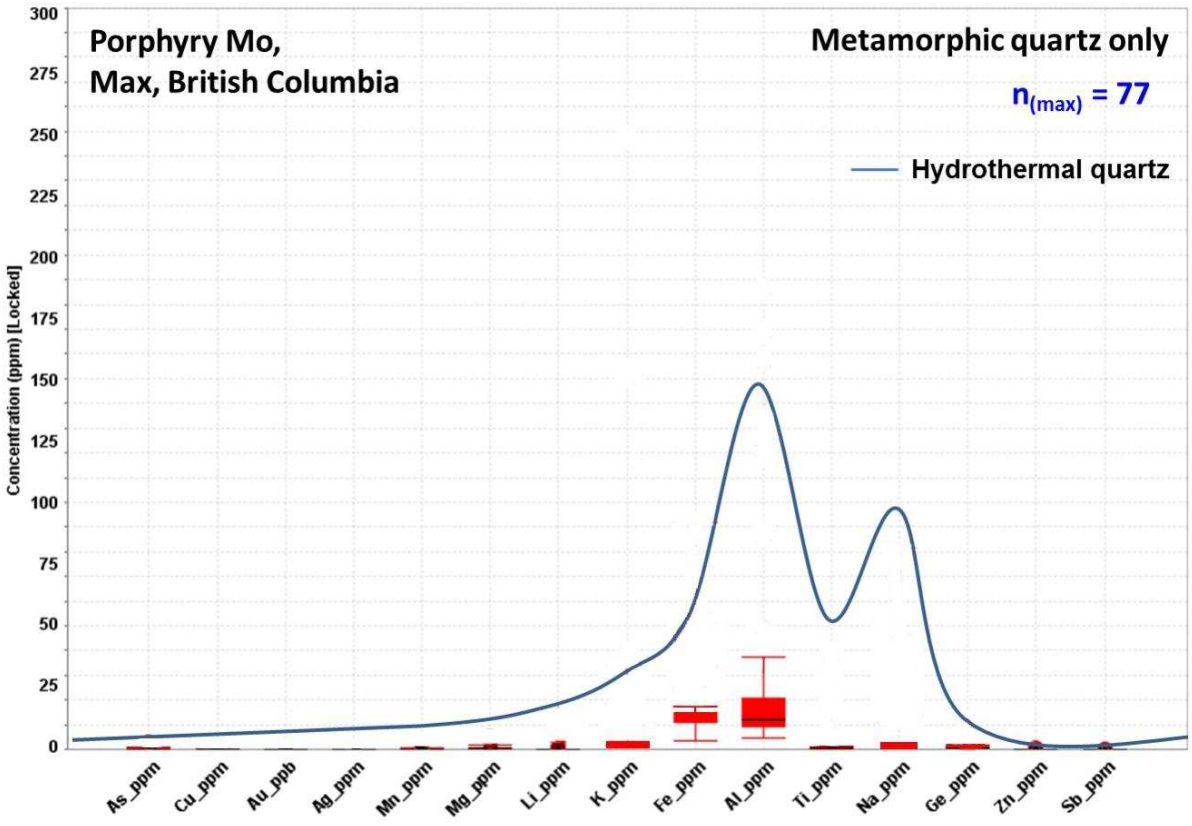


Figure 5.20 Box and whisker plot showing trace element concentrations in regional metamorphic quartz. Concentrations obtained from 77 LA-ICP-MS spot analyses taken from nine samples from the MAX deposit (Table 5.2). Blue line is maximum concentrations for hydrothermal quartz.

Table 5.2 Regional metamorphic quartz LA-ICP-MS results, MAX

	n.N	n.BDL	Min.	Max.	Mean	Median	σ
Li	67	2	0.0463	3.094	0.2285	0.1673	0.3682
Na	3	63	12.36	50.31	24.43	19.72	12.86
Mg	47	22	0.1074	4.537	0.6960	0.4693	0.8139
Al	69	0	4.488	87.48	16.50	12.01	13.13
K	17	52	2.378	33.12	10.49	9.358	7.206
Ti	69	0	0.3458	2.866	0.9008	0.7626	0.5164
V	4	65	0.0820	0.0976	0.0909	0.0920	0.0066
Cr	3	63	0.2786	3.791	1.393	1.005	1.194
Mn	4	55	0.1041	1.364	0.2807	0.1822	0.3161
Fe	18	51	3.323	258.6	43.99	18.96	59.64
Cu	4	65	0.2130	1.645	0.6318	0.3341	0.5914
Cu	8	61	0.2491	1.523	0.5107	0.3524	0.3957
Zn	10	59	0.1147	0.5939	0.2298	0.1966	0.1286
Ge	69	0	0.5756	9.862	1.219	0.9208	1.170
As	3	63	0.1295	2.795	0.6925	0.2911	0.9489
Rb	6	63	0.0306	0.1269	0.0667	0.0585	0.0334
Sr	64	5	0.0155	2.854	0.1472	0.0450	0.4143
Zr	3	66	0.0081	0.0261	0.0185	0.0214	0.0076
Ag	1	68	0.0785	0.0785	0.0785	0.0785	0
Sb	29	40	0.0316	0.2040	0.0750	0.0610	0.0385
Cs	21	48	0.0064	0.1232	0.0308	0.0201	0.0285
Gd	2	67	0.0134	0.0198	0.0166	0.0166	0.0032
Hf	5	64	0.0051	0.0091	0.0075	0.0081	0.0015
Ta	3	66	0.0019	0.0051	0.0031	0.0022	0.0014
Au	1	68	0.0141	0.0141	0.0141	0.0141	0
Pb	33	36	0.0097	0.2900	0.0564	0.0347	0.0603
Bi	11	58	0.0027	0.0164	0.0081	0.0075	0.0044
U	9	60	0.0018	0.0199	0.0063	0.0045	0.0056

n.N = number of analyses within detection limit; n.BDL = number of analyses below detection limit; Min = minimum value acquired; Max = maximum value acquired; Mean = mean value; Median = median value. Mean and median values do not take into account analyses that are below the detection limit. All elements are ppm except for Au and Ag which is ppb.

Hydrothermally altered quartz

Cathodoluminescence was used to recognize metasomatic effects in metamorphic quartz. Quartz that had undergone hydrothermal alteration displayed variations in luminescence within individual crystals (Figs. 5.21, 5.22, 5.23, 5.24), a phenomenon not observed in unaltered samples (Figs. 5.18, 5.19). Alteration produced alternating bands of light and dark luminescence (Figs. 5.21, 5.22), lighter nucleii surrounded by darker rims (e.g., Fig. 5.21), or more commonly a darker nucleus surrounded by a lighter/more luminescent rim (Fig. 5.24). This effect may be seen throughout an individual sample or more locally affecting groups of crystals in a given sample. Also there is textural evidence for dissolution and metasomatism, as some rocks appear more porous than their more pristine counterpart (e.g., Figs. 5.23, 5.24).

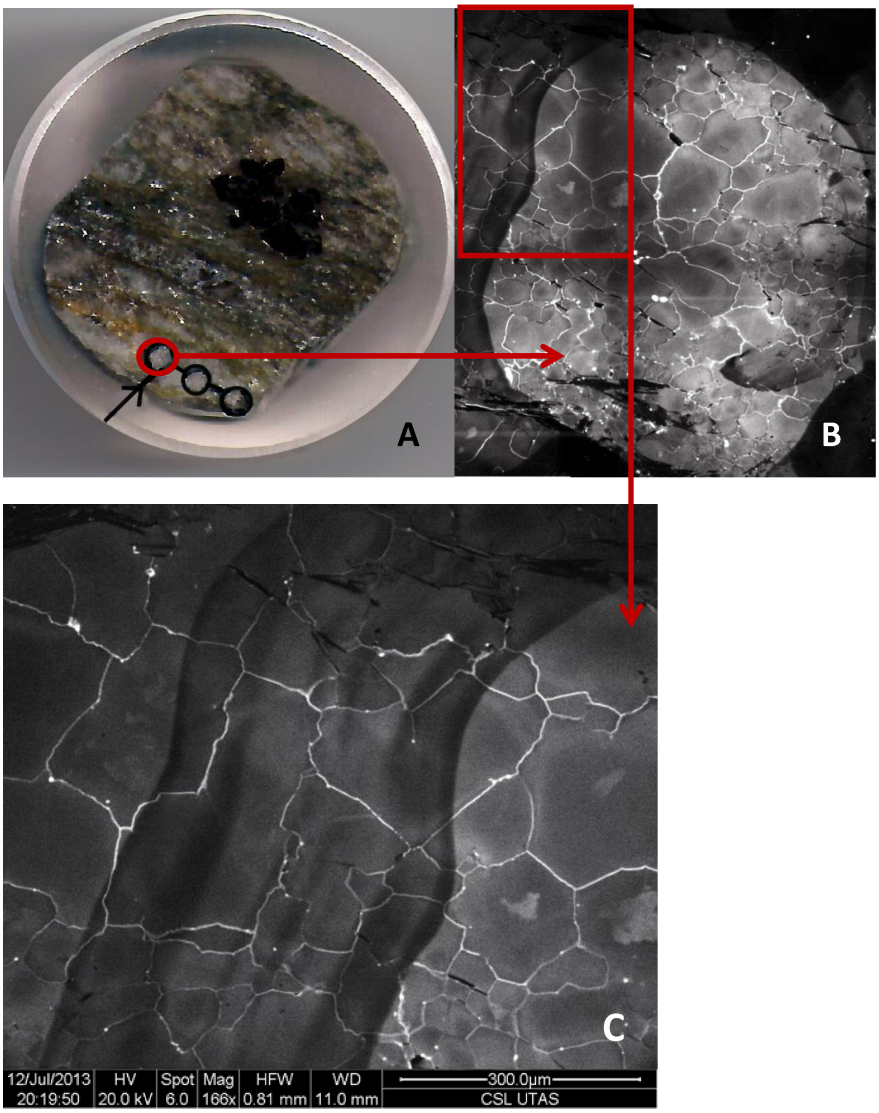


Figure 5.21 Quartz lenses in a silicified phyllite. Darker quartz contrasting lighter nucleus caused by compositional variance within the crystal. Otherwise crystals show typical regional metamorphic textures (i.e. triple junction and sutured grain boundaries). Dark crosshair (B) is an artifact, dark line (C) is outline of circle drawn in black marker. Sample MX12AB047, circle 1. NAD83 459865E, 5612284N.

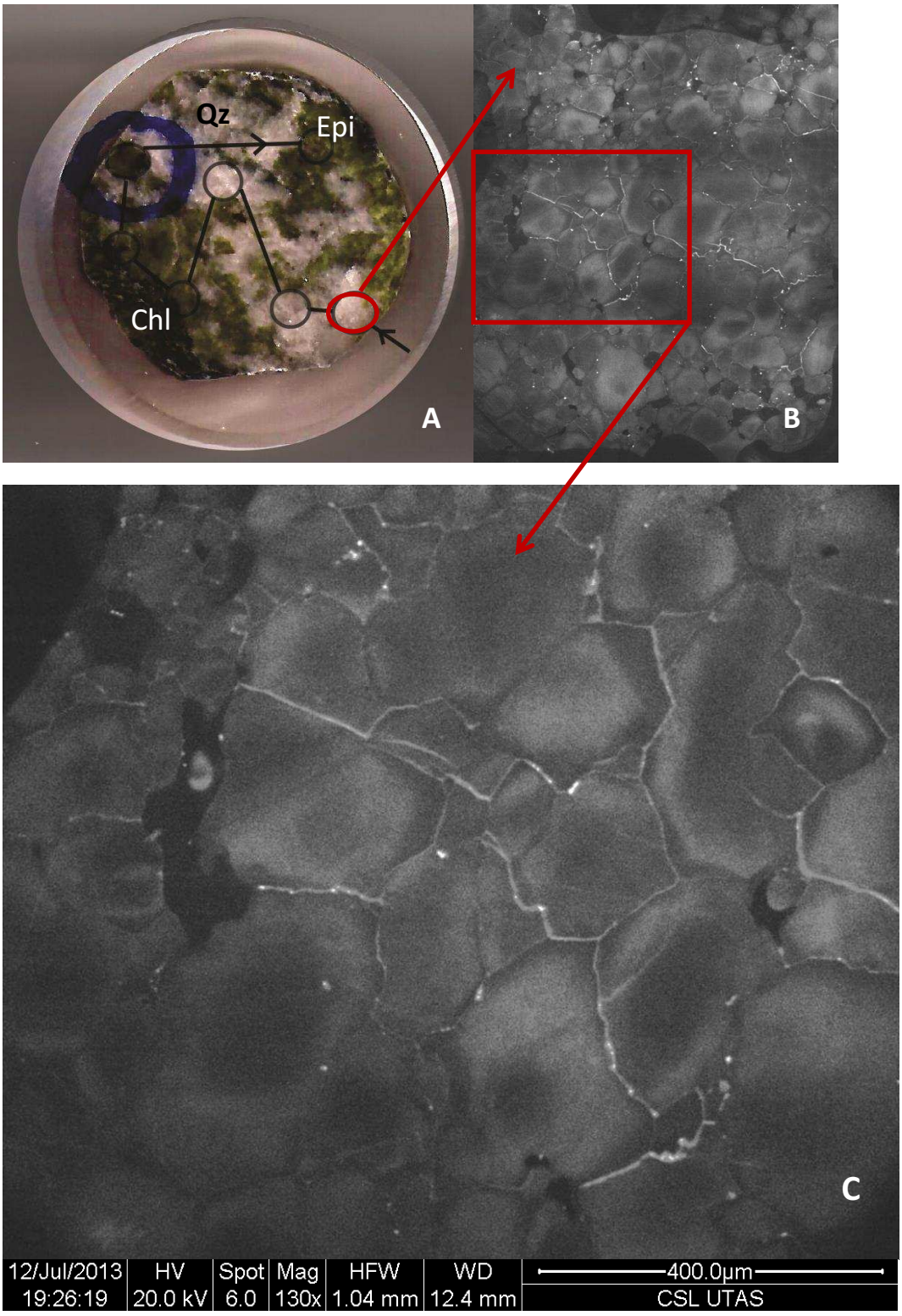


Figure 5.22 Quartz + calcite + epidote vein in chlorite schist. CL image displaying variation in luminescence in quartz caused by compositional zoning. Also shows triple junction grain boundaries produced by metamorphic recrystallization. Sample MX12AB022, circle 1. NAD83 459830E, 5611023N.

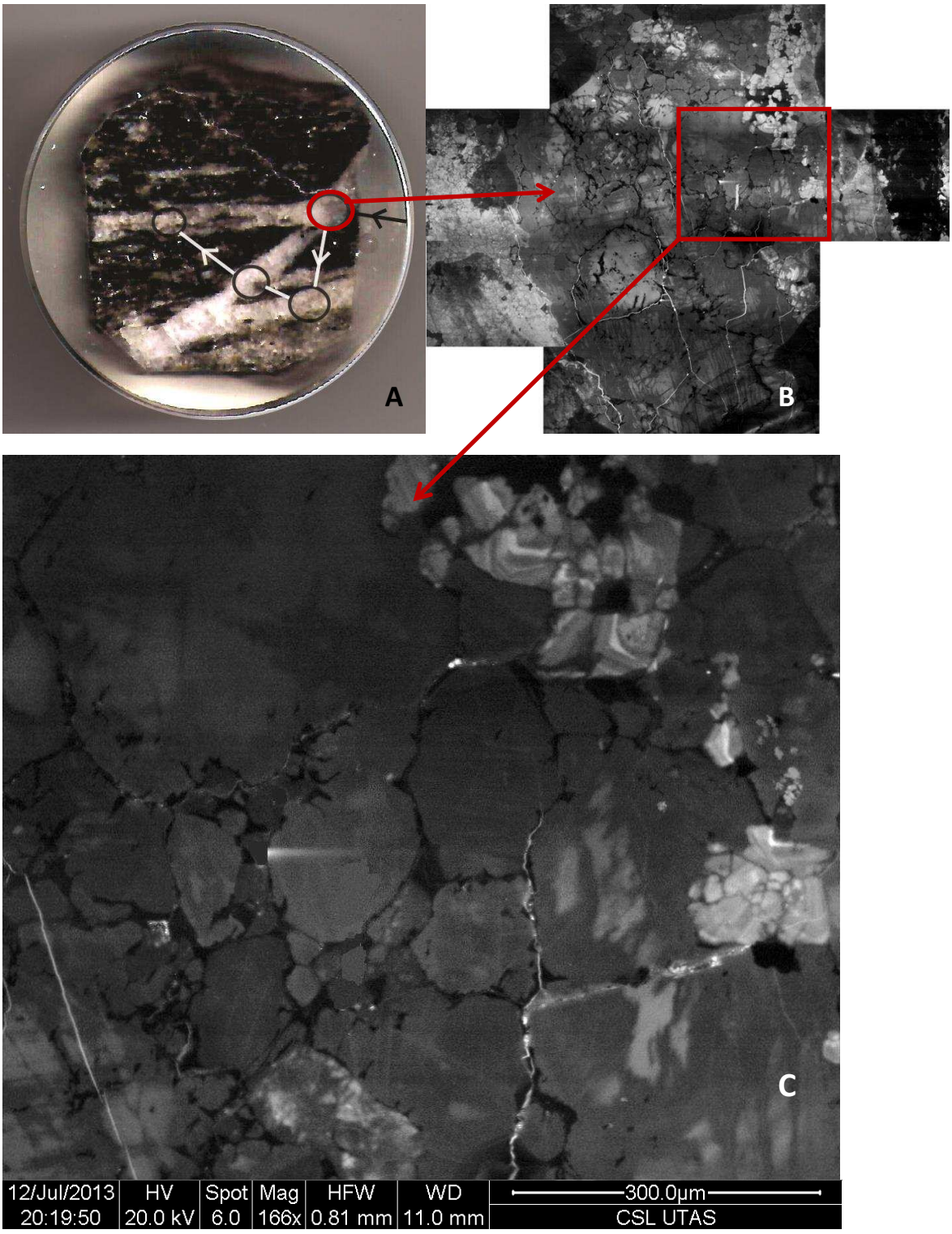


Figure 5.23 Quartz veins in biotite schist. Zones of differing luminescence may be seen within individual crystals. Relict triple junction grain boundaries are present but dissolution has occurred along these boundaries. Sample MX12AB024, circle 1. NAD83 457801E, 5609853N.

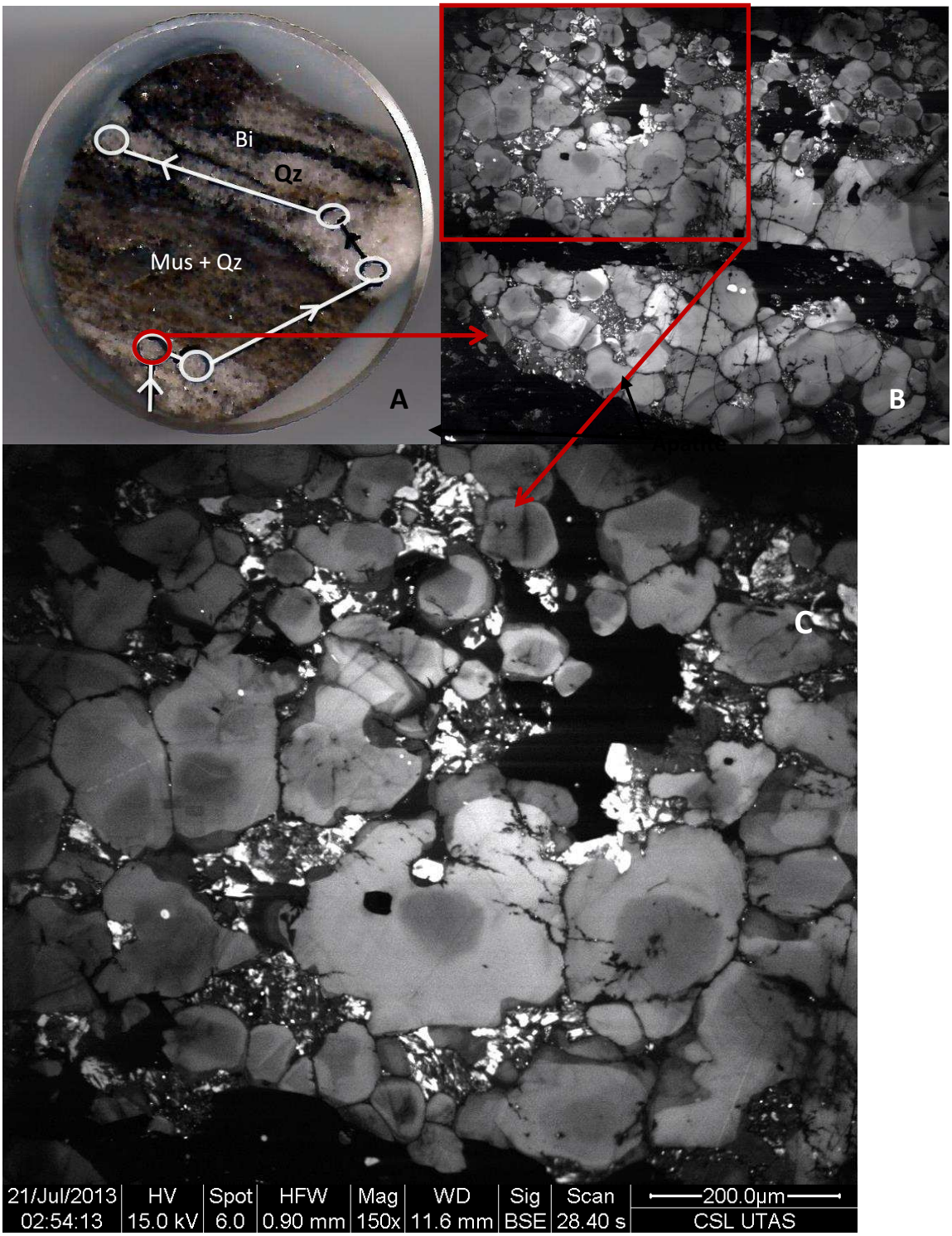


Figure 5.24 Quartz vein in silicified mica schist (A). Crystals display tonal variation – darker nucleus surrounded by zones of higher luminescence (B,C). Crystals are sub to anhedral and locally show dissolution along grain boundaries and fractures. Sample MX12AB074, circle 1. NAD83 457500.1E, 5609665.5N.

Trace element concentration for hydrothermally altered quartz was obtained from 14 spot analyses taken from three samples (Table 5.3). Metamorphic quartz that was modified by hydrothermal alteration within the propylitic halo of the MAX deposit was found to have distinctly different trace element concentrations than metamorphic quartz unaffected by hydrothermal alteration (Fig. 5.25). In the altered quartz samples analysed Al was found to be the most abundant trace element with a mean concentration of 76 ppm, followed by K (30 ppm), Ti (11 ppm), Li (5 ppm) and Mg (1 ppm, Table 7.5). The hydrothermally altered quartz samples have higher Ti values and overall trace element concentrations were significantly higher than unaltered metamorphic quartz samples (Fig. 5.25; Table 5.5). Elements enriched in hydrothermal vein quartz relative to alteration quartz are Na and Ti (Tables 5.5, 5.4).

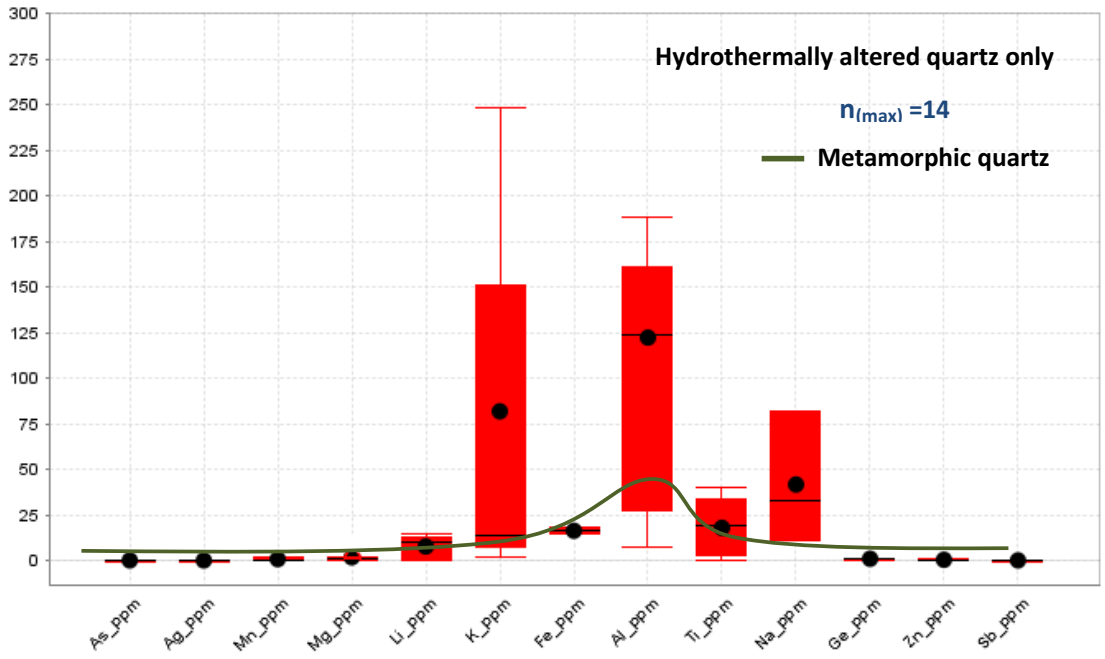


Figure 5.25 Box and whisker plot showing trace element concentrations in hydrothermally altered quartz. Concentrations obtained from 14 LA-ICP-MS spot analyses taken from three samples from the MAX deposit. Green outlines maximum metamorphic concentration.

Table 5.3 Hydrothermal alteration LA-ICP-MS results, MAX

Element	n.N	n.BDL	Min.	Max.	Mean	Median	σ
Li	14	0	0.0445	14.41	7.578	10.41	5.587
Na	3	11	10.76	81.61	41.59	32.39	29.65
Mg	11	3	0.1958	6.114	1.669	0.8705	1.948
Al	14	0	7.125	451.9	122.2	123.7	110.0
K	11	3	1.799	393.7	81.71	13.77	123.7
Ti	13	1	0.3866	39.90	17.90	19.02	14.14
V	3	11	0.0293	0.1309	0.0828	0.0881	0.0416
Cr	10	4	0.5591	1.923	1.058	0.9532	0.4209
Mn	6	8	0.0971	2.077	0.6779	0.1598	0.7844
Fe	2	12	14.26	18.27	16.27	16.27	2.005
Cu	0	14	0.0000	0.0000	0.0000	0.0000	0.000
Cu	0	14	0.0000	0.0000	0.0000	0.0000	0.000
Zn	6	8	0.1575	0.8905	0.3640	0.3140	0.2456
Ge	13	1	0.4401	1.2683	0.9424	0.9559	0.2535
As	1	13	0.0665	0.0665	0.0665	0.0665	0.0000
Rb	9	5	0.0363	0.9738	0.2582	0.0668	0.3441
Sr	14	0	0.0112	9.642	0.8966	0.2095	2.433
Zr	6	8	0.0113	0.9558	0.1973	0.0273	0.3426
Ag	2	12	0.0137	0.0155	0.0146	0.0146	0.0009
Sb	5	9	0.0252	0.0736	0.0481	0.0491	0.0177
Cs	11	3	0.0165	4.607	0.4823	0.0573	1.305
Gd	0	14	0.0000	0.0000	0.0000	0.0000	0.000
Hf	2	12	0.0110	0.0268	0.0189	0.0189	0.0079
Ta	1	13	0.0078	0.0078	0.0078	0.0078	0.000
Au	0	14	0.0000	0.0000	0.0000	0.0000	0.000
Pb	9	5	0.0113	0.4702	0.1235	0.0344	0.1480
Bi	3	11	0.0034	0.0098	0.0062	0.0053	0.0027
U	7	7	0.0025	0.0209	0.0080	0.0052	0.0064

n.N = number of analyses within detection limit; n.BDL = number of analyses below detection limit; Min = minimum value acquired; Max = maximum value acquired; Mean = mean value; Median = median value. Mean and median values do not take into account analyses that are below the detection limit. Concentrations are ppm except for Au and Ag which is ppb.

Hydrothermal vein quartz

Quartz that precipitated directly from a hydrothermal fluid commonly displayed a cellular-porous texture (Figs. 5.26, 5.27). This is typical of hydrothermally precipitated quartz due to low pressures relative to the compact cellular quartz formed under regional metamorphic conditions (Heynke et al., 1992). Hydrothermal quartz when observed under CL, displays zonal growth similar to igneous quartz (Figs. 5.11, 5.28), in that they record changes in trace element composition over time (Götze and Möckel, 2012). Cathodoluminescence also reveals the complexity of the quartz. Veins of compositional distinction, as well as zonal lamellae, may be observed under CL (Fig. 5.26), features that would go undetected if only observed under transmitted or reflected light microscopy. Additionally, veins of distinct compositions and lamellae were not observed in the igneous or metamorphic quartz examined. The tonal variation may be very complex, showing irregular growth zoning (Fig. 5.28), or having a mottled appearance (Fig. 5.26). The lamellae observed were too fine to analyze via LA-ICP-MS but other tonal variations were selected for geochemical analysis to see if they were caused by compositional variations within the mineral.

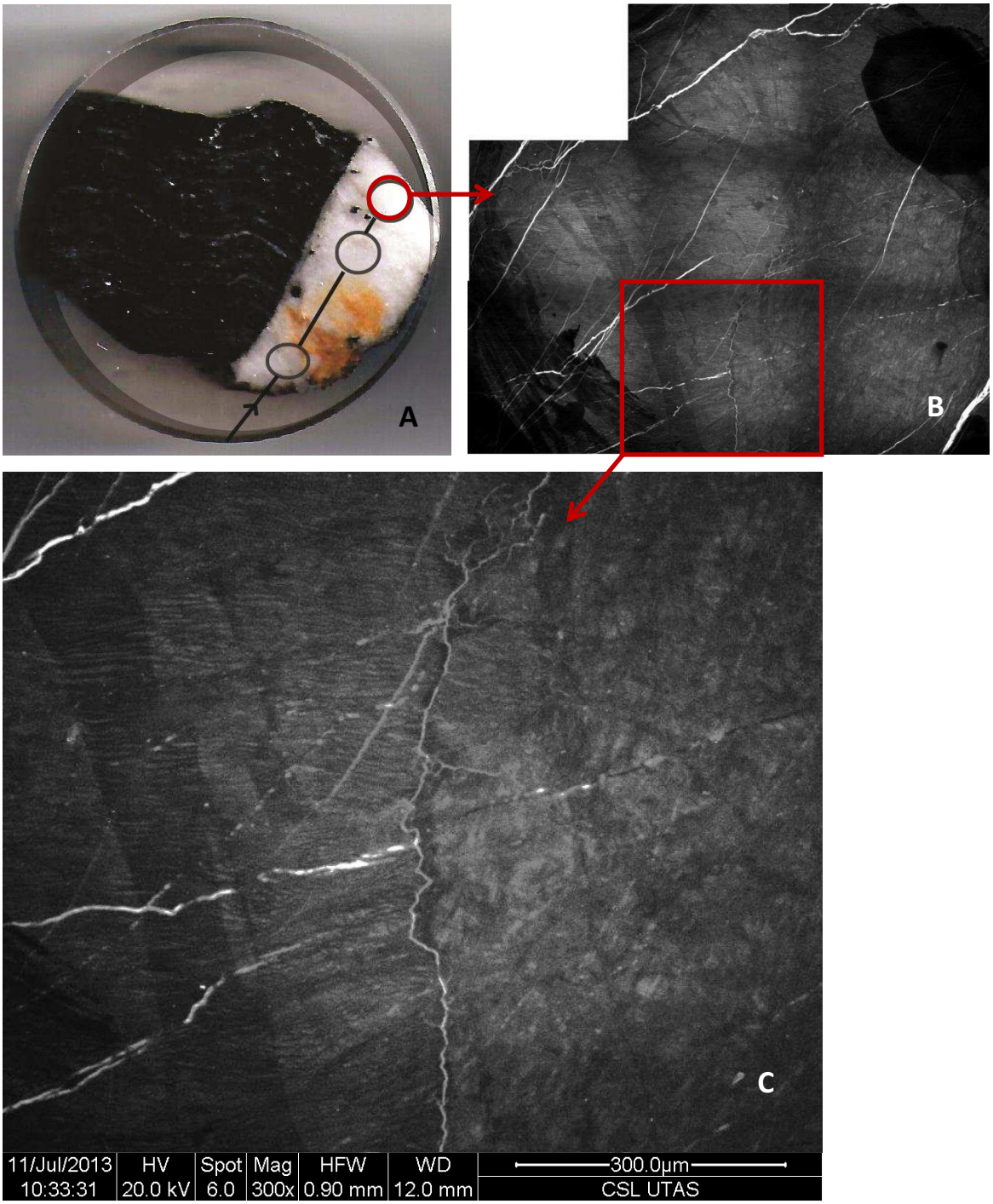


Figure 5.26 Quartz vein in biotite mica schist (A). Cathodoluminescence images reveal lamellae, veinlets, and mottled pattern (B, C). Sample MX12AB012, circle 3. NAD83 458298 E, 5610550N.

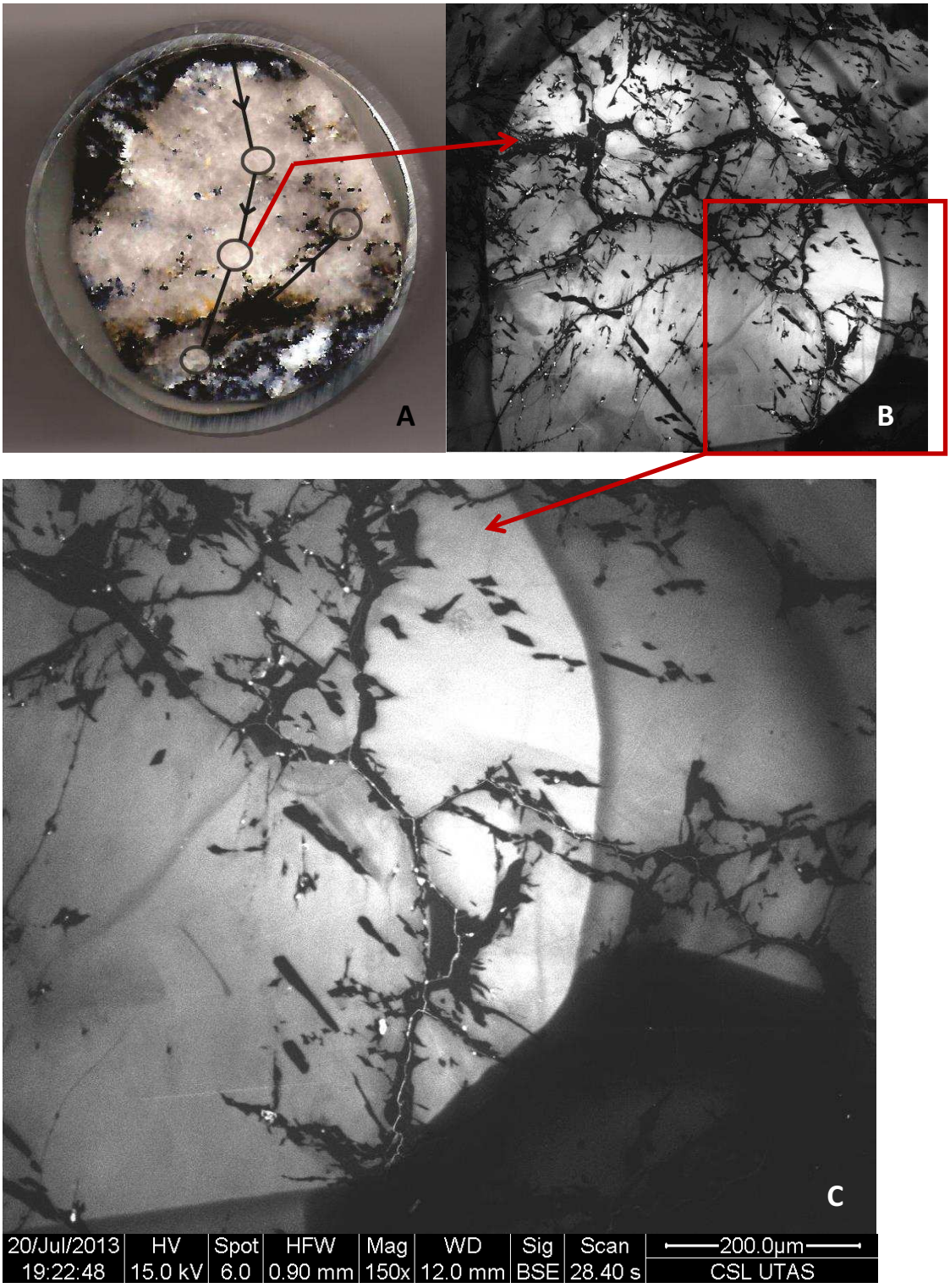


Figure 5.27 Hydrothermal quartz vein containing molybdenite, pyrite, and pyrrhotite (A). Quartz displays cellular porous texture with inclusions of bladed elongate crystals of molybdenite (B, C). Sample MX12AB023, circle 2. NAD83 457801E, 5609953N.

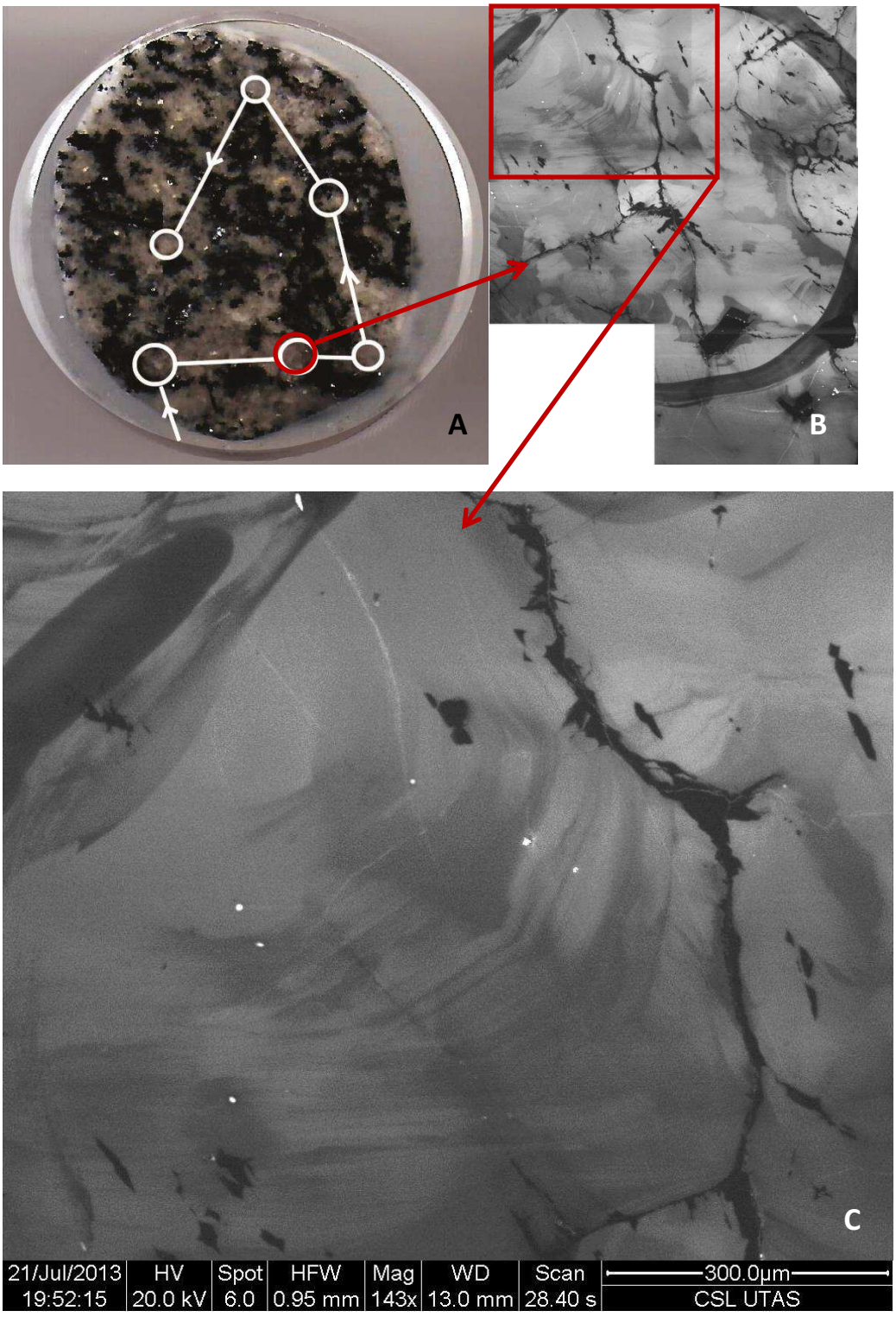


Figure 5.28 Hydrothermal quartz vein (A). Cathodoluminescence image displays irregular tonal variation in quartz (B, C). Sample MX12AB089, circle 2. NAD83 457363.9E, 5609519.3N.

Thirty-four samples of hydrothermal vein quartz were analyzed from within the alteration halo (potassic and propylitic) around the Trout Lake stock, in the domain where there is an intensely developed quartz vein stockwork. Two hundred and eighty-six spot analyses of hydrothermal quartz were carried out on the 34 samples (Table 5.4). The average total trace element concentration of the elements analysed within the hydrothermal quartz was found to be 138 ppm. Similar to igneous quartz, aluminum had the highest average concentration at 58 parts per million (ppm), followed by Ti (19 ppm), Na (12 ppm), Fe (9 ppm), K (6 ppm), Ca (6 ppm), Li (4 ppm), Mg (3 ppm) and Ge (1 ppm, Fig 5.29; Table 5.5). Magnesium had an average concentration of 3 ppm, which was higher than the other types of quartz examined, followed by igneous quartz which averaged 2 ppm magnesium (Table 5.5).

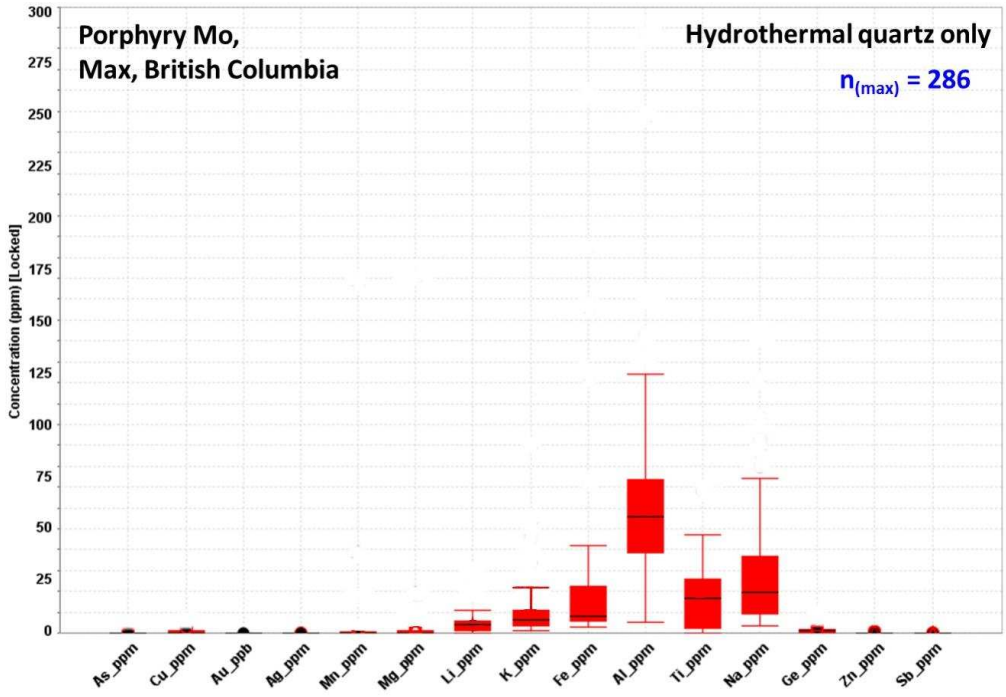


Figure 5.29 Box and whisker plot showing trace element concentrations in hydrothermal quartz. Concentrations obtained from 273 LA-ICP-MS spot analyses from 34 samples from the MAX mine. n = number of analyses.

Table 5.4 Hydrothermal vein quartz LA-ICP-MS results, MAX

Element	n.N	n.BDL	Min.	Max.	Mean	Median	σ
Li	241	32	0.0667	9.997	3.906	3.895	3.177
Na	128	145	4.254	123.2	27.95	19.75	24.94
Mg	197	76	0.0813	171.7	6.631	0.2544	59.07
Al	273	0	7.851	311.9	59.73	55.78	40.35
K	157	116	1.551	54.97	10.39	6.442	12.41
Ti	258	15	0.3121	685.5	20.15	16.9	47.17
V	13	260	0.0278	1.189	0.3207	0.0864	0.3908
Cr	58	215	0.2384	8.017	1.206	0.7797	1.426
Mn	119	154	0.0788	18.77	2.181	0.1705	15.97
Fe	43	230	4.861	1370	72.55	8.335	238.9
Cu	44	229	0.1369	2.847	0.7457	0.3351	1.217
Cu	46	227	0.1445	3.559	0.7981	0.3656	1.324
Zn	42	231	0.0585	0.5006	0.216	0.1626	0.1498
Ge	268	5	0.0854	5.848	1.174	1.035	0.8677
As	27	246	0.0834	0.3672	0.1639	0.1287	0.0841
Rb	102	171	0.0161	0.2351	0.0673	0.051	0.0486
Sr	267	6	0.0054	9.378	0.2475	0.1232	0.6893
Zr	18	255	0.0072	14.54	0.9720	0.0190	3.398
Ag	9	264	0.0127	0.1324	0.0375	0.0226	0.0368
Sb	64	209	0.0158	0.3228	0.0776	0.0444	0.0879
Cs	194	77	0.0055	0.4349	0.0577	0.0357	0.0618
Gd	16	257	0.0113	0.0979	0.02306	0.0182	0.0205
Hf	14	259	0.0037	0.2841	0.0306	0.008	0.0735
Ta	17	256	0.0014	0.2132	0.016	0.0024	0.0510
Au	8	265	0.0048	0.0216	0.0163	0.0148	0.0077
Pb	121	152	0.0023	7.369	0.1055	0.0237	0.6688
Bi	28	245	0.0023	0.9691	0.049	0.0069	0.1810
U	34	239	0.0011	0.4956	0.0292	0.0046	0.0892

n.N = number of analyses above detection limit; n.BDL = number of analyses below detection limit; Min = minimum value acquired; Max = maximum value acquired; Mean = mean value; Median = median value. Mean and median values do not take into account analyses that are below the detection limit. Concentration is in ppm except for Au and Ag which is ppb.

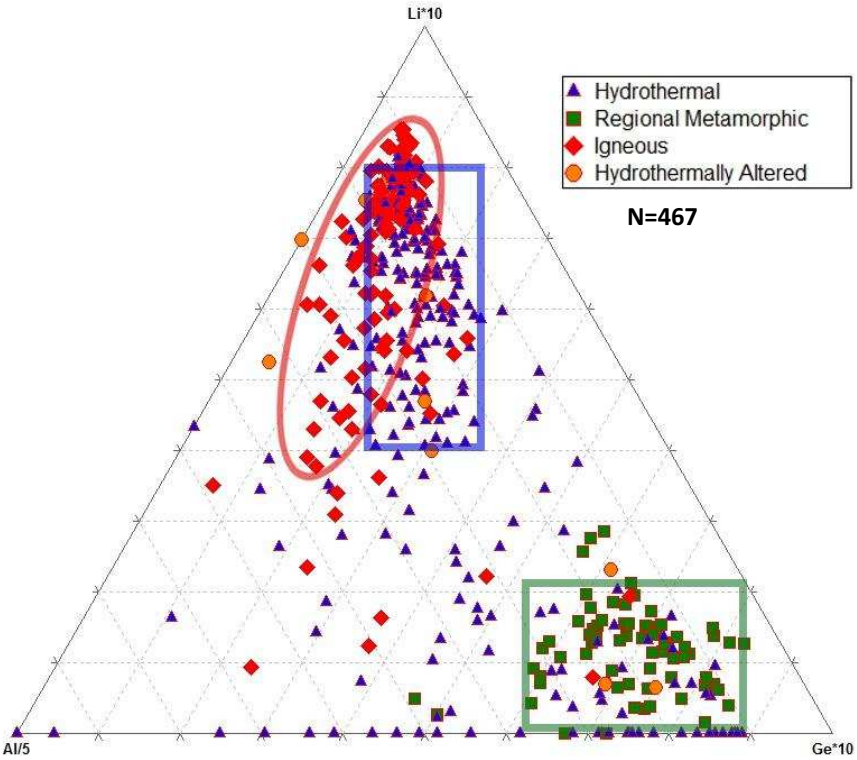


Figure 5.30 Ternary plot showing Li (x10) *versus* Al (/5) *versus* Ge (x10) for all LA-ICP-MS quartz spot data. Igneous quartz is distinguished by relatively high Li and low Ge (red oval - 86% of data), and metamorphic quartz by relatively high Ge (x10) and low Al/5 and Li (x10) (green rectangle - 93% of data). Hydrothermal quartz has the highest variation in Li, Al and Ge (blue rectangle - 65% of data).

Table 5.5 Average trace element concentrations in quartz

Trace Element	Primary Igneous Quartz	Regional Metamorphic Quartz	Hydrothermally Altered Quartz	Hydrothermal Vein Quartz
Al	73.8	15.3	75.5	58.1
Ti	25.2	0.8	11.0	19.0
Na	17.9	3.8	2.1	12.0
Fe	10.7	18.1	4.3	8.4
K	9.0	2.0	30.3	6.0
Li	3.9	0.1	5.2	3.5
Mg	1.9	0.4	1.2	3.2
Ge	0.8	1.2	0.8	1.0
Mn	0.7	0.1	0.8	0.4
Cr	0.4	0.2	0.5	0.3
Cu	0.1	0.0	0.0	0.2
Sr	0.3	0.2	0.9	0.2
Zr	0.1	0.0	0.0	0.1
Zn	0.1	0.0	0.1	0.0
As	0.0	0.1	0.0	0.0
Rb	0.1	0.0	0.1	0.0
Cs	0.1	0.0	0.4	0.0
SUM	190.39	43.11	182.00	137.62

*All values are in parts per million (ppm). N = 466. Values take into account analyses that were below detection limit and given fixed value (detection limit/2).

5.5.2-III Vectoring potential of trace elements in hydrothermal quartz

Variations in the trace element concentrations of quartz were examined to document any observable trends. As with chlorite and epidote, the elements were categorized as proximal pathfinders, distal pathfinders, and no observable trend. The elements analysed were Li, Na, Mg, Al, K, Ca, Ti, V, Cr, Mn, Fe, Cu, Zn, Ge, As, Rb, Sr, Zr, Ag, Sb, Cs, Gd, Hf, Ta, Au, Pb, Bi and U.

Three elements (Ti, Al and Li) showed an increase in concentration towards the center of the deposit. Aluminum was found to have significantly higher concentrations than other trace elements in quartz and was also found to increase in concentration towards the deposit center (Figs. 5.31, 5.32). Ti and Li show similar behaviour (Figs. 5.32 – 5.36). It is important to note that Al, Ti and Li concentrations stay relatively low and constant in the regional metamorphic quartz, regardless of the sample location (Fig. 5.39).

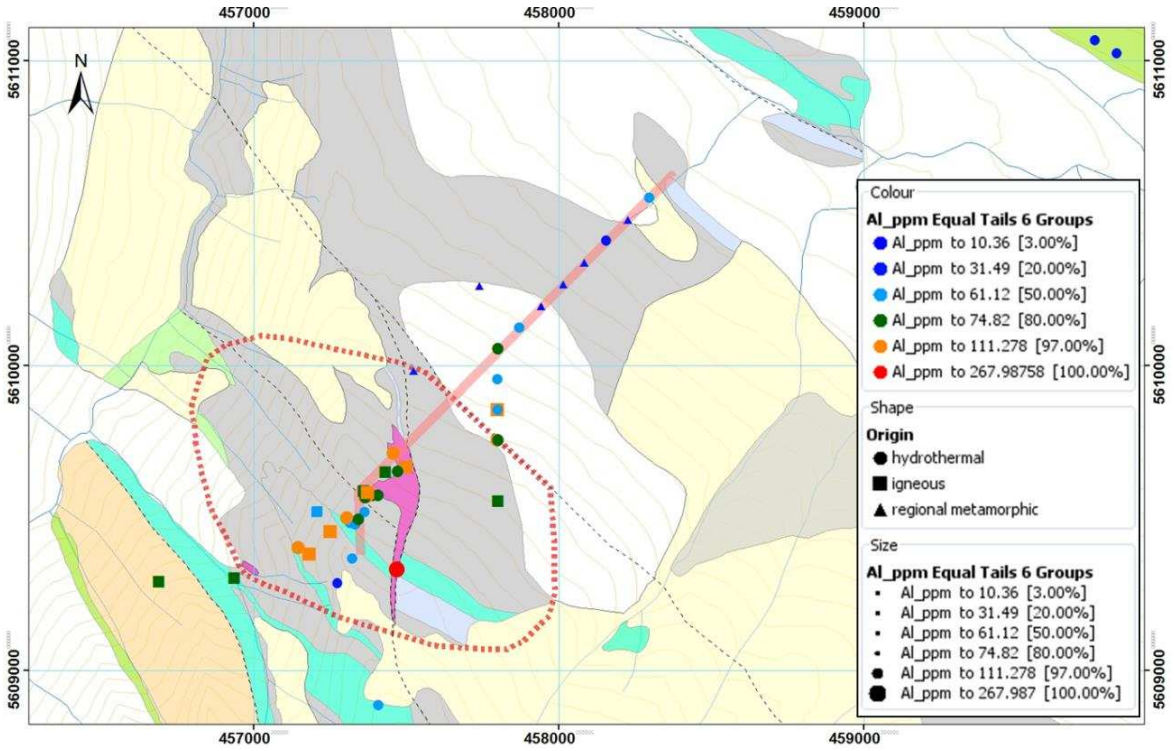


Figure 5.31 Geological map showing the trace element concentration of Al (ppm) in quartz. Alteration isograd (red dashed line from Read et al., 2009) outlines the extent of diopside alteration and all known Mo mineralization.

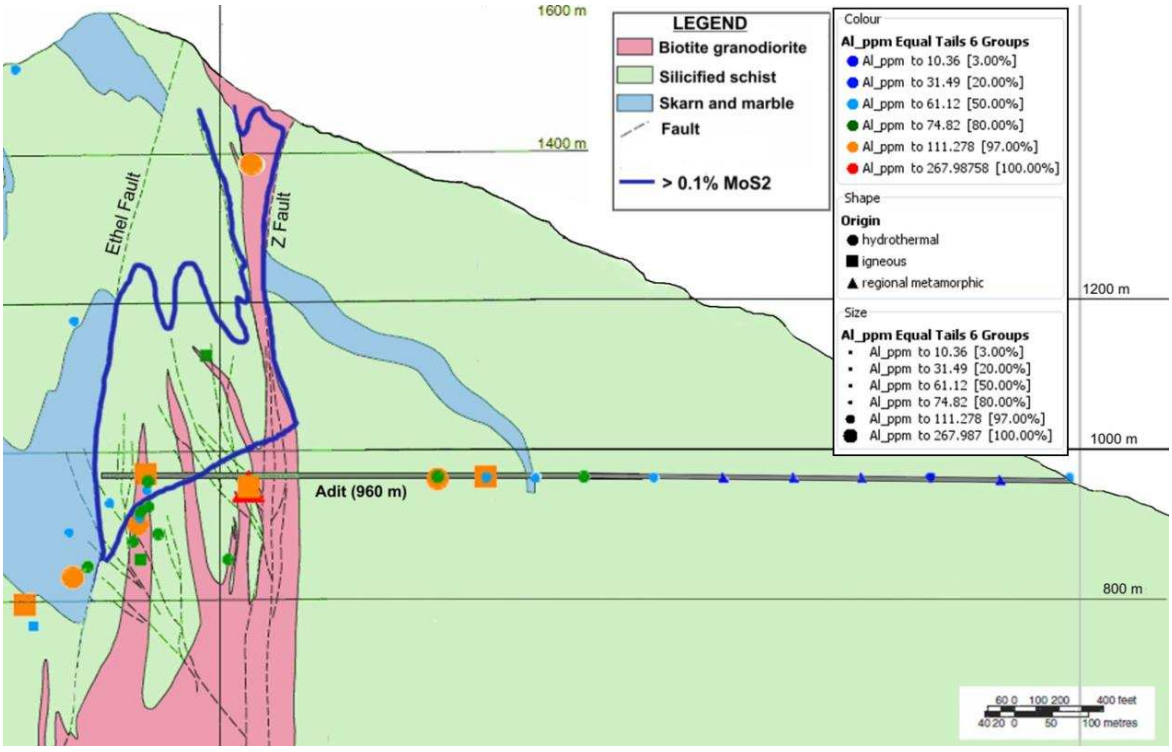


Figure 5.32 Cross-section showing trace element concentration of Al (ppm) in quartz approaching the Trout Lake stock from adit. Data from within 50 meters of the section is projected onto the cross-section. Cross-section modified from Lawley et al. (2010).

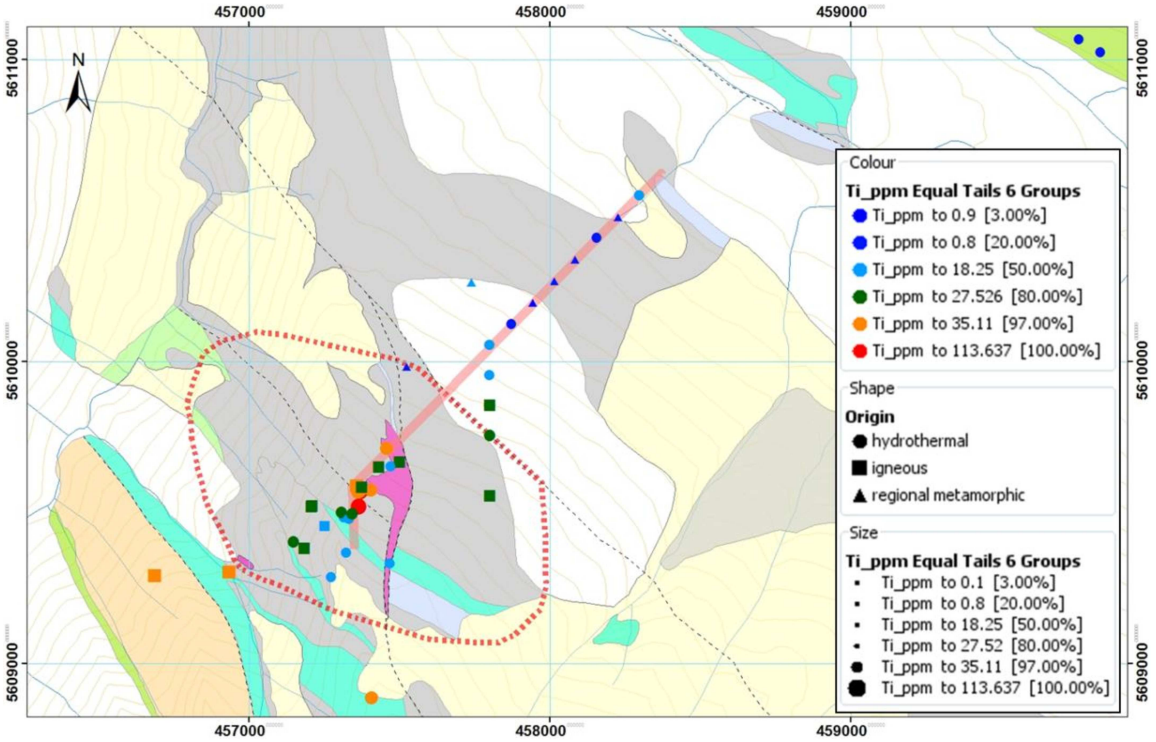


Figure 5.33 Geological map showing the trace element concentration of Ti (ppm) in quartz. Alteration isograd (red dashed line from Read et al., 2009) outlines the extent of diopside alteration and all known Mo mineralization.

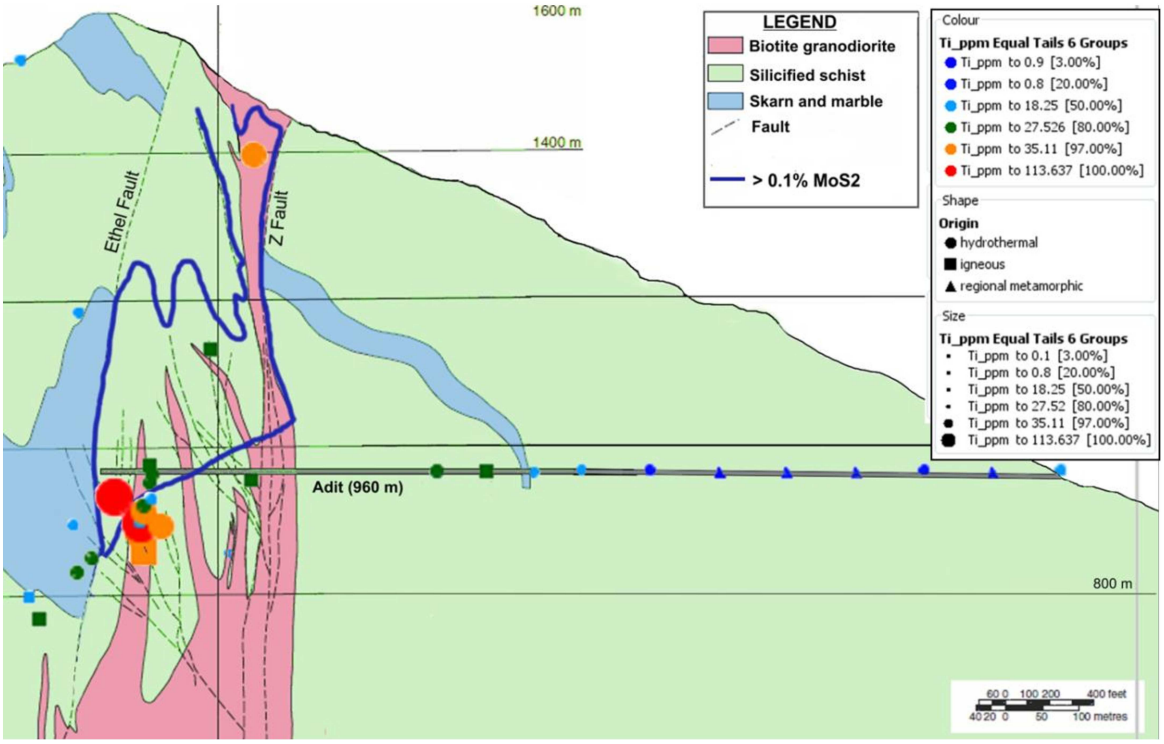


Figure 5.34 Cross-section showing trace element concentration of Ti (ppm) in quartz approaching the Trout lake stock from adit. Data from within 50 meters of the section is projected onto the cross-section. Cross-section modified from Lawley et al. (2010).

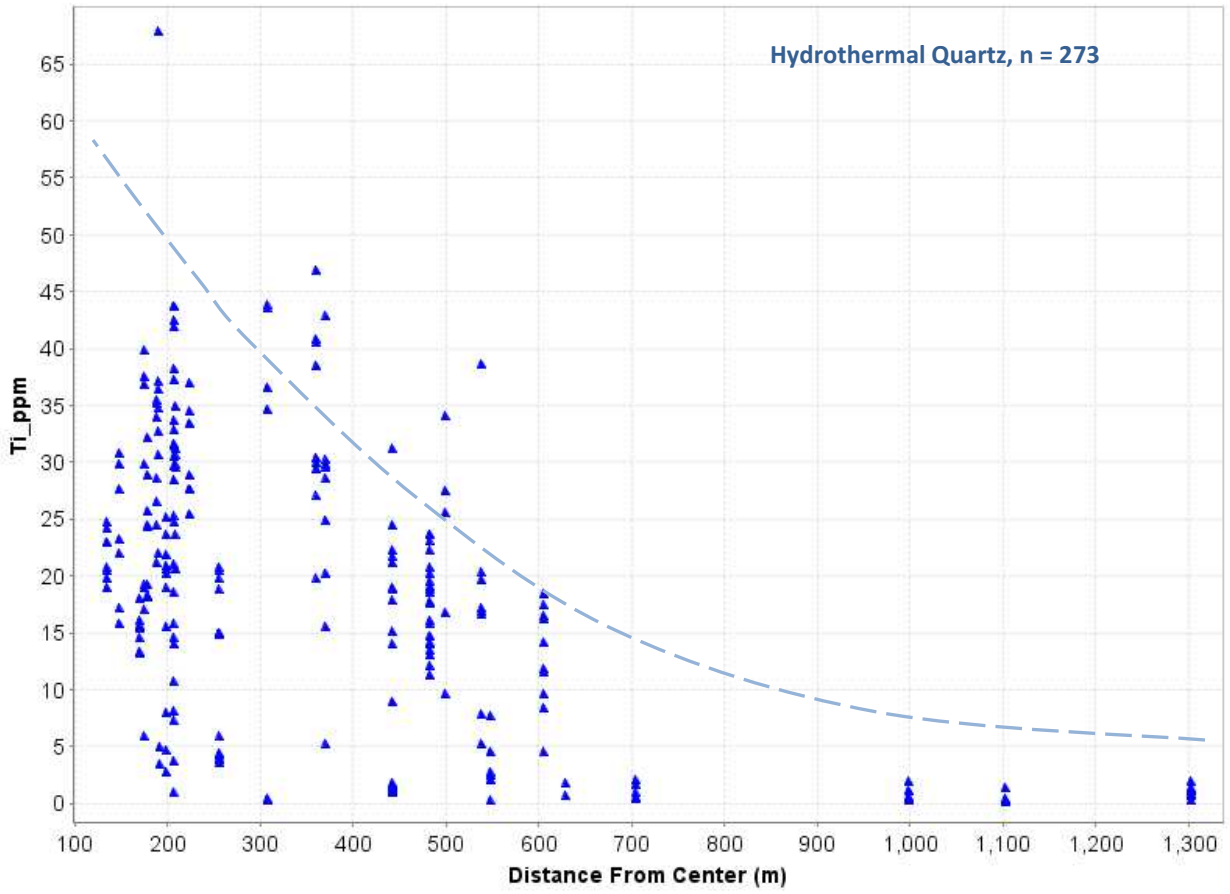


Figure 5.35 Scatter plot displaying distance from center of deposit *versus* Ti (ppm) for hydrothermal quartz. Dashed line shows overall trend of Ti increasing with proximity to the deposit center. n = number of analyses.

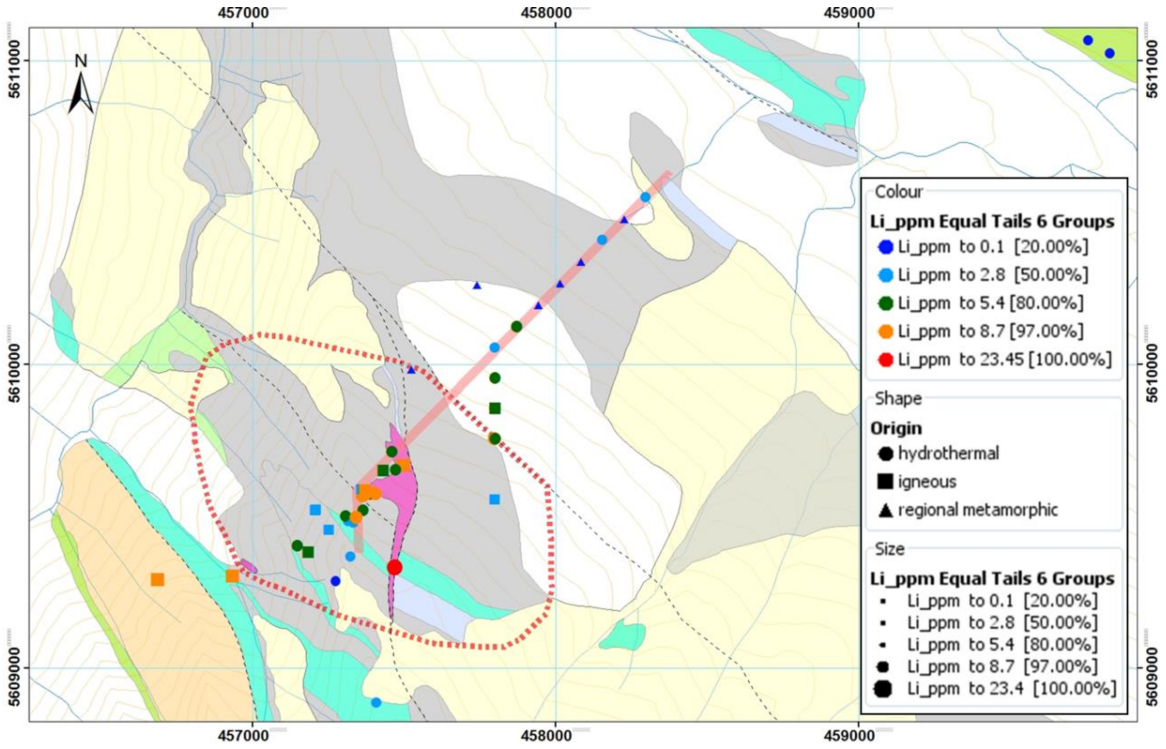


Figure 5.36 Geological map showing the trace element concentration of Li (ppm) in quartz. Alteration isograd (red dashed line from Read et al., 2009) outlines the extent of diopside alteration and all known Mo mineralization.

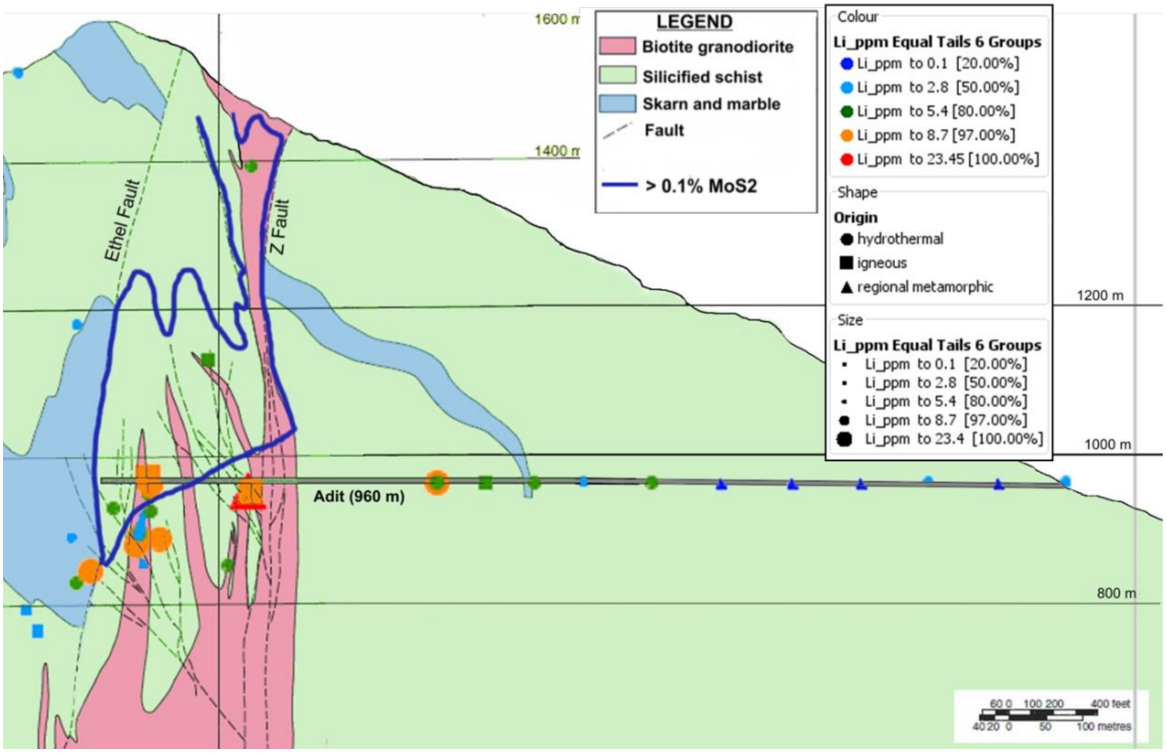


Figure 5.37 Cross-section showing trace element concentration of Li (ppm) in quartz approaching the Trout lake stock from adit. Data from within 50 meters of the section is projected onto the cross-section. Cross-section modified from Lawley et al. (2010).

Germanium was the only element analysed that increased in concentration away from the deposit center (Fig. 5.38). In contrast, Ge concentrations decreased distally in regional metamorphic quartz (Fig. 5.38). Germanium was present in very low concentrations or below detection limits in the igneous quartz examined.

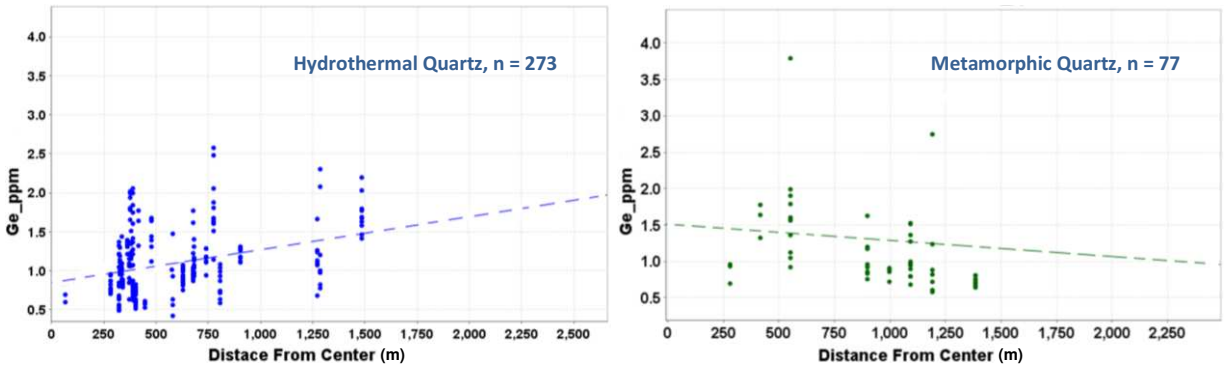


Figure 5.38 Scatter plots displaying distance from center of deposit *versus* Ge (ppm) for hydrothermal and regional metamorphic quartz. Regression lines shows overall trend of Ge decreasing with proximity to the deposit center, having an inverse relationship to Ge in metamorphic quartz. n = number of analyses.

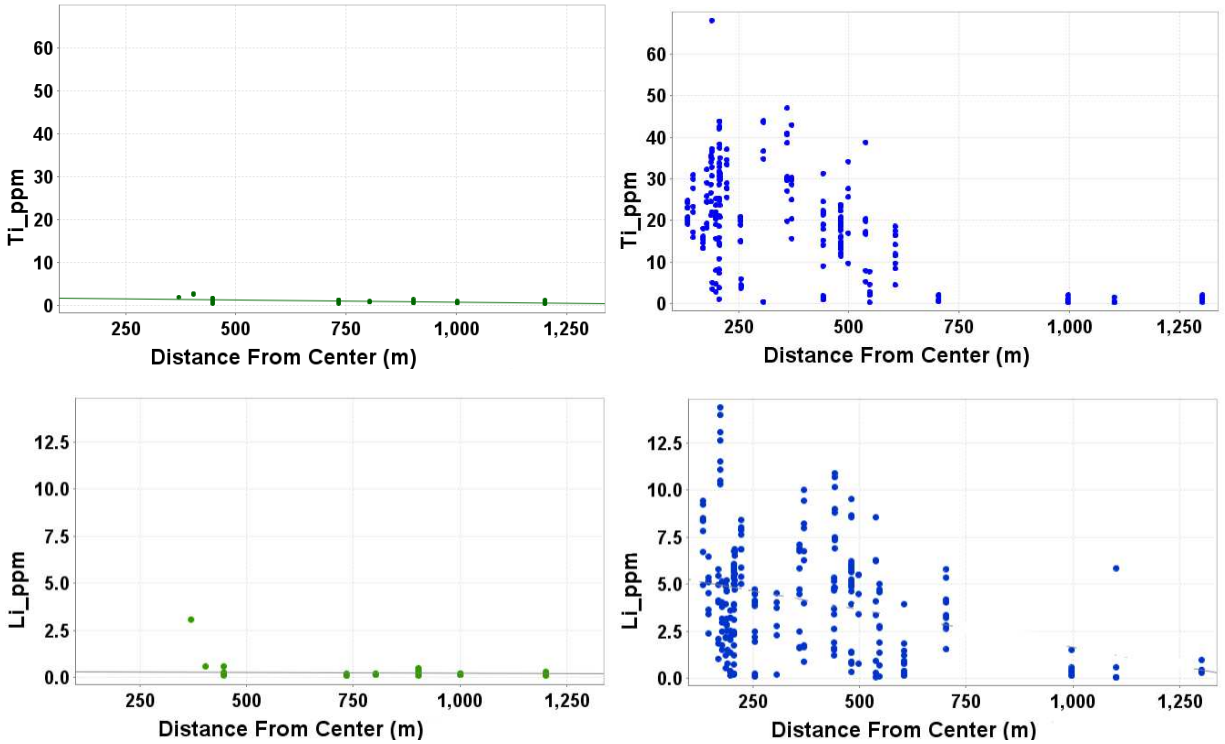


Figure 5.39 Scatter plots displaying distance from center of deposit *versus* Ti and Li (ppm) for hydrothermal (right) and regional metamorphic quartz (left). Plots show overall trend of elements increasing with proximity to the deposit center in hydrothermal quartz, and remaining relatively constant in regional metamorphic quartz.

5.6.1 Trace element analysis of epidote and chlorite

Chlorite trace element geochemistry

Five hundred and sixty-four LA-ICP-MS analyses of chlorite were obtained from 315 grains in 33 samples. Of the 564 analyses 318 were discarded during the data reduction and quality control process, as they did not meet the necessary standards (quality ranking < 1). The concentrations of Li, B, Na, Mg, Al, Si, K, Ca, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Sr, Y, Zr, Ag, Sn, Sb, Ba, La, Ce, Pb, Bi, and U were obtained for all analyses (Table 5.6). Only replacement chlorite of hydrothermal origin was analysed. Samples were categorized based on the primary host rock composition from which the replacement chlorite was taken, in order to determine what effects, if any, that protoliths had on trace element abundances in chlorite. Element concentrations have been determined for chlorite, and these have been categorized as distal pathfinder elements, proximal pathfinder elements, or no observable trend.

Of the 30 trace elements detected in chlorite only Ti and V were found to increase with proximity to the deposit center, both showing a progressive increase in concentration with highest concentrations closest to the deposit center (Figs. 5.40, 5.41). Strontium and Ba may also show trends that increase toward the deposit center but require further analyses to increase certainty. Strontium peaks at around 350-400 meters from the deposit and then decreases in concentration closer to the deposit (Fig. 5.42).

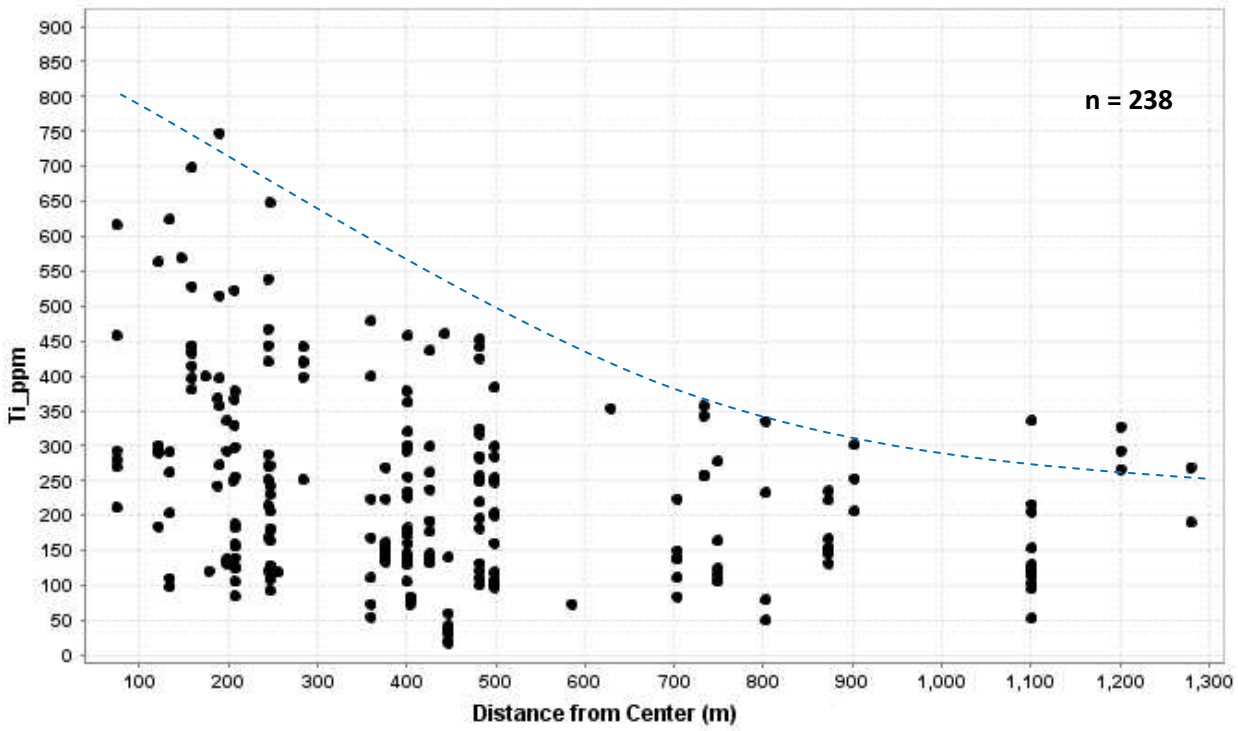


Figure 5.40 Scatter plot showing distance from center (m) *versus* Ti (ppm) in chlorite. Dashed line emphasizes overall trend of Ti increase in concentration with proximity to the deposit center in chlorite. n = number of analyses.

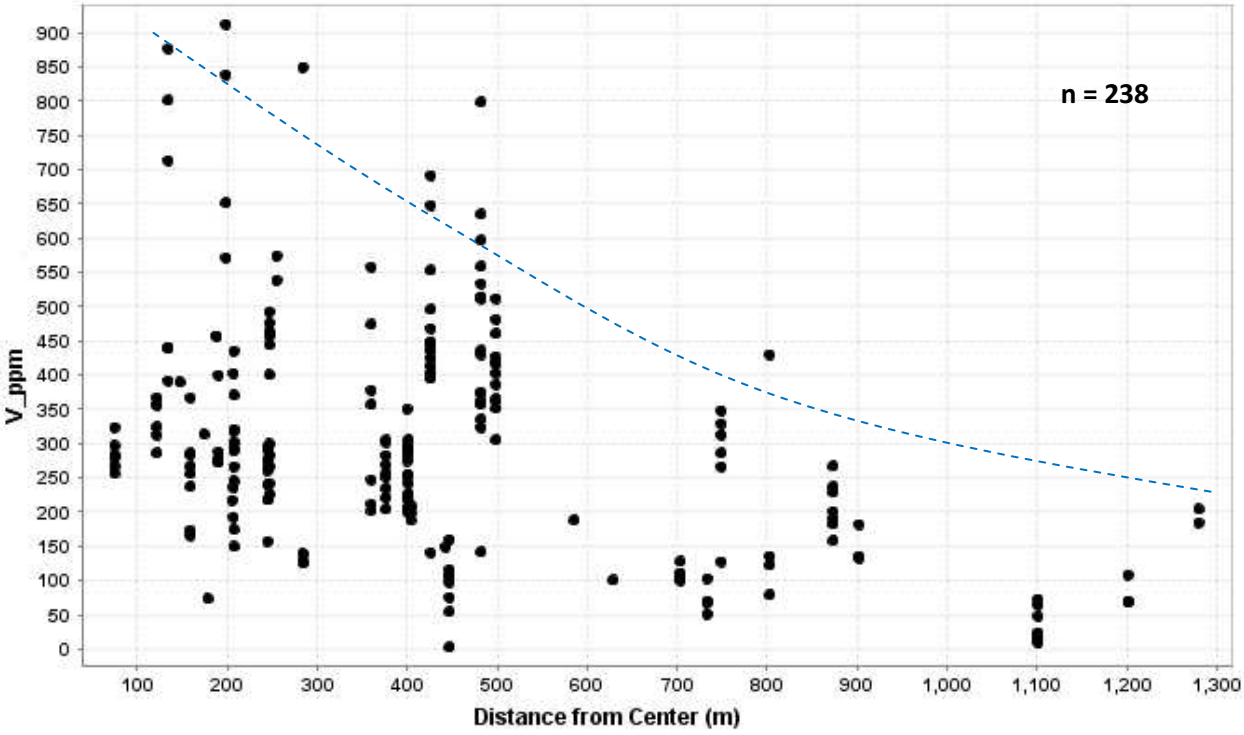


Figure 5.41 Scatter plot showing distance from center of deposit (m) *versus* V (ppm) in chlorite. Vanadium increases in concentration with proximity to the deposit. n = number of analyses.

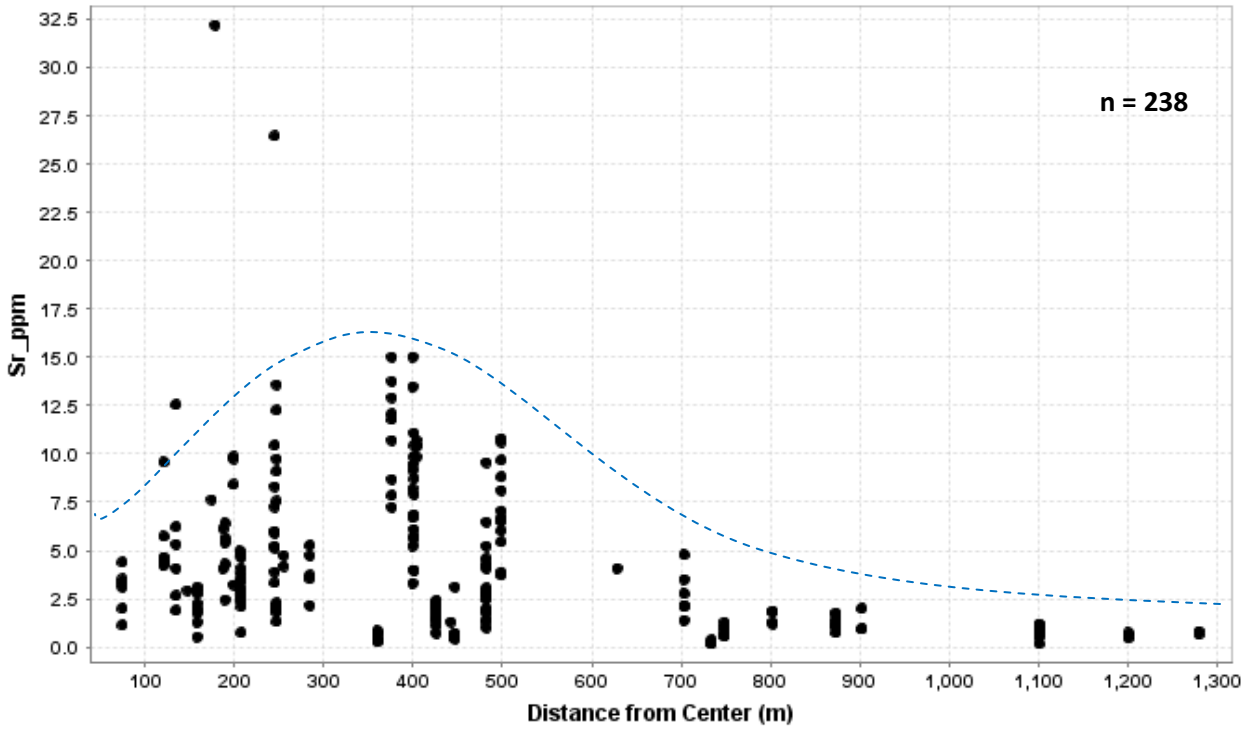


Figure 5.42 Scatter plot showing distance from center of deposit (m) *versus* Sr (ppm) in chlorite. Strontium concentrations peak around 400 meters and then decreases away from the deposit. n = number of analyses.

Table 5.6 Chlorite LA-ICP-MS results, MAX

	n.N	n.BDL	Min.	Max.	Mean	Median	σ
Major elements							
Si (wt %)	233	0	9.7	22.5	12.8	12.6	1.7
Mg (wt %)	233	0	1.7	14.2	7.8	7.5	2.0
Fe (wt %)	233	0	9.7	30.0	21.8	22.1	3.9
Al (wt %)	233	0	5.0	13.4	11.1	11.3	0.8
Minor elements							
Ca (ppm)	116	117	239.8	3639	693.5	416.6	660.9
Mn (ppm)	233	0	343.4	12778	5554	6024	2489
Trace elements							
Li (ppm)	233	0	46.51	496.6	210.2	199.4	63.72
B (ppm)	188	45	1.363	92.88	8.536	4.425	12.55
Na (ppm)	19	214	44.40	4187	311.3	95.76	820.3
K (ppm)	208	25	9.053	946.1	95.80	49.90	134.8
Ti (ppm)	233	0	4.682	943.9	240.3	215.5	142.8
V (ppm)	233	0	1.160	912.4	285.2	267.5	172.6
Cr (ppm)	208	25	1.706	731.1	53.17	8.049	121.9
Co (ppm)	233	0	1.411	129.6	18.61	11.68	20.33
Ni (ppm)	206	27	0.5869	886.8	43.59	3.543	120.1
Cu (ppm)	49	184	0.7166	264.4	14.64	1.601	47.99
Zn (ppm)	233	0	5.418	1836	646.0	626.5	210.3
As (ppm)	48	185	0.2220	44.90	1.803	0.4431	6.322
Sr (ppm)	233	0	0.1515	1420	10.77	2.809	91.93
Y (ppm)	161	72	0.0266	12.63	0.3974	0.1291	1.437
Zr (ppm)	83	150	0.0528	14.06	1.398	0.3034	2.611
Ag (ppm)	3	230	0.0388	0.0710	0.0534	0.0502	0.0134
Sn (ppm)	96	137	0.0384	20.39	0.3948	0.1090	2.063
Sb (ppm)	13	220	0.0524	1.620	0.4420	0.2489	0.4708
Ba (ppm)	223	10	0.1860	31.99	3.270	1.977	4.801
La (ppm)	93	140	0.0100	2.088	0.1455	0.0459	0.3214
Ce (ppm)	165	68	0.0150	4.006	0.1829	0.0763	0.4187
Pb (ppm)	161	72	0.0215	56.54	5.342	1.185	9.843
Bi (ppm)	44	189	0.0101	0.9813	0.1238	0.0372	0.2097
U (ppm)	118	115	0.0127	3.434	0.1340	0.0516	0.3455

N = number of analyses; BDL = number of analyses below detection limit; Min = minimum value acquired; Max = maximum value acquired; Mean = mean value; Median = median value. Mean and median values do not take into account analyses that are below detection limit.

Epidote trace element geochemistry

Two hundred and sixty-six LA-ICP-MS analyses of epidote were obtained from 266 grains in 29 samples. Of the 266 analyses 130 were discarded during the data reduction and quality control process (quality ranking <1, overall quality ranking = 1.8). Epidote occurs as a fine-grained alteration product of plagioclase. It ranges from Fe-rich epidote to clinozoisite (Table 5.7). It typically has a grain size of <50 µm. Due to the small grain size, it was not possible to conduct more than one LA-ICP-MS analysis per grain. Many analyses had to be discarded due to grains being breached and neighboring minerals being ablated. Also any drift in the laser resulted in ablation of neighboring minerals. Thirty six elements were analysed, Na, Mg, Al, Si, K, Ca, Ti, V, Mn, Fe, Co, Cu, Zn, As, Sr, Y, Zr, Mo, Ag, Sn, Sb, Ba, La, Ce, Eu, Gd, Yb, Lu, Hf, Ta, Au, Tl, Pb, Bi, Th, and U. Elements were categorized as proximal pathfinders, distal pathfinders and no observable trend.

The concentrations of four trace elements in epidote increased with concentration with proximity to the deposit, Sr, Ce, Sb and Eu (Figs. 5.43, 5.44, 5.45, 5.46). The greatest variations in elemental concentrations within individual epidote crystals occurs in epidote that formed closest to the deposit center (Figs. 5.43, 5.44, 5.45, 5.46). Due to the low quality and amount of discards, the data are sporadic and inconclusive.

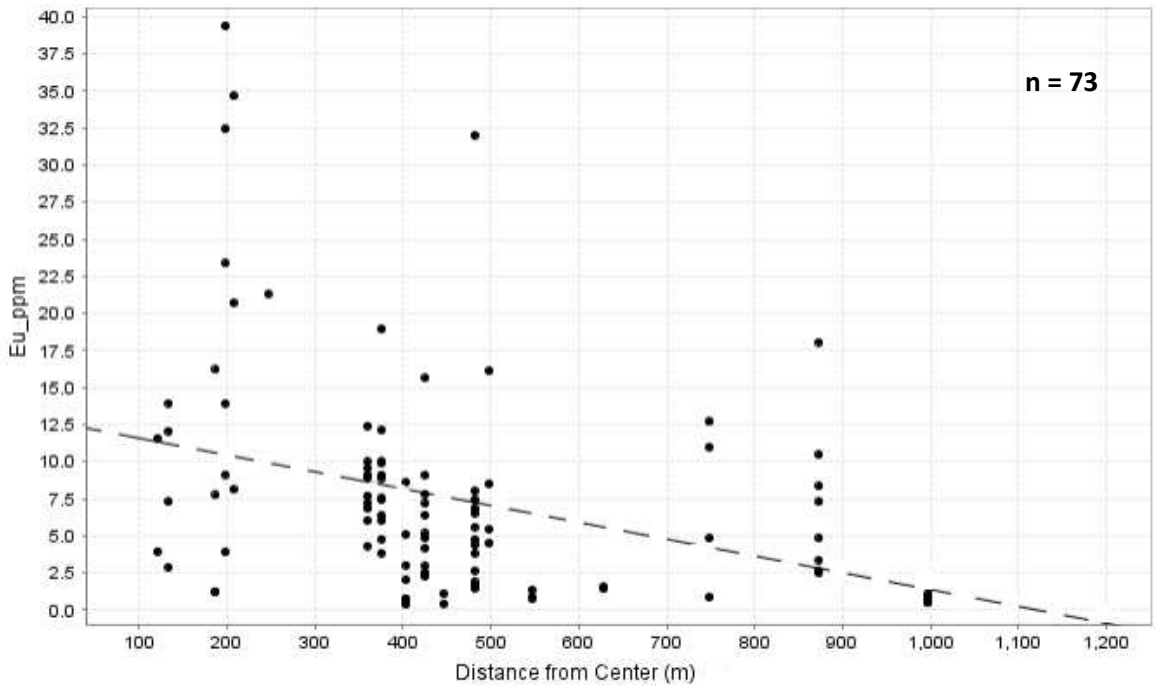


Figure 5.43 Scatter plot showing distance from center of deposit (m) *versus* Eu (ppm) in epidote. There is a general increase in the maximum value of Eu concentration with proximity to the deposit center as shown by regression line. There is greater variation in concentration closest to the center of deposit. n = number of analyses.

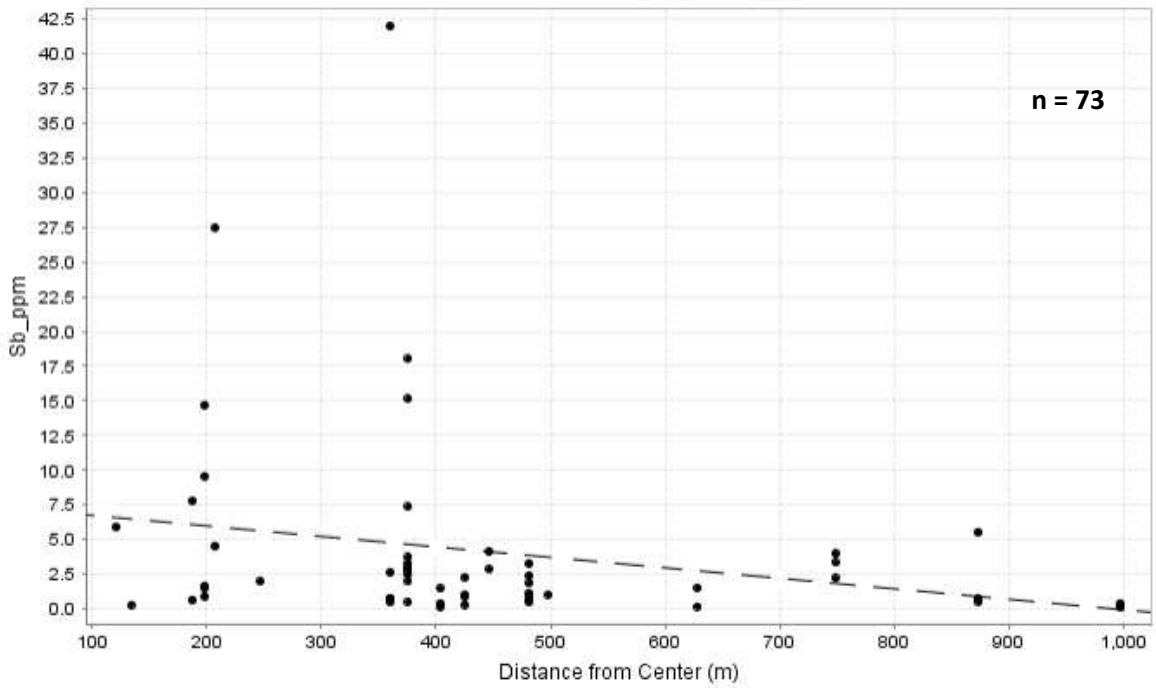


Figure 5.44 Scatter plot showing distance from center of deposit (m) *versus* Sb (ppm) in epidote. There is a general increase in Sb concentration with proximity to the deposit center as shown by regression line. n = number of analyses.

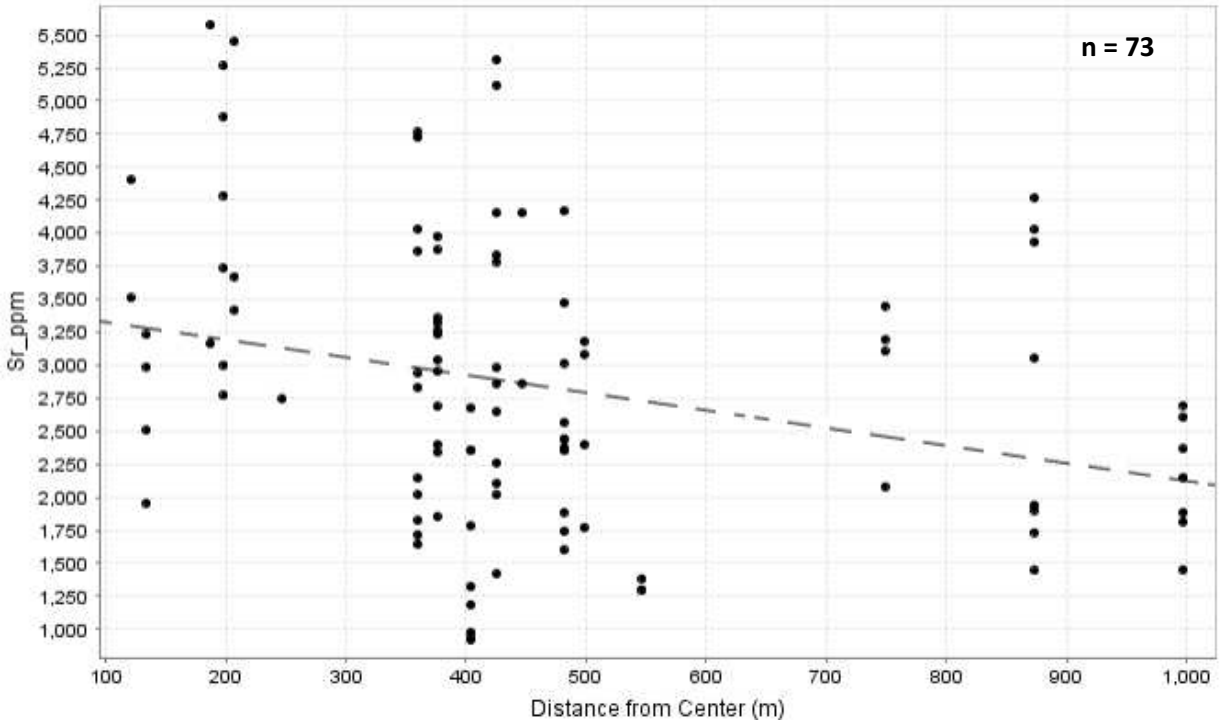


Figure 5.45 Scatter plot showing distance from center of deposit (m) vs. Sr (ppm) in epidote. There is an overall increase in Sr concentration with proximity to the deposit center as shown by regression line. n = number of analyses.

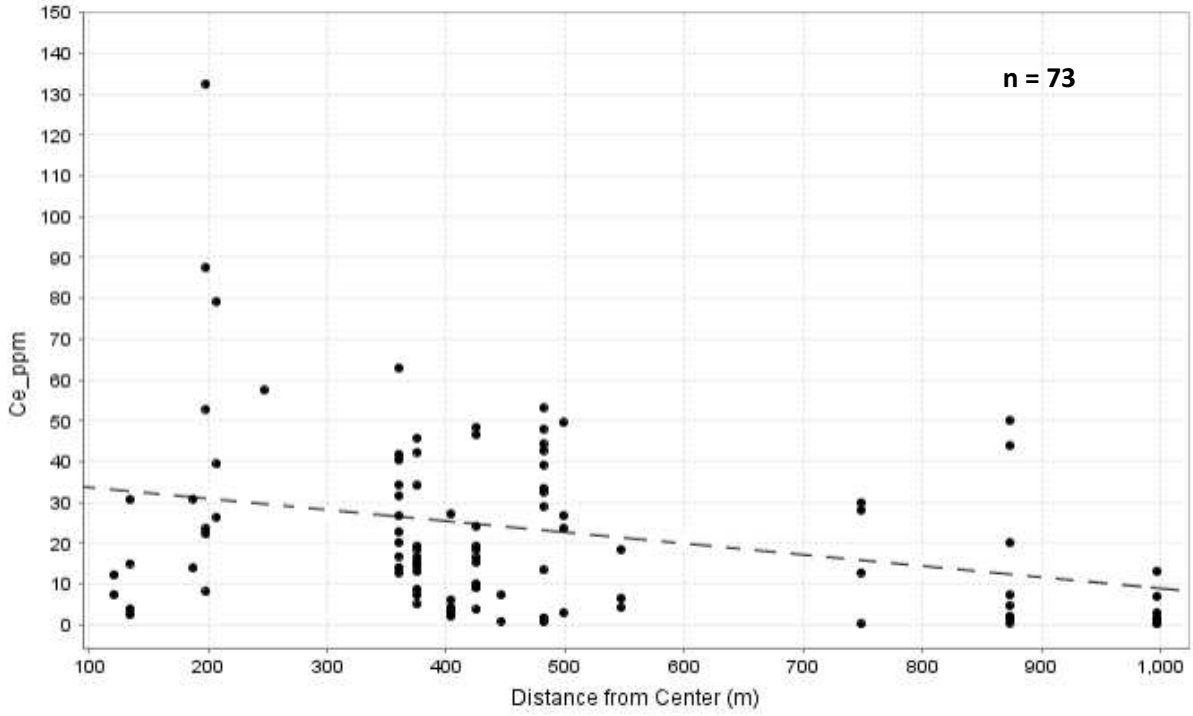


Figure 5.46 Scatter plot showing distance from center of deposit (m) vs. Ce (ppm) in epidote. There is an overall increase in Ce concentration with proximity to the deposit center as shown by regression line. n = number of analysis.

Of the thirty six trace elements analysed in epidote, Sn was the only element that showed an overall trend increasing away from the deposit (Fig. 5.45).

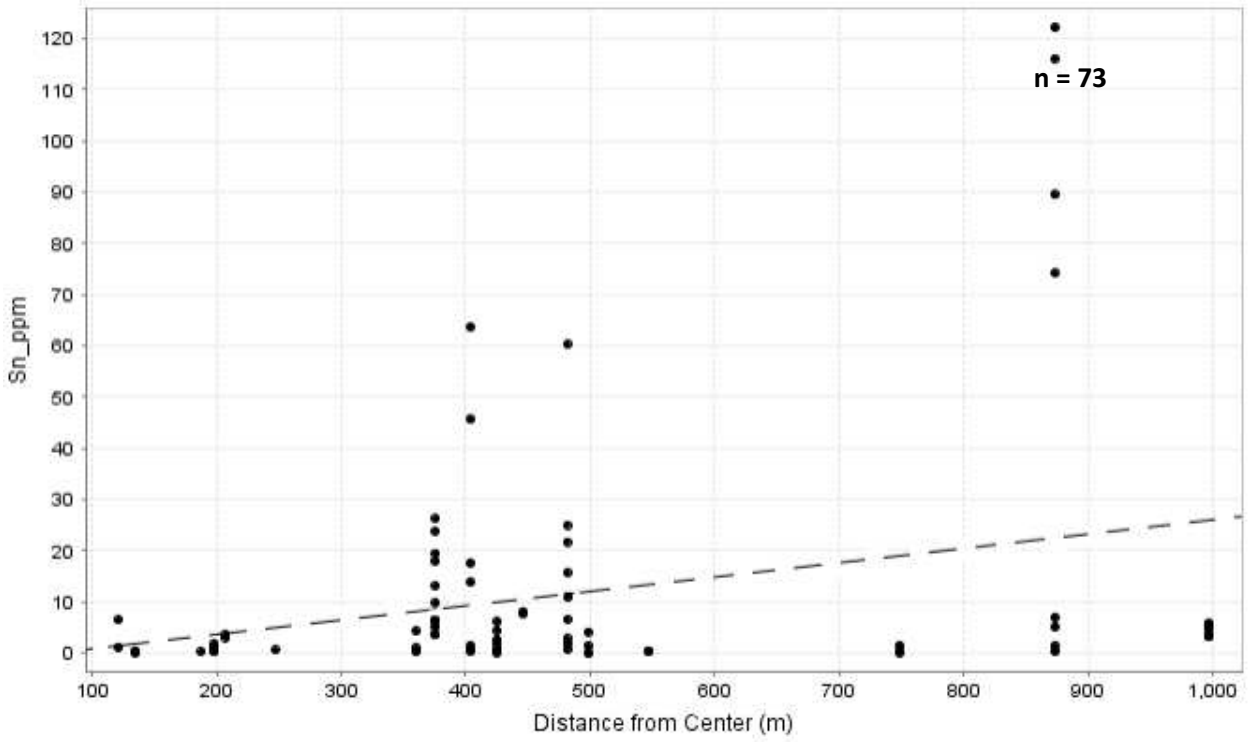


Figure 5.47 Scatter plot showing distance from center of deposit (m) vs. Sn (ppm) in epidote. There is an overall increase in concentration of Sn with distance from the deposit center. n = number of analyses.

Table 5.7 Epidote LA-ICP-MS results, MAX

	n.N	n.BDL	Min.	Max.	Mean	Median	σ
Major elements							
Ca (wt %)	135	0	12.2	25.9	17.0	17.0	1.8
Fe (wt %)	135	0	0.2	21.9	6.5	6.5	4.8
Al (wt %)	135	0	9.7	21.5	15.0	15.4	2.9
Si (wt %)	135	0	12.2	34.6	20.3	19.5	3.7
Minor elements							
Na (ppm)	54	81	53.8	7807	2019	1219	2130
Mg (ppm)	134	1	4.101	34812	1155	285.4	3658
K (ppm)	77	58	12.69	21919	1527	178.1	3792
Ti (ppm)	135	0	14.93	43088	1454	391.1	4465
Trace elements							
V (ppm)	121	14	0.7051	1234	254.2	147.7	270.2

	n.N	n.BDL	Min.	Max.	Mean	Median	σ
Mn (ppm)	135	0	100.0	10369	2629	1823	2461
Co (ppm)	48	87	0.1676	15.99	2.217	1.048	2.974
Cu (ppm)	32	103	1.263	214.9	12.60	3.118	39.83
Zn (ppm)	118	17	0.9334	504.7	25.61	10.62	66.31
As (ppm)	90	45	0.8975	34.36	6.596	4.438	6.332
Sr (ppm)	135	0	0.2356	25482	4322	2984	4478
Y (ppm)	131	4	0.3153	2630	77.89	7.820	359.4
Zr (ppm)	132	3	0.2409	81.06	13.94	10.66	13.22
Mo (ppm)	19	116	0.4077	113.8	11.78	0.7948	30.14
Ag (ppm)	7	128	0.1475	0.2087	0.1781	0.1781	0.0306
Sn (ppm)	115	20	0.1068	374.1	16.26	2.697	51.22
Sb (ppm)	84	51	0.1441	99.22	4.391	1.141	12.37
Ba (ppm)	124	11	0.6212	466.5	29.40	9.933	67.47
La (ppm)	132	3	0.1186	70338	1231	7.206	8200
Ce (ppm)	133	2	0.1321	137605	2461	13.46	16400
Eu (ppm)	135	0	0.1835	885.1	23.08	4.837	110.1
Gd (ppm)	105	30	0.1882	3570	96.08	1.581	539.2
Yb (ppm)	98	37	0.1178	76.46	4.399	1.332	12.36
Lu (ppm)	94	41	0.0240	8.291	0.5492	0.1907	1.444
Hf (ppm)	101	34	0.0671	3.794	0.7099	0.5736	0.6075
Ta (ppm)	44	91	0.0221	18.19	0.9957	0.1454	3.032
Au (ppb)	7	128	0.0619	0.2925	0.1772	0.1772	0.1153
Tl (ppm)	21	114	0.0429	2.131	0.6353	0.1629	0.6771
Pb (ppm)	133	2	1.032	175.6	30.03	17.75	31.66
Bi (ppm)	98	37	0.0414	198.7	5.780	0.7740	21.32
Th (ppm)	93	42	0.0343	16909	474.9	0.2704	2596
U (ppm)	127	8	0.0994	527.9	12.47	0.6555	66.47

n.N = number of analyses above detection limit; BDL = number of analyses below detection limit; Min = minimum value acquired; Max = maximum value acquired; Mean = mean value; Median = median value. Mean and median values do not take into account analyses that are below detection limit.

Chapter 6 – Discussion and Conclusions

For this study, logging, sampling, petrography, whole rock geochemistry and mineral chemistry was used to investigate alteration systems around a small known porphyry Mo deposit. The study tested new trace element vectoring techniques in hydrothermal alteration minerals to see if any trends could be detected that could be used to vector towards mineralization and delineate deposits at depth. Quartz, chlorite and epidote were examined from within the propylitic alteration halo surrounding the Trout Lake stock and variations in their trace element concentrations, related to conditions of formation and the distance from the magmatic intrusion, were documented.

6.1 Discussion

6.1.1 Quartz Mineral Chemistry

6.1.1-I Using trace elements to distinguish bewteen quartz generations and types

When comparing the various types of quartz analysed in this study it was found that the total average trace element concentration in regional metamorphic quartz was significantly less than quartz formed by hydrothermal or magmatic processes. Regionally metamorphosed quartz was the oldest quartz examined as the magmatism and subsequent hydrothermal activity was determined to be post-kinematic based on cross-cutting relationships and hydrothermal overprinting of regional metamorphic metasedimentary rocks. The low trace element concentrations are interpreted in part to be the result of recrystallization during regional metamorphism, as regionally metamorphic recrystallization results in more chemically homogenous crystals. However, regionally metamorphic quartz has the highest concentrations of

Fe among all quartz types analysed. This is interpreted to be due to the higher Fe content in the protolith relative to the magmatic hydrothermal system (5.6 wt. % Fe_2O_3 for metamorphic rocks vs. 2.7 wt. % for igneous phases). The regional metamorphic quartz is the only variety of quartz that does not have average concentrations of Al that are significantly higher than the other elements analysed. Aluminum has an average concentration of 19.8 ppm in the metamorphic quartz, far lower than hydrothermal and igneous quartz. The low concentrations of Ti and Al (Fig. 6.2) in regional metamorphic quartz is interpreted to indicate lower temperatures of formation, as low values of these elements are expected for regionally metamorphosed recrystallized quartz formed under a high pressure and low temperature environment (Dennen et al., 1970; Wark and Watson, 2006).

Regional metamorphic samples were observed under SEM-CL for textural evidence of multi-generation and hydrothermal alteration. This was observed in three samples as compositional bands within the crystals (Fig. 6.1). When the chemistry of these bands was analysed in these samples it was discovered that their Ti and Al values are anomolously high compared to unaltered regionally metemorphic quartz. Average Al concentration in altered samples was found to be 75.5 ppm, higher than all other quartz types analysed. Average Ti concentration was 11.0 ppm as opposed to unaltered metamorphic samples at 0.8 ppm. This is interpreted to be the result of high temperature fluids, altering previously formed quartz (Wark and Watson, 2006; Ehrlich et al., 2012), adding Al to the relatively immobile relict Al concentrations.

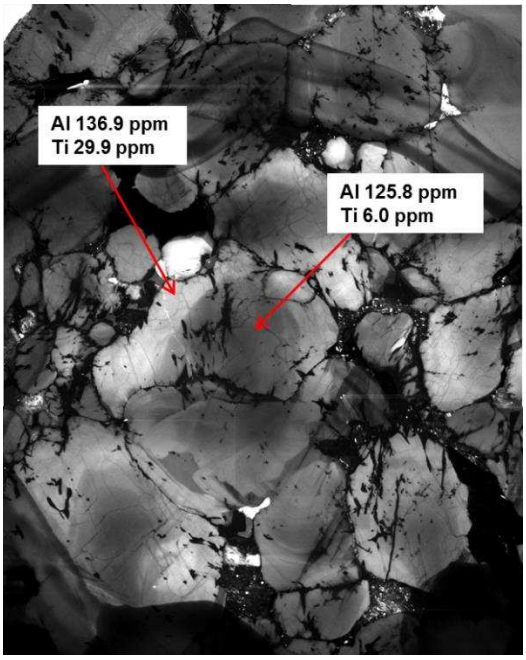


Figure 6.1 SEM-CL image of hydrothermally altered metamorphic quartz showing compositional growth banding and variation in Al and Ti concentrations at specific locations. Bands of higher luminescence have higher concentrations of Al and Ti than bands with relatively lower luminescence. Sample MX12AB074, circle 5.

In the primary igneous quartz analysed, average Al concentrations were found to be 73.8 ppm, higher than regional metamorphic and hydrothermal percipitated quartz. The average Ti concentration is 25.2 ppm, the highest documented, indicating higher temperatures of crystallization (Wark and Watson, 2006). Germanium occurs at very low concentrations or below detection limits in igneous quartz and is found to be in higher concentrations in the hydrothermal quartz. This may indicate a carbonated aqueous fluid which was found to increase the solubilty of Ge and the partitioning of Ge and Mo into the fluid over the melt (Bai and Koster, 1999).

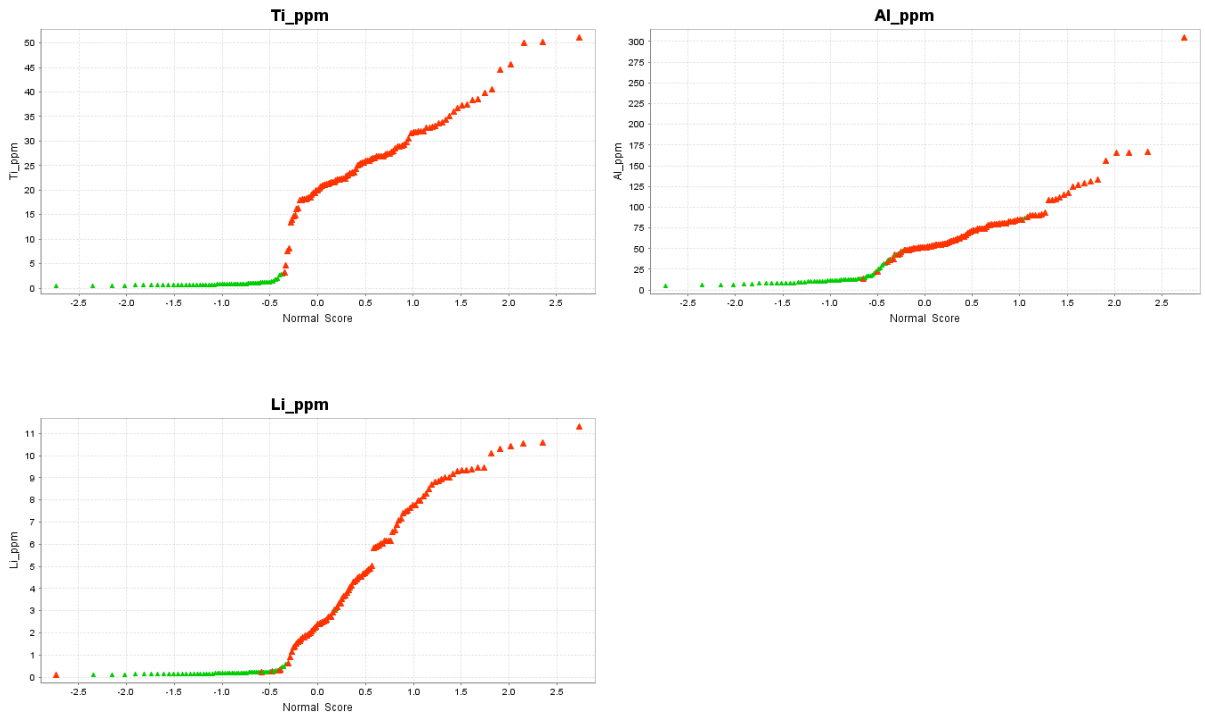


Figure 6.2 Probability plots for Ti, Al and Li showing mineral chemistry data for regional metamorphic quartz (green) and igneous quartz (red). The elements are stable and in low concentrations in the metamorphic quartz where igneous quartz shows a range in concentration having higher concentrations than metamorphic quartz.

Typically, trace element concentrations increased in quartz that formed at higher temperatures. Aluminum, Ti, Na, Ca, K, and Li are all higher in average concentration in hydrothermal vein quartz than regional metamorphic quartz. On the other hand igneous quartz was enriched in these elements relative to hydrothermal vein quartz. Hydrothermal quartz has the highest variance in individual trace element concentrations whereas regional metamorphic quartz is documented as having the lowest variance in concentration. This is to be expected as regional quartz forms under relatively stable conditions of pressure and temperature whereas hydrothermal quartz percipitates in a range of temperatures from a fluid with varying chemistry.

MAX was also compared to other Amira P1060 study sites that analysed quartz chemistry. Smyk (2015) looked at the alteration systems around the White Pine Intrusion, Utah, and the Buckingham Porphyry in Nevada. As part of the study, quartz chemistry was examined

and the differing types of quartz were compared and characterized. Similar to MAX, igneous quartz from Buckingham showed elevated Ti (51.84 ppm) when compared to hydrothermal vein quartz (24.52 ppm). However Al was higher in hydrothermal vein quartz (218.4 ppm) than in igneous quartz (105.4 ppm) from the site. Also Li (10.48 ppm), Na (19.13 ppm), K (37.63 ppm) and Fe (45.42 ppm) were all found to be elevated in hydrothermal vein quartz relative to igneous quartz from Buckingham (Smyk, 2015). White Pine Fork showed similar average trace elemental abundances to MAX in hydrothermal quartz; Li (3.4 ppm), K (8.4 ppm), Na (10.6 ppm) and Ge (1.8 ppm). Unlike MAX, both Al and Ti were found to be higher on average in hydrothermal vein quartz than in igneous quartz, however igneous quartz had higher maximum concentrations of both elements and higher lower limits as well. This is interpreted to reflect the greater variability in hydrothermal quartz concentrations and where hydrothermal vein quartz samples were taken in the system.

6.1.1-II Potential pathfinder elements in quartz

The trace element chemistry of the quartz analysed in this study shows systematic variations in concentration depending on distance from the porphyry center, providing insight into the fluid chemistry and temperature at the timing of crystallization. Quartz observed under scanning electron microscope cathodoluminescence revealed banding, which when chemically analysed, showed that trace element concentrations not only vary depending on distance from the deposit but may vary within individual crystals depending on location within the crystal (Fig. 6.3). These compositional growth bands suggest that the formation of these minerals did not

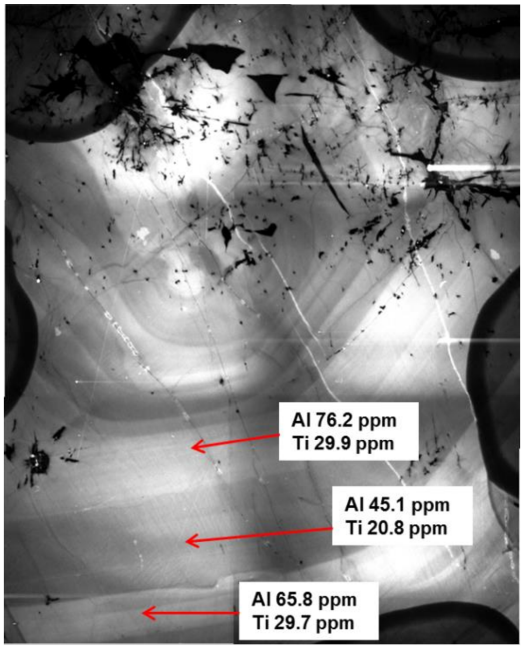


Figure 6.3 SEM-CL image of hydrothermal quartz showing compositional growth banding and variation in Al and Ti concentrations at specific locations. Sample MX12AB076, circle 1.

occur in a homogenous, static environment, but occurred in an active pulsing magmatic and fluctuating hydrothermal environment in a multistage process. The fluxing nature of the hydrothermal fluid, specifically pertaining to chemistry and temperature, was investigated using

concentrations of trace elements at various sites within individual crystals (Figs. 6.1, 6.3). These differing bands when analysed by LA-ICP-MS show variance in trace element chemistry, particularly in their concentrations of Ti and Al. Therefore elements that are used as geothermometers may show low concentrations as well as high concentrations within the same grain depending on where the spot analyses were taken with overall maximum concentrations reached closest to the heat source. These chemical variations at specific locations assist in explaining why trends observed are not perfectly linear, but display a range in concentration at each location (Fig. 6.4). The values of Ti were used to calculate temperatures in order to give some indication as to temperature ranges at specific locations as well as to show overall increasing maximum temperatures of formation as you move closer to the deposit center (Fig. 6.4).

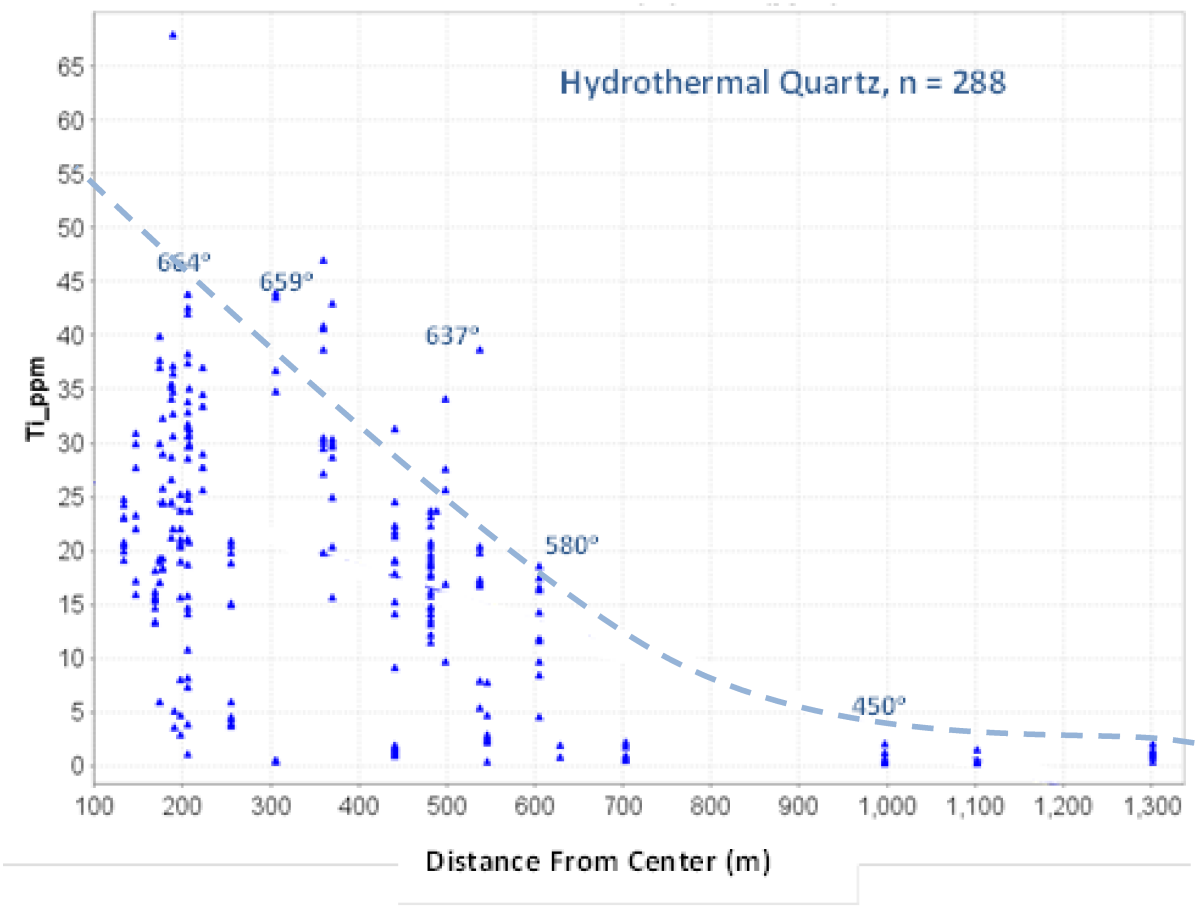


Figure 6.4 Scatter plot showing distance from center (m) *versus* Ti (ppm) with calculated peak temperatures at certain locations using Wark and Watson (2006) TitaniQ calculation.

Temperatures were calculated using Wark and Watson's (2006) "TitaniQ" equation which was established as a geothermometer for Ti in quartz. It was developed through the synthesis of quartz from both an aqueous fluid and a hydrous silicate melt in the presence of rutile at pressures of 10 Kbars (1.0 GPa) and temperatures from 600 to 1000°C. The equation is as follows:

$$T\,(°C) = \frac{-3765}{\log\left(X_{Ti}^{qtz}\right) - 5.69} - 273$$

Where $X^{qtz}/_{Ti}$ is the amount of Ti in quartz which is divided by $^{a}TiO_2$ which is the activity of TiO_2, assumed to be 1 in this case due to the presence of sphene and ilmenite. Linnen and William-Jones (1990) estimated a lithostatic pressure of 2 Kbars implying a depth of emplacement of 7 km, whereas Lawley et al. (2010) assumed a lithostatic pressure of 1.4 – 1.7 Kbars based on previous fluid inclusion studies conducted by Linnen and William-Jones (1990) implying a depth of emplacement of 4-5 km. This is a significant difference from the 10 Kbars and the implicated 30 km depth of formation in which the conditions of the Wark and Watson (2006) study was conducted. There is evidence that pressure effect is minimal on the TitaniQ calibration as seen by comparison to Hayden and Watson (2007) Zr-sphene geothermometer at pressures < 0.2 GPa, which yielded similar temperatures (within ±21 °C at most) and similar temperature results to the TitaniQ calculation were produced from Cherniak et al. (2007) Si-Ti interdiffusion study with conditions at 1 bar (Wark and Watson, 2006). Higher pressures have been documented to affect trace element substitution particularly in elements that are larger than the cation they are substituting for as compressed crystal structures are unfavourable for substitution of larger cations (Thomas et al., 2010). This effect has not been tested in quartz, although quartz is anomolously compressible compared to other silicates (Thomas et al., 2010). The most common elements that substitute for Si are Ti, Al, Li, and Ge, all of which have atomic radii that are larger than Si, with Ge being the closest in size at 11% larger than Si. The effect has been documented in Zr-in-rutile and Zr-in-sphene (Thomas et al., 2010); however, pressure conditions were much higher than those asssumed at MAX. The temperatures calculated for this study are calculated assuming that the pressures at the time of formation are negligible.

The Trout Lake vein quartz used for temperature calculations was of hydrothermal origin. The TitaniQ calculation can be used for magmatic-hydrothermal quartz veins and has a lower

limit of temperature of crystallization around 400°C (Wark and Watson, 2006). However, a study by Huang and Audétat (2012) took into consideration another variable, growth rate, and deduced that TitaniQ should not be used for quartz crystalized from hydrothermal fluids, due to growth rates being highly variable in these environments. For this study the range of data is shown in order to give an indication as to what maximum temperatures were reached during the formation of these crystals, but it is acknowledged that they may not be accurate estimates.

Hydrothermal quartz had the greatest number of analyses taken in order to test for potential pathfinder elements that may have the ability to vector towards the center of a deposit. It was found that Li, Ti and Al concentration in hydrothermal quartz could be used as geothermometer pathfinder elements at MAX. These elements decrease in concentration away from the deposit center reflecting the physical and chemical characteristics of the hydrothermal fluids at the time of formation (Rusk et al., 2008). Aluminum and Ti will substitute for Si in the quartz structure, whereas Li is an interstitial element which serves the purpose of charge balancing when substitution occurs (Götze and Möckel, 2012). This is most likely what is occurring in the hydrothermal quartz at MAX when Al^{3+} substitutes for Si^{4+}. The most probable and strongest control on Al substitution in quartz is fluid chemistry and this may reflect the Al in the fluids from which the quartz precipitated (Rusk et al., 2008).

Ge^{4+} is another of the few elements that will substitute for Si^{4+} in the quartz structure. Unlike Al, Li and Ti, the Ge concentrations at MAX increased with distance from the deposit and displayed an inverse relationship when compared with regional metamorphic quartz. This may indicate rock buffered isotopic exchange during hydrothermal evolution as the fluids move away from the deposit center.

Whole rock geochemistry was compared with trace element mineral chemistry data to see if trends were reflecting protolith chemistry and to see if systematic variations in concentration relative to the porphyry center could be observed and if so, was whole rock data as effective as mineral chemistry data for potential vectoring. While the laser data showed a systematic increase or decrease in certain trace elements the whole rock data displayed no trend or concentrations of trace elements were too diluted to observe any systematic variations in concentration as a function of spatial location (Figs. 6.5 - 6.8). For graphs with both whole rock and mineral data, elemental ratios and log scales were used.

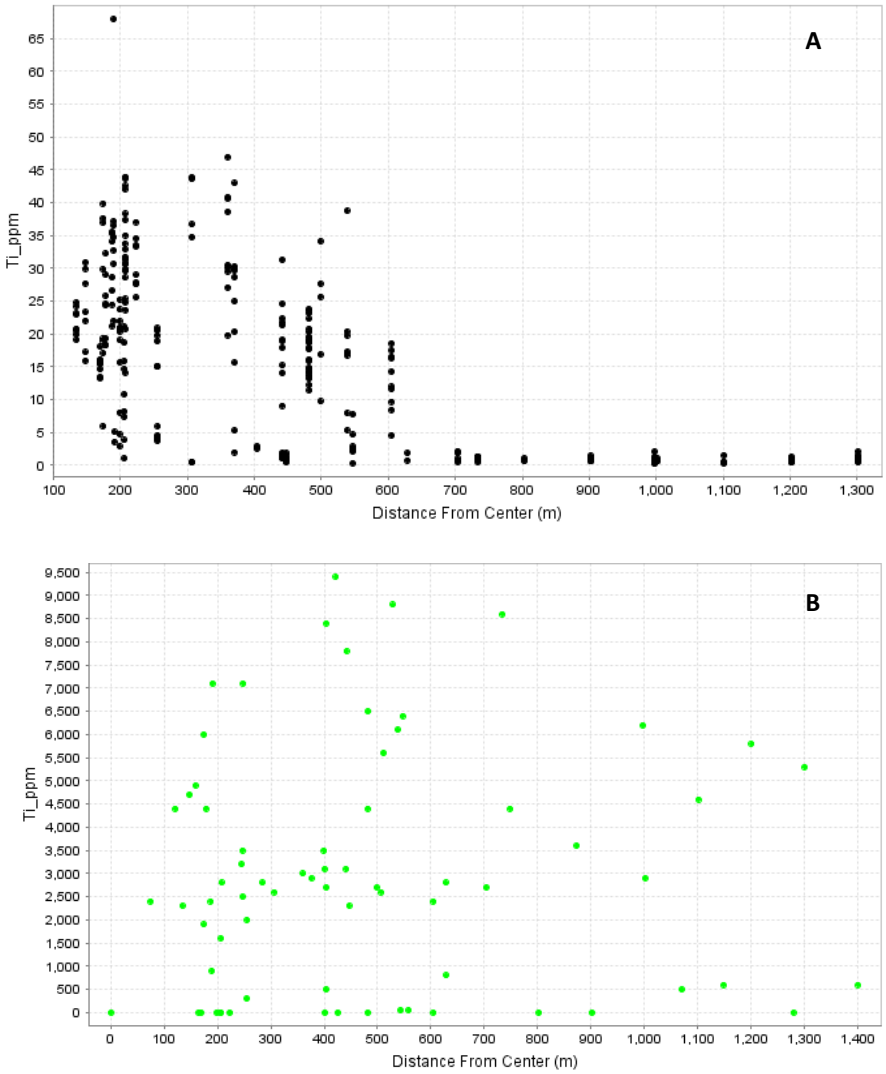


Figure 6.5 Scatter plot showing distance from center (m) of deposit Vs. Ti (ppm) for mineral chemistry (A) and whole rock data (B).

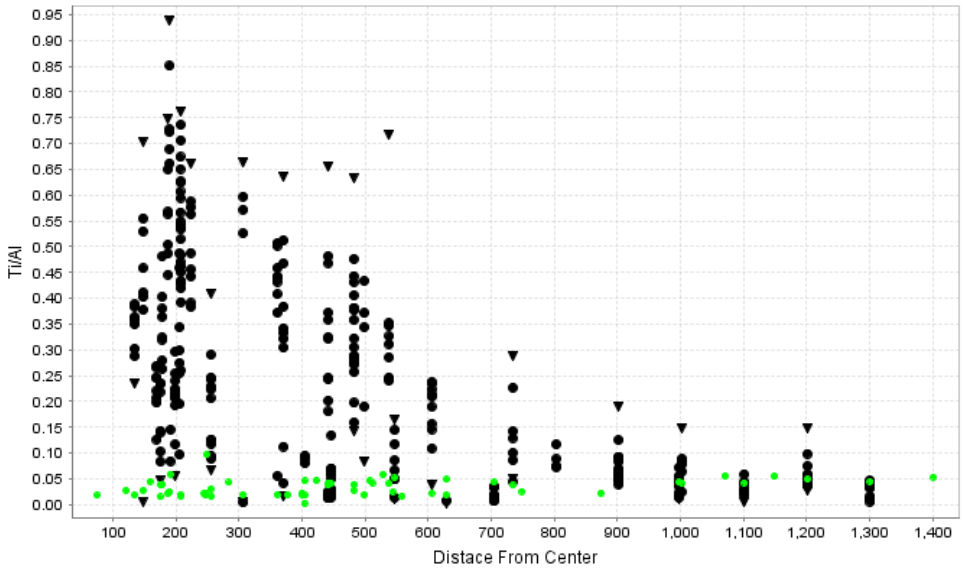


Figure 6.6 Scatter plot showing distance from center (m) *versus* Ti/Al, for both mineral chemistry data (black) and whole rock data (green). The mineral chemistry data shows an increase with proximity to the deposit center while the whole rock data is relatively constant.

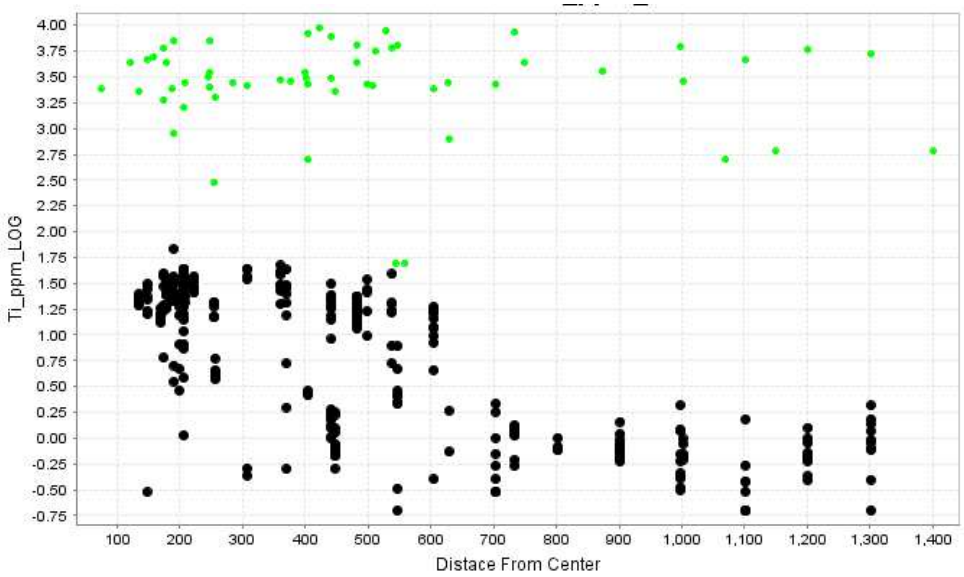


Figure 6.7 Scatter plot showing radial distance from the center of deposit (m) *versus* Ti LOG (ppm), for both mineral chemistry data (black) and whole rock data (green). The mineral chemistry data shows a gradual increase with proximity to the deposit center while the whole rock data is relatively constant.

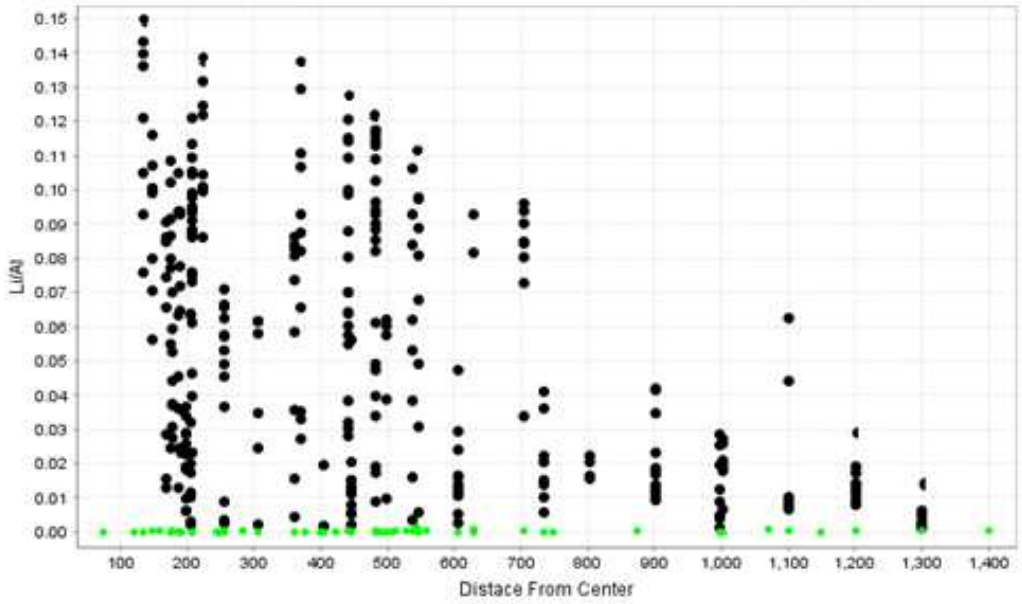
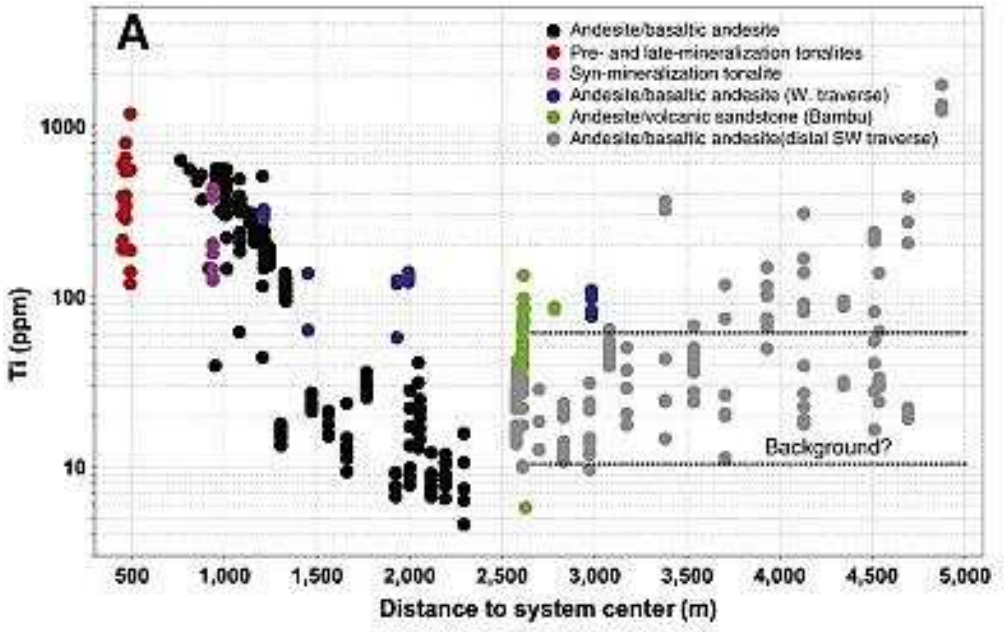


Figure 6.8 Scatter plot showing radial distance from the center of deposit (m) *versus* Li/Al, for both mineral chemistry data (black) and whole rock data (green). The mineral chemistry data shows an increase with proximity to the deposit center while the whole rock data is relatively constant.

6.1.2 Chlorite and Epidote Mineral Chemistry

The trace element chemistry of epidote and chlorite from within the propylitic alteration halo was also examined. Aluminosilicates are relatively immobile during hydrothermal alteration but cation substitution may occur during metasomatism, altering the mineral assemblage and incorporating trace elements that can be used to vector towards mineralization (Cooke et al., 2014; Wilkinson et al., 2015). The fact that Ti in biotite has been demonstrated to show thermal dependence may be reflected in the secondary chlorite as well (Henry et al., 2005; Wilkinson et al., 2015). Similar to quartz, Ti concentrations in chlorite can be used as a geothermometer (Walshe, 1986; Caritat et al., 1993; Rusk et al., 2008; Wilkinson et al., 2015), as with increasing temperature the ability for Ti to substitute into chlorite increases (Rusk et al., 2008; Wilkinson et al., 2015).

The chlorite in this study formed from the replacement of biotite in the propylitic alteration halo where the residual Ti from biotite would be incorporated into secondary titanite as well as the octohedral site of chlorite, being dependent on the oxidation state and temperature of crystallization (Wilkinson et al., 2015). In this study it was found that Ti and V both decrease in overall concentration with distance from the deposit center making them both preferred pathfinder elements in chlorite. This was also found in a study conducted by Wilkinson et al. (2015; Fig. 6.9) at Batu Hijau, a large porphyry Cu Au deposit in Indonesia, where Ti, V and Mg were found to decrease in concentration with distance from the deposit center, mapping out a thermal anomaly that extends up to 4.5 km. Due to the small size of the Trout Lake porphyry the chlorite thermal anomaly at MAX was extended to 1.1 km, though with more exposure and systematic sampling it is believed that the thermal anomaly could be further extended.



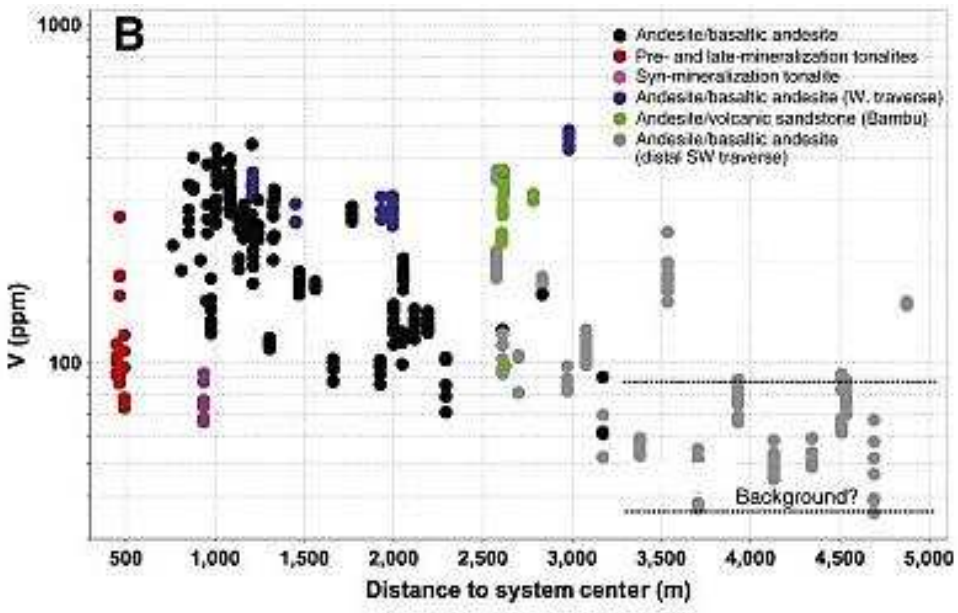


Figure 6.9 Scatter plots showing radial distance from the Batu Hijau center versus elemental concentrations of Ti (A) and V (B) for the different igneous phases recognized at Batu Hijau. From Wilkinson et al. (2015).

Wilkinson et al. (2015) also showed that K, Li, Mg, Ca, Sr, Ba, Mn, Co, Ni Zn and Pb increase in concentration away from the porphyry center and are most likely incorporated into the chlorite lattice during formation. At MAX only Sr was found to show an intitial increase in concentration, peaking at around 350-400 meters away from the deposit center and then decreasing in concentration away from the deposit center.

The epidote in this study was too fine for precise and consistent stable analyses. Often the laser would breach mineral boundaries, only ablating a few (<10) seconds of the desired grain. For this reason the data quality is low and further analyses are required for a more accurate study. Subsequently the sample spread is not ideal, and little can be extrapolated from the epidote data. In a study conducted by Cooke et al. (2014) it was found that highest concentrations of Cu, Mo, Au and Sn were detected in epidote that was proximal to the potassic alteration zone, while concentrations of As, Sb, Pb, Zn and Mn increased away from the

porphyry center, being highest 1.5 km away. This was not found to be true at MAX although without better quality data no difinitive conclusions can be made at this time.

6.2 Recommendations

Trace element geochemistry of alteration minerals should be further tested on other porphyry Mo deposits, Climax type and other Endako type deposits to see if the same trends may be observed, if they are more pronounced on larger deposits and if they delineate and extend currently documented alteration halos beyond their recognized limits. It would be interesting to see this technique tested on quartz from deposits with multiple stages of overprinting and on deposits that may have experienced interference from other magmatic-hydrothermal systems and if certain hydrothermal systems may be differentiated at a single point. An issue that may arise is in areas where the stock intrudes into igneous or volcanic rocks that produced their own alteration assemblages that should not be confused with those that belong to the system in question. It is also common when looking at porphyry deposits that a later hydrothermal system may affect the rocks in the area. Thus these cases should be investigated to see if it is possible to establish trends that are specific to a particular hydrothermal system and if trends may be delineated in a cost effective and efficient manner. For chlorite trends were successfully observed and differentiated at Batu Hijau, a large porphyry Cu-Au in chlorite, as well as in quartz and chlorite at MAX, a small porphyry Mo, this technique should be tested in exploration for deposits and further research would be beneficial for both academia and industry.

6.3 Conclusions

It was found that quartz evolution could be distinguished using trace element geochemistry and cathodoluminescence of quartz could further be used to give strong implications regarding evolution and the environment of formation of the quartz examined.

Regional metamorphic quartz had significantly lower concentrations of trace elements incorporated into its structure when compared to hydrothermally precipitated and altered quartz and primary igneous quartz. All trace elements were lower on average in metamorphic quartz except Fe and Ge. The higher Fe in the metamorphic quartz was likely due to higher Fe concentrations in the host rock when compared to whole rock samples taken of igneous phases. Primary igneous quartz had the highest concentrations of trace elements with the highest concentrations in all elements examined for except Fe, Mg and Ge. Germanium was consistently low (<1 ppm) in all primary igneous samples and was determined to be ideal when it came to distinguishing between primary igneous and regionally metamorphic quartz at MAX. Hydrothermal quartz displayed the greatest variance in trace elemental concentrations which were found to be dependent on the distance from the Trout Lake stock, from which the fluids were derived. Trace element concentrations could therefore be used to vector towards the center of the deposit and could be used as pathfinder elements when looking for the source of heat or to pinpoint potential areas of mineralization. Titanium, Al and Li were found to increase in hydrothermal quartz towards the center of the deposit whereas overall Ge concentrations decreased. Hydrothermally derived epidote and chlorite were also examined from within the zone of propylitic alteration. The quality of the epidote data and sample spread was not sufficient to make any definitive statements although varying trace elements were observed in the epidote examined. In hydrothermally derived chlorite it was found that both Ti and V increased towards the deposit center. Strontium showed potential as pathfinder elements within chlorite peaking at 350-400 m from the deposit center. The correlation of trace element confirmed alteration vectors with subtle but identifiable field criteria has the potential to assist exploration companies in the search for new deposits.

References

Allan, M.M., Yardley, B.W.D., Forbes, L.J., Shmulovich, K.I., Banks, D.A., and Shepherd, T.J., 2005. Validation of LA-ICP-MS fluid inclusion analysis with synthetic fluid inclusions. American Mineralogist, 90, 1767p

Allan, M.M., Meier, D., and Guillong, M., 2010. SILLS: Signal Integration for Laboratory Systems, v.1.1.0, Matlab program

Armstrong, R.L., 1988. Mesozoic and Early Cenozoic magmatic evolution of the Canadian Cordillera. Geological Society of America, 218, pp. 55 – 91

Bai, T.B., and Koster van Groos, A.F., 1999. The distribution of Na, K, Rb, Sr, Al, Ge, Cu, W, Mo, La, and Ce between granitic melts and coexisting aqueous fluids. Geochimica et Cosmochimica Acta, 63, pp. 1117 – 1131

Bally, A.W., Gordy, P.L., and Stewart, G.A., 1966. Structure, seismic data and orogenic evolution of the southern Canadian Rockies. Bulletin of Canadian Petroleum Geology, 14, pp. 337 – 381

Bambauer, H.U., 1961. Spurenelemente und y-Farbzentren in Quarzen aus Zerr-kluf-ten der Schwei-zer Alpen. Schweizerische Mineralogische Petrographische Mitteilungen, 41, pp. 335 – 367

Blake, D.W., Theodore, T.G., Batchelder, J.N., and Kretschmer, E.L., 1979. Structural relations of igneous rocks and mineralization in the Battle Mountain mining district, Lander County, Nevada. Nevada Bureau of Mines Geological Report, 33, pp. 87 – 99

Boggs, S., and Krinsley, D., 2006. Application of cathodoluminescence imaging to the study of sedimentary rocks. Cambridge University Press, 165p

Boyle, H.C., and Leitch, C.M.B., 1983. Geology of the Trout Lake molybdenum deposit. Candadian Mining and Metallurgy Bulletin, 76, pp. 115 – 124

Britton, J., DeGrace, J., Grieve, D., Kyba, J., Madu, B., Northcote, B., Febbo, G., and Pelletier, M., 2011. British Columbia mines and minerals exploration overview. Ministry of Energy and Mines, 28p

Brock, R.W. 1904. The Lardeau mining district, B.C. Geological Survey of Canada, Annual Report, XVI, pp. 80 – 91

Brown, R.L., Lane, L.S., 1988. Tectonic interpretation of west-vergingfolds in the Selkirk allochthon of the southern Canadian Cordillera. Canadian Journal of Earth Sciences, 25, pp. 292 – 300

Burrows, D.R. and Spooner, E.T.C. 1987. Generation of a magmatic H_2O-CO_2 fluid enriched in Mo, Au, and W within an Archean sodic granodiorite stock, Mink Lake, northwestern Ontario. Economic Geology, 82, pp. 1931 - 1957

Caritat, P., Hutcheon, I., and Walshe, J.L. 1993. Chlorite geothermometry: a review. Clay Mineral, 41, pp. 219 – 239

Cherniak, D.J., Watson, E.B., and Wark, E.B. 2007. Ti diffusion in quartz. Chemical Geology, 236, pp. 65 – 74

Colpron, M., and Price, R.A. 1995. Tectonic significance of the Kootenay terrane, southeastern Canadian Cordillera: an alternative model. Geology, 23, pp. 25 – 28

Nelson, J.L. and Colpron, M., 2007. Tectonics and metallogeny of the Canadian and Alaskan Cordillera, 1.8 Ga to present. In: Mineral Deposits of Canada: A Synthesis of Major Deposit Types, District Metallogeny, the Evolution of Geological Provinces, and Exploration Methods, W.D. Goodfellow (ed.), Mineral Deposit Division, Geological Association of Canada, Special Publication 5, p. 755-791

Cooke, D.R., Hollings, P., Wilkinson, J.J., and Tosdal, R.M. 2014. Geochemistry of porphyry deposits. In: H.D. Holland, K.K. Turekian (Eds.), Treatise on Geochemistry (Second edition), 13 Elsevier, Oxford, pp. 357–381

Cui, Y., Miller, D., Nixon, G., and Nelson, J., 2015. British Columbia digital geology.

Dennen, W.H., Blackburn, W.H., and Quesada, A. 1970. Aluminum in quartz as a geothermometer. Contributions to Mineralogy and Petrology, 27, pp. 332 – 342

Eggleton, R.A. and Banfield, J.F., 1985. The alteration of granitic biotite to chlorite. American Miner, 70, pp. 902 – 910.

Ehrlich K., Vers E., Kirs J., Soesoo A., 2012. Using a titanium in quartz geothermometer for crystallization temperature estimation of the Palaeoproterozoic Suursaari quartz porphyry. Estonian Journal of Earth Sciences, 61, pp. 195-204

Emmens, N.W., 1915. Lardeau Mining Division, in Ministry of Mines, Annual Report, 1914; British Columbia; British Columbia Ministry of Energy, Mines and Petroleum Resources, pp. 245 – 283

Evenchick, C.A., McMechan, M.E., McNicoll, V.J., and Carr, S.D., 2007. A synthesis of the Jurassic–Cretaceous tectonic evolution of the central and southeastern Canadian Cordillera:

Exploring links across the orogen. The Geological Association of America, Special Paper, 433, pp 117 – 145

Fingler, J. and Turner, J., 2010. Technical report on the Kootenay arc property, Revelstoke and Slocan Mining divisions for Mineral Mountain Resources Ltd. 100p

Fyles, J.T., and Eastwood, G.E.P., 1962. Geology of the Ferguson area, Lardeau district British Columbia. B.C. Dept. of Mines and Petroleum Resources, 45, 97p

Gabrielse, H., Monger, J.W.H., Wheeler, J.O., and Yorath, C.J., 1991. Part A: Morphological belts, tectonic assemblages, and terranes, *in* Chapter 2, Geology of the Cordilleran Orogen in Canada. Geological Survey of Canada, 4, pp. 15 – 28

Gadd, B., 2011. Geology of the Canadian Rockies and Columbia Mountains. http://www.bengadd.com/Downloads/Geology%20of%20the%20Rockies%20and%20Columbias%20plus%20time%20scale%202014.pdf, 5p

Garber, J., 2011. Chapter 1: Tectonic history of British Columbia. Ecogeomorphology of the Chilko-Chilcotin River system, University of California, field guides, 9p

Götze, J., Plötze, M., Fuchs, H., Habermann, D., 1999. Defect structure and luminescence behaviour of agate: results of electron paramagnetic resonance (EPR) and cathodoluminescence (CL) studies. Mineralogical Magazine, 63, pp. 149 – 163

Götze, J., and Möckel, R., 2012. Quartz: Deposits, mineralogy, and analytics. Institute of Mineralogy, 360p

Haggart, J.W., and Richstad, R.L., (compilers)., 1998. Paleontological resources of the Lillooet Land Resource Management Plan (LRMP) area, British Columbia. Geological Survey of Canada, Open File 3588, 42p

Hamilton, T.S., 2012. The geology of western Canada and assembly of the cordillera. Camosun College, 14p

Hayden, L.A., and Watson, E.B., 2007. Rutile saturation in hydrous siliceous melts and its bearing on Ti-thermometry of quartz and zircon. Earth Planetary Science Letters, 258, pp. 561 – 568.

Henry, D. J., Guidotti, C. V. and Thomson, J. A., 2005. The Ti-saturation surface for low-to-medium pressure metapelitic biotite: Implications for Geothermometry and Ti-substitution Mechanisms. American Mineralogist, 90, pp. 316 – 328

Heynke, U., Leeder, O., and Schulz, H., 1992. On distinguishing quartz of hydrothermal or metamorphogenic origin in different monomineralic veins in the eastern part of Germany. Mineralogy and Petrology, 46, pp. 315 – 329

Huang, R., and Audétat, A., 2012. The titanium-in-quartz (TitaniQ) thermobarometer: A critical examination and re-calibration. Geochemica et Cosmochimica Acta, 84, pp. 75 – 89

Kirkham, R. V., 1972. Geology of copper and molybdenum deposits. Canadian Geological Survey, Pap. 72—1A, pp. 82—87

Kirkham, R.V., and Sinclair, W.D., 1995. Porphyry copper, gold, molybdenum, tungsten, tin, silver, in Eckstrand, O.R., Sinclair, W.D., and Thorpe, R.I., eds., Geology of Canadian

Mineral Deposit Types: Geological Survey of Canada, Geology of Canada, 8, pp. 421 – 446

Kraft, J.L., Thompson, R.I., and Erdmer, P., 2007. Geological relationships at Upper Arrow Lake, southeastern British Columbia: Implications for the Milford and Kaslo groups. Geological Survey of Canada, 12 p

Lawley, C.J.M., Richards, J.P., Anderson, R.G., Creaser, R.A., and Heaman, L.M., 2010. Geochronology and geochemistry of the MAX porphyry Mo deposit and its relationship to Pb-Zn-Ag mineralization, Kootenay Arc, Southeastern British Columbia, Canada. Economic Geology, 105, pp. 1113 – 1142

Le Maitre, R.W., Bateman, P., Dudek, A., Keller, J., Lameyre, J., Le Bas, M. J., Sabine, P. A., Schmid, R., Sorensen, H., Streckeisen, A., Woolley, A. R. and Zanettin, B., 1989. A classification of igneous rocks and glossary of term: recommendations of the international union of geological sciences subcommission on the systematics of igneous rocks. Blackwell Scientific Publications, Oxford.

Lehmann, G., and Bambaner, H.U., 1973. Angewandte Chemie International Edition. 12, pp. 83 – 91

Linnen, R.L., 1985. Contact metamorphism, wallrock alteration, and molybdenite mineralization at the Trout Lake stockwork deposit, Southeastern British Columbia, M.Sc. thesis, McGill University, 220p

Linnen, R.L., and William-Jones, A.E., 1987. Tectonic control on quartz vein orientations at the Trout Lake stockwork molybdenum deposit, southeastern British Columbia: Implications for metallogeny in the Kootenay Arc. Economic Geology, 82, pp. 1283 – 1293

Linnen, R.L., and Williams-Jones, A.E., 1990. Evolution of aqueous-carbonic fluids during contact metamorphism, wallrock alteration, and molybdenite deposition at Trout Lake, British Columbia. Economic Geology, 85, pp. 1840 – 1856

Little, H.W., 1960. Nelson map-area, west half, British Columbia. Geological Survey of Canada, Memoir 308, pp. 231 – 243

Logan, J.M., 2002. Intrusion-related gold mineral occurrences of the Bayonne Magmatic Belt. Geological Fieldwork 2001, BC MEMPR, Paper 2002-1, pp. 237 - 246

Logan, J.M. and Drobe, J.R, 1993. Summary of activities, North Selkirk Project, Goldstream River and Downie Creek, (82M/8,9 and parts of 10). British Columbia Geological Survey, Geological Fieldwork 1993, 169p

Ludington, S., and Plumlee, G.S., 2009. Climax-type porphyry molybdenum deposits. United States Geological Survey, open file, 13 p

Macauley, T.N., 2004. Technical Report on the Max Molybdenum Property (Company Report) Placer Dome File: http://www.rocamines.com

Mathews, W.H., and Monger, J.W.H., 2005. Roadside Geology of Southern British Columbia. Mountain Press Publishing Company, 403 p

Middlemost, E.A.K., 1994. Naming materials in the magma/igneous rock system: Earth Science Reviews, 37-1, pp. 215 – 224

Monecke, T., Kempe, U., and Götze, J., 2002. Genetic significance of the trace element content in metamorphic and hydrothermal quartz: A reconnaissance study: Earth and Planetary Science Letters, 202, pp. 709 – 724

Monger, J.W.H., Souther, J.G., and Gabrielse, H., 1972. Evolution of the Canadian Cordillera: a plate-tectonic model. American Journal of Science, 272, pp. 577 – 602

Müller, A., Kronz, A., and Breiter, K., 2002. Trace elements and growth patterns in quartz: a fingerprint of the evolution of the subvolcanic Podlesi Granite System. Bulletin of Geosciences, 77-2, pp. 135 – 145

Mutschler, F. E., Wright, E.G., Ludington, S., and Abbott, J. T., 1981. Granite molybdenite systems. Economic Geology, 76, pp. 874 – 897

Parrish, R.R., and Wheeler, J.O., 1983. Uranium-lead Zircon Age of the Kuskanax Batholith, Southeastern British Columbia, Canadian Journal of Earth Sciences, 20, pp. 1751 – 1756

Pelletier, C., 2009. Trout Lake molybdenum property reclamation case study. British Columbia Mine Reclamation Symposia, conference paper, 9 p

Perry, E. C., JR., 1963. Aluminum Substitution in quartz, a Study in geothermometry. Ph.D. Thesis, Massachusetts Institute of Technology, Cambridge, Massachusetts, 86 p

Pinset, R., 2004. Trout Lake area, Lardeau District (082K11). British Columbia Geological Survey of Canada, 2 p

Price, R.A., 1981. The Cordilleran Thrust and Fold Belt in the southern Canadian Rocky Mountains. In: Thrust and nappe tectonics. K.R. McClay and N.J. Price (eds.). Geological Society of London, Special Publication no. 9, pp. 427 – 448

Price, R.A., 2012. Chapter 2: Cordilleran tectonics and the evolution of the western Canada sedimentary basin. Geological Atlas of the Western Canada Sedimentary Basin, 14 p

Price, R.A. and Mountjoy, E.W., 1970. Geologic structure of the Canadian Rocky Mountains between Bow and Athabasca Rivers: A progress report. In: Structure of the Southern Canadian Cordillera. J.O. Wheeler (ed.). Geological Association of Canada, Special Publication no. 6, pp. 7 – 25

Psutka, J.F., Read, P.B., and Fyles, J.T., 1982. Stratigraphy, structure and metamorphism, Trout Lake molybdenum deposit and vicinity. Geotex Consultants Limited, Vancouver, B.C., 23 p

Ramseyer, K., Baumann, J., Matter, A., and Mullis, J., 1988. Cathodoluminescence colours of α-quartz. Mineral, 52, pp. 669 – 677

Ramseyer, K., and Mullis, J., 1990. Factors influencing short-lived blue cathodoluminescence of alpha-quartz. American Mineral, 75, pp. 791 – 800

Read, P.B., and Wheeler, J.O., 1976. Geology of the Lardeau west-half map area. British Columbia. Geological Survey of Canada, Open File 432, 1:250 000 scale

Read, P.B., Brown, R.L., 1981. Columbia River fault zone: southeastern margin of the Shuswap and Monashee complexes, southern British Columbia. Canadian Journal of Earth Sciences 18, pp. 1127 – 1145

Read, P.B., Psutka, J.F., Fyles, J.T., and MacLeod, R.F., 2009. Geology, MAX Molybdenum Mine area (NTS 82K/12), British Columbia. Geological Survey of Canada, Open File 6215, 2 sheets, 1:10,000 scale, and report, 21p

Rusk, B.G., Lowers, H.A., and Reed, M.H., 2008. Trace elements in hydrothermal quartz: Relationships to cathodoluminescent textures and insights into vein formation. Geology, 36, pp. 547 - 550

Sillitoe, R.H., 1980. Types of porphyry molybdenum deposits: Mining Magazine, 142, pp. 550 – 553

Sinclair, W.D., 2007, Porphyry deposits, in Goodfellow, W.D., ed., Mineral Deposits of Canada: A Synthesis of Major Deposit-Types, District Metallogeny, the Evolution of Geological Provinces, and Exploration Methods. Geological Association of Canada, Mineral Deposits Division, Special Publication, 5, pp. 223–243

Smith, M.T., and Gerhels, G.E., 1992. Structural Geology of the Lardeau Group near Trout Lake, British Columbia: Implications for the structural development of the Kootenay Arc. Canadian Journal of Earth Sciences, 29, pp. 1305 – 1319

Smyk, E., 2015. A comparison of the hydrothermal alteration systems around the Mo-hosting White Pine Intrusion, Utah, and the Buckinham Porphyry, Nevada. M.Sc. Thesis, Ontario, Canada, Lakehead University, 168 p

Stevens-Kalceff, M.A., 2009. Cathodoluminescence microcharacterization of point defects in a-quartz. Mineralogical Magazine, 73, no. 4, pp. 585 - 605

Sun, S.S., and McDonough, W.F., 1989. Chemical and isotopic systematics of oceanic basalts; implications for mantle composition and processes. *In*: Magmatism in the ocean basins. Saunders, A.D. and Norry, M.J. (Editors), Geological Society of London, 42, pp. 313 – 345

Theodore, T.G., and Menzie, W.D., 1984. Flourine-deficient porphyry molybdenum deposits in the cordillera of western North America. International Association on the Genesis of Ore Deposits Quadrennial Symposium, 6th Tbilisi, U.S.S.R., 1982, Proceedings: Stuttgart, E. Schweizerbart'sche Verlagsbuchhandlung, 1, pp. 463 – 470

Thomas, B.T., Watson, E.B., Spear, F.S., Shemella, P.T., Nayak, S.K., and Lanzarotti, A., 2010. TitaniQ under pressure: The effect of pressure and temperature on the solubility of Ti in quartz. Contributions to Mineralogy and Petrology, 160, pp. 743 – 759

Thompson, R.I., 1979. A structural interpretation across part of the northern Rocky Mountains, British Columbia, Canada. Canadian Journal of Earth Sciences, 16, pp. 1228 – 1241

Trettin, H.P., 1952. Silver Cup Mine, Lardeau regional frame-work and structural ore control. M.Sc. Thesis, British Columbia, Canada, University of British Columbia, 48 p

Tusk, B. 2008. Geological belts of western Canada. Digital file, 1 p

Walker, J.F., Bancroft, M.F. and Gunning, H.C., 1929. Lardeau map-area, British Columbia. Geological Survey of Canada, Memoir 161, 142 p

Walshe, J.L., 1986. A six-component chlorite solid solution model and the conditions of chlorite formation in hydrothermal and geothermal systems. Economic Geology, 81, pp. 681 – 703

Wark, D.A., and Watson, E.B., 2006. TitaniQ: a titanium in quartz geothermometer. Contributions to Mineral Petrology, 152, pp. 743 – 754

Weil, J.A., 1984. A review of electron spin spectrometry and its application to the study of paramagnetic defects in crystalline quartz. Physics and Chemistry of Minerals, 10, pp. 149 – 165

Wheeler, J.O., 1966. Lardeau (west half) map-area (82K/W). Geological Survey of Canada, 66-1, pp. 102 – 103

Wheeler, J.O., 1968. Lardeau (west half) map-area (82K/W). Geological Survey of Canada, 68-1, part A, pp. 56 – 58

Wilkinson, J.J., Chang, Z., Cooke, D.R., Baker, M.J., Wilkinson, C.C., Inglis, S.,Chen, H., and Gemmell, B., 2015. The chlorite proximitor: A new tool for detecting porphyry ore deposits. Journal of Geochemical Exploration, 152, pp. 10 – 26

Woodsworth, G.J., McNicoll, V.J., Friedman, R.M., and Rusmore, M.E., 2000. New U-Pb ages from the Eastern Coast Belt, southern British Columbia. Geological Survey of Canada: Radiogenic age and isotopic studies, 13, 10 p

APPENDICES

APPENDICES

Appendix 1: Petrography

The International Union of Geological Sciences (IUGS) nomenclature and rock classifications used. Standardized grain size classification is as follows: vfg = crystals too small to see by naked eye, fg - <1mm, mg - 1-5mm, cg - >5mm, vcg - > 50mm.

Mineral abbreviations (International Mineral Association):

Act = actinolite, Bt = biotite, Cal = calcite, Ccp = chalcopyrite, Chl = chlorite, Czo = clinozoisite, Di =diopside, Ep = epidote, Fsp = feldspar, Hbl = hornblende, Kfs = K-feldspar, Mag = magnetite, Mc = microcline, Mol = molybdenite, Ms = muscovite, Or = orthoclase, Pl = plagioclase, Py = pyrite, Qz = quartz, Ttn = titanite, Tr = tremolite, Wo = wollastonite.

Sample ID: **MX12AB001**
Rock Name: **Quartz vein**
Hand Sample Description: Qz vein, strong Fe-oxidation, trace disseminated Py and possible sphalerite

Silicates:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Quartz	99	Avg = 0.5	- anhedral - seriate grain boundaries - moderate Fe staining throughout - subgrains - undulatory extinction
Oxides:			
Mineralogy	***Modal %***	***Grain Size(mm)***	***Description***
Hematite	1	amorphous	- along 0.001 mm wide fractures in rock

Sample ID: **MX12AB002**
Rock Name: **Sandstone**
Hand Sample Description: - medium-grained, Qz rich - wht/gry, dissemninated Py more concentrated around Qz vein

Silicates:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Quartz	45-50	0.1 – 1.5	- angular to sub-rounded grains - subgrains - undulous extinction - brecciated grains
Muscovite	25-30	vfg	- subhedral - fine grained in matrix - asymmetrical crenulation
Feldspar	1-5	0.1	- anhedral - poly-synthetic twinning - tartan twinning - imperfect twins
Chlorite	1-5	vfg	- anhedral - in matrix - along margin of Qz vein and in Qz vein - in brecciated fractures in Qz
Corbonates:			
Calcite	15-20	vfg – 1.0	- anhedral - in cement - deformed cleavage - rhombohedral cleavage
Oxides:			
Spinel	trace	vfg	- anhedral - amorphous - along margins of Qz vein - reddish-brown in plain light - disseminated throughout
Sulfides:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Pyrite	trace	vfg	- subhedral - disseminated throughout

Sample ID:	**MX12AB003**
Rock Name:	**Skarn**
Hand Sample Description:	- medium-grained, silica-rich, wollastonite, diopside, 2-3% sulphides Py, Mo, 1mm thick Qz veins t/o

Silicates:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Plagioclase	60	<1.0 - 5.0	- poikilitic - intergranular - poly-synthetic twinning
Clinopyroxene	25-30	0.2 - 1.0 Avg = 0.8	- interstitial between plagioclase - inclusions within large plagioclase laths
Orthopyroxene	5	0.5	
Secondary:			
Iddingsite	1-3		- Fe oxidation along fractures
Opaques	5		
Oxides:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Magnetite	10	0.1 – 1.3 Avg 0.5	- very fine grained exsolution lamellae of ilmenite - coarser exsolution lamellae width 0.05 - interstitial with reaction rims of amphibole - intergrown with ilmenite
Ilmenite	<1	Avg vfg	- as exsolution lamellae in magnetite - intergrown with magnetite
Hematite	trace		- amorphous with pentlandite inclusions - rimming pyroxene
Sulphides:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Pentlandite	trace	vfg	- included within hematite

Sample ID: **MX12AB016**
Rock Name: **Silicified schist**
Hand Sample Description: silicified schist with 80-85% fine grained Qz, trace disseminated Py, Po. One cleavage surface shows 50-60% Po, Py

Silicates:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Quartz	80-85	0.001 - 2.0 mm	- anhedral - poikilitic with very fine grained chlorite and muscovite inclusions - seriate grain boundaries - fine grained chlorite, muscovite, biotite along grain boundaries - subgrains - triple junction grain boundaries - alternating bands of fine grained Qz and aligned bands of mica - 4mm wide band of granoblastic coarse grained Qz with aligned 0.4 mm wide bands of mica
Muscovite	10-15	0.001 – 0.25	- euhedral - bladed - aligned and as inclusions within quartz - forming foliated bands with biotite, Py, and hematite
Chlorite	1-5		- subhedral - being embayed by Py - interstitial between coarse Qz grains
Biotite	1-5		- euhedral - forming foliated bands with muscovite, Py, and hematite - moderate to weakly aligned crystals
Oxides:			
Mineralogy	***Modal %***	***Grain Size(mm)***	***Description***
Magnetite	trace	vfg	- subhedral - hematite altering from magnetite - in aligned bands of mica, with Py - bladed crystals aligned with mica minerals
Sulphides:			
Mineralogy	***Modal %***	***Grain Size(mm)***	***Description***
Pyrite	1-3	Avg = 0.05	- anhedral - associated with chlorite and hematite - inclusions of Qz, muscovite and biotite mica - hematite reaction rims

			- pressure shadows

Sample ID: **MX12AB018**
Rock Name: **Silicified schist**
Hand Sample Description: silicified carbonate altered biotite mica schist with talc and trace disseminated Py

Silicates:			
Mineralogy	***Modal %***	***Grain Size(mm)***	***Description***
Quartz	90	0.01 – 1.0	- Subhedral - triple junction grain boundaries - subgrains - undulatory extinction - larger grains 0.4 – 1.0 mm in vein with chlorite along contact with finer grained quartz (0.01 – 0.4 mm) - granoblastic texture between foliated 0.4 mm bands of muscovite
Chlorite	5		- bladed and radiating (within Qz vein) - analogous blue birefringence - along boundary of Qz vein - amorphous within host rock with inclusions of Qz - altered from biotite
Muscovite	5	1.0 - 2.0	- subhedral - foliated - associated biotite and chlorite - in 0.4 mm wide bands
Biotite	trace	0.1	- subhedral - altering to chlorite - in aligned mica bands
Epidote	trace	0.1 – 0.3	- anhedral - high relief
Sulphides:			
Mineralogy	***Modal %***	***Grain Size(mm)***	***Description***
Pyrite	trace	0.1 - 0.4	- subhedral - disseminated - growing around Qz and with Qz inclusions
Oxides:			-
Magnetite	trace	0.01 - 0.1	- anhedral - breakdown of mica
Other:			

Graphite	trace	0.01 - 0.1	- anhedral - associated with chlorite - with aligned mica bands

Sample ID:	**MX12AB022**
Rock Name:	**Epidote chlorite quartz vein**
Hand Sample Description:	Chlorite, epidote and medium grained Qz, calcite veins in a chlorite schist host rock.

Silicates:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Quartz	30 - 35	0.01 – 1.0	- subhedral - undulatory extinction - sub-grains - triple junction grain boundaries - seriate grain boundaries - inclusions within calcite
Epidote	25 - 30	0.1 – 2.0	- anhedral - high relief - highly fractured - Qz, calcite and chlorite along fractures
Chlorite	20 -25	Avg = 0.1	- euhedral - bladed - aligned crystals as well as radiating - along epidote, Qz, and calcite grain boundaries
Calcite	20	Avg = 0.5	- subhedral - cleavage and twinning clearly observed - forms 2cm wide vein with Qz - inclusions within Qz - inclusions of Qz
Oxides:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Magnetite	trace	0.001 - 0.1	- subhedral - disseminate
Oxides:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Pyrite	trace	vfg	- anhedral - euhedral - disseminated

Sample ID:	**MX12AB023**
Rock Name:	**Biotite schist**
Hand Sample Description:	- biotite schist with mineralized Qz veins with 5-10% Mo, Py, Po, dolomite lenses and veins - effervesce when powdered

Silicates:

Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Quartz	55-60	2.0 – vein 0.1 - host	- anhedral - locally poikilitic - sutured grain boundaries with calcite - inclusions of apatite, biotite, chlorite, molybdenite and embayed by molybdenite, biotite, chlorite - muscovite, calcite, chlorite, biotite along margins
Biotite	20-25	0.1	- euhedral - no preferred orientation - inclusions within quartz - bird's eye extinction
Muscovite	10-15	vfg	- euhedral - no preferred orientation - altered from feldspar - associated with molybdenite
Feldspar	5	0.3	- anhedral - locally polysynthetic twinning - very strong sericite alteration - offset and imperfect twins
Chlorite	1-5	0.1	- subhedral - altering from biotite - inclusions within quartz
Epidote	1-3	0.1	- anhedral - altering from feldspar - inclusion of apatite

Sulphides:

Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Pyrite	5-8	amorphous	- anhedral - interstitial between quartz crystals
Molybdenite	1-5	0.3	- euhedral - bladed - fibrous - radiating crystals - along contact of quartz vein

Sample ID:	**MX12AB024**
Rock Name:	**Quartz veins in silicified biotite schist**
Hand Sample Description:	- fine-grained holocrystalline silicified biotite schist with fine grained disseminated Po, Py, Mo, cross cut by hydrothermal Qz veins

Silicates:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Quartz	90-95	<0.1 - 1.5	- anhedral - 3.0 mm quartz veins - finer grained phase closer to boundary with host rock - sutured grain boundaries - inclusions of muscovite, biotite - embayed by feldspar - as inclusions within pyrite
Feldspar	3-5	-	- very strong sericite alteration - along vein margins - inclusions of biotite and muscovite - offset twins - within vein - altering to epidote
Muscovite	<1	vfg	- subhedral - altering from feldspar - inclsusions within quartz
Biotite	<1	vfg	- subhedral - inclusions within quartz and feldspar
Epidote	<1	vfg	- subhedral - altering from feldspar - associated with muscovite
Carbonates:			
Dolomite	1	-	- amorphous - along grain boundaries - along vein margins associated with feldspars - interstitial
Oxides:			
Rutile	trace	vfg	- anhedral - high relief - dark red-brown color
Hematite	trace	vfg	- associated with pyrite
Sulfides:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Pyrite	3-5	0.3	- anhedral

			- dolomite reaction rims - associated with molybdenite - disseminated throughout host rock (avg=0.1 mm)
Molybdenite	trace	vfg	- euhedral - fibrous - associated with pyrite

Sample ID: **MX12AB027**
Rock Name: **Diorite (should be granodiorite)**
Hand Sample Description: - fine- to medium-grained biotite altered diorite cut by more felsic dyke (less alteration), disseminated Py, Po, and Mo

Silicates:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Quartz	40-45	Avg 0.05	- anhedral - sutured grain boundaries - 1 – 3mm phenos - poikilitic
Plagioclase	15-20	0.5	- subhedral - poikilitic - poly-synthetic twinning - strong sericitization - growth zoning
Chlorite	10	0.5	- subhedral - poikilitic - alteration of biotite - associated with epidote? - anomalous blue birefringence
Biotite	5	0.2	- anhedral - altered to chlorite
Epidote	1-5		- anhedral - altered from plagioclase - associated with chlorite
Muscovite	1-5		- subhedral - associated with chlorite
Oxides:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***

Sphene	1-3	0.3	- euhedral - embayed within quartz
Sulphides:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Pyrite	1-5	0.3	- anhedral - disseminated - altered from chlorite - embayed by muscovite and chlorite
Sphalerite	Trace	vfg	- subhedral - disseminated

Sample ID: **MX12AB028**
Rock Name: **Diorite**
Hand Sample Description: - fine- to medium-grained biotite altered diorite with trace disseminated Po, Py, and Mo

Silicates:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Plagioclase	55-60	0.7	- subhedral - polysynthetic twinning - offset twins - concentric growth zoning - poikilitic - decussate - moderate to strong sericite alteration - strongest sericite alteration around 2.0mm quartz vein
Quartz	15-20	0.3	- anhedral - undulose extinction - poikilitic - coarser grains (2.0mm) in veins - inclusions of chlorite, epidote, sphene in veins
Biotite	5-10	0.1	- anhedral - bird's eye extinction - altering to chlorite, muscovite, sphene, epidote, quartz - associated with pyrite
Chlorite	3-5	0.1	- anhedral - anomalous blue birefringence - altering from biotite, and albite - associated with sphene, epidote, quartz, muscovite, pyrite

Muscovite	1-5	vfg	- anhedral - as sericite - altering from biotite and albite - associated with chlorite, quartz
Sulfides:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Pyrite	1-5	0.1	- anhedral - inclusions of chalcopyrite - associated with biotite, chlorite, chalcopyrite - coarser grains in Qz vein (1.0-2.0mm)
Chalcopyrite	trace	vfg	- anhedral - included and associated with pyrite
Molybdenite	trace	0.1	- subhedral - fibrous - acicular

Sample ID: **MX12AB043**
Rock Name: **Granodiorite**
Hand Sample Description: - medium-grained silica altered porphyritic granodiorite

Silicates:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Alkali-feldspar	50-55	1.0	- subhedral - strong alteration to muscovite - relict tartan and simple twinning - seriate grain boundaries - muscovite altering along cleavage planes - inclusion within pyrite
Quartz	35-40	0.1 1.5 – phenos	- anhedral - bimodal grain size - inclusions within calcite, pyrite - embaying pyrite
Muscovite	10-15	vfg - 0.5	- anhedral - altering from feldspar - decussate - embayed by calcite - inclusions of acicular molybdenite - associated with calcite, magnetite

Sample ID:	**MX12AB047**
Rock Name:	**Silicified phyllite**
Hand Sample Description:	- silicified phyllite with disseminated medium to coarse grained euhedral pyrite

Silicates:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Quartz	55-60	vfg – 0.5	- anhedral - triple junction grain boundaries - undulatory extinction - granoblastic between bands of aligned mica - inclusions of muscovite
Muscovite	30-35		- euhedral - bladed - fibrous - aligned with chlorite in bands between granoblastic Qz - included within Qz
Chlorite	15 - 20		- subhedral - brown analogous birefringence - bladed - aligned in sub-parallel bands with muscovite
Epidote (Clinozoisite)	1 - 5		- subhedral - perfect cleavage
Oxides:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Magnetite	5	0.25 - 1.5 Avg 0.5	
Hematite	0.5-1	0.1 - 0.5	
Sulphides:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Pyrite	trace	Avg 0.015	
Chalcopyrite			

Sample ID:	**MX12AB054**
Rock Name:	**Qz carbonate vein**
Hand Sample Description:	Qz carbonate vein with abundant epidote hosted in a chlorite schist with trace fine grained magnetite.

Silicates:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Epidote	35 - 40	0.5 – 1.0	- anhedral - high relief - highly fractured - Qz, calcite and chlorite along fractures - undulatory extinction - locally replacing calcite - replacing calcite - being replaced by calcite and Qz
Calcite	30	Avg = 0.25	- subhedral - triple junction grain boundaries - cleavage and twinning clearly seen - being replaced by epidote - along fractures of epidote - inclusions of Qz - interstitial between Qz grains
Quartz	25 - 30	Avg = 0.2	- anhedral - subgrains - triple junction grain boundaries - seriate grain boundaries - along fractures in epidote - inclusions of epidote - seriate grain boundaries - undulatory extinction
Chlorite	trace	Avg = 0.1	- subhedral - disseminated - associated with epidote
Oxides:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Magnetite	trace	vfg	- subhedral - spongy - disseminated

Sample ID:	**MX12AB067**
Rock Name:	**Silicified schist**
Hand Sample Description:	- silicifed chlorite schist, with Qz carbonate veining

Silicates:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Quartz	65	vfg – 0.1	- anhedral -undulatory extinction
Clinopyroxene	20-25	0.5	- poikilitic - anhedral - exsolution lamellae
Orthopyroxene	5-10	0.5	- anhedral
Secondary:			
Uralite	<5		- fibrous veinlet - alteration of pyroxene - along fractures
Oxides:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Magnetite	<5	Avg 0.5	- anhedral - spongy - interstitial - very fine exsolution lamellae of ilmenite - disseminated
Ilmenite	1-2	Avg 0.1	- inter-grown with magnetite
Rutile?	trace	<0.1– 0.3 Avg 0.2	- greeny-blue in reflected light - disseminated throughout - associated with magnetite and chalcopyrite
Sulphides:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
	trace	vfg	
Chalcopyrite	trace	vfg	

Sample ID:	**MX12AB068**
Rock Name:	**Chlorite mica schist**
Hand Sample Description:	- chlorite rich schist with 2mm to > 10 cm thick Qz veins - highly deformed

Silicates:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Quartz	40 - 45	vfg – 2.0	- anhedral - subgrains - vein within chlorite schist - cross-cut by calcite veins - interstitial calcite - seriate grain boundaries
Chlorite	30 - 35	vfg	- subhedral - aligned along with muscovite - foliated, folded and faulted - along fractures in Qz vein - decussate - as inclusions within calcite
Muscovite	25 - 30	vfg	- euhedral - aligned along with chlorite - foliated, folded, and faulted - layers with bands of granoblastic chlorite and Qz increasing toward the main Qz vein
Calcite			- subhedral - veins cross cutting mica and Qz vein - triple junction grain boundaries - interstitial between Qz - inclusions of chlorite
Oxides:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Magnetite	trace	vfg	- anhedral - disseminated
Hematite	trace	amorphous	- anhedral - dendritic

Sample ID:	**MX12AB070**
Rock Name:	**Silicified schist**
Hand Sample Description:	- foliated schist with bands of quartz and aligned mica

Silicates:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Muscovite			- euhedral - asymmetrical crenulation - foliated
Quartz			- subhedral - granoblastic - triple junction grain boundaries
Tremolite			- euhedral - radiating crystals - in granoblastic band between aligned micaceous layers - associated with quartz and hematite
Secondary:			
Uralite			
Serpentine	2-5		- altering along fractures within pyroxene
Iddingsite	1		- along fractures within plagioclase and pyroxenes
Sericite	<1		- alteration of plagioclase
Oxides:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Hematite	1-4	vfg	- anhedral – amorphous - along fractures parallel to foliation - oxidizing from magnetite
Magnetite	1	vfg	- anhedral - disseminated throughout micaceous layers

Sample ID:	**MX12AB075**
Rock Name:	**Granodiorite**
Hand Sample Description:	- medium-grained light grey holocrystalline porphyritic granodiorite

Silicates:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Feldspar	55-60	1.0	- euhedral - poikilitic - strong sericite/muscovite alteration - relict poly-synthetic twinning - relict tartan twinning - hard to quantify % albite, microcline due to strong alteration - offset twins - inclusions of quartz, chlorite and lesser calcite
Quartz	15-20	0.4	- anhedral - as inclusions within feldspar
Muscovite	10-15	vfg - 1.0	- subhedral - fibrous - altering from feldspar - decussate
Chlorite	1	0.1	- subhedral - tabular - anomalous blue birefringence
Corbonates:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Calcite	1	0.1	- anhedral - amorphous - inclusions within feldspar - 0.1mm vein
Oxides:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Magnetite	Trace	Vfg	- anhedral - associated with chlorite
Sulfides:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Pyrite	1-5	0.1	- euhedral - cubic and hexagonal sections

			- inclusions within feldspar

Sample ID:	**MX12AB081**
Rock Name:	**Granodiorite**
Hand Sample Description:	- medium-grained holocrystalline, light grey granodiorite

Silicates:

Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Plagioclase	40	1.0	- subhedral - poikilitic - poly-synthetic twinning - strong sericite alteration - inclusions of biotite and muscovite - altering to chlorite - concentric growth zoning
Alkali-feldspar	15	1.0	- subhedral - poikilitic - simple twinning - strong sericite alteration
Quartz	20	1.0	- anhedral - poikilitic - fractured crystals - biotite, and titanite inclusions - altered from biotite and albite
Biotite	5-10	1.0	- subhedral - altering to chlorite, muscovite, quartz, titanite, epidote - bird's eye extinction
Chlorite	5-10	1.0	- subhedral - altering from biotite - associated with muscovite, quartz, titanite, epidote - altering from albite
Muscovite	5	0.5	- subhedral - altering from biotite - associated with chlorite, titanite, quartz, epidote - altering from feldspar
Titanite	1	0.1 – 0.3	- subhedral - altering from biotite

			- associated with chlorite, muscovite, quartz, epidote - wedge shaped crystals
Oxides:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Magnetite?	trace		
Sulphides:			

Sample ID:	**MX12AB083**
Rock Name:	**Trondhjemite**
Hand Sample Description:	- medium-grained holocrystalline, white to light grey leucocratic rock

Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Pyrite	1-3	0.3	- anhedral - altering from biotite - disseminated - associated with titanite, chlorite, biotite

Silicates:			
Quartz	45-50	0.2	- anhedral - 1.0 – 2.0 mm phenocrysts - phenos have inclusions of chlorite, plagioclase, magnetite - little equigranular crystals surrounding larger plagioclase crystals
Plagioclase	40	1.0	- euhedral - strong sericite alteration - inclusions of muscovite and quartz - locally included within quartz phenos
Chlorite	5-10	0.3	- subhedral - altering from biotite - associated with muscovite, sphene, epidote, pyrite, and magnetite
Muscovite	5	vfg- 0.1	- subhedral - altering from biotite, and plagioclase - included within quartz
Epidote	trace	0.1	- anhedral - altering from plagioclase - included within plagioclase
Titanite	trace	0.1	- subhedral - altering from biotite, associated with chlorite, muscovite, epidote
Oxides:			

Magnetite	trace	vfg	- anhedral - altering from biotite - as inclusions within chlorite and pyrite
Sulfides:			
Pyrite	trace	0.3	- euhedral - inclusions of magnetite, quartz - disseminated throughout

Sample ID:	**MX12AB085**
Rock Name:	**Tonalite**
Hand Sample Description:	- medium-grained white-light grey holocrystalline plagioclase rich unit

Silicates:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Plagioclase	40-45	0.5 – 1.0	- euhedral - poikilitic - poly-synthetic twinning - simple twins - strong sericitization
Quartz	35-40	0.2	- anhedral - small crystals surrounding larger plagioclase crystals - larger 2.0 mm quartz phenos
Chlorite	5-10	0.2 – 2.0	- subhedral - rutile, epidote and quartz inclusions - associated with muscovite - altering from biotite
Muscovite	5	vfg – 1.0	- subhedral - altering from plagioclase
Biotite	<5	0.1 – 1.0	- subhedral - altering to chlorite
Epidote	trace	0.1	- anhedral - inclusions within chlorite
Titanite	trace	0.1	- subhedral - altering from biotite, associated with chlorite, muscovite, epidote
Oxides:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Rutile	trace		- subhedral - twinning - exsolution lamellae maximum thickness 0.1 mm - vey fine exsolution lamellae of ilmenite

			- large inter-growths of ilmenite - interstitial
Sulphides:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Pentlandite	trace	vfg	- a couple isolated grains

Sample ID:	**MX12AB086**
Rock Name:	**Aplite**
Hand Sample Description:	- medium-grained white rock with feldspar, quartz, and muscovite and trace pyrite

Silicates:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Microcline	40-45	1.0 - <2.0	- anhedral - tartan twinning - myrmekitic texture with 0.5-1.0 mm quartz intergrowths - poikilitic - quartz and muscovite inclusions
Quartz	35-40	0.5	- anhedral - myrmekitic intergrowths in alkali feldspar - inclusions of muscovite
Plagioclase	10-15	0.5	- anhedral - poikilitic - poly-synthetic twins - imperfect twins - inclusions of muscovite and quartz
Muscovite	5-10	vfg – 2.0mm	- subhedral - euhedral - as inclusions within feldspar and quartz - locally radiating - inclusions of alkali feldspar and quartz
Sulfides:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Pyrite	trace	0.3 – 3.0mm	- subhedral - included within alkali feldspar - inclusions of alkali feldspar

Sample ID:	**MX12AB088**
Rock Name:	**Biotite Tonalite**
Hand Sample Description:	- medium-grained white-light grey holocrystalline plagioclase rich unit with 2mm quartz phenos and ~5% biotite

Silicates:

Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Plagioclase	60	0.5	- subhedral - poikilitic - growth zoning - poly-synthetic twinning - moderate to strong sericite alteration - decussate
Quartz	15-20	0.2	- anhedral - 2mm quartz phenos - small crystals surrounding larger plagioclase crystals - completely replacing plagioclase
Muscovite/ Sericite	10	vfg	- replacing plagioclase
Biotite	5	0.5	- subhedral - altering to chlorite - bird's eye extinction
Chlorite	5	0.5	- subhedral - altering from biotite - inclusions of epidote
Epidote	Trace	Vfg	- subhedral - associated with chlorite -

Sulfides:

Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Pyrite	trace	vfg	- anhedral -dissminated

Sample ID:	**MX12AB089**
Rock Name:	**Quartz vein in granodiorite**
Hand Sample Description:	

Silicates:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Quartz	70-75	<0.1 - host 0.7 - vein	- anhedral - coarser grained vein Qz associated with interstitial pyrite and molybdenite - fine grained surrounding coarser laths of plagioclase - inclusions within plagioclase - seriate grain sizes in host
Plagioclase	15-20	1.0	- euhedral - poly-synthetic twinning - moderate sericite alteration - poikilitic - inclusions of muscovite, quartz - concentric growth zoning
K-spar	5-10	0.7	- subhedral - tartan twinning - simple twinning - weak – moderate sericite alteration
Muscovite	1-5	0.1	- anhedral - altering from feldspar - associated with chlorite, pyrrhotite - altering from biotite
Chlorite	1-5	0.1	- anhedral - altering from biotite - associated with muscovite, titanite, pyrrhotite
Epidote	trace	<0.1	- euhedral - associated with chlorite
Corbonates:			
Calcite	trace	-	- anhedral - amorphous - altering from plagioclase - inclusions within plagioclase

Oxides:			
Rutile	trace	0.1	- euhedral - red-brown color - twinned
Sulfides:			
Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Pyrrhotite	10-15	vfg – 5.0	- anhedral - amorphous - interstitial - associated with molybdenite - within Qz vein and along margins of vein
Molybdenite	1-3	0.3	- euhedral - fibrous - acicular - associated with pyrrhotite

Sample ID:	**MX12AB096**
Rock Name:	**Biotite granodiorite**
Hand Sample Description:	- medium-grained holocrystalline, light grey granodiorite with 5-10% biotite

Silicates:

Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Plagioclase	65-70	0.5	- subhedral - poikilitic - poly-synthetic twinning - growth zoning - moderate sericite alteration
Quartz	15-20	0.05	- anhedral - smaller crystals surrounding larger plagioclase crystals
Biotite	5-10	0.3	- subhedral - bird's eye extinction - altering to chlorite and lesser muscovite
Chlorite	3-5	0.3	- anhedral - altering from biotite - interstitial - inclusions of epidote
Muscovite/sericite	5	Vfg	- anhedral - altering from plagioclase - strongest alteration along fractures
Epidote	<1	0.1	- anhedral - rimming chlorite and plagioclase - inclusions within chlorite

Sulfides

Mineralogy	***Modal %***	***Grain Size (mm)***	***Description***
Pyrite	Trace	0.1	- anhedral - interstitial - disseminated

Appendix 2: Sample lists

MAX sample locations, UTM coordinates are NAD83.

Sample	Lithology	Easting	Northing	Elevation	Depth(m)	Mount
MX12AB001	Qz-vein	469234	5605838	977		
MX12AB002	pelite	462371	5611578	796		Y
MX12AB003	skarn	457470	5609330	1642		Y
MX12AB004	skarn	457368	5609445	1618		
MX12AB005	phyllite	457341	5609549	1591		
MX12AB006	silicified-schist	457412	5609501	1581		
MX12AB007	meta-sediment	457533	5609495	1543		
MX12AB008	meta-sediments	457708	5609398	1533		
MX12AB009	granodiorite	457460	5609712	1430		Y
MX12AB010	silicified-schist	457524	5609982	1314		Y
MX12AB011	phyllite	457741	5610261	1176		Y
MX12AB012	biotite-mica-schist	458299	5610556	966		Y
MX12AB013	biotite-mica-schist	458229	5610486	966		Y
MX12AB014	silicified-schist	458159	5610416	967		Y
MX12AB015	silicified-schist	458089	5610346	967		Y
MX12AB016	silicified-phyllite	458019	5610281	967		Y
MX12AB017	silicified-schist	457949	5610216	968		Y
MX12AB018	silicified-schist	457879	5610146	968		Y
MX12AB019	Qz-vein	457809	5610081	968		Y
MX12AB020	diorite	457809	5610081	968		
MX12AB021	skarn	458369	5610621	966		

MX12AB022	chlorite-schist	459830	5611023	784		Y
MX12AB023	biotite-schist					Y
MX12AB024	silicified-schist					Y
MX12AB025	silicified-schist					Y
MX12AB026	biotite-gneiss					
MX12AB027	diorite					Y
MX12AB028	diorite					Y
MX12AB029	diorite					Y
MX12AB030	Qz-vein	457370	5609443	1596.2	5.8	Y
MX12AB031	skarn	457370	5609443	1507.1	94.9	
MX12AB032	skarn	457389	5609574	1596.8	5.2	Y
MX12AB033	diorite	457389	5609574	1583.12	18.88	Y
MX12AB034	diorite	457389	5609574	1571.65	30.35	Y
MX12AB035	silicified-schist	457389	5609574	1570.32	31.68	
MX12AB036	biotite-schist	457389	5609574	1570.32	31.68	
MX12AB037	biotite-schist	457389	5609574	1551.25		Y
MX12AB038	biotite-schist	457370	5609443	1404.1	50.75	Y
MX12AB039	silicified-schist	457389	5609574	1541.38	197.9	Y
MX12AB040	granodiorite	457389	5609574	1530	60.62	Y
MX12AB041	granodiorite	457389	5609574	807	72	Y
MX12AB042		457389	5609574	1522.05	795	Y
MX12AB043		457389	5609574	1521.45	80	Y
MX12AB044	silicified-schist	457389	5609574	1504.85	80.55	Y
MX12AB045	mafic intrusion	460515	5610034	782	97	Y
MX12AB046	silicified-schist	459862	5612284	784		Y

MX12AB047	silicified-phyllite	459865	5612284	784		Y
MX12AB048	biotite-mica-schist	460443	5610116	780		
MX12AB049	biotite-mica-schist	460192	5610356	769		
MX12AB050	staurolite-mica-schist	460371	5610191	765		
MX12AB051	biotite-mica-schist	460282	5610258	782		
MX12AB052	biotite-mica-schist	459670	5611099	798		
MX12AB053	silicified-phyllite	457508	5609672	-385		
MX12AB054	Qz-vein	459757	5611067	791		Y
MX12AB055	diorite	457508	5609672	18.75	1345	Y
MX12AB056	diorite	457508	5609672	507.85	941.25	Y
MX12AB057	diorite	457508	5609672	681.2	452.15	Y
MX12AB058	diorite	465119	5606533	725	278.8	Y
MX12AB059	slate	465712	5605537	870		
MX12AB060	phyllite	466362	5605065	848		
MX12AB061	slate	466250	5605125	843		
MX12AB062	slate	463650	5612474	850		
MX12AB063	chlorite-mica-schist	463416	5612472	845		
MX12AB064	phyllite	463227	5612280	841		
MX12AB065	pelite	463061	5612095	842		
MX12AB066	chlorite-mica-schist	462872	5611907	826		
MX12AB067	chlorite-schist	462076	5611710	796		
MX12AB068	chlorite-mica-schist	462513	5611586	799		Y
MX12AB069	limestone	457411	5608885	1764		
MX12AB070	silicified-schist	457502	5608823	1797		Y
MX12AB071	limestone	457506	5608746	1828		

MX12AB072	limestone	457309	5609522	1600		
MX12AB073	skarn	457507	5609672	949.25		
MX12AB074	biotite-schist	457507	5609672	949.7	10.75	Y
MX12AB075	granodiorite	457507	5609672	801.8	10.3	Y
MX12AB076	granodiorite	457507	5609672	661.7	158.2	Y
MX12AB077	granodiorite	457507	5609672	581.5	298.3	Y
MX12AB078	granodiorite	457507	5609672	447.85	378.5	Y
MX12AB079	granodiorite	457507	5609672	311.42	512.15	Y
MX12AB080	granodiorite	457507	5609672	186.3	648.58	
MX12AB081	granodiorite	457507	5609672	840.05	773.7	Y
MX12AB082	Qz-vein	457508	5609672	564.12	119.95	Y
MX12AB083	trondjemite	457508	5609672	562.45	395.88	Y
MX12AB084	tonalite/trondjemite	457508	5609672	563.4	397.55	Y
MX12AB085	tonalite	457508	5609672	560.1	396.6	
MX12AB086	aplite	457508	5609672	755.5	399.9	
MX12AB087	biotie-granodiorite	457508	5609672	752.58	204.5	Y
MX12AB088	biotite-tonalite	457390	5609535	913.5	207.42	
MX12AB089	Qz-vein	457505	5609775	562.2	46.5	Y
MX12AB090	biotite-schist	457505	5609775	819.1	397.8	Y
MX12AB091	conglomerate	457505	5609775	314.7	140.9	
MX12AB092	biotite-schist	457505	5609775	670.25	645.3	Y
MX12AB093	granodiorite	457468	5609721	832.15	289.75	Y
MX12AB094	granodiorite	457468	5609721	628	127.85	
MX12AB095	granodiorite	457468	5609721	475.32	332	
MX12AB096	biotite-granodiorite	457375	5609584	974.6	484.68	Y

Polished mounts for mineral chemistry

Sample	Igneous Qz	Metamorphic Qz	Hydrothml Qz	Hydrothml alt. Qz	Chlorite	Epidote
MX12AB002			x		x	
MX12AB003			x			
MX12AB009			x		x	x
MX12AB010		x			x	
MX12AB011		x			x	
MX12AB012			x			
MX12AB013		x			x	
MX12AB014			x		x	
MX12AB015		x				
MX12AB016		x			x	
MX12AB017		x			x	
MX12AB018			x		x	
MX12AB019			x			
MX12AB022			x		x	x
MX12AB023			x			
MX12AB024			x			
MX12AB025			x			
MX12AB027	x				x	x
MX12AB028	x				x	
MX12AB029			x		x	x
MX12AB030			x			
MX12AB032			x			x
MX12AB033			x		x	x
MX12AB034			x			
MX12AB035					x	
MX12AB037			x			
MX12AB038			x			
MX12AB039		x				x
MX12AB040			x			x
MX12AB041			x		x	x
MX12AB042			x			
MX12AB043			x			
MX12AB044			x		x	
MX12AB045			x			
MX12AB046		x				
MX12AB047				x		
MX12AB054			x			x
MX12AB055	x				x	

Sample	Igneous Qz	Metamorphic Qz	Hydrothml Qz	Hydrothml alt. Qz	Chlorite	Epidote
MX12AB056	x				x	x
MX12AB057	x				x	
MX12AB058			x			
MX12AB059						
MX12AB068			x			
MX12AB069						
MX12AB070			x			x
MX12AB074				x		
MX12AB075	x					
MX12AB076			x		x	x
MX12AB077			x			
MX12AB078	x				x	x
MX12AB079			x			x
MX12AB081	x				x	x
MX12AB082			x			
MX12AB083	x				x	
MX12AB084	x				x	
MX12AB085	x				x	
MX12AB086						
MX12AB087	x				x	
MX12AB088					x	
MX12AB089			x		x	
MX12AB090			x			
MX12AB092			x		x	
MX12AB093	x				x	
MX12AB094					x	x
MX12AB096	x				x	

Appendix 3: Whole-rock geochemistry

Sample	SiO2	Al2O3	Fe2O3	MgO	CaO	Na2O	K2O	TiO2	P2O5	MnO	Cr2O3	Ba	Sc	Sum	Cs	Ga	Hf	Nb	Rb	Sn	Sr	Ta	Th	U	V
MX12AB001	97	0.88	1.21	0.04	0.06	0.26	0.1	0.02	0.05	<0.01	<0.002	23	<1	100	<0.1	0.6	0.1	3.4	4.1	<1	19.6	0.2	1.1	<0.1	8
MX12AB003	45.6	1.65	6.89	9.98	19.4	0.04	0.34	0.08	0.09	0.87	0.002	27	2	99.65	12.8	11	1.5	3.6	27.5	16	199.4	0.2	2.8	2.4	16
MX12AB004	17.7	0.31	2.71	20.32	26.85	0.02	0.01	<0.01	0.06	0.2	<0.002	20	<1	99.57	0.6	2.4	<0.1	0.7	0.6	<1	248.3	<0.1	<0.2	0.3	<8
MX12AB005	68.6	13.27	7.61	2.01	0.41	0.89	4.08	0.56	0.07	0.1	0.01	602	10	99.84	11.2	14.8	5.7	10.1	167	2	116.9	0.8	12.2	3.3	48
MX12AB006	87.4	5.67	2.38	0.53	0.12	1.18	1.19	0.26	0.04	<0.01	0.005	167	4	99.95	2.7	5.1	4.7	7.2	45.8	<1	66.3	0.4	9	2.6	28
MX12AB007	48.1	14.25	12.15	3.98	7.62	1.39	2.59	2.89	0.39	0.16	0.026	325	19	99.69	9.3	20.7	5.5	60.1	119	10	553.5	3.7	5.6	0.9	100
MX12AB008	49.8	13.46	9.02	7.74	10.13	2.31	1.52	1.85	0.46	0.23	0.031	193	19	99.69	5.4	20.9	2.8	24.6	78	5	561.1	1.4	3.7	1.1	167
MX12AB009	70.2	15.38	2.47	0.64	2.57	3.68	3.01	0.3	0.14	0.05	0.002	1449	3	99.71	4.6	17	3.7	12.1	80.8	<1	585.3	0.8	6.9	6	16
MX12AB010	89.2	5.63	1.19	0.57	0.12	0.28	1.61	0.23	0.02	0.01	0.003	297	3	99.95	3.9	5.9	5.1	4.9	57	<1	33.2	0.4	8.3	1.1	30
MX12AB011	57.1	22.95	6.02	1.6	0.14	0.47	6.68	0.86	0.09	0.03	0.015	1134	18	99.73	8.1	29.2	7.4	16.1	256	4	101.6	1	24.1	4.4	132
MX12AB012	70.4	11.84	4.75	2.12	2.12	0.98	2.14	0.53	0.04	0.22	0.009	456	9	99.85	3.6	15.4	5.5	11.6	81.4	2	127.2	0.8	10.9	2.2	63
MX12AB013	70.6	11.95	5.82	1.83	1.26	1.37	2.31	0.58	0.05	0.15	0.009	527	10	99.85	4.2	15.7	4.6	12.6	90.8	2	114.9	0.8	10.8	2.5	65
MX12AB014	76.8	10.87	4.5	1.47	0.17	2.69	1.25	0.46	0.07	0.03	0.01	238	7	99.89	1.8	12.3	8.1	10.8	50.2	<1	54.5	0.8	15.3	2.9	49
MX12AB015	83.4	6.86	2.21	0.8	1.01	0.57	1.93	0.29	<0.01	0.06	0.006	300	4	99.89	2.4	7.2	6.6	5.4	80.6	<1	120.9	0.5	9.7	2.4	31
MX12AB018	85.2	6.15	2.89	0.9	0.82	1.26	1.15	0.27	0.02	0.06	0.007	276	5	99.9	4.2	6.5	5.3	5.3	48.7	<1	132.9	0.5	7.8	1.9	35
MX12AB020	77.9	10.79	2.04	0.48	2.16	2.72	1.9	0.24	0.11	0.04	0.002	1464	2	99.61	3.5	12.6	2.9	6.9	57	<1	486.8	0.6	7.2	3.8	28
MX12AB021	4.3	1.12	0.68	18.05	30.8	0.01	0.38	0.06	0.1	0.02	<0.002	81	1	99.64	0.6	0.9	0.2	0.7	9.9	<1	294.8	0.1	1.3	0.3	12
MX12AB023	65.8	14.91	5.34	1.81	2.06	2.48	4.25	0.61	0.03	0.13	0.011	1111	11	99.59	14.3	18.8	4.8	15.1	178	<1	309.1	1	13.3	6.3	85
MX12AB024	63.1	16.8	5.01	1.76	1.29	1.81	5.93	0.65	0.08	0.07	0.012	1017	13	99.73	11.2	20	5	14.5	226	1	200.5	1	16.6	4.3	80
MX12AB025	61.9	18.43	4.99	1.98	0.39	1.32	6.69	0.78	0.08	0.04	0.013	986	14	99.72	11.1	22.3	9.9	13.9	244	2	120.7	1.3	23.5	5.4	106
MX12AB026	57.4	20.2	5.58	2.23	0.92	1.9	6.57	0.94	0.09	0.06	0.015	943	16	99.72	11.4	28.4	8.1	17.9	233	3	183.4	1.6	22.7	4.7	118
MX12AB028	66.9	15.87	4.61	0.89	4.05	3.88	1.7	0.44	0.23	0.07	<0.002	1144	4	99.67	5.6	19.6	3.7	15.2	67.9	<1	778.9	0.9	5.7	5.3	55
MX12AB030	76.6	8.19	5.58	1.41	2.26	1.24	1.52	0.31	0.17	0.08	0.004	464	6	99.49	11.4	12.3	1.7	10.4	83.3	<1	206.4	0.6	6.5	2.9	58
MX12AB031	19	0.2	3.77	17	26.39	0.03	0.01	<0.01	0.03	0.3	<0.002	7	2	99.62	0.5	1.9	<0.1	0.5	0.4	<1	630.3	<0.1	<0.2	0.1	<8
MX12AB032	67.7	12.35	5.49	2.57	5.46	1.55	1.48	0.64	0.05	0.08	0.011	417	10	99.81	2.7	18.1	6.1	11.3	61.1	4	313.8	0.8	14.3	2.9	61

Sample	W	Zr	Y	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	LOI	TOT/C	TOT/S	Mo	Cu
MX12AB001	<0.5	3.4	1	1.9	3.6	0.41	2.1	0.34	0.11	0.43	0.04	0.42	0.05	0.12	0.01	0.07	0.01	0.4	0.03	0.01	0.2	16.61
MX12AB003	93.2	56.9	5.8	6.3	12.9	1.42	4	0.95	0.23	0.88	0.14	0.71	0.18	0.44	0.08	0.45	0.07	14.7	4.51	0.5	530.55	6.62
MX12AB004	402	0.7	3.8	2.4	4.2	0.56	1.4	0.57	0.22	0.64	0.09	0.47	0.09	0.18	0.02	0.22	0.02	31.4	9.23	0.13	3.37	20
MX12AB005	3.5	207.4	18.4	33.4	72.5	7.42	28.4	4.35	0.94	4.07	0.58	3.57	0.66	1.76	0.32	1.75	0.29	2.2	0.04	0.08	8.39	34.98
MX12AB006	5.2	176.9	10.7	17.4	38.7	3.9	15	2.6	0.48	2.09	0.37	2.08	0.39	1.17	0.17	1.02	0.2	1.2	0.02	0.05	19.39	41.21
MX12AB007	11.7	244.8	22.6	56.4	122.2	13.59	53.6	10.11	3.39	8.97	1.24	5.88	0.95	2.08	0.3	1.5	0.25	6.1	0.04	4.14	1.53	227.37
MX12AB008	8.2	113.2	22	31.4	64.2	7.29	29.6	5.65	1.73	5.6	0.85	4.55	0.91	2.14	0.3	1.81	0.23	3.2	0.03	2.02	3.83	67.65
MX12AB009	0.9	123.9	10.1	24.7	51.5	5.71	21.2	3.97	1.07	3.11	0.43	1.76	0.39	0.96	0.13	0.98	0.14	1.2	<0.01	0.28	208.53	14.46
MX12AB010	2.2	165.3	7.5	16.5	31.7	3.44	13.6	2	0.32	1.4	0.21	1.51	0.28	0.62	0.13	0.73	0.12	1	0.18	0.01	1.04	9.09
MX12AB011	2.3	248.4	33.7	70.1	138.6	15.61	57.7	9.48	1.76	7.59	1.08	6.21	1.29	3.61	0.59	3.37	0.54	3.8	0.09	0.65	3.71	31.1
MX12AB012	1.3	210.1	14	27.4	56.7	6.08	24.2	4.09	0.78	3.3	0.48	2.55	0.54	1.37	0.22	1.46	0.24	4.7	0.87	0.18	0.54	14.14
MX12AB013	1.2	167.3	18.3	26.5	56	5.9	22.4	4.55	0.87	3.72	0.58	3.34	0.62	2.02	0.28	1.69	0.26	3.9	0.65	0.15	0.39	33.98
MX12AB014	0.7	292.6	20.1	29.9	64.8	6.82	25	4.54	0.86	3.61	0.56	3.58	0.69	2.06	0.31	2.11	0.31	1.6	0.05	0.25	0.74	15.63
MX12AB015	6.3	204.1	7.9	16.9	34.7	3.83	14.9	2.38	0.52	1.65	0.28	1.56	0.37	1.01	0.14	1.09	0.18	2.8	0.72	1.17	0.39	9.42
MX12AB018	1.2	190	11	16.4	36.6	3.53	14.6	2.42	0.47	2.24	0.35	1.96	0.34	1.11	0.2	1.19	0.18	1.1	0.14	0.12	2.92	9.1
MX12AB020	1.1	93.1	7.1	21.9	46.9	5.36	22.5	3.6	1.02	2.78	0.35	1.72	0.28	0.71	0.11	0.71	0.13	1.3	0.13	0.17	1047.5	3.37
MX12AB021	<0.5	12.3	5.6	6.1	8.9	1.33	6.2	0.98	0.18	0.82	0.15	0.87	0.17	0.47	0.07	0.35	0.06	44.1	12.87	<0.01	1.06	0.59
MX12AB023	1.7	153.6	15.9	42.1	85.5	9.47	36.7	5.59	1.22	4.24	0.6	3.14	0.57	1.55	0.3	1.68	0.3	2.2	0.25	0.21	1108.7	9.96
MX12AB024	6.1	172.4	22.1	54.3	113.9	11.78	41.5	7.28	1.4	5.56	0.88	5.11	0.92	2.38	0.39	2.36	0.37	3.2	0.45	0.6	121.74	26.38
MX12AB025	5.3	356.2	28	62.7	126.4	13.92	49.3	8.01	1.57	6.39	0.97	5.58	1.13	3.1	0.55	2.87	0.56	3.1	0.33	0.42	15.14	24.68
MX12AB026	5.5	294.4	28.2	60	125.6	12.95	48.1	8.32	1.67	6.6	1	5.47	1.17	3.08	0.49	3.12	0.52	3.8	0.52	0.27	13.72	16.3
MX12AB028	1	147.8	13.9	26.2	53.8	6.77	28.6	5.21	1.4	4.01	0.58	2.26	0.48	1.15	0.18	1.08	0.19	1	0.03	0.65	267.64	46.84
MX12AB030	2.1	66.3	14.2	23.1	49.8	5.51	21.4	4.18	0.85	3.44	0.53	3.02	0.58	1.55	0.23	1.47	0.24	2.1	0.21	1.08	>2000.00	54.83
MX12AB031	87.9	0.8	10.6	2.6	6.1	0.88	3	0.89	0.26	1.19	0.28	1.77	0.39	0.85	0.12	0.77	0.06	32.9	9.68	0.28	2.67	17.89
MX12AB032	2.8	201.7	21	35.9	74.6	8.33	29.4	6.85	1.15	4.64	0.68	4.03	0.77	2.23	0.38	2.46	0.35	2.4	0.05	1.72	1.04	100.36

Sample	Pb	Zn	Ag	Ni	Co	Mn	As	Au	Cd	Sb	Bi	Cr	B	Tl	Hg	Se	Te	Ge	In	Re	Be	Li	Pd	Pt
MX12AB001	50.5	15.4	37	1.7	0.7	48	1.3	2.1	0.07	0.44	0.04	5.1	1	<0.02	151	<0.1	<0.02	<0.1	<0.02	<1	<0.1	1.2	<10	<2
MX12AB003	8.95	322	972	3.1	3.7	4756	73.3	12	3.97	0.41	8.18	3.9	7	0.11	<5	<0.1	0.48	0.1	0.46	63	5.3	10.6	<10	<2
MX12AB004	4.68	47.7	110	6.6	3.4	926	0.3	1.5	2.21	0.03	0.48	<0.5	7	0.03	<5	0.4	0.03	0.4	0.11	5	0.8	1.8	<10	<2
MX12AB005	6.13	77	64	37.9	17.5	661	0.9	1.2	0.1	<0.02	0.36	35.1	2	1	<5	<0.1	<0.02	<0.1	<0.02	<1	0.5	49	<10	3
MX12AB006	3.62	20.4	95	8.4	2.3	61	2.8	<0.2	0.34	0.04	0.18	11	1	0.1	<5	<0.1	<0.02	<0.1	<0.02	<1	0.2	7	13	<2
MX12AB007	10.8	119	833	142	53.2	535	<0.1	<0.2	0.71	0.13	5.39	57.6	3	0.19	<5	1	0.65	<0.1	<0.02	<1	0.5	20.2	<10	<2
MX12AB008	8.23	78	540	106	25.5	278	<0.1	0.2	0.34	0.05	5.06	47.2	1	0.28	<5	0.4	0.17	<0.1	0.02	2	0.1	7.5	<10	<2
MX12AB009	7.53	60.2	38	2.4	2.7	281	0.6	0.4	0.21	0.02	0.67	3.1	2	0.07	<5	0.1	<0.02	<0.1	<0.02	35	0.2	10.5	<10	<2
MX12AB010	6.33	17.5	58	13.2	3.8	67	4.1	<0.2	0.09	0.08	0.26	5.8	1	0.07	<5	<0.1	<0.02	<0.1	<0.02	1	0.3	4.1	<10	<2
MX12AB011	4.27	48.7	28	40.9	16.6	103	<0.1	<0.2	0.04	0.06	0.28	10.6	2	0.13	<5	0.2	<0.02	<0.1	<0.02	2	0.3	8	<10	<2
MX12AB012	9.14	65.9	26	26.9	10.4	1637	11.1	0.2	0.02	0.12	0.09	22	<1	0.09	<5	0.2	<0.02	<0.1	<0.02	<1	0.2	59.9	<10	<2
MX12AB013	66.2	91.2	143	33.2	12	1045	0.2	0.7	0.1	0.14	0.39	21	1	0.06	14	<0.1	0.03	<0.1	<0.02	<1	<0.1	37.9	<10	<2
MX12AB014	2.73	67.7	32	21.6	9.3	221	<0.1	0.9	0.02	0.06	0.12	23.8	1	0.05	<5	<0.1	<0.02	<0.1	<0.02	<1	0.1	19.7	16	<2
MX12AB015	31.6	29.4	783	11.6	4.2	480	184.5	2	0.16	1.12	0.99	12.7	8	0.07	6	<0.1	0.03	<0.1	<0.02	<1	0.4	1	<10	<2
MX12AB018	6.83	35.9	69	14	5.8	458	0.7	<0.2	0.03	0.07	0.21	32.9	1	0.17	<5	<0.1	<0.02	<0.1	<0.02	<1	<0.1	12.6	<10	<2
MX12AB020	7.8	46.1	70	1.3	1.8	314	1.7	<0.2	1.21	0.14	0.17	10.5	3	0.09	13	<0.1	0.07	<0.1	<0.02	139	0.1	12.5	*	<2
MX12AB021	3.14	19.1	9	6.2	1.6	172	<0.1	<0.2	0.2	0.25	<0.02	1.5	<1	<0.02	<5	<0.1	<0.02	<0.1	<0.02	<1	0.2	4.3	<10	<2
MX12AB023	8.56	110	50	27.4	8.7	924	1	<0.2	1.35	0.05	0.12	59.8	2	0.87	7	<0.1	0.03	<0.1	<0.02	95	0.3	41.3	*	<2
MX12AB024	13.4	61.9	162	35.2	13.9	500	2.2	0.2	0.15	0.06	1.12	37	3	0.63	<5	<0.1	0.08	<0.1	<0.02	14	0.3	28.4	54	<2
MX12AB025	7.1	62	61	34.8	13.3	330	2.2	<0.2	0.06	0.16	0.13	35.8	2	0.75	<5	<0.1	0.08	<0.1	<0.02	<1	0.6	37.4	<10	<2
MX12AB026	11.1	70.6	57	41.2	15.6	504	4.8	<0.2	0.05	0.11	0.12	36.5	3	0.64	<5	<0.1	0.03	0.1	<0.02	<1	0.2	26.7	<10	<2
MX12AB028	3.39	77	149	1.2	4.5	586	0.1	<0.2	0.35	0.02	0.24	2.9	1	0.35	<5	0.6	0.08	<0.1	<0.02	30	0.1	16.8	*	<2
MX12AB030	3.21	86.1	90	18.1	12.4	575	3.7	0.4	3.3	0.06	0.54	24.2	1	0.46	13	0.6	0.31	<0.1	<0.02	418	0.6	23.6	*	<2
MX12AB031	8.42	74.6	177	3.4	2.4	1710	12.9	2.3	0.89	0.37	0.27	1.1	1	<0.02	<5	0.4	0.03	0.3	0.09	<1	1	2.4	<10	<2
MX12AB032	6.71	50	312	24.6	11.7	130	0.1	0.9	0.27	0.06	1.49	20.5	3	0.09	<5	0.7	0.53	<0.1	<0.02	<1	0.3	5.1	<10	<2

Sample	SiO2	Al2O3	Fe2O3	MgO	CaO	Na2O	K2O	TiO2	P2O5	MnO	Cr2O3	Ba	Sc	Sum	Cs	Ga	Hf	Nb	Rb	Sn	Sr	Ta	Th	U	V
MX12AB033	73.7	13	2.85	0.46	2.54	3.21	2.3	0.23	0.11	0.04	0.002	1407	3	99.64	2.7	15.9	3.4	7	60.6	<1	545	0.4	6.1	2.5	20
MX12AB034	66.17	16.91	4.27	1.17	4.49	3.97	1.52	0.47	0.29	0.1	0.002	839	5	99.76	9.9	21	4.1	13	79.8	<1	770.5	0.5	6	2.5	45
MX12AB035	74.17	10.87	4.69	1.47	1.06	1.82	3.81	0.49	0.04	0.07	0.009	774	9	99.83	10.2	15	5.1	14.2	142	<1	215.2	0.9	11.3	3.1	61
MX12AB038	74.28	11.09	4.57	1.53	0.73	1.26	3.25	0.44	0.04	0.05	0.009	611	8	99.81	6.9	15	4.1	8.7	139	<1	118.3	0.7	9.3	2.7	48
MX12AB039	57.6	18.42	5.62	2.9	5.4	1.16	4.15	0.84	0.11	0.08	0.015	972	16	99.73	8.1	23.8	4.5	14.4	147	4	370.7	1.2	18.2	4.3	90
MX12AB040	75.63	11.4	3	0.55	2.61	2.93	1.35	0.24	0.15	0.04	0.003	829	3	99.61	4.6	12.4	2.1	7	48.1	<1	524.2	0.3	5.6	4.4	23
MX12AB044	77.14	9.3	3.96	0.34	1.44	1.98	2.53	0.16	0.1	0.03	0.002	1959	2	99.14	4.2	10.3	2	5	68.1	<1	337.8	0.5	5.9	5.1	<8
MX12AB048	49.25	13.55	9.9	5.55	6.01	0.84	1.74	0.91	0.1	0.21	0.035	595	39	99.74	5.4	14	1.3	2.1	56.2	<1	317.1	0.1	1.1	0.3	243
MX12AB049	59.26	11.11	8.59	3.07	5.72	1.21	1.19	0.67	0.11	0.18	0.02	255	18	99.83	3.5	13	3.8	8.2	40.5	1	130.8	0.5	6	2.1	135
MX12AB052	63.17	17.91	6.65	2.3	0.21	0.56	3.6	1.09	0.15	0.04	0.052	588	38	99.79	8.4	20.8	3.2	6.9	113	2	91.6	0.4	4.6	1.5	218
MX12AB053	33.5	9.08	6.07	1.95	22.9	1.55	1.37	1.3	0.17	0.17	0.024	1193	21	99.68	2.2	10.1	2.3	7.8	34.2	<1	729.4	0.6	0.4	0.4	177
MX12AB056	68.2	15.95	3.3	0.67	3.31	3.97	2.58	0.36	0.15	0.09	0.002	1413	3	99.72	7.3	18.6	3.9	12.9	102	3	644.3	0.7	8.8	6.1	16
MX12AB057	69.91	14.77	2.73	0.54	2.64	3.69	3.22	0.27	0.14	0.08	<0.002	1139	3	99.75	5.2	18.2	4	12.3	112	1	515.1	1.1	8.6	8	8
MX12AB058	73.59	12.84	1.54	0.39	2.04	2.75	3.54	0.2	0.12	0.06	0.003	913	2	99.78	7.6	14.2	3.6	10.9	130	<1	225.1	1	7.3	10.3	<8
MX12AB059	66.27	15.06	2.81	0.98	2.32	1.55	3.8	0.73	0.23	0.2	0.014	3543	14	99.53	7.1	18.2	4.5	14.2	143	2	89.5	0.9	11	3.8	113
MX12AB060	63.51	16.43	4.91	3.82	0.23	0.87	3.75	0.8	0.22	0.02	0.013	1955	16	99.64	6.9	20.6	5.1	15.8	132	3	98.1	1.1	11.8	6	130
MX12AB061	71.92	12.79	1.8	0.95	0.25	1.57	3.01	0.7	0.16	<0.01	0.012	3855	13	99.5	5	16	4.1	12.4	107	3	111.4	1.1	11.4	5.6	134
MX12AB062	65.78	14.03	4.46	2.13	0.17	1.32	3	0.73	0.16	0.01	0.014	2500	15	99.61	5.6	18.8	3.7	12.8	109	2	93.1	0.8	11.2	5.8	188
MX12AB063	61.41	17.01	8.03	2.63	0.3	0.06	5.67	0.72	0.08	0.05	0.011	1216	18	99.75	5.1	23.2	4.4	15.6	214	3	37.7	1.2	17.3	4.1	165
MX12AB064	66.75	15.55	5.33	2.23	0.27	0.57	5.01	0.63	0.22	0.04	0.01	1021	13	99.8	4.4	22	4.8	16.6	188	3	28.8	1.3	15.4	3.6	136
MX12AB065	96.67	1.49	0.71	0.06	0.01	0.21	0.35	0.08	0.02	<0.01	0.01	73	<1	100	0.4	3.3	3.3	1.7	13	<1	6	0.2	3.9	0.9	70
MX12AB066	70.81	14.21	5.1	1.57	0.05	1.62	2.93	0.57	0.05	0.09	0.01	666	10	99.85	2.7	19.5	6.3	10.2	111	2	45.7	0.8	13.1	3.4	118
MX12AB067	70.61	13.55	4.83	1.75	0.71	2.34	2.61	0.54	0.05	0.09	0.009	698	9	99.85	2.5	18.7	6.4	11.7	103	2	71.9	0.9	12.1	2.8	100
MX12AB069	29.1	1.09	1.78	13.58	21.1	0.3	0.21	0.08	0.09	0.13	0.008	118	3	99.72	0.4	1	1.5	1.1	7	<1	248.1	0.1	1.2	1.5	65
MX12AB070	59.93	14.41	7.97	2.92	7.08	2.03	0.96	0.62	0.13	0.16	0.011	213	14	99.81	4.7	18.6	3.8	9.4	30.1	7	488.9	0.8	13.2	3.5	115
MX12AB071	3.38	0.9	0.97	4.02	48.1	0.03	0.28	0.05	0.15	0.03	0.003	54	1	99.69	1.1	0.7	2.3	0.2	13.7	<1	1639	<0.1	0.4	2	<8
MX12AB072	6.85	1.1	1.16	0.63	50	0.18	0.21	0.06	0.04	0.03	<0.002	44	2	99.72	0.8	1.2	0.5	0.3	7.5	<1	1910	<0.1	0.5	<0.1	10
MX12AB073	64.01	15.01	4.04	2.65	3.22	0.85	5.16	0.88	0.2	0.05	0.014	1595	15	99.67	5.1	17.7	4.2	17.1	155	6	269.7	1.2	12.4	4.2	132
MX12AB074	66.38	15.2	4.73	1.73	0.7	1.29	4.57	0.6	0.06	0.06	0.01	550	12	99.86	9.7	19.6	6	13	196	2	113.9	1.1	18.1	3.8	85

Sample	W	Zr	Y	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	LOI	TOT/C	TOT/S	Mo	Cu	Pb	Zn	Ag	Ni	Co
MX12AB033	0.7	110.6	6.2	19.8	42.3	4.88	16.7	3.21	0.98	2.29	0.28	1.3	0.23	0.66	0.08	0.56	0.09	1.2	0.09	0.4	822.5	14.8	5.41	33.1	81	1.7	2.9
MX12AB034	<0.5	139.8	11	23.7	51.9	6.09	27.9	4.66	1.3	3.2	0.44	1.97	0.41	0.95	0.14	1.06	0.12	0.4	0.04	0.1	29.91	6.48	19.9	118	420	1.8	4.3
MX12AB035	1.1	177.7	15.3	30.2	63.3	6.65	21	4.23	0.91	3.48	0.52	2.83	0.61	1.83	0.22	1.32	0.25	1.3	0.14	0.3	45.7	17.1	8	77.1	76	25.8	11
MX12AB038	11	157.7	12.6	27.2	58	5.92	22.5	3.86	0.78	3.1	0.43	2.19	0.56	1.22	0.24	1.39	0.23	2.5	0.16	0.3	319.6	33.1	13.4	61.9	334	27.1	9.5
MX12AB039	3.1	166.5	23.5	56.7	118	12.96	50.2	8.57	1.68	6.89	0.94	4.95	0.99	2.81	0.41	2.86	0.41	3.4	0.27	1.6	1.93	56.7	66.9	82.1	739	45.3	13.7
MX12AB040	2	93.8	11.1	18.1	36.6	4.21	15.4	3.14	0.88	2.46	0.4	2.34	0.38	1.16	0.16	1	0.16	1.7	0.2	0.8	1510	28	7.23	34.9	172	5.7	6.1
MX12AB044	3.7	66	7.2	20.9	44.3	4.8	16.1	3.28	0.88	2.48	0.27	1.46	0.29	0.62	0.09	0.76	0.08	2.2	0.22	1.6	>2000	67.9	5.93	26.6	427	2	6.1
MX12AB048	<0.5	46.9	22.3	4.5	11	1.37	7.2	2.39	0.75	3.15	0.63	4.22	0.92	2.4	0.44	2.78	0.41	12	2.61	0.1	1.82	52.5	3.03	59.1	35	91.6	35.8
MX12AB049	1.1	134.4	27.4	22.2	47	5.06	20.2	4.42	1.05	4.33	0.8	5.75	1.11	3.19	0.5	3.21	0.52	8.7	1.97	0	4.65	53.4	5.19	78.8	58	127	24.2
MX12AB052	0.7	120.2	21.5	18.1	37.3	4.07	15.6	3.13	0.78	3.56	0.62	3.44	0.87	2.77	0.4	2.76	0.4	4	0.15	<0.01	0.31	78.1	1.54	102	19	91.4	27.5
MX12AB053	0.8	68.8	22.8	9.1	21.7	3.08	13.8	3.8	1.39	4.34	0.81	4.78	0.98	2.5	0.36	2.04	0.29	22	6.04	0	0.43	48.4	4.77	35.2	65	52.8	21.8
MX12AB056	0.6	150.3	11.2	29.2	61.9	7.16	28.7	5.1	1.43	3.63	0.48	2.33	0.38	0.98	0.14	0.87	0.13	1.2	0.05	0.2	5.9	2.65	14.7	82.2	350	0.9	2.3
MX12AB057	0.6	118.1	12.1	24.1	50.1	5.93	23.1	4.65	1.18	3.12	0.46	2.5	0.4	1.14	0.18	1.01	0.14	1.8	0.17	0.5	172.5	23.6	19.3	63.1	223	1	1.8
MX12AB058	11	92.9	9	18.2	37.5	4.46	16.7	3.18	0.88	2.63	0.35	1.92	0.35	1.11	0.15	0.92	0.11	2.7	0.43	0.3	579.3	16.1	19	53.4	436	0.6	0.8
MX12AB059	2.1	159.1	26.2	38.6	74	8.62	32.8	5.91	1.25	5.52	0.81	5.02	1.06	2.81	0.45	2.6	0.39	5.6	2.03	0	6.02	37.7	7.85	42.7	132	33.3	5.4
MX12AB060	1.8	174	25.7	35.2	71.3	8.29	31.4	5.67	1.12	4.7	0.77	5.04	1.05	2.93	0.45	2.78	0.39	5.1	0.62	1.1	17.45	44.6	11.2	53.3	131	28.3	17.8
MX12AB061	1.7	161.9	21.5	34.1	72.1	8.19	30.2	5.89	1.19	5.16	0.76	4.42	0.82	2.63	0.37	2.25	0.36	6.3	3.8	0.2	13.74	10.6	5.74	16.8	220	3.8	1.7
MX12AB062	2	152	27.7	36.7	77.4	8.68	32.8	6.5	1.19	5.57	0.84	4.64	1.06	2.89	0.42	2.49	0.43	7.8	3.78	1.1	38.76	39.8	15.6	44.7	477	24.3	3.5
MX12AB063	1.6	146	26.2	63.7	122	13.4	48	8.13	1.33	6.35	0.9	5.32	0.94	2.85	0.42	2.6	0.38	3.8	0.09	0	0.35	31.6	3.77	69.3	45	31.1	20.5
MX12AB064	0.9	167.2	24.3	33.5	73.1	8.62	33.8	6.57	0.99	5.41	0.83	4.56	0.96	2.53	0.37	2.47	0.37	3.2	0.06	0	0.51	12	12.8	56	15	25.2	14.2
MX12AB065	<0.5	123.3	4.3	9.3	25	2.27	8.5	1.46	0.21	1.1	0.13	0.63	0.13	0.43	0.06	0.54	0.07	0.4	0.02	0	0.46	1.49	2.38	3.4	33	1.8	1
MX12AB066	1.1	230.7	15.8	23.2	46.9	5.18	18.9	3.46	0.7	3.19	0.47	2.86	0.54	1.78	0.25	1.78	0.29	2.8	0.05	0	0.51	21	16.2	56.1	41	28.6	9.7
MX12AB067	1.3	248.4	13.1	23.1	48.8	5.45	21	3.48	0.58	2.62	0.37	2.07	0.48	1.44	0.2	1.4	0.22	2.8	0.18	0	0.22	6.81	8.05	53.7	19	22.2	11.5
MX12AB069	<0.5	55	18.5	8.8	11.4	2.31	9.9	2.41	0.55	2.77	0.45	2.85	0.56	1.67	0.22	1.54	0.23	32	9.47	0	1.15	6.93	0.51	23.8	91	7.7	0.9
MX12AB070	3.4	125.9	25.2	37.3	72.2	8.71	32.1	6.41	1.17	4.97	0.75	4.22	0.84	2.88	0.39	2.78	0.42	3.6	0.05	0	2.76	114	12	114	381	30.8	11.4
MX12AB071	<0.5	85.8	13.2	4.4	8.9	1.32	4.8	1.36	0.26	1.79	0.23	1.63	0.3	0.86	0.11	0.78	0.1	42	13	0.1	0.23	2.28	3.25	6.5	15	0.6	1.9
MX12AB072	<0.5	15.7	8.8	5.7	10.2	1.32	5.8	1.43	0.55	1.51	0.21	1.13	0.29	0.77	0.08	0.61	0.04	40	12.1	0.2	0.11	4.83	6.94	6.6	20	0.6	1.8
MX12AB073	2.6	152.4	29.1	43.7	89.5	10.34	40.9	7.31	1.53	6.08	0.92	5.37	0.97	3.16	0.4	2.89	0.42	3.6	0.03	1.6	7.57	61.6	9.86	106	391	75.5	26.2
MX12AB074	6	221.1	22.7	47.6	92.3	10.58	39	6.31	1.13	5.23	0.7	4	0.8	2.33	0.33	2.36	0.35	4.5	0.78	0.6	1.84	21.1	14.8	59.2	272	25	9.6

Sample	Ag	Ni	Co	Mn	As	Au	Cd	Sb	Bi	Cr	B	Tl	Hg	Se	Te	Ge	In	Re	Be	Li	Pd	Pt
MX12AB033	81	1.7	2.9	239	0.5	0.4	0.16	0.06	0.15	6.1	<1	0.07	<5	0.2	0.05	<0.1	<0.02	100	0.2	9	<10	<2
MX12AB034	420	1.8	4.3	711	0.5	<0.2	0.09	0.57	0.05	5	<1	0.69	<5	<0.1	<0.02	<0.1	0.02	4	0.2	29	<10	<2
MX12AB035	76	25.8	11	506	1.6	<0.2	0.03	0.03	0.14	46.8	1	0.66	<5	<0.1	0.04	<0.1	<0.02	3	0.1	34	<10	<2
MX12AB038	334	27.1	9.5	359	23	1.7	0.11	0.61	0.42	24.9	2	0.18	<5	0.1	0.05	<0.1	<0.02	45	0.7	19	<10	<2
MX12AB039	739	45.3	13.7	313	0.2	0.8	0.19	0.37	1.05	32.4	1	0.15	<5	0.5	0.2	<0.1	<0.02	2	0.7	12	<10	<2
MX12AB040	172	5.7	6.1	216	0.6	<0.2	0.3	0.14	0.29	7.2	1	0.09	<5	0.3	0.18	<0.1	<0.02	203	0.1	9.1	<10	<2
MX12AB044	427	2	6.1	208	19.3	1	0.56	0.11	0.39	7.5	2	0.12	<5	0.9	0.61	<0.1	<0.02	>1000	0.4	9	<10	<2
MX12AB048	35	91.6	35.8	1543	7.8	1.4	0.21	0.28	0.04	105	<1	<0.02	<5	0.1	<0.02	<0.1	0.02	<1	0.1	107	<10	<2
MX12AB049	58	126.9	24.2	1379	4.3	0.4	0.17	0.55	0.1	72.5	<1	<0.02	<5	<0.1	<0.02	<0.1	0.03	2	<0.1	109	<10	<2
MX12AB052	19	91.4	27.5	363	0.4	<0.2	0.08	0.12	<0.02	118	<1	0.02	<5	<0.1	<0.02	<0.1	0.02	<1	0.3	87	<10	3
MX12AB053	65	52.8	21.8	1323	16.2	<0.2	0.16	0.09	<0.02	42.4	<1	<0.02	<5	0.2	0.03	<0.1	0.02	<1	<0.1	16	<10	<2
MX12AB056	350	0.9	2.3	521	1.1	<0.2	0.15	0.22	14.8	5.2	2	0.19	<5	<0.1	<0.02	<0.1	<0.02	<1	0.1	26	<10	<2
MX12AB057	223	1	1.8	363	2.5	0.4	0.27	0.16	0.56	6.9	2	0.11	<5	<0.1	0.03	<0.1	<0.02	10	0.2	7	<10	<2
MX12AB058	436	0.6	0.8	384	23.4	0.4	1.1	0.02	1.04	4.6	2	0.12	6	<0.1	0.02	<0.1	<0.02	11	0.4	2.9	<10	<2
MX12AB059	132	33.3	5.4	1491	0.1	<0.2	0.44	0.09	0.06	3.7	<1	0.07	12	<0.1	<0.02	<0.1	<0.02	<1	0.3	2.2	<10	<2
MX12AB060	131	28.3	17.8	92	0.3	<0.2	0.26	0.16	0.23	16.2	<1	0.1	<5	1.9	0.03	<0.1	<0.02	16	0.3	28	<10	<2
MX12AB061	220	3.8	1.7	33	<0.1	<0.2	0.11	0.2	0.16	7.8	<1	0.08	<5	1.6	0.04	<0.1	<0.02	11	0.2	3	<10	<2
MX12AB062	477	24.3	3.5	57	10.5	<0.2	0.13	0.54	0.31	23	<1	0.09	12	4.2	0.18	<0.1	<0.02	23	0.2	29	<10	<2
MX12AB063	45	31.1	20.5	295	8.6	<0.2	0.02	0.09	0.09	16.8	2	0.11	<5	<0.1	<0.02	<0.1	<0.02	<1	0.4	28	<10	<2
MX12AB064	15	25.2	14.2	220	5.1	1	0.01	0.07	0.28	13	2	0.1	11	<0.1	0.04	<0.1	<0.02	<1	0.3	24	<10	<2
MX12AB065	33	1.8	1	52	1.3	0.8	<0.01	0.22	0.03	16.5	<1	<0.02	7	<0.1	<0.02	<0.1	<0.02	<1	<0.1	0.6	<10	<2
MX12AB066	41	28.6	9.7	630	13	1.1	<0.01	0.23	0.45	19.3	<1	0.05	18	<0.1	0.04	<0.1	<0.02	<1	0.2	39	<10	<2
MX12AB067	19	22.2	11.5	686	2.5	<0.2	0.05	0.04	0.2	21.1	2	0.05	<5	<0.1	<0.02	<0.1	<0.02	<1	0.2	37	<10	<2
MX12AB069	91	7.7	0.9	829	2.4	<0.2	0.28	0.1	<0.02	17.6	<1	<0.02	52	1.1	<0.02	<0.1	<0.02	<1	0.2	1.7	<10	<2
MX12AB070	381	30.8	11.4	401	56.4	<0.2	0.82	0.26	0.99	27.7	2	0.03	<5	0.4	0.17	<0.1	0.05	<1	0.9	15	<10	<2
MX12AB071	15	0.6	1.9	230	2.9	<0.2	0.03	0.08	<0.02	3	<1	0.06	<5	0.5	<0.02	<0.1	<0.02	2	0.2	6.8	<10	<2
MX12AB072	20	0.6	1.8	217	0.3	<0.2	0.02	0.11	0.05	2.1	<1	<0.02	5	0.4	0.02	<0.1	<0.02	<1	<0.1	1.1	<10	<2
MX12AB073	391	75.5	26.2	289	0.6	<0.2	0.18	<0.02	1.12	65.8	<1	0.58	<5	0.7	0.31	<0.1	<0.02	6	0.8	26	<10	<2
MX12AB074	272	25	9.6	435	11.4	0.7	0.07	0.06	0.95	10.5	2	0.21	<5	0.1	<0.02	<0.1	<0.02	<1	0.3	7.5	<10	<2

Sample	SiO2	Al2O3	Fe2O3	MgO	CaO	Na2O	K2O	TiO2	P2O5	MnO	Cr2O3	Ba	Sc	Sum	Cs	Ga	Hf	Nb	Rb	Sn	Sr	Ta	Th	U	V
MX12AB075	73.92	12.9	1.68	0.59	0.83	2.42	5.2	0.19	0.07	0.03	0.003	598	5	99.9	5.1	11.7	1.9	6.4	163	<1	163.1	0.6	7.5	3.4	34
MX12AB076	70.22	14.85	2.5	0.55	2.64	3.47	3.37	0.28	0.13	0.06	<0.002	1758	3	99.72	9.1	16.3	3.7	9.1	103	<1	521.1	0.7	7.1	4.6	31
MX12AB077	72.12	13.61	3.11	0.58	1.24	2.77	3.19	0.26	0.13	0.04	<0.002	789	3	99.87	8.2	16.5	2.9	9.5	126	<1	202.5	0.9	7.5	7.1	33
MX12AB078	68.76	15.25	2.67	0.57	2.69	3.78	3.52	0.29	0.14	0.06	<0.002	1215	3	99.78	6.4	17.5	3.2	11	105	<1	540.4	1.2	6.6	6.9	31
MX12AB079	70.5	14.67	3.07	0.58	2.93	3.85	2.35	0.27	0.12	0.05	0.002	1592	3	99.67	4.1	17.7	3.7	9.5	58.1	<1	625	0.7	7.3	8.8	37
MX12AB080	69.45	15.15	2.67	0.55	2.88	3.63	3.64	0.28	0.13	0.04	0.003	1178	3	99.77	4.3	17.2	3.5	14	88.4	<1	613.3	1.1	7.2	6.7	30
MX12AB081	65.33	16.98	3.99	0.86	3.69	4.24	2.85	0.44	0.2	0.07	0.003	1145	4	99.74	5.7	20.4	4	16	93.8	1	674.9	0.7	9.4	4.8	37
MX12AB082	94.02	1	2.66	0.07	0.67	0.26	0.28	0.03	0.01	0.02	0.002	63	<1	100.01	0.4	2.1	0.2	0.5	7.7	<1	27.8	<0.1	1.3	1.7	12
MX12AB083	67.78	15.44	3.22	0.72	2.9	3.7	3.31	0.35	0.16	0.06	0.003	1307	4	99.75	8.5	19.2	3.7	10	109	<1	595	0.9	8.4	6.4	33
MX12AB085	67.67	15.41	2.86	0.75	2.89	3.74	3.53	0.31	0.15	0.05	<0.002	1375	3	99.74	10.2	16.6	3.6	14	111	<1	562.6	1.1	8.4	7.3	19
MX12AB086	66.84	19.29	0.57	0.06	0.21	7.48	4.69	0.05	0.01	<0.01	<0.002	482	1	99.89	3.5	16.4	2.7	9.3	127	<1	227.7	1.9	11.8	26.2	<8
MX12AB087	68.98	15.2	2.99	0.66	2.97	3.66	2.99	0.32	0.15	0.07	<0.002	1124	4	99.74	8.5	16.8	4.3	12	93.6	<1	600.9	0.9	8.9	7	20
MX12AB088	68.89	15.38	3.3	0.71	3.15	3.65	2.61	0.35	0.14	0.07	<0.002	1183	3	99.71	6.1	17.1	4.7	13	76.8	<1	610.7	0.8	7.7	5.9	24
MX12AB089	88.95	3.62	3	0.19	1.03	0.99	0.41	0.09	0.15	0.02	<0.002	191	<1	99.88	0.8	3.8	1.1	2.7	14.5	<1	173.5	0.3	2.7	2.2	<8
MX12AB090	55.3	11.94	6.08	3.26	6.14	0.03	3.95	0.71	0.18	0.14	0.015	337	13	99.79	23.7	13.3	3.2	12	199	<1	303.1	0.9	11.2	4.7	104
MX12AB091	42.86	7.33	6.21	6.78	13.3	0.02	2.43	0.71	0.12	0.22	0.025	190	9	99.75	16.4	12.2	1.6	7.3	142	3	522.1	0.4	2.2	1.4	55
MX12AB092	84.9	6.54	2.52	0.91	0.73	1.65	1.56	0.28	0.05	0.04	0.005	239	4	99.92	4.5	6.5	5	5.4	65.3	<1	113.7	0.4	8.5	2.1	32
MX12AB093	72.62	13.58	2.03	0.53	1.34	2.91	3.28	0.24	0.14	0.04	<0.002	717	3	99.85	5	13.3	3.5	10	120	<1	213.4	0.6	6.6	5.8	13
MX12AB094	69.88	13.78	2.98	0.52	2.32	2.96	3.91	0.25	0.12	0.04	<0.002	1313	3	99.76	12.1	13.9	2.6	9.3	112	<1	444.2	0.8	6.7	5.5	25
MX12AB096	66.68	15.96	4.24	0.9	3.99	3.87	1.82	0.44	0.25	0.07	<0.002	1114	4	99.7	6.7	20.8	4	17	72.2	<1	784.9	0.7	6	4.4	39

Sample	W	Zr	Y	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	LOI	TOT/C	TOT/S	Mo	Cu	Pb	Zn	Ag	Ni	Co
MX12AB075	3.9	71.9	16.1	16	33.2	3.87	13.9	3.05	0.74	2.63	0.4	2.77	0.5	1.51	0.21	1.44	0.2	2.1	0.31	0.5	19.55	3.52	33.4	20.3	463	5.8	2.8
MX12AB076	1.2	136	11.3	22.4	46.3	5.54	23.5	4.1	1.07	3.1	0.38	1.98	0.3	1.05	0.12	1.09	0.1	1.7	0.24	0.3	4.52	11.2	8.97	55	160	1.2	1.9
MX12AB077	18.2	121	10.1	21.7	43.5	5.32	20.7	4.15	0.77	3.11	0.39	2.02	0.3	0.94	0.12	0.85	0.1	2.8	0.38	1.3	3.13	2.56	9.43	8.6	337	1.1	2.6
MX12AB078	3.6	122	13.8	20.6	41.5	5.15	21.3	3.95	1.07	3.11	0.41	2.46	0.4	1.05	0.15	1.04	0.2	2.1	0.29	0.3	2.82	10.8	9.68	62.5	119	1.2	2
MX12AB079	<0.5	130	10.9	23	47.2	5.64	23.2	3.92	1.01	3.12	0.37	2.4	0.3	1.04	0.13	0.95	0.1	1.3	0.06	0.4	356.8	14.4	6.66	49.8	104	1.1	2.5
MX12AB080	1.9	136	11.8	24.3	47.8	5.91	23	4.08	1.1	2.95	0.38	2.09	0.4	1.11	0.14	1.08	0.2	1.4	0.14	0.4	46.65	27.3	6.76	36.4	86	0.8	2
MX12AB081	18.2	169	12	33.8	65.8	7.79	29.6	5.2	1.26	3.67	0.46	2.11	0.4	1.08	0.13	0.99	0.1	1.1	0.04	0.6	1.03	35.9	7.63	54.6	154	1.2	3.2
MX12AB082	0.9	12.5	1.5	3.5	6.7	0.76	2.8	0.45	0.04	0.44	0.04	0.3	<0.02	0.13	<0.01	0.15	<0.01	1	0.14	0.9	155.3	82	2.6	6.9	139	8.6	7.1
MX12AB083	2.1	134	10.7	27	55.5	6.64	27.7	4.61	1.23	3.41	0.39	2.1	0.4	0.81	0.11	0.81	0.1	2.1	0.25	0.4	1.39	13.5	8.36	51.9	104	1.5	2.9
MX12AB085	3.6	120	10.1	25.9	56	6.11	25.3	4.73	1.18	3.5	0.45	2.03	0.4	0.83	0.15	1.1	0.2	2.4	0.3	0.3	0.26	12.3	7.62	46.7	88	1.4	2.8
MX12AB086	5.5	41.3	16.7	11.7	28.6	3.25	14	3.74	0.42	3.17	0.54	2.8	0.6	1.42	0.22	1.44	0.2	0.7	0.05	0.2	159.9	2.94	3.3	1.4	117	0.5	0.5
MX12AB087	0.9	122	13.1	28.8	60	6.88	29.3	4.97	1.15	3.63	0.48	2.78	0.4	1.2	0.18	1.15	0.2	1.8	0.15	0.2	1.07	9.53	8.38	66.2	57	1.1	2.3
MX12AB088	<0.5	127	11	26	54.9	6.37	24.4	4.82	1.25	3.5	0.46	2.55	0.4	1.12	0.15	1.01	0.2	1.5	0.11	0.1	249.8	7.64	5.4	61.1	31	1.1	2.3
MX12AB089	2	28.3	7.1	13.4	29	3.32	12.9	2.59	0.7	1.92	0.29	1.56	0.3	0.66	0.11	0.67	0.1	1.4	0.16	1	537.2	61.2	1.98	15.9	119	1.5	5.7
MX12AB090	12	107	23.4	33.9	71.5	8.03	32.9	5.92	1.28	5.21	0.82	4.66	0.9	2.62	0.41	2.89	0.4	12	3.41	1.8	4.98	64.9	11.2	53.5	608	68.3	20.3
MX12AB091	65.4	47.6	11.9	8.8	17.8	2.1	8.4	2.23	1.02	2.47	0.41	2.27	0.5	1.3	0.17	0.96	0.1	20	5.81	0.7	5.22	3.45	6.19	13.9	220	94.1	22.5
MX12AB092	2.2	181	12.1	20.2	44.8	4.43	16.8	3.11	0.66	2.55	0.4	2.11	0.4	1.18	0.2	1.02	0.2	0.7	0.05	0.1	24.34	6.02	3.28	33.6	22	13.8	4.2
MX12AB093	8.2	109	10.7	21.1	44.1	5.05	19.2	3.82	0.82	3	0.38	2.03	0.4	0.88	0.13	0.89	0.1	3.1	0.37	1.1	37.21	6.38	9.76	24.5	416	1.4	2.1
MX12AB094	3.4	106	9.8	23.3	46.9	5.15	20.2	3.51	0.92	2.69	0.35	1.83	0.3	0.86	0.14	0.72	0.1	3	0.43	0.6	78.66	28.7	11.4	35.8	228	1.7	3.2
MX12AB096	0.8	161	10	24.6	48.5	5.98	23.2	4.17	1.19	3	0.41	1.82	0.3	1.01	0.13	1.06	0.1	1.5	0.11	0.3	119.2	23.4	2.94	74.3	68	1.6	4.3

Sample	Mn	As	Au	Cd	Sb	Bi	Cr	B	Tl	Hg	Se	Te	Ge	In	Re	Be	Li	Pd	Pt
MX12AB075	273	59.7	2.1	0.14	0.15	0.72	6.2	3	0.1	<5	<0.1	<0.02	<0.1	<0.02	<1	0.2	1.5	<10	<2
MX12AB076	452	2.6	<0.2	0.14	0.09	0.33	6.1	2	0.08	6	<0.1	<0.02	<0.1	<0.02	<1	0.3	9.1	<10	<2
MX12AB077	281	83.7	1.9	0.07	0.19	0.91	5.9	4	0.15	<5	0.2	0.03	<0.1	<0.02	<1	0.7	1.6	<10	<2
MX12AB078	423	1.4	0.6	0.28	0.05	0.35	5.2	3	0.13	<5	<0.1	0.02	<0.1	<0.02	<1	0.4	12	<10	<2
MX12AB079	375	0.5	<0.2	0.13	0.02	0.21	6	2	0.1	<5	0.1	0.04	<0.1	<0.02	35	0.2	14	<10	<2
MX12AB080	312	0.6	<0.2	0.09	0.05	0.31	5.5	2	0.06	<5	<0.1	0.06	<0.1	<0.02	2	0.2	12	<10	<2
MX12AB081	420	1.1	0.4	0.14	0.04	0.57	5.6	<1	0.25	<5	0.2	<0.02	<0.1	<0.02	1	0.2	20	<10	<2
MX12AB082	142	2.6	0.3	0.14	0.1	1.75	11.8	<1	0.02	6	0.1	0.04	<0.1	<0.02	3	<0.1	1.9	26	<2
MX12AB083	402	10.3	<0.2	0.04	0.08	0.39	7.5	2	0.09	5	<0.1	<0.02	<0.1	0.02	<1	0.2	14	<10	<2
MX12AB085	420	0.9	<0.2	0.07	0.05	0.3	3.5	2	0.06	5	<0.1	<0.02	<0.1	<0.02	<1	0.6	15	<10	<2
MX12AB086	42	9.4	<0.2	0.21	0.04	0.18	1.2	1	0.03	<5	<0.1	<0.02	<0.1	<0.02	2	0.1	0.6	49	<2
MX12AB087	555	0.4	<0.2	0.05	0.02	0.23	2.6	1	0.1	7	<0.1	<0.02	<0.1	<0.02	<1	0.4	13	<10	<2
MX12AB088	514	0.4	<0.2	0.31	0.03	0.07	3.1	2	0.13	<5	<0.1	<0.02	<0.1	<0.02	10	0.4	17	*	<2
MX12AB089	168	0.4	<0.2	0.84	0.03	0.4	3.7	2	0.04	9	0.6	0.09	<0.1	<0.02	197	<0.1	3.6	*	<2
MX12AB090	1019	194	<0.2	0.26	0.75	0.85	13.5	6	0.23	<5	1	0.1	<0.1	0.03	14	1.1	2	<10	<2
MX12AB091	1590	238	8.2	0.08	0.95	1.86	19.8	8	0.17	<5	0.3	0.11	<0.1	0.06	9	1.1	1.7	<10	<2
MX12AB092	318	1.1	<0.2	0.03	0.03	0.05	32.1	<1	0.42	7	<0.1	<0.02	<0.1	<0.02	<1	<0.1	21	<10	<2
MX12AB093	314	126	9.7	0.47	0.48	1.95	2.8	10	0.14	<5	<0.1	0.15	<0.1	<0.02	3	0.4	1.3	14	<2
MX12AB094	307	15.7	2.1	0.27	0.11	0.74	3.8	7	0.15	<5	0.2	<0.02	<0.1	<0.02	5	0.2	6.8	24	<2
MX12AB096	524	0.9	2.5	0.1	0.06	0.83	3.2	<1	0.29	<5	0.4	0.04	<0.1	0.03	10	0.2	20	36	<2

Oxides are reported in weight %

Au, Pt, Pd are reported in ppb

All other elements are reported in ppm

Appendix 4: Quartz mineral chemistry by LA-ICP-MS

Sample	Distance (m)	Type	Li7	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	Ti49	V51	Cr53
MX12AB002-1	5352.9	H	<0.15569	28.217081	2.6410563	74.680599	462791	35.531426	<79.1546	0.5504339	0.5740911	<0.064544	0.3434995
MX12AB002-2	5352.9	H	0.1223965	9.145612	0.3492104	20.574622	462791	6.3783623	<87.3038	0.9414316	<0.43898	<0.050923	<0.47937
MX12AB002-3	5352.9	H	<0.10224	24.245724	0.8517476	30.545445	462791	11.685596	<106.5435	0.54421	0.631071	<0.056471	<0.451
MX12AB002-4	5352.9	H	<0.14497	23.902878	0.7651445	64.664365	462791	27.17068	<92.497	0.8848067	0.6738705	<0.0701	<0.49574
MX12AB002-5	5352.9	H	<0.16078	7.6742763	1.382173	35.317909	462791	9.0495686	<125.0151	0.57591	0.7415966	<0.063652	<0.5893
MX12AB002-6	5352.9	H	<0.11669	56.875621	3.0976856	108.19859	462791	49.51312	73.796074	1.1578037	<0.47235	<0.065695	<0.49136
MX12AB002-7	5352.9	H	<0.15027	36.649206	0.8547005	76.371922	462791	35.062008	<109.4478	0.66095	<0.61195	<0.064438	<0.56667
MX12AB002-8	5352.9	H	<0.18757	86.7112	1.9740219	64.172485	462791	28.84568	<118.6733	1.0180841	0.8231345	<0.085947	<0.74997
MX12AB002-9	5352.9	H	1.7362555	50.246029	0.9743209	111.77137	462791	37.05182	<156.538	0.57853	<0.70579	<0.058981	<0.33937
MX12AB002-10	5352.9	H	<0.12605	79.928605	1.6145977	51.011985	462791	33.269586	<100.4029	1.7494403	0.7223506	<0.057349	<0.42558
MX12AB003-1	628.4	H	26.704431	<4.8529	795.38527	287.99528	462791	9.0793013	2186.2544	1.8486543	0.6548163	0.2692056	<0.49474
MX12AB003-2	628.4	H	20.215031	<5.7066	171.03892	247.97989	462791	<4.0735	370.27624	0.73761	0.8340379	<0.069861	<0.67536
MX12AB009-1	359.9	H	1.6089028	144.80731	1.6601632	357.02575	462791	4.4228162	<131.1595	19.833635	18.171944	<0.043542	0.447782
MX12AB009-2	359.9	H	5.8659154	8.8294041	0.1635106	100.25654	462791	13.224648	<42.4073	40.882362	41.05024	<0.042543	1.1428864
MX12AB009-3	359.9	H	4.7487563	4.2966989	0.1244542	64.469057	462791	2.4628556	<56.8797	29.556158	29.533068	<0.028535	<0.3012
MX12AB009-4	359.9	H	2.514904	7.7186403	0.1241914	70.626939	462791	15.26629	<50.5616	30.517283	29.962948	<0.028523	<0.24699
MX12AB009-5	359.9	H	4.4707123	7.2894076	0.0939608	53.9318	462791	1.4576396	<44.4316	27.093018	27.649179	<0.027743	<0.22959
MX12AB009-6	359.9	H	6.9193683	<4.1643	<0.087725	80.127478	462791	2.5828458	<72.8055	40.645201	41.074844	<0.025263	3.7705491
MX12AB009-7	359.9	H	6.7672906	14.272584	0.4270422	80.760463	462791	<1.2735	<71.0133	30.053325	29.487971	<0.029884	1.7326646
MX12AB009-8	359.9	H	7.1093224	11.535788	0.5275696	88.164483	462791	3.7670187	<78.0969	38.628761	39.789444	<0.019244	1.3198327
MX12AB009-9	359.9	H	1.6507941	5.9564271	0.1710741	106.14708	462791	26.210115	<80.6694	46.984906	48.36829	<0.03644	<0.49475
MX12AB010-1	446.4	M	0.18721	<6.339	<0.20429	12.479307	462791	<3.595	<158.2451	0.8757508	0.6303698	<0.079702	<0.44163
MX12AB010-2	446.4	M	0.2127519	<5.1157	1.4032112	37.319149	462791	13.488436	<133.3106	1.1248624	0.8147786	<0.072996	1.0420872
MX12AB010-3	446.4	M	0.22595	<6.7838	0.2635011	11.072494	462791	<3.3244	<142.0545	0.67391	0.9788433	0.0870667	<0.49086
MX12AB010-4	446.4	M	0.2639862	<4.8024	0.5426386	19.617903	462791	4.9750092	<85.7402	0.50472	0.5466946	<0.068225	<0.47993
MX12AB010-5	446.4	M	0.2522996	<6.0326	0.6529204	16.871117	462791	3.5503912	<139.1819	0.853741	<0.70877	<0.076093	<0.53491
MX12AB010-6	446.4	M	0.21635	<6.4378	0.7465522	42.529922	462791	<2.805	<195.3619	0.76181	1.0807927	<0.068819	<0.4457

Sample	Distance (m)	Type	Li7	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	Ti49	V51	Cr53
MX12AB010-7	446.4	M	0.5822462	<4.598	<0.10815	10.379629	462791	<2.1726	<98.2507	0.670963	0.7304926	<0.064242	<0.43987
MX12AB010-8	446.4	M	0.18279	<6.3703	3.6487355	87.475516	462791	33.122046	<127.0039	1.2602283	1.5727939	<0.084679	<0.57354
MX12AB010-9	446.4	M	0.17151	<4.1885	0.2907367	13.426699	462791	<1.7954	<129.7116	0.814371	1.0862896	<0.084502	<0.69399
MX12AB010-10	446.4	M	0.20173	<6.5598	1.0525661	25.756836	462791	9.5821473	<116.7136	1.794522	1.4038782	0.0968426	<0.70801
MX12AB010-11	446.4	M	0.13379	<4.231	<0.11245	12.088343	462791	<2.1644	<100.7939	0.69024	0.9014323	<0.04999	<0.49065
MX12AB010-12	446.4	M	0.14369	<4.5114	0.1863983	12.493004	462791	<2.4319	<87.6919	1.6831395	1.2655143	<0.075552	<0.33898
MX12AB011-1	733.9	M	0.15132	<5.0849	0.5810295	26.687553	462791	10.411002	<96.298	1.2077866	1.4328752	<0.069432	<0.57493
MX12AB011-2	733.9	M	0.12181	<5.0489	1.1701753	12.199509	462791	<3.5083	<143.8214	0.61771	<0.53041	<0.083459	<0.80619
MX12AB011-3	733.9	M	0.21186	<5.4977	0.7235572	5.8853588	462791	<2.6135	<112.845	1.3352921	1.8708599	<0.085503	<0.70858
MX12AB011-4	733.9	M	0.17303	<5.2022	0.4430025	8.4875487	462791	<2.0184	<101.0221	1.0992063	<0.47982	<0.085101	<0.43335
MX12AB011-5	733.9	M	0.13023	<5.0167	0.2677971	8.5373559	462791	<2.016	<125.7854	1.2159558	0.5723057	<0.054763	<0.38886
MX12AB011-6	733.9	M	0.13881	<4.2288	0.1073826	6.241947	462791	<1.6446	<97.2793	0.53877	<0.54097	<0.046357	<0.34716
MX12AB011-7	733.9	M	0.18413	<6.4578	0.2512129	4.4884361	462791	<3.0972	<125.7795	1.2908272	0.8026623	<0.11995	<0.43035
MX12AB011-8	733.9	M	0.14498	<4.1583	0.1401722	10.430299	462791	<2.7684	<156.3074	1.0485428	0.9492436	<0.051194	<0.49762
MX12AB012-1	1301.1	H	0.4814207	<4.8844	0.5726805	35.222044	462791	<2.6835	<103.5135	<0.58951	<0.64886	<0.053715	<0.54626
MX12AB012-2	1301.1	H	<0.13814	<4.8968	0.2079619	24.410552	462791	<2.3049	<83.4204	0.3954875	<0.47283	<0.048027	<0.52479
MX12AB012-3	1301.1	H	0.3659293	17.001829	<0.11428	78.07976	462791	4.5055629	<124.9965	0.8913418	0.8270239	<0.064059	<0.47938
MX12AB012-4	1301.1	H	0.974124	9.4312048	0.3510265	69.028217	462791	4.0065021	<100.9474	0.7982077	0.8446619	<0.0512	<0.49267
MX12AB012-5	1301.1	H	<0.17829	7.7994396	0.5695181	34.227803	462791	<2.5676	<106.0779	1.1613808	1.0733921	<0.086089	<0.45829
MX12AB012-6	1301.1	H	<0.16529	<4.9212	<0.11707	30.050616	462791	<2.5471	<118.9237	0.9621865	0.9217107	<0.054005	<0.53285
MX12AB012-7	1301.1	H	0.313467	<4.9151	0.4520219	49.396443	462791	<2.1586	<100.7594	2.0671274	1.5313399	<0.061339	<0.46053
MX12AB012-8	1301.1	H	<0.1648	<4.3215	0.3233514	32.933286	462791	<2.3306	<118.9515	1.367189	1.2916426	<0.079737	<0.72436
MX12AB012-9	1301.1	H	<0.15044	<4.1773	0.2657939	16.636863	462791	<1.6638	<105.1673	0.7670007	0.5653714	<0.070429	0.4310563
MX12AB012-10	1301.1	H	<0.12164	<4.1337	0.1669318	34.82956	462791	<1.9579	<101.5557	1.5277793	1.1820656	<0.06032	<0.53527
MX12AB013-1	1201.2	M	0.15496	<4.3144	0.2367299	10.864931	462791	<2.4771	<103.1285	0.63808	<0.5661	<0.076022	<0.53737
MX12AB013-2	1201.2	M	0.2991041	<4.3968	<0.10964	10.301488	462791	<2.0229	<102.5465	0.43193	<0.32925	<0.046809	<0.41275
MX12AB013-3	1201.2	M	0.11591	<4.6486	<0.11561	12.652791	462791	<2.2907	<100.5971	0.6788601	<0.43831	<0.065714	<0.56304
MX12AB013-4	1201.2	M	0.1541	<5.9529	<0.12568	12.602618	462791	<2.1015	<95.7626	0.72721	<0.69738	<0.078358	<0.49765
MX12AB013-5	1201.2	M	0.20678	<5.8464	<0.14408	12.014809	462791	<3.1253	<133.4989	0.8916485	0.6125735	<0.063066	<0.4184
MX12AB013-6	1201.2	M	0.17722	<5.2019	0.3119033	10.130469	462791	<3.0667	<95.6876	1.0004839	<0.48392	<0.067178	<0.47308

Sample	Distance (m)	Type	Li7	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	Ti49	V51	Cr53
MX12AB013-7	1201.2	M	0.16672	<5.2924	<0.12959	12.191435	462791	<2.714	<124.5461	0.6001999	<0.49806	<0.07368	<0.62759
MX12AB013-8	1201.2	M	0.16385	<5.3873	<0.11724	8.5467569	462791	<2.6453	<113.6689	1.2639492	0.698042	<0.058023	<0.52868
MX12AB013-9	1201.2	M	0.14748	<4.5802	<0.18822	17.996739	462791	<2.227	<121.2351	0.65295	<0.47975	<0.074022	<0.57836
MX12AB013-10	1201.2	M	0.12804	<4.4784	<0.12744	16.448753	462791	<1.8975	<116.9486	0.6219	<0.66171	<0.066431	<0.40534
MX12AB013-11	1201.2	M	0.16132	<5.5942	0.2805365	14.51729	462791	<1.9949	<67.2733	0.38838	0.4923673	<0.063178	0.968054
MX12AB014-1	1101.2	H	0.0643063	13.425078	0.9173856	7.5071058	462791	5.2428841	<100.3989	<0.52318	<0.5603	<0.043966	<0.41507
MX12AB014-2	1101.2	H	0.598307	<3.9211	<0.070139	9.5475933	462791	<1.3872	<71.0067	0.3794225	<0.42683	<0.040434	<0.37601
MX12AB014-3	1101.2	H	<0.047441	<3.7449	0.1060294	7.5258351	462791	<1.0391	<67.395	<0.33829	<0.37758	<0.031333	0.7804749
MX12AB014-4	1101.2	H	<0.049642	10.701259	<0.091119	6.6084045	462791	1.3831698	<46.1324	<0.22944	<0.20494	<0.03145	0.283505
MX12AB014-5	1101.2	H	<0.065199	6.6092515	0.1126824	6.827669	462791	1.8101549	<80.1702	0.3049019	0.3684772	<0.051312	<0.23831
MX12AB014-6	1101.2	H	0.0875494	<4.0335	<0.114	8.7449709	462791	<1.4855	<44.6587	<0.42235	<0.38719	<0.036431	<0.30396
MX12AB014-7	1101.2	H	0.0558199	5.1920941	0.2088268	6.3631546	462791	<1.3754	<53.8372	0.3772577	<0.3947	<0.026149	<0.26272
MX12AB014-8	1101.2	H	7.0755694	4.7828964	0.1872297	75.001438	462791	<1.5761	<69.2595	1.5227908	0.8309871	<0.030481	3.7672849
MX12AB014-9	1101.2	H	5.867816	73.973165	0.1866969	133.15574	462791	2.2915045	<68.5024	0.547572	<0.41873	<0.046619	0.3558127
MX12AB015-1	1001.5	M	0.14384	<5.7865	<0.14661	7.9898703	462791	<2.4412	<79.9626	0.706016	<0.50956	<0.072845	<0.46039
MX12AB015-2	1001.5	M	0.22126	<4.6947	0.3214598	8.630437	462791	<2.1996	<139.9613	0.67534	<0.51441	<0.099409	0.3890252
MX12AB015-3	1001.5	M	0.23372	21.572732	0.6282896	36.082151	462791	15.307112	<142.3766	0.88436	0.5866047	<0.074584	<0.71012
MX12AB015-4	1001.5	M	0.16725	<5.8216	<0.14592	7.9494261	462791	<2.6287	<121.0684	0.66549	<0.41577	<0.054827	<0.41909
MX12AB015-5	1001.5	M	0.15768	<4.8576	<0.15187	7.9532168	462791	<2.7374	<122.4314	0.67568	<0.4429	<0.069437	<0.62474
MX12AB015-6	1001.5	M	0.17965	<5.4859	<0.10469	6.6327091	462791	<2.4919	<79.1431	0.9813039	0.6513608	<0.064024	<0.51393
MX12AB015-7	1001.5	M	0.18233	<6.6585	0.4693187	9.7118222	462791	<2.8435	<142.5214	0.62366	<0.78222	<0.090627	<0.64354
MX12AB016-1	902.0	M	0.29827	12.360927	1.4366216	22.131163	462791	8.6124755	<209.3215	0.86991	<0.90775	<0.13326	<0.74557
MX12AB016-2	902.0	M	0.19264	<5.8503	0.5856419	11.498032	462791	2.377584	<125.5292	1.4364725	1.2905939	<0.074913	<0.61757
MX12AB016-3	902.0	M	0.21483	<6.4191	0.2307366	9.2215662	462791	<3.1389	<108.5743	0.76261	0.6956918	<0.089208	<0.54447
MX12AB016-4	902.0	M	0.12623	<6.3272	0.2483451	9.195807	462791	<2.7862	<88.5258	0.8555594	0.9951527	<0.078269	<0.56783
MX12AB016-5	902.0	M	0.24194	<7.3635	<0.16719	5.7577997	462791	<3.7907	<152.2034	1.0929533	0.6521501	<0.089895	<0.53042
MX12AB016-6	902.0	M	0.464908	<4.6251	0.2804433	13.430792	462791	<2.8016	<168.7162	0.63985	0.9862898	<0.070668	<0.54846
MX12AB016-7	902.0	M	0.483475	<5.2794	0.3384258	11.615426	462791	<2.7269	<112.7602	0.6659452	<0.65945	<0.065554	<0.35266
MX12AB016-8	902.0	M	0.1201	<5.422	0.1635874	11.520107	462791	<2.1864	<122.7243	0.7292	<0.42512	<0.096669	<0.68348
MX12AB016-9	902.0	M	0.15075	17.861253	1.6070088	16.332735	462791	4.6779299	<133.5534	0.77498	<0.64469	<0.076849	<0.59951

Sample	Distance (m)	Type	Li7	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	Ti49	V51	Cr53
MX12AB016-10	902.0	M	0.20767	<7.4618	0.5698807	11.480245	462791	<2.5981	<117.8074	0.5933	<0.66332	<0.074081	<0.54946
MX12AB016-11	902.0	M	0.15623	<4.9059	0.6676305	8.4287694	462791	<2.739	<102.2265	0.78158	0.4704228	<0.085383	<0.57342
MX12AB016-12	902.0	M	0.16663	<5.7408	0.6431576	13.817048	462791	<2.5754	<164.6449	0.9650456	0.8669284	<0.074872	<0.55923
MX12AB017-1	802.5	M	0.14597	<5.4742	<0.17196	7.159651	462791	<2.7089	<145.3265	0.83467	<0.51695	<0.063506	<0.55659
MX12AB017-2	802.5	M	0.16876	<5.4306	0.6046608	10.383609	462791	<3.0752	<133.7696	0.76516	<0.43931	<0.093348	<0.6257
MX12AB017-3	802.5	M	0.18096	29.83779	<0.19865	11.48937	462791	9.3584052	<127.1441	1.0097	<0.64628	<0.097503	<0.5625
MX12AB017-4	802.5	M	0.2368	50.309311	0.2527163	10.607839	462791	7.4628996	<192.1875	0.77498	<0.70355	<0.094047	<0.77113
MX12AB018-1	703.4	H	5.3491194	<5.4417	0.327756	59.217255	462791	5.2808826	<109.4959	1.0084359	1.1157365	<0.061383	<0.4061
MX12AB018-2	703.4	H	1.5501348	<6.0051	0.7666991	46.063856	462791	4.4179867	<122.3762	<0.99768	1.1375032	<0.081612	<0.59115
MX12AB018-3	703.4	H	2.6656354	<8.6252	0.6581005	31.398341	462791	<4.4581	<207.6171	<0.79477	0.554655	<0.094182	<1.0761
MX12AB018-4	703.4	H	2.8211126	<6.1439	0.2537979	33.465733	462791	<3.165	<119.0017	0.5392056	<0.72327	<0.08656	<0.45231
MX12AB018-5	703.4	H	4.1946811	<6.7099	0.2554795	41.927379	462791	<2.1075	<101.1092	<0.71729	<0.48089	<0.063705	<0.38988
MX12AB018-6	703.4	H	3.3768846	<5.8936	0.2102621	35.171371	462791	<2.5598	<146.7806	0.7067845	0.7117881	<0.075383	0.4489967
MX12AB018-7	703.4	H	3.2263126	<6.0543	0.6985675	40.234794	462791	<3.1998	<117.9709	<0.62549	<0.6399	<0.099263	<0.83206
MX12AB018-8	703.4	H	4.0313555	<6.6014	0.4489725	55.350868	462791	<2.8453	<133.1304	1.8060338	2.0776054	<0.096858	1.6144265
MX12AB018-9	703.4	H	5.8186391	<7.8299	<0.17264	61.991893	462791	<2.934	<105.0864	2.1593372	1.3834235	<0.065036	<0.44876
MX12AB019-1	604.8	H	0.8045496	44.703705	0.1699705	61.113595	462791	14.49872	<119.1684	11.588749	10.792566	<0.060722	<0.45609
MX12AB019-2	604.8	H	1.8595354	49.788836	<0.12828	77.550518	462791	12.468343	<117.2588	16.569158	15.90618	<0.080784	0.8768765
MX12AB019-3	604.8	H	3.9431098	21.985779	0.154673	83.153023	462791	7.174649	<117.1597	18.558106	18.170818	<0.062805	<0.67208
MX12AB019-4	604.8	H	0.304247	31.291941	<0.13297	29.136224	462791	<2.8728	<185.3641	4.5641486	4.8663528	<0.082357	<0.69216
MX12AB019-5	604.8	H	1.4784526	25.018817	0.1543627	50.235109	462791	5.9858235	<129.8084	11.955737	11.409757	<0.068561	<0.37145
MX12AB019-6	604.8	H	0.9399847	28.265245	<0.13388	68.003698	462791	15.823585	<110.8461	14.258706	12.982908	<0.057323	<0.4581
MX12AB019-7	604.8	H	0.4212698	45.010482	0.1901654	82.261852	462791	11.27269	<122.4715	17.493335	17.16573	<0.059242	<0.40502
MX12AB019-8	604.8	H	0.1871	38.004757	<0.17569	69.571365	462791	21.807686	<149.1233	16.350318	15.862036	<0.061093	0.615179
MX12AB019-9	604.8	H	0.8011733	33.638454	0.2129049	66.333823	462791	7.3069322	<123.4461	9.6931487	8.3755573	<0.076684	<0.55194
MX12AB019-10	604.8	H	1.2289993	60.245638	<0.11742	77.60839	462791	7.42382	<107.481	8.4462289	8.5096891	<0.04888	<0.47055
MX12AB019-11	604.8	H	0.17423	25.376869	<0.13209	10.590042	462791	<2.2404	<111.5591	<0.80585	<0.49575	<0.068087	<0.41799
MX12AB022-1	2824.7	H	<0.22227	<7.4008	0.2027895	5.0536633	462791	<3.8612	<159.4365	<0.81565	0.7665248	<0.083186	<0.73076
MX12AB022-2	2824.7	H	<0.18081	<6.4085	0.7389696	7.3214366	462791	<3.6674	<104.0174	0.8066858	0.8314332	<0.068996	<0.70856
MX12AB022-3	2824.7	H	<0.20466	<6.7711	1.9529683	23.143276	462791	9.4633188	<148.6302	1.6787135	<0.60978	<0.11221	<0.89534

Sample	Distance (m)	Type	Li7	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	Ti49	V51	Cr53
MX12AB022-4	2824.7	H	<0.24581	<8.362	0.8866498	7.2649463	462791	<3.3214	<163.8154	<1.1156	0.9506953	<0.10042	<0.71788
MX12AB023-1	537.8	H	3.3845111	44.198266	0.1394428	54.585837	462791	8.3495934	<61.3799	17.002993	18.442953	<0.033706	<0.30771
MX12AB023-2	537.8	H	0.2963367	39.902313	0.6533344	18.673299	462791	<1.2795	<58.4914	5.3305745	5.9397216	<0.025678	<0.39389
MX12AB023-3	537.8	H	6.2372326	10.087044	0.0913733	58.790474	462791	3.8908622	<71.3962	20.374562	20.801663	<0.028049	<0.26331
MX12AB023-4	537.8	H	4.1191685	28.39862	<0.075176	48.981277	462791	2.1484433	<61.7137	17.247562	17.112758	<0.038433	<0.28728
MX12AB023-5	537.8	H	0.0934556	8.0471401	0.927519	27.542338	462791	2.3334206	<59.1805	19.765239	20.636359	0.0296356	<0.32744
MX12AB023-6	537.8	H	6.2975206	15.427744	0.4782444	67.856599	462791	7.0460225	<82.3474	16.741413	16.830765	<0.036961	0.6063066
MX12AB023-7	537.8	H	0.9369514	18.965237	0.1481882	24.309994	462791	<1.743	<99.9264	7.9236217	8.1616054	<0.049761	<0.38033
MX12AB023-8	537.8	H	8.5593399	<3.2948	0.3068025	161.22638	462791	44.422891	<47.4982	38.736164	38.089184	<0.024104	3.7119444
MX12AB024-1	481.9	H	0.9076857	56.408517	0.448881	52.217287	462791	6.3072786	<99.7691	14.733895	14.80518	<0.040841	<0.32403
MX12AB024-2	481.9	H	0.3482788	5.72572	<0.072266	38.904311	462791	2.7811143	<69.9384	14.838357	15.429809	<0.029449	<0.27664
MX12AB024-3	481.9	H	0.8020214	6.5726372	0.3066643	42.038686	462791	2.1414427	<118.3879	13.572879	13.215442	<0.039641	<0.48537
MX12AB024-4	481.9	H	8.575794	<3.6798	0.1549274	88.903438	462791	6.9519855	<107.7676	14.179583	13.109304	<0.047035	0.779675
MX12AB024-5	481.9	H	9.5231049	<4.5817	0.2748124	105.59293	462791	11.021407	<82.9179	20.802587	20.037585	<0.042703	<0.6034
MX12AB024-6	481.9	H	4.9678479	<3.8152	0.096287	42.34414	462791	<1.5029	<104.545	12.230705	12.852891	0.0239545	<0.31588
MX12AB024-7	481.9	H	1.3844645	<3.9223	0.0964542	34.712282	462791	5.111273	<79.34	13.146965	13.532914	<0.039662	<0.26117
MX12AB024-8	481.9	H	8.6606193	<4.3554	0.1946724	74.63775	462791	<1.8065	<93.886	19.185132	19.790941	<0.039708	<0.4618
MX12AB024-9	481.9	H	5.9479246	<4.2864	1.2008776	67.357189	462791	4.3744822	<86.8875	18.625449	20.107995	<0.068737	<0.5181
MX12AB024-10	481.9	H	4.885426	<5.6494	8.4109254	79.677939	462791	91.500432	<167.0311	11.417124	10.562415	0.1182522	0.4466333
MX12AB024-11	481.9	H	6.0756059	3.543447	0.1246467	59.228294	462791	<1.2696	<108.6409	16.137331	16.084673	<0.049348	0.2829752
MX12AB025-1	441.6	H	7.3415365	<3.5684	0.1183413	73.553144	462791	5.7003868	<129.2406	1.0315394	0.7885144	<0.044332	<0.29532
MX12AB025-2	441.6	H	10.163752	<4.9783	0.4006333	79.895788	462791	<2.112	<79.3652	1.5155923	1.3268686	<0.051165	<0.4606
MX12AB025-3	441.6	H	6.9135218	<3.6401	0.1796137	69.975321	462791	4.0019066	<66.6067	1.2377566	1.1582954	<0.036523	<0.28534
MX12AB025-4	441.6	H	8.8079556	<3.3789	0.1695021	80.671125	462791	2.4610484	<74.84	1.9023797	1.8185956	<0.036973	<0.35673
MX12AB025-5	441.6	H	8.9972646	4.668079	0.1551974	78.811371	462791	5.3269568	<73.3436	0.9969585	0.8410017	<0.032107	<0.29621
MX12AB025-6	441.6	H	10.903727	5.0818389	0.489506	124.02194	462791	12.805085	<118.0496	1.7199634	1.2575533	<0.035652	0.4336871
MX12AB025-7	441.6	H	10.680287	<3.4231	0.1974841	88.50563	462791	3.0545202	<100.6205	1.3331369	1.2664185	<0.027298	<0.49841
MX12AB025-8	441.6	H	4.8488548	28.046635	0.3499854	80.373836	462791	10.978667	<88.8354	1.7063655	1.5953595	<0.034639	<0.39122
MX12AB025-9	441.6	H	7.5044296	<3.5728	0.1883124	65.173066	462791	1.8853396	<67.1319	1.5438608	1.0572905	<0.031211	<0.289
MX12AB027-1	425.4	I	1.9487811	48.398012	45.971827	114.91075	462791	5.6934181	421.43707	44.595947	40.774343	0.6524765	<0.55659

Sample	Distance (m)	Type	Li7	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	Ti49	V51	Cr53
MX12AB027-2	425.4	I	2.6022445	25.201531	3.3675379	87.543047	462791	38.969662	<168.4001	31.864894	33.787897	<0.053194	<0.47586
MX12AB027-3	425.4	I	1.8651771	23.185235	<0.10873	34.116786	462791	<2.5462	<104.329	23.355391	23.971433	<0.055584	<0.37203
MX12AB027-4	425.4	I	0.3188015	10.852364	<0.095778	22.513913	462791	5.2541472	<132.5695	8.1626373	8.2261614	<0.051729	<0.55888
MX12AB027-5	425.4	I	4.0358967	15.877166	0.1254275	79.693658	462791	12.255125	<89.1041	21.663644	19.639911	<0.046308	<0.36778
MX12AB027-6	425.4	I	3.6931568	9.7362793	2.247089	92.940895	462791	42.032846	<105.4243	14.662139	14.139272	<0.053455	<0.35845
MX12AB028-1	481.4	I	3.6690805	166.47569	0.3536254	305.36363	462791	10.745732	411.36925	28.875979	27.102962	<0.066047	<0.44161
MX12AB028-2	481.4	I	4.5536747	19.63141	<0.090481	52.042628	462791	11.480783	<79.6948	26.316782	25.06018	<0.043755	<0.32883
MX12AB028-3	481.4	I	4.7870806	31.281245	<0.091028	62.227092	462791	4.3530882	<125.0093	25.930898	25.778437	<0.053057	2.9387447
MX12AB028-4	481.4	I	3.0674039	4.2509726	0.1709286	44.047571	462791	<1.8212	<62.4898	17.895518	19.081754	<0.034349	<0.28842
MX12AB029-1	481.4	H	5.0923952	<3.669	0.2294299	62.076978	462791	<2.4217	<98.0785	23.661897	24.616329	<0.032238	0.3615014
MX12AB029-2	481.4	H	6.2124431	<3.4595	<0.080641	55.009757	462791	<2.1144	<110.4483	23.744421	24.144165	<0.047418	<0.3849
MX12AB029-3	481.4	H	6.0488379	<3.9317	<0.094592	49.897251	462791	<2.0816	<69.2199	14.115979	14.768951	<0.036022	<0.25106
MX12AB029-4	481.4	H	1.4029794	24.494892	0.3036916	41.200944	462791	8.4149132	<103.2632	19.628104	20.813794	<0.040595	<0.44201
MX12AB029-5	481.4	H	4.9067772	4.2129515	<0.080386	52.215481	462791	2.6483709	<78.7514	23.146672	23.187488	<0.038049	0.5215923
MX12AB029-6	481.4	H	4.6495197	3.555608	<0.089452	50.051942	462791	2.9023068	<78.3001	20.295309	21.117812	<0.045033	<0.4055
MX12AB029-7	481.4	H	5.247313	8.8910292	0.0800249	61.444818	462791	3.6345329	<68.2022	17.640349	18.37944	<0.054735	<0.46393
MX12AB029-8	481.4	H	5.7101698	<3.7059	<0.059036	49.962327	462791	<1.8314	<75.5178	18.906078	18.764137	<0.035955	<0.26386
MX12AB029-9	481.4	H	1.4136822	<2.6678	<0.056313	29.799191	462791	<1.3858	<90.3189	18.87506	18.939076	<0.025939	<0.34668
MX12AB029-10	481.4	H	5.8478418	<4.0128	<0.061598	49.878014	462791	<1.3596	<71.1918	17.859764	19.202267	<0.036222	<0.29385
MX12AB029-11	481.4	H	5.6648526	<4.0735	0.1437853	51.921667	462791	1.861773	<84.2852	15.844499	15.43665	<0.047523	<0.49384
MX12AB029-12	481.4	H	3.9564881	18.720806	<0.11602	80.35137	462791	7.6721483	<118.5132	22.297273	22.659604	<0.04249	<0.5401
MX12AB030-1	441.3	H	4.8324465	28.533145	0.0952259	68.870464	462791	6.6315415	<129.9914	22.35687	23.390888	<0.032112	<0.33589
MX12AB030-2	441.3	H	5.3372965	<4.2214	0.1295895	66.314437	462791	<1.4398	<99.8551	21.319641	22.257029	<0.043981	<0.4707
MX12AB030-3	441.3	H	4.6752774	19.838701	0.1057037	72.867015	462791	<1.806	<71.3408	17.908868	18.245188	<0.028856	0.8600636
MX12AB030-4	441.3	H	1.9155243	<3.6432	<0.086355	30.01516	462791	<2.0121	<76.7511	14.069635	13.899627	<0.041175	<0.3141
MX12AB030-5	441.3	H	3.6873331	10.092758	0.1234036	52.772416	462791	2.304477	<122.383	18.940667	17.217254	<0.036757	<0.37094
MX12AB030-6	441.3	H	3.3993474	15.322263	0.2354958	121.62581	462791	32.056824	<121.2887	24.565966	22.905842	<0.05416	0.4847787
MX12AB030-7	441.3	H	5.1800795	10.010166	0.2144484	89.772857	462791	12.650498	<104.7882	21.790344	22.454419	<0.050801	2.0301965
MX12AB030-8	441.3	H	1.6100131	22.283256	0.1497328	50.39783	462791	12.786167	<83.784	9.0832745	8.3370803	<0.036879	<0.20049
MX12AB030-9	441.3	H	2.6219165	<3.6821	<0.091788	47.760899	462791	<2.2913	<117.6896	31.289613	32.543189	<0.044765	<0.38713

Sample	Distance (m)	Type	Li7	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	Ti49	V51	Cr53
MX12AB030-10	441.3	H	1.5244804	<4.5714	0.2292947	39.616271	462791	<1.8284	<75.005	19.070236	18.000904	<0.034492	<0.27922
MX12AB030-11	441.3	H	1.2328062	43.743708	0.128983	40.876939	462791	5.7543792	<149.0264	15.201181	14.774911	<0.058921	<0.35526
MX12AB032-1	546.7	H	4.5872867	<3.5831	<0.1206	46.89612	462791	<1.3067	<74.819	7.7607999	6.6047187	<0.037192	<0.40761
MX12AB032-2	546.7	H	1.9162968	<3.3177	0.3280614	21.574758	462791	<1.8801	<120.9594	2.5392232	2.7852637	<0.04106	<0.31836
MX12AB032-3	546.7	H	2.7668072	<3.8953	0.1068782	24.909674	462791	<1.9462	<147.9901	2.1293004	2.3463488	<0.039857	<0.35769
MX12AB032-4	546.7	H	5.0349331	<3.4087	0.171335	51.716135	462791	<1.841	<61.8589	2.5972714	2.9271327	<0.035918	<0.28652
MX12AB032-5	546.7	H	0.1149371	<5.1245	2.8110853	19.776164	462791	<3.4788	<148.4922	2.8552699	2.0843918	0.0545809	<0.32292
MX12AB032-6	546.7	H	0.7166905	<3.0916	0.499347	23.270126	462791	<1.9132	<58.5394	0.3256152	<0.43629	<0.042636	1.4340455
MX12AB032-7	546.7	H	1.3646071	<6.2933	0.4561489	20.094378	462791	<2.7594	<123.4236	<0.3597	<0.68428	<0.055167	0.9686488
MX12AB032-8	546.7	H	4.7364045	<3.6291	1.099305	96.134737	462791	6.2398481	<112.188	4.6635824	5.2163006	<0.041605	<0.49841
MX12AB032-9	546.7	H	2.7028557	<6.851	3.5281098	33.374774	462791	<2.3798	<200.2694	2.2186369	2.8496998	<0.060208	0.3662235
MX12AB033-1	134.0	H	8.5162616	<2.8567	<0.087218	62.47877	462791	<1.466	<82.4344	24.2632	22.688202	<0.035545	<0.29279
MX12AB033-2	134.0	H	6.731072	13.178441	0.507201	88.867084	462791	12.697867	<94.7321	20.815405	20.094136	<0.044778	<0.24588
MX12AB033-3	134.0	H	4.9551451	4.2542087	0.1099029	53.462139	462791	<2.0318	<89.4696	20.535015	19.636831	<0.030771	<0.40616
MX12AB033-4	134.0	H	8.3834744	<4.1195	<0.10331	69.184652	462791	4.3857223	<122.5336	24.783023	25.077167	<0.050564	<0.36007
MX12AB033-5	134.0	H	8.4215046	26.42274	0.1672922	80.165564	462791	3.5481971	<66.8961	23.086319	23.428374	<0.039961	<0.38329
MX12AB033-6	134.0	H	9.2245623	<3.6528	0.1270043	65.912242	462791	<1.8894	<86.8578	19.907122	20.059741	<0.026212	<0.55136
MX12AB033-7	134.0	H	7.8155329	<3.755	<0.10087	54.613904	462791	<1.7563	<106.868	19.104152	19.738264	<0.034945	<0.29101
MX12AB033-8	134.0	H	9.4274191	20.147272	<0.095289	63.243858	462791	<1.4594	<79.7925	22.988852	23.093731	<0.044047	0.9534791
MX12AB034-1	147.2	H	5.3762637	19.510114	<0.089037	53.636889	462791	2.4420385	<79.1832	22.037309	23.194953	<0.046897	<0.35582
MX12AB034-2	147.2	H	5.1225344	<4.0693	0.4269789	50.908661	462791	<1.4825	<134.0376	23.313063	24.759222	<0.033778	<0.41157
MX12AB034-3	147.2	H	6.4596809	<3.8722	0.0895169	55.654677	462791	1.7758677	<40.3474	30.904175	31.150075	<0.032267	<0.2908
MX12AB034-4	147.2	H	2.3802426	45.990425	1.3028004	42.1905	462791	6.0749447	<72.6519	15.935076	17.39714	<0.046405	<0.45534
MX12AB034-5	147.2	H	3.6401159	50.667505	1.8426086	51.553834	462791	8.382057	<90.679	<0.64251	<0.51899	<0.047659	1.9990672
MX12AB034-6	147.2	H	4.5544667	5.2044754	<0.062501	42.561256	462791	2.0981	<77.578	29.967624	28.708957	<0.032147	<0.34781
MX12AB034-7	147.2	H	3.4171206	16.613849	<0.086778	42.71698	462791	6.1228318	<53.1123	17.207839	13.20061	<0.02539	<0.33052
MX12AB034-8	147.2	H	5.1753989	6.1037367	<0.10047	52.296323	462791	3.4433873	<87.3135	27.728167	26.777394	<0.037183	<0.35783
MX12AB037-1	169.2	H	4.9905268	<4.8889	0.2101728	57.843816	462791	<1.4381	<52.1328	15.437232	14.992724	<0.037319	<0.45223
MX12AB037-2	169.2	H	5.4532148	<4.6537	0.1419256	64.251165	462791	<1.5202	<103.3761	15.786283	15.437539	<0.038967	<0.39471
MX12AB037-3	169.2	H	5.814006	<3.5789	0.2096527	64.206939	462791	1.5509426	<76.9242	13.274761	13.030581	<0.027518	0.3513571

Sample	Distance (m)	Type	Li7	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	Ti49	V51	Cr53
MX12AB037-4	169.2	H	4.1483545	<3.2711	<0.076523	63.119885	462791	2.8016545	<49.108	15.564576	15.748502	<0.029473	<0.38299
MX12AB037-5	169.2	H	4.04063	<4.6395	<0.10861	54.315889	462791	<1.4078	<52.4245	14.632536	15.180813	<0.035812	0.5926015
MX12AB037-6	169.2	H	1.8616246	17.049282	0.4393559	142.7737	462791	47.978648	69.6713	18.074941	19.247206	<0.035946	<0.47084
MX12AB037-7	169.2	H	2.0975699	62.94253	0.2178023	73.227535	462791	16.594235	<49.1319	16.147422	15.92575	<0.028001	<0.32371
MX12AB037-8	169.2	H	1.0587277	35.410539	0.6354216	68.185025	462791	17.240722	<110.8652	13.433619	14.907019	<0.051158	<0.44904
MX12AB038-1	178.1	H	3.8172834	<3.4434	<0.093481	64.23399	462791	5.2290455	<91.0672	24.385244	22.84128	<0.038606	<0.47923
MX12AB038-2	178.1	H	5.1435338	9.9280258	<0.13724	73.351866	462791	4.1859664	<79.3137	19.315129	19.834367	<0.031599	0.2897029
MX12AB038-3	178.1	H	1.7921785	7.3688808	0.3322922	65.360273	462791	9.4697225	<66.7582	18.243171	18.292048	<0.032326	<0.44962
MX12AB038-4	178.1	H	2.9693372	18.220702	0.1469968	79.771268	462791	7.187877	<43.6819	25.825547	25.264627	<0.034515	<0.33869
MX12AB038-5	178.1	H	2.503798	19.555394	0.1098946	67.047238	462791	8.633988	<94.5087	32.260678	33.760696	<0.042887	<0.38348
MX12AB038-6	178.1	H	4.0377548	<3.5608	0.1985859	76.725725	462791	7.2717186	<59.1801	24.561692	23.897747	<0.035653	<0.4155
MX12AB038-7	178.1	H	1.5432374	13.217137	0.6531298	50.416844	462791	5.3937759	<101.8955	18.380464	17.938458	<0.034181	<0.25761
MX12AB038-8	178.1	H	3.1949038	10.599945	0.2669519	72.062789	462791	9.2746508	<69.9576	29.014222	27.694746	<0.029319	<0.28636
MX12AB039-1	403.7	M	0.5837413	<3.2288	<0.089599	30.111472	462791	<1.5068	<87.1702	2.8657308	2.3151598	<0.035735	<0.26977
MX12AB039-2	403.7	M	<0.040835	14.656824	0.1721069	31.465055	462791	<1.9465	<65.1037	2.7822986	2.4009403	<0.0341	<0.36009
MX12AB039-3	403.7	M	<0.06805	<5.6533	0.1585864	32.395197	462791	<2.2237	<125.9228	2.5850356	3.2406697	<0.067873	1.8860542
MX12AB040-1	187.3	H	0.5688574	123.2456	<0.23647	43.652577	462791	7.2041073	<89.9119	21.247048	18.834768	<0.044031	<0.40556
MX12AB040-2	187.3	H	1.2365317	24.352157	<0.10495	50.794181	462791	6.347737	<98.4839	28.634069	28.46499	<0.04119	<0.37422
MX12AB040-3	187.3	H	2.205267	25.948786	<0.093704	48.630826	462791	3.158255	<49.7338	24.500973	24.462243	<0.036479	<0.37555
MX12AB040-4	187.3	H	2.1499438	31.145228	0.0921122	59.654188	462791	2.3662112	<119.4251	26.606038	25.706746	<0.037605	<0.37393
MX12AB040-5	187.3	H	4.9099558	<3.2625	<0.098966	52.349484	462791	<1.7548	<99.4488	34.045107	35.992216	<0.059489	<0.28767
MX12AB040-6	187.3	H	4.9438151	<3.1252	0.1040406	47.167969	462791	<1.5176	<47.7658	35.269279	34.089146	<0.04659	<0.31109
MX12AB040-7	187.3	H	3.969096	66.937942	<0.067594	62.61638	462791	5.0038549	<71.2927	35.538174	35.958189	<0.036664	<0.38499
MX12AB041-1	198.2	H	2.5236992	55.857694	0.1517818	86.602334	462791	3.6048766	<99.6964	21.975988	21.043978	<0.037946	<0.40392
MX12AB041-2	198.2	H	2.0619117	54.377286	0.1629911	90.99187	462791	6.4496111	<83.9549	20.351235	21.384769	<0.054538	<0.32045
MX12AB041-3	198.2	H	2.259727	50.923178	0.1815289	88.00451	462791	5.1264006	<108.5563	19.026971	19.488181	<0.047828	<0.48127
MX12AB041-4	198.2	H	3.6291734	10.87255	0.2428587	107.71018	462791	9.2153758	<115.8083	20.672218	21.45953	<0.059077	1.2066725
MX12AB041-5	198.2	H	3.2242743	19.262873	0.3034284	113.15284	462791	12.151454	<100.3876	25.220927	24.495868	<0.030532	0.3392323
MX12AB041-6	198.2	H	2.1753863	35.332031	0.2617032	113.57257	462791	14.177351	52.056654	23.711949	23.887504	<0.05644	0.4306095
MX12AB041-7	198.2	H	0.3976967	39.969739	0.1020819	40.646483	462791	8.0991073	<88.7365	4.7239187	4.5560659	<0.038982	1.0651614

Sample	Distance (m)	Type	Li7	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	Ti49	V51	Cr53
MX12AB041-8	198.2	H	0.3407907	92.319226	0.5227819	53.252404	462791	26.664283	<78.0021	2.8828184	2.3449758	<0.045765	<0.58725
MX12AB041-9	198.2	H	0.1669548	51.08554	<0.099591	27.112891	462791	7.1906718	<110.9196	8.0395281	7.1213613	<0.046674	<0.47144
MX12AB041-10	198.2	H	1.3911751	20.968858	0.1750446	76.103733	462791	9.6839517	<75.7485	15.651209	14.530701	<0.043774	<0.48549
MX12AB041-11	198.2	H	3.2204678	45.844565	0.2178379	87.847115	462791	10.206001	<120.081	21.001249	19.938954	<0.035911	1.0435138
MX12AB042-1	205.6	H	0.2726734	17.763372	<0.12628	23.594461	462791	<1.5879	<49.2938	10.814615	10.963127	<0.037369	<0.45762
MX12AB042-2	205.6	H	2.3283579	21.92212	0.2550995	72.9224	462791	8.9548381	<109.0302	18.639837	19.454441	<0.036847	<0.44051
MX12AB042-3	205.6	H	3.65396	14.507746	0.1136273	57.57974	462791	4.2059012	<53.2909	15.849802	16.889953	<0.033273	<0.31244
MX12AB042-4	205.6	H	3.9184307	29.248632	0.1193268	61.375025	462791	1.9225123	<61.984	21.104258	22.216259	<0.03358	0.8247598
MX12AB042-5	205.6	H	0.7585669	103.51838	0.1443032	75.282523	462791	9.7740837	<80.2458	14.677867	14.66639	<0.040896	<0.34436
MX12AB042-6	205.6	H	0.2180115	25.374122	0.2276915	10.964722	462791	<1.2444	<76.9754	1.0615588	0.8092374	<0.043331	<0.32539
MX12AB042-7	205.6	H	0.2551312	<3.872	0.234213	14.855506	462791	<2.3482	<60.6065	3.8234381	4.3511942	<0.036223	<0.42832
MX12AB042-8	205.6	H	<0.084247	10.122973	6.751535	24.621224	462791	<1.8941	<149.2442	7.3597222	8.8136862	<0.052258	<0.46231
MX12AB042-9	205.6	H	<0.081171	14.040626	2.8550482	16.854346	462791	<1.8337	142.37477	8.215301	8.1377791	<0.040032	<0.36821
MX12AB043-1	206.1	H	2.3311612	8.5631824	0.2097148	50.438187	462791	2.1404609	<123.8453	28.57573	28.006955	<0.044563	1.0522792
MX12AB043-2	206.1	H	5.7381178	<4.1179	<0.090876	52.384709	462791	<1.1741	<81.497	31.760948	32.642167	<0.035561	0.238391
MX12AB043-3	206.1	H	5.0235189	<3.4003	<0.072422	57.354115	462791	<1.503	<71.4444	31.523695	31.13757	<0.030565	<0.29926
MX12AB043-4	206.1	H	5.3080415	<3.2594	<0.09687	56.430587	462791	<1.5913	<103.9103	30.619432	28.952537	<0.054623	<0.45993
MX12AB043-5	206.1	H	2.478161	5.7980021	0.2679524	62.385154	462791	<1.7907	<63.7	42.030588	41.00647	<0.03501	<0.38352
MX12AB043-6	206.1	H	1.2545232	68.152917	<0.10776	53.840779	462791	4.0146852	<123.1019	25.329698	27.709256	<0.047704	<0.32577
MX12AB043-7	206.1	H	3.9492926	<3.2709	<0.092011	51.906803	462791	<1.3344	<55.212	33.777803	31.920405	<0.043776	<0.32593
MX12AB043-8	206.1	H	1.7569449	23.464308	0.2137926	76.268297	462791	6.8963189	<89.3809	685.4749	620.85335	0.6364812	<0.24615
MX12AB044-1	206.7	H	6.072056	<3.578	0.2314021	69.937997	462791	3.5175235	<83.5704	43.784402	43.872984	<0.047433	<0.39713
MX12AB044-2	206.7	H	3.1139662	10.264322	0.3260655	50.77143	462791	3.7207994	<105.0828	37.37419	38.391327	<0.051855	<0.46819
MX12AB044-3	206.7	H	5.4642704	<3.1431	<0.064973	55.901775	462791	<1.2019	<83.7597	42.556563	43.241927	<0.029147	<0.33664
MX12AB044-4	206.7	H	5.6528784	5.791618	0.0813226	62.023464	462791	3.0040862	<87.8179	43.82199	42.611911	<0.0463	<0.35639
MX12AB044-5	206.7	H	5.7532495	7.657654	0.1125798	76.742987	462791	7.6141148	<72.758	32.911045	32.628656	<0.042654	<0.40124
MX12AB044-6	206.7	H	5.9696144	6.8959689	0.1443245	81.629867	462791	9.07521	<100.7397	43.760009	42.491436	<0.030832	0.3452827
MX12AB044-7	206.7	H	5.0430855	<4.3542	0.1264425	54.039179	462791	<1.8496	<106.8599	14.104978	14.533259	<0.037558	<0.46362
MX12AB044-8	206.7	H	6.7860474	<4.2321	0.4764528	64.371938	462791	2.1032606	<90.9331	38.295535	37.159236	<0.053822	<0.3361
MX12AB044-9	206.7	H	5.3952326	<3.4687	<0.11068	47.568531	462791	<1.5255	<78.0498	29.721231	29.108577	<0.03826	1.1718631

Sample	Distance (m)	Type	Li7	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	Ti49	V51	Cr53
MX12AB044-10	206.7	H	5.8353155	<4.233	<0.095725	48.219728	462791	<1.342	70.112685	24.798014	24.198967	<0.029305	1.1074749
MX12AB045-1	222.9	H	6.8411274	6.7130069	<0.093431	65.497752	462791	5.6149831	<82.1042	25.574207	26.290748	<0.034056	<0.42532
MX12AB045-2	222.9	H	5.3921885	16.622419	<0.090937	62.580886	462791	21.940809	<85.5045	27.724304	27.819485	<0.038937	<0.33939
MX12AB045-3	222.9	H	5.8745436	<4.3301	0.0916179	48.202902	462791	3.5943939	<67.2488	27.769028	27.675954	<0.04119	<0.35615
MX12AB045-4	222.9	H	8.4327072	<3.7319	0.0978323	61.368968	462791	<1.6946	<75.2341	34.558759	34.790892	<0.036909	<0.27999
MX12AB045-5	222.9	H	7.8744695	4.3216553	<0.095926	63.131277	462791	<1.5083	<81.4406	37.067898	36.761492	<0.042336	<0.28979
MX12AB045-6	222.9	H	5.0414586	<4.6123	0.1289437	50.579241	462791	<1.6992	<127.0567	33.410895	32.495398	<0.070277	<0.38049
MX12AB045-7	222.9	H	8.0324399	<4.0221	0.1075495	60.918532	462791	<1.8177	<69.0679	27.72364	26.51534	<0.044791	<0.33671
MX12AB045-8	222.9	H	6.8714691	15.447271	0.179744	68.527252	462791	4.6018634	<69.4648	33.452733	35.108771	<0.04062	<0.43402
MX12AB045-9	222.9	H	7.6433568	6.0996918	0.1336961	75.597433	462791	4.2981446	<75.6874	28.993984	28.137416	<0.040844	<0.34709
MX12AB046-1	3642.7	M	0.058447	<5.3355	0.7524685	23.321874	462791	10.438318	<97.1176	0.39092	0.571563	<0.065877	<0.34554
MX12AB046-2	3642.7	M	0.054296	<5.4645	1.0774678	48.658473	462791	18.370504	<112.8892	0.4198711	<0.49963	<0.067191	<0.43662
MX12AB046-3	3642.7	M	0.046267	<5.0343	0.870919	13.908918	462791	<2.1802	<58.2633	0.40377	0.3332954	0.0819873	<0.43492
MX12AB046-4	3642.7	M	0.054762	<4.8287	0.1233142	9.0603859	462791	<2.3677	<95.5262	0.35432	<0.43353	<0.036741	<0.44072
MX12AB046-5	3642.7	M	0.067179	<8.0249	0.7701869	32.859787	462791	15.178542	<120.8186	0.55038	<0.54019	<0.051654	<0.69143
MX12AB046-6	3642.7	M	0.064449	<4.9244	<0.10146	9.7956175	462791	<1.8426	<67.6327	0.34583	<0.30266	<0.039444	<0.31638
MX12AB046-7	3642.7	M	0.2853922	<4.2656	<0.09526	9.4922169	462791	<1.8891	<106.8116	0.424869	<0.45672	<0.065085	<0.4468
MX12AB046-8	3642.7	M	0.0519622	<4.5283	<0.095551	6.9024614	462791	<2.0997	<108.1107	0.6109994	<0.47251	<0.045198	<0.43513
MX12AB046-9	3642.7	M	0.054733	<5.8195	0.4673722	16.459526	462791	2.9254961	<100.4526	0.39884	<0.35412	<0.063339	<0.48714
MX12AB046-10	3642.7	M	0.077171	<4.9042	0.1747721	17.260801	462791	<1.9998	<120.2527	0.38633	<0.34839	0.0976327	0.2786121
MX12AB046-11	3642.7	M	0.06657	<5.5015	4.5369133	17.701172	462791	8.4467532	<87.4285	0.929785	0.6499954	<0.046308	3.7918347
MX12AB047-1	3644.7	H.A.	0.049469	<4.855	<0.066303	7.1247494	462791	<1.1885	<61.1391	0.38661	0.6452356	<0.046148	0.6995149
MX12AB047-2	3644.7	H.A.	5.6227658	<4.7055	<0.084531	121.71705	462791	151.30864	<177.0295	20.197828	51.64895	<0.096394	<5.7246
MX12AB047-3	3644.7	H.A.	0.2897534	<5.5999	<0.10738	9.7391599	462791	<1.9042	<90.9803	0.4973026	0.8202543	<0.04309	1.0390651
MX12AB047-4	3644.7	H.A.	0.044537	<4.5332	0.195835	7.8564588	462791	1.7988248	<55.8656	0.5965398	0.3427002	<0.025639	1.1571879
MX12AB054-1	2784.0	H	<0.078431	<7.0138	0.6108205	13.47176	462791	<2.0459	<46.8371	0.4918512	0.6817477	0.0522338	1.4060184
MX12AB054-2	2784.0	H	<0.066309	<5.3527	0.4372633	10.447868	462791	<2.1623	<74.3559	0.5244059	2.0802256	0.0367585	6.7948183
MX12AB054-3	2784.0	H	0.0667359	<6.1291	<0.16896	9.4963436	462791	<2.8219	<85.7947	<0.45161	0.4577125	<0.055841	<0.6878
MX12AB054-4	2784.0	H	0.2242779	<7.06	1.3486392	14.692634	462791	<2.2836	<127.9179	0.5048196	<0.73621	<0.054551	1.395638
MX12AB054-5	2784.0	H	0.4805459	19.748813	0.7061566	12.932936	462791	6.8540413	<96.9232	1.5598276	1.8133412	<0.04743	<0.73067

Sample	Distance (m)	Type	Li7	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	Ti49	V51	Cr53
MX12AB054-6	2784.0	H	<0.080246	<6.1764	<0.099578	90.437483	462791	<1.9084	113.55043	0.8407817	0.6594385	0.4245896	<0.34532
MX12AB055-1	1279.8	I	7.983529	<5.4168	<0.097628	54.534652	462791	4.4946819	<78.4531	32.034348	31.410445	<0.029946	<0.41229
MX12AB055-2	1279.8	I	3.8180455	<5.7957	0.5289838	37.655222	462791	5.6211885	<96.8893	19.420423	19.172435	<0.042202	<0.46049
MX12AB055-3	1279.8	I	7.7789562	<8.4893	21.541511	128.91041	462791	11.640725	<136.5277	39.754355	36.745085	0.1564457	<0.46402
MX12AB055-4	1279.8	I	2.2913315	19.593887	0.1659438	89.83494	462791	26.679965	<66.5551	50.070313	46.95753	<0.078111	1.8691281
MX12AB055-5	1279.8	I	2.4403622	7.8866037	0.3615694	36.77373	462791	4.8173544	<57.7735	18.536411	18.733114	<0.027825	<0.37998
MX12AB055-6	1279.8	I	5.9584016	8.1897783	0.218036	64.278103	462791	11.940182	123.39536	36.695849	33.718361	<0.046418	<0.3787
MX12AB056-1	873.3	I	9.4500209	<5.0968	0.1297516	55.106365	462791	1.6647509	<142.8987	30.440545	29.841495	<0.037577	<0.40572
MX12AB056-2	873.3	I	11.332048	<5.1356	0.1476301	89.69413	462791	11.907601	<75.3622	45.60974	45.582366	<0.0494	<0.47851
MX12AB056-3	873.3	I	10.308263	<4.7736	0.1966999	108.95597	462791	24.997734	<49.0177	51.192224	51.493511	0.0345387	<0.25126
MX12AB056-4	873.3	I	9.3098753	<6.3272	<0.088645	56.513533	462791	4.3691842	<40.2732	26.479254	26.962371	<0.043879	<0.31335
MX12AB056-5	873.3	I	9.453419	<4.3919	<0.13564	59.144542	462791	3.0860999	<44.5462	26.794924	29.407982	<0.044602	0.3378789
MX12AB056-6	873.3	I	10.540832	<4.1737	0.1263714	62.55738	462791	<1.756	<69.75	29.709446	28.660684	<0.022393	0.2027596
MX12AB056-7	873.3	I	7.490234	10.296672	0.3493456	54.630016	462791	4.0945417	54.810754	33.086313	34.903193	<0.049947	<0.46623
MX12AB056-8	873.3	I	7.142894	24.746162	1.181599	124.71097	462791	45.927452	<103.6443	27.297292	26.181643	<0.038017	0.6877402
MX12AB056-9	873.3	I	5.8694362	<5.5038	<0.12905	43.196276	462791	<1.8774	<38.3144	18.139526	18.418773	<0.039323	0.2331
MX12AB056-10	873.3	I	8.4777518	<5.3469	0.2121708	50.270947	462791	<1.9961	<77.1996	21.902785	22.688575	<0.032365	<0.33177
MX12AB056-11	873.3	I	7.7605865	<4.6544	<0.1223	48.695743	462791	2.3733249	<60.2276	21.643739	21.308269	<0.03711	<0.40163
MX12AB056-12	873.3	I	6.1473504	<3.7655	<0.084703	42.294016	462791	2.0492024	<49.371	14.80326	14.607872	<0.037047	0.5776797
MX12AB057-1	403.6	I	2.1564834	11.360336	<0.13896	49.927666	462791	4.2090787	<74.8137	19.007723	20.137177	<0.047903	0.4891258
MX12AB057-2	403.6	I	2.4927638	10.519962	<0.11598	51.722568	462791	2.9606638	<40.6625	21.271835	22.025595	<0.043789	<0.32021
MX12AB057-3	403.6	I	1.8924588	10.258396	0.1568741	48.542577	462791	4.0630582	<35.402	19.972205	19.156681	<0.02869	<0.2349
MX12AB057-4	403.6	I	2.7070487	9.0472031	<0.13425	55.873509	462791	5.8409364	<104.9699	27.409603	28.19367	<0.054161	<0.33594
MX12AB057-5	403.6	I	4.5259549	<4.8605	0.2229971	59.475757	462791	<1.6184	<66.3575	25.578496	26.777347	<0.041683	1.2124944
MX12AB057-6	403.6	I	4.4827519	12.951745	0.2389828	74.076731	462791	2.1196024	101.47533	32.656877	33.016956	<0.023749	<0.28879
MX12AB057-7	403.6	I	5.8986597	<5.0529	0.2604922	165.49697	462791	40.733311	<77.2608	50.21044	51.308945	<0.027283	<0.35481
MX12AB057-8	403.6	I	6.134563	<5.1738	0.1309529	71.863585	462791	2.8438447	<56.4149	27.887835	27.915447	<0.029122	<0.342
MX12AB057-9	403.6	I	3.3154389	105.82389	0.1734271	133.21733	462791	11.14902	<87.2858	20.649942	20.463509	<0.03739	<0.33681
MX12AB057-10	403.6	I	2.7165704	28.632821	<0.13043	78.779982	462791	8.680917	<53.7329	26.55219	26.310394	<0.038304	<0.35169
MX12AB058-1	255.4	H	0.1325231	16.931414	<0.11198	37.288835	462791	<2.0518	<71.3305	4.3959221	4.2732566	<0.037415	0.5335385

Sample	Distance (m)	Type	Li7	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	Ti49	V51	Cr53
MX12AB058-2	255.4	H	0.1114824	49.212545	<0.11922	45.527128	462791	7.0046033	<60.9165	4.0329816	4.365171	<0.044009	0.5455695
MX12AB058-3	255.4	H	2.4941361	<8.621	0.4157574	68.032876	462791	<2.6903	<130.9938	4.5540995	5.8839719	<0.06649	1.520266
MX12AB058-4	255.4	H	4.4682627	<6.1205	<0.12559	63.075448	462791	<2.0193	<56.3988	5.9487102	6.5481534	<0.03287	0.3357941
MX12AB058-5	255.4	H	1.9519002	<5.4159	<0.13116	31.228954	462791	<1.7901	<54.7249	3.9218707	3.218136	<0.037836	<0.45626
MX12AB058-6	255.4	H	0.2579998	<6.7711	<0.14562	29.505708	462791	<1.9653	<78.8892	3.7074456	3.7166512	<0.043324	<0.43386
MX12AB068-1	5487.8	H	<0.084183	<5.4543	<0.11672	7.8512222	462791	<1.8832	<47.6969	0.54311	<0.30599	<0.034245	<0.40048
MX12AB068-2	5487.8	H	<0.088108	<7.9594	0.8451377	19.908441	462791	8.8478535	<166.8439	0.73322	<0.4234	<0.047804	<0.5433
MX12AB068-3	5487.8	H	<0.098913	<7.831	0.4531417	9.9587838	462791	<2.775	<61.4549	0.44881	<0.54833	<0.039134	<0.45872
MX12AB068-4	5487.8	H	<0.084845	<9.4268	1.6762766	23.319613	462791	10.698345	<122.6082	0.82962	0.5535321	<0.064304	<0.41353
MX12AB068-5	5487.8	H	0.0875363	30.642723	3.8075892	96.430835	462791	47.771969	<113.8696	0.4389817	0.8136862	<0.052857	<0.44339
MX12AB070-1	997.1	H	<0.11071	<8.5967	<0.16207	10.630738	462791	<2.1065	<105.6548	0.43409	<0.75463	<0.044506	<0.44676
MX12AB070-2	997.1	H	<0.10021	<10.2553	<0.2353	12.831026	462791	<3.2992	<200.6136	0.60131	<0.78301	<0.057633	<0.71784
MX12AB070-3	997.1	H	0.3520413	<8.1284	0.4733113	18.030003	462791	4.1168715	<152.0731	0.40983	<0.51032	<0.058354	<0.43982
MX12AB070-4	997.1	H	0.3735053	<6.67	0.1979233	13.160328	462791	<1.8591	<77.4202	0.458934	0.4295169	<0.04171	<0.33364
MX12AB070-5	997.1	H	0.5803441	<7.5114	0.585452	22.959146	462791	5.4404533	<90.5752	0.31213	<0.39767	<0.039548	<0.58103
MX12AB070-6	997.1	H	1.5212986	<5.7641	0.241269	15.612336	462791	2.5140717	<69.1814	0.3302551	<0.45403	<0.023826	<0.4356
MX12AB070-7	997.1	H	0.1983138	<11.2111	1.5909076	46.483329	462791	20.00542	<151.7699	0.702	<0.38824	<0.075629	<0.58775
MX12AB070-8	997.1	H	0.1513169	<6.88	0.2771478	17.242966	462791	4.0459495	<95.4088	1.2235064	1.2560262	<0.04493	<0.5347
MX12AB070-9	997.1	H	0.4632675	23.701701	<0.20962	37.075804	462791	<3.3115	72.0551	2.0662443	2.1060391	<0.038758	<0.73843
MX12AB070-10	997.1	H	<0.11029	26.303666	18.618076	311.85694	462791	11.872847	<156.1994	307.0327	317.24135	1.1891263	3.0555675
MX12AB070-11	997.1	H	0.1525727	<9.5933	9.3994582	112.91768	462791	54.967312	<61.1487	1.1743001	1.0182684	<0.060096	<0.62641
MX12AB074-1	174.2	H.A.	13.078591	10.756304	0.9492758	169.62037	462791	23.971018	<86.5801	39.896259	38.98701	0.0293077	0.6789187
MX12AB074-2	174.2	H.A.	12.618138	<6.9732	1.5849985	158.12352	462791	35.889686	64.368451	36.94077	33.715792	0.0880548	0.966923
MX12AB074-3	174.2	H.A.	11.093663	81.61262	5.3088136	451.86693	462791	393.6777	<81.1678	37.664264	34.16019	0.130907	1.9232227
MX12AB074-4	174.2	H.A.	14.405291	<7.6896	0.4674053	132.58869	462791	8.3632947	<147.934	19.019039	19.073723	<0.049724	1.7215155
MX12AB074-5	174.2	H.A.	10.330977	32.391872	1.1579762	187.8305	462791	248.08238	<74.6875	19.272244	17.695797	<0.057617	<0.62251
MX12AB074-6	174.2	H.A.	10.482575	<6.071	0.6305322	121.14167	462791	7.1524528	<58.6125	17.064854	17.880441	<0.032738	0.8882918
MX12AB074-7	174.2	H.A.	11.525944	<4.9884	0.3777789	125.77882	462791	12.059394	<123.5922	5.9839097	5.3411273	<0.0412	0.9394127
MX12AB074-8	174.2	H.A.	13.974982	<7.5872	0.7026118	136.91434	462791	13.764786	<88.9993	29.885011	31.030691	<0.038888	0.5591249
MX12AB075-1	174.2	I	8.704114	14.837025	0.2501325	117.41624	462791	14.720585	<93.5807	16.05647	14.510743	<0.046397	<0.43632

Sample	Distance (m)	Type	Li7	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	Ti49	V51	Cr53
MX12AB075-2	174.2	I	6.8847666	9.9506507	<0.12961	78.921118	462791	5.2018605	<117.7784	25.040027	25.79236	<0.058293	<0.46096
MX12AB075-3	174.2	I	10.093787	<5.5958	0.1432908	108.78141	462791	7.7839614	<64.4544	23.452911	23.253885	<0.03662	<0.23245
MX12AB075-4	174.2	I	6.1581791	<6.6812	0.5564777	51.162778	462791	2.499227	<96.9237	16.272692	16.300562	<0.043664	<0.46806
MX12AB075-5	174.2	I	7.9514715	<7.813	<0.16867	78.76436	462791	2.0870369	50.797959	26.789543	26.925282	<0.0401	<0.48833
MX12AB075-6	174.2	I	9.1561574	<7.7756	0.1894948	109.94449	462791	9.0556342	<143.3233	31.816656	30.729756	<0.041342	<0.58289
MX12AB075-7	174.2	I	8.9481043	<7.131	13.23769	111.82802	462791	12.614295	<72.2418	27.772138	27.473236	<0.041993	<0.40896
MX12AB075-8	174.2	I	9.0090473	<6.0981	0.2310774	91.768691	462791	4.4287301	<66.9173	28.436524	28.985672	<0.054384	<0.30058
MX12AB075-9	174.2	I	10.58526	<6.8712	0.189173	127.1779	462791	30.173012	79.394148	31.588923	32.022105	<0.05486	<0.36847
MX12AB075-10	174.2	I	9.0322816	<5.5139	<0.14409	84.404091	462791	<2.341	<52.0629	25.297579	23.776588	<0.038748	<0.37209
MX12AB075-11	174.2	I	9.3419099	<4.7633	0.1030331	82.512487	462791	<1.3671	<66.2768	26.041979	25.259224	<0.021982	<0.61785
MX12AB075-12	174.2	I	9.357104	<5.366	0.1301821	82.629393	462791	<2.0556	<78.559	28.817473	29.597148	<0.042045	<0.60748
MX12AB076-1	207.3	H	6.527598	<7.0372	0.2398061	65.747162	462791	<2.0087	<54.5237	29.686385	31.142798	<0.040643	0.5927232
MX12AB076-2	207.3	H	4.7104343	<5.8392	0.1794101	45.085827	462791	<2.0266	<78.1734	20.768197	21.203456	<0.038963	<0.38681
MX12AB076-3	207.3	H	6.7422107	<4.9193	0.2060826	76.193141	462791	<2.1664	<83.6376	29.926029	30.324556	<0.06715	<0.31634
MX12AB076-4	207.3	H	6.8730538	<8.195	0.2000248	73.323385	462791	2.4101243	<70.6522	30.730365	30.190132	<0.025674	<0.52752
MX12AB076-5	207.3	H	4.9520055	<7.5458	0.3212523	65.538321	462791	<1.934	<115.978	35.046787	35.233065	<0.036719	<0.36991
MX12AB076-6	207.3	H	5.1963046	<7.3076	<0.20693	54.573437	462791	<2.1728	<105.8374	23.661779	23.712006	<0.045234	<0.44928
MX12AB076-7	207.3	H	5.571974	<7.2202	0.1847743	64.780489	462791	<1.8014	<52.4301	31.345371	29.656257	<0.052754	<0.28369
MX12AB077-1	306.5	H	2.8015655	62.111393	0.2456477	113.97286	462791	11.376768	<74.6695	0.435755	0.5148446	<0.03631	<0.45501
MX12AB077-2	306.5	H	0.2127183	47.4244	<0.12861	98.357678	462791	12.845064	<79.8112	0.5082757	0.446711	<0.040427	<0.67059
MX12AB077-3	306.5	H	2.2888246	12.916662	<0.16952	65.787638	462791	3.1392039	<125.3218	43.593684	40.263971	<0.069003	<0.43049
MX12AB077-4	306.5	H	4.0471792	<6.8204	<0.1207	69.726038	462791	5.888017	<113.7234	36.682884	35.821943	<0.031584	<0.33458
MX12AB077-5	306.5	H	4.5388767	<5.9108	0.1637895	73.486038	462791	3.6465793	<50.5152	43.894134	43.98977	<0.034967	<0.44428
MX12AB077-6	306.5	H	3.7370424	<5.9433	<0.13562	60.799029	462791	<1.6826	<45.494	34.769756	36.286784	<0.043722	<0.36099
MX12AB078-1	375.8	I	0.0868713	49.750341	0.2670002	13.929295	462791	<2.2522	<76.4468	3.2876025	2.135419	<0.046951	0.682171
MX12AB078-2	375.8	I	0.609521	35.442853	0.1651122	68.24389	462791	8.2488268	<77.5297	26.834411	27.467056	<0.036252	<0.3178
MX12AB078-3	375.8	I	1.6569949	10.791419	1.2661046	69.347395	462791	4.7806342	<81.9718	37.480736	38.61011	0.0357761	<0.46894
MX12AB078-4	375.8	I	2.2601617	14.867469	1.0847622	165.88122	462791	30.296325	<65.8087	7.550996	7.1472618	<0.039688	<0.31523
MX12AB078-5	375.8	I	2.4192125	16.48778	0.6203932	156.23189	462791	33.03002	<109.0028	4.6666918	4.3871732	<0.030091	<0.26908
MX12AB078-6	375.8	I	2.9120052	13.470078	<0.14297	58.533449	462791	<1.999	<59.8816	21.03667	19.802718	<0.041676	<0.46394

Sample	Distance (m)	Type	Li7	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	Ti49	V51	Cr53
MX12AB078-7	375.8	I	1.7921367	14.483307	0.1350195	54.689464	462791	<2.0106	<77.6857	26.891504	26.782275	<0.043949	<0.48869
MX12AB079-1	498.2	H	5.5240949	<5.7534	<0.13604	88.76407	462791	5.285149	<66.6402	16.899854	16.511411	<0.046037	<0.52986
MX12AB079-2	498.2	H	4.505731	<6.4389	<0.12937	116.64162	462791	44.677706	<99.7784	9.7223574	10.653755	<0.035985	<0.61003
MX12AB079-3	498.2	H	5.5267073	<8.0728	1.2620645	92.018769	462791	9.9880087	<145.7289	34.140641	35.373192	<0.032386	<0.48401
MX12AB079-4	498.2	H	0.777875	66.296612	1.6495805	80.483193	462791	19.118439	<107.8166	27.64013	31.480568	<0.067427	<0.61461
MX12AB079-5	498.2	H	3.4054041	36.623442	0.2460604	59.188222	462791	5.9194858	<49.4305	25.667136	24.825811	<0.031104	<0.32368
MX12AB081-1	748.5	I	10.430503	16.275487	0.1614993	80.263422	462791	10.686447	<112.0141	40.558593	41.02176	<0.058659	0.5312551
MX12AB081-2	748.5	I	8.7992469	<8.6325	17.409318	82.541383	462791	52.895079	116.36906	38.594083	37.095315	0.2934488	<0.40436
MX12AB081-3	748.5	I	7.5080519	<6.3951	<0.13018	49.766092	462791	<1.7857	<120.0977	13.910196	12.394318	<0.048684	<0.47681
MX12AB081-4	748.5	I	8.8614944	15.555613	0.3613848	64.63607	462791	6.2510891	<108.5603	29.0272	27.946202	<0.042653	<0.47132
MX12AB081-5	748.5	I	9.3968371	24.96529	<0.14141	66.522727	462791	5.3411165	<95.7605	27.509821	29.047797	<0.049334	<0.38668
MX12AB081-6	748.5	I	7.0728598	51.505263	<0.13202	55.759808	462791	10.768128	<130.0875	23.094316	23.484162	<0.039835	<0.41913
MX12AB081-7	748.5	I	8.1608651	<5.4646	<0.15825	75.7557	462791	9.1046278	<116.6969	22.34108	24.076216	<0.032551	<0.33184
MX12AB082-1	254.4	H	4.741268	<6.1976	0.2584758	82.243594	462791	<2.0751	<55.0538	18.891758	19.568704	<0.047852	0.8207233
MX12AB082-2	254.4	H	3.8715453	<6.2961	0.2890608	72.978637	462791	<1.9323	<65.1359	15.01177	13.360181	<0.046874	0.5330078
MX12AB082-3	254.4	H	3.999845	<6.1389	<0.13348	60.773805	462791	<1.8547	<58.1786	14.993243	13.524662	<0.0469	0.7400146
MX12AB082-4	254.4	H	4.4991178	<7.5802	<0.097722	67.869809	462791	3.6750267	<75.1651	15.104387	14.46692	<0.04892	<0.43655
MX12AB082-5	254.4	H	4.1421118	8.4202427	0.1695325	84.589786	462791	9.3807545	68.023077	20.514811	20.788532	<0.033917	<0.3773
MX12AB082-6	254.4	H	2.1960777	<7.6332	<0.13849	48.489093	462791	<2.3282	<77.0839	19.822802	19.848168	<0.02724	<0.40048
MX12AB082-7	254.4	H	4.1123254	<5.6211	0.171992	71.849607	462791	8.5344063	<111.8416	20.879787	20.692201	<0.040764	<0.32486
MX12AB083-1	399.6	I	4.661048	<5.7708	0.3760733	60.720502	462791	2.7358632	<62.8446	21.354921	21.551858	<0.029957	<0.33997
MX12AB083-2	399.6	I	2.5131543	<7.7286	0.6056581	48.401829	462791	<2.3159	<116.6831	22.127105	19.362375	<0.042525	2.4661003
MX12AB083-3	399.6	I	0.2611989	13.815631	0.4716488	53.09071	462791	13.051571	<102.0452	13.425317	14.405781	<0.051079	0.9855648
MX12AB083-4	399.6	I	1.7909178	<8.0402	0.5642994	52.739883	462791	<2.4744	<44.3058	22.186448	22.721055	<0.0539	1.6532576
MX12AB083-5	399.6	I	4.338226	20.114155	0.1561317	74.395606	462791	13.055681	<84.8328	21.305588	19.467542	<0.031287	<0.57773
MX12AB084-1	401.0	I	0.3361095	25.593483	0.4797848	48.680206	462791	12.108908	<71.9365	18.536159	20.234659	<0.060554	<0.79242
MX12AB084-2	401.0	I	2.0671083	<8.6939	0.4785596	53.216077	462791	<2.6287	77.126815	22.288669	23.991815	<0.051696	1.3064862
MX12AB084-3	401.0	I	4.12194	<8.5876	0.7485882	79.92308	462791	9.5447283	<96.3458	32.021604	33.291588	<0.053631	<0.49911
MX12AB084-4	401.0	I	3.1870156	<8.8419	<0.16437	58.131952	462791	<2.1725	<63.7234	33.548555	31.844662	<0.043735	<0.48298
MX12AB084-5	401.0	I	2.7383896	21.932468	0.157403	90.166395	462791	21.139251	<45.0008	29.316535	30.798423	<0.041917	0.9526872

Sample	Distance (m)	Type	Li7	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	Ti49	V51	Cr53
MX12AB084-6	401.0	I	1.1651103	12.14544	<0.14842	50.793815	462791	<2.5317	<114.1261	20.783949	21.919578	<0.042596	<0.43546
MX12AB084-7	401.0	I	1.3368376	<8.0895	<0.14565	45.983794	462791	2.4643449	<89.3091	22.385387	21.937869	<0.029956	<0.35459
MX12AB084-8	401.0	I	0.9276278	16.048868	0.1595056	47.952102	462791	3.0059535	<101.605	18.139353	18.322567	<0.057049	<0.37148
MX12AB087-1	244.7	I	3.3431473	16.899662	0.2335554	90.463051	462791	11.781219	66.851298	38.298869	37.895859	<0.028562	2.3411267
MX12AB087-2	244.7	I	2.4113241	20.236454	<0.12456	55.174014	462791	<2.3124	<77.7787	22.101171	23.71877	<0.052723	1.1037326
MX12AB087-3	244.7	I	1.5245743	17.201011	<0.12517	51.741009	462791	<1.7735	<85.5813	17.868959	17.016276	<0.044403	<0.29819
MX12AB087-4	244.7	I	1.7251511	<8.1994	0.2215803	73.924315	462791	13.201032	<90.0731	35.984798	34.803721	<0.056692	1.8305465
MX12AB087-5	244.7	I	0.2257858	19.705501	0.3223844	80.652169	462791	17.12727	<117.7285	25.460052	26.430887	<0.072633	<0.69917
MX12AB087-6	244.7	I	1.6114206	<6.7312	0.4021391	78.889575	462791	13.775595	<93.3482	31.983174	33.915846	<0.036651	0.6940219
MX12AB087-7	244.7	I	1.9915657	14.170095	<0.1136	48.289067	462791	2.6269588	<65.1575	20.984812	20.624667	<0.045398	<0.47671
MX12AB087-8	244.7	I	1.4056007	42.079105	0.1532577	80.975127	462791	17.277059	<85.0432	37.338076	41.311026	<0.035384	<0.40243
MX12AB089-1	189.6	H	5.2167193	<8.2942	0.5595498	72.453448	462791	6.8617331	<99.8168	67.969947	67.950639	<0.049316	2.8248904
MX12AB089-2	189.6	H	2.5333296	<6.5051	0.1947883	37.81471	462791	<1.904	<74.9451	37.173533	35.782421	<0.037201	<0.36869
MX12AB089-3	189.6	H	2.8310819	<9.0484	0.2459916	30.264178	462791	<2.3658	<133.2278	22.027381	23.680841	<0.048446	<0.43986
MX12AB089-4	189.6	H	4.6274336	<7.4571	0.2026061	49.498887	462791	<2.0131	<71.8737	32.772512	32.58674	<0.030495	0.8943183
MX12AB089-5	189.6	H	4.6915868	<7.2357	<0.2126	50.521004	462791	<2.5159	<135.7744	36.492961	35.861579	<0.051994	<0.4135
MX12AB089-6	189.6	H	2.8707699	<8.3003	<0.1487	44.488847	462791	<2.5176	<104.8325	30.679694	30.061456	<0.035335	<0.66555
MX12AB089-7	189.6	H	3.1758939	<9.6945	0.3010585	40.907964	462791	<2.6161	<138.093	34.792743	32.024412	<0.065757	<0.60111
MX12AB090-1	190.5	H	0.8008826	<9.0128	171.70035	34.808241	462791	<3.4397	141.59328	5.0594815	4.9955169	0.9854288	8.0166927
MX12AB090-2	190.5	H	1.5101657	<10.816	6.5575411	42.139922	462791	<3.5732	<82.1007	3.552232	3.4724905	<0.055966	<0.67736
MX12AB092-1	370.1	H	3.9886924	<12.6546	2.897583	48.610792	462791	<4.0084	<88.7971	15.629814	16.112083	<0.056237	<0.5192
MX12AB092-2	370.1	H.A.	0.9107622	<11.4971	0.8704635	33.293309	462791	<3.4431	97.326252	<1.122	0.8456671	<0.053518	<0.68663
MX12AB092-3	370.1	H.A.	1.6587812	<7.4562	6.1144022	46.97934	462791	2.7711166	<115.6096	5.2948563	5.7593928	<0.041172	<0.36757
MX12AB092-4	370.1	H	6.2746646	7.1315301	0.4760219	67.542293	462791	7.2002789	103.11601	42.965391	42.091083	<0.032347	<0.49366
MX12AB092-5	370.1	H	9.4442177	<12.9553	1.0810619	88.579635	462791	5.4727432	<179.4773	30.310976	29.546534	<0.075927	<0.74896
MX12AB092-6	370.1	H	8.2364592	<7.9233	19.880844	94.297138	462791	8.54834	<108.1918	28.663247	29.516392	<0.05455	<0.26101
MX12AB092-7	370.1	H	9.9970841	<6.7575	0.3920919	77.231022	462791	<2.7225	<70.3705	29.701333	29.372041	<0.040992	<0.40925
MX12AB092-8	370.1	H	8.0026713	<5.8764	0.148844	58.399617	462791	3.2417397	<92.6096	29.895418	28.764395	<0.056231	<0.45045
MX12AB092-9	370.1	H	6.7445472	<7.0908	0.9494867	61.007279	462791	6.4353434	<91.3094	20.338498	21.394293	0.0277836	0.7258111
MX12AB092-10	370.1	M	3.0938261	<7.8704	1.2569809	47.157673	462791	<2.7303	<114.7469	1.9842303	1.0564557	<0.045515	<0.55468

Sample	Distance (m)	Type	Li7	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	Ti49	V51	Cr53
MX12AB092-11	370.1	H	1.7586008	<9.6604	0.8542315	53.344928	462791	42.391044	<89.0225	24.976336	25.373259	<0.050706	<0.52319
MX12AB093-1	175.8	I	3.5292421	16.677193	0.8469043	74.30637	462791	10.246148	<103.0367	18.299403	18.362812	<0.056442	1.846602
MX12AB093-2	175.8	I	5.0100348	<10.3224	0.1930624	54.884108	462791	<2.5387	<45.8768	20.31114	21.584968	<0.039229	2.1209924
MX12AB093-3	175.8	I	7.3845544	65.443099	0.3826229	166.61679	462791	39.782445	<102.3619	25.574501	24.000746	<0.055748	<0.45852
MX12AB093-4	175.8	I	4.9076045	<9.0967	<0.12107	50.944862	462791	<2.6035	<57.0546	18.131592	17.368657	<0.032908	<0.45384
MX12AB093-5	175.8	I	2.5459042	<6.0661	0.1762427	63.973612	462791	<2.3295	<73.8405	19.379821	19.772848	<0.031069	<0.45163
MX12AB093-6	175.8	I	6.1674032	<7.8298	<0.13411	52.400458	462791	<2.3487	<69.7365	24.315236	24.497345	<0.031782	<0.38411
MX12AB093-7	175.8	I	6.0481739	<5.859	0.1394096	51.452264	462791	<2.1003	<85.3088	23.610958	22.889817	<0.037506	<0.37941
MX12AB093-8	175.8	I	7.6331681	<8.0824	0.1881046	84.052966	462791	3.2730282	<75.9205	34.276498	31.51899	<0.030507	<0.34868
MX12AB096-1	312.2	I	8.2894493	<6.4051	0.2568258	80.650434	462791	9.1608417	<112.3572	35.03009	36.831758	<0.048721	<0.37548
MX12AB096-2	312.2	I	6.048673	<6.3995	0.2235642	51.4062	462791	<2.2983	<61.1915	21.520418	20.330846	0.0249654	2.5080577
MX12AB096-3	312.2	I	4.4235144	59.816087	<0.14847	60.366914	462791	6.9030951	64.655855	19.955883	18.033601	<0.029307	<0.31015
MX12AB096-4	312.2	I	5.8119323	<6.0842	0.7181243	84.852158	462791	9.9431349	<61.5869	32.665537	31.301316	0.0593402	<0.37372
MX12AB096-5	312.2	I	4.8637529	<9.4395	3.3744635	130.80891	462791	3.6932244	<126.2128	26.812516	27.001761	0.3610655	<0.64269
MX12AB096-6	312.2	I	6.6262536	35.72456	0.4168795	73.990585	462791	9.9172428	<122.8116	25.918476	27.626396	<0.048417	0.9599251
MX12AB096-7	312.2	I	4.7011755	65.557673	0.4509318	71.616388	462791	11.600204	<103.467	23.676822	25.894227	<0.060602	<0.39078
MX12AB096-8	312.2	I	3.9292648	164.54984	1.3343227	71.209957	462791	10.074304	<147.4046	33.731097	30.692576	0.081889	<0.56015
MX12AB096-9	312.2	I	4.2964208	<8.9172	5.9787118	72.084799	462791	9.9134385	65.194979	22.937282	20.178065	<0.051362	<0.42563
MX12AB096-10	312.2	I	6.5373547	25.354472	16.288825	84.86101	462791	6.0355702	<64.1274	32.967702	34.385961	0.2392855	<0.36679

Sample	Distance (m)	Type	Mn55	Fe57	Cu63	Cu65	Zn66	Ge74	As75	Rb85	Sr88	Zr90
MX12AB002-1	5352.9	H	0.2859304	6.4203316	<0.30792	<0.26412	0.2886164	1.1534996	<0.2503	0.1548995	0.8757341	<0.032124
MX12AB002-2	5352.9	H	<0.10254	<2.6354	<0.21644	<0.39764	<0.21296	1.1878603	<0.17744	<0.050755	0.3811487	<0.023697
MX12AB002-3	5352.9	H	0.2647792	<3.5927	<0.23185	<0.26147	<0.18366	0.9858046	<0.31944	<0.045933	0.6031659	<0.024594
MX12AB002-4	5352.9	H	<0.10553	<3.6766	<0.22584	<0.29639	<0.16172	1.1246396	<0.21828	0.080584	0.4315048	<0.019075
MX12AB002-5	5352.9	H	<0.1471	<3.3826	<0.27749	<0.35723	<0.24355	0.8835455	<0.17133	<0.075024	0.2747943	<0.023384
MX12AB002-6	5352.9	H	0.2364229	9.8633413	<0.23334	<0.29089	0.1575711	0.9433011	<0.19623	0.1912014	0.5801436	<0.024909

Sample	Distance (m)	Type	Mn55	Fe57	Cu63	Cu65	Zn66	Ge74	As75	Rb85	Sr88	Zr90
MX12AB002-7	5352.9	H	0.2466807	4.509234	0.2802506	0.4148548	<0.15756	0.9696984	<0.27264	0.1417667	0.4552381	<0.035191
MX12AB002-8	5352.9	H	<0.15511	5.8736706	<0.33503	<0.39456	0.4288951	1.2510257	<0.22249	0.1490366	0.9002562	<0.040133
MX12AB002-9	5352.9	H	0.1373383	4.269739	<0.22725	<0.2761	0.5675028	1.0777047	<0.33691	0.1624582	0.2660154	<0.025458
MX12AB002-10	5352.9	H	<0.096503	4.5885232	<0.22828	<0.26936	0.1368167	1.0839561	<0.18774	0.1145263	1.2535519	<0.028041
MX12AB003-1	628.4	H	169.55851	812.66153	<0.27171	<0.3003	0.4565773	8.9356121	<0.20421	0.1053123	5.1320466	<0.025553
MX12AB003-2	628.4	H	39.363339	185.10346	<0.32152	<0.41379	<0.2862	9.0933511	<0.32115	<0.078515	1.0674816	<0.028339
MX12AB009-1	359.9	H	<0.14121	29.226375	<0.27695	0.4226433	<0.44985	1.0477687	<0.2535	<0.031624	1.6825405	<0.034275
MX12AB009-2	359.9	H	0.3304306	<3.8532	<0.13453	<0.14644	<0.20154	0.5664853	<0.13344	0.1043377	0.5757298	<0.027043
MX12AB009-3	359.9	H	0.1490133	<3.4372	<0.12409	<0.14103	<0.11721	0.5402336	<0.087887	0.0476169	0.1394375	<0.017789
MX12AB009-4	359.9	H	0.2436849	<3.0126	<0.12565	<0.17365	<0.17288	0.4861732	<0.09743	0.2124486	0.2305055	<0.014158
MX12AB009-5	359.9	H	0.08632	<3.4333	<0.12186	<0.16886	<0.15885	0.5517599	<0.099248	<0.013449	0.0284155	<0.014481
MX12AB009-6	359.9	H	0.127092	<5.1345	<0.15777	<0.19471	<0.26927	0.6494514	<0.15411	<0.028262	0.1272854	<0.012423
MX12AB009-7	359.9	H	0.1312446	<4.2083	<0.093425	<0.23915	0.7325859	0.6311956	<0.098494	<0.017848	0.1734079	0.0227136
MX12AB009-8	359.9	H	0.2462285	<4.3204	0.1677265	<0.1566	<0.15824	0.5070077	0.1094495	0.0506167	0.1600631	0.0918965
MX12AB009-9	359.9	H	0.2347083	<5.3572	<0.19863	<0.23327	<0.21245	0.491134	0.2302962	0.1397266	0.3445382	0.8975646
MX12AB010-1	446.4	M	0.1928975	<5.9602	<0.28154	<0.57606	<0.24787	0.9207864	<0.28344	<0.084523	0.0154575	<0.035546
MX12AB010-2	446.4	M	<0.12216	<4.0124	<0.23583	<0.29229	<0.27245	1.3646742	<0.26027	<0.076538	0.0297229	<0.030169
MX12AB010-3	446.4	M	<0.16953	<5.3466	<0.31468	<0.38452	<0.24197	1.0508586	<0.28524	<0.08887	0.0273728	<0.022182
MX12AB010-4	446.4	M	<0.11362	<2.77	<0.24086	<0.18451	<0.23733	1.1248154	<0.21962	<0.061229	<0.014685	<0.026137
MX12AB010-5	446.4	M	0.107678	<4.1725	<0.27892	<0.45069	<0.17079	1.7863743	<0.38264	<0.071665	0.0287977	<0.02261
MX12AB010-6	446.4	M	0.4350629	92.139364	0.4296255	<0.3357	0.5939063	1.606463	<0.23224	<0.076961	0.0959595	<0.026045
MX12AB010-7	446.4	M	<0.093385	<3.1148	<0.21467	<0.27852	<0.1492	3.7866345	<0.18212	<0.058302	<0.012021	<0.026193
MX12AB010-8	446.4	M	1.3642387	20.309449	<0.32991	<0.39686	<0.18069	9.862257	<0.30246	0.1269242	0.1575053	<0.026353
MX12AB010-9	446.4	M	<0.13396	<4.9798	<0.24967	<0.36857	0.1324716	1.9899616	<0.15571	<0.051519	0.1408943	<0.0222
MX12AB010-10	446.4	M	0.1801015	<4.6271	<0.30728	<0.38038	0.2329544	1.5605118	<0.31725	<0.092012	0.0251686	<0.025254
MX12AB010-11	446.4	M	0.1100078	<2.7326	<0.23208	<0.29591	<0.21131	1.5966443	<0.17081	<0.051994	0.0247193	<0.021645
MX12AB010-12	446.4	M	<0.096823	<3.8038	<0.21753	<0.32494	<0.12083	1.9035724	<0.20215	<0.050253	0.0237582	<0.039463
MX12AB011-1	733.9	M	<0.1337	<3.3705	<0.3035	0.2628947	0.1586216	1.6292849	<0.21782	<0.080174	0.0402107	<0.019166
MX12AB011-2	733.9	M	<0.11472	<4.4888	<0.24301	<0.31125	<0.1612	1.1756166	<0.29914	<0.076113	0.0217786	<0.022163
MX12AB011-3	733.9	M	<0.12088	8.1657334	<0.31035	<0.30031	<0.29956	1.2024838	<0.2213	<0.063793	<0.012843	<0.026761
MX12AB011-4	733.9	M	<0.093153	3.5714558	<0.27176	<0.32509	<0.18046	0.8583855	0.1665338	<0.063746	0.0314087	<0.025303

Sample	Distance (m)	Type	Mn55	Fe57	Cu63	Cu65	Zn66	Ge74	As75	Rb85	Sr88	Zr90
MX12AB011-5	733.9	M	<0.10827	22.719476	<0.21805	<0.33626	<0.2176	0.8298072	<0.26209	<0.052485	0.0992231	<0.02419
MX12AB011-6	733.9	M	<0.11401	3.3232727	<0.26469	<0.24519	<0.16091	0.7538045	<0.19017	<0.053592	0.0425131	<0.02884
MX12AB011-7	733.9	M	<0.19092	<4.5621	<0.35169	<0.38128	<0.31666	0.9643628	<0.28714	<0.080384	0.0409739	<0.035552
MX12AB011-8	733.9	M	<0.11043	14.55711	<0.30287	<0.37078	0.2611057	0.9193305	<0.19081	<0.054816	0.1049193	<0.032426
MX12AB012-1	1301.1	H	0.2478974	5.3136701	<0.22242	<0.27534	<0.23954	1.5769021	<0.15886	<0.069468	0.3040826	<0.025664
MX12AB012-2	1301.1	H	0.1460371	<3.5497	<0.18438	<0.25435	<0.15843	1.4635882	<0.14377	<0.052041	0.1294604	<0.022586
MX12AB012-3	1301.1	H	0.0918442	<3.8222	<0.16792	<0.25783	<0.2337	1.6287781	<0.20862	<0.057774	0.4745922	<0.027592
MX12AB012-4	1301.1	H	0.152658	<2.8877	<0.23343	<0.23212	<0.18327	1.688114	<0.20571	<0.040636	0.4238262	<0.017517
MX12AB012-5	1301.1	H	0.2414715	<2.9458	<0.23562	<0.31547	<0.2133	2.1921574	<0.31591	<0.067097	0.3075611	<0.017615
MX12AB012-6	1301.1	H	<0.14585	<3.5143	<0.27773	<0.39648	<0.22792	1.7958302	<0.22921	<0.071686	0.1656906	<0.029179
MX12AB012-7	1301.1	H	0.2033836	<4.3096	<0.20304	<0.28681	<0.24223	1.410685	<0.21652	<0.053696	0.1832903	<0.024061
MX12AB012-8	1301.1	H	0.1441911	<3.267	<0.28935	<0.37761	<0.13393	2.0257845	0.2276343	<0.058682	0.2051343	<0.023638
MX12AB012-9	1301.1	H	0.2400103	<3.9907	<0.22902	<0.27158	<0.28754	1.6717949	<0.20759	<0.072293	0.1937251	<0.019049
MX12AB012-10	1301.1	H	<0.095154	<2.993	<0.21327	<0.24029	<0.13918	1.7707633	<0.15933	<0.047548	0.0872993	<0.021398
MX12AB013-1	1201.2	M	<0.099363	<3.4904	<0.23034	<0.27522	<0.15556	0.647922	<0.1829	<0.058807	0.0162779	<0.020024
MX12AB013-2	1201.2	M	<0.1011	<2.6125	<0.18575	<0.28517	<0.14682	0.6550614	<0.19975	<0.076245	0.0211721	<0.021917
MX12AB013-3	1201.2	M	<0.083513	<2.5706	<0.2446	<0.29469	<0.2171	0.6584362	<0.21394	<0.06933	0.0164473	<0.023941
MX12AB013-4	1201.2	M	<0.11062	<3.5561	<0.23602	<0.24388	<0.24427	0.6991879	<0.21049	<0.056935	0.1002008	<0.02471
MX12AB013-5	1201.2	M	<0.096997	<4.5745	<0.3042	<0.43339	<0.21234	0.7132556	<0.23354	<0.070329	0.0387066	<0.036919
MX12AB013-6	1201.2	M	<0.10746	<3.757	<0.2147	<0.31423	<0.29539	0.7598032	<0.23515	<0.053564	0.0717417	<0.021808
MX12AB013-7	1201.2	M	<0.10496	<4.9856	<0.26999	<0.23923	<0.2653	0.6397549	<0.1991	<0.071752	0.0282492	<0.026949
MX12AB013-8	1201.2	M	<0.10375	<3.6354	<0.21565	<0.23415	<0.24139	0.8041565	<0.19493	<0.074887	0.0345176	<0.026113
MX12AB013-9	1201.2	M	<0.10999	<4.5844	<0.25794	<0.30295	0.1912693	0.7124449	<0.27596	<0.072619	0.0269189	<0.020829
MX12AB013-10	1201.2	M	<0.11392	<4.7046	<0.22198	<0.29468	<0.21888	0.7222964	<0.21861	<0.055325	0.0469958	<0.01417
MX12AB013-11	1201.2	M	<0.092764	<3.1094	<0.21087	<0.32095	0.201876	0.8038657	<0.21288	<0.046183	0.0610931	<0.027676
MX12AB014-1	1101.2	H	<0.11006	<5.8851	<0.18683	<0.25275	<0.24331	0.9989253	<0.17651	0.0642163	0.2162703	<0.024291
MX12AB014-2	1101.2	H	<0.098927	<4.7204	<0.13542	<0.16752	<0.13861	0.7763372	<0.13869	<0.021466	0.0334975	<0.015777
MX12AB014-3	1101.2	H	<0.083382	<4.3546	<0.10016	<0.18331	<0.11319	1.2011892	<0.11765	<0.014721	0.0419274	<0.014007
MX12AB014-4	1101.2	H	<0.081135	<4.5078	<0.13435	<0.13231	<0.18104	0.9791685	<0.096094	0.0212278	0.0977932	<0.017994
MX12AB014-5	1101.2	H	<0.096152	<5.528	<0.14744	<0.23453	<0.2009	0.97279	<0.1436	<0.021653	0.0704503	<0.012397
MX12AB014-6	1101.2	H	<0.077538	<5.1946	<0.14192	<0.17237	<0.17158	1.0016123	<0.12072	0.0154539	0.0221922	<0.013662

Sample	Distance (m)	Type	Mn55	Fe57	Cu63	Cu65	Zn66	Ge74	As75	Rb85	Sr88	Zr90
MX12AB014-7	1101.2	H	<0.082402	<4.6987	<0.13644	<0.19863	0.229096	0.8173054	<0.12393	<0.014879	0.1020168	<0.019019
MX12AB014-8	1101.2	H	<0.084741	<5.1756	0.228338	<0.25451	<0.17921	2.3008935	<0.09458	<0.020567	0.0748422	<0.018664
MX12AB014-9	1101.2	H	<0.12824	5.6538618	<0.16527	<0.25748	<0.14447	2.0763363	<0.12777	<0.024666	0.0631679	<0.014589
MX12AB015-1	1001.5	M	<0.098806	<4.0603	<0.23486	<0.30598	<0.15969	0.8214647	<0.18969	<0.052004	0.043066	<0.021941
MX12AB015-2	1001.5	M	<0.11152	<4.497	<0.33033	<0.42788	<0.26425	0.8802103	<0.24188	<0.058946	0.1227489	<0.026688
MX12AB015-3	1001.5	M	0.1883594	62.64731	<0.35047	<0.48529	<0.34986	2.7474416	2.7950572	<0.07633	0.0788785	<0.041439
MX12AB015-4	1001.5	M	<0.096943	<3.7744	<0.28353	<0.30678	<0.22676	0.5756206	<0.19599	<0.054883	0.0213254	<0.029629
MX12AB015-5	1001.5	M	<0.12566	<3.4449	<0.22267	<0.35812	<0.22332	0.7185975	<0.20816	<0.059883	<0.011599	<0.028509
MX12AB015-6	1001.5	M	<0.10617	<4.485	<0.23214	<0.30341	<0.31411	0.6051394	<0.31925	<0.069004	<0.013375	<0.021799
MX12AB015-7	1001.5	M	<0.13521	<3.5471	<0.34827	<0.32115	<0.24013	1.2412935	<0.27743	<0.058792	0.1191975	<0.027459
MX12AB016-1	902.0	M	<0.19794	<6.744	<0.46742	<0.60165	<0.39897	1.5223532	<0.3989	<0.10145	0.3376928	<0.035075
MX12AB016-2	902.0	M	<0.11106	<3.888	<0.19883	<0.35398	<0.1226	1.3650578	<0.19464	<0.061873	0.0315433	<0.02661
MX12AB016-3	902.0	M	<0.15129	<4.7325	<0.27525	<0.42876	<0.28407	0.9921713	<0.33375	<0.072843	0.0301648	<0.028329
MX12AB016-4	902.0	M	<0.10136	<4.1372	<0.18229	<0.31725	<0.21599	1.2768467	<0.24421	<0.044606	0.085902	<0.020053
MX12AB016-5	902.0	M	<0.15085	<6.0308	<0.3549	<0.42688	<0.35873	1.5186019	<0.33804	<0.090746	0.0639101	<0.031988
MX12AB016-6	902.0	M	<0.11187	<3.6383	<0.17717	<0.33915	<0.17652	0.9529049	<0.25984	<0.051313	0.0420625	<0.022259
MX12AB016-7	902.0	M	<0.1005	<4.4386	<0.24071	<0.30762	<0.20492	0.9756603	<0.23428	<0.04251	0.0384853	<0.02248
MX12AB016-8	902.0	M	<0.10763	<4.2268	<0.24614	<0.25896	<0.25131	0.9468743	<0.25219	<0.052083	0.0408468	<0.019413
MX12AB016-9	902.0	M	0.2969398	17.036803	<0.28304	0.5704023	<0.24602	0.6787063	0.4814724	0.0640196	0.3429264	<0.023472
MX12AB016-10	902.0	M	0.3686988	10.418552	<0.35954	<0.37103	<0.2509	0.9000074	<0.29412	<0.080453	0.175335	<0.01963
MX12AB016-11	902.0	M	<0.12794	<4.2621	<0.31056	<0.34512	<0.30701	0.7914226	<0.17537	<0.063965	0.0681913	<0.017141
MX12AB016-12	902.0	M	<0.13604	<5.6736	<0.3393	0.3732628	<0.19112	0.7961502	<0.18826	<0.058435	0.190041	<0.036522
MX12AB017-1	802.5	M	<0.10656	<3.6982	<0.2436	<0.33219	<0.15548	0.9043682	<0.2909	<0.075461	0.0606893	<0.028703
MX12AB017-2	802.5	M	<0.092467	<4.5078	<0.28108	<0.35878	<0.25081	0.8747748	<0.29879	<0.059547	0.0940845	<0.033964
MX12AB017-3	802.5	M	<0.13449	<4.0716	<0.36946	<0.39823	<0.17522	0.7225865	<0.20831	<0.071221	1.8837555	<0.029669
MX12AB017-4	802.5	M	0.1618671	<4.2634	<0.32055	<0.5662	<0.35268	0.8529468	0.3937182	<0.081951	2.8542446	<0.031722
MX12AB018-1	703.4	H	<0.10315	<3.2856	<0.23131	<0.31706	<0.19788	1.295678	<0.26293	<0.059872	0.0789521	<0.019464
MX12AB018-2	703.4	H	0.1217249	<4.5644	<0.28941	<0.28846	<0.22655	1.2936583	<0.21867	<0.054094	0.0846949	<0.019669
MX12AB018-3	703.4	H	<0.14708	<7.7847	<0.43753	<0.56377	<0.35492	1.2579344	<0.27014	<0.076734	0.0379556	<0.031049
MX12AB018-4	703.4	H	0.1035216	<4.9031	<0.26808	<0.39444	<0.2531	1.1705635	<0.12637	<0.053627	0.0767237	<0.030151
MX12AB018-5	703.4	H	<0.10578	<3.1752	<0.27047	<0.26283	<0.17182	1.3071222	<0.21143	<0.066225	0.0934797	<0.011246

Sample	Distance (m)	Type	Mn55	Fe57	Cu63	Cu65	Zn66	Ge74	As75	Rb85	Sr88	Zr90
MX12AB018-6	703.4	H	<0.09402	<4.2497	<0.24074	<0.31809	<0.14369	1.1250194	<0.2232	<0.05975	0.0437147	<0.018733
MX12AB018-7	703.4	H	<0.1159	<3.7866	0.3838374	<0.41595	<0.28421	1.1759743	<0.24119	<0.053947	0.127108	<0.03718
MX12AB018-8	703.4	H	0.1429494	<5.2331	<0.3083	<0.41643	<0.24942	1.110415	<0.23715	<0.057558	0.1316552	<0.021145
MX12AB018-9	703.4	H	<0.10693	<3.3979	<0.27667	<0.31271	<0.1961	1.2739554	<0.24123	<0.069103	0.1714384	<0.023602
MX12AB019-1	604.8	H	<0.1202	<4.3775	<0.25959	<0.30808	<0.18645	1.0786449	<0.24795	<0.086322	0.3387861	<0.019071
MX12AB019-2	604.8	H	0.1771881	<3.8696	<0.2092	<0.34821	<0.17497	0.6357935	<0.27451	0.105388	0.2829266	<0.017388
MX12AB019-3	604.8	H	0.1448425	<3.2068	<0.1762	0.3656205	<0.15181	0.5842903	<0.16806	<0.059947	0.1792336	<0.017543
MX12AB019-4	604.8	H	<0.14383	<4.2726	<0.23188	<0.35108	<0.24248	0.7189961	<0.23582	<0.061516	0.1279166	<0.025623
MX12AB019-5	604.8	H	<0.095838	<3.5786	<0.26388	<0.2572	<0.16596	0.7287441	<0.19865	<0.068779	0.1136462	<0.03105
MX12AB019-6	604.8	H	0.1065402	<4.2938	<0.24531	<0.31544	<0.20266	1.0385831	<0.24668	0.1658729	0.2046935	<0.029564
MX12AB019-7	604.8	H	<0.097655	<2.9491	<0.24498	<0.31697	<0.22148	0.8674071	<0.22184	<0.066195	0.6616208	<0.021266
MX12AB019-8	604.8	H	<0.098387	<3.9965	<0.26247	<0.34442	<0.31181	0.9914938	<0.24265	0.0888129	0.3257418	<0.013585
MX12AB019-9	604.8	H	<0.099823	<3.0482	<0.20412	<0.40543	<0.17267	0.7426652	<0.20806	0.0664255	0.1250757	<0.016749
MX12AB019-10	604.8	H	<0.093826	<4.0094	<0.2176	<0.36228	<0.16633	0.7251616	0.1924	0.0690772	0.2348725	<0.020026
MX12AB019-11	604.8	H	<0.11515	<4.4791	<0.24135	<0.30281	<0.27583	0.933642	0.410056	<0.070262	0.1400669	<0.020095
MX12AB022-1	2824.7	H	<0.12891	<4.8559	<0.24461	<0.44099	<0.28078	0.2508165	<0.25858	<0.069504	0.0254106	<0.025861
MX12AB022-2	2824.7	H	<0.19734	5.3120988	2.8413517	2.9315875	<0.23359	<0.088598	<0.29622	<0.078599	0.0162579	<0.030087
MX12AB022-3	2824.7	H	<0.14572	10.240855	7.0756914	7.8078422	<0.18388	<0.11526	<0.25393	<0.068289	0.0383236	<0.024002
MX12AB022-4	2824.7	H	<0.16507	<6.2243	1.0138132	0.5512342	<0.26058	<0.13281	<0.29795	<0.079915	0.0763308	<0.036743
MX12AB023-1	537.8	H	0.131932	<5.8492	0.2766388	0.243136	<0.17989	1.1129045	<0.16702	0.0283967	0.0823837	<0.010753
MX12AB023-2	537.8	H	0.1231893	<3.9931	<0.15335	<0.17336	<0.13689	1.2804151	<0.14076	<0.026148	0.3992249	<0.028631
MX12AB023-3	537.8	H	<0.084862	<3.7183	<0.097936	0.1514038	<0.13641	1.1153385	<0.11991	0.0297677	0.0654681	<0.010572
MX12AB023-4	537.8	H	<0.095901	<3.9992	<0.087339	0.1383853	<0.13806	1.1743459	0.0865302	<0.016317	0.0237528	<0.014422
MX12AB023-5	537.8	H	0.2221098	<4.9342	<0.14733	0.2203814	<0.14628	1.1159396	<0.15674	<0.021991	0.4608977	<0.010585
MX12AB023-6	537.8	H	0.1830056	<5.6134	0.718681	0.7837555	0.2064179	1.176185	<0.11046	0.0708769	0.1773697	<0.018931
MX12AB023-7	537.8	H	<0.13695	<4.6143	<0.21619	<0.21412	<0.14994	1.2791646	<0.16706	<0.029387	0.0886676	<0.020017
MX12AB023-8	537.8	H	0.5326965	<4.9803	0.0997126	<0.1563	<0.11376	0.9432365	0.1762285	0.1991003	0.8289953	<0.017295
MX12AB024-1	481.9	H	<0.069497	<4.075	<0.17827	<0.19768	<0.11827	0.9341598	0.080825	0.0430832	0.0999887	<0.019307
MX12AB024-2	481.9	H	<0.078094	<3.3878	<0.14075	<0.21734	<0.13709	1.0595889	<0.093822	<0.017829	0.0513929	<0.013688
MX12AB024-3	481.9	H	<0.1024	<3.8505	<0.18691	<0.23298	0.1284777	1.4054736	<0.17244	<0.020979	0.1367616	<0.014775
MX12AB024-4	481.9	H	0.1006421	<3.9137	<0.15456	<0.19571	<0.10669	1.1441253	<0.11015	<0.030624	0.1904227	<0.016864

Sample	Distance (m)	Type	Mn55	Fe57	Cu63	Cu65	Zn66	Ge74	As75	Rb85	Sr88	Zr90
MX12AB024-5	481.9	H	<0.1179	<4.1906	<0.19272	<0.23038	<0.10901	0.9684435	0.125327	0.047509	0.2213314	0.1598463
MX12AB024-6	481.9	H	<0.098467	<3.7621	<0.13961	<0.1488	<0.15606	1.0336604	<0.062296	<0.027169	0.0413119	<0.022755
MX12AB024-7	481.9	H	<0.10222	<3.9721	<0.19765	<0.18154	<0.11531	1.0735414	<0.12114	<0.02305	0.0614752	<0.0086182
MX12AB024-8	481.9	H	<0.097117	3.171095	<0.13889	<0.20227	<0.16298	1.1669385	<0.10227	<0.024158	0.0570746	<0.018079
MX12AB024-9	481.9	H	<0.14014	<4.354	<0.17476	<0.19654	<0.22654	0.9731581	<0.14013	<0.029231	0.0852539	<0.010114
MX12AB024-10	481.9	H	0.3976339	26.245171	<0.21221	<0.19851	<0.18256	1.1366212	<0.13864	0.1086638	0.168656	<0.02759
MX12AB024-11	481.9	H	<0.11862	<3.6656	<0.12748	<0.1673	<0.16155	1.3113016	<0.11125	<0.024427	0.0637367	<0.021734
MX12AB025-1	441.6	H	<0.095567	<4.0799	<0.17364	<0.17954	<0.14259	1.0411762	<0.11899	<0.019157	0.0647615	<0.013843
MX12AB025-2	441.6	H	<0.090105	<3.7395	<0.15095	<0.23001	<0.12488	0.9281613	<0.10375	<0.026665	0.0390797	<0.021989
MX12AB025-3	441.6	H	<0.064246	<3.4084	<0.14855	<0.16481	<0.13001	1.0372329	<0.11767	<0.022508	0.0729124	<0.0094473
MX12AB025-4	441.6	H	<0.082673	<4.0055	<0.13008	<0.27662	<0.11567	0.9437327	<0.094987	<0.029138	0.0168844	<0.010962
MX12AB025-5	441.6	H	<0.074472	<3.158	<0.15571	<0.17855	<0.11695	0.8423693	<0.13256	<0.025583	0.0332692	<0.013729
MX12AB025-6	441.6	H	<0.11879	<4.2483	<0.18783	<0.2049	0.1842391	1.0393485	<0.14492	0.0406666	0.1036662	<0.02025
MX12AB025-7	441.6	H	0.0990186	<3.6177	<0.16504	<0.1136	<0.15241	0.9053869	<0.10477	<0.025038	0.0171243	<0.011016
MX12AB025-8	441.6	H	<0.095841	<3.8126	<0.11927	<0.1652	<0.14387	0.856359	0.0993246	<0.024456	0.0916725	<0.015556
MX12AB025-9	441.6	H	<0.079643	<2.5314	<0.14205	<0.19217	<0.10077	0.8317512	<0.11708	<0.023106	0.0373411	<0.013721
MX12AB027-1	425.4	I	5.1562073	220.63117	4.9948802	5.863831	1.9189788	0.9197714	<0.19561	0.0376188	0.987522	3.2145817
MX12AB027-2	425.4	I	0.4057596	23.22952	<0.21887	<0.28599	<0.17611	0.8249473	<0.21899	0.1547479	0.5543327	0.0200735
MX12AB027-3	425.4	I	0.1906064	<4.9154	2.1579802	2.2966196	<0.20166	0.933647	<0.13505	0.0388864	0.4324273	0.0563656
MX12AB027-4	425.4	I	<0.12742	<5.6586	<0.17082	<0.21037	<0.20709	0.6652337	<0.16098	0.0713385	0.0647962	<0.022522
MX12AB027-5	425.4	I	0.2337851	<2.7526	<0.12375	<0.15222	<0.19265	1.0929569	<0.12202	0.0751015	0.3484192	0.0214593
MX12AB027-6	425.4	I	0.4071883	6.6156183	<0.17536	<0.20153	<0.23215	1.8083653	0.1160144	0.2801602	0.4346978	0.0279935
MX12AB028-1	481.4	I	0.7773036	7.8017842	<0.14467	<0.26652	0.1441473	0.6828659	<0.17148	0.0694252	3.3656419	1.0451568
MX12AB028-2	481.4	I	<0.07338	<3.1805	<0.15762	<0.14859	<0.07748	0.5540223	<0.13857	0.1039433	0.1913532	<0.018145
MX12AB028-3	481.4	I	0.1080812	<3.7891	<0.16463	<0.24996	<0.17224	0.5178563	<0.13203	0.0846114	0.091023	<0.014148
MX12AB028-4	481.4	I	<0.092758	<3.812	0.1890617	0.1925831	0.1106604	1.1184844	<0.08533	0.0251133	0.1099901	<0.019393
MX12AB029-1	481.4	H	<0.10277	<4.163	<0.14566	<0.11577	0.1166168	1.0158578	<0.16129	<0.027895	0.1614875	<0.016323
MX12AB029-2	481.4	H	<0.10495	<3.9762	<0.1553	<0.22694	<0.13092	0.9961416	<0.15417	<0.02287	0.0390738	<0.01356
MX12AB029-3	481.4	H	<0.096523	<4.4982	<0.12163	<0.22057	<0.13327	1.0352768	<0.098275	<0.026066	0.0376523	<0.010914
MX12AB029-4	481.4	H	<0.13304	<5.2881	<0.18839	<0.23766	<0.18532	0.9399514	<0.12338	0.047954	0.1776215	<0.018531
MX12AB029-5	481.4	H	<0.098352	<4.1717	<0.12262	<0.16412	<0.12119	0.9460769	<0.17346	<0.022335	0.4642275	<0.021298

Sample	Distance (m)	Type	Mn55	Fe57	Cu63	Cu65	Zn66	Ge74	As75	Rb85	Sr88	Zr90
MX12AB029-6	481.4	H	0.1165188	<4.5545	0.3636134	0.3472993	0.0942006	1.0337183	<0.2046	<0.021881	0.0610552	<0.011357
MX12AB029-7	481.4	H	<0.098127	<3.6847	<0.15125	<0.16021	<0.11361	0.9007794	<0.095667	0.0243338	0.2560083	<0.0077255
MX12AB029-8	481.4	H	<0.11252	<3.881	<0.14489	0.1076375	<0.12709	0.9660078	<0.061403	<0.024753	0.0323665	<0.010749
MX12AB029-9	481.4	H	<0.084961	<3.4464	<0.10741	<0.12203	<0.093259	0.8654323	<0.097189	<0.017605	0.1512989	<0.015509
MX12AB029-10	481.4	H	<0.091109	<4.3517	<0.099506	<0.16225	<0.12641	1.7666268	<0.10521	<0.023132	0.0189801	<0.011536
MX12AB029-11	481.4	H	<0.093775	<3.9513	<0.15456	<0.19399	<0.12349	1.2202579	<0.082794	0.0236611	0.074497	<0.016599
MX12AB029-12	481.4	H	0.1447844	<4.7643	<0.196	<0.22751	<0.15811	1.6139979	<0.087811	0.0344449	0.1340625	<0.013924
MX12AB030-1	441.3	H	0.1014412	<3.7893	<0.14078	<0.12775	<0.1194	0.8984665	<0.14276	0.0252453	0.11933	<0.02765
MX12AB030-2	441.3	H	<0.10812	<3.9072	<0.13127	<0.19713	<0.12503	0.9122227	<0.11091	0.0246844	0.0505536	<0.011544
MX12AB030-3	441.3	H	<0.077121	<2.955	<0.099331	<0.11018	<0.10822	1.0720077	0.1108452	<0.022047	0.0472113	<0.017208
MX12AB030-4	441.3	H	<0.090319	<4.047	<0.14091	<0.17348	<0.11059	0.9876541	<0.13937	<0.02576	0.0380601	<0.010564
MX12AB030-5	441.3	H	<0.1123	8.2051376	<0.15875	<0.16636	<0.15044	0.9250242	<0.11071	<0.024497	0.1715077	<0.015553
MX12AB030-6	441.3	H	0.3243263	<4.6136	0.2858223	0.6329114	<0.14123	0.751516	0.1178403	0.1677224	0.2462184	<0.013658
MX12AB030-7	441.3	H	0.2067366	<5.6287	0.5771143	0.5430715	0.1747106	0.8103519	<0.16053	0.1040531	0.4421014	<0.014037
MX12AB030-8	441.3	H	0.2239709	3.5993248	<0.13436	0.1588062	<0.14168	1.0170073	<0.13014	0.0744123	0.1513472	0.0190183
MX12AB030-9	441.3	H	<0.10551	<4.4128	<0.14912	<0.15762	<0.13415	0.8836362	<0.13918	<0.027903	0.0323935	<0.02538
MX12AB030-10	441.3	H	<0.083687	6.151732	<0.14501	<0.20755	<0.13113	1.0346272	<0.11182	<0.018022	0.1078857	<0.013549
MX12AB030-11	441.3	H	<0.12548	5.4459142	<0.195	<0.26039	0.1626123	0.8988278	<0.14961	<0.031249	0.1926137	<0.014631
MX12AB032-1	546.7	H	<0.093093	<4.2138	<0.11937	<0.1819	<0.10962	1.2129559	<0.12134	<0.023765	0.0139288	<0.015187
MX12AB032-2	546.7	H	<0.07546	<3.7537	<0.091996	<0.20454	<0.12713	0.6795084	<0.10049	<0.025205	0.0108249	<0.018688
MX12AB032-3	546.7	H	<0.12979	<4.6516	<0.16595	<0.22365	<0.21809	1.371561	<0.1866	<0.029515	<0.0067596	<0.014962
MX12AB032-4	546.7	H	<0.081903	<3.2636	<0.14767	<0.15028	<0.1435	0.8489081	<0.12258	<0.023081	0.0230307	<0.020907
MX12AB032-5	546.7	H	0.6902393	8.8300058	<0.21417	<0.23198	0.4474677	0.8036385	<0.18539	<0.046787	<0.010251	<0.021046
MX12AB032-6	546.7	H	<0.11006	<4.3342	0.1368751	<0.13837	<0.13144	1.3216875	<0.20046	<0.02225	0.0517409	<0.0077206
MX12AB032-7	546.7	H	<0.17512	<6.0035	<0.13735	<0.24088	<0.21256	1.2149298	<0.20811	<0.03881	0.013863	<0.028153
MX12AB032-8	546.7	H	0.1861924	9.3052228	<0.16448	<0.15913	0.203695	1.216474	<0.16442	0.0477271	0.3316262	<0.014907
MX12AB032-9	546.7	H	<0.1459	6.8218915	<0.22636	<0.24133	<0.21377	0.8120667	<0.19861	<0.029187	<0.017312	<0.024802
MX12AB033-1	134.0	H	<0.09814	<3.9206	<0.11481	<0.15701	0.0982764	0.8356232	<0.059913	<0.018127	0.0418649	<0.01245
MX12AB033-2	134.0	H	0.1504974	6.1830079	<0.095832	<0.13302	<0.14117	1.2946932	<0.088562	0.0599334	0.3212322	<0.015234
MX12AB033-3	134.0	H	0.0928599	<4.5302	0.1448249	0.2197522	<0.12296	1.1905033	<0.08652	<0.029552	0.2677061	<0.019614
MX12AB033-4	134.0	H	<0.097175	<4.0668	<0.12371	<0.14999	0.2061758	0.9518337	0.0964333	0.0259233	0.0451199	<0.0095818

Sample	Distance (m)	Type	Mn55	Fe57	Cu63	Cu65	Zn66	Ge74	As75	Rb85	Sr88	Zr90
MX12AB033-5	134.0	H	<0.11935	<4.7003	<0.14431	<0.21716	<0.18756	0.9809175	<0.11489	<0.029235	0.1633328	<0.012506
MX12AB033-6	134.0	H	0.0794818	<3.8833	<0.13027	<0.099394	<0.087923	1.1077489	<0.14589	<0.020534	0.0256419	<0.011902
MX12AB033-7	134.0	H	0.1029651	<4.7851	<0.12202	<0.18411	<0.097904	1.0154117	<0.1008	<0.021305	0.0186388	<0.016104
MX12AB033-8	134.0	H	<0.10078	<3.9416	<0.15377	<0.21226	<0.11987	1.1375198	<0.10237	<0.033254	0.0315337	<0.01502
MX12AB034-1	147.2	H	<0.089333	<4.8511	<0.15571	<0.16997	<0.16383	0.9550751	<0.12449	<0.020364	0.0432578	<0.022943
MX12AB034-2	147.2	H	0.5066668	<5.5781	<0.1279	<0.18431	<0.14098	0.8958469	<0.11647	0.032032	0.3641986	<0.021009
MX12AB034-3	147.2	H	0.109711	<4.0101	<0.1611	<0.22747	<0.114	1.0353279	<0.083195	<0.021798	0.0364601	<0.019055
MX12AB034-4	147.2	H	0.196219	21.970563	<0.19202	<0.2234	<0.12787	1.1002701	<0.22829	0.0685551	0.3097636	<0.016701
MX12AB034-5	147.2	H	0.1719054	<5.6413	<0.16714	<0.31183	<0.20898	1.4347054	<0.18892	0.1080815	0.3844602	<0.019977
MX12AB034-6	147.2	H	<0.08225	<4.5609	<0.13005	<0.16634	<0.16946	1.0101969	<0.12127	<0.018254	0.0360178	<0.0077037
MX12AB034-7	147.2	H	0.123319	<5.0902	<0.17245	<0.18466	<0.13471	1.0010624	<0.15157	<0.021975	0.0080874	<0.017382
MX12AB034-8	147.2	H	0.1367797	<4.8252	0.2986653	0.3485974	<0.12504	1.0790217	<0.15298	0.0302502	0.1490984	<0.012104
MX12AB037-1	169.2	H	0.1125032	<4.4424	<0.17141	<0.15717	0.1738565	1.2400373	<0.11705	<0.021248	0.054764	<0.013888
MX12AB037-2	169.2	H	<0.095166	<5.0901	<0.10878	<0.17088	<0.15379	1.0885157	<0.18836	<0.013364	0.04595	<0.024141
MX12AB037-3	169.2	H	<0.091649	<4.4443	<0.18073	<0.22617	<0.11957	1.074167	<0.11251	0.017913	0.0385256	<0.024585
MX12AB037-4	169.2	H	<0.083739	<4.7322	<0.11552	<0.15481	<0.14042	1.1303876	<0.10279	<0.019146	0.0759134	<0.012279
MX12AB037-5	169.2	H	<0.093797	<4.5911	<0.11859	<0.20503	<0.14652	1.0930863	<0.17057	<0.017236	0.0438356	<0.016747
MX12AB037-6	169.2	H	0.5979694	<6.0566	<0.15451	<0.21891	<0.14113	0.6810003	<0.094763	0.2351381	0.1054946	<0.012197
MX12AB037-7	169.2	H	0.1438301	<5.6558	<0.13269	0.3609164	0.3061098	1.2651929	0.1853057	0.1219624	0.3689029	<0.016499
MX12AB037-8	169.2	H	0.1722184	<7.5473	<0.15957	<0.29738	<0.20483	1.6610459	<0.19719	0.0985697	0.2776561	<0.013413
MX12AB038-1	178.1	H	0.0907794	<3.9015	<0.16027	<0.13099	<0.1491	1.3725783	<0.14586	0.0263143	0.1056386	<0.012781
MX12AB038-2	178.1	H	<0.094256	<3.7688	<0.10231	<0.20084	<0.096341	1.3056113	<0.088283	0.0245249	0.1340539	<0.016928
MX12AB038-3	178.1	H	0.1542684	4.8612703	0.7810759	0.8193399	<0.12918	1.3029464	<0.085377	0.052696	0.2910126	<0.013501
MX12AB038-4	178.1	H	0.1908618	<4.3921	<0.1396	<0.19204	<0.11837	1.3173833	<0.13972	0.0516787	0.2079336	<0.010364
MX12AB038-5	178.1	H	0.2093842	<4.8423	0.5465719	0.5419571	<0.15863	1.341288	<0.094179	0.0438523	0.1469918	<0.019961
MX12AB038-6	178.1	H	0.1005748	<3.6563	<0.10543	<0.15919	<0.15416	1.3894975	<0.14341	<0.027563	0.0864257	<0.014035
MX12AB038-7	178.1	H	0.102148	<3.5599	0.1539893	0.2919883	<0.082672	1.2117845	<0.13255	0.0319931	0.2236194	<0.0054359
MX12AB038-8	178.1	H	0.1309792	<3.6569	0.379871	0.3648717	<0.13591	1.3903897	<0.084576	0.0335542	0.1763377	<0.01378
MX12AB039-1	403.7	M	0.1194078	<4.3868	<0.13103	<0.18007	<0.12783	1.7747362	<0.094241	<0.032423	0.0214267	<0.013632
MX12AB039-2	403.7	M	<0.098215	<3.6053	<0.12503	<0.14488	0.1146749	1.6396274	<0.094295	<0.018473	0.3206005	0.0081102
MX12AB039-3	403.7	M	0.18439	258.68392	<0.20298	<0.20193	<0.18807	1.3247882	<0.13617	<0.036152	0.1682023	<0.02927

Sample	Distance (m)	Type	Mn55	Fe57	Cu63	Cu65	Zn66	Ge74	As75	Rb85	Sr88	Zr90
MX12AB040-1	187.3	H	0.1044577	<4.8867	0.8924806	0.7524534	0.0987107	1.1511898	0.1316844	0.0559649	0.2301301	<0.015073
MX12AB040-2	187.3	H	<0.10034	<4.7587	<0.13145	<0.13216	<0.11404	0.6295612	<0.099848	0.0338206	0.3721476	<0.013298
MX12AB040-3	187.3	H	<0.090543	<4.8673	0.4146498	0.5092728	<0.14156	0.9014372	<0.11672	<0.020022	0.1023943	<0.013616
MX12AB040-4	187.3	H	<0.10214	<4.0157	<0.16285	<0.18167	<0.1428	1.0920718	<0.11927	<0.022225	0.1376513	<0.010517
MX12AB040-5	187.3	H	<0.092475	<4.7193	<0.10641	<0.10731	<0.12468	1.0571287	<0.092989	<0.019867	0.0364682	<0.01979
MX12AB040-6	187.3	H	<0.084085	<3.7265	<0.13044	<0.13007	<0.077678	0.8521559	<0.10594	<0.01905	0.0413797	<0.011994
MX12AB040-7	187.3	H	<0.094104	<5.0794	<0.13405	<0.13521	<0.092016	0.8446437	<0.069082	0.0401136	0.1974505	<0.016279
MX12AB041-1	198.2	H	0.1834781	<3.9875	<0.13337	0.1445158	0.1040341	1.5100898	<0.12199	0.0453269	0.2090358	<0.021868
MX12AB041-2	198.2	H	0.1516377	<4.9749	<0.14398	<0.16258	<0.099794	1.1997846	<0.082323	0.0386755	0.2016402	<0.017896
MX12AB041-3	198.2	H	0.1768523	<5.6664	<0.15117	<0.23528	<0.074424	1.3452038	<0.13511	<0.019633	0.1511976	<0.01914
MX12AB041-4	198.2	H	0.2843257	<3.9984	<0.15745	<0.1706	<0.097825	1.2395282	<0.12682	0.0664836	0.07133	<0.019734
MX12AB041-5	198.2	H	0.2867064	<4.131	0.2802993	0.1792378	0.1769531	1.1589733	<0.093634	0.09776	0.0638063	<0.012565
MX12AB041-6	198.2	H	0.3249784	<4.1445	0.3552002	0.5430897	<0.11824	1.0654742	<0.10898	0.1448452	0.2197722	<0.01064
MX12AB041-7	198.2	H	0.1489027	<5.105	<0.14737	<0.19837	0.1150533	1.2025438	<0.14495	0.0387387	0.4357547	<0.020771
MX12AB041-8	198.2	H	<0.11152	8.1513129	<0.15844	<0.22751	<0.10588	1.1604192	<0.12636	0.090927	0.6135881	<0.0068743
MX12AB041-9	198.2	H	<0.11848	<4.9952	<0.13581	<0.21573	<0.123	1.1696675	<0.18907	0.0359423	0.1590895	<0.021047
MX12AB041-10	198.2	H	<0.12081	<3.9641	<0.16002	<0.20135	<0.17552	1.19122	0.1516794	0.0541958	0.3043617	0.011421
MX12AB041-11	198.2	H	0.2383487	<4.4247	0.4207497	0.2523224	<0.099535	1.37177	0.1010424	0.0651589	0.3251481	<0.014966
MX12AB042-1	205.6	H	<0.098936	<5.609	<0.22679	<0.20664	<0.19921	1.3640886	0.3672305	<0.024177	0.1133374	<0.034048
MX12AB042-2	205.6	H	<0.11442	<4.5581	<0.16765	<0.1987	<0.12745	1.2692934	<0.13435	0.0564177	0.2634267	<0.014578
MX12AB042-3	205.6	H	<0.09739	<3.4739	<0.14615	<0.14109	<0.16895	1.4192369	<0.1099	<0.018748	0.1253468	<0.01115
MX12AB042-4	205.6	H	<0.099314	<5.2975	0.2952561	0.4012904	<0.13238	1.2092107	<0.11219	0.0317885	0.1091779	<0.018063
MX12AB042-5	205.6	H	0.1035818	<4.9876	<0.15178	<0.20448	<0.14206	2.0604615	<0.16297	0.0732581	0.2417959	<0.011851
MX12AB042-6	205.6	H	<0.10336	<5.7674	0.2311664	<0.19999	<0.13375	1.8375452	<0.10755	<0.02583	0.1368818	<0.023192
MX12AB042-7	205.6	H	<0.11003	<5.2699	<0.19384	<0.21491	<0.14626	1.6026464	<0.14936	0.0296305	0.1001578	<0.011956
MX12AB042-8	205.6	H	2.3510019	41.94299	<0.19386	<0.28543	<0.20178	1.7448027	<0.17447	<0.019829	1.4465797	<0.017441
MX12AB042-9	205.6	H	0.8230714	23.273677	<0.16232	<0.21011	<0.14604	2.0004011	<0.1488	<0.031677	0.7743011	<0.020338
MX12AB043-1	206.1	H	<0.11978	<5.0943	0.285885	0.4978273	<0.15335	0.7866814	<0.12127	<0.023845	0.146338	<0.021961
MX12AB043-2	206.1	H	0.1364004	<4.443	0.3572951	0.4197409	0.0929178	0.7234267	<0.11575	<0.019267	0.0296622	<0.013362
MX12AB043-3	206.1	H	0.0788241	<4.0445	<0.081097	<0.14547	<0.09889	0.7382555	<0.078959	<0.016118	0.0583294	<0.0099288
MX12AB043-4	206.1	H	0.0858285	<3.8167	<0.1489	<0.14713	<0.13991	0.8114815	<0.10986	<0.018573	0.0338511	<0.015198

Sample	Distance (m)	Type	Mn55	Fe57	Cu63	Cu65	Zn66	Ge74	As75	Rb85	Sr88	Zr90
MX12AB043-5	206.1	H	0.1034764	<3.9055	0.1544372	<0.097591	<0.11618	0.7230539	<0.067015	<0.021948	0.0798152	<0.0074024
MX12AB043-6	206.1	H	<0.095161	<4.0642	<0.13928	<0.15168	0.1219792	0.8674697	0.1390987	0.0309689	0.1854224	<0.014105
MX12AB043-7	206.1	H	<0.099908	<4.1037	<0.11607	<0.13721	<0.11854	0.62747	<0.084286	<0.029353	0.0771051	<0.025858
MX12AB043-8	206.1	H	0.5223347	9.2863444	<0.14744	0.2091052	<0.11592	0.8117213	<0.097714	<0.027518	0.2844252	14.535195
MX12AB044-1	206.7	H	<0.098868	<5.9302	<0.11066	<0.11429	<0.12283	0.6474344	<0.16041	<0.025202	0.0372252	<0.012623
MX12AB044-2	206.7	H	0.3953675	<5.8278	0.1813663	0.3426897	0.1191789	0.7163134	0.143236	<0.027199	0.4586669	0.0143469
MX12AB044-3	206.7	H	<0.097374	<3.5443	<0.10635	<0.18105	<0.097894	0.6771653	<0.078432	<0.02268	0.0446906	<0.0103
MX12AB044-4	206.7	H	0.1160846	<4.518	<0.12194	<0.15937	<0.12829	0.7388223	<0.053653	<0.022936	0.1529529	<0.010221
MX12AB044-5	206.7	H	0.1165134	<4.1077	<0.11074	<0.10468	<0.11879	0.641281	<0.11722	<0.021082	0.1772088	<0.010641
MX12AB044-6	206.7	H	0.1872166	<3.7131	<0.10211	<0.15805	<0.10708	0.7392359	<0.08787	0.0259409	0.1066376	<0.0096865
MX12AB044-7	206.7	H	<0.086565	<4.1747	<0.14991	<0.15054	<0.11519	1.0735966	<0.087942	<0.017094	0.0602108	<0.021345
MX12AB044-8	206.7	H	0.0957847	<4.527	<0.13871	<0.18156	<0.15542	0.7454224	<0.11252	<0.022209	0.0464205	<0.012183
MX12AB044-9	206.7	H	<0.10216	<4.6523	<0.12096	<0.10434	<0.10863	0.8762921	<0.15405	<0.022446	0.0172557	<0.011786
MX12AB044-10	206.7	H	<0.078194	<4.187	<0.11056	<0.15736	<0.12775	0.7636829	<0.059636	<0.017938	0.005425	<0.012404
MX12AB045-1	222.9	H	<0.10618	<4.0438	<0.15891	<0.10606	<0.12455	0.7226343	<0.07751	<0.022541	0.1519989	<0.021403
MX12AB045-2	222.9	H	<0.093608	<4.6952	<0.10029	<0.12571	<0.092083	0.7234428	<0.099027	0.0333744	0.1409346	<0.014912
MX12AB045-3	222.9	H	<0.070578	<5.4387	<0.11802	<0.23685	0.0704898	0.7806453	<0.14312	<0.023503	0.1002568	<0.0058903
MX12AB045-4	222.9	H	0.0870776	<4.8772	<0.12631	<0.1319	<0.057624	0.6937539	<0.11415	<0.019311	0.0130691	<0.01492
MX12AB045-5	222.9	H	<0.1065	<4.4717	<0.11221	<0.15272	<0.119	0.7039876	<0.15345	<0.020662	0.0146032	<0.012557
MX12AB045-6	222.9	H	<0.098859	<4.51	<0.12564	<0.14004	<0.11008	0.7412179	0.1234827	<0.019098	0.1248388	<0.01024
MX12AB045-7	222.9	H	<0.091919	<4.8805	<0.09976	<0.14575	<0.14896	0.7818532	<0.15034	<0.024139	0.0397926	<0.0084364
MX12AB045-8	222.9	H	0.1669047	<4.8059	<0.14861	<0.12002	0.098572	0.8285758	0.0834106	<0.025564	0.2219317	<0.01479
MX12AB045-9	222.9	H	0.1193566	<3.5294	<0.1393	<0.13455	<0.12588	0.7553445	<0.083089	<0.018931	0.2182946	<0.0099217
MX12AB046-1	3642.7	M	<0.11791	<5.9214	0.2385339	<0.20545	<0.12605	0.8152755	<0.098186	0.0306063	0.0662038	0.0214428
MX12AB046-2	3642.7	M	<0.10945	17.612557	<0.13652	<0.24235	<0.12134	1.0375451	<0.1635	0.0904147	0.1377203	<0.013992
MX12AB046-3	3642.7	M	<0.11087	90.960663	1.6458503	1.5233118	0.1879769	0.9844134	<0.10909	<0.026064	0.0338187	<0.026828
MX12AB046-4	3642.7	M	<0.094814	11.559948	<0.15672	0.2491461	<0.1032	0.8874996	<0.11417	<0.031256	0.0351822	<0.014458
MX12AB046-5	3642.7	M	<0.15628	<4.8266	<0.20871	<0.26432	<0.2226	0.6228871	<0.10455	0.0529829	0.0736641	<0.021943
MX12AB046-6	3642.7	M	0.1041146	<7.2097	<0.16808	<0.1876	<0.17964	0.6531079	<0.13701	<0.027406	0.0304686	<0.012997
MX12AB046-7	3642.7	M	<0.11176	<3.6041	<0.13825	<0.14082	<0.18937	0.8696517	<0.11162	<0.025201	0.0417179	<0.012592
MX12AB046-8	3642.7	M	<0.10909	<5.0805	<0.16463	<0.13522	<0.12234	1.0985682	<0.11273	<0.022409	0.0351935	<0.010393

Sample	Distance (m)	Type	Mn55	Fe57	Cu63	Cu65	Zn66	Ge74	As75	Rb85	Sr88	Zr90
MX12AB046-9	3642.7	M	<0.094398	47.772769	0.2130349	0.3075029	<0.13368	1.0843741	<0.15181	<0.031581	0.0708473	<0.026045
MX12AB046-10	3642.7	M	<0.10432	79.2161	<0.2038	0.3315804	0.2229231	0.6497753	0.1885747	0.0351919	0.1141573	0.0260742
MX12AB046-11	3642.7	M	0.1167258	23.938337	<0.14849	0.4673544	<0.20411	1.3101861	0.1294847	<0.027793	0.0546837	<0.015083
MX12AB047-1	3644.7	H.A.	<0.099959	<5.0468	<0.13261	<0.18213	<0.13053	0.5774615	<0.1048	<0.019815	0.0111572	<0.015569
MX12AB047-2	3644.7	H.A.	1.4337699	<72.2492	<0.97777	<0.78729	<0.58166	<-2.6737	<124.8542	<-0.69134	9.6418958	<1.3673
MX12AB047-3	3644.7	H.A.	<0.096344	<5.2556	<0.15464	<0.20493	0.3173234	0.7665978	<0.1271	<0.018732	0.0247372	0.0134243
MX12AB047-4	3644.7	H.A.	<0.07814	<4.1853	<0.13998	<0.1792	<0.13406	0.4401176	<0.11765	<0.021965	0.0604957	<0.020151
MX12AB054-1	2784.0	H	0.1247222	5.4268473	<0.15675	<0.23308	<0.12384	<0.085687	<0.17944	<0.02546	0.1644892	<0.020901
MX12AB054-2	2784.0	H	0.6945763	6.5510881	<0.2088	<0.27431	<0.1814	0.116482	<0.19082	<0.022885	0.3658806	<0.020154
MX12AB054-3	2784.0	H	<0.16222	<5.3666	<0.17308	<0.34751	<0.14683	0.1031088	<0.15115	<0.027214	0.1012718	<0.017349
MX12AB054-4	2784.0	H	0.9545537	7.3251731	0.6849733	1.0846031	<0.22173	<0.1127	<0.21808	<0.022642	0.3375235	<0.014063
MX12AB054-5	2784.0	H	<0.13292	6.9941376	0.4881006	0.4048908	<0.15985	0.1413921	<0.2606	<0.029445	0.2371203	0.0133537
MX12AB054-6	2784.0	H	1.1525835	123.5682	0.2228243	<0.27112	0.2124249	0.085426	<0.074891	<0.024236	9.3780559	<0.017544
MX12AB055-1	1279.8	I	<0.10557	<4.1464	<0.1078	<0.17089	<0.1066	0.5722959	<0.087775	0.0112055	0.1797227	<0.014954
MX12AB055-2	1279.8	I	<0.10954	<4.3312	<0.12793	<0.28582	0.226284	0.9420601	<0.15528	<0.025114	0.1561511	0.0189472
MX12AB055-3	1279.8	I	6.472278	172.7858	<0.23961	<0.26428	0.7392732	0.3990368	<0.15923	0.0509295	0.6440133	0.1133175
MX12AB055-4	1279.8	I	0.331874	<9.8188	0.6830968	<0.51791	<0.63004	7.7659995	<1.142	<-0.15943	<-0.017329	-0.0418277
MX12AB055-5	1279.8	I	<0.094204	<3.7327	<0.11501	<0.18847	<0.14862	1.1873773	<0.10169	0.0317232	0.0848377	<0.015527
MX12AB055-6	1279.8	I	0.3891126	<5.0147	<0.12166	<0.17102	<0.12257	0.5954197	0.2040722	0.050806	0.4729631	0.5127281
MX12AB056-1	873.3	I	0.1196562	<6.4231	<0.13654	<0.1962	<0.081378	0.5128635	<0.15184	<0.020633	0.0588183	<0.0078249
MX12AB056-2	873.3	I	0.2677056	3.971811	<0.21143	<0.18016	<0.11385	0.5371584	<0.10965	0.0792138	0.1363312	<0.018886
MX12AB056-3	873.3	I	0.6614659	<5.6073	<0.17964	<0.22796	<0.15236	0.4727802	<0.12109	0.2217027	0.2596921	<0.01377
MX12AB056-4	873.3	I	0.1401163	<4.887	<0.14196	<0.20541	<0.15271	0.5593739	0.129885	0.020016	0.0963198	<0.01865
MX12AB056-5	873.3	I	0.1613591	<6.2811	<0.18793	<0.23859	<0.10178	0.6125814	<0.23197	<0.029678	0.0555957	<0.026581
MX12AB056-6	873.3	I	0.1572501	<4.7513	<0.1305	<0.21049	<0.097283	0.5437921	<0.12682	<0.026214	0.0226695	<0.0093081
MX12AB056-7	873.3	I	<0.10415	<5.3892	<0.13356	<0.15259	<0.15818	0.5712836	<0.10968	0.0580479	0.1891655	0.0199336
MX12AB056-8	873.3	I	0.493788	8.9939968	<0.17559	<0.21144	<0.12794	0.5454328	<0.1138	0.2929716	0.4195733	0.0405747
MX12AB056-9	873.3	I	<0.095353	<4.8828	<0.16153	<0.15598	<0.12871	0.6615138	<0.16153	<0.022257	0.0593767	<0.016114
MX12AB056-10	873.3	I	<0.10026	<5.111	<0.15598	<0.24379	<0.1664	0.6750595	<0.13913	<0.019181	0.0330063	<0.01023
MX12AB056-11	873.3	I	0.0981276	<4.933	<0.15615	<0.27466	<0.14105	0.6153163	<0.10786	0.0328261	0.098275	<0.0091061
MX12AB056-12	873.3	I	<0.090115	<5.0612	<0.12714	<0.18949	0.0932644	0.877444	<0.17511	<0.015878	0.0427403	<0.01528

Sample	Distance (m)	Type	Mn55	Fe57	Cu63	Cu65	Zn66	Ge74	As75	Rb85	Sr88	Zr90
MX12AB057-1	403.6	I	<0.12928	<4.8349	<0.17056	<0.17712	<0.1596	0.8268957	<0.13295	<0.026821	0.0628125	<0.016149
MX12AB057-2	403.6	I	<0.081599	<5.3688	<0.1742	<0.17529	<0.15364	0.6600926	0.1215904	<0.017865	0.0596688	<0.014131
MX12AB057-3	403.6	I	<0.098864	<4.1487	<0.18378	0.3523569	0.0995357	0.6300687	<0.12349	0.0244826	0.0960679	<0.013531
MX12AB057-4	403.6	I	0.1585091	<6.5329	<0.18333	<0.20743	<0.14724	0.542447	0.1331953	0.0556206	0.1250108	<0.018099
MX12AB057-5	403.6	I	<0.13183	<5.1419	<0.17262	<0.21853	<0.13891	0.6350807	<0.098755	<0.015923	0.0169293	<0.013206
MX12AB057-6	403.6	I	0.7321145	<4.6532	<0.11509	<0.16681	0.1153236	0.5489042	<0.17321	0.0195969	0.1732645	<0.015826
MX12AB057-7	403.6	I	0.6434176	<6.0813	<0.14239	<0.19714	0.1095739	0.517381	<0.13421	0.230282	0.9052913	<0.013142
MX12AB057-8	403.6	I	0.0882453	<4.4797	<0.10891	<0.14485	0.1204214	0.642546	<0.10688	0.0280229	0.0756016	0.0228462
MX12AB057-9	403.6	I	0.1706327	<5.6579	<0.21365	<0.26088	<0.14558	1.2963194	<0.13482	0.0393697	0.5074915	<0.012796
MX12AB057-10	403.6	I	<0.11955	<7.0812	<0.20021	<0.17907	<0.16507	0.6038221	0.0754617	0.0457508	0.3541349	<0.016219
MX12AB058-1	255.4	H	<0.10308	<6.1362	<0.1993	<0.18689	<0.19244	1.9922438	<0.12546	<0.018653	0.0516689	0.0072089
MX12AB058-2	255.4	H	<0.093729	<4.9483	<0.13883	<0.23107	<0.16316	2.0152332	<0.098281	0.0585057	0.1161832	<0.015504
MX12AB058-3	255.4	H	<0.16819	<8.5903	<0.30566	<0.44973	<0.26529	1.6560635	<0.26275	<0.038459	0.1894309	<0.035941
MX12AB058-4	255.4	H	<0.097622	<6.3774	<0.19875	<0.17707	<0.14199	1.8006596	<0.14905	<0.014151	0.0084359	<0.01247
MX12AB058-5	255.4	H	<0.09416	<6.4651	<0.17487	0.1915662	<0.18496	1.7775869	<0.19523	<0.022893	0.0759447	<0.010087
MX12AB058-6	255.4	H	<0.10654	<5.0873	<0.16477	<0.27387	<0.10947	1.9415285	<0.15953	<0.016586	0.1096806	<0.013072
MX12AB068-1	5487.8	H	<0.12439	<5.7468	0.1897052	0.3049709	<0.18107	0.8776425	<0.13442	<0.018134	0.2749068	<0.0087451
MX12AB068-2	5487.8	H	<0.18616	<9.1996	2.7231023	2.3713733	<0.21889	1.0532594	<0.13881	0.0532829	0.2131292	<0.034021
MX12AB068-3	5487.8	H	<0.10658	<6.2032	0.2886961	0.2878292	<0.13193	0.8715662	<0.15296	<0.027159	0.2405359	<0.015452
MX12AB068-4	5487.8	H	<0.13245	<6.3685	0.5500029	0.6897734	<0.17289	0.9942258	<0.19072	0.0528427	0.2911418	<0.018765
MX12AB068-5	5487.8	H	0.2402465	15.639314	2.8467835	3.4091749	0.1495177	2.0526651	<0.26119	0.146925	0.9216137	0.0154716
MX12AB070-1	997.1	H	<0.095685	<8.022	<0.23051	<0.21593	<0.12845	1.6017997	<0.14632	<0.018765	0.0252247	<0.01272
MX12AB070-2	997.1	H	<0.14306	<10.3485	<0.29158	<0.49424	<0.17757	1.6446167	<0.1542	<0.033501	0.0249188	<0.015331
MX12AB070-3	997.1	H	<0.145	<7.2461	<0.23713	<0.33404	<0.15019	1.8715453	<0.12489	<0.028554	0.0162947	<0.015051
MX12AB070-4	997.1	H	<0.11897	<5.6706	<0.17817	<0.19763	<0.15686	1.6319801	<0.078183	<0.018636	0.0228991	<0.01936
MX12AB070-5	997.1	H	<0.12071	<8.974	<0.23581	<0.25259	<0.21852	1.8070619	<0.18998	<0.033327	0.2389712	<0.024028
MX12AB070-6	997.1	H	<0.084293	<5.5942	<0.16755	<0.35963	<0.12422	1.142719	<0.11123	0.0235692	<0.0084246	<0.013118
MX12AB070-7	997.1	H	<0.16594	<8.8719	<0.38068	<0.27342	<0.16105	2.4813978	<0.21758	0.0540317	0.0486007	<0.028875
MX12AB070-8	997.1	H	<0.12312	<8.0146	<0.22501	<0.275	<0.13988	1.6786379	<0.10277	<0.032019	0.0272022	<0.024451
MX12AB070-9	997.1	H	<0.13474	<7.8871	<0.251	<0.27396	<0.37342	1.511782	<0.20899	<0.041896	0.0842864	<0.022397
MX12AB070-10	997.1	H	0.4015212	1369.8204	2.6674704	3.5589554	0.5006083	2.057554	0.2973074	0.0626817	2.4688004	0.2159571

Sample	Distance (m)	Type	Mn55	Fe57	Cu63	Cu65	Zn66	Ge74	As75	Rb85	Sr88	Zr90
MX12AB070-11	997.1	H	0.5081667	11.172658	0.2573334	<0.32752	<0.16917	2.5766877	<0.20196	0.1699447	0.1398033	0.0137046
MX12AB074-1	174.2	H.A.	0.1449415	<6.4497	<0.18541	<0.20821	0.3343747	0.8772074	<0.22542	0.1197978	0.2638253	<0.027642
MX12AB074-2	174.2	H.A.	0.174637	<7.4157	<0.17146	<0.25248	<0.21276	0.9850204	<0.16481	0.1750671	0.1844209	0.1489171
MX12AB074-3	174.2	H.A.	0.1404742	14.260247	<0.30601	<0.28818	0.3106006	0.9559426	<0.24815	0.9738185	0.8014182	0.9558178
MX12AB074-4	174.2	H.A.	<0.10713	<8.9443	<0.2229	<0.21942	0.8904503	1.2682997	<0.13311	0.0493137	0.1496558	<0.017922
MX12AB074-5	174.2	H.A.	<0.13473	<7.8038	<0.22188	<0.37725	<0.21866	1.2673094	<0.15914	0.8126368	0.2667669	<0.025306
MX12AB074-6	174.2	H.A.	0.0970735	<5.982	<0.20097	<0.22036	0.1575407	1.1853366	<0.18133	0.0504224	0.2473353	0.0113194
MX12AB074-7	174.2	H.A.	<0.097041	<7.2343	<0.19294	<0.23474	<0.17348	1.1695861	<0.11155	0.0400143	0.2346363	<0.0065551
MX12AB074-8	174.2	H.A.	<0.094612	<5.0866	<0.20313	<0.19957	0.1735086	1.1210859	<0.091685	0.0667815	0.1585648	<0.012501
MX12AB075-1	174.2	I	0.1106541	6.4785171	0.2026976	0.2910265	0.138893	0.7641346	<0.12901	0.0650644	0.29536	<0.018648
MX12AB075-2	174.2	I	<0.11583	<6.8752	<0.22768	<0.26227	<0.16045	1.0049571	<0.16588	0.0336422	0.0329576	<0.020817
MX12AB075-3	174.2	I	<0.11162	<5.3223	<0.20561	<0.15876	<0.10704	1.1001433	<0.16875	<0.019094	0.13617	<0.015832
MX12AB075-4	174.2	I	0.1396612	<5.7894	<0.21595	<0.25926	<0.10708	0.9043611	<0.16228	<0.02507	0.031257	<0.017278
MX12AB075-5	174.2	I	<0.11616	<5.6164	<0.14562	<0.31	<0.11785	1.0223187	<0.098618	0.0207267	0.027505	<0.017505
MX12AB075-6	174.2	I	<0.12074	<6.0628	0.3265295	0.6504465	0.1523759	1.1345841	<0.22141	0.0663061	0.1281935	<0.012919
MX12AB075-7	174.2	I	0.2804024	29.118014	<0.19308	<0.34807	0.1863461	0.7542623	<0.13973	0.0523048	0.1261181	0.0165966
MX12AB075-8	174.2	I	<0.10704	<6.0543	<0.21562	<0.24018	<0.21458	1.1628521	<0.072169	<0.016381	0.1013623	0.0198617
MX12AB075-9	174.2	I	<0.094676	<6.2803	<0.23152	<0.20152	<0.17053	1.1838852	<0.15327	0.0773756	0.0680476	<0.018425
MX12AB075-10	174.2	I	<0.10682	<6.5287	<0.15971	<0.16307	<0.16354	1.1142015	<0.13074	<0.021674	0.0122168	<0.012858
MX12AB075-11	174.2	I	<0.10125	<4.4096	<0.17037	<0.14208	<0.10736	1.0996328	<0.06286	<0.019621	0.0147027	<0.013418
MX12AB075-12	174.2	I	0.099317	<5.1594	<0.16872	<0.21874	<0.13831	1.182678	<0.12209	<0.01788	0.0760068	<0.01113
MX12AB076-1	207.3	H	0.1846855	<7.0663	<0.19077	<0.20463	<0.17018	0.6087656	<0.096218	<0.02144	<0.011422	0.0125223
MX12AB076-2	207.3	H	<0.094947	<4.4797	<0.20329	<0.22944	<0.17854	0.5481094	<0.1032	<0.029003	0.0625769	<0.01347
MX12AB076-3	207.3	H	<0.11565	<5.5452	<0.21048	<0.32551	<0.17915	0.5575744	<0.10833	0.0202248	0.1341367	<0.01149
MX12AB076-4	207.3	H	0.1463737	<5.0981	<0.14012	<0.19714	0.227071	0.5122441	<0.15574	<0.021838	0.0427387	<0.012378
MX12AB076-5	207.3	H	0.1384765	<6.876	<0.1959	0.2622024	<0.12434	0.5922744	<0.1927	0.025485	0.0233599	<0.015725
MX12AB076-6	207.3	H	<0.097582	<6.5442	<0.16638	<0.24033	<0.1732	0.6342298	<0.16226	<0.026725	0.0229964	<0.025993
MX12AB076-7	207.3	H	0.1310936	<4.5052	<0.18737	<0.22973	<0.16858	0.5773129	<0.16721	0.0217132	0.0087113	<0.020381
MX12AB077-1	306.5	H	<0.1131	5.0487397	<0.15978	<0.27512	<0.16397	4.3320038	<0.16482	0.0620023	0.409718	<0.014927
MX12AB077-2	306.5	H	<0.094841	8.464759	<0.16523	<0.20274	<0.076794	5.8479206	0.2343608	0.1289935	0.8844337	<0.026854
MX12AB077-3	306.5	H	<0.13571	<6.9163	<0.23145	<0.25955	<0.22442	0.5800858	<0.20153	<0.027187	0.091053	0.4444503

Sample	Distance (m)	Type	Mn55	Fe57	Cu63	Cu65	Zn66	Ge74	As75	Rb85	Sr88	Zr90
MX12AB077-4	306.5	H	0.1903192	<5.6597	<0.17342	<0.19537	0.0585275	0.5830494	0.1257078	0.0181528	0.2365529	0.0379546
MX12AB077-5	306.5	H	0.1826514	<5.8217	<0.18138	<0.17505	<0.12776	0.5289968	<0.10331	0.0277573	0.2264148	<0.017296
MX12AB077-6	306.5	H	0.1249117	<3.7513	<0.18418	<0.26004	<0.099192	0.6122139	<0.087614	<0.014793	0.0586778	<0.021152
MX12AB078-1	375.8	I	<0.13761	<6.8312	<0.30477	<0.20473	<0.20527	0.730202	0.2412221	<0.028152	0.0337793	<0.01862
MX12AB078-2	375.8	I	<0.10008	<6.3488	<0.14221	<0.24347	<0.10266	0.6174435	0.1062624	0.0510019	0.1917373	<0.014515
MX12AB078-3	375.8	I	0.2674818	13.417141	<0.19001	<0.19342	0.1101495	0.4861819	<0.094505	0.0339213	0.1880239	<0.018996
MX12AB078-4	375.8	I	1.5922463	8.0826138	<0.17332	<0.21933	<0.1877	1.7126796	<0.087928	0.3187008	0.4570412	0.0156446
MX12AB078-5	375.8	I	1.3367516	<6.07	<0.15647	<0.22364	0.1401795	1.5925724	<0.12573	0.2998952	0.3325733	0.0128484
MX12AB078-6	375.8	I	0.1448666	<4.6922	<0.16164	<0.20527	0.1081336	0.5822107	<0.077379	<0.016735	0.0338882	<0.016366
MX12AB078-7	375.8	I	<0.10766	<6.3198	<0.15695	<0.27755	<0.11222	0.5865074	<0.12906	<0.020918	0.0597513	<0.012606
MX12AB079-1	498.2	H	0.4304254	<4.9444	<0.18659	<0.23453	0.135354	0.9269161	<0.19058	0.0359474	0.1184279	<0.010102
MX12AB079-2	498.2	H	0.4630949	<7.3379	<0.20283	<0.31008	<0.17279	1.4719986	<0.13231	0.1540814	0.2989306	<0.019922
MX12AB079-3	498.2	H	0.3345667	<8.4483	<0.26192	<0.25155	<0.16735	0.4258284	<0.12302	0.0591185	0.2688933	<0.016168
MX12AB079-4	498.2	H	0.1863616	<8.3866	<0.32644	<0.37544	<0.20727	0.5574221	<0.21993	0.1746238	0.5440997	<0.026018
MX12AB079-5	498.2	H	<0.099543	<6.6227	<0.17914	<0.18188	0.1032119	0.6294605	<0.1054	0.0477901	0.1029736	<0.0086629
MX12AB081-1	748.5	I	<0.13255	<7.4869	<0.21951	<0.26749	<0.14704	0.5435288	<0.16544	0.0472015	0.1211561	<0.018159
MX12AB081-2	748.5	I	1.0363321	115.07497	<0.30182	<0.26216	0.2005384	0.613628	<0.23674	0.4055664	0.0584027	0.9635658
MX12AB081-3	748.5	I	<0.10124	<6.3205	<0.1657	<0.23021	0.1428014	0.7862239	<0.13261	<0.022891	0.1086377	<0.015925
MX12AB081-4	748.5	I	<0.10405	<5.816	<0.20305	<0.24883	<0.094942	0.6320244	0.1235789	0.0651839	0.1258492	<0.030524
MX12AB081-5	748.5	I	0.1583713	<6.7653	0.328935	0.6528298	<0.14875	0.7714491	<0.15984	0.0401168	0.1581806	<0.016433
MX12AB081-6	748.5	I	<0.10262	<7.3808	<0.20302	<0.20717	<0.1172	0.6074966	0.2594179	0.0762396	0.2575286	<0.014371
MX12AB081-7	748.5	I	0.1339766	<5.7175	0.4100528	0.418376	<0.099887	0.7228531	<0.13457	0.0677033	0.2517502	<0.015703
MX12AB082-1	254.4	H	<0.16397	<6.4482	<0.21065	<0.19118	<0.17103	1.4423	<0.10101	<0.01991	0.0779474	<0.018759
MX12AB082-2	254.4	H	<0.11802	<6.6086	<0.17811	<0.2576	<0.15295	1.6586321	<0.13974	0.0285566	0.0902336	0.0113065
MX12AB082-3	254.4	H	0.0981326	<5.9513	<0.12183	<0.26909	<0.12168	1.6707071	<0.12696	0.0160454	<0.010188	<0.014494
MX12AB082-4	254.4	H	<0.1251	<5.1654	0.1879298	<0.19863	<0.14863	1.6372525	<0.095755	<0.026672	0.019547	<0.014945
MX12AB082-5	254.4	H	0.1589872	<5.4212	<0.19235	<0.22384	<0.15043	1.1196728	<0.14202	0.0509685	0.1080355	<0.011356
MX12AB082-6	254.4	H	<0.096026	<5.4788	<0.16424	<0.29956	<0.13874	1.3891497	<0.15302	<0.022748	0.1021429	<0.010926
MX12AB082-7	254.4	H	<0.091545	<5.346	<0.1478	<0.22739	<0.13364	1.3069664	<0.10337	0.0401167	0.1194894	<0.012689
MX12AB083-1	399.6	I	<0.089872	<7.5525	<0.15974	<0.21038	<0.078749	0.5955407	<0.10567	<0.021729	0.0523382	0.0083855
MX12AB083-2	399.6	I	<0.10864	<7.3026	<0.22034	<0.26354	<0.15102	0.5753239	<0.13112	<0.025136	0.0895927	<0.015221

Sample	Distance (m)	Type	Mn55	Fe57	Cu63	Cu65	Zn66	Ge74	As75	Rb85	Sr88	Zr90
MX12AB083-3	399.6	I	0.206072	<7.4491	0.3307667	<0.31937	<0.12993	0.7742348	<0.20219	0.1019376	0.1565008	<0.026628
MX12AB083-4	399.6	I	<0.13507	<7.9181	<0.18782	<0.30548	<0.18017	1.114092	<0.22033	<0.033658	0.0735462	<0.017124
MX12AB083-5	399.6	I	<0.12039	<5.9113	<0.21388	<0.30734	<0.2015	0.6406187	<0.19314	0.1168165	0.3008932	<0.019808
MX12AB084-1	401.0	I	<0.18137	<10.352	0.4799259	0.5561963	<0.33923	0.7515464	<0.17471	0.0476522	0.0397858	0.0201591
MX12AB084-2	401.0	I	<0.11929	<6.3292	<0.20599	<0.23833	<0.16301	0.6707963	0.1310723	<0.021146	0.0654213	<0.017639
MX12AB084-3	401.0	I	0.1253638	6.0066246	<0.18288	<0.21873	<0.14449	0.5054605	<0.15075	0.0744584	0.19464	<0.01703
MX12AB084-4	401.0	I	<0.13729	<7.4958	<0.28415	<0.28862	0.2072472	0.5210839	<0.11259	<0.026314	0.1282472	0.0210724
MX12AB084-5	401.0	I	0.1431983	<4.8914	0.2014493	<0.17152	<0.12733	0.6147482	<0.12607	0.1750646	0.2074464	<0.021135
MX12AB084-6	401.0	I	0.1520317	<8.5409	<0.22304	<0.25339	0.1636266	0.5299082	<0.23728	<0.026247	0.0841041	<0.14011
MX12AB084-7	401.0	I	<0.12568	<6.3396	<0.21033	<0.19911	<0.13383	0.6144596	<0.13189	<0.017913	0.0339078	0.0262539
MX12AB084-8	401.0	I	<0.13026	<6.3032	<0.21439	<0.27443	<0.2135	0.6711418	<0.12134	0.0354756	0.0717987	<0.016662
MX12AB087-1	244.7	I	0.4271592	<5.6754	<0.22531	<0.19421	0.2294534	0.5040507	<0.16064	0.1090627	0.0662687	<0.016038
MX12AB087-2	244.7	I	0.1056741	<5.7847	<0.18399	<0.23563	0.100696	0.5990987	0.1389138	<0.025327	0.0323231	0.0129105
MX12AB087-3	244.7	I	<0.12524	<5.446	<0.20653	<0.20901	<0.085345	0.619522	<0.16059	0.0253588	0.2085314	<0.012817
MX12AB087-4	244.7	I	<0.14171	<6.8246	<0.17793	<0.26486	<0.19617	0.6682073	<0.15575	0.0801515	0.1011889	0.0165342
MX12AB087-5	244.7	I	0.2156373	<7.0351	<0.26109	<0.31215	<0.17968	0.5839396	<0.16864	0.1103524	0.4474261	<0.024432
MX12AB087-6	244.7	I	0.2346832	<6.2412	<0.20944	<0.25189	0.1118426	0.5573114	<0.068129	0.056546	0.2606696	<0.018071
MX12AB087-7	244.7	I	<0.097849	<6.0124	<0.17235	<0.22067	0.1390151	0.6287187	<0.12182	0.0309735	0.0944629	<0.016843
MX12AB087-8	244.7	I	0.3450857	<7.3715	<0.21481	0.3474343	0.1452651	0.5766594	0.3302956	0.1608213	0.405778	0.0830308
MX12AB089-1	189.6	H	0.1602872	<6.8623	<0.21104	<0.39651	0.4541467	0.8802847	<0.13371	0.0432892	0.1740176	<0.011245
MX12AB089-2	189.6	H	0.1690839	<4.8337	0.3350771	0.3287129	<0.16972	0.8239403	<0.15876	0.0184334	0.2564581	<0.015456
MX12AB089-3	189.6	H	0.1613389	<7.796	<0.27936	<0.2004	<0.20915	0.8423396	0.1134363	<0.015079	0.1300289	<0.017986
MX12AB089-4	189.6	H	<0.11927	<6.7148	<0.13165	<0.16841	<0.21691	0.866682	<0.14474	<0.023799	0.0150757	<0.016343
MX12AB089-5	189.6	H	0.1469974	<6.9443	<0.21731	<0.31363	0.1363378	0.782449	<0.14432	<0.020456	0.0702719	<0.01633
MX12AB089-6	189.6	H	0.213529	<6.4428	<0.20842	<0.27641	<0.16462	0.8771009	<0.11977	<0.019647	0.1596183	<0.013608
MX12AB089-7	189.6	H	0.2968032	13.077168	<0.28668	<0.31393	<0.2099	0.8471096	<0.17113	<0.034782	0.1750397	<0.017812
MX12AB090-1	190.5	H	18.770364	155.55181	<0.20474	<0.20621	<0.20748	0.6927954	<0.090567	0.0339135	0.9840644	<0.01917
MX12AB090-2	190.5	H	1.2068695	13.966671	<0.25893	<0.36234	<0.20317	0.595397	<0.16317	<0.029556	0.0781722	<0.026059
MX12AB092-1	370.1	H	0.3187671	<10.3398	<0.31093	<0.35075	<0.24254	0.8682611	<0.29576	<0.024147	0.0783428	<0.017387
MX12AB092-2	370.1	H.A.	<0.15386	<9.4547	<0.27461	<0.37762	<0.3048	0.7005403	<0.23983	<0.037527	0.1405393	0.0157741
MX12AB092-3	370.1	H.A.	2.0767688	18.270044	<0.22301	<0.36699	<0.14819	0.9369703	0.0664587	0.0362771	0.3664726	0.038755

Sample	Distance (m)	Type	Mn55	Fe57	Cu63	Cu65	Zn66	Ge74	As75	Rb85	Sr88	Zr90
MX12AB092-4	370.1	H	<0.12555	<6.2534	<0.14779	<0.21634	<0.12185	0.7659429	<0.12483	<0.019924	0.1799449	<0.015131
MX12AB092-5	370.1	H	0.4177163	<8.964	<0.42142	<0.40772	<0.18448	0.8236551	<0.30411	<0.037409	0.0420694	<0.026087
MX12AB092-6	370.1	H	0.8887115	28.631575	<0.21117	<0.30399	0.251718	0.7406795	<0.15571	0.0391456	0.1216228	<0.013711
MX12AB092-7	370.1	H	<0.10301	<8.3656	<0.1792	<0.17576	<0.12423	0.7406924	<0.16044	<0.025216	0.045958	<0.022949
MX12AB092-8	370.1	H	0.0897549	<4.6965	<0.18511	<0.21567	0.1434447	0.7783101	<0.092529	<0.018781	0.02163	<0.0097525
MX12AB092-9	370.1	H	0.124669	<5.7992	<0.18022	<0.31118	0.1265232	0.7426732	<0.15974	<0.021058	0.0324047	<0.010522
MX12AB092-10	370.1	M	<0.13084	7.2490382	<0.23	<0.27361	<0.13997	0.9570598	<0.092123	<0.023203	0.0800637	<0.018516
MX12AB092-11	370.1	H	<0.12744	<7.53	<0.29437	<0.26395	0.2436587	0.8670314	<0.12544	0.0994667	0.1921178	<0.021931
MX12AB093-1	175.8	I	0.2930048	<5.8248	<0.25554	<0.27298	0.1153418	0.6557339	<0.17686	0.0645369	0.1993503	<0.019208
MX12AB093-2	175.8	I	<0.10531	<5.4223	<0.20752	<0.29065	0.1500951	0.919056	<0.10211	<0.034306	0.056906	<0.0073097
MX12AB093-3	175.8	I	0.3953417	8.3367063	<0.17883	<0.28802	<0.13514	0.4398526	<0.19733	0.1526763	0.6028335	0.5520436
MX12AB093-4	175.8	I	<0.11563	<6.2536	<0.20825	<0.2052	<0.20869	0.6493687	0.0712731	<0.028928	0.0431954	0.12326
MX12AB093-5	175.8	I	0.1530884	<6.0925	<0.13418	<0.19928	<0.14595	0.6208948	<0.081636	0.0286666	0.1349153	0.1754481
MX12AB093-6	175.8	I	<0.10323	<6.3648	<0.20211	<0.30704	<0.13001	0.6563417	<0.12543	<0.026508	<0.01009	0.2281091
MX12AB093-7	175.8	I	<0.087036	<5.1619	<0.20673	<0.20077	<0.12954	0.565939	<0.11473	<0.014641	0.0208059	0.0926908
MX12AB093-8	175.8	I	0.2935971	<4.5568	<0.17365	<0.16411	0.1641344	0.5357359	<0.13992	0.0366859	0.0885869	0.0356683
MX12AB096-1	312.2	I	0.1816601	<5.3673	<0.20583	<0.16395	<0.12623	0.4382195	<0.083749	0.0193658	0.17999	0.0139948
MX12AB096-2	312.2	I	<0.10656	<5.7445	<0.1482	<0.21272	0.1115707	0.6161298	<0.07611	<0.022757	0.0384646	<0.0056706
MX12AB096-3	312.2	I	0.1636468	<5.533	<0.20402	0.2134817	0.1360739	0.6038236	<0.11149	0.0517095	0.0794521	<0.01899
MX12AB096-4	312.2	I	0.9757187	23.980755	<0.13654	<0.23601	<0.11713	0.4850256	<0.15398	0.0596791	0.1634494	<0.013961
MX12AB096-5	312.2	I	3.6762539	97.729598	<0.21692	<0.18868	0.4936519	0.54381	<0.17314	<0.028181	0.413557	0.0219044
MX12AB096-6	312.2	I	0.2625799	8.9380261	<0.17823	0.2642653	0.2076165	0.5475058	0.1316339	0.06499	0.2619249	<0.011367
MX12AB096-7	312.2	I	0.2008805	<6.9336	0.2080883	0.3538599	0.3126861	0.5444001	<0.17418	0.0473327	0.1448035	<0.011552
MX12AB096-8	312.2	I	0.2561394	12.267303	<0.21691	<0.29871	<0.20925	0.4787455	<0.1811	0.0633315	0.1165115	<0.027543
MX12AB096-9	312.2	I	1.3370344	28.961956	<0.21012	<0.22563	<0.15894	0.5151068	<0.14612	0.0495993	0.3937103	<0.013801
MX12AB096-10	312.2	I	1.665574	77.274922	<0.20328	<0.24434	0.1740802	0.5638855	<0.19477	0.0269987	0.2269603	<0.01898

Sample	Distance (m)	Type	Ag107	Sb121	Cs133	Gd157	Hf178	Ta181	Au197	Pb208	Bi209	U238
MX12AB002-1	5352.9	H	<0.031459	0.0498762	0.0731245	<0.033911	<0.01066	<0.0070892	<0.019239	0.1131846	<0.005196	<0.0037386
MX12AB002-2	5352.9	H	<0.031947	0.0443537	<0.018465	<0.029153	<0.0090351	<0.0030069	<0.016314	0.0222998	<0.0049549	<0.0035869
MX12AB002-3	5352.9	H	<0.03599	<0.044445	0.0573092	<0.027084	0.0311767	<0.0034954	<0.020038	0.0653504	<0.0048783	<0.005878
MX12AB002-4	5352.9	H	<0.030774	<0.039363	0.0337144	<0.035355	<0.009585	<0.004769	<0.014366	0.0503394	<0.0079909	<0.002676
MX12AB002-5	5352.9	H	<0.040958	0.0431094	<0.025182	<0.042096	<0.016353	<0.0086342	<0.023473	0.0621749	<0.0057152	<0.0048738
MX12AB002-6	5352.9	H	<0.032077	<0.032485	0.0503219	<0.029191	<0.011416	<0.0030462	<0.01554	<0.014736	<0.0054645	<0.0025547
MX12AB002-7	5352.9	H	<0.036283	<0.051523	0.0556817	<0.029284	<0.015928	<0.0054459	<0.024365	<0.022771	<0.0094518	<0.0042873
MX12AB002-8	5352.9	H	<0.059034	<0.049379	0.1270195	<0.028617	<0.011581	<0.0039791	<0.022698	0.3050227	<0.0093636	<0.0075742
MX12AB002-9	5352.9	H	<0.052505	0.0944548	0.0585563	<0.029319	<0.012793	<0.0031997	<0.014455	0.0818492	<0.0059359	<0.0033665
MX12AB002-10	5352.9	H	<0.037279	0.0412359	0.1345637	<0.022851	0.0101105	<0.0026664	0.009599	0.098005	<0.0069204	<0.0033407
MX12AB003-1	628.4	H	<0.069309	0.3828535	0.0259637	<0.031178	<0.015135	<0.0043313	<0.01864	0.0317404	0.0115783	<0.0037695
MX12AB003-2	628.4	H	<0.057979	0.3918939	0.0976609	<0.026387	<0.023494	<0.0030318	<0.022527	0.0894585	0.0457523	0.0100615
MX12AB009-1	359.9	H	<0.023769	<0.040876	0.0484913	<0.026696	<0.017415	<0.004727	<0.029504	0.4578212	<0.0071313	<0.0072554
MX12AB009-2	359.9	H	<0.01096	0.0226506	0.2498836	<0.023033	<0.0095722	<0.0035494	<0.02943	0.0414065	<0.0036554	<0.0052855
MX12AB009-3	359.9	H	<0.022798	<0.014339	0.0653163	<0.017357	<0.0095035	<0.002961	<0.014213	0.0129161	<0.0063402	<0.0027526
MX12AB009-4	359.9	H	<0.016482	0.0191535	0.1387754	<0.013866	<0.0079873	<0.0046853	<0.014144	0.0186429	<0.0055382	<0.0042451
MX12AB009-5	359.9	H	<0.019679	<0.014682	0.0225603	<0.016072	<0.0093831	<0.0023848	<0.01186	<0.0068087	<0.004698	<0.0035258
MX12AB009-6	359.9	H	<0.026949	<0.011618	0.0406228	<0.018752	<0.020312	<0.0053677	<0.028661	<0.013032	<0.0061538	0.0050306
MX12AB009-7	359.9	H	<0.021698	<0.019389	0.0209582	<0.02599	<0.010884	<0.0044878	<0.016793	0.0166634	<0.0054424	0.0122275
MX12AB009-8	359.9	H	<0.027388	<0.019322	0.0453085	<0.019213	<0.013362	<0.0058759	<0.021078	0.0234712	<0.0054741	<0.0041364
MX12AB009-9	359.9	H	<0.03809	0.0318728	0.1165387	<0.028139	<0.020493	<0.0066048	<0.018057	0.04718	<0.0069112	0.0103587
MX12AB010-1	446.4	M	<0.061705	<0.048284	<0.019441	<0.040644	<0.011683	<0.0066879	<0.027812	<0.010382	<0.010043	<0.0056148
MX12AB010-2	446.4	M	<0.050562	0.0611713	<0.024224	<0.033059	<0.020688	<0.0045883	<0.021125	<0.01594	<0.0090491	<0.0038602
MX12AB010-3	446.4	M	<0.052089	0.0559404	<0.026234	<0.046879	<0.023192	<0.0057856	<0.018726	<0.019992	<0.0084389	<0.0043237
MX12AB010-4	446.4	M	<0.037168	0.0850628	<0.016266	<0.025208	<0.010731	<0.0025823	<0.016923	<0.017154	<0.0050782	<0.0030843

Sample	Distance (m)	Type	Ag107	Sb121	Cs133	Gd157	Hf178	Ta181	Au197	Pb208	Bi209	U238
MX12AB010-5	446.4	M	<0.039642	0.0331605	<0.023219	<0.03634	<0.014438	0.005104	<0.03293	<0.02023	<0.007223	<0.0043734
MX12AB010-6	446.4	M	<0.050449	<0.047938	<0.023007	<0.047985	<0.023859	<0.0044477	<0.034603	0.289975	0.0163726	0.0050021
MX12AB010-7	446.4	M	<0.026646	<0.03373	<0.013598	0.0197775	<0.0096251	<0.0044819	<0.010556	<0.013557	<0.0040791	<0.0032893
MX12AB010-8	446.4	M	<0.042528	0.0610163	<0.02069	<0.028933	<0.013273	<0.0040075	<0.014612	0.156164	0.0092893	<0.0050717
MX12AB010-9	446.4	M	<0.043844	0.0768997	<0.018237	<0.026039	<0.011911	<0.0037724	<0.014327	0.0936535	<0.0052319	<0.0042062
MX12AB010-10	446.4	M	<0.023362	<0.053407	<0.023737	<0.020188	<0.029177	<0.0027908	<0.015343	<0.014814	<0.0076116	0.0037126
MX12AB010-11	446.4	M	<0.027116	<0.045392	<0.022104	<0.020157	<0.0095832	<0.0035332	<0.012669	<0.0094776	<0.0066018	<0.0038718
MX12AB010-12	446.4	M	<0.039242	0.0598164	<0.015159	<0.026961	<0.012327	<0.0054078	<0.019005	<0.015211	<0.005706	<0.0034455
MX12AB011-1	733.9	M	<0.034231	<0.040145	<0.015137	<0.026627	<0.011068	<0.003203	<0.017605	0.0138344	<0.0047716	<0.0040366
MX12AB011-2	733.9	M	<0.026445	<0.044127	<0.017007	<0.031676	<0.010051	<0.0046053	<0.011423	<0.012159	<0.0053341	<0.007487
MX12AB011-3	733.9	M	<0.044992	<0.037174	<0.023234	<0.024687	<0.0098906	<0.0053983	<0.017054	0.0454846	0.008762	<0.0031183
MX12AB011-4	733.9	M	<0.040198	<0.025708	<0.021006	<0.029699	<0.013561	<0.0027067	<0.012269	<0.011504	<0.0062942	<0.004008
MX12AB011-5	733.9	M	<0.034278	<0.050267	0.0181191	<0.023716	<0.011685	<0.0056391	<0.016015	0.0754512	<0.0063921	<0.0041217
MX12AB011-6	733.9	M	<0.034262	0.0420287	0.0126679	<0.019243	<0.009683	<0.0051976	<0.0087432	<0.016542	<0.0063866	<0.0044007
MX12AB011-7	733.9	M	<0.040508	<0.04803	<0.02302	<0.030067	<0.017123	<0.0041513	<0.030966	0.0194195	<0.0071546	0.0045133
MX12AB011-8	733.9	M	<0.032581	<0.033642	<0.019415	<0.030714	0.0081155	<0.0046869	<0.013058	0.0567651	<0.0051997	<0.003004
MX12AB012-1	1301.1	H	<0.038682	0.1640902	0.0317079	<0.038154	<0.011784	<0.0058665	<0.017158	<0.013111	<0.0080484	0.0062306
MX12AB012-2	1301.1	H	<0.024109	0.2318681	0.0238109	<0.021659	<0.0089654	<0.0025998	<0.014185	<0.0077965	<0.0046655	0.0096997
MX12AB012-3	1301.1	H	<0.034029	0.1849143	0.0542169	<0.025702	<0.011107	<0.0030063	<0.011419	<0.010138	<0.0055562	<0.0031278
MX12AB012-4	1301.1	H	<0.03213	0.2692902	0.043435	<0.023992	<0.0072186	<0.0027429	<0.014244	<0.011484	<0.0053059	<0.0045193
MX12AB012-5	1301.1	H	<0.035887	0.0942077	0.0246969	<0.041788	<0.0082019	<0.002054	<0.012775	0.0547112	<0.0055882	<0.0033864
MX12AB012-6	1301.1	H	<0.042184	<0.045142	0.02266	<0.016476	<0.016324	<0.0022733	<0.016822	<0.014742	<0.006184	<0.0037471
MX12AB012-7	1301.1	H	<0.042934	0.0856157	0.0208204	<0.02319	<0.013528	<0.0026858	0.0147851	0.0383297	<0.0038316	<0.0053033
MX12AB012-8	1301.1	H	<0.036936	0.1120594	0.0381519	0.0236956	0.0078536	<0.002605	<0.011758	0.0134842	<0.0060595	<0.0033993
MX12AB012-9	1301.1	H	<0.050446	0.0557811	<0.019372	<0.010631	<0.012386	0.0023154	<0.015856	<0.0098885	<0.0065903	<0.0033717
MX12AB012-10	1301.1	H	<0.031801	0.036974	0.0321277	<0.020945	<0.013434	<0.0036825	<0.015352	<0.010135	<0.0063091	<0.0012521
MX12AB013-1	1201.2	M	<0.053587	<0.04475	<0.020249	<0.0255	<0.011438	<0.0033048	<0.022375	0.0146249	<0.0042728	<0.0046842
MX12AB013-2	1201.2	M	<0.035035	0.0599821	<0.012381	<0.028965	0.0090653	<0.0039942	<0.017327	0.0175954	<0.0045037	<0.0036171
MX12AB013-3	1201.2	M	<0.029635	0.0316325	<0.021797	<0.023715	<0.0061827	<0.0046633	<0.016323	<0.008803	<0.0029256	<0.0046785
MX12AB013-4	1201.2	M	<0.032425	0.056849	0.0193818	<0.036954	<0.012419	0.0019276	<0.019647	<0.0098107	<0.0073763	<0.0038986
MX12AB013-5	1201.2	M	<0.030472	<0.047461	<0.022671	<0.050554	<0.011879	<0.0036003	<0.018098	<0.01225	<0.0075531	0.0024937

Sample	Distance (m)	Type	Ag107	Sb121	Cs133	Gd157	Hf178	Ta181	Au197	Pb208	Bi209	U238
MX12AB013-6	1201.2	M	<0.03024	<0.041359	0.0231105	<0.020584	<0.010302	<0.0039787	<0.0092683	0.0346551	<0.0043463	<0.0029388
MX12AB013-7	1201.2	M	<0.033524	0.0476821	<0.016806	<0.026871	<0.013722	<0.0029629	<0.0097035	<0.012108	<0.0072462	<0.0038376
MX12AB013-8	1201.2	M	<0.046323	<0.043361	<0.014963	<0.031408	<0.011192	<0.0027063	<0.020354	<0.018393	<0.0060554	<0.0033337
MX12AB013-9	1201.2	M	<0.026578	0.0427123	<0.017538	<0.032417	<0.008822	<0.0044623	<0.012053	<0.0158	<0.0049495	<0.0016494
MX12AB013-10	1201.2	M	<0.04232	0.0417767	0.0254865	<0.025627	<0.0067185	<0.0027968	<0.013173	<0.0084635	<0.006121	<0.0040763
MX12AB013-11	1201.2	M	<0.037071	0.0606017	<0.016492	<0.020563	<0.011794	<0.0024871	<0.022442	0.0488092	<0.0060142	<0.0033921
MX12AB014-1	1101.2	H	<0.028227	0.0636605	0.1623352	<0.055128	<0.025215	<0.0066126	<0.025775	0.1869758	<0.0046787	<0.0070017
MX12AB014-2	1101.2	H	<0.022033	0.0264055	0.0403751	<0.017045	<0.01107	<0.0034545	<0.021535	<0.013252	0.0040525	<0.0058013
MX12AB014-3	1101.2	H	<0.025654	0.0466418	<0.0075747	<0.022784	<0.014515	<0.0037726	<0.012498	0.0716734	<0.0060377	<0.0046245
MX12AB014-4	1101.2	H	<0.018084	0.0585246	0.0621993	<0.028595	<0.011754	<0.0063114	<0.021327	0.0106811	<0.0044749	<0.0038291
MX12AB014-5	1101.2	H	<0.021435	0.0448148	0.0629713	<0.027101	<0.016352	<0.0025827	<0.030726	0.0316746	<0.0079752	0.0038746
MX12AB014-6	1101.2	H	0.0226499	0.0510872	<0.0076776	<0.036394	<0.021843	<0.0041859	<0.019826	<0.012154	<0.0060565	<0.0046099
MX12AB014-7	1101.2	H	<0.023214	0.0408137	0.0517833	<0.033243	0.0079157	<0.0039961	<0.017288	0.1900536	<0.0069992	<0.0055874
MX12AB014-8	1101.2	H	<0.028361	0.0273338	<0.008906	<0.021252	<0.013339	<0.0055607	<0.011677	0.0635268	<0.0056025	<0.0032584
MX12AB014-9	1101.2	H	<0.033291	0.0342773	<0.0072795	<0.021558	<0.020001	<0.0042893	0.0197822	0.1549098	<0.0097832	<0.0040122
MX12AB015-1	1001.5	M	<0.029497	<0.040439	<0.013098	0.0133769	<0.011187	<0.0056672	<0.012718	<0.010197	<0.0050228	<0.0035151
MX12AB015-2	1001.5	M	<0.03598	0.0458625	<0.021019	<0.024896	<0.010183	<0.0027091	0.0140702	<0.011803	<0.0050617	<0.0052111
MX12AB015-3	1001.5	M	<0.038862	0.0835233	0.0565424	<0.032608	<0.0092786	<0.0040324	<0.01272	0.0259528	<0.0079451	<0.0061102
MX12AB015-4	1001.5	M	<0.038282	<0.033527	<0.011967	<0.018507	<0.013954	<0.0025302	<0.017317	0.0097254	<0.0044228	<0.0029781
MX12AB015-5	1001.5	M	<0.037922	<0.044176	0.0203922	<0.025265	<0.011934	<0.0036186	<0.014438	<0.01462	<0.0052598	<0.0035683
MX12AB015-6	1001.5	M	<0.031352	<0.032688	0.0145757	<0.014791	<0.0080511	<0.0024411	<0.011017	<0.0083116	<0.0060575	<0.0028701
MX12AB015-7	1001.5	M	<0.058908	<0.041825	0.0307998	<0.025484	<0.017158	<0.0041985	<0.01249	0.0317745	<0.0054496	<0.0035954
MX12AB016-1	902.0	M	<0.051288	0.0593222	<0.025316	<0.024877	<0.0279	<0.0071446	<0.0251	0.0913095	<0.0084034	<0.0042386
MX12AB016-2	902.0	M	<0.031022	<0.045361	<0.022497	<0.026841	<0.014806	<0.0039105	<0.016773	<0.0080366	<0.0061614	<0.0026619
MX12AB016-3	902.0	M	<0.029079	<0.059131	<0.017083	<0.024897	<0.013982	<0.0024692	<0.01531	<0.018938	<0.0076592	<0.0043716
MX12AB016-4	902.0	M	<0.033654	<0.026975	<0.015809	<0.017141	<0.010461	<0.0026645	<0.022884	0.0123214	<0.0037909	<0.0030279
MX12AB016-5	902.0	M	<0.042095	<0.044444	<0.020766	<0.030935	<0.0065726	<0.0042207	<0.018994	<0.011506	<0.0081418	<0.002866
MX12AB016-6	902.0	M	<0.030255	<0.038305	<0.013397	<0.02595	<0.0087732	<0.002335	<0.016796	0.012687	0.0031502	<0.0034156
MX12AB016-7	902.0	M	<0.038831	<0.037105	<0.01409	<0.023426	<0.011246	<0.003422	<0.019584	0.1894477	<0.0041926	<0.0040322
MX12AB016-8	902.0	M	<0.039364	<0.032788	<0.019122	<0.02663	<0.015305	<0.0043136	<0.017216	0.0120626	<0.0046837	<0.0037345
MX12AB016-9	902.0	M	<0.049296	<0.053132	0.0517606	<0.016779	<0.012947	<0.0044158	<0.016796	0.0712126	<0.0044715	<0.0032343

Sample	Distance (m)	Type	Ag107	Sb121	Cs133	Gd157	Hf178	Ta181	Au197	Pb208	Bi209	U238
MX12AB016-10	902.0	M	<0.028187	<0.050295	<0.017864	<0.024063	<0.013698	<0.0023816	<0.01069	0.0180875	<0.0048713	<0.0049525
MX12AB016-11	902.0	M	<0.030374	<0.032317	<0.016703	<0.023143	0.0051348	<0.0047116	<0.012828	0.0390488	0.0033885	<0.0021344
MX12AB016-12	902.0	M	<0.050047	<0.038045	0.0213824	<0.037168	<0.011658	<0.0035335	<0.017927	0.0760215	0.0156052	0.0024273
MX12AB017-1	802.5	M	<0.046764	<0.029309	<0.014966	<0.02304	<0.017587	<0.0038302	<0.0088594	<0.010965	<0.0055679	<0.0020293
MX12AB017-2	802.5	M	<0.034492	<0.042717	<0.01551	<0.026359	<0.012225	<0.0031127	<0.022147	<0.010259	<0.004426	<0.0048672
MX12AB017-3	802.5	M	<0.042636	<0.038185	0.0828103	<0.048618	<0.017224	<0.0074472	<0.014788	<0.016925	0.0090024	<0.0042227
MX12AB017-4	802.5	M	<0.067635	<0.057656	0.1231724	<0.029086	<0.015075	<0.0045752	<0.01795	0.025271	<0.0083404	<0.0047128
MX12AB018-1	703.4	H	<0.049486	<0.027782	<0.016873	<0.026629	<0.01199	<0.0052957	<0.0089742	<0.010325	<0.0047033	<0.0033544
MX12AB018-2	703.4	H	<0.049644	<0.032219	<0.017626	<0.042917	<0.01688	<0.0066581	<0.014294	<0.010441	<0.0060084	<0.0036004
MX12AB018-3	703.4	H	<0.051324	<0.074004	<0.028374	<0.038133	<0.028343	<0.0058523	<0.027845	<0.020625	<0.0062585	<0.0045392
MX12AB018-4	703.4	H	<0.029258	<0.031899	0.0190543	<0.034746	<0.013364	<0.0025381	<0.018304	<0.011572	<0.0052441	<0.0029845
MX12AB018-5	703.4	H	<0.023443	<0.038955	<0.01392	<0.016715	<0.0062453	<0.0030061	<0.016385	0.0166369	<0.0053635	<0.0023678
MX12AB018-6	703.4	H	<0.026115	<0.027382	<0.0152	<0.020926	<0.011798	<0.0029912	<0.017226	<0.012012	<0.0044125	<0.0041668
MX12AB018-7	703.4	H	<0.036212	<0.029604	<0.015656	<0.031755	<0.019994	<0.0032306	<0.012283	0.0490129	<0.008127	<0.0032101
MX12AB018-8	703.4	H	<0.034189	<0.044585	<0.021077	<0.022903	<0.011793	<0.0039466	<0.023702	<0.010758	<0.0087828	<0.0049324
MX12AB018-9	703.4	H	<0.033323	<0.03195	0.0169035	<0.030702	<0.013893	<0.0031695	<0.012545	<0.016545	<0.0062444	<0.0017115
MX12AB019-1	604.8	H	<0.038861	0.0655885	0.1795371	<0.019205	<0.015126	<0.0030084	<0.013581	<0.011307	<0.0071684	<0.0034434
MX12AB019-2	604.8	H	<0.02943	0.0634726	0.1670712	<0.025298	<0.01038	<0.003333	<0.017295	<0.012285	0.004018	<0.0034644
MX12AB019-3	604.8	H	<0.043271	0.0490858	0.0834226	<0.017664	<0.011568	<0.0030526	<0.018389	<0.014556	<0.004252	<0.0014984
MX12AB019-4	604.8	H	<0.051185	<0.038157	0.0660392	<0.034091	<0.012832	<0.005384	<0.01162	<0.014436	<0.0050192	<0.0019161
MX12AB019-5	604.8	H	0.0225552	<0.026859	0.0466133	0.0207304	<0.0066314	<0.0049986	<0.015603	<0.015842	<0.004236	<0.0028745
MX12AB019-6	604.8	H	<0.037576	0.0490915	0.1842462	<0.014672	<0.0066596	<0.0036966	<0.014485	<0.012491	<0.0050313	<0.0040577
MX12AB019-7	604.8	H	<0.035995	<0.035564	0.1307017	<0.035285	<0.014009	<0.0032148	<0.01499	<0.015334	<0.0035955	<0.0038611
MX12AB019-8	604.8	H	<0.035877	<0.050809	0.0834927	<0.026085	<0.01342	<0.0040692	<0.026311	<0.020117	<0.0049966	<0.0029816
MX12AB019-9	604.8	H	<0.032534	<0.034218	0.0746639	<0.016664	<0.012601	<0.0034604	<0.015717	<0.011992	<0.006406	<0.0033641
MX12AB019-10	604.8	H	<0.031734	<0.030659	0.1153994	<0.021632	<0.012467	<0.003062	<0.01285	0.0055192	<0.0053969	<0.0035494
MX12AB019-11	604.8	H	<0.046983	0.0489757	0.1045917	<0.010961	<0.012657	<0.0028844	<0.014404	<0.010123	<0.0037248	<0.0035586
MX12AB022-1	2824.7	H	<0.031426	<0.033188	<0.018926	<0.026889	<0.014044	<0.0026903	<0.025381	<0.0095033	<0.0052639	<0.0027865
MX12AB022-2	2824.7	H	<0.06192	<0.039178	<0.018491	<0.025787	0.0088639	<0.0042243	<0.019925	<0.018085	<0.0067414	<0.0046592
MX12AB022-3	2824.7	H	<0.040433	<0.029262	<0.024292	<0.02367	<0.01548	<0.0019322	<0.019242	<0.013047	<0.0087521	<0.0020036
MX12AB022-4	2824.7	H	<0.037721	0.0569269	<0.022433	<0.028909	<0.0095383	<0.0055965	<0.015745	<0.017613	<0.0051519	0.0048926

Sample	Distance (m)	Type	Ag107	Sb121	Cs133	Gd157	Hf178	Ta181	Au197	Pb208	Bi209	U238
MX12AB023-1	537.8	H	<0.021909	<0.018979	0.0581952	<0.034722	<0.0090851	<0.0037733	<0.031294	<0.014163	<0.0070186	<0.0037018
MX12AB023-2	537.8	H	<0.040058	0.0281106	0.0472887	<0.037237	<0.020956	<0.0030116	<0.013025	<0.01514	<0.006749	<0.0037935
MX12AB023-3	537.8	H	<0.022107	0.0264838	0.0297925	0.0181457	<0.011339	<0.0021743	<0.013566	<0.0067619	<0.0062834	<0.0036789
MX12AB023-4	537.8	H	<0.018581	<0.018727	0.0306286	<0.015884	<0.012598	<0.0042996	<0.025461	<0.012821	<0.004786	<0.0026746
MX12AB023-5	537.8	H	<0.027662	0.032895	0.0150438	<0.029493	<0.017466	<0.005828	<0.024618	<0.0088401	<0.0059865	<0.0035676
MX12AB023-6	537.8	H	<0.036307	<0.026639	0.0790626	<0.028292	<0.014009	<0.0053368	<0.013275	0.0387743	<0.0059675	<0.0032227
MX12AB023-7	537.8	H	<0.027121	<0.026275	0.0319625	<0.022286	<0.010137	<0.0060116	<0.027425	<0.0091702	<0.0064294	<0.0049595
MX12AB023-8	537.8	H	<0.017585	0.0191419	0.30052	<0.022765	<0.01357	<0.0023685	<0.014448	0.0500972	<0.0070809	0.0153583
MX12AB024-1	481.9	H	<0.016512	<0.020434	0.0603967	<0.013909	<0.011726	<0.0018378	<0.013405	0.0895678	<0.0044767	<0.0032513
MX12AB024-2	481.9	H	<0.028369	<0.015729	0.0132674	<0.016538	<0.0053171	<0.0026383	<0.011208	0.0216654	<0.0055423	<0.0035268
MX12AB024-3	481.9	H	<0.034568	<0.019156	<0.01302	<0.025257	<0.011902	<0.0030266	<0.011288	0.0372274	<0.0060646	<0.0048119
MX12AB024-4	481.9	H	<0.026504	<0.021983	0.0883245	<0.048721	<0.012892	<0.0048267	<0.01745	<0.011778	<0.0058211	<0.0057315
MX12AB024-5	481.9	H	<0.035307	<0.029145	0.1424558	<0.0223	<0.014329	<0.006896	<0.026688	0.0186015	<0.0060443	0.0438881
MX12AB024-6	481.9	H	<0.013395	<0.020597	<0.0063709	0.014541	<0.0092565	<0.0018498	<0.020807	<0.0076188	<0.0048711	<0.0027459
MX12AB024-7	481.9	H	<0.015838	<0.019689	0.0121901	0.0239266	<0.018437	<0.0037573	<0.014016	0.0079621	<0.0031842	<0.0071504
MX12AB024-8	481.9	H	<0.024268	<0.026727	<0.0093012	<0.031134	<0.0072356	<0.0026438	<0.0092575	<0.010942	<0.0076133	<0.0053468
MX12AB024-9	481.9	H	<0.02591	<0.02761	<0.013758	<0.036467	<0.019769	<0.003881	<0.025951	0.0115122	0.0058873	<0.0043834
MX12AB024-10	481.9	H	<0.02098	<0.026696	0.0106265	<0.026522	<0.012919	<0.0040894	<0.0078045	0.0340835	<0.0059905	<0.0056148
MX12AB024-11	481.9	H	<0.02041	<0.026278	0.0099592	<0.024722	<0.0084983	<0.0028363	<0.011973	<0.0089171	<0.0048895	<0.0027707
MX12AB025-1	441.6	H	<0.025824	<0.023899	0.0111078	<0.029923	<0.012315	<0.0037275	<0.01572	<0.0087095	<0.0029559	<0.0030148
MX12AB025-2	441.6	H	<0.016873	<0.018258	<0.0060573	<0.012054	<0.010355	<0.0026356	<0.016317	<0.0097763	<0.0023019	<0.0035389
MX12AB025-3	441.6	H	<0.018908	<0.019442	<0.010044	<0.017816	<0.0078651	<0.0023809	<0.011562	<0.0076464	<0.0034003	<0.0034084
MX12AB025-4	441.6	H	<0.020265	<0.022649	<0.0070321	<0.022138	<0.016871	<0.0025058	<0.011623	<0.0088931	<0.0021889	<0.0044076
MX12AB025-5	441.6	H	<0.019548	<0.018702	0.0241999	<0.026304	<0.010277	<0.0017884	<0.013096	<0.0043991	<0.002593	<0.0041681
MX12AB025-6	441.6	H	<0.029325	<0.018792	0.0236765	<0.018876	<0.01891	<0.0015637	<0.025224	<0.010877	<0.003597	<0.00283
MX12AB025-7	441.6	H	<0.014165	<0.024807	<0.0090048	<0.017428	<0.011645	<0.0029882	<0.011641	<0.014195	<0.0035848	<0.0029728
MX12AB025-8	441.6	H	<0.016194	<0.016953	0.0434853	<0.02289	<0.0090036	<0.0047174	<0.021203	<0.0070052	<0.0058435	<0.003363
MX12AB025-9	441.6	H	<0.023591	<0.016795	<0.0067924	<0.016598	<0.014374	<0.0031822	<0.013371	<0.0084856	<0.0035771	<0.0034154
MX12AB027-1	425.4	I	<0.029268	<0.02606	0.1882808	0.1535268	0.0905792	<0.0050575	<0.020697	0.0747453	0.0169327	0.0989031
MX12AB027-2	425.4	I	<0.040862	<0.035864	0.0205049	<0.024679	<0.01484	<0.0051868	<0.032027	<0.011107	<0.0083207	<0.0072786
MX12AB027-3	425.4	I	<0.054164	<0.040071	0.0472628	<0.022238	<0.014826	<0.0040057	<0.023532	0.1743025	0.0061327	0.0169587

Sample	Distance (m)	Type	Ag107	Sb121	Cs133	Gd157	Hf178	Ta181	Au197	Pb208	Bi209	U238
MX12AB027-4	425.4	I	<0.034133	<0.032935	0.0706527	<0.026166	<0.014685	<0.0049743	<0.020895	<0.010085	<0.0053123	<0.0055516
MX12AB027-5	425.4	I	<0.036972	<0.032366	0.1756894	<0.014415	<0.0074902	0.0208653	<0.0095229	<0.0086237	<0.0042947	<0.0040095
MX12AB027-6	425.4	I	<0.031014	<0.024086	0.3706858	<0.016275	<0.010212	0.0076271	<0.025967	0.0311604	<0.0046391	0.0094931
MX12AB028-1	481.4	I	<0.030663	<0.032663	0.0730537	0.2013076	0.0295021	<0.0033265	<0.012277	0.0372966	<0.0055707	0.1137475
MX12AB028-2	481.4	I	0.0145572	<0.024276	0.1619014	<0.015688	<0.00809	<0.0021485	0.0083652	<0.0090384	<0.0041003	<0.0030449
MX12AB028-3	481.4	I	<0.027479	<0.018833	0.1240148	<0.01506	<0.0088324	<0.0019415	<0.014007	<0.0075806	<0.0070236	<0.001449
MX12AB028-4	481.4	I	<0.021878	<0.026697	0.0332334	<0.021671	0.0043202	<0.0021118	<0.0052679	0.014789	<0.0031548	<0.0018198
MX12AB029-1	481.4	H	<0.034504	<0.027963	0.0093948	<0.033062	<0.013825	<0.0028244	<0.017106	<0.012269	<0.0048044	<0.0029207
MX12AB029-2	481.4	H	<0.029719	<0.0203	<0.01025	<0.035599	<0.0078654	<0.0038003	<0.018775	<0.009479	<0.0032151	<0.0014624
MX12AB029-3	481.4	H	<0.027769	<0.027356	<0.0075609	<0.028504	<0.014112	<0.0045498	<0.016789	<0.0055752	<0.0026218	<0.0026016
MX12AB029-4	481.4	H	<0.030765	<0.021347	0.1499687	<0.017379	<0.010136	<0.0040823	<0.01808	<0.0094173	<0.0067565	<0.0027854
MX12AB029-5	481.4	H	<0.021754	<0.022766	0.0403786	<0.018155	<0.013635	<0.0023659	<0.0051716	<0.0056525	<0.0033381	<0.0044255
MX12AB029-6	481.4	H	<0.037054	<0.030415	<0.0085663	<0.027581	<0.015729	<0.0022969	<0.0096351	0.0119401	<0.0056469	<0.0032164
MX12AB029-7	481.4	H	<0.018519	<0.017282	0.0243321	<0.022166	<0.012334	<0.0030528	<0.0090127	<0.0043148	<0.0034504	<0.0018395
MX12AB029-8	481.4	H	<0.020788	<0.029048	<0.0070741	<0.021277	<0.0074166	<0.0026698	<0.0094145	<0.0085677	<0.0039094	<0.0016881
MX12AB029-9	481.4	H	<0.01391	<0.021206	0.0133401	<0.0065893	<0.0067464	<0.0024457	<0.0059743	0.0031748	<0.0027628	<0.0020271
MX12AB029-10	481.4	H	<0.020842	<0.021233	<0.0073455	<0.014397	<0.0053579	<0.0011623	<0.0093517	<0.0068296	<0.003299	<0.0030711
MX12AB029-11	481.4	H	<0.031932	<0.021569	0.0267657	<0.020139	<0.010449	<0.0035115	<0.018283	<0.0072185	<0.0035235	<0.0022719
MX12AB029-12	481.4	H	<0.033249	<0.025303	0.0178575	<0.020645	<0.013185	<0.0035253	<0.0097433	<0.009784	<0.0053188	<0.0029063
MX12AB030-1	441.3	H	<0.028374	<0.034338	0.071504	<0.025567	<0.0069711	<0.0031993	<0.013396	<0.010144	<0.0037863	<0.0024868
MX12AB030-2	441.3	H	<0.029286	<0.024101	0.0121126	<0.017099	<0.0057799	<0.004351	<0.01272	<0.006398	<0.0037885	<0.0029563
MX12AB030-3	441.3	H	<0.023535	<0.016797	0.0492013	<0.01609	<0.0093152	<0.0019856	<0.0068776	<0.0049912	<0.0040869	<0.0016995
MX12AB030-4	441.3	H	<0.020099	<0.028906	<0.0094636	<0.025003	<0.012127	<0.0049906	<0.019025	<0.006085	0.0069153	<0.0054476
MX12AB030-5	441.3	H	<0.019616	<0.015149	0.0320766	<0.021828	<0.0073716	<0.0025406	<0.016204	<0.0067664	<0.0060081	<0.0023092
MX12AB030-6	441.3	H	<0.045203	<0.032675	0.1743312	<0.027229	<0.0087143	<0.0030047	<0.01257	0.2535115	0.0052075	<0.0045652
MX12AB030-7	441.3	H	<0.021975	<0.026631	0.0905939	<0.016535	<0.010621	<0.0036392	<0.014055	0.0733033	<0.0050678	<0.004766
MX12AB030-8	441.3	H	<0.022107	0.023626	0.0793869	<0.011057	<0.0085731	<0.0025965	<0.016233	0.0212027	<0.002784	<0.002141
MX12AB030-9	441.3	H	<0.022887	<0.021495	<0.0085887	<0.041095	<0.0063303	<0.0019173	0.0301752	<0.0070136	<0.00556	<0.0023963
MX12AB030-10	441.3	H	<0.016576	<0.014596	0.0139205	<0.017806	<0.01459	<0.0031017	<0.0081153	0.0074461	<0.0031003	<0.0043345
MX12AB030-11	441.3	H	<0.030808	<0.022045	0.1140118	<0.019001	<0.018208	<0.003687	<0.0073095	0.0643278	<0.0055496	<0.0048624
MX12AB032-1	546.7	H	<0.033613	<0.016864	<0.0068534	<0.015573	<0.0099359	<0.001731	<0.0072769	<0.0072197	<0.0035277	<0.0028859

Sample	Distance (m)	Type	Ag107	Sb121	Cs133	Gd157	Hf178	Ta181	Au197	Pb208	Bi209	U238
MX12AB032-2	546.7	H	<0.014194	<0.023406	<0.0060282	<0.029375	<0.013151	<0.0017607	<0.018407	<0.0083795	<0.0057767	<0.0030778
MX12AB032-3	546.7	H	<0.033336	<0.035878	<0.0088905	0.0202669	<0.012822	<0.0014462	<0.011646	<0.0055025	<0.0047569	<0.0055218
MX12AB032-4	546.7	H	<0.018838	<0.028161	<0.0073018	<0.016552	<0.005502	<0.0022938	<0.0096498	<0.0057652	<0.0035749	<0.002573
MX12AB032-5	546.7	H	<0.021147	<0.033241	<0.012944	<0.032167	<0.0092739	<0.0073548	<0.021679	<0.0076932	<0.0073777	<0.0055335
MX12AB032-6	546.7	H	<0.019606	<0.017044	0.007434	<0.018985	<0.0084391	<0.0041963	<0.017673	0.02112	<0.0044111	<0.0020695
MX12AB032-7	546.7	H	<0.037653	<0.026617	<0.012366	<0.029507	<0.013133	<0.0018739	<0.011027	0.0217358	<0.0075649	<0.006039
MX12AB032-8	546.7	H	<0.026324	<0.020052	0.048613	<0.015744	<0.009925	<0.0072668	<0.017554	0.0266675	<0.004691	0.0032762
MX12AB032-9	546.7	H	<0.037115	<0.036129	<0.0088758	<0.030088	<0.013957	<0.0019116	<0.016113	<0.010532	<0.0054427	<0.0027075
MX12AB033-1	134.0	H	<0.016011	<0.019843	0.0192236	<0.013339	<0.0079584	<0.0017815	<0.01387	<0.0072866	<0.0026137	<0.0043866
MX12AB033-2	134.0	H	<0.023981	<0.016543	0.0934274	<0.019686	<0.01041	<0.002593	<0.016525	0.0441817	<0.002628	<0.0025069
MX12AB033-3	134.0	H	<0.024198	<0.0264	0.0189964	<0.016579	<0.0096079	<0.0033368	<0.012289	0.0121334	<0.0022457	<0.0022151
MX12AB033-4	134.0	H	<0.011849	<0.017448	0.0478567	<0.018478	<0.0085747	<0.0050318	<0.016251	<0.0097463	<0.0024194	<0.0030205
MX12AB033-5	134.0	H	<0.02781	<0.029212	0.0181979	<0.026103	<0.0088911	0.0034281	<0.0099929	<0.0067778	<0.0049722	<0.0032414
MX12AB033-6	134.0	H	<0.031495	<0.018461	0.015747	<0.01683	0.0046938	<0.0016785	<0.010774	<0.0054599	<0.0023688	<0.0016918
MX12AB033-7	134.0	H	<0.028328	<0.019149	0.0109225	<0.011247	<0.0067844	<0.002342	<0.017302	0.0056697	<0.0036388	<0.0023593
MX12AB033-8	134.0	H	<0.024997	<0.018731	<0.0080432	<0.012937	<0.0088826	<0.0026921	<0.016747	<0.0109	<0.0041819	<0.0029875
MX12AB034-1	147.2	H	<0.027686	<0.019094	0.0495676	<0.034282	<0.016101	<0.003888	<0.016902	<0.009395	0.0034213	<0.0040905
MX12AB034-2	147.2	H	<0.030007	<0.027991	0.024767	<0.027081	<0.014021	<0.0042983	<0.032624	<0.010182	<0.0057054	0.0030655
MX12AB034-3	147.2	H	<0.021874	<0.02082	0.0071695	<0.03791	<0.011415	<0.0064628	<0.02045	<0.0079555	<0.0070927	<0.0029089
MX12AB034-4	147.2	H	<0.028745	0.0461537	0.1528169	<0.021325	<0.0080309	<0.0057441	<0.014731	<0.013138	<0.0063752	<0.0065967
MX12AB034-5	147.2	H	<0.027942	0.2219514	0.1769799	<0.039455	<0.019902	<0.004787	<0.040992	0.011589	<0.0065182	<0.0047189
MX12AB034-6	147.2	H	<0.033252	<0.020496	0.0148268	<0.025718	<0.016547	<0.0043337	<0.016361	<0.012377	<0.0062051	<0.0048969
MX12AB034-7	147.2	H	<0.019423	<0.028577	0.032576	<0.025026	<0.0097285	<0.0043792	<0.023677	<0.010896	<0.0046601	<0.0034492
MX12AB034-8	147.2	H	<0.019881	<0.02804	0.0212484	<0.022028	<0.014596	<0.0039671	<0.015243	<0.011414	<0.0037624	<0.0034474
MX12AB037-1	169.2	H	<0.021932	<0.023335	0.0138258	0.0180973	<0.016069	0.0024408	<0.016036	<0.01008	<0.0056146	<0.0042506
MX12AB037-2	169.2	H	<0.023211	<0.021673	0.016852	<0.020881	<0.01165	<0.0030045	<0.030313	0.0075977	<0.0037108	<0.0054902
MX12AB037-3	169.2	H	<0.02478	<0.025618	0.0121836	<0.019881	<0.005992	<0.0022173	<0.014683	<0.010148	<0.0031165	<0.0052717
MX12AB037-4	169.2	H	<0.014423	<0.026527	0.0116801	<0.018524	0.0089549	<0.0024659	<0.012837	<0.0080244	<0.0051755	<0.0046738
MX12AB037-5	169.2	H	<0.017075	<0.022652	0.0075586	<0.027592	<0.010658	<0.0019997	<0.013248	<0.007105	<0.0051724	<0.0045323
MX12AB037-6	169.2	H	<0.026137	<0.022799	0.0892273	<0.020765	<0.0065627	<0.0030474	<0.0088039	0.0347465	<0.0057994	<0.0028961
MX12AB037-7	169.2	H	<0.026578	<0.029955	0.1373878	<0.029714	<0.01047	<0.0049983	<0.029156	0.0297755	<0.005665	<0.0039592

Sample	Distance (m)	Type	Ag107	Sb121	Cs133	Gd157	Hf178	Ta181	Au197	Pb208	Bi209	U238
MX12AB037-8	169.2	H	<0.03362	<0.032577	0.143366	<0.02674	<0.016668	<0.0041691	<0.017441	0.0247036	<0.0057423	<0.0030711
MX12AB038-1	178.1	H	<0.028561	<0.018068	0.0224726	0.0116008	<0.0065214	<0.0019785	<0.013355	<0.0053195	<0.0040137	<0.0035948
MX12AB038-2	178.1	H	<0.023175	<0.015064	0.0324039	<0.013122	<0.0065194	<0.0011733	<0.012647	0.0039969	<0.0023063	<0.0031725
MX12AB038-3	178.1	H	<0.031122	<0.02287	0.0511222	<0.020273	<0.007429	<0.0032019	<0.0056367	0.0391601	<0.0029935	0.0037139
MX12AB038-4	178.1	H	<0.015911	<0.019169	0.034491	<0.026809	<0.010307	<0.0017973	<0.011492	0.0103311	<0.0038368	<0.0028589
MX12AB038-5	178.1	H	<0.015177	<0.020476	0.0697576	<0.020501	<0.012623	<0.0015955	<0.013032	0.0171577	<0.0025645	0.0043397
MX12AB038-6	178.1	H	<0.020351	<0.017645	0.0227875	<0.018541	<0.0090675	<0.0038517	<0.0096823	<0.0064299	<0.0048838	<0.0019431
MX12AB038-7	178.1	H	<0.018367	0.0205146	0.0426763	<0.015998	<0.010593	<0.0024106	<0.011489	0.0269249	0.002881	<0.0021929
MX12AB038-8	178.1	H	<0.01674	<0.016391	0.0492707	<0.018105	<0.006757	<0.00288	<0.0044941	0.0118429	<0.0023911	<0.0024502
MX12AB039-1	403.7	M	<0.022476	<0.020348	<0.0072764	<0.013285	<0.014328	<0.0022793	<0.012782	<0.0039693	<0.0039068	<0.0016611
MX12AB039-2	403.7	M	<0.015934	<0.020184	0.062491	<0.012798	<0.0075361	<0.0015957	<0.0096366	0.0124355	<0.0031944	<0.0030913
MX12AB039-3	403.7	M	<0.038331	<0.03814	<0.011671	<0.035162	<0.015256	<0.0046208	<0.019468	0.1067185	0.0075233	<0.0036253
MX12AB040-1	187.3	H	<0.021316	0.0238413	0.1273383	<0.014419	<0.012722	<0.0024731	<0.0075658	0.0273724	0.0062309	<0.0030938
MX12AB040-2	187.3	H	<0.013635	<0.022217	0.0786456	<0.02108	<0.0049654	<0.0015071	<0.0076713	0.0146462	0.0032164	<0.0025956
MX12AB040-3	187.3	H	<0.026052	<0.018735	0.0502933	<0.013214	<0.0054259	<0.0011801	<0.011341	0.0173872	<0.0042018	<0.0016517
MX12AB040-4	187.3	H	<0.021866	<0.025331	0.018559	<0.014488	<0.011487	<0.0033052	<0.010891	<0.004926	<0.0028969	<0.0021875
MX12AB040-5	187.3	H	<0.029264	<0.015694	<0.0059065	<0.013624	<0.017397	<0.0025731	<0.01308	<0.0055086	<0.0027241	<0.0020569
MX12AB040-6	187.3	H	<0.012334	<0.015205	<0.0075481	<0.014332	<0.0088648	<0.0018942	<0.013342	<0.0072655	<0.0018285	<0.0023853
MX12AB040-7	187.3	H	<0.026368	0.0174968	0.1723045	<0.016887	<0.0072713	<0.0029372	<0.0067472	<0.0061488	<0.0040657	<0.0029456
MX12AB041-1	198.2	H	<0.019977	<0.01934	0.116187	<0.019604	<0.003798	<0.00161	<0.0097004	0.0101849	<0.003281	<0.0042245
MX12AB041-2	198.2	H	<0.02213	<0.01709	0.0271802	<0.015944	<0.0089282	<0.0023996	<0.013461	0.0086413	<0.0037335	<0.0015825
MX12AB041-3	198.2	H	<0.027005	<0.020876	0.0911951	<0.011221	<0.0055629	<0.0023262	<0.013743	0.0113765	<0.0033834	<0.0020474
MX12AB041-4	198.2	H	<0.025404	<0.016922	0.0162644	<0.01757	0.0080055	<0.0028548	<0.01112	0.0217192	<0.002033	0.0016167
MX12AB041-5	198.2	H	<0.02233	<0.024043	0.0204861	<0.017241	<0.0075536	<0.0018263	<0.013361	0.0179473	<0.003074	<0.0026016
MX12AB041-6	198.2	H	<0.018086	<0.01687	0.083191	<0.014592	<0.0082375	<0.0033279	<0.013114	0.0143014	<0.0030371	<0.0035218
MX12AB041-7	198.2	H	<0.022268	<0.023821	0.0892253	<0.020567	<0.010193	<0.0024666	<0.011807	<0.0078224	<0.0036108	<0.0024734
MX12AB041-8	198.2	H	<0.022998	0.0675155	0.1640408	<0.029564	<0.013185	0.0014776	<0.010053	<0.0071909	<0.0046709	<0.002398
MX12AB041-9	198.2	H	<0.041226	0.0318861	0.0433615	<0.017716	<0.011681	<0.0030673	<0.014907	<0.0052878	<0.0038772	<0.0048332
MX12AB041-10	198.2	H	<0.021282	<0.021255	0.0898504	<0.013662	<0.00401	<0.0020553	<0.0098427	0.0203961	0.0109569	<0.0017047
MX12AB041-11	198.2	H	<0.021031	<0.027774	0.1324473	<0.015394	<0.005541	<0.0034032	<0.0085443	0.0357656	<0.0029789	0.0034475
MX12AB042-1	205.6	H	<0.022563	<0.023157	0.0395485	<0.03022	<0.021254	<0.0035885	<0.015741	<0.011904	<0.0066864	<0.0029896

Sample	Distance (m)	Type	Ag107	Sb121	Cs133	Gd157	Hf178	Ta181	Au197	Pb208	Bi209	U238
MX12AB042-2	205.6	H	<0.025607	<0.023579	0.1118115	<0.021822	<0.015744	<0.0025509	<0.018721	<0.014132	<0.0073061	<0.0030369
MX12AB042-3	205.6	H	<0.015303	<0.026539	0.0449892	<0.017494	<0.012915	<0.0035516	<0.010232	<0.0066911	<0.0036308	<0.0030408
MX12AB042-4	205.6	H	<0.017284	<0.02851	0.0394768	<0.024664	<0.012007	0.0035689	<0.014931	0.0290361	<0.0041931	<0.0016067
MX12AB042-5	205.6	H	<0.017284	0.1187653	0.2915433	<0.028298	<0.014068	<0.0032324	<0.016317	<0.0091274	<0.0050793	<0.0030635
MX12AB042-6	205.6	H	<0.024189	<0.024965	0.0500956	<0.024741	<0.018246	<0.004878	<0.023735	0.1187606	0.0380104	<0.0050926
MX12AB042-7	205.6	H	<0.021519	<0.030199	<0.0081628	<0.031716	<0.016009	<0.0046546	<0.022079	0.0235416	<0.0071618	<0.0045252
MX12AB042-8	205.6	H	0.0375025	0.030139	0.0216593	<0.029455	<0.019381	<0.0044381	<0.019549	0.1040388	0.0204329	<0.0059411
MX12AB042-9	205.6	H	0.1324092	0.0413804	0.0302762	<0.019814	<0.014532	<0.0041086	<0.013804	0.0858576	0.0161789	<0.0044282
MX12AB043-1	206.1	H	<0.016372	0.0238325	0.0338709	<0.014714	<0.0063728	<0.0025391	<0.012467	<0.0071126	0.0046672	<0.0027446
MX12AB043-2	206.1	H	<0.02194	<0.028267	0.0205974	<0.016	0.003744	<0.002685	0.0048256	0.0234151	<0.0029346	<0.002822
MX12AB043-3	206.1	H	<0.017313	<0.020747	0.0095371	<0.014651	<0.0087172	<0.0032799	<0.020876	<0.0065144	<0.0034192	<0.0021897
MX12AB043-4	206.1	H	<0.012787	<0.021629	<0.0067931	<0.028286	<0.0037075	<0.0019012	<0.016148	<0.0051256	<0.0027916	0.0071761
MX12AB043-5	206.1	H	<0.018628	<0.021261	0.0193581	<0.020024	<0.0098708	<0.0024291	<0.0076044	<0.0051369	<0.0020913	<0.0024222
MX12AB043-6	206.1	H	<0.023875	<0.018782	0.0616324	<0.0077326	<0.0064295	<0.0022246	<0.012585	0.0053099	<0.0018886	<0.0026397
MX12AB043-7	206.1	H	<0.015092	<0.01863	0.0067603	<0.018765	<0.0086634	<0.0018529	<0.010334	<0.0056021	<0.0041957	<0.0023205
MX12AB043-8	206.1	H	<0.018238	0.042912	0.0593057	0.0978716	0.2841014	0.2132235	<0.010411	0.0201634	0.0031966	0.189143
MX12AB044-1	206.7	H	<0.010323	<0.016814	<0.0078129	<0.010574	<0.010532	<0.0011332	<0.0067427	<0.0060769	<0.0022345	<0.0021679
MX12AB044-2	206.7	H	<0.029053	0.0204035	0.0281635	<0.021884	<0.0080971	<0.0024603	<0.01396	0.039275	<0.0038263	<0.0024489
MX12AB044-3	206.7	H	0.0175136	<0.021145	<0.0057907	<0.0064385	<0.0081111	<0.0035185	<0.0094126	<0.0043854	<0.0021652	<0.0018435
MX12AB044-4	206.7	H	<0.016771	<0.018131	0.0189625	<0.013541	<0.010593	<0.0020249	<0.0075851	<0.0070338	<0.002367	<0.0010474
MX12AB044-5	206.7	H	<0.01982	<0.018067	0.0320186	<0.011209	<0.0065342	<0.0029783	<0.0059201	0.004857	<0.0019592	<0.0019751
MX12AB044-6	206.7	H	<0.011839	<0.018707	0.0141336	<0.012809	<0.0079061	<0.0021802	<0.010737	0.0067212	<0.0037435	0.0020864
MX12AB044-7	206.7	H	<0.018676	<0.018705	<0.0055245	<0.014576	<0.0037352	0.0017073	<0.010263	<0.0063618	<0.0025472	<0.0015749
MX12AB044-8	206.7	H	<0.024618	<0.023812	<0.0049269	<0.012817	<0.0085346	0.0014971	<0.010279	0.0022622	0.0023105	0.001131
MX12AB044-9	206.7	H	<0.01533	<0.01701	<0.0075616	<0.010231	<0.0087874	<0.0015288	<0.01037	<0.0071208	<0.0032761	<0.0020928
MX12AB044-10	206.7	H	<0.01932	<0.015192	<0.0050666	<0.016343	<0.0085719	<0.0010188	<0.0092395	<0.0034178	<0.0027245	<0.0029665
MX12AB045-1	222.9	H	<0.021293	<0.018979	<0.0058117	<0.015757	<0.0036511	<0.0029981	<0.01008	<0.0077546	<0.002973	<0.0026432
MX12AB045-2	222.9	H	<0.017732	<0.014466	0.0108258	<0.015894	<0.0047605	<0.0017492	<0.011361	0.0149789	<0.0037047	<0.0014369
MX12AB045-3	222.9	H	<0.02464	<0.021112	<0.0061113	0.0113705	<0.010744	<0.002957	<0.01097	<0.0064947	<0.0018877	0.0020477
MX12AB045-4	222.9	H	<0.013598	<0.019696	<0.0044349	<0.019595	<0.0049754	<0.0018282	<0.015682	<0.0045693	<0.0024361	<0.0018148
MX12AB045-5	222.9	H	<0.020269	<0.023281	0.0076284	<0.013844	<0.0049402	<0.0037382	<0.013528	<0.0057738	<0.0026648	<0.001801

Sample	Distance (m)	Type	Ag107	Sb121	Cs133	Gd157	Hf178	Ta181	Au197	Pb208	Bi209	U238
MX12AB045-6	222.9	H	<0.026376	<0.023796	0.0112001	<0.020343	<0.0075062	<0.0025143	<0.0097953	0.0127922	<0.0026685	<0.0026093
MX12AB045-7	222.9	H	<0.020228	<0.019062	<0.0042213	<0.0152	<0.0038882	<0.0019925	<0.014311	<0.0056317	<0.0033109	<0.0011724
MX12AB045-8	222.9	H	<0.014239	<0.02685	0.0149408	<0.014548	<0.0074256	<0.0011286	<0.010736	<0.0047633	<0.0056006	<0.0036613
MX12AB045-9	222.9	H	<0.01067	<0.015097	0.0204033	<0.0067544	<0.0046284	<0.002453	<0.0060477	0.0060422	<0.003329	0.0026409
MX12AB046-1	3642.7	M	<0.016485	0.0914214	0.0063724	<0.01476	<0.0082496	<0.002508	<0.015858	<0.008482	<0.0036589	<0.0031002
MX12AB046-2	3642.7	M	<0.029203	0.116332	0.0181807	<0.021761	<0.010676	<0.0032458	<0.012931	0.0123142	<0.0031851	<0.002698
MX12AB046-3	3642.7	M	<0.023089	0.2040073	<0.0060693	<0.020582	<0.0083588	<0.0016767	<0.0051745	0.1236487	0.0071804	0.019938
MX12AB046-4	3642.7	M	<0.024648	0.1029013	<0.0083872	<0.029797	<0.0060795	<0.0028049	<0.0079682	0.0129656	<0.0039612	<0.0027774
MX12AB046-5	3642.7	M	<0.022201	0.0619154	<0.010752	<0.011717	<0.021374	<0.0033561	<0.014478	<0.0093815	<0.0043286	<0.0029166
MX12AB046-6	3642.7	M	<0.019654	0.0880477	0.0115318	<0.018604	<0.011029	<0.0041446	<0.013749	<0.0090551	<0.0046788	<0.0025907
MX12AB046-7	3642.7	M	<0.024544	0.0537843	<0.0070083	<0.020886	0.0087519	<0.0023389	<0.0088668	<0.0068427	<0.0027367	<0.0012043
MX12AB046-8	3642.7	M	<0.014045	0.065414	0.0082979	<0.020415	<0.010003	<0.0027179	<0.010287	<0.0023705	0.0027138	0.0017521
MX12AB046-9	3642.7	M	<0.017794	0.1280198	0.0089676	<0.019761	<0.0087512	<0.0026612	<0.01939	0.0146881	<0.0041962	0.0048456
MX12AB046-10	3642.7	M	0.0784918	0.1704984	0.0200991	<0.0084448	0.006644	<0.0021236	<0.01892	0.0359807	0.0059404	0.0122921
MX12AB046-11	3642.7	M	<0.027379	0.0876966	0.010032	<0.016924	<0.0072724	0.0021892	<0.0079198	0.062446	<0.003924	<0.0043712
MX12AB047-1	3644.7	H.A.	0.015468	0.0601061	<0.008175	<0.029399	<0.014451	<0.0028688	<0.01264	<0.010777	<0.0040634	<0.0044729
MX12AB047-2	3644.7	H.A.	<0.19595	<0.17216	4.6070569	<0.17621	<0.031835	<0.020667	<1.1535	0.2288928	<0.013299	0.0134653
MX12AB047-3	3644.7	H.A.	<0.025779	0.0736454	<0.0068355	<0.013271	<0.010429	<0.0040659	<0.017885	<0.049444	<0.0056458	<0.0054091
MX12AB047-4	3644.7	H.A.	<0.014058	0.0491469	<0.0065778	<0.014221	<0.010598	<0.0022526	<0.014261	0.0174116	<0.0023006	0.0025134
MX12AB054-1	2784.0	H	<0.044352	<0.022855	0.0119409	<0.033832	<0.017582	<0.0073914	<0.018052	0.0085382	<0.0063921	<0.0067092
MX12AB054-2	2784.0	H	<0.016215	<0.025463	0.0110895	<0.03599	<0.023138	<0.0037794	<0.01901	0.0205082	<0.0069072	<0.0041062
MX12AB054-3	2784.0	H	<0.037439	<0.023635	0.0163105	<0.021607	<0.024753	<0.002848	<0.021272	<0.010672	<0.011539	<0.0029946
MX12AB054-4	2784.0	H	<0.037431	0.0540646	0.0427232	<0.03515	<0.02054	<0.0043955	<0.027334	<0.016934	<0.0068637	<0.0030518
MX12AB054-5	2784.0	H	<0.028568	0.071237	0.0779085	<0.022796	<0.0082801	<0.0043513	<0.015147	<0.012098	0.010374	<0.0051544
MX12AB054-6	2784.0	H	<0.019325	0.0321258	0.0357447	<0.03155	<0.016994	<0.0041025	<0.020995	0.0203719	<0.0035813	<0.0034673
MX12AB055-1	1279.8	I	<0.026627	<0.023536	<0.0066459	<0.034055	<0.012525	<0.0013627	<0.015098	0.0105864	<0.0035626	<0.0043599
MX12AB055-2	1279.8	I	<0.028773	<0.026412	0.021385	<0.041046	<0.011155	<0.0039203	<0.0097859	0.034103	<0.0068473	0.0050224
MX12AB055-3	1279.8	I	<0.0398	<0.035659	0.0231334	<0.034697	<0.015594	<0.0041378	<0.023939	0.0236523	0.00345	0.0124813
MX12AB055-4	1279.8	I	-0.0046091	-0.0207272	<-0.0045066	-0.004944	-0.0021292	-0.0022717	0.0053131	<-0.0094294	-0.0003383	<-0.0023618
MX12AB055-5	1279.8	I	<0.019682	<0.033824	0.0138849	<0.022875	<0.018903	<0.0027216	<0.013599	0.0102778	<0.0042884	<0.0041974
MX12AB055-6	1279.8	I	<0.027737	<0.019088	0.025049	0.1083322	<0.011945	<0.003656	<0.014127	0.0304066	<0.00523	0.0330101

Sample	Distance (m)	Type	Ag107	Sb121	Cs133	Gd157	Hf178	Ta181	Au197	Pb208	Bi209	U238
MX12AB056-1	873.3	I	<0.017547	<0.024342	0.0198621	<0.021828	<0.012456	<0.003086	<0.019706	0.0083149	0.0037753	<0.0029897
MX12AB056-2	873.3	I	<0.014654	<0.018106	0.0679108	<0.013455	<0.0079268	<0.0027962	<0.019232	0.0292268	0.0022651	<0.0033734
MX12AB056-3	873.3	I	<0.021448	<0.017902	0.2506958	<0.021915	<0.0056111	<0.0029473	<0.0090363	0.0554998	<0.0042873	<0.0027179
MX12AB056-4	873.3	I	<0.013112	<0.014397	0.0533409	<0.016261	<0.0043853	<0.0034249	<0.016455	<0.004615	<0.0039694	0.0021654
MX12AB056-5	873.3	I	<0.024088	<0.022073	0.0332092	<0.029837	<0.010529	<0.0035435	<0.012357	0.0099863	<0.0039806	<0.0044363
MX12AB056-6	873.3	I	<0.018212	<0.012973	0.0062099	<0.01605	<0.0072862	<0.0018462	<0.016239	<0.010886	<0.0051629	<0.0029144
MX12AB056-7	873.3	I	<0.022535	<0.020658	0.1418241	<0.031927	<0.0059938	<0.0038493	<0.020876	0.0150396	<0.004912	0.0027675
MX12AB056-8	873.3	I	<0.017095	<0.016357	0.3301064	<0.021098	<0.01444	<0.0034968	<0.018658	0.0407896	<0.0048588	0.0175833
MX12AB056-9	873.3	I	<0.031096	<0.0175	0.0123929	<0.023048	<0.014606	<0.0030129	0.007144	<0.01202	<0.0033758	<0.0054022
MX12AB056-10	873.3	I	<0.024833	<0.031128	0.0059295	<0.017556	<0.013808	<0.0024351	0.0094391	<0.0075108	<0.0048029	<0.0036024
MX12AB056-11	873.3	I	<0.01602	<0.020747	0.0343943	<0.027814	<0.01456	<0.0059762	<0.010753	0.0100869	<0.0040464	<0.0043506
MX12AB056-12	873.3	I	<0.030146	<0.025939	0.0060252	<0.014393	<0.01124	<0.0022702	<0.017176	<0.0092608	<0.0042437	<0.0031887
MX12AB057-1	403.6	I	<0.021489	0.0301815	0.082309	0.0090423	<0.01563	<0.0049245	<0.018174	<0.0061219	<0.0037041	<0.0024856
MX12AB057-2	403.6	I	<0.023995	0.0292718	0.0568856	<0.015902	<0.0054056	<0.0025062	<0.0072273	<0.0064408	<0.0053241	<0.0017184
MX12AB057-3	403.6	I	<0.013398	<0.020782	0.0530451	<0.015206	<0.0081922	<0.0025058	<0.0095051	<0.0056071	<0.0026818	<0.0024886
MX12AB057-4	403.6	I	<0.028524	0.039691	0.1000856	<0.012924	<0.0047699	<0.0037157	<0.016285	0.0194777	0.0025364	<0.0052536
MX12AB057-5	403.6	I	<0.012945	<0.019719	0.0166992	<0.015819	<0.010155	<0.0029639	<0.012967	0.0082703	<0.0040866	<0.0018776
MX12AB057-6	403.6	I	<0.018209	0.0336439	0.0700798	0.1011519	<0.013531	<0.0028962	<0.018589	0.0337113	<0.0033105	0.0076466
MX12AB057-7	403.6	I	<0.017704	0.0156441	0.4464887	<0.014697	0.0062156	<0.0020301	<0.015459	0.0499553	0.01392	0.0116914
MX12AB057-8	403.6	I	0.0172782	<0.013969	0.0220375	<0.020718	<0.0055165	<0.003541	<0.018851	<0.0088838	<0.0048594	0.0038018
MX12AB057-9	403.6	I	<0.013721	<0.015513	0.0374425	<0.035191	<0.011214	0.0034805	<0.022788	0.0935603	<0.0043661	0.0533155
MX12AB057-10	403.6	I	<0.019544	<0.01313	0.0742428	<0.028166	<0.0045787	<0.0030964	<0.0085628	0.01339	<0.0029052	0.004981
MX12AB058-1	255.4	H	<0.031559	<0.020319	0.0734773	<0.034573	<0.010757	<0.0048234	<0.018503	<0.0099221	<0.0056203	<0.0058392
MX12AB058-2	255.4	H	<0.022382	0.0375351	0.1745473	<0.022889	<0.0083635	<0.0031908	<0.013341	<0.0077243	<0.0027658	<0.002322
MX12AB058-3	255.4	H	<0.033957	<0.03357	0.0274382	<0.027965	<0.017044	<0.0061565	<0.021196	0.0299337	<0.0082321	<0.0039833
MX12AB058-4	255.4	H	<0.029435	<0.033922	<0.0085528	<0.022195	<0.0075106	0.0014385	<0.015271	<0.0083932	<0.0032188	<0.0019639
MX12AB058-5	255.4	H	<0.04214	<0.033793	<0.0063074	<0.025475	<0.0091907	<0.0052672	<0.01668	<0.0095566	<0.0041066	0.0022008
MX12AB058-6	255.4	H	<0.030853	<0.032849	0.0095734	<0.024307	<0.010261	<0.0026441	<0.02306	<0.010691	<0.0054424	<0.0045651
MX12AB068-1	5487.8	H	<0.016187	<0.020011	0.0227604	<0.029125	<0.021223	<0.0043706	<0.0154	0.0238449	<0.0050065	<0.0028569
MX12AB068-2	5487.8	H	<0.025219	<0.033086	0.0339251	<0.022397	<0.006804	<0.0041597	0.0215632	0.0631276	0.0111791	<0.004898
MX12AB068-3	5487.8	H	0.0368058	<0.030697	0.0151643	0.0181603	<0.013112	<0.0023345	<0.025541	0.0304148	<0.0067119	<0.0039444

Sample	Distance (m)	Type	Ag107	Sb121	Cs133	Gd157	Hf178	Ta181	Au197	Pb208	Bi209	U238
MX12AB068-4	5487.8	H	<0.016102	0.0253953	0.0159872	<0.021976	<0.0098708	<0.0058405	<0.032254	0.0242695	<0.0075541	<0.0042141
MX12AB068-5	5487.8	H	<0.042094	<0.024329	0.072687	<0.030097	<0.0096234	<0.0039873	<0.014736	0.14309	0.0267932	<0.0048457
MX12AB070-1	997.1	H	<0.042523	<0.02198	<0.008844	<0.033515	<0.013045	<0.0030114	<0.015119	0.0251211	<0.0040149	<0.0052755
MX12AB070-2	997.1	H	<0.037902	<0.035179	<0.0088487	<0.025326	<0.018019	<0.0054866	<0.013893	0.0064892	<0.0078072	0.0046372
MX12AB070-3	997.1	H	<0.025003	<0.017307	<0.0070127	<0.022737	<0.0074342	0.0017111	<0.011998	0.0306902	<0.0060216	<0.0016322
MX12AB070-4	997.1	H	<0.024821	<0.019773	<0.0060216	<0.017769	<0.0088213	<0.002461	<0.013341	<0.0065824	<0.002621	<0.0024547
MX12AB070-5	997.1	H	<0.019391	<0.022371	0.0064427	<0.04036	<0.010818	<0.0030055	<0.017461	0.0201118	<0.0046608	<0.00253
MX12AB070-6	997.1	H	<0.015533	<0.018886	0.0054697	<0.011915	<0.012941	<0.0029721	<0.019657	<0.0050282	<0.0033424	<0.0013024
MX12AB070-7	997.1	H	<0.042793	0.0211643	<0.010324	<0.03264	<0.015513	<0.0031465	<0.026401	<0.0095884	<0.0097447	<0.0065957
MX12AB070-8	997.1	H	<0.026931	<0.019501	<0.0086063	<0.020139	<0.010595	<0.0029557	<0.0093365	<0.0087295	<0.0052694	<0.0021472
MX12AB070-9	997.1	H	<0.027347	<0.030118	<0.0090571	<0.026807	<0.0097086	<0.0060207	<0.028345	0.2033939	0.0118426	<0.0029838
MX12AB070-10	997.1	H	<0.0516	<0.04471	0.013533	<0.050465	<0.01214	0.0096338	<0.02712	7.3689568	0.9690577	0.4955833
MX12AB070-11	997.1	H	<0.033156	<0.024664	<0.0075043	<0.029308	<0.012947	<0.0036077	<0.015678	<0.016627	<0.0061612	<0.0045034
MX12AB074-1	174.2	H.A.	<0.024104	<0.028684	0.1457284	<0.016899	<0.016737	<0.0035081	<0.022361	0.0245298	<0.0039552	<0.0021539
MX12AB074-2	174.2	H.A.	<0.013119	<0.016965	0.0567654	<0.02085	0.0110318	<0.0026909	<0.018466	0.0133701	<0.0052047	0.0051565
MX12AB074-3	174.2	H.A.	<0.028485	0.0323096	0.057328	<0.033496	0.026829	0.0078274	<0.022407	0.4702096	<0.0058851	0.0209396
MX12AB074-4	174.2	H.A.	0.0137091	0.0252097	0.0322886	<0.020963	<0.014169	<0.003419	<0.013482	<0.0095473	0.005297	<0.0038888
MX12AB074-5	174.2	H.A.	<0.021755	<0.035582	0.1641813	<0.043156	<0.016369	<0.0031458	<0.020727	0.2267696	0.0097686	<0.0039732
MX12AB074-6	174.2	H.A.	<0.028723	<0.019897	0.0885162	<0.025838	<0.0074601	<0.0028794	<0.0082491	0.0848038	<0.0050265	0.002469
MX12AB074-7	174.2	H.A.	<0.020898	<0.014744	0.0646657	<0.021089	<0.01126	<0.0014222	<0.013097	<0.0073464	<0.0048957	<0.0024154
MX12AB074-8	174.2	H.A.	<0.019841	<0.020642	0.0470804	<0.012804	<0.0064284	<0.0033916	<0.012313	0.0112974	<0.0046536	0.0036808
MX12AB075-1	174.2	I	<0.019172	0.0202644	0.1391899	<0.013005	<0.0078963	<0.0038824	<0.015995	0.0338056	<0.0033723	<0.0037078
MX12AB075-2	174.2	I	<0.016926	<0.02378	0.0849519	<0.017606	<0.019716	<0.0022529	<0.017006	<0.0062468	<0.0075565	<0.0051434
MX12AB075-3	174.2	I	<0.021673	<0.016211	0.0324205	<0.012237	<0.0084672	<0.0022859	<0.0082277	<0.0098652	<0.0031768	<0.0028938
MX12AB075-4	174.2	I	<0.040999	0.0151834	<0.0093317	<0.02133	<0.0097437	<0.0015604	<0.0094685	<0.0099588	<0.0051346	<0.0040245
MX12AB075-5	174.2	I	<0.024545	<0.021415	0.0201787	<0.015549	<0.0078324	<0.0019936	<0.015861	0.0059152	<0.002435	<0.0036845
MX12AB075-6	174.2	I	<0.030312	<0.017316	0.0135203	<0.030705	<0.0092552	<0.0028448	<0.014086	0.0211598	<0.0075087	<0.0028755
MX12AB075-7	174.2	I	<0.01707	<0.020325	0.0388002	<0.017821	<0.011291	<0.0022846	<0.017061	<0.012493	<0.0038457	<0.004865
MX12AB075-8	174.2	I	<0.017603	<0.021417	0.029473	0.0223403	<0.0092317	<0.0056662	<0.013089	0.0109509	<0.0033361	0.0342652
MX12AB075-9	174.2	I	<0.015698	0.0281499	0.0147278	<0.042295	<0.013272	<0.0032028	<0.022074	0.0382285	<0.0031169	<0.004495
MX12AB075-10	174.2	I	<0.020486	<0.012009	0.0228174	<0.026998	<0.0048304	<0.0020726	<0.018236	0.0099541	<0.0063116	<0.0038454

Sample	Distance (m)	Type	Ag107	Sb121	Cs133	Gd157	Hf178	Ta181	Au197	Pb208	Bi209	U238
MX12AB075-11	174.2	I	<0.0171	<0.008829	<0.0050006	<0.018272	<0.010914	<0.0033547	0.0090866	<0.0042438	<0.0029244	<0.0049367
MX12AB075-12	174.2	I	<0.021059	<0.017165	0.0037112	<0.02851	<0.010221	<0.0031416	<0.011895	<0.005968	<0.0030364	<0.002897
MX12AB076-1	207.3	H	0.0182064	<0.029908	<0.005941	<0.015342	0.0070243	<0.0031371	<0.014059	0.0096382	<0.0044309	<0.0049981
MX12AB076-2	207.3	H	<0.025878	<0.015345	0.0066343	<0.019897	<0.0093509	<0.0013581	<0.013466	<0.006255	<0.004865	<0.0031474
MX12AB076-3	207.3	H	<0.028998	<0.024018	0.0163647	<0.026267	<0.010454	<0.0025617	<0.015048	<0.0097401	<0.004236	<0.0045117
MX12AB076-4	207.3	H	<0.03065	<0.014611	<0.004867	<0.023567	<0.0046842	<0.0014387	<0.011983	0.0137255	<0.0055553	<0.0033272
MX12AB076-5	207.3	H	<0.026294	0.0232101	0.0110044	<0.023984	<0.01008	<0.0024653	<0.01405	0.0083699	<0.0048211	<0.0033929
MX12AB076-6	207.3	H	<0.028532	<0.01618	0.0090904	<0.02157	<0.0087224	<0.0046536	<0.02022	0.0110741	<0.007073	<0.0049227
MX12AB076-7	207.3	H	<0.025853	<0.018517	0.0060337	0.0124765	<0.011255	<0.002991	<0.01244	<0.0066307	<0.003778	<0.0023145
MX12AB077-1	306.5	H	<0.018063	0.3227914	0.2651374	<0.017062	<0.012052	0.0018159	<0.012735	<0.009101	<0.0035797	<0.0032109
MX12AB077-2	306.5	H	<0.017506	0.2891851	0.4348842	<0.0128	<0.0098477	<0.0028577	<0.015868	0.1389142	0.0664037	<0.0040879
MX12AB077-3	306.5	H	<0.029288	<0.020876	0.0365651	<0.030575	<0.01549	<0.0054563	<0.017885	<0.012627	<0.0050233	0.0047197
MX12AB077-4	306.5	H	<0.015274	<0.017855	0.0781237	<0.033125	<0.012364	0.0024603	<0.01237	0.0135972	0.0049488	<0.0028873
MX12AB077-5	306.5	H	<0.014649	<0.016933	0.0349843	<0.012745	<0.007814	<0.0046324	<0.016654	0.0089102	<0.002927	0.0025263
MX12AB077-6	306.5	H	<0.017571	0.0158357	0.0243484	<0.017371	<0.0080002	<0.003607	<0.016302	<0.0049388	<0.0031184	<0.0024906
MX12AB078-1	375.8	I	<0.035979	<0.048363	0.0670489	<0.02779	<0.012448	<0.0038188	<0.013247	0.0139449	<0.0037182	<0.0035179
MX12AB078-2	375.8	I	<0.023149	0.0273012	0.1975282	<0.011249	<0.0086681	<0.0021176	<0.0092089	<0.0068133	<0.0035034	<0.0030522
MX12AB078-3	375.8	I	<0.019786	<0.020638	0.0636658	<0.019513	<0.0075572	<0.0040381	<0.012667	0.0082001	<0.0065427	<0.0033981
MX12AB078-4	375.8	I	0.0165987	0.0131945	0.0543006	<0.028955	<0.0086563	<0.0033581	<0.012724	0.1196718	<0.0032391	0.010502
MX12AB078-5	375.8	I	<0.018947	<0.015511	0.0449897	<0.017777	<0.0094326	<0.0029895	<0.013003	0.1352596	<0.0038216	0.0064881
MX12AB078-6	375.8	I	<0.017498	<0.015884	0.0542031	<0.016512	<0.0092455	<0.0040888	<0.014887	<0.0072596	<0.0054772	<0.0022907
MX12AB078-7	375.8	I	<0.014939	<0.019173	0.0499988	<0.021551	<0.009474	<0.0040101	<0.012096	<0.0067455	<0.0045209	<0.0067564
MX12AB079-1	498.2	H	<0.019807	<0.015673	0.0426487	<0.018762	<0.0072655	<0.002797	<0.0080188	0.0269701	<0.0041177	0.0027059
MX12AB079-2	498.2	H	<0.022364	<0.026247	0.1465562	<0.026664	<0.008939	<0.0057911	<0.023709	0.0362538	<0.0047434	<0.0039473
MX12AB079-3	498.2	H	<0.03594	<0.029809	0.0484727	<0.029209	<0.0097908	<0.0059744	<0.018867	0.0179529	<0.0055644	<0.0060863
MX12AB079-4	498.2	H	<0.034799	0.0264803	0.3029963	<0.026143	<0.018658	0.0045463	<0.017719	0.029919	<0.0049608	0.0104188
MX12AB079-5	498.2	H	<0.020699	<0.013958	0.0781389	<0.018545	<0.0062111	<0.0023	<0.010011	<0.008031	<0.0023189	<0.0040524
MX12AB081-1	748.5	I	<0.028125	0.0173573	0.1129394	<0.026976	<0.0070945	<0.0026249	<0.011454	0.0059509	<0.0043268	<0.0040336
MX12AB081-2	748.5	I	<0.037179	<0.017039	0.1036049	<0.030744	0.0328366	0.0119572	<0.016401	<0.0081134	<0.004565	0.0101566
MX12AB081-3	748.5	I	<0.025977	<0.021778	0.0155811	<0.012882	<0.0046857	<0.0032752	<0.025363	<0.011444	<0.0029429	<0.0027928
MX12AB081-4	748.5	I	<0.045038	<0.018737	0.0822809	<0.021477	<0.0056728	<0.0039728	<0.032655	0.0093673	<0.0059673	<0.0049742

Sample	Distance (m)	Type	Ag107	Sb121	Cs133	Gd157	Hf178	Ta181	Au197	Pb208	Bi209	U238
MX12AB081-5	748.5	I	<0.014612	<0.015127	0.137242	<0.019143	<0.011733	<0.0042186	<0.01039	0.0097907	<0.0048216	<0.0027371
MX12AB081-6	748.5	I	<0.019545	<0.015964	0.2516447	<0.02287	<0.008168	<0.0033902	<0.013775	<0.0071165	<0.0063173	<0.0028885
MX12AB081-7	748.5	I	<0.023821	<0.018117	0.0889965	<0.022084	<0.011202	<0.0022623	<0.0058842	0.0349773	<0.0044019	<0.0028827
MX12AB082-1	254.4	H	<0.023941	<0.024957	<0.0069937	0.0121665	<0.011913	<0.0032855	<0.010027	<0.0069235	<0.0031573	<0.0029025
MX12AB082-2	254.4	H	<0.018364	<0.022013	0.0086222	<0.02924	<0.008723	<0.0029437	<0.0085344	<0.0078582	<0.0043269	<0.0036034
MX12AB082-3	254.4	H	<0.015184	<0.015004	<0.0051583	<0.019441	<0.0082807	<0.003725	0.0137935	<0.0074584	<0.0050031	<0.0032059
MX12AB082-4	254.4	H	<0.031206	<0.021332	<0.0066087	<0.015782	<0.0092126	<0.0030536	<0.0056164	<0.0077932	<0.0021608	<0.0042201
MX12AB082-5	254.4	H	0.0126957	<0.02114	0.0511609	<0.014008	<0.0080853	<0.0021726	<0.010918	0.009952	<0.0030056	<0.0054493
MX12AB082-6	254.4	H	<0.023306	<0.015216	0.032954	<0.023264	0.0065434	<0.0027112	<0.013193	<0.0068736	<0.0054257	<0.0032725
MX12AB082-7	254.4	H	<0.027314	<0.02055	0.0335618	<0.02664	<0.008525	<0.0045333	<0.011075	<0.0088092	<0.0040502	<0.0047177
MX12AB083-1	399.6	I	<0.022665	<0.018111	<0.0079391	<0.019378	<0.0089113	<0.002727	<0.01693	<0.0072496	<0.004407	<0.00243
MX12AB083-2	399.6	I	<0.025002	<0.02785	0.0141668	<0.014083	<0.0098175	<0.0042189	<0.013298	0.0109168	<0.0045477	<0.0030466
MX12AB083-3	399.6	I	<0.036575	0.0229597	0.106988	<0.022353	<0.0093687	<0.0087662	<0.028325	0.0567355	<0.0052727	<0.0035121
MX12AB083-4	399.6	I	<0.027957	<0.032289	0.0065965	<0.028374	<0.012766	<0.0022757	<0.013882	0.0169474	<0.0053323	<0.0046622
MX12AB083-5	399.6	I	<0.016949	<0.025317	0.3551619	<0.020014	<0.017795	0.0030447	<0.018312	0.0144643	<0.0033021	0.0949513
MX12AB084-1	401.0	I	<0.044497	<0.038978	0.1317527	<0.036016	<0.0099411	<0.0049896	<0.0096941	<0.015579	<0.0071331	<0.0046849
MX12AB084-2	401.0	I	<0.031492	<0.024753	0.0159077	0.0174872	<0.01052	<0.0016765	<0.02105	<0.0080291	<0.0042987	<0.0051896
MX12AB084-3	401.0	I	<0.021613	<0.025501	0.0826966	<0.023875	<0.0096763	<0.0049144	<0.016464	0.0247584	<0.0031506	<0.0031276
MX12AB084-4	401.0	I	<0.025033	<0.018295	0.0511251	<0.020992	<0.009319	<0.0041117	<0.012718	<0.009537	<0.0049825	<0.0028906
MX12AB084-5	401.0	I	<0.020735	<0.017323	0.2614789	<0.012997	<0.0065708	<0.0022897	<0.015037	0.0171662	<0.0040791	0.0050791
MX12AB084-6	401.0	I	<0.021249	<0.023339	0.0608577	<0.023164	<0.017226	<0.0032493	<0.016006	<0.010783	<0.0062056	<0.004627
MX12AB084-7	401.0	I	<0.019577	<0.01917	0.0314535	<0.019523	<0.0082827	<0.00337	<0.0099462	<0.0071095	<0.003383	<0.0037772
MX12AB084-8	401.0	I	<0.02403	<0.021786	0.0882953	0.0222227	<0.0072088	<0.003341	<0.013578	<0.0092445	<0.0053921	<0.0022356
MX12AB087-1	244.7	I	<0.014283	<0.025706	0.1529208	<0.0086515	<0.0099498	<0.0025606	<0.013526	0.0340816	<0.0031024	<0.0032267
MX12AB087-2	244.7	I	<0.019245	0.0205432	0.076566	<0.021274	<0.006147	<0.0018815	<0.0083484	<0.0072062	<0.0061829	<0.0027208
MX12AB087-3	244.7	I	<0.021037	<0.018459	0.0499379	<0.018372	<0.0058372	<0.0021602	<0.016043	<0.0085991	<0.0026177	<0.0025818
MX12AB087-4	244.7	I	<0.029157	<0.023447	0.1128494	<0.022351	<0.022823	<0.0066775	0.0077509	<0.0062465	<0.0053185	<0.0039286
MX12AB087-5	244.7	I	<0.021671	0.0260026	0.1666426	<0.022759	<0.01146	<0.0038705	<0.015529	0.0186876	<0.0042521	0.0061605
MX12AB087-6	244.7	I	<0.016054	<0.019468	0.0619335	<0.029543	<0.013137	0.0057928	<0.012665	0.0182375	<0.0043299	0.0098742
MX12AB087-7	244.7	I	<0.022401	<0.020556	0.0460961	0.0132192	<0.0098227	<0.0025249	<0.016402	<0.0095368	<0.0030608	<0.0018463
MX12AB087-8	244.7	I	<0.027444	<0.026026	0.3016945	<0.018069	<0.007978	0.0021794	<0.013558	0.0292813	<0.003882	0.0054057

Sample	Distance (m)	Type	Ag107	Sb121	Cs133	Gd157	Hf178	Ta181	Au197	Pb208	Bi209	U238
MX12AB089-1	189.6	H	<0.024288	<0.026101	0.051866	<0.021018	<0.015545	<0.0043082	<0.0074053	0.0366776	<0.0059868	<0.0035897
MX12AB089-2	189.6	H	<0.02092	<0.018826	0.0298546	<0.015738	<0.0091082	0.0026737	<0.010655	0.0249624	0.0061253	0.0026866
MX12AB089-3	189.6	H	<0.028881	<0.022262	<0.0068173	<0.014169	<0.013057	<0.004	<0.013201	0.0283638	0.0216959	<0.00333
MX12AB089-4	189.6	H	<0.019227	<0.020934	<0.0062113	<0.019744	<0.007322	<0.0013296	<0.009841	0.0086753	<0.0049277	<0.002565
MX12AB089-5	189.6	H	<0.02206	<0.019942	<0.0094694	0.026176	<0.017069	<0.0027014	<0.016052	<0.010146	<0.004443	0.0809095
MX12AB089-6	189.6	H	<0.015991	<0.025942	0.0088466	<0.018326	<0.011482	0.0019855	<0.010847	<0.011522	<0.0024858	0.0088889
MX12AB089-7	189.6	H	<0.018977	<0.033015	0.0108558	0.0166395	0.0083613	<0.0036883	<0.0076182	<0.011968	<0.0048321	<0.0029453
MX12AB090-1	190.5	H	<0.023398	0.0971853	0.0966396	<0.024589	<0.012354	<0.0026953	<0.020591	0.0536506	<0.0045942	0.0029627
MX12AB090-2	190.5	H	<0.01583	0.024363	0.035755	<0.040673	<0.01098	<0.0080623	<0.014697	<0.01927	<0.0053593	<0.0047894
MX12AB092-1	370.1	H	<0.023355	<0.032625	<0.0084786	<0.03495	<0.0068548	<0.005375	<0.023378	<0.017323	<0.0091252	<0.004444
MX12AB092-2	370.1	H.A.	<0.026978	<0.043859	0.0165362	<0.018533	<0.013322	<0.0046625	<0.023957	<0.012881	0.0034212	0.0080262
MX12AB092-3	370.1	H.A.	<0.014101	<0.011885	0.0249342	<0.028634	<0.0099001	<0.002901	<0.0093076	0.0343864	<0.0052061	<0.0024318
MX12AB092-4	370.1	H	<0.022738	<0.017868	0.0297788	<0.008389	<0.012866	<0.0012904	<0.011927	<0.0084911	<0.0030235	<0.0028528
MX12AB092-5	370.1	H	<0.04066	<0.033513	<0.011173	<0.03471	<0.014431	<0.0044255	<0.024575	<0.011875	<0.0048894	<0.0029104
MX12AB092-6	370.1	H	<0.022605	<0.022577	0.0494381	<0.01452	<0.011663	<0.0013222	<0.017653	<0.0081148	<0.0041275	<0.0034032
MX12AB092-7	370.1	H	<0.017543	<0.023616	0.0086585	<0.014466	<0.0085971	<0.0037287	<0.012211	<0.0075114	<0.0027133	<0.0026357
MX12AB092-8	370.1	H	<0.015794	<0.021779	<0.0037204	<0.013014	<0.0038671	<0.0022813	<0.014001	0.0068495	<0.0032014	<0.0022811
MX12AB092-9	370.1	H	<0.031814	0.0172659	0.0099687	<0.021306	<0.0088644	<0.0024643	<0.010773	0.0118312	<0.0057123	<0.0024647
MX12AB092-10	370.1	M	<0.018794	<0.016798	<0.0064798	<0.018319	<0.010529	<0.002711	<0.016658	<0.0083601	<0.0029028	<0.0027122
MX12AB092-11	370.1	H	<0.033532	<0.026408	<0.0073451	<0.015149	<0.016652	<0.0036951	<0.01234	0.1117546	<0.0049783	0.0072089
MX12AB093-1	175.8	I	<0.015721	<0.017454	0.0435481	<0.017509	<0.012341	<0.0026948	<0.02974	0.0124634	<0.0055954	0.0034518
MX12AB093-2	175.8	I	<0.020189	<0.017832	<0.0064475	<0.023514	<0.010438	<0.0055145	<0.01517	<0.0078043	<0.0035456	<0.0021109
MX12AB093-3	175.8	I	<0.02155	<0.018636	0.0326427	<0.0093723	0.0165233	<0.0020138	<0.010682	0.0339568	<0.0045061	0.0094966
MX12AB093-4	175.8	I	<0.017673	<0.016217	<0.0035783	<0.021268	<0.0075131	<0.0026248	<0.011528	0.0108191	<0.0042679	<0.0032805
MX12AB093-5	175.8	I	<0.020812	<0.018416	<0.0064984	<0.028105	<0.0069285	<0.0032212	<0.010638	<0.0065288	<0.0029584	<0.0032287
MX12AB093-6	175.8	I	<0.014815	<0.016366	0.0037885	<0.020483	<0.0042847	<0.0031533	<0.013866	<0.0051211	<0.0036878	<0.002226
MX12AB093-7	175.8	I	<0.01192	<0.013604	<0.0039337	<0.007828	<0.011522	<0.0030844	<0.012151	0.0096491	<0.0020578	<0.0023248
MX12AB093-8	175.8	I	<0.022699	<0.016529	0.0103231	<0.01548	<0.0068217	<0.0033472	<0.013964	0.0241699	<0.0046027	<0.0036466
MX12AB096-1	312.2	I	0.0126921	<0.020607	0.0369208	<0.012872	<0.0064607	<0.0030051	<0.018472	0.0108971	<0.0040651	0.0029155
MX12AB096-2	312.2	I	<0.014673	<0.018508	0.0168831	<0.015308	<0.0053651	<0.0037363	<0.0087684	<0.0058259	<0.0024343	<0.0031954
MX12AB096-3	312.2	I	<0.018608	<0.02736	0.0642532	0.0543966	<0.0059126	<0.0021928	<0.01215	0.007286	<0.0030576	0.0039401

Sample	Distance (m)	Type	Ag107	Sb121	Cs133	Gd157	Hf178	Ta181	Au197	Pb208	Bi209	U238
MX12AB096-4	312.2	I	<0.025872	<0.01873	0.029049	0.3157632	<0.0099877	0.0017887	<0.017101	0.0280063	<0.0047652	0.0401609
MX12AB096-5	312.2	I	<0.02662	<0.019074	0.0299908	1.2929295	<0.0096406	<0.0061441	<0.014406	0.1050666	0.0024929	0.3048414
MX12AB096-6	312.2	I	<0.022319	<0.021148	0.1509791	<0.017533	<0.0077279	<0.0031099	<0.013152	0.0154777	<0.003307	<0.0036096
MX12AB096-7	312.2	I	<0.025542	<0.012522	0.0627981	<0.019658	<0.0078604	<0.0046627	<0.020638	0.0191822	<0.0055441	0.0016414
MX12AB096-8	312.2	I	<0.043923	<0.029414	0.0549732	<0.025466	<0.018253	<0.0023906	<0.010575	0.0163459	0.0039728	0.0048284
MX12AB096-9	312.2	I	<0.032247	<0.031047	0.0435117	0.0166169	<0.01071	<0.002387	<0.018134	0.0527165	<0.0076438	0.0225713
MX12AB096-10	312.2	I	<0.015925	<0.017135	0.0742351	<0.024615	<0.012943	0.0025814	<0.016789	<0.0080714	0.0027662	<0.0038124

Distance is distance from center of deposit

H = hydrothermal vein, I = igneous, H.A = hydrothermally altered, M = regionally metamorphic

Appendix 5: Chlorite mineral chemistry by LA-ICP-MS

Sample	Distance (m)	Type	Li7	B11	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	V51	Cr53	Mn55
MX12AB002(1)-1	5352.9	H	230.0	2.7	<62.192	55514.1	107000	115316.8	165.7		289.1	88.4	11.3	1360.1
MX12AB002(1)-2	5352.9	H	307.6	4.5	<80.1699	52653.0	107000	120940.5	28.5		204.5	66.9	8.4	1412.4
MX12AB002(1)-3	5352.9	H	249.9	3.9	<83.4747	54785.7	110000	226415.3	946.1		275.4	90.1	6.0	1488.8
MX12AB002(1)-4	5352.9	H	218.7	2.1	<39.6632	53010.4	101000	140094.8	<12.6697		232.8	71.7	4.0	1315.5
MX12AB002(1)-5	5352.9	H	217.1	5.3	<47.4378	51813.3	101000	104377.5	28.5		222.5	70.8	14.1	1271.5
MX12AB003-1	628.4	H	8.8	<4.1188	<113.7656	6073.3	100000	194841.3	904.8		4242.9	118.6	<3.5716	8769.1
MX12AB003-2	628.4	H	80.1	8.2	<65.3281	95319.2	100000	142096.3	538.9		353.2	100.6	4.4	12778.9
MX12AB003-3	628.4	H	19.5	5.1	<84.117	14180.2	100000	182277.5	894.3		2632.7	104.9	<2.7101	11675.9
MX12AB008-1	585.0	H	156.2	2.6	4186.7	117091.0	102000	127772.6	390.5		73.0	188.8	395.5	3864.6
MX12AB009-1	359.9	H	183.5	3.0	119.9	74139.7	115000	137720.7	5586.1		76.8	394.0	7.7	6229.5
MX12AB009-2	359.9	H	224.4	4.2	<64.6905	69317.8	115000	122761.3	18.5		399.1	202.3	<2.626	6541.4
MX12AB009-3	359.9	H	180.7	4.2	<72.4372	69940.0	108000	119518.1	<17.195		110.6	246.9	<3.0758	5943.2
MX12AB009-4	359.9	H	193.0	<1.4471	<45.1902	68411.1	105000	104023.5	<10.9678		478.6	211.7	2.4	6180.8
MX12AB009-5	359.9	H	183.0	3.0	<54.8466	76460.4	110000	123773.2	<16.0816		224.2	474.0	9.1	6190.1
MX12AB009-6	359.9	H	175.5	2.8	<53.1088	74985.1	104000	113315.3	25.9		168.2	557.6	6.7	5199.2
MX12AB009-7	359.9	H	175.1	5.3	<55.5327	73663.8	107000	122902.4	<12.6226		73.2	357.7	4.5	5899.3
MX12AB009-8	359.9	H	185.2	2.6	<60.1259	74391.0	107000	114538.9	9.5		54.8	377.6	9.1	5899.7
MX12AB010-1	446.4	H	202.4	10.3	<140.6102	142009.8	108000	340319.9	39.2		158.5	97.9	36.4	2123.0
MX12AB010-2	446.4	H	379.7	19.4	<43.5099	141936.1	101000	138805.0	105.1		39.9	2.8	4.5	2337.7
MX12AB010-3	446.4	H	153.7	2.0	<49.8778	136226.9	103000	116440.1	9.8		30.0	55.0	16.0	2283.5
MX12AB010-4	446.4	H	205.7	4.4	<49.2571	122572.6	98000	135073.0	19.7		17.2	115.6	21.2	1891.4
MX12AB010-5	446.4	H	219.0	10.4	<43.087	114996.7	94000	151016.1	169.9		36.6	159.1	43.2	1888.0
MX12AB010-6	446.4	H	225.1	7.3	<45.5054	127320.3	97000	121526.3	32.9		140.9	75.2	<1.998	2221.6
MX12AB010-7	446.4	H	171.2	2.2	<58.1849	129817.2	107000	129896.1	39.3		60.0	108.5	2.6	2546.3
MX12AB010-8	446.4	H	209.9	12.7	<52.8869	125843.8	100000	172834.9	30.9		19.4	107.3	5.0	2234.2
MX12AB010-9	446.4	H	156.0	4.7	<50.2729	121723.3	100000	120372.1	48.3		42.9	97.5	<2.1681	2449.2
MX12AB011-1	733.9	H	107.4	8.7	<49.0506	79487.0	115000	115880.5	35.6		356.8	69.9	18.8	1287.2
MX12AB011-2	733.9	H	103.9	5.2	<58.331	79355.5	113000	130540.5	13.1		342.1	67.1	15.2	1272.7

Sample	Distance (m)	Type	Li7	B11	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	V51	Cr53	Mn55
MX12AB011-3	733.9	H	98.6	5.8	<40.3893	65071.3	98000	94196.6	<10.563		312.0	59.5	13.7	1243.6
MX12AB011-4	733.9	H	108.7	6.0	<44.776	69481.0	98000	102079.6	<14.6085		258.7	50.3	3.5	1145.4
MX12AB011-5	733.9	H	111.7	17.7	<49.2936	75349.4	108000	120245.8	42.2		256.6	102.6	15.2	1339.0
MX12AB013-1	1201.2	H	323.8	15.9	<102.7823	55548.1	99000	113754.3	275.2		292.7	70.5	48.8	1703.2
MX12AB013-2	1201.2	H	343.5	17.1	73.5	57060.3	104000	106097.4	22.3		266.1	68.4	39.1	1658.6
MX12AB013-3	1101.3	H	375.3	7.1	100.2	62824.1	105000	120021.4	21.0		336.0	73.1	71.6	1791.8
MX12AB013-4	1201.2	H	375.6	7.4	<59.7767	63287.4	108000	187042.6	67.4		326.5	108.3	57.2	1911.4
MX12AB014-1	1101.2	H	124.6	22.7	<54.0593	133106.4	102000	125096.5	71.2		216.3	47.4	2.6	422.3
MX12AB014-2	1101.2	H	160.2	37.9	<59.7287	125157.1	104000	134922.1	142.1		121.1	64.1	<2.8452	403.9
MX12AB014-3	1101.2	H	162.7	32.1	<84.4288	123585.7	105000	142752.0	405.6		53.4	21.6	<4.2357	1477.2
MX12AB014-4	1101.2	H	167.0	37.3	<132.2599	121617.3	105000	152823.3	519.9		153.6	17.8	<5.5868	1313.2
MX12AB014-5	1101.2	H	186.2	24.4	<47.6113	124283.8	108000	121938.2	68.1		121.8	12.0	<1.97	1369.1
MX12AB014-6	1101.2	H	181.1	8.0	<50.697	88261.0	114000	112962.1	14.6		204.9	24.0	2.1	1029.5
MX12AB014-7	1101.2	H	207.2	10.4	<61.9646	131578.9	108000	144403.5	110.2		95.5	17.5	<2.313	1215.6
MX12AB014-8	1101.2	H	189.0	23.5	44.4	118213.4	104000	125658.9	39.3		112.1	9.8	<1.533	1317.1
MX12AB014-9	1101.2	H	187.5	6.4	<57.3063	126050.7	107000	110025.3	32.5		101.9	9.5	<1.9212	1327.5
MX12AB014-10	1101.2	H	179.2	12.2	<87.5675	101299.7	107000	125751.8	19.4		129.7	13.2	<3.8453	1291.5
MX12AB016-1	902.0	H	192.3	4.8	<42.2664	99001.5	106000	112974.5	130.5		206.1	182.2	18.6	2572.2
MX12AB016-2	902.0	H	155.8	2.7	<47.0745	95268.9	105000	104347.9	41.1		252.6	132.4	12.7	2530.1
MX12AB016-3	902.0	H	144.0	2.7	<45.376	94076.3	105000	110684.9	55.8		301.1	135.8	44.5	2586.1
MX12AB017-1	802.5	H	158.2	5.8	<47.4141	86683.5	90000	98761.8	17.1		233.0	79.6	59.2	3036.6
MX12AB017-2	802.5	H	186.7	5.8	<41.7349	91386.5	90000	105253.3	12.7		79.3	135.2	174.9	2839.8
MX12AB017-3	802.5	H	222.8	11.8	<44.5361	106227.5	107000	125642.1	12.9		50.0	123.1	134.8	2946.6
MX12AB017-4	802.5	H	239.1	9.3	<48.3523	102200.1	102000	125661.1	9.1		334.9	429.8	478.4	2734.3
MX12AB018-1	703.4	H	176.1	19.0	<56.6911	76548.2	103000	120828.8	31.6		111.7	99.9	74.5	5601.3
MX12AB018-2	703.4	H	178.3	12.4	<47.3723	81722.9	103000	120982.0	56.2		83.8	109.1	57.2	5934.9
MX12AB018-3	703.4	H	181.0	54.4	<42.2535	77442.9	103000	121040.7	10.6		137.6	108.3	8.3	6030.2
MX12AB018-4	703.4	H	180.6	40.2	<52.5463	78912.9	103000	121217.7	14.0		139.4	110.3	8.0	6231.6
MX12AB018-5	703.4	H	183.9	28.5	<56.6316	78759.4	105000	119489.6	18.6		223.1	101.8	21.9	6026.5
MX12AB018-6	703.4	H	161.4	12.4	<53.1506	79018.6	105000	119258.3	34.2		149.1	128.0	7.4	6004.3

Sample	Distance (m)	Type	Li7	B11	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	V51	Cr53	Mn55
MX12AB022-1	2824.7	H	195.5	4.6	<53.6611	93017.4	99000	113366.3	16.2		224.4	194.9	9.5	2445.5
MX12AB022-2	2824.7	H	198.1	5.3	<43.0431	94760.3	100000	111065.6	112.0		202.2	201.5	11.0	2505.4
MX12AB022-3	2824.7	H	200.3	1.7	<49.0616	99811.2	101000	113150.4	74.6		240.8	207.9	8.9	2470.2
MX12AB024-1	481.9	H	272.7	42.3	<176.5665	83030.7	119000	164635.0	595.2	<611.045	453.0	142.1	387.9	1681.2
MX12AB024-2	441.8	H	271.0	19.8	<68.5942	90734.6	119000	153677.5	210.3	<321.5596	461.0	148.5	303.4	1813.7
MX12AB027-1	425.4	H	252.6	20.4	<61.9891	79106.2	119000	173860.2	127.4	29333.36	26744.3	464.1	12.8	6399.5
MX12AB027-2	451.6	H	256.4	15.6	78.3	78965.0	114000	129811.0	103.2	300.6742	299.1	140.1	15.0	6851.3
MX12AB027-3	497.0	H	237.8	2.8	<54.7063	83129.5	115000	132518.8	106.7	<318.1148	137.5	691.0	20.5	5646.4
MX12AB027-4	556.8	H	215.6	4.2	<48.2016	76006.7	113000	139892.3	125.4	<244.7084	138.9	467.9	5.7	6422.0
MX12AB027-5	626.9	H	192.6	6.7	51.1	83479.6	115000	138087.9	296.3	<288.0717	145.3	424.4	7.2	6601.5
MX12AB027-6	704.3	H	210.8	16.5	<65.3551	71673.8	108000	139996.1	75.9	<336.0874	237.3	395.0	7.1	5778.1
MX12AB027-7	786.8	H	210.8	2.3	<56.6718	76714.6	114000	138628.1	76.3	239.8391	177.4	412.8	6.9	6419.1
MX12AB027-8	872.9	H	222.2	6.4	<52.8457	76103.3	113000	139614.5	72.4	<251.7685	131.8	403.8	4.1	6212.9
MX12AB027-9	961.8	H	244.1	3.7	<49.353	79031.5	116000	142471.4	17.7	<227.256	191.5	449.1	6.8	6842.0
MX12AB027-10	1052.6	H	168.3	<1.7127	<49.0281	84540.0	115000	132171.5	34.6	<294.3537	192.0	496.8	3.7	6258.6
MX12AB027-11	1145.0	H	203.3	3.0	<53.2891	84803.3	123000	133540.3	364.3	<422.2095	436.1	553.1	12.3	6516.9
MX12AB027-12	1238.5	H	217.0	3.9	<55.0018	79929.1	117000	127073.2	173.9	<278.462	262.1	445.1	5.8	6425.4
MX12AB027-13	1333.0	H	172.4	8.2	<161.1968	73175.4	116000	167806.0	87.7	11116.67	11835.2	475.7	8.2	5983.8
MX12AB027-14	1428.3	H	171.0	10.0	<158.48	80873.3	116000	211402.0	279.4	<1111.5642	1129.2	608.0	10.6	5952.9
MX12AB027-15	1524.1	H	240.4	9.3	45.5	85007.3	116000	135211.2	61.4	<318.6528	133.2	435.1	6.1	6348.9
MX12AB027-16	1620.5	H	247.0	6.5	<157.7944	84682.2	116000	168511.7	<35.6236	1881.369	943.9	647.8	<5.6485	6263.9
MX12AB028-1	481.4	H	225.4	7.5	211.1	75391.4	117000	136133.1	191.7	<324.4343	257.4	374.8	3.8	6612.8
MX12AB028-2	481.4	H	156.9	8.1	<50.0237	74797.3	98000	129360.5	181.8	293.8925	101.1	336.1	3.6	4209.5
MX12AB028-3	481.4	H	249.0	12.4	175.7	79364.6	115000	150997.3	182.6	<390.4695	120.4	511.6	9.3	5363.7
MX12AB028-4	481.4	H	199.3	20.3	<148.7425	78034.0	117000	168213.9	86.9	<981.5823	316.8	634.9	14.2	4451.8
MX12AB028-5	481.4	H	247.9	5.7	<77.2533	71556.7	112000	142526.1	<13.9841	<333.3868	182.0	436.3	15.3	6003.2
MX12AB028-6	481.4	H	191.8	18.4	264.5	103243.7	134000	171774.3	721.3	334.5788	442.4	799.2	12.6	6172.1
MX12AB028-7	481.4	H	240.0	7.1	81.4	81068.0	118000	142558.8	24.9	<302.808	196.2	430.2	4.5	5585.1
MX12AB028-8	481.4	H	233.0	4.3	<46.6664	75514.4	120000	143094.1	28.5	314.8503	323.9	357.3	1.7	5800.0
MX12AB029-1	481.4	H	226.9	8.8	<72.4222	101300.2	114000	195118.2	66.0	<360.4639	285.0	323.2	48.3	6019.2

Sample	Distance (m)	Type	Li7	B11	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	V51	Cr53	Mn55
MX12AB029-2	481.4	H	67.5	19.4	<148.8026	24867.9	115000	630541.6	<30.3798	681598.5	689403.4	3405.6	436.6	3622.5
MX12AB029-3	481.4	H	211.1	2.9	<52.0046	90300.8	114000	142696.0	80.5	<264.5121	219.3	559.2	32.9	5927.1
MX12AB029-4	481.4	H	248.8	<3.1594	<78.1018	88282.6	114000	149851.9	16.9	<495.5373	281.7	533.6	56.8	6134.6
MX12AB029-5	481.4	H	229.7	8.6	62.6	83372.1	119000	126071.3	<10.3868	315.8391	109.5	361.3	104.7	6527.6
MX12AB029-6	481.4	H	260.9	7.8	<45.3926	79483.9	112000	131826.2	<8.4744	265.2041	425.4	372.9	137.0	6693.8
MX12AB029-7	481.4	H	225.1	17.4	149.4	81434.8	112000	172379.7	13.9	<266.0659	131.7	512.7	276.5	6438.6
MX12AB029-8	481.4	H	176.8	4.8	55.8	90080.0	113000	125186.9	44.2	825.1501	248.6	596.8	280.2	5639.3
MX12AB029-9	481.4	H	187.6	<2.8701	<64.8422	89835.8	116000	130137.0	23.1	449.6365	252.9	514.0	594.0	5981.7
MX12AB030-1	441.3	H	46.5	77.8	156.9	17386.7	50000	158433.0	85.0	2769.527	4.7	1.2	<3.9257	343.4
MX12AB030-2	441.3	H	35.1	1019.4	271.1	19195.8	49000	212306.9	295.3	8445.012	8.7	0.4	<2.9835	477.4
MX12AB033-1	134.0	H	285.7	9.1	731.7	80813.7	122000	150312.6	162.8	546.0807	623.8	802.1	6.8	4686.5
MX12AB033-2	134.0	H	215.5	3.3	<57.8189	81878.6	117000	153547.8	46.2	<321.0249	110.4	876.5	7.5	5967.5
MX12AB033-3	134.0	H	254.3	2.3	<38.881	77218.7	116000	137828.9	32.8	<237.2525	203.6	713.2	7.8	5922.9
MX12AB033-4	134.0	H	244.5	13.8	91.3	85309.7	117000	120924.4	26.3	<343.2681	98.5	439.7	10.5	5341.5
MX12AB033-5	134.0	H	258.9	4.7	<48.3238	66023.5	118000	139994.8	45.0	<276.7855	262.4	391.8	6.6	6520.8
MX12AB033-6	134.0	H	275.8	9.7	<70.0852	67838.0	122000	146048.9	509.3	<410.4852	291.6	441.0	5.3	6534.7
MX12AB034-1	147.2	H	176.6	<2.716	<60.9779	67436.3	108000	102101.4	188.8		569.4	390.4	<2.9055	5340.6
MX12AB034-2	147.2	H	2321.6	2754.0	<47526.7699	25846452.3	90000	7889069.9	19456.5		<2097.9246	5592.5	<1431.7157	7037800.0
MX12AB035-1	158.3	H	285.5	2.4	<42.0777	92114.8	118000	127507.6	40.1	<278.277	380.5	267.4	59.0	5040.9
MX12AB035-2	158.3	H	246.8	23.9	<118.2232	81970.6	116000	233534.8	1914.8	<637.261	292.3	231.5	28.7	4459.1
MX12AB035-3	158.3	H	321.8	5.2	<44.2096	87075.3	116000	144118.7	52.8	<244.0001	443.2	165.5	87.5	4908.1
MX12AB035-4	158.3	H	334.3	15.9	<58.2396	85690.5	118000	156304.7	34.8	<406.2949	414.1	238.0	527.9	4614.8
MX12AB035-5	158.3	H	251.9	2.7	<45.1253	92447.6	122000	124460.6	28.2	<349.4559	698.7	366.3	201.5	2921.1
MX12AB035-6	158.3	H	335.2	12.4	249.6	89740.8	116000	132271.9	36.1	351.0686	441.2	286.0	360.8	4844.4
MX12AB035-7	158.3	H	328.0	2.8	259.7	90813.1	118000	130371.2	41.6	<283.3866	396.5	283.9	490.9	4769.9
MX12AB035-8	158.3	H	271.1	4.2	<38.5119	90431.3	117000	125263.7	21.5	<305.782	432.5	256.4	206.8	4570.2
MX12AB035-9	158.3	H	304.7	7.0	<54.3059	91652.6	123000	140234.0	93.6	<291.2781	527.6	172.9	19.1	5072.3
MX12AB038-1	178.1	H	128.9	66.7	48.7	64171.2	80000	138510.3	85.8	1126.507	119.9	73.5	1.8	1694.3
MX12AB040-1	187.3	H	254.2	<5.6032	<221.8407	81423.1	110000	146149.9	1017.4	2095.417	2100.4	441.3	9.7	4030.1
MX12AB040-2	187.3	H	158.8	<1.9549	<76.6617	79172.3	110000	112840.5	76.0	<259.4381	242.8	457.2	6.2	5234.3

Sample	Distance (m)	Type	Li7	B11	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	V51	Cr53	Mn55
MX12AB040-3	187.3	H	218.6	2.9	<99.516	74652.8	110000	124875.6	62.6	<497.9246	368.4	456.8	6.5	3969.3
MX12AB041-1	198.2	H	312.0	2.5	<38.2511	112874.9	120000	136008.0	16.6	345.9616	292.2	912.4	3.9	6781.0
MX12AB041-2	198.2	H	387.5	<1.7659	<41.2978	105598.9	124000	153187.7	<8.7948	377.5639	335.7	652.2	<2.4159	6969.2
MX12AB041-3	198.2	H	334.8	4.1	<49.4931	111593.5	127000	156027.3	30.2	<368.562	130.5	838.4	18.1	7360.4
MX12AB041-4	198.2	H	328.5	1.9	<46.9113	108382.6	123000	138092.7	42.4	247.6977	138.0	570.8	15.1	7463.7
MX12AB042-1	205.6	H	188.6	2.5	<40.7742	83432.4	100000	106410.9	45.6		249.8	217.1	2.6	4071.7
MX12AB044-1	206.7	H	240.5	28.7	<75.7504	100826.4	115000	177044.0	144.8	<601.0416	328.9	402.5	185.0	4943.5
MX12AB044-2	206.7	H	280.8	9.1	<102.9515	91570.4	116000	163365.2	103.2	<517.8726	366.3	235.4	387.4	5283.0
MX12AB044-3	206.7	H	245.2	2.6	53.2	98843.7	117000	184270.3	71.6	292.2716	522.7	192.3	176.0	5068.0
MX12AB045-1	222.9	H	279.7	29.4	<74.6322	103961.6	117000	227116.4	217.9	113285.1	116159.4	433.0	557.0	4104.5
MX12AB046-1	3642.7	H	453.9	55.7	<117.55	71159.9	123000	465471.6	938.1	1509.913	256.5	310.5	61.8	681.1
MX12AB046-2	3642.7	H	496.6	92.9	<71.2115	91001.8	134000	326033.4	152.8	948.7598	342.9	328.0	143.2	711.5
MX12AB047-1	3644.7	H	428.4	<3.7159	<137.2623	72065.9	116000	148686.0	47.5		194.3	62.7	76.1	648.2
MX12AB047-2	3644.7	H	459.9	<3.1905	<119.2085	66376.2	116000	181777.5	87.1		176.1	59.7	44.3	647.6
MX12AB054-1	2784.0	H	188.4	5.4	48.9	116212.0	102000	114985.7	111.8		116.9	232.1	731.1	2570.5
MX12AB054-2	2784.0	H	206.2	5.4	<84.6149	112793.2	103000	130149.6	395.9		182.9	230.3	638.3	2511.1
MX12AB055-1	1279.8	H	242.9	<4.3489	<84.231	48521.9	98000	132874.5	<28.196		45327.3	186.3	8.7	7027.6
MX12AB055-2	1279.8	H	280.3	<92.8382	<1872.3698	49469.7	105000	5329262.2	664.0		2808.4	200.4	<56.7892	7778.1
MX12AB055-3	1279.8	H	306.6	<143.1409	<4198.0144	43201.5	101000	9295562.8	9075.7		45350.8	278.8	<150.2265	5775.7
MX12AB055-4	1279.8	H	220.4	<2.4149	<50.9838	50503.3	97000	99484.7	183.4		190.1	184.2	6.5	8054.9
MX12AB055-5	1279.8	H	166.4	<2.283	<64.8908	49586.4	100000	112983.0	134.4		268.5	204.1	3.6	9018.0
MX12AB056-1	873.3	H	274.9	3.3	<58.3208	57647.1	103000	112678.5	313.7		222.6	237.8	4.6	7979.8
MX12AB056-2	873.3	H	235.2	3.6	<58.9599	54337.6	98000	112097.1	49.2		167.3	189.4	7.1	7757.7
MX12AB056-3	873.3	H	265.2	5.1	<49.5989	60169.5	108000	107085.7	14.3		130.8	159.0	6.8	8875.7
MX12AB056-4	873.3	H	287.2	3.8	<65.5568	57597.9	109000	117462.4	39.6		145.5	229.2	3.1	8424.3
MX12AB056-5	873.3	H	376.8	17.3	<98.3908	46133.7	95000	149756.5	188.4		48919.3	343.9	4.3	5153.4
MX12AB056-6	873.3	H	306.9	<4.4378	<81.4782	56739.2	109000	123874.6	49.9		154.0	200.1	6.4	8805.6
MX12AB056-7	873.3	H	274.1	<2.7715	<60.3896	56734.0	105000	118670.5	251.6		153.0	267.1	4.5	8435.7
MX12AB056-8	873.3	H	270.1	<2.5504	<61.6827	55807.8	102000	100612.1	112.2		235.0	182.3	4.4	7699.2
MX12AB056-9	873.3	H	123.2	13.3	<54.5384	25656.5	97000	133101.2	<16.0787		500.0	89.2	<1.7784	2878.7

Sample	Distance (m)	Type	Li7	B11	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	V51	Cr53	Mn55
MX12AB057-1	403.6	H	198.0	1.7	<36.1695	70738.7	100000	101308.1	29.7		72.6	205.6	2.7	7592.4
MX12AB057-2	403.6	H	201.5	<2.4765	<61.0967	70701.4	100000	115384.2	24.6		83.0	188.2	<1.8801	7502.7
MX12AB057-3	403.6	H	200.6	4.5	<39.5095	70350.2	100000	108301.4	28.6		82.1	210.6	3.4	7642.6
MX12AB057-4	403.6	H	219.2	3.1	<50.3014	74408.1	105000	118799.1	26.4		81.3	199.4	<2.4204	7993.8
MX12AB075-1	174.2	H	239.6	4.7	<41.1109	84387.7	116000	115976.4	41.3	<178.1783	399.7	314.1	105.5	896.7
MX12AB075-2	174.2	H	192.6	8.6	<111.2826	82040.1	115000	557645.5	41.1	887.7532	419.4	199.7	12.6	1070.6
MX12AB076-1	207.3	H	182.0	<2.5322	<44.5304	73509.0	118000	128778.2	17.4	<243.4266	139.2	371.6	10.5	8279.8
MX12AB076-2	207.3	H	148.8	2.3	<50.4019	70906.9	115000	126791.1	50.9	<274.0337	297.8	301.3	4.0	7639.6
MX12AB076-3	207.3	H	135.9	<4.115	<118.1553	67723.8	111000	137163.1	<26.5858	<545.4808	212.3	318.3	5.4	7368.3
MX12AB076-4	207.3	H	159.5	<2.462	<39.6302	76481.5	116000	122702.8	36.8	<241.4079	105.4	290.3	19.6	3437.0
MX12AB076-5	207.3	H	170.4	2.0	<53.0693	79208.2	118000	131479.7	44.4	<383.6543	158.8	290.2	11.7	2924.5
MX12AB076-6	207.3	H	254.5	<1.7195	<45.4349	68078.8	114000	124693.9	12.1	<236.5016	378.4	434.6	26.0	6623.7
MX12AB076-7	207.3	H	171.7	2.1	<51.1628	75740.5	115000	137065.3	67.8	317.7714	183.3	265.9	18.8	3515.6
MX12AB076-8	207.3	H	146.8	6.1	<45.9663	65804.4	116000	105721.4	3105.4	<295.8742	273.0	310.9	3.5	6937.8
MX12AB076-9	207.3	H	146.6	<2.6066	<67.2121	66914.4	115000	131859.9	30.9	362.4078	188.1	319.9	4.3	7790.5
MX12AB076-10	207.3	H	130.6	<2.5594	<55.4373	69253.5	115000	127970.5	47.8	<338.0571	255.6	317.8	12.2	8203.0
MX12AB076-11	207.3	H	153.6	<2.6997	<86.1469	68239.6	117000	138605.6	41.1	<429.6552	126.6	245.9	4.9	7946.8
MX12AB076-12	207.3	H	128.7	<1.9503	<59.2064	73668.8	117000	127300.2	48.3	<262.5983	155.6	301.6	6.8	7728.3
MX12AB076-13	207.3	H	168.2	2.5	<45.8474	69678.0	116000	123474.2	42.7	<280.0851	85.1	149.6	7.9	7358.6
MX12AB076-14	207.3	H	140.7	<1.5084	<46.211	70464.7	113000	105253.9	45.0	<248.5379	124.9	175.4	5.8	7114.9
MX12AB078-1	375.8	H	165.2	1.59176	<56.2536	61326.752	116000	126625.311	43.3854	347.3257	147.716799	251.718641	6.2868893	9058.102
MX12AB078-2	375.8	H	171.146	1.98233	<69.0842	55984.176	113000	122789.477	34.9109	559.9533	139.025708	204.341983	4.5826778	8685.742
MX12AB078-3	375.8	H	115.483	2.09997	<68.9052	61294.324	115000	129912.324	35.425	<350.155	223.871192	302.170255	7.2759365	8963.796
MX12AB078-4	375.8	H	130.837	6.6014	<86.9388	59421.55	113000	276500.697	54.7306	<447.9761	161.276206	282.744295	<2.7089	9110.707
MX12AB078-5	375.8	H	165.505	<2.6299	<52.381	63589.407	117000	119499.817	51.6536	<268.8154	133.353724	235.398928	7.465949	8922.717
MX12AB078-6	375.8	H	149.81	2.06394	<42.5385	57550.55	112000	121742.944	54.9333	<294.1259	153.688548	221.696266	10.533914	7799.687
MX12AB078-7	375.8	H	209.149	15.4293	<181.9205	60295.697	118000	157016.007	287.902	<805.0016	2102.4983	364.549973	<6.7541	7295.493
MX12AB078-8	375.8	H	135.392	1.36396	<40.7172	59562.125	112000	120263.899	77.0262	<329.7883	268.525502	256.515502	8.2215551	9219.126
MX12AB078-9	375.8	H	138.995	2.48262	<48.1392	59686.436	114000	123783.192	40.1522	<379.4179	138.200283	268.68117	7.0755096	9300.444
MX12AB078-10	375.8	H	157.321	3.07352	<65.9969	66092.57	119000	120719.432	35.016	<299.5975	158.714629	304.927898	7.2974334	10037.22

Sample	Distance (m)	Type	Li7	B11	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	V51	Cr53	Mn55
MX12AB079-1	498.2	H	214.55	5.34133	<118.0778	66033.932	121000	129085.983	<17.7367	<332.6026	204.08625	365.635718	5.9933186	7642.027
MX12AB079-2	498.2	H	205.085	4.9842	<100.2196	62347.705	116000	119352.785	<17.0102	<405.342	108.523347	386.509919	10.729675	6556.901
MX12AB079-3	498.2	H	204.041	3.12589	<75.7486	65307.973	117000	129968.882	21.2545	<347.4476	160.096048	363.180399	6.2642507	6469.791
MX12AB079-4	498.2	H	189.919	5.31082	<110.1289	61789.989	115000	130269.719	51.4633	<396.7898	299.717834	402.708284	5.4029832	8167.265
MX12AB079-5	498.2	H	195.93	4.62173	<95.7045	64921.64	115000	125649.545	71.7714	<217.9843	254.021963	418.104291	4.9828299	8392.103
MX12AB079-6	498.2	H	186.603	3.06407	<128.8455	63537.084	113000	126184.576	<26.4326	416.6136	283.878818	480.804205	10.452114	6330.206
MX12AB079-7	498.2	H	195.271	2.69213	<176.3099	64961.314	117000	137996.581	<32.1899	<498.6263	200.391621	427.048579	5.5389757	7796.623
MX12AB079-8	498.2	H	177.45	2.20241	<101.9972	61733.578	119000	113072.778	44.2899	<414.0869	248.136924	415.711425	7.6339471	9140.031
MX12AB079-9	498.2	H	166.945	2.57766	<92.5729	58354.524	112000	107851.422	72.1008	964.9982	1283.81296	373.358013	8.0390694	8589.093
MX12AB079-10	498.2	H	199.63	2.30489	<157.6578	61222.97	112000	138989.631	<33.2495	<609.9477	384.266566	511.6646	14.465507	8052.316
MX12AB079-11	498.2	H	214.552	6.69674	<107.4509	67042.762	118000	138871.219	<25.6518	<314.6332	102.45031	305.92326	4.3086084	8085.188
MX12AB079-12	498.2	H	226.249	2.887	<116.414	64286.085	116000	129832.032	<27.2569	<379.5498	118.756234	351.282186	12.842564	8191.899
MX12AB079-13	498.2	H	239.307	5.38003	<121.2946	68370.418	123000	123522.659	<23.6944	299.8354	97.2084178	460.574468	18.51334	6470.311
MX12AB081-1	748.5	H	216.606	<2.9953	<99.2585	85008.276	110000	120271.731	<23.3973	<418.4956	116.27604	266.225017	9.9066727	7063.837
MX12AB081-2	748.5	H	194.628	1.78265	<79.7968	86086.835	110000	107636.266	<16.5378	<273.3866	164.33169	328.742701	16.001988	7365.616
MX12AB081-3	748.5	H	223.731	<4.0674	<149.5784	81862.98	110000	141216.916	48.4072	<550.5304	124.387911	347.598309	4.3794044	7582.325
MX12AB081-4	748.5	H	232.813	3.41181	<94.2641	77888.274	110000	120066.764	47.6491	<337.8054	105.499636	286.152974	14.800563	7632.959
MX12AB081-5	748.5	H	230.969	<2.3968	<91.4792	79534.049	110000	122228.788	95.3798	354.1629	108.071535	312.706823	9.753481	7496.792
MX12AB081-6	748.5	H	0.56522	7.19637	<82.1958	167.13428	110000	150706.615	85.8023	131967.3	653.107131	523.895726	3.5082861	1263.596
MX12AB081-7	748.5	H	230.07	2.05295	<123.6737	73629.087	110000	128631.584	129.997	<340.5538	277.34347	127.718896	<3.0701	8040.448
MX12AB082-1	254.4	H	144.213	2.48725	<87.4077	93941.777	95000	104790.168	193.839	<223.8054	119.149669	538.434826	247.61724	4729.229
MX12AB082-2	254.4	H	139.096	2.37407	<72.0229	95769.785	95000	106075.357	207.389	<268.3883	118.588437	573.626645	307.7376	4848.004
MX12AB083-1	399.6	H	158.474	3.9319	<141.9475	61019.473	109000	125664.63	160.658	613.2993	378.302978	295.974867	4.3498897	5125.376
MX12AB083-2	399.6	H	164.379	5.99876	<171.8063	59261.444	107000	126793.176	197.046	4468.006	2679.57434	323.697042	7.2562632	4952.944
MX12AB083-3	399.6	H	207.567	14.3744	<171.7044	63224.116	111000	154949.664	724.872	25364.58	22339.5489	390.617589	7.1696431	4029.992
MX12AB083-4	399.6	H	155.661	<2.154	<106.4624	60901.193	113000	116363.298	29.3491	<425.3822	129.547255	283.049058	5.9389942	5689.485
MX12AB083-5	399.6	H	164.747	1.87627	<93.7396	60927.125	113000	112322.155	<16.2026	<301.7693	136.512102	274.727747	6.2074589	5945.276
MX12AB083-6	399.6	H	187.193	4.03946	<94.8518	64119.765	113000	124931.355	60.5682	2231.356	9022.92307	376.112773	8.3259446	4648.368
MX12AB083-7	399.6	H	204.991	6.44483	<232.5765	61036.285	113000	142068.381	234.107	<782.9865	176.117099	252.600671	4.1417568	5728.226
MX12AB083-8	399.6	H	166.696	2.38153	<86.0843	60666.306	113000	110623.333	15.5174	<304.6434	146.097099	350.236687	7.4511323	4807.058

Sample	Distance (m)	Type	Li7	B11	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	V51	Cr53	Mn55
MX12AB083-9	399.6	H	167.697	1.84088	<103.9687	57379.616	115000	97097.9882	20.2258	<218.7339	292.422564	201.103708	7.5529682	5811.186
MX12AB083-10	399.6	H	181.343	3.74621	<151.8273	62043.146	115000	139082.128	25.8322	763.1838	135.489735	287.479128	5.7215196	5755.845
MX12AB083-11	399.6	H	157.937	3.56721	<84.5074	62122.721	115000	113937.286	28.4987	<333.4427	105.357436	253.357703	6.3660715	5508.312
MX12AB084-1	401.0	H	183.247	1.75619	<83.0063	66458.282	119000	124490.12	61.4882	<375.5373	300.723381	306.245471	<2.7256	6764.4
MX12AB084-2	401.0	H	150.139	2.50927	<101.6457	71407.032	118000	129460.712	68.5304	1648.349	1403.88119	242.597122	8.1446995	6504.757
MX12AB084-3	401.0	H	164.825	<2.6985	<101.5461	69423.305	118000	128159.162	72.6734	431.3752	362.365581	201.875621	8.6993983	6932.619
MX12AB084-4	401.0	H	176.217	1.61803	<128.6108	67572.373	118000	127830.587	23.3133	<283.1146	160.047432	218.81564	<2.6222	6663.139
MX12AB084-5	401.0	H	181.458	3.03066	<105.827	68016.737	118000	125700.624	47.2417	<405.7661	140.234658	205.441981	<3.2644	6463.631
MX12AB085-1	400.4	H	3.6615	11.4077	<86.4673	936.72803	113000	154885.368	1024.88	138137.9	11588.1943	288.871302	4.8096481	2550.128
MX12AB085-2	400.4	H	176.979	<5.0772	<199.7426	69918.133	111000	326343.801	30.3329	<516.2589	318.408251	345.103697	11.720534	5819.281
MX12AB085-3	400.4	H	175.267	5.28791	<78.3533	66462.185	115000	119039.658	31.3729	<255.5949	225.723616	207.079409	3.537868	6434.575
MX12AB085-4	400.4	H	158.712	3.57606	<77.8359	66484.06	115000	108636.725	27.7283	<270.899	233.851262	226.968808	5.0355643	6223.911
MX12AB085-5	400.4	H	139.195	2.61939	<156.5967	70497.829	115000	144620.506	<38.5191	1447.061	320.824558	296.338772	7.3461977	6642.755
MX12AB085-6	400.4	H	185.849	2.02027	<87.4609	69818.322	114000	121079.745	53.9347	<397.9583	182.121879	221.552678	7.099981	6259.653
MX12AB085-7	400.4	H	190.043	<4.573	<264.1842	70224.404	114000	153593.054	70.0772	<930.7818	457.589983	225.567357	<7.3161	6878.088
MX12AB085-8	400.4	H	195.779	<3.2548	<121.081	68327.504	115000	131618.545	72.0603	<466.1788	255.156641	254.485014	8.9940655	6623.712
MX12AB085-9	400.4	H	178.49	<3.0937	<73.3673	66134.853	108000	115065.342	58.8288	<346.4736	172.087337	242.064463	4.2608964	6163.132
MX12AB087-1	244.7	H	177.807	4.78818	<123.0982	61639.855	116000	133858.826	245.253	3639.442	167.814214	277.578095	7.1090843	8841.202
MX12AB087-2	244.7	H	166.762	<2.9227	<107.0302	61072.673	116000	111906.548	210.519	737.3111	539.105324	218.726226	4.0216216	8915.558
MX12AB087-3	244.7	H	169.926	<4.4723	<117.6869	61571.842	115000	114167.975	81.9467	<464.6094	271.955821	260.140613	2.9316613	9055.389
MX12AB087-4	244.7	H	203.22	3.72861	<109.4024	62810.143	114000	123435.898	95.8417	<398.5899	443.676121	218.163973	12.472464	9652.986
MX12AB087-5	244.7	H	202.177	2.94194	<85.4149	63321.644	111000	110020.749	156.042	<272.6718	466.40836	157.235954	5.0339811	9225.653
MX12AB087-6	244.7	H	167.572	<2.9073	<98.4608	64323.012	113000	125211.392	54.3047	<437.7601	287.468683	274.938025	4.7524576	9438.259
MX12AB087-7	244.7	H	200.882	<4.7406	<195.4684	65683.581	116000	139871.359	38.0399	<550.818	420.180884	291.038925	10.733393	10396.47
MX12AB087-8	244.7	H	177.328	1.48972	<106.9845	63267.713	114000	124072.366	49.5104	<335.8881	251.889473	239.68324	5.5086133	9500.605
MX12AB087-9	244.7	H	168.313	2.77633	<130.3884	66786.079	114000	126131.536	53.2341	<355.0084	214.708603	264.115777	12.432238	9508.684
MX12AB087-10	244.7	H	169.884	1.68144	<89.7158	67185.85	115000	126688.402	41.1251	329.935	120.800586	296.285646	5.0168603	9161.266
MX12AB088-1	246.8	H	155.163	3.31833	<162.5519	52374.321	113000	157218.921	56.1257	46259.51	40218.1658	301.847164	3.875052	6924.691
MX12AB088-2	246.8	H	133.502	5.07236	<66.8577	56486.588	114000	113128.771	56.8717	466.8061	648.361172	241.248549	5.6828895	7141.482
MX12AB088-3	246.8	H	155.639	2.27212	<88.5628	54595.428	114000	117434.348	55.9149	250.6529	271.244903	226.629477	2.3251209	7303.91

Sample	Distance (m)	Type	Li7	B11	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	V51	Cr53	Mn55
MX12AB088-4	246.8	H	203.5	1.62134	<102.1037	55299.693	114000	122928.812	17.8854	<258.7849	164.441865	265.420166	4.4513	7595.119
MX12AB088-5	246.8	H	219.248	2.8547	<138.0761	58848.994	114000	143453.319	189.291	673.7525	230.667797	300.024102	4.5490109	7752.748
MX12AB088-6	246.8	H	216.438	5.28928	146.977	57328.863	114000	131156.581	201.941	<342.7834	242.013871	281.958246	10.910078	7335.569
MX12AB089-1	189.6	H	249.905	3.74442	<108.8247	95980.286	122000	133531.004	49.4977	<274.3789	357.397942	274.887764	3.7707377	7222.764
MX12AB089-2	189.6	H	249.595	3.06996	<91.0084	91913.858	120000	134266.681	65.739	<429.035	397.435938	287.233333	4.4765388	7296.134
MX12AB089-3	189.6	H	262.821	2.62753	<82.3624	102344.3	120000	121316.692	82.7055	<381.0683	272.153092	277.799863	8.7704712	7242.224
MX12AB089-4	189.6	H	243.282	2.57162	<127.3903	96322.742	119000	123373.042	328.72	1197.046	514.943472	272.661789	8.74523	7161.465
MX12AB089-5	189.6	H	257.287	5.44339	<196.8709	103845.28	136000	170952.862	93.0205	<1253.5516	1668.82891	434.324504	6.6407363	9353.157
MX12AB089-6	189.6	H	216.342	3.12442	<102.662	92377.862	125000	134864.031	60.3369	716.1872	747.828383	400.029722	9.5246592	8349.662
MX12AB092-1	283.7	H	280.369	4.71781	<138.2012	93205.439	120000	143460.602	39.374	375.7333	419.928714	138.398348	46.851316	4107.833
MX12AB092-2	283.7	H	239.77	4.74127	<94.6172	92142.634	115000	138746.962	73.8845	<379.4509	397.983806	139.778969	9.482677	3901.947
MX12AB092-3	283.7	H	275.412	<3.4741	<107.1317	92819.516	120000	140355.473	58.3705	875.6575	441.530942	128.779141	35.346248	3960.708
MX12AB092-4	283.7	H	234.925	<2.5346	105.4605	106982.51	118000	121704.385	55.639	<276.926	252.035226	849.196131	514.57237	4170.223
MX12AB092-5	283.7	H	294.774	<3.3133	<127.5352	89974.783	117000	134108.971	60.7943	<478.3559	421.227238	125.778156	84.943505	4344.84
MX12AB093-1	74.3	H	164.796	3.60366	<137.4564	63571.546	115000	136209.451	108.986	<568.2437	617.078015	323.64982	7.2860494	6020.85
MX12AB093-2	74.3	H	176.658	<3.4006	<89.3949	58401.858	113000	124919.997	51.1872	394.3928	280.373801	296.83448	5.6903299	7304.331
MX12AB093-3	74.3	H	143.877	<2.3534	<93.6241	58577.076	111000	104190.956	40.0024	<324.6471	292.742854	284.169634	5.5869209	7124.677
MX12AB093-4	74.3	H	230.846	<4.1418	<114.2075	55222.372	114000	116312.582	40.322	<458.2134	270.635994	279.135734	14.141826	5830.007
MX12AB093-5	74.3	H	226.222	1.97158	<89.9647	67032.496	118000	220446.732	<24.9849	381.4977	457.991827	257.160559	355.41821	5731.177
MX12AB093-6	74.3	H	188.601	<1.989	<84.8117	62688.08	117000	113925.399	13.8194	<307.6939	211.799498	267.657889	5.2109884	6409.263
MX12AB094-1	246.9	H	172.603	<2.9742	<103.7373	73767.837	114000	129222.557	37.0956	<340.97	93.0136094	400.744424	8.6748209	5408.523
MX12AB094-2	246.9	H	157.318	2.02027	<73.1653	73291.038	110000	124162.696	61.8543	<246.0568	128.185125	464.241724	9.4838683	4939.545
MX12AB094-3	246.9	H	166.161	1.54601	<81.5306	75657.599	110000	116440	30.4522	<298.1701	108.639276	444.514072	5.282423	5376.599
MX12AB094-4	246.9	H	0.88697	<3.2059	209.3416	5182.6041	110000	188868.858	<18.6718	111805.4	4054.68786	305.271212	15.348403	5372.165
MX12AB094-5	246.9	H	153.168	<2.7866	<99.6543	73571.281	110000	123502.961	48.8718	<291.6686	178.721857	491.715851	3.9252981	4983.828
MX12AB094-6	246.9	H	162.429	3.15078	<86.8831	75139.466	110000	113975.121	45.554	567.2917	180.736831	476.002989	5.5625595	5289.417
MX12AB094-7	246.9	H	150.305	1.36334	<102.4795	72532.006	110000	123422.914	22.5428	<417.7428	206.380644	456.565954	4.5939874	4976.224
MX12AB096	120.9	H	199.926	3.17698	<83.9166	64004.898	110000	117001.57	62.5208	<410.3841	294.404217	325.071672	3.7174533	6596.304
MX12AB096	120.9	H	221.01	4.42531	<85.2196	62028.731	110000	114950.768	71.8636	<333.7093	299.890524	312.526266	7.2616897	6367.051
MX12AB096	120.9	H	237.027	7.16968	<88.1893	62163.586	110000	115769.616	38.2783	<413.3382	289.648688	366.505154	7.5260372	7010.775

Sample	Distance (m)	Type	Li7	B11	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	V51	Cr53	Mn55
MX12AB096	120.9	H	235.055	3.97718	<73.8075	61916.404	110000	115635.498	73.7135	<391.6701	291.412846	355.574546	5.2009463	6910.434
MX12AB096	120.9	H	252.522	9.05036	<100.5308	61489.018	110000	120141.651	31.535	<341.9238	183.971418	356.875461	26.747562	6477.718
MX12AB096	120.9	H	180.886	2.83785	<122.7506	64249.928	110000	120918.497	61.3827	953.6344	562.980927	286.677737	3.7954416	6395.526

Sample	Distance (m)	Type	Co59	Ni60	Cu65	Zn66	As75	Sr88	Y89	Zr90	Ag107	Sn118	Sb121	Ba137
MX12AB002(1)-1	5352.9	H	41.3	207.2	<1.0269	1681.8	0.9	1.3	0.4	<0.10047	<0.20987	<0.11801	<0.11552	4.9
MX12AB002(1)-2	5352.9	H	36.5	168.9	<1.4725	1326.3	<0.80909	0.9	0.1	<0.13034	<0.19978	0.1	<0.11568	1.5
MX12AB002(1)-3	5352.9	H	44.7	223.9	<1.8488	1836.0	<1.2797	1.4	0.1	<0.21215	<0.44337	<0.22864	<0.21223	27.3
MX12AB002(1)-4	5352.9	H	46.2	233.5	<1.2566	1628.1	1.1	1.2	0.3	0.1	<0.20928	<0.094998	<0.089003	1.6
MX12AB002(1)-5	5352.9	H	46.8	224.9	<0.92275	1630.5	2.9	1.5	0.3	0.1	<0.15506	0.1	0.1	2.5
MX12AB003-1	628.4	H	0.4	<1.5034	<1.5473	28.7	<0.91447	3.1	189.2	57.5	<0.2893	409.1	0.5	2.0
MX12AB003-2	628.4	H	1.4	<0.87101	<1.4704	264.0	<0.68738	4.1	12.5	3.2	<0.22448	20.4	0.6	1.4
MX12AB003-3	628.4	H	0.4	<1.1991	<1.419	41.1	<0.90857	2.5	50.6	24.8	<0.27207	287.3	0.7	1.5
MX12AB008-1	585.0	H	9.7	39.2	<1.1803	317.2	<0.50123	50.6	<0.057006	<0.10899	<0.17889	0.1	<0.11787	5.9
MX12AB009-1	359.9	H	10.0	1.4	<1.5689	589.6	<0.83008	23.8	0.2	0.3	<0.25311	<0.23615	<0.10512	711.0
MX12AB009-2	359.9	H	9.3	1.8	<1.6214	808.3	<0.83227	0.4	<0.054895	<0.11188	<0.27885	<0.1591	<0.10767	1.6
MX12AB009-3	359.9	H	7.7	<0.9778	<1.1655	545.0	<0.76627	0.4	0.2	<0.092838	<0.2054	<0.15068	<0.12643	0.4
MX12AB009-4	359.9	H	7.8	1.8	<0.62362	714.6	<0.39626	0.3	<0.039957	<0.09655	<0.13848	0.1	<0.08306	0.2
MX12AB009-5	359.9	H	6.4	1.2	<0.9101	467.5	<0.71561	0.8	0.1	<0.071918	<0.19108	<0.11651	<0.096273	0.6
MX12AB009-6	359.9	H	7.5	1.8	<0.75617	391.8	0.5	0.7	0.2	<0.10127	<0.15862	<0.084989	<0.088263	1.3
MX12AB009-7	359.9	H	8.4	1.0	<0.9977	503.9	<0.64425	0.4	0.1	<0.11504	<0.19967	<0.097439	<0.078425	0.7
MX12AB009-8	359.9	H	8.0	1.1	<0.93545	469.5	<0.4827	0.7	0.4	0.5	<0.24093	<0.14321	<0.086578	0.3
MX12AB010-1	446.4	H	23.4	57.9	9.8	450.5	<1.3595	1.2	0.8	<0.18725	<0.44134	0.4	<0.22604	5.8
MX12AB010-2	446.4	H	10.8	75.4	65.1	476.4	0.4	3.1	0.5	<0.075571	<0.14318	0.2	<0.072713	11.5
MX12AB010-3	446.4	H	31.4	53.4	4.0	289.5	<0.59221	0.7	0.3	<0.060838	<0.15663	<0.08164	<0.087557	2.1
MX12AB010-4	446.4	H	22.4	68.8	7.8	312.9	<0.5075	0.7	1.0	<0.14367	<0.14996	<0.097992	<0.098653	3.8

Sample	Distance (m)	Type	Co59	Ni60	Cu65	Zn66	As75	Sr88	Y89	Zr90	Ag107	Sn118	Sb121	Ba137
MX12AB010-5	446.4	H	20.7	61.1	5.1	282.1	<0.37358	0.4	0.7	<0.083085	<0.1251	0.1	<0.089811	3.1
MX12AB010-6	446.4	H	24.8	70.8	6.5	328.2	0.3	0.5	0.9	<0.068314	<0.13946	0.1	<0.094791	1.9
MX12AB010-7	446.4	H	39.3	140.2	3.7	479.5	<0.36411	0.5	0.4	<0.12396	<0.14343	0.1	<0.069076	2.9
MX12AB010-8	446.4	H	37.0	78.0	7.7	375.4	0.3	0.5	0.6	<0.071941	<0.13743	0.2	<0.080493	4.7
MX12AB010-9	446.4	H	34.6	124.8	4.7	404.2	0.3	0.5	0.2	<0.0878	<0.14189	<0.13299	<0.095588	3.3
MX12AB011-1	733.9	H	30.0	26.2	<0.7686	787.3	0.4	0.2	<0.054216	0.1	<0.16283	0.1	<0.09391	<0.36216
MX12AB011-2	733.9	H	26.4	17.9	<1.2046	786.3	0.4	0.3	<0.046942	<0.062947	<0.18464	<0.14483	<0.083664	0.3
MX12AB011-3	733.9	H	20.1	16.8	<0.67159	640.3	<0.42143	0.2	0.0	0.1	<0.14536	<0.089858	<0.067159	<0.18829
MX12AB011-4	733.9	H	18.5	11.6	1.1	699.7	<0.56228	0.2	<0.026475	0.1	<0.16701	0.1	<0.078846	<0.26415
MX12AB011-5	733.9	H	16.6	23.8	1.1	687.6	2.2	0.4	0.1	0.3	<0.14314	0.2	0.1	0.2
MX12AB013-1	1201.2	H	54.6	117.5	<1.5158	822.8	<0.95819	0.7	<0.071696	<0.10362	<0.22937	<0.22585	0.3	4.0
MX12AB013-2	1201.2	H	54.6	115.6	<0.94054	623.6	<0.47329	0.6	0.1	<0.073213	<0.13184	0.1	0.3	0.5
MX12AB013-3	1101.3	H	61.6	127.9	<1.1438	791.0	<0.76551	1.1	<0.075332	<0.21378	<0.18874	0.1	0.9	1.1
MX12AB013-4	1201.2	H	68.7	61.8	<1.156	746.6	<0.5509	0.5	<0.059091	0.1	<0.162	0.2	0.2	2.8
MX12AB014-1	1101.2	H	2.7	4.6	0.8	296.8	0.3	0.7	0.6	0.1	<0.13419	<0.11069	<0.12285	0.8
MX12AB014-2	1101.2	H	2.4	5.5	1.4	393.5	<1.2427	0.7	0.4	<0.10181	<0.23488	0.1	<0.19304	0.4
MX12AB014-3	1101.2	H	4.9	1.4	<1.2654	503.3	<0.68477	1.2	0.3	0.1	<0.26339	0.2	<0.16963	2.3
MX12AB014-4	1101.2	H	4.6	2.2	<2.2579	592.8	<1.1769	1.2	0.7	<0.36961	<0.39124	<0.28173	<0.29169	1.5
MX12AB014-5	1101.2	H	6.1	3.3	<1.0995	508.0	<0.57872	0.9	0.3	<0.093902	<0.13148	<0.078172	<0.080446	1.3
MX12AB014-6	1101.2	H	9.0	15.5	<0.9832	844.4	<0.42995	0.2	<0.051168	<0.082448	<0.15629	<0.11936	<0.082403	<0.22127
MX12AB014-7	1101.2	H	4.2	0.9	<1.2242	578.5	<0.60336	0.5	0.2	<0.11606	<0.14963	<0.10813	<0.099552	0.6
MX12AB014-8	1101.2	H	8.1	4.7	<0.83152	478.4	<0.51573	1.0	0.5	0.1	<0.13451	<0.080429	<0.073231	0.8
MX12AB014-9	1101.2	H	5.3	2.7	<0.95344	484.5	<0.4364	0.7	0.2	<0.12227	<0.13783	<0.099323	<0.065113	0.9
MX12AB014-10	1101.2	H	10.5	6.5	<1.686	838.6	<1.1165	0.6	0.1	<0.25475	<0.28538	0.2	<0.19237	<0.54044
MX12AB016-1	902.0	H	8.6	18.5	0.7	457.1	<0.53093	2.0	0.4	<0.10301	<0.16004	<0.10541	<0.084768	1.5
MX12AB016-2	902.0	H	7.6	10.0	<0.80967	611.2	<0.48867	0.9	0.3	0.1	<0.13004	0.1	<0.080837	0.3
MX12AB016-3	902.0	H	7.4	7.3	<1.0494	722.0	<0.49102	0.9	0.2	<0.097462	<0.14857	<0.14148	<0.074545	0.5
MX12AB017-1	802.5	H	5.9	3.2	1.4	813.9	<0.41228	1.3	0.2	<0.087465	<0.10334	<0.092608	<0.077237	0.4
MX12AB017-2	802.5	H	6.4	3.8	<0.93281	561.1	<0.34594	1.2	0.2	0.1	<0.12561	0.1	<0.076184	0.2
MX12AB017-3	802.5	H	8.7	5.7	2.1	520.6	<0.55872	1.9	0.5	0.1	<0.15963	0.2	<0.087973	0.4

Sample	Distance (m)	Type	Co59	Ni60	Cu65	Zn66	As75	Sr88	Y89	Zr90	Ag107	Sn118	Sb121	Ba137
MX12AB017-4	802.5	H	8.3	23.4	1.1	412.5	0.2	1.8	0.3	0.1	<0.16362	<0.10791	<0.096494	<0.24549
MX12AB018-1	703.4	H	38.2	119.2	<1.1233	606.6	<0.55904	2.2	0.1	<0.087387	<0.17441	<0.10071	<0.10292	0.6
MX12AB018-2	703.4	H	39.7	119.3	1.0	557.3	<0.41714	1.4	0.1	<0.10438	<0.1099	0.1	<0.11677	1.8
MX12AB018-3	703.4	H	41.1	52.1	3.3	639.3	<0.44834	2.8	0.1	<0.09487	<0.10932	0.3	<0.093347	0.4
MX12AB018-4	703.4	H	42.3	52.6	2.6	692.4	<0.46736	2.1	0.1	<0.098648	<0.14779	0.1	<0.08582	0.3
MX12AB018-5	703.4	H	39.7	95.7	2.1	632.4	<0.704	3.5	0.3	<0.07535	<0.13885	0.1	<0.14698	0.5
MX12AB018-6	703.4	H	40.1	106.6	1.5	606.9	0.3	4.8	0.3	<0.094248	<0.13145	0.1	<0.095551	0.7
MX12AB022-1	2824.7	H	124.7	868.2	11.9	334.4	<0.50262	0.2	<0.055246	<0.07968	<0.17402	<0.077096	<0.0814	2.5
MX12AB022-2	2824.7	H	122.6	829.7	8.8	333.1	<0.52436	0.3	<0.034178	<0.12814	<0.1134	<0.11665	<0.094331	3.5
MX12AB022-3	2824.7	H	129.6	886.8	8.9	344.8	<0.53098	0.2	<0.031771	<0.065971	<0.15214	<0.12065	<0.07388	1.8
MX12AB024-1	481.9	H	23.3	66.9	<2.7473	933.3	<1.7747	1.4	0.3	2.4	<0.39663	<0.34777	0.4	3.0
MX12AB024-2	441.8	H	23.7	58.6	<1.1956	826.1	1.2	1.3	0.2	1.4	<0.10605	<0.11655	<0.11749	1.5
MX12AB027-1	425.4	H	10.6	2.5	<1.4872	678.9	<0.46495	8.4	1.8	3.4	<0.17064	2.4	<0.10027	8.8
MX12AB027-2	451.6	H	8.5	<0.82208	<0.9604	635.7	<0.56443	2.4	0.1	<0.077238	<0.095023	<0.10188	<0.083619	4.7
MX12AB027-3	497.0	H	9.1	2.0	<0.86348	450.8	<0.56571	2.4	0.1	<0.092093	<0.1168	<0.072183	<0.069452	2.3
MX12AB027-4	556.8	H	9.2	1.6	<0.96395	744.2	<0.38914	1.4	<0.039346	<0.092978	<0.070966	<0.077567	<0.125	5.4
MX12AB027-5	626.9	H	8.7	1.0	<0.94459	584.0	0.4	1.8	<0.028955	<0.053791	<0.089127	0.1	<0.068391	30.3
MX12AB027-6	704.3	H	8.4	1.0	<1.2121	645.5	<0.68996	1.6	0.5	2.9	<0.21309	<0.17185	<0.11907	2.2
MX12AB027-7	786.8	H	10.1	1.3	0.8	699.3	<0.41964	1.4	<0.046283	<0.090668	<0.082252	<0.09833	<0.081772	2.4
MX12AB027-8	872.9	H	9.0	1.3	<0.96974	661.6	<0.47099	2.0	0.0	<0.081915	<0.088721	<0.11602	<0.090558	1.2
MX12AB027-9	961.8	H	8.2	<0.66281	<0.95113	688.3	0.4	1.1	0.1	0.3	<0.093336	0.1	<0.069186	0.5
MX12AB027-10	1052.6	H	8.7	1.6	<0.80347	574.2	<0.50248	0.7	0.0	<0.050046	<0.09548	<0.093856	<0.077344	0.6
MX12AB027-11	1145.0	H	13.8	2.3	<1.1369	549.7	<0.50409	2.2	0.3	<0.095088	<0.13626	0.2	<0.06449	32.0
MX12AB027-12	1238.5	H	10.9	2.0	<0.78502	659.0	<0.56008	2.1	0.0	<0.075808	<0.08418	<0.076566	<0.086081	7.4
MX12AB027-13	1333.0	H	9.2	2.0	<1.8418	776.2	<1.7012	3.2	1.3	1.0	<0.23755	6.0	<0.19289	3.6
MX12AB027-14	1428.3	H	13.2	<4.1057	3.3	956.4	<1.7328	2.7	0.2	1.7	<0.38295	<0.38263	<0.32029	4.3
MX12AB027-15	1524.1	H	8.2	<0.92082	1.7	612.3	<0.4754	2.2	0.0	<0.057611	<0.10513	0.1	<0.094319	6.6
MX12AB027-16	1620.5	H	9.1	3.4	<2.4032	930.6	<1.7482	2.1	<0.12882	<0.23301	<0.30639	<0.19502	<0.28231	1.3
MX12AB028-1	481.4	H	8.3	1.0	1.6	660.8	<0.58965	4.1	<0.043759	<0.067985	<0.12214	0.1	<0.11811	5.3
MX12AB028-2	481.4	H	5.4	<0.74522	2.0	481.7	<0.44039	2.8	0.3	1.9	<0.085034	0.1	<0.071652	5.3

Sample	Distance (m)	Type	Co59	Ni60	Cu65	Zn66	As75	Sr88	Y89	Zr90	Ag107	Sn118	Sb121	Ba137
MX12AB028-3	481.4	H	7.8	<0.62647	<1.3521	734.0	<0.42767	1.3	0.1	0.6	<0.13534	<0.19462	<0.13088	2.0
MX12AB028-4	481.4	H	9.0	<3.3831	<2.8815	834.9	<1.5112	2.5	0.2	9.3	<0.37553	0.2	0.2	3.1
MX12AB028-5	481.4	H	7.6	<1.2119	<1.1136	849.7	<0.51527	1.0	0.1	0.5	<0.10883	<0.13207	<0.093349	<0.28192
MX12AB028-6	481.4	H	11.7	1.0	<1.0507	734.6	0.5	9.6	0.3	0.3	<0.12215	0.4	<0.1255	4.7
MX12AB028-7	481.4	H	8.1	<0.58421	1.1	606.7	<0.4423	2.6	0.1	0.2	<0.098687	<0.088024	<0.07155	0.7
MX12AB028-8	481.4	H	7.5	<0.61358	<1.0444	692.3	<0.40157	1.8	0.1	<0.096186	<0.12633	<0.090996	<0.074419	<0.3211
MX12AB029-1	481.4	H	24.5	14.5	<1.3711	531.4	1.2	4.3	0.2	<0.076945	<0.17568	<0.12447	0.6	0.3
MX12AB029-2	481.4	H	3.9	5.4	<3.0982	191.9	<1.92	29.4	68.9	251.6	<0.30317	230.2	0.7	0.8
MX12AB029-3	481.4	H	10.6	8.4	<0.81126	646.1	<0.40267	4.6	<0.032027	<0.096223	<0.096863	<0.087792	<0.079768	1.4
MX12AB029-4	481.4	H	13.6	8.1	<1.4917	899.1	<0.64849	1.9	<0.054476	<0.1694	<0.15908	<0.16755	<0.10912	<0.30619
MX12AB029-5	481.4	H	10.5	6.1	0.7	577.8	<0.467	2.0	0.1	0.6	<0.11535	0.1	<0.07173	0.2
MX12AB029-6	481.4	H	9.9	6.2	<0.81971	624.8	<0.44233	2.7	<0.031899	<0.081105	<0.10936	<0.10402	<0.049885	<0.18682
MX12AB029-7	481.4	H	8.6	8.2	1.4	535.9	<0.54054	6.5	<0.04743	0.2	<0.078865	0.1	<0.078431	0.3
MX12AB029-8	481.4	H	10.3	9.6	<0.90547	514.2	<0.35839	5.2	<0.047575	<0.08259	<0.072466	<0.1102	<0.078126	2.2
MX12AB029-9	481.4	H	10.5	11.3	<0.93595	639.0	<0.84504	3.1	<0.050759	<0.10017	<0.094205	<0.11978	<0.12424	0.7
MX12AB030-1	441.3	H	7.0	1.3	<1.1406	5.4	<1.0347	114.7	0.9	0.6	<0.18836	<0.16985	<0.20318	3.6
MX12AB030-2	441.3	H	15.1	3.8	26.4	4.3	<0.76356	567.2	1.1	0.2	<0.21899	7.7	<0.14676	22.6
MX12AB033-1	134.0	H	15.1	1.9	<1.2585	626.6	0.6	12.6	0.1	<0.065305	<0.13175	0.2	<0.10645	26.1
MX12AB033-2	134.0	H	19.2	2.2	<0.91893	866.3	<0.49528	1.9	<0.044953	<0.087277	<0.11808	<0.14739	<0.099948	1.2
MX12AB033-3	134.0	H	11.2	1.5	<0.70671	626.4	<0.41306	2.7	0.0	<0.057696	<0.078247	<0.081357	<0.078843	1.7
MX12AB033-4	134.0	H	16.3	1.0	2.2	541.8	<0.52789	6.2	0.1	0.1	<0.12131	0.1	<0.13273	4.0
MX12AB033-5	134.0	H	15.7	1.3	0.9	836.8	<0.56638	4.0	<0.046674	<0.086717	<0.098702	<0.14913	<0.072252	2.8
MX12AB033-6	134.0	H	16.6	1.5	<1.4233	787.0	<0.57401	5.3	<0.02745	0.1	<0.16927	<0.15038	<0.11585	31.3
MX12AB034-1	147.2	H	12.6	1.8	<0.87774	634.4	<0.39992	2.9	0.8	5.0	<0.13629	<0.11739	<0.096757	6.9
MX12AB034-2	147.2	H	800.1	<779.926	<987.47	23887.5	<438.1087	1085821.8	13842.8	56.1	<123.5577	<99.943	<57.448	8927.5
MX12AB035-1	158.3	H	32.6	84.3	<0.64711	779.5	<0.24575	0.5	<0.037062	<0.067796	<0.11595	0.1	<0.086504	0.2
MX12AB035-2	158.3	H	31.2	122.0	4.6	978.7	<1.3084	3.3	0.1	0.3	<0.29744	<0.21748	<0.30278	13.9
MX12AB035-3	158.3	H	26.8	76.4	1.3	744.2	<0.36644	2.0	0.1	0.1	<0.075523	<0.076488	<0.092405	2.0
MX12AB035-4	158.3	H	28.5	94.0	<1.2796	902.7	1.0	2.8	0.3	0.3	<0.10638	<0.10189	<0.13789	1.7
MX12AB035-5	158.3	H	29.2	129.0	<0.97529	637.8	0.5	1.3	0.1	<0.1059	<0.095936	0.2	<0.091813	1.4

Sample	Distance (m)	Type	Co59	Ni60	Cu65	Zn66	As75	Sr88	Y89	Zr90	Ag107	Sn118	Sb121	Ba137
MX12AB035-6	158.3	H	26.7	74.0	1.4	718.8	<0.48635	3.1	0.1	<0.056158	<0.062711	<0.074318	<0.078905	0.8
MX12AB035-7	158.3	H	25.8	74.8	<0.65598	701.4	<0.4654	2.2	<0.048288	0.7	<0.096944	0.1	<0.058275	0.3
MX12AB035-8	158.3	H	25.0	50.6	1.3	616.5	0.4	1.7	0.1	<0.048414	<0.093324	<0.073251	<0.080936	0.5
MX12AB035-9	158.3	H	25.1	76.6	<0.8343	792.8	<0.75191	2.9	0.1	<0.078584	0.1	<0.10685	<0.096203	1.5
MX12AB038-1	178.1	H	34.5	39.7	62.8	80.7	44.9	32.2	2.1	0.3	<0.091216	1.1	1.6	1.4
MX12AB040-1	187.3	H	10.3	2.3	<2.2608	599.9	<1.1618	8.2	<0.077466	<0.17083	<0.21222	0.2	<0.19453	62.6
MX12AB040-2	187.3	H	10.9	5.6	<1.1492	624.0	<0.44154	4.1	<0.029908	<0.05313	<0.065213	<0.050351	0.1	3.8
MX12AB040-3	187.3	H	8.8	5.3	<1.227	668.5	<1.0447	6.2	0.1	0.1	<0.099744	<0.064794	<0.1042	2.2
MX12AB041-1	198.2	H	5.2	<0.69253	0.9	587.0	<0.37347	9.9	0.1	<0.068748	<0.095936	0.1	<0.080495	1.2
MX12AB041-2	198.2	H	6.5	<0.79834	<0.88747	850.2	<0.34236	3.2	0.3	<0.085104	<0.082128	<0.099658	<0.079153	0.3
MX12AB041-3	198.2	H	9.7	0.9	<0.89178	642.2	<0.45087	9.7	0.1	1.2	<0.079091	<0.080011	<0.080058	1.3
MX12AB041-4	198.2	H	8.4	<0.64339	<0.66782	623.1	<0.43528	8.4	0.2	0.1	<0.093359	<0.060868	<0.075934	3.3
MX12AB042-1	205.6	H	4.1	<0.59587	1.1	619.8	<0.48375	5.0	<0.037121	0.6	<0.12568	0.1	<0.073348	1.9
MX12AB044-1	206.7	H	21.3	37.0	1.6	742.4	<0.71477	3.8	<0.065664	<0.18496	<0.17113	<0.19318	<0.1098	1.3
MX12AB044-2	206.7	H	26.3	59.7	<1.6889	1124.1	1.4	4.1	0.3	<0.20272	<0.16991	<0.16517	<0.16982	0.9
MX12AB044-3	206.7	H	22.1	32.1	<0.85545	632.1	0.8	4.9	0.4	0.1	<0.1177	0.1	<0.09935	1.1
MX12AB045-1	222.9	H	25.2	59.4	1.9	646.9	<0.75416	15.0	151.8	13.2	<0.13038	21.6	0.3	1.7
MX12AB046-1	3642.7	H	75.3	482.5	238.1	739.8	7.8	4.4	0.1	2.2	<0.16524	5.1	0.4	9.7
MX12AB046-2	3642.7	H	58.4	228.7	264.4	1067.5	13.6	1.9	0.1	2.0	<0.18188	0.3	1.6	0.8
MX12AB047-1	3644.7	H	49.9	170.0	14.3	1105.7	<1.6512	0.2	<0.10727	<0.27933	<0.30709	<0.22469	<0.18367	0.8
MX12AB047-2	3644.7	H	89.8	443.8	17.5	890.8	<0.78111	0.5	<0.064986	<0.22994	<0.25454	0.1	0.2	1.6
MX12AB054-1	2784.0	H	116.3	278.9	3.6	348.4	<0.62928	0.3	0.0	<0.06382	<0.10431	0.1	<0.085181	1.8
MX12AB054-2	2784.0	H	129.1	333.1	5.6	459.5	<0.95276	0.2	<0.074042	0.1	<0.16863	0.2	<0.11108	5.7
MX12AB055-1	1279.8	H	21.9	4.4	<1.7671	602.9	<1.1992	4.8	4.1	20.7	<0.2274	4.2	<0.1939	0.6
MX12AB055-2	1279.8	H	13.9	<38.5673	<33.0369	34.2	<24.5229	2.0	<1.7357	<3.3165	2.9	<3.749	3.4	130.9
MX12AB055-3	1279.8	H	25.3	<57.2332	<58.0715	<75.5584	<35.5502	12.9	<3.8656	<8.67	<8.5561	<6.9489	<7.1912	187.9
MX12AB055-4	1279.8	H	24.3	3.9	<0.90938	712.2	0.3	0.8	<0.03604	<0.068133	<0.074904	<0.093873	<0.094538	7.2
MX12AB055-5	1279.8	H	22.7	4.6	<0.95558	769.0	<0.83021	0.7	<0.046112	<0.08309	<0.15277	0.1	<0.099388	2.5
MX12AB056-1	873.3	H	11.0	3.0	<0.79075	661.0	0.3	1.0	<0.030639	<0.088142	<0.11987	<0.10557	<0.11807	15.1
MX12AB056-2	873.3	H	9.6	2.6	<0.93057	650.8	<0.69811	1.1	<0.042938	<0.070478	<0.10129	<0.11096	<0.11896	3.0

Sample	Distance (m)	Type	Co59	Ni60	Cu65	Zn66	As75	Sr88	Y89	Zr90	Ag107	Sn118	Sb121	Ba137
MX12AB056-3	873.3	H	10.0	3.6	<1.1808	624.3	<0.6229	1.2	<0.027648	<0.10718	<0.10583	<0.081919	<0.081511	0.6
MX12AB056-4	873.3	H	12.1	3.1	<1.215	679.5	<0.82153	1.8	<0.0669	<0.12781	<0.13519	<0.14136	<0.1331	1.1
MX12AB056-5	873.3	H	10.2	2.2	<1.5359	400.4	<1.1647	8.9	2.3	2.1	<0.17362	22.6	<0.17141	11.0
MX12AB056-6	873.3	H	12.4	3.3	<2.0959	767.1	<1.0663	1.7	<0.072516	3.2	<0.26962	<0.27908	<0.1372	2.3
MX12AB056-7	873.3	H	11.3	2.5	<1.2183	628.6	0.5	0.7	<0.041072	<0.13837	<0.10715	<0.09654	<0.067732	11.1
MX12AB056-8	873.3	H	14.9	3.2	<0.90685	548.6	0.6	1.4	<0.027255	0.5	<0.14625	0.2	<0.11848	7.5
MX12AB056-9	873.3	H	5.6	2.9	<0.98986	251.5	<1.068	1419.5	12.6	1.8	<0.20537	1.0	<0.084975	0.4
MX12AB057-1	403.6	H	4.2	1.0	<0.67158	457.8	<0.4639	10.4	0.1	<0.065311	<0.084992	<0.11036	<0.06599	1.7
MX12AB057-2	403.6	H	4.9	0.7	<0.85617	574.9	<0.53275	10.7	0.0	<0.09679	<0.10709	<0.14461	<0.086793	2.0
MX12AB057-3	403.6	H	4.6	0.7	<0.86902	528.4	<0.58356	9.8	<0.04041	<0.10681	<0.10739	<0.095035	<0.084388	2.6
MX12AB057-4	403.6	H	4.6	<0.86478	<0.86513	589.0	<0.82232	10.4	0.1	<0.056355	<0.14395	<0.11856	<0.082386	2.5
MX12AB075-1	174.2	H	20.0	43.4	<0.61297	514.5	<0.46331	7.6	0.1	<0.073987	<0.080644	<0.097602	<0.074323	2.2
MX12AB075-2	174.2	H	39.0	131.6	3.6	440.2	3.9	7.7	<0.10815	1.7	<0.3204	<0.33484	<0.2405	2.8
MX12AB076-1	207.3	H	12.8	7.5	<0.72058	675.3	0.4	2.5	0.0	<0.054805	<0.087071	<0.11393	<0.080293	1.1
MX12AB076-2	207.3	H	11.8	5.2	<0.7387	573.4	<0.4871	2.8	0.1	<0.05534	<0.073923	0.1	0.1	2.4
MX12AB076-3	207.3	H	12.2	6.0	<1.6181	829.1	<0.85077	2.2	0.7	50.0	<0.19134	<0.14072	<0.14457	0.9
MX12AB076-4	207.3	H	6.9	1.5	<0.64665	704.0	<0.40238	3.0	0.1	<0.086769	<0.1108	<0.12878	<0.083438	1.8
MX12AB076-5	207.3	H	7.7	1.1	<0.83049	712.9	0.5	3.4	0.1	0.5	<0.10192	0.1	<0.089371	2.3
MX12AB076-6	207.3	H	6.8	1.1	<0.65923	829.3	<0.40888	0.7	<0.04685	<0.073445	<0.1036	0.3	<0.072428	<0.19123
MX12AB076-7	207.3	H	6.4	1.3	<0.93273	606.2	<0.49522	2.4	0.1	0.4	<0.11666	<0.10232	<0.083692	1.0
MX12AB076-8	207.3	H	7.5	4.0	<0.87388	453.5	0.7	2.9	0.1	<0.07117	<0.10209	<0.083577	0.1	71.9
MX12AB076-9	207.3	H	13.6	5.5	<1.2215	619.2	<0.54843	2.9	0.1	<0.11121	<0.15424	0.1	<0.10236	2.2
MX12AB076-10	207.3	H	12.3	5.2	<0.89906	649.1	0.4	2.1	0.1	<0.12155	<0.11348	<0.090774	<0.0883	1.8
MX12AB076-11	207.3	H	8.6	3.8	<1.4901	742.9	<0.99179	2.6	0.1	1.2	<0.14536	<0.15003	<0.13262	2.1
MX12AB076-12	207.3	H	8.0	1.0	<0.88599	550.4	<0.54656	2.8	0.1	<0.085149	<0.10585	<0.11873	<0.069786	2.3
MX12AB076-13	207.3	H	16.5	7.3	<1.0013	514.9	<0.44234	4.6	0.1	<0.088597	<0.105	<0.093585	<0.091628	2.1
MX12AB076-14	207.3	H	15.7	6.4	<0.80904	436.9	<0.47767	3.5	0.1	<0.075873	<0.082262	<0.072097	<0.076395	2.3
MX12AB078-1	375.8	H	14.2271	5.03385	<1.0102	707.96878	<0.54071	10.71	0.04954	<0.10856	<0.10942	<0.12911	<0.082263	2.6987
MX12AB078-2	375.8	H	12.6899	4.94248	<1.1256	572.18307	<0.8207	13.745	0.20576	0.187456	<0.098181	<0.15557	<0.13784	1.8117
MX12AB078-3	375.8	H	16.9065	4.41552	<1.0102	604.95478	0.657364	11.799	0.09164	<0.084797	<0.11195	<0.12859	<0.076039	2.9549

Sample	Distance (m)	Type	Co59	Ni60	Cu65	Zn66	As75	Sr88	Y89	Zr90	Ag107	Sn118	Sb121	Ba137
MX12AB078-4	375.8	H	17.1362	3.73845	<1.502	619.94796	0.521463	12.924	0.15823	1.538222	<0.17174	<0.1321	<0.15159	2.5398
MX12AB078-5	375.8	H	13.8768	4.25231	<0.86677	695.6303	0.32685	8.6859	0.09955	0.481631	<0.070588	0.06816724	<0.090005	2.8653
MX12AB078-6	375.8	H	11.4027	2.73738	<1.0192	611.1886	<0.45662	7.8579	0.09787	<0.088745	<0.10451	<0.1093	<0.084563	3.7113
MX12AB078-7	375.8	H	13.6996	5.20137	<2.6113	627.80048	<1.4909	14.978	0.25496	<0.30594	<0.32065	1.8789739	<0.27131	23.836
MX12AB078-8	375.8	H	17.2051	3.8357	<0.84621	748.4377	<0.62864	7.2325	<0.054415	<0.11068	<0.10867	<0.093209	<0.080256	4.4293
MX12AB078-9	375.8	H	16.9284	5.36658	<0.73602	696.06254	<0.62809	12.084	0.12073	<0.14955	<0.077584	<0.10721	<0.089096	2.2279
MX12AB078-10	375.8	H	15.993	5.85294	<1.0009	664.14621	<0.6715	15.008	0.07965	2.469044	<0.076652	<0.10194	<0.072906	2.5574
MX12AB079-1	498.2	H	8.93361	0.69715	<1.0208	684.70223	<0.7993	9.7065	0.11472	<0.077554	<0.088577	<0.083108	<0.08706	1.0508
MX12AB079-2	498.2	H	10.5609	<1.565	1.014682	598.22631	<0.59268	6.4964	0.13321	0.140351	<0.061345	0.09888063	<0.093471	1.0744
MX12AB079-3	498.2	H	11.3181	1.23055	<1.0257	608.11504	<0.48827	8.8373	0.21311	<0.072481	<0.12062	0.13719101	<0.07197	1.7855
MX12AB079-4	498.2	H	15.8865	1.62036	<1.3035	738.14812	<0.44689	8.1053	0.14815	<0.051493	<0.08778	0.16064256	<0.082345	2.9919
MX12AB079-5	498.2	H	16.0028	1.89378	<1.5083	677.06791	<0.80549	6.0498	0.09531	<0.076972	<0.076805	0.2261093	<0.10312	1.8402
MX12AB079-6	498.2	H	16.5179	1.32659	<1.5735	688.35507	<0.68941	6.7188	0.37373	0.062479	<0.093036	0.09109685	<0.11676	1.5025
MX12AB079-7	498.2	H	14.6411	1.80951	<1.6577	699.80398	<0.93891	10.616	0.76714	9.739926	<0.17479	<0.089112	<0.10195	3.8504
MX12AB079-8	498.2	H	10.5695	<1.6691	<0.85667	648.87039	<0.40812	3.7277	0.36603	<0.077123	<0.084407	<0.09317	<0.087227	1.6848
MX12AB079-9	498.2	H	9.48658	<0.65997	1.069811	587.40286	<0.40672	5.9113	0.17113	0.104305	<0.07913	0.14473004	<0.077799	2.6462
MX12AB079-10	498.2	H	14.283	1.95224	<2.3839	799.20588	<0.84209	3.8546	0.77802	14.05803	<0.20201	<0.10496	<0.11235	0.6547
MX12AB079-11	498.2	H	13.8417	2.01282	<1.8742	825.38343	<0.60025	7.0376	0.19952	0.293853	<0.081152	0.10397245	<0.078321	1.6839
MX12AB079-12	498.2	H	13.4395	0.95831	<1.2416	931.46451	<0.55811	5.4634	0.10964	<0.11528	<0.090545	0.10743653	<0.069825	0.7829
MX12AB079-13	498.2	H	12.9881	0.88123	<0.95998	576.67124	<0.38803	10.773	0.23627	0.208129	<0.067918	0.28982637	<0.057659	1.0754
MX12AB081-1	748.5	H	5.86749	0.58689	<1.2197	603.87255	<0.45312	1.1145	<0.041018	<0.17163	<0.10114	0.04829618	<0.067426	0.6678
MX12AB081-2	748.5	H	4.57502	<0.77567	<1.1755	458.48839	<0.5073	0.938	0.06186	<0.060263	<0.0629	0.05552943	<0.10377	0.3699
MX12AB081-3	748.5	H	5.4319	<2.2477	<1.7627	636.78118	<0.45361	1.2685	<0.032928	<0.11609	<0.15833	<0.1322	<0.095847	1.0446
MX12AB081-4	748.5	H	4.90156	<0.97925	<0.91676	581.21969	<0.38329	0.6792	<0.045466	0.075739	<0.06355	<0.056233	<0.054746	0.4266
MX12AB081-5	748.5	H	5.14186	0.60823	<1.2467	562.94825	0.257625	0.606	<0.024025	<0.072741	<0.085348	0.04181791	<0.063163	1.569
MX12AB081-6	748.5	H	<0.11299	<0.94148	<0.98513	4.9849864	0.636866	2203.8	11.7298	6.618181	<0.077765	15.7212885	<0.082346	4.7734
MX12AB081-7	748.5	H	5.52917	0.88066	<1.3952	675.95209	0.36259	0.5758	<0.049852	<0.099534	<0.054274	<0.080439	<0.102	6.5932
MX12AB082-1	254.4	H	7.94821	3.54259	<0.80793	484.00199	<0.39887	4.1833	<0.044085	<0.086711	<0.051492	0.04575112	<0.063054	1.764
MX12AB082-2	254.4	H	6.99158	3.29126	<1.0079	478.28405	<0.34214	4.7151	0.04656	<0.061731	<0.051084	0.09644682	<0.05663	1.6874
MX12AB083-1	399.6	H	16.5487	<0.85803	<1.7768	539.56748	<0.81087	6.7266	0.19399	<0.16895	<0.15525	0.15645401	<0.094182	16.181

Sample	Distance (m)	Type	Co59	Ni60	Cu65	Zn66	As75	Sr88	Y89	Zr90	Ag107	Sn118	Sb121	Ba137
MX12AB083-2	399.6	H	16.0091	0.78854	<2.2574	553.8264	0.38112	4.5165	5.13478	0.127559	<0.13749	0.96793805	<0.1276	21.964
MX12AB083-3	399.6	H	11.06	3.18297	<2.0957	404.0945	<0.92605	22.767	3.97525	5.795507	<0.10329	6.34669362	<0.14501	54.223
MX12AB083-4	399.6	H	9.55742	1.04374	<1.1297	518.49126	<0.37478	8.1758	0.04534	1.037023	<0.11445	<0.059937	<0.068878	1.9733
MX12AB083-5	399.6	H	10.5504	1.25217	<1.0152	602.97402	<0.32639	5.2303	0.06241	0.584282	<0.06507	0.03841723	<0.032062	1.0687
MX12AB083-6	399.6	H	9.7033	<1.3397	<1.4775	296.05872	0.265019	10.26	1.42443	0.226701	<0.059996	2.56453055	<0.089438	9.5435
MX12AB083-7	399.6	H	14.1467	1.98483	<2.4835	925.81646	<1.2668	15.022	<0.099732	0.247567	<0.202	<0.19184	<0.18659	7.6007
MX12AB083-8	399.6	H	13.6467	3.04722	<0.95303	469.26694	<0.55317	9.4426	0.05071	0.132704	<0.064668	0.04669803	<0.056762	1.9319
MX12AB083-9	399.6	H	14.1917	1.93355	<1.0929	617.72002	<0.33065	3.2831	0.06196	<0.079843	<0.065902	<0.098429	<0.075746	1.7701
MX12AB083-10	399.6	H	17.4974	3.63058	<1.4753	732.98816	<0.89999	13.465	0.65083	2.037498	<0.098838	<0.15797	<0.074973	3.4083
MX12AB083-11	399.6	H	16.5837	3.09394	<0.9224	567.01286	<0.41272	9.1675	0.15327	1.645047	<0.045942	0.04671911	<0.053251	2.7635
MX12AB084-1	401.0	H	10.7244	4.48703	<0.96509	678.03275	<0.62773	8.738	0.10722	0.134731	<0.1061	0.30513008	<0.064123	3.783
MX12AB084-2	401.0	H	9.53505	3.61939	<1.1743	644.43335	<0.76286	9.6662	0.19261	0.306768	<0.10747	1.18405947	<0.092436	2.0939
MX12AB084-3	401.0	H	11.2807	3.25622	1.007997	717.49102	<0.45827	3.9779	0.03522	<0.080058	<0.08884	<0.082238	<0.054883	3.48
MX12AB084-4	401.0	H	10.705	2.05978	<1.1736	593.32472	<0.69689	7.8878	0.08455	0.160032	<0.084758	<0.092135	<0.071567	2.4561
MX12AB084-5	401.0	H	10.5464	1.38684	<1.4091	557.8373	<0.73512	10.448	0.19781	0.380571	<0.084469	<0.080699	<0.066752	3.388
MX12AB085-1	400.4	H	0.32625	<0.78162	<1.0189	18.895469	0.550669	2097.2	4.29147	2.122232	0.25927547	1.79018523	<0.08308	76.298
MX12AB085-2	400.4	H	14.6457	1.83658	2.23189	632.34249	<1.0345	3.8537	<0.038565	0.173168	<0.22278	<0.17858	<0.14692	1.9689
MX12AB085-3	400.4	H	11.0444	1.55483	<1.0703	621.18282	<0.43992	5.5897	0.12663	<0.093063	<0.047469	<0.068343	<0.057602	2.409
MX12AB085-4	400.4	H	10.9126	2.24646	<0.74602	576.87455	<0.37448	3.992	0.04255	0.154093	<0.087548	<0.049002	<0.065513	1.4356
MX12AB085-5	400.4	H	12.2246	1.59343	1.830886	627.363	<0.9665	9.8894	6.01425	1.232375	<0.13398	<0.08152	<0.092698	2.6353
MX12AB085-6	400.4	H	15.4745	2.01483	<1.1211	613.69696	<0.3352	5.7314	0.03431	<0.062033	<0.059693	<0.064774	<0.055559	2.023
MX12AB085-7	400.4	H	17.6	4.95774	<2.9978	794.27506	<1.5252	11.076	<0.16959	<0.26076	<0.22273	<0.15669	<0.31217	6.4894
MX12AB085-8	400.4	H	15.245	2.62687	<1.681	691.55616	<0.5249	6.8468	<0.042867	<0.057627	<0.13589	<0.11119	<0.074534	3.438
MX12AB085-9	400.4	H	14.246	1.8765	<0.83817	587.70564	<0.57386	6.089	<0.036372	<0.046017	<0.049893	<0.06066	<0.05806	1.7896
MX12AB087-1	244.7	H	9.75336	1.39053	<1.5992	713.72642	0.345692	26.467	0.49119	8.912775	<0.087018	0.07073088	<0.092479	8.3542
MX12AB087-2	244.7	H	9.47629	1.13958	<1.1063	573.03078	0.289176	10.467	0.21044	11.0909	<0.10523	0.21019293	<0.078789	6.3143
MX12AB087-3	244.7	H	8.81847	0.98569	1.100141	626.47144	<0.62288	5.8834	0.53779	<0.051149	<0.086767	0.0791175	<0.074607	3.5061
MX12AB087-4	244.7	H	8.36625	1.18971	<1.2955	652.28414	<0.49281	5.1293	<0.044958	<0.054575	<0.093573	0.08682638	<0.069838	4.7324
MX12AB087-5	244.7	H	8.02897	0.82018	<1.1585	555.49121	0.286161	5.2196	0.03152	<0.051259	0.03878093	0.06712355	<0.049605	7.7603
MX12AB087-6	244.7	H	8.69606	1.18317	<1.061	671.559	<0.56531	3.3263	<0.024022	<0.051062	<0.079007	<0.069694	<0.049453	3.2396

Sample	Distance (m)	Type	Co59	Ni60	Cu65	Zn66	As75	Sr88	Y89	Zr90	Ag107	Sn118	Sb121	Ba137
MX12AB087-7	244.7	H	9.00762	<1.9397	<2.7767	868.64919	0.671113	3.8836	<0.072523	<0.15831	<0.25237	0.14484374	<0.14621	1.039
MX12AB087-8	244.7	H	8.71694	1.12809	<1.2456	636.24867	0.314327	5.9977	<0.045037	<0.074448	<0.091764	<0.065951	<0.08107	2.5069
MX12AB087-9	244.7	H	8.7288	1.1968	<1.2759	554.50111	0.443125	7.2558	0.03944	<0.077573	<0.088469	0.10682072	<0.067694	2.2902
MX12AB087-10	244.7	H	11.8274	1.22056	<1.3876	533.43095	0.343175	8.3143	0.04945	<0.067015	<0.092322	<0.056717	<0.058872	1.1103
MX12AB088-1	246.8	H	23.087	4.72039	<1.6944	685.17832	<1.3354	17.636	2.53979	3.287887	<0.22927	7.13572043	<0.22181	2.662
MX12AB088-2	246.8	H	24.5838	4.75351	<0.70163	656.54609	<0.52473	7.5518	0.03945	<0.073568	<0.10218	0.09537158	<0.088662	2.6994
MX12AB088-3	246.8	H	24.7794	4.10203	0.883654	702.04362	<0.50524	9.7454	0.07955	2.928674	<0.08829	0.04900059	<0.1168	2.7215
MX12AB088-4	246.8	H	25.1325	4.89869	<1.2024	602.58091	<0.5988	9.1219	<0.036708	0.069172	<0.066869	<0.071368	<0.10312	1.252
MX12AB088-5	246.8	H	28.0795	6.04146	<1.5673	700.42564	<0.80461	12.259	0.60801	6.337099	<0.16225	<0.16274	<0.14741	10.874
MX12AB088-6	246.8	H	25.9659	4.87384	<0.83026	569.66864	0.502704	13.596	0.16223	5.903223	0.05023533	<0.073935	<0.07917	9.2957
MX12AB089-1	189.6	H	6.62419	<1.1073	<0.98653	718.10569	<0.45417	5.3877	<0.029847	<0.063386	<0.1189	<0.093357	<0.076241	2.8244
MX12AB089-2	189.6	H	7.04438	0.97803	<1.1541	718.10051	<0.61321	5.6392	<0.042801	<0.075522	<0.10446	<0.082359	<0.091374	5.1129
MX12AB089-3	189.6	H	6.51738	<0.76423	<1.0128	662.64516	<0.57312	4.3132	<0.029452	<0.040989	<0.067491	<0.089163	<0.079096	5.7248
MX12AB089-4	189.6	H	6.05094	<1.0888	<1.4363	675.89019	<0.60414	6.437	0.26591	0.069176	<0.12331	0.13853195	<0.088437	22.51
MX12AB089-5	189.6	H	10.3613	<1.2486	<2.238	1133.6038	0.471566	4.3909	<0.03327	0.211603	<0.18744	0.17953271	<0.14814	7.5416
MX12AB089-6	189.6	H	7.82801	<0.8901	<0.89819	739.52444	0.438201	2.4469	<0.044229	0.057191	<0.067095	0.14566099	<0.051382	4.1463
MX12AB092-1	283.7	H	31.4611	67.249	<1.7454	732.9066	<0.61702	5.2817	0.19181	<0.1071	<0.121	0.0921575	<0.082062	1.0785
MX12AB092-2	283.7	H	27.4122	48.7208	<0.91318	775.56507	<0.5223	3.7142	0.20654	<0.056325	<0.076836	0.14783192	<0.062979	0.7716
MX12AB092-3	283.7	H	27.4943	43.3857	<1.4044	787.53802	<0.69441	4.7192	0.1265	0.074604	<0.07657	0.18266269	<0.082635	1.0479
MX12AB092-4	283.7	H	41.5964	179.081	1.336784	613.24055	<0.76344	2.1333	0.1041	<0.033991	<0.075251	0.15948246	<0.081583	0.5115
MX12AB092-5	283.7	H	20.9529	16.6408	1.468394	691.14068	0.221997	3.5592	0.20163	0.120322	<0.10012	0.15412313	<0.10043	1.0466
MX12AB093-1	74.3	H	18.6109	5.2485	<2.0955	602.13021	0.511062	4.4025	0.22633	0.095752	<0.093647	0.1740551	<0.14592	8.5004
MX12AB093-2	74.3	H	19.1133	2.67976	<1.5255	625.2731	<0.52929	3.0969	0.12246	<0.058044	<0.094672	<0.059464	0.0523615	2.2273
MX12AB093-3	74.3	H	19.7254	1.53593	<1.1167	542.21581	<0.47741	1.1512	<0.023882	<0.081454	<0.080524	0.05607867	<0.067664	1.6273
MX12AB093-4	74.3	H	16.7866	2.89329	<1.4669	532.89998	<0.81507	3.5178	0.13153	<0.12769	<0.12282	0.15737369	<0.13532	3.2981
MX12AB093-5	74.3	H	19.4015	2.30323	<1.1651	535.70141	<0.59497	3.2874	0.06598	1.872277	<0.12977	0.0837858	0.1262662	1.1991
MX12AB093-6	74.3	H	18.0201	1.91808	<0.88855	536.57303	<0.61734	2.0077	0.32585	<0.078909	<0.07168	<0.052818	<0.079804	0.3773
MX12AB094-1	246.9	H	6.9386	0.861	<1.2861	588.46752	<0.49193	2.2835	0.06175	<0.096517	<0.090783	<0.10665	<0.11998	1.8194
MX12AB094-2	246.9	H	8.07206	0.88495	<0.9518	483.62261	0.320776	2.1513	0.05113	<0.044753	<0.14509	<0.10072	<0.11131	4.5174
MX12AB094-3	246.9	H	7.12227	1.12219	<0.83261	528.25137	<0.38279	1.3294	<0.045152	0.314716	<0.04973	<0.069694	<0.059693	2.0715

Sample	Distance (m)	Type	Co59	Ni60	Cu65	Zn66	As75	Sr88	Y89	Zr90	Ag107	Sn118	Sb121	Ba137
MX12AB094-4	246.9	H	5.39029	1.10267	<1.2593	274.47693	18.13044	409.37	1283.25	13.82969	<0.10305	13.3179306	<0.10269	2.9806
MX12AB094-5	246.9	H	6.41243	1.21924	<1.0091	447.46445	0.306043	1.8133	0.10541	<0.065516	<0.060675	0.04167007	<0.074427	3.2294
MX12AB094-6	246.9	H	6.72689	1.46287	0.937197	484.06601	<0.43063	1.9753	0.05538	0.072085	<0.073672	<0.087627	<0.07036	3.2463
MX12AB094-7	246.9	H	8.68258	1.21352	<0.99851	485.30085	<0.48905	1.9941	0.09438	<0.041254	<0.078972	<0.082315	<0.087157	1.901
MX12AB096	120.9	H	13.6311	3.25214	<0.9937	627.59797	<0.46511	4.276	<0.04029	<0.050934	<0.092068	0.07449446	<0.058548	2.1645
MX12AB096	120.9	H	13.5679	2.59483	<0.93347	602.69516	<0.47327	4.6462	<0.029486	<0.052389	<0.078651	<0.082662	<0.087672	3.4656
MX12AB096	120.9	H	11.782	2.36025	<1.0476	730.84267	<0.66738	4.4942	0.04166	0.42836	<0.062646	0.04270866	<0.087736	3.4372
MX12AB096	120.9	H	11.6658	1.94032	<0.90783	724.71742	<0.54319	5.732	<0.032522	<0.076638	<0.092341	<0.055581	<0.060546	4.5146
MX12AB096	120.9	H	9.3746	1.05606	<1.4765	648.63514	<0.49517	4.2499	<0.029916	0.343225	<0.11567	<0.10179	<0.084895	1.3004
MX12AB096	120.9	H	12.7432	2.32379	<1.1423	575.24509	<0.93174	9.5878	0.05764	0.265533	<0.1376	0.08935321	<0.086178	1.9797

Sample	Distance (m)	Type	Fe57	La139	Ce140	Pb208	Bi209	U238
MX12AB002(1)-1	5352.9	H	254761.1	<0.02678	<0.030866	32.8	<0.018388	0.0
MX12AB002(1)-2	5352.9	H	249898.7	<0.034251	<0.052343	19.0	<0.035739	<0.043586
MX12AB002(1)-3	5352.9	H	274715.1	<0.056912	0.1	37.4	<0.032528	0.0
MX12AB002(1)-4	5352.9	H	239630.9	0.0	0.1	13.9	<0.020104	0.0
MX12AB002(1)-5	5352.9	H	239781.0	<0.017701	0.0	22.4	<0.017307	0.1
MX12AB003-1	628.4	H	65232.8	<0.064189	0.2	0.2	<0.035599	2.9
MX12AB003-2	628.4	H	175572.9	0.1	0.2	0.1	<0.024956	0.2
MX12AB003-3	628.4	H	78455.9	<0.05867	0.3	<0.082459	<0.037338	2.1
MX12AB008-1	585.0	H	121175.7	<0.030762	<0.019534	1.9	<0.023334	<0.014919
MX12AB009-1	359.9	H	228902.3	0.2	0.3	1.0	<0.033467	<0.055257

MX12AB009-2	359.9	H	229477.9	0.1	0.2	0.2	<0.014178	0.2
MX12AB009-3	359.9	H	229029.7	0.2	0.5	<0.057722	<0.019734	0.2
MX12AB009-4	359.9	H	215442.6	0.0	0.1	<0.041979	<0.023446	0.0
MX12AB009-5	359.9	H	241447.4	0.1	0.2	0.1	<0.023469	0.1
MX12AB009-6	359.9	H	220623.0	0.1	0.2	0.2	<0.020042	0.1
MX12AB009-7	359.9	H	230465.6	0.1	0.2	<0.058898	<0.022249	0.1
MX12AB009-8	359.9	H	226350.9	0.2	0.4	0.1	<0.018498	0.2
MX12AB010-1	446.4	H	127389.2	0.5	0.3	6.3	0.2	<0.056029
MX12AB010-2	446.4	H	96875.7	1.3	1.5	11.5	0.0	<0.019543
MX12AB010-3	446.4	H	131180.6	0.4	0.4	2.5	<0.020071	<0.035464
MX12AB010-4	446.4	H	128679.7	1.1	1.7	4.3	0.0	0.0
MX12AB010-5	446.4	H	126447.0	0.8	1.3	2.2	0.0	<0.017841
MX12AB010-6	446.4	H	129861.6	0.8	0.7	7.6	0.1	0.0
MX12AB010-7	446.4	H	146232.6	0.2	0.2	9.9	0.1	<0.031466
MX12AB010-8	446.4	H	129991.2	0.3	0.2	8.8	0.7	0.0
MX12AB010-9	446.4	H	134938.8	0.3	0.1	9.0	0.2	<0.013373
MX12AB011-1	733.9	H	213332.3	<0.020431	0.0	1.5	0.0	0.0
MX12AB011-2	733.9	H	208661.7	<0.02448	<0.037521	1.7	<0.020235	0.0
MX12AB011-3	733.9	H	186898.2	<0.017295	0.1	2.1	<0.013954	<0.02166
MX12AB011-4	733.9	H	183850.0	<0.015986	<0.033092	0.8	<0.01927	<0.020258
MX12AB011-5	733.9	H	214674.3	0.1	0.3	16.9	<0.022999	0.1
MX12AB013-1	1201.2	H	203710.2	<0.045852	<0.053967	12.8	<0.042122	<0.024201
MX12AB013-2	1201.2	H	208795.5	<0.015095	<0.034007	6.3	<0.023305	0.0
MX12AB013-3	1101.3	H	220065.7	<0.033911	<0.035773	8.9	<0.022323	0.0
MX12AB013-4	1201.2	H	226863.1	<0.033277	<0.019734	10.7	0.0	0.0
MX12AB014-1	1101.2	H	161998.8	0.2	0.5	49.6	<0.0085634	0.1
MX12AB014-2	1101.2	H	180586.4	0.2	0.3	43.3	<0.023181	0.1
MX12AB014-3	1101.2	H	166635.6	0.2	0.3	9.9	<0.037559	0.1
MX12AB014-4	1101.2	H	178113.4	<0.10409	0.2	14.0	<0.066367	0.3
MX12AB014-5	1101.2	H	149467.2	0.0	0.1	4.1	<0.012144	0.1
MX12AB014-6	1101.2	H	195743.1	<0.021768	<0.029561	1.0	<0.022909	<0.022076

MX12AB014-7	1101.2	H	155707.1	0.1	<0.051825	26.4	0.0	0.1
MX12AB014-8	1101.2	H	145056.1	0.1	0.2	56.5	0.1	0.1
MX12AB014-9	1101.2	H	136093.1	<0.031252	0.1	10.4	0.0	0.1
MX12AB014-10	1101.2	H	176199.3	0.1	0.1	4.2	<0.031673	0.1
MX12AB016-1	902.0	H	186871.4	<0.026251	0.1	0.0	<0.021075	<0.020105
MX12AB016-2	902.0	H	164453.3	0.0	0.0	<0.027543	<0.014302	<0.012088
MX12AB016-3	902.0	H	165964.7	<0.034869	<0.026799	0.2	<0.01867	0.0
MX12AB017-1	802.5	H	143051.5	0.0	0.1	0.2	<0.013255	0.0
MX12AB017-2	802.5	H	149497.8	0.0	0.1	0.7	<0.0088385	<0.038219
MX12AB017-3	802.5	H	187678.7	0.1	0.3	40.8	<0.017577	<0.030067
MX12AB017-4	802.5	H	181076.7	0.1	0.1	1.6	<0.018018	0.0
MX12AB018-1	703.4	H	206445.9	<0.031575	0.1	3.4	<0.017525	<0.034742
MX12AB018-2	703.4	H	209246.2	<0.03168	0.0	3.8	0.3	<0.014292
MX12AB018-3	703.4	H	204332.2	<0.04108	0.0	5.3	0.3	<0.018334
MX12AB018-4	703.4	H	210000.4	<0.027372	0.0	3.5	0.2	<0.029009
MX12AB018-5	703.4	H	202748.7	<0.023634	0.1	2.6	0.0	<0.014737
MX12AB018-6	703.4	H	211387.9	<0.024239	0.1	3.5	0.0	<0.028573
MX12AB022-1	2824.7	H	181533.7	<0.028804	<0.019785	<0.061469	<0.017624	<0.02235
MX12AB022-2	2824.7	H	180944.4	<0.01299	<0.023461	<0.045731	<0.016139	<0.013372
MX12AB022-3	2824.7	H	186248.6	<0.024414	<0.014196	<0.047689	<0.013899	<0.01733
MX12AB024-1	481.9	H	206012.3	<0.092731	0.2	6.2	<0.050477	0.4
MX12AB024-2	441.8	H	202587.8	<0.031034	0.1	5.0	<0.025237	0.2
MX12AB027-1	425.4	H	205725.8	0.1	0.2	4.7	0.0	0.2
MX12AB027-2	451.6	H	199022.3	<0.027772	0.0	2.0	0.0	<0.03708
MX12AB027-3	497.0	H	209433.0	<0.013852	0.1	1.9	<0.013184	0.0
MX12AB027-4	556.8	H	205002.0	<0.019072	0.0	0.1	<0.022814	<0.042086
MX12AB027-5	626.9	H	208511.4	<0.021732	0.0	0.3	<0.01935	<0.033424
MX12AB027-6	704.3	H	185873.8	0.0	0.1	2.1	<0.02114	0.1
MX12AB027-7	786.8	H	203562.5	<0.022366	0.0	0.1	<0.01962	<0.018496
MX12AB027-8	872.9	H	207532.8	<0.033721	0.1	2.5	<0.014886	<0.027358
MX12AB027-9	961.8	H	202076.5	<0.030198	0.0	3.4	0.0	<0.042305

MX12AB027-10	1052.6	H	212851.1	<0.020259	<0.015515	<0.046262	<0.012634	<0.012737
MX12AB027-11	1145.0	H	229872.8	0.1	0.1	0.1	<0.016854	<0.028434
MX12AB027-12	1238.5	H	205964.9	<0.026939	<0.025349	0.1	<0.010858	<0.025474
MX12AB027-13	1333.0	H	210386.3	0.0	0.1	2.0	<0.048582	0.1
MX12AB027-14	1428.3	H	231933.3	<0.10392	<0.090018	0.9	<0.075405	0.3
MX12AB027-15	1524.1	H	202901.1	0.0	<0.031624	0.4	<0.016475	<0.032289
MX12AB027-16	1620.5	H	211205.1	<0.048148	<0.053716	0.5	<0.054738	<0.044597
MX12AB028-1	481.4	H	210797.5	<0.024448	0.0	0.1	<0.041218	<0.019751
MX12AB028-2	481.4	H	169950.9	0.1	0.3	<0.035566	<0.023024	<0.028874
MX12AB028-3	481.4	H	196878.3	<0.034164	0.2	2.0	0.1	0.1
MX12AB028-4	481.4	H	207393.2	0.2	0.3	10.8	1.0	0.7
MX12AB028-5	481.4	H	195506.3	0.0	0.2	3.3	0.1	0.0
MX12AB028-6	481.4	H	231052.1	0.1	0.3	0.8	<0.025683	<0.03566
MX12AB028-7	481.4	H	204261.4	0.0	0.2	1.7	0.0	0.0
MX12AB028-8	481.4	H	203514.6	<0.028561	0.1	1.1	<0.020572	0.0
MX12AB029-1	481.4	H	168624.9	0.2	0.6	10.1	0.9	0.1
MX12AB029-2	481.4	H	65104.5	0.4	2.4	2.8	2.5	6.9
MX12AB029-3	481.4	H	186764.4	<0.02389	0.0	<0.0388	<0.010077	<0.013428
MX12AB029-4	481.4	H	183290.6	<0.023969	<0.050883	0.1	<0.032233	<0.055588
MX12AB029-5	481.4	H	203863.1	0.0	0.1	0.4	0.0	0.1
MX12AB029-6	481.4	H	182249.6	<0.019857	0.0	0.6	<0.013888	<0.027994
MX12AB029-7	481.4	H	180907.5	0.0	0.1	0.6	<0.010895	0.0
MX12AB029-8	481.4	H	185472.2	0.0	0.1	<0.037322	<0.02015	<0.024315
MX12AB029-9	481.4	H	189471.7	<0.027718	0.1	0.1	<0.023036	<0.042018
MX12AB030-1	441.3	H	299966.7	0.1	0.2	0.8	0.4	3.4
MX12AB030-2	441.3	H	351453.7	0.1	0.3	0.3	0.0	3.0
MX12AB033-1	134.0	H	226770.8	0.0	0.1	16.4	0.2	<0.027963
MX12AB033-2	134.0	H	214323.8	<0.023766	<0.028578	1.3	<0.02715	<0.026626
MX12AB033-3	134.0	H	208723.6	<0.019726	<0.021184	0.0	0.0	<0.02369
MX12AB033-4	134.0	H	202736.0	<0.024754	0.1	11.0	0.0	0.1
MX12AB033-5	134.0	H	219447.7	<0.036206	0.0	0.2	<0.019438	<0.034664

MX12AB033-6	134.0	H	220676.1	<0.02859	0.1	4.8	<0.036665	0.1
MX12AB034-1	147.2	H	219750.5	0.1	0.7	0.0	<0.018497	0.0
MX12AB034-2	147.2	H	90689078	4576.2	11158.6	1019.5	<11.8175	30.9
MX12AB035-1	158.3	H	189448.0	<0.026017	<0.021312	3.3	0.0	<0.016545
MX12AB035-2	158.3	H	195449.6	0.1	<0.078568	103.3	0.8	<0.04055
MX12AB035-3	158.3	H	184055.0	<0.017716	0.0	8.5	0.0	0.0
MX12AB035-4	158.3	H	197265.2	0.0	0.2	22.1	0.0	0.0
MX12AB035-5	158.3	H	207395.1	<0.036726	0.0	8.2	<0.029175	<0.015173
MX12AB035-6	158.3	H	193660.6	0.0	0.1	1.5	<0.012221	<0.033142
MX12AB035-7	158.3	H	191830.4	<0.034346	<0.01056	1.4	<0.0099518	0.0
MX12AB035-8	158.3	H	191375.0	0.0	0.1	25.1	0.0	<0.021345
MX12AB035-9	158.3	H	197613.1	<0.022789	0.0	0.9	<0.025388	<0.026101
MX12AB038-1	178.1	H	187007.5	0.2	0.6	20.9	0.4	0.1
MX12AB040-1	187.3	H	238121.8	<0.065915	<0.0957	<0.12305	<0.047404	<0.074467
MX12AB040-2	187.3	H	217723.1	<0.010973	<0.018948	0.1	<0.0087071	<0.021393
MX12AB040-3	187.3	H	213446.2	<0.023779	0.0	0.1	<0.017462	0.0
MX12AB041-1	198.2	H	152617.4	<0.018261	0.0	<0.034918	<0.010786	<0.024161
MX12AB041-2	198.2	H	172739.4	0.0	0.5	0.9	0.1	0.0
MX12AB041-3	198.2	H	178775.3	<0.026765	0.0	<0.060334	<0.015788	0.0
MX12AB041-4	198.2	H	161486.2	<0.015675	0.1	0.1	<0.022069	<0.017279
MX12AB042-1	205.6	H	173108.9	<0.020153	<0.034158	0.5	<0.012841	0.1
MX12AB044-1	206.7	H	176697.8	<0.042834	<0.052841	2.0	0.1	0.1
MX12AB044-2	206.7	H	179897.6	0.1	0.1	1.3	<0.041304	<0.069662
MX12AB044-3	206.7	H	168311.7	<0.016076	0.1	1.2	0.0	<0.034566
MX12AB045-1	222.9	H	134213.3	0.7	3.8	7.0	0.0	1.5
MX12AB046-1	3642.7	H	238913.0	<0.076047	0.1	0.2	<0.053366	0.3
MX12AB046-2	3642.7	H	244580.5	0.0	0.1	0.4	<0.034963	0.2
MX12AB047-1	3644.7	H	195617.2	<0.10294	<0.078054	0.3	<0.039068	0.7
MX12AB047-2	3644.7	H	220573.6	<0.057885	<0.035419	0.3	<0.038681	0.6
MX12AB054-1	2784.0	H	162353.0	<0.028553	<0.025463	<0.042053	<0.017152	<0.031485
MX12AB054-2	2784.0	H	169735.8	<0.023102	<0.031359	<0.06151	<0.035617	<0.024225

MX12AB055-1	1279.8	H	217121.7	<0.05143	<0.059713	3.2	<0.039886	0.4
MX12AB055-2	1279.8	H	205167.4	<1.2586	<0.61191	3.1	<0.62169	<1.3117
MX12AB055-3	1279.8	H	185016.7	<1.7384	<1.6581	3.9	<2.0698	<2.9437
MX12AB055-4	1279.8	H	228457.8	<0.016971	<0.020335	2.2	<0.020321	0.0
MX12AB055-5	1279.8	H	247589.4	<0.035422	<0.029833	0.1	<0.028851	<0.025871
MX12AB056-1	873.3	H	244750.4	<0.020691	<0.027502	<0.33788	<0.028127	<0.034275
MX12AB056-2	873.3	H	232076.1	<0.022249	0.0	<0.057613	<0.020213	<0.028046
MX12AB056-3	873.3	H	253175.2	<0.02025	<0.020982	0.1	<0.023377	0.1
MX12AB056-4	873.3	H	263485.8	<0.043111	<0.026809	0.1	<0.025521	<0.051714
MX12AB056-5	873.3	H	207882.8	0.1	0.2	0.2	<0.040546	0.1
MX12AB056-6	873.3	H	265904.9	<0.050102	<0.053641	<0.055937	<0.039604	0.1
MX12AB056-7	873.3	H	259681.1	<0.050573	<0.058925	<0.045817	<0.023193	<0.019072
MX12AB056-8	873.3	H	239738.7	0.0	<0.034251	0.3	<0.021952	0.0
MX12AB056-9	873.3	H	109895.5	1.7	2.6	16.2	0.0	1.3
MX12AB057-1	403.6	H	205429.7	<0.026375	<0.016575	0.0	<0.01525	<0.037659
MX12AB057-2	403.6	H	206729.2	<0.029331	0.0	<0.042405	<0.02658	<0.026072
MX12AB057-3	403.6	H	206254.1	<0.022171	0.0	0.2	<0.015524	0.0
MX12AB057-4	403.6	H	217745.7	<0.019997	<0.047957	<0.054707	<0.022138	<0.054616
MX12AB075-1	174.2	H	237081.8	<0.021755	<0.022445	<0.27332	<0.018701	0.0
MX12AB075-2	174.2	H	237847.8	<0.090379	0.1	106.0	0.1	0.1
MX12AB076-1	207.3	H	254252.7	<0.031391	<0.016935	<0.039882	<0.019699	<0.02932
MX12AB076-2	207.3	H	247030.4	<0.030525	<0.024238	<0.042804	<0.018572	<0.031059
MX12AB076-3	207.3	H	245762.0	<0.059327	0.0	<0.11959	<0.026479	1.5
MX12AB076-4	207.3	H	245698.5	<0.02163	0.1	0.0	<0.013175	<0.02106
MX12AB076-5	207.3	H	256546.0	<0.027889	0.0	0.0	<0.016037	<0.030778
MX12AB076-6	207.3	H	253263.6	0.0	<0.021307	0.0	<0.01747	<0.027902
MX12AB076-7	207.3	H	248124.3	0.0	0.0	0.1	<0.018211	0.1
MX12AB076-8	207.3	H	238830.0	<0.02379	<0.011924	<0.037667	<0.024242	<0.043986
MX12AB076-9	207.3	H	266988.2	<0.03514	0.0	<0.043108	<0.015256	<0.037635
MX12AB076-10	207.3	H	263460.2	<0.02548	<0.0328	<0.058082	<0.027318	0.0
MX12AB076-11	207.3	H	263987.3	<0.03432	<0.030815	<0.044273	<0.029974	<0.021239

MX12AB076-12	207.3	H	268920.0	<0.04035	0.0	0.1	<0.020723	<0.01816
MX12AB076-13	207.3	H	263737.1	0.0	0.0	<0.032065	<0.018684	<0.017862
MX12AB076-14	207.3	H	255516.3	0.0	0.0	<0.030583	<0.016676	<0.016817
MX12AB078-1	375.8	H	273711	<0.031416	<0.028554	0.03154	<0.012812	<0.024107
MX12AB078-2	375.8	H	264771.2	<0.043879	0.1139	0.06197	<0.021139	0.0563083
MX12AB078-3	375.8	H	282100.6	<0.037781	<0.032108	0.03952	<0.018033	<0.03329
MX12AB078-4	375.8	H	281053.4	<0.039058	0.10334	3.31187	<0.024209	0.1355223
MX12AB078-5	375.8	H	282434.8	<0.020401	0.02852	<0.050552	<0.014073	0.0832957
MX12AB078-6	375.8	H	268638.7	<0.029117	<0.02717	<0.066945	<0.022438	<0.028462
MX12AB078-7	375.8	H	308310	0.0818886	0.16515	0.47044	<0.062624	0.0986515
MX12AB078-8	375.8	H	269484.9	<0.032207	<0.023137	<0.031472	<0.022243	<0.019504
MX12AB078-9	375.8	H	279137	<0.032019	0.03983	0.17864	<0.016084	0.0282976
MX12AB078-10	375.8	H	289456.2	<0.03702	0.02161	<0.052894	<0.018048	0.1462311
MX12AB079-1	498.2	H	252377.7	0.0295693	0.08664	0.10879	<0.017647	0.0188655
MX12AB079-2	498.2	H	246874.9	0.0137285	0.03787	<0.041727	<0.018591	<0.011812
MX12AB079-3	498.2	H	252976.3	<0.027925	0.09289	0.03598	<0.015045	0.0300844
MX12AB079-4	498.2	H	258228.9	0.0159605	0.04063	0.22141	<0.011902	0.0233565
MX12AB079-5	498.2	H	260978.7	0.027672	0.03836	0.12235	<0.014398	0.0375574
MX12AB079-6	498.2	H	258422.3	0.0747375	0.17134	1.6048	<0.016175	<0.015141
MX12AB079-7	498.2	H	268312.9	<0.02462	0.08737	0.06626	<0.020683	0.3235226
MX12AB079-8	498.2	H	264621.7	0.0433273	0.08589	<0.025762	<0.014999	<0.011856
MX12AB079-9	498.2	H	252137.5	<0.020029	0.08019	<0.021311	<0.011606	0.0312299
MX12AB079-10	498.2	H	268337.2	0.0500159	0.27577	0.10295	<0.02139	0.1130549
MX12AB079-11	498.2	H	254332.1	0.0428894	0.08832	12.05	0.030015	0.0782116
MX12AB079-12	498.2	H	248481	<0.029288	0.10068	12.4	0.038065	0.1040386
MX12AB079-13	498.2	H	253628.9	0.0265753	0.10687	14.717	0.047628	0.065587
MX12AB081-1	748.5	H	217692.1	0.0141728	0.02462	<0.031651	<0.01762	<0.030382
MX12AB081-2	748.5	H	221767.8	0.0477205	0.08896	<0.05178	<0.0066609	<0.0162
MX12AB081-3	748.5	H	237719.8	<0.029745	<0.03486	<0.036676	0.010087	0.0316683
MX12AB081-4	748.5	H	224605.7	0.0408604	0.1116	<0.025442	<0.010293	0.8567164
MX12AB081-5	748.5	H	222757.9	<0.020174	0.01763	<0.035156	<0.013212	<0.019082

MX12AB081-6	748.5	H	62390.57	11.551672	23.2144	14.5816	0.157898	2.8979136
MX12AB081-7	748.5	H	233295.3	<0.025453	<0.028762	<0.040784	<0.019515	0.0163759
MX12AB082-1	254.4	H	154715.2	0.0274908	0.0455	1.6627	0.025083	<0.0095431
MX12AB082-2	254.4	H	154963.8	<0.01831	0.01607	2.48075	0.013513	<0.0095938
MX12AB083-1	399.6	H	251083.8	0.030312	0.0766	0.21222	<0.019096	<0.025323
MX12AB083-2	399.6	H	243279.3	0.5248875	1.92815	0.17414	0.009175	0.1208818
MX12AB083-3	399.6	H	252868.2	0.1914965	0.88119	0.92661	<0.039368	0.3187663
MX12AB083-4	399.6	H	247354.5	0.0239582	0.04745	<0.039664	<0.013524	0.0496646
MX12AB083-5	399.6	H	246687.1	0.0224741	0.01969	<0.02303	<0.013445	<0.018007
MX12AB083-6	399.6	H	258173.2	1.2739396	2.42393	0.08341	<0.011056	0.3442233
MX12AB083-7	399.6	H	255177.7	<0.062931	0.0609	0.99139	<0.02477	0.0339895
MX12AB083-8	399.6	H	250959.1	0.0224995	0.03688	3.90153	<0.014045	<0.025248
MX12AB083-9	399.6	H	235956.1	0.0226896	<0.032287	<0.030457	<0.013931	0.018382
MX12AB083-10	399.6	H	260761.8	0.1008461	0.51604	<0.038374	<0.016821	0.0910222
MX12AB083-11	399.6	H	249581.2	0.0311302	0.10433	<0.038204	<0.013736	0.044544
MX12AB084-1	401.0	H	244230.1	<0.018943	0.02758	0.05042	<0.022308	0.0913898
MX12AB084-2	401.0	H	245261.4	0.0353309	0.12427	0.07128	<0.028084	0.0845221
MX12AB084-3	401.0	H	241305.9	<0.01939	0.02617	<0.034119	<0.019483	0.0162802
MX12AB084-4	401.0	H	242559.2	<0.016246	<0.028737	0.31584	0.011462	<0.026226
MX12AB084-5	401.0	H	244130.4	0.0651802	0.15012	0.30368	0.020299	0.0412004
MX12AB085-1	400.4	H	90466.06	1.5209432	2.97896	43.8382	0.578198	1.5865061
MX12AB085-2	400.4	H	264737	<0.031672	<0.034177	2.85493	0.022814	<0.049735
MX12AB085-3	400.4	H	252906	0.0246829	0.10044	<0.040267	<0.010197	0.0215415
MX12AB085-4	400.4	H	243900.8	<0.013105	0.02483	<0.022654	<0.011683	0.0127459
MX12AB085-5	400.4	H	278769.2	0.257225	0.96456	<0.051929	<0.023616	0.1003592
MX12AB085-6	400.4	H	243397.7	<0.02405	0.01763	<0.034624	<0.015829	<0.026723
MX12AB085-7	400.4	H	267383.3	<0.03573	0.07143	2.68298	<0.035354	0.0515711
MX12AB085-8	400.4	H	253769.9	<0.051042	<0.023998	<0.074835	<0.02482	<0.015786
MX12AB085-9	400.4	H	239268	<0.015173	0.01909	<0.017892	<0.0116	<0.010417
MX12AB087-1	244.7	H	258061.9	2.0880905	4.00618	0.04671	<0.024732	0.206349
MX12AB087-2	244.7	H	257410.3	0.0663963	0.28036	<0.030429	<0.009001	0.2520085

MX12AB087-3	244.7	H	247579.4	0.0247334	0.09628	0.04389	<0.014985	0.0283227
MX12AB087-4	244.7	H	240422.7	<0.018035	0.03909	<0.035855	<0.012219	0.0422737
MX12AB087-5	244.7	H	229472.2	0.0100287	<0.018617	0.05235	<0.010757	<0.022637
MX12AB087-6	244.7	H	252602.6	<0.014296	0.01504	<0.030389	<0.015543	0.0244104
MX12AB087-7	244.7	H	254463.5	<0.039777	<0.033889	<0.055638	<0.056366	<0.024723
MX12AB087-8	244.7	H	248605.8	0.0170358	<0.019608	<0.030424	<0.026397	0.0352136
MX12AB087-9	244.7	H	257598.2	<0.015914	<0.026968	<0.070715	<0.01135	0.0534123
MX12AB087-10	244.7	H	251976.4	<0.021136	0.03292	<0.03797	<0.017378	0.0282636
MX12AB088-1	246.8	H	245165.4	0.2887496	0.57171	0.14517	<0.055318	0.5170507
MX12AB088-2	246.8	H	250815.8	<0.0072495	0.07948	0.03732	<0.01881	<0.01697
MX12AB088-3	246.8	H	249498.8	<0.027087	0.02956	<0.04298	<0.016007	0.1935047
MX12AB088-4	246.8	H	261717.3	<0.015042	<0.020822	0.05049	<0.023306	0.0308462
MX12AB088-5	246.8	H	286391.1	<0.024312	0.0641	0.07655	<0.013817	0.1947634
MX12AB088-6	246.8	H	276547.6	<0.019647	0.07615	0.06088	<0.015697	0.2436473
MX12AB089-1	189.6	H	209597.5	<0.012895	<0.029678	<0.051282	0.021369	<0.017905
MX12AB089-2	189.6	H	208365.1	0.0154044	<0.023935	<0.033689	<0.014724	<0.019351
MX12AB089-3	189.6	H	195805.2	<0.022425	0.02837	<0.029858	<0.0090779	<0.011484
MX12AB089-4	189.6	H	188313.9	0.0595752	0.28479	0.02405	<0.025213	0.0495584
MX12AB089-5	189.6	H	266261.4	<0.063171	0.08081	<0.05424	<0.027958	<0.027774
MX12AB089-6	189.6	H	236715.9	<0.037482	<0.016842	0.10451	0.016268	<0.017393
MX12AB092-1	283.7	H	232605.7	0.0290324	0.03907	7.34127	<0.022147	<0.036808
MX12AB092-2	283.7	H	221332.7	0.0256719	0.03373	1.10181	<0.015265	<0.01835
MX12AB092-3	283.7	H	224919.6	<0.035627	0.03648	0.48727	<0.012418	<0.014249
MX12AB092-4	283.7	H	216963.5	0.0214536	0.08307	0.68425	<0.012653	<0.02275
MX12AB092-5	283.7	H	218063.5	0.0295544	0.0796	4.14984	<0.01488	<0.030525
MX12AB093-1	74.3	H	271202.2	0.0771777	0.16041	2.69745	<0.046339	0.1042222
MX12AB093-2	74.3	H	268335.7	0.0134252	0.07097	0.04627	<0.01642	0.0136921
MX12AB093-3	74.3	H	265020.8	<0.023064	<0.011615	0.02274	<0.008214	<0.016675
MX12AB093-4	74.3	H	248104.5	<0.010675	0.03132	36.3063	<0.029686	0.0290412
MX12AB093-5	74.3	H	266276.2	<0.016274	0.04079	31.6151	0.073811	0.1817784
MX12AB093-6	74.3	H	265374.1	0.0550419	0.06798	3.06934	<0.019157	0.0403278

MX12AB094-1	246.9	H	236354	<0.025916	<0.021892	<0.040528	<0.01953	<0.014204
MX12AB094-2	246.9	H	228983.7	0.02032	0.02301	<0.030826	<0.020186	<0.017862
MX12AB094-3	246.9	H	225025.4	<0.015212	<0.014356	<0.025802	<0.012872	<0.014952
MX12AB094-4	246.9	H	129405.8	44068.438	83533.1	88.6223	0.662843	272.61228
MX12AB094-5	246.9	H	231525.8	<0.022416	0.03607	0.02152	<0.013568	0.0560931
MX12AB094-6	246.9	H	228488.4	<0.01397	0.02697	<0.031659	<0.017108	0.0271257
MX12AB094-7	246.9	H	238108.7	<0.018585	0.03654	<0.037638	<0.01427	<0.01651
MX12AB096	120.9	H	242207.5	<0.021049	0.03015	<0.039804	<0.014529	<0.012054
MX12AB096	120.9	H	232368.7	<0.019815	0.0298	<0.01846	<0.0085417	<0.010856
MX12AB096	120.9	H	233750.3	0.0221597	0.0371	2.05559	<0.015153	0.0256785
MX12AB096	120.9	H	230305.2	<0.022505	0.02764	0.14612	<0.011424	0.0206423
MX12AB096	120.9	H	233090.1	0.0438528	0.09066	1.18325	<0.018784	0.0610633
MX12AB096	120.9	H	241117.9	<0.045323	<0.029974	<0.049047	<0.014935	<0.030669

Distance is distance from the center of deposit

H = hydrothermal

Sample	Distance (m)	Type	Ce140	Eu153	Gd157	Yb172	Lu175	Hf178	Ta181	Au197	Tl205	Pb208	Bi209
MX12AB003-1	628.4	H	0.8161662	1.3996047	19.215592	7.7225591	0.4985751	2.8852905	7.2556806	<0.15988	1.8131561	<0.32512	<0.0532
MX12AB003-2	628.4	H	0.4094208	1.5267775	2.6959652	0.5588265	<0.052506	0.2651842	1.447154	<0.13756	<0.092044	<0.092825	<0.0483
MX12AB009-1	359.9	H	12.867734	4.3268981	0.5437036	<0.22615	<0.049406	0.7483275	<0.066311	<0.27346	<0.17857	16.261585	1.77877
MX12AB009-2	359.9	H	20.229948	8.9504523	0.9335415	<0.41952	<0.094886	<0.23964	<0.048572	<0.41296	<0.12822	27.478023	0.08099
MX12AB009-3	359.9	H	40.302148	9.0449296	0.4879104	<0.36147	0.0414533	0.2195561	<0.043963	<0.26202	<0.10253	109.52791	<0.0779
MX12AB009-4	359.9	H	62.992928	8.9215305	1.9681723	0.5120734	<0.060657	0.3703911	<0.067509	<0.17943	<0.11309	90.349066	<0.0495
MX12AB009-5	359.9	H	31.59441	7.2039385	<0.32226	0.1696411	0.0334835	0.9348116	<0.058304	<0.29117	<0.092675	63.161716	<0.0897
MX12AB009-6	359.9	H	26.627323	7.6983199	0.5230286	<0.21734	<0.047518	0.3388559	<0.043843	<0.2733	<0.097505	138.40767	<0.0784
MX12AB009-7	359.9	H	16.84645	6.8495345	<0.45446	<0.19425	<0.042483	0.9747893	0.0706342	<0.21909	<0.1259	42.954449	15.1594

Appendix 6: Epidote mineral chemistry by LA-ICP-MS

Sample	Distance (m)	Type	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	V51	Mn55	Co59	Fe57
MX12AB003-1	628.4	H	<110.2151	13088.875	106892	186080.95	2385.7288	248998.26	6380.5919	78.35538	9027.6454	0.4228016	82162.252
MX12AB003-2	628.4	H	<97.5928	853.2133	103615.69	158631.94	127.77973	258998.19	1971.5871	54.005012	7808.3897	<0.45718	39964.416
MX12AB009-1	359.9	H	535.07238	642.99663	161025.11	207766.58	<43.3221	173998.78	60.627439	6.6769362	3627.9558	<0.51812	53026.151
MX12AB009-2	359.9	H	1019.7366	575.54141	168925.6	204181.21	<62.462	162998.86	140.72887	2.4108781	1780.2347	<0.55708	13067.03
MX12AB009-3	359.9	H	1580.2591	8.3805554	190845.7	198356.87	<43.0428	178998.75	137.846	<0.67918	227.4771	<0.61922	4672.3607
MX12AB009-4	359.9	H	2653.3928	11.360813	192472.17	204320.47	35.937956	179998.74	131.32858	<0.55679	253.73481	<0.48177	3443.5546
MX12AB009-5	359.9	H	<152.4759	264.98052	171938.09	178582.59	<33.8041	174998.78	507.59747	9.531101	463.00092	<0.39235	9587.851
MX12AB009-6	359.9	H	1119.0705	14.63156	178503.36	200051.28	46.576487	170998.8	109.326	<0.67426	375.26436	<0.36282	1845.8057
MX12AB009-7	359.9	H	3259.57	291.7964	153748.78	203713.64	<33.2642	167998.82	727.06063	30.143423	4119.6766	<0.4047	65401.821
MX12AB009-8	359.9	H	<271.8785	12.74622	172027.45	230154.76	<54.0522	165998.84	38.406207	<1.1006	306.95678	<0.63006	7669.258
MX12AB009-9	359.9	H	5465.3006	<13.987	191363.56	289236.32	<200.4077	173998.78	101.68918	<4.0207	118.85335	<1.6444	5168.874
MX12AB009-10	359.9	H	2240.455	491.66757	157442.98	172334.37	<42.1145	170998.8	60.201223	1.3803097	1593.9191	<0.47634	34008.9
MX12AB009-11	359.9	H	561.18423	427.28801	163548.7	212338.84	<45.089	168998.82	176.84841	3.1803564	2072.409	<0.61705	44518.149
MX12AB010-1	446.4	H	<112.5463	2921.7901	149234.26	188180.23	<28.0436	169998.81	3788.9451	243.17266	797.02347	1.3186223	63552.7
MX12AB010-2	446.4	H	<171.7813	14700.689	163926.06	214771.62	1548.3006	169998.81	1417.9607	101.48299	1442.951	4.0647919	66103.017
MX12AB022-1	2824.7	H	<147.2091	521.83731	114076.97	187890.31	<31.4982	153998.92	614.23745	337.56947	7375.793	0.4407459	116212.44
MX12AB022-2	2824.7	H	<210.1273	10580.534	121311.86	261991.53	87.905855	166998.83	426.59144	452.91102	3052.009	15.989058	160266.79
MX12AB022-3	2824.7	H	<192.7195	393.55217	118810.44	181110.85	134.33005	166998.83	546.31641	570.98934	2404.8356	1.0479755	129077.53
MX12AB022-4	2824.7	H	<157.6445	1095.2527	112110.66	186183.62	<57.699	147998.96	434.85594	367.65969	5004.743	1.8974814	123528.77
MX12AB022-5	2824.7	H	<124.0837	634.24708	107030.32	166143.34	112.88726	152998.93	244.83033	444.38966	2133.1681	1.0775188	117058.04
MX12AB022-6	2824.7	H	<163.3701	264.54401	111662.1	178602.62	<36.4776	155998.91	197.14436	392.2495	1089.3194	0.4437898	126156.7
MX12AB022-7	2824.7	H	<242.9066	181.98103	107194.02	195053.52	71.751657	158998.89	328.26444	380.85977	1534.5997	1.1350597	131436.38
MX12AB022-8	2824.7	H	<250.3975	461.12962	116642.98	214495.01	94.04552	165998.84	1033.3856	563.33365	1549.8522	2.6766665	137982
MX12AB022-9	2824.7	H	<216.9791	192.35897	139072.09	236721.31	<51.2013	191998.66	347.3613	372.95964	9784.1539	<0.87109	163064.77
MX12AB022-10	2824.7	H	<125.4337	84.670908	112058.02	189918.39	<39.8343	161998.87	971.73626	579.93221	1845.2716	<0.47575	128576.42
MX12AB022-11	2824.7	H	<267.0804	285.42708	104418.46	197140.29	49.122664	134999.06	584.20886	252.88118	7228.8597	1.0088345	123051.24
MX12AB022-12	2824.7	H	<248.9475	128.4935	106472.96	203934.31	<56.7969	157998.89	314.9978	518.41615	2074.253	<0.87662	143316.83
MX12AB027-1	425.4	H	<391.7601	455.01602	153521.72	233576.13	183.21725	184998.69	1722.6403	510.29898	2494.6424	<1.1298	85158.838

Sample	Distance (m)	Type	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	V51	Mn55	Co59	Fe57
MX12AB027-2	425.4	H	2736.7338	25.851839	192674.19	191861.58	<36.7401	183998.7	82.620293	<0.47522	186.38187	<0.49983	3108.7988
MX12AB027-3	425.4	H	541.94314	341.00355	119889.99	149870.89	39.074802	129999.08	1600.8594	70.027194	2437.2998	<0.52395	37650.084
MX12AB027-4	425.4	H	2386.148	14.222013	139084.51	154650.53	<47.3968	133999.05	99.066148	<0.82419	277.68205	0.6828058	3426.931
MX12AB027-5	425.4	H	<185.7842	21.576398	202343.91	174331.11	43.30589	198998.59	81.971755	<0.77357	176.86771	<0.52956	3455.9373
MX12AB027-6	425.4	H	1584.3382	294.69537	152495.58	164828.8	198.99129	182998.71	1319.5882	303.6455	2520.4472	<0.37039	52143.602
MX12AB027-7	425.4	H	1534.2378	76.539372	161979.14	153350.32	<29.7019	163998.84	830.22428	1.5301716	629.65719	<0.5199	8594.6156
MX12AB027-8	425.4	H	4051.7321	82.704574	181849.36	168247.93	106.32245	175998.76	203.96162	0.7051102	99.996991	<1.0287	4527.6482
MX12AB027-9	425.4	H	1436.4088	46.747652	176771.56	232939.9	<66.1773	179998.73	153.43682	<1.5274	419.56424	<1.1231	5345.1826
MX12AB027-10	425.4	H	<124.1594	386.64967	170594.43	171914.52	<33.8906	179998.73	558.95933	15.54812	4454.7324	<0.26635	36066.065
MX12AB027-11	425.4	H	466.46618	228.13806	174185.41	158747.76	<38.8128	182998.71	381.48293	0.9245983	903.86783	<0.54073	16299.702
MX12AB027-12	425.4	H	156.81353	171.48156	176766.65	192492.99	<30.2515	184998.69	1829.7711	138.42055	6580.0754	<0.5104	47671.669
MX12AB028-3	481.4	H	159.6613	4.101212	186750.76	211421.15	20.190754	184998.69	102.31153	<0.8048	203.43496	<0.54212	3297.4708
MX12AB029-1	481.4	H	<212.9348	34812.177	162266.2	212948.14	4100.4493	179998.73	43087.986	860.76346	3635.4962	5.7010285	151536.65
MX12AB029-2	481.4	H	<98.505	151.95743	114410.36	121617.34	773.79986	173998.77	135.38241	78.225106	1139.7584	0.2586821	27269.625
MX12AB029-3	481.4	H	<302.5771	182.64852	138445.99	218587.28	<57.2769	174998.76	140.15087	635.76249	2691.6595	<1.0469	92520.761
MX12AB029-4	481.4	H	<656.3601	2683.6982	150545.81	342154.36	1656.3716	175998.76	1358.105	1234.0923	2278.9203	2.8175881	85423.534
MX12AB029-5	481.4	H	<310.0394	560.13228	139629.07	222485.28	109.45106	177998.74	253.83188	821.48621	2555.0391	<0.70043	97346.287
MX12AB029-6	481.4	H	<137.6538	410.47018	143250.53	179439.39	278.50528	177998.74	235.39274	305.88545	985.84616	<0.40361	72329.124
MX12AB029-7	481.4	H	248.9876	3155.5749	178013.66	279794.69	12654.488	181998.71	6258.1441	1117.6056	3398.0458	<0.76076	87769.541
MX12AB029-8	481.4	H	2172.0729	89.27191	140985.3	205340.89	<45.8087	175998.76	130.92023	500.60532	2080.7916	<0.48398	91862.242
MX12AB029-9	481.4	H	<238.2857	610.30221	134685.71	213775.14	996.31721	175998.76	3295.6573	901.26699	1980.8829	<0.72529	94726.866
MX12AB029-10	481.4	H	<262.0369	821.15363	167809.54	230560.54	1871.1789	209998.52	2343.7202	670.68115	2225.5075	<0.57221	97905.367
MX12AB029-11	481.4	H	16241.067	779.73767	170056.54	278973.18	1777.2542	174998.76	693.93975	47.982333	2094.0979	<1.5046	63358.4
MX12AB029-12	481.4	H	13080.101	5554.3669	200516.34	393061	5556.2503	175998.76	5185.1073	167.50502	2443.163	0.6588063	64290.903
MX12AB032-1	546.7	H	322.04758	243.61262	160451.52	345545.41	<59.3529	161998.85	28.190127	1.6776133	801.23976	<0.52735	8721.2539
MX12AB032-2	546.7	H	4764.0769	439.34705	179338.17	285396.9	<50.2923	178998.73	51.288886	1.2578618	1096.6196	<0.69303	18240.56
MX12AB032-5	546.7	H	3775.2526	671.68166	193523.3	214569.36	<37.062	179998.73	105.04567	5.1517067	1330.6571	<0.61882	8914.6474
MX12AB033-2	134.0	H	425.1395	91.172167	154893.22	192531.06	90.492683	181998.71	52.027243	22.07175	887.56115	8.9186223	95679.75
MX12AB033-3	134.0	H	730.96725	128.38231	157710.36	192720.27	<27.847	183998.7	80.506785	15.615558	719.16402	1.8228628	69644.58
MX12AB033-4	134.0	H	873.74906	500.19498	184868.23	220339.78	593.45736	184998.69	494.0784	14.461604	588.97497	<0.88119	27059.946
MX12AB033-6	134.0	H	6044.3775	23.999931	189508.14	208774.02	192.74146	181998.71	154.57582	3.5075549	400.96209	<0.40269	4636.2362

Sample	Distance (m)	Type	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	V51	Mn55	Co59	Fe57
MX12AB039-1	403.7	H	1421.5649	200.74779	122067.79	218229.24	<61.1756	121999.15	14.93393	0.7839348	309.6692	<0.62972	2052.3378
MX12AB039-2	403.7	H	482.71461	362.18807	162139.39	651386.22	171.65835	164998.85	24.008669	<2.5364	271.16355	<2.0151	3337.1094
MX12AB039-3	403.7	H	<287.7539	254.28038	154428.98	189230.57	89.549792	155998.91	59.648849	0.9859689	363.59009	3.3043233	23663.181
MX12AB039-4	403.7	H	<117.5271	167.3963	139044.95	166781.37	<32.5903	147998.96	84.607833	69.561347	631.41747	<0.52302	29336.23
MX12AB039-5	403.7	H	<251.5468	645.40317	144833.9	241709.25	<70.6891	145998.98	73.386911	202.71636	682.28321	<0.73967	31090.91
MX12AB039-6	403.7	H	<185.459	938.40897	136820.14	168010.76	87.251513	147998.96	64.925392	10.525998	1406.5822	<0.78172	24534.14
MX12AB039-7	403.7	H	138.09829	357.39848	145253.75	187721.22	37.765677	151998.94	104.29193	34.723215	559.08434	2.0900256	28085.045
MX12AB040	187.3	H	1343.3157	1405.222	161393.29	196130.79	779.24472	169998.8	202.70828	363.06709	1468.9682	0.8159284	68947.269
MX12AB040	187.3	H	<1445.8744	698983.42	1042014.7	1117624.2	475.61444	169998.8	125943.62	4691.2814	48337.77	87.962382	1833568.6
MX12AB040	187.3	H	<4887.3567	955241.23	1378081.2	1852923.4	<913.9974	169998.8	120904.83	6249.6653	66944.797	115.85755	2580617.6
MX12AB040	187.3	H	7761.1015	521.84745	184297.02	239425.05	585.00034	169998.8	178.88361	<0.61406	534.07892	<0.56729	10508.86
MX12AB041	198.2	H	2061.9318	161.33542	171738.62	178335.38	416.7734	179998.73	288.70885	48.608299	835.75824	<1.151	35912.127
MX12AB041	198.2	H	822.45812	255.98676	149429.72	167869.22	977.25554	181998.71	99.890005	2.728816	659.12734	<1.3775	43015.513
MX12AB041	198.2	H	2045.6856	150.44056	164197.13	211345.19	135.01009	178998.73	840.72716	10.69531	2197.0418	<0.75446	29035.601
MX12AB041	198.2	H	<678.355	169.9183	167166.74	203298.01	476.73943	182998.71	52.610327	2.5901894	1119.7611	2.8730968	67200.345
MX12AB041	198.2	H	9366.2704	208.25337	178516.94	247936.07	<106.1344	176998.75	116.4984	14.89321	4680.2449	<0.65263	23813.823
MX12AB041	198.2	H	4301.2104	54.341273	192188.59	186282.69	<147.6615	184998.69	174.10196	5.3535392	1323.023	<1.4303	16247.908
MX12AB054-1	2784.0	H	77.855558	78.497971	110501.23	172412.69	<13.2058	164998.83	935.37244	429.08569	1122.5027	0.3428995	126720.74
MX12AB054-2	2784.0	H	<77.5979	61.854849	105357.88	180887.33	<20.3791	156998.89	461.98961	401.30417	1097.2118	<0.28452	126615.34
MX12AB054-3	2784.0	H	<75.3762	50.245625	108606.52	179479.72	<13.6071	159998.87	618.05139	419.87937	1323.9266	0.2227837	121230.77
MX12AB054-4	2784.0	H	<81.7586	48.371536	103385.56	192815.44	37.626569	153998.91	230.992	327.27892	944.40974	<0.22966	131644.3
MX12AB054-5	2784.0	H	<65.2385	37.944646	111634.39	180397.15	<12.6363	155998.9	374.49431	321.44721	1763.5969	<0.21113	120334.84
MX12AB054-6	2784.0	H	53.883444	39.7462	105087.78	160978.7	16.774951	142998.99	256.51119	297.00806	2376.7197	<0.16246	115646.41
MX12AB054-7	2784.0	H	<64.2441	80.087366	109169.08	180344.44	<14.0207	154998.9	757.40047	502.29586	1441.987	<0.22054	126669.66
MX12AB054-8	2784.0	H	<71.9214	112.61517	96719.569	167200.28	<20.4809	132999.06	463.46795	293.98072	956.82247	0.3194727	112102.69
MX12AB054-9	2784.0	H	<70.2747	48.810556	106254.91	171755.36	12.68991	154998.9	186.50024	412.02591	901.9863	0.1676446	122350.74
MX12AB054-10	2784.0	H	<60.9238	62.411263	105478.22	174726.48	<16.0805	153998.91	679.13845	440.06041	729.58882	0.2745234	121025.31
MX12AB054-11	2784.0	H	<60.135	101.17706	108960.41	176787.06	36.031424	160998.86	1011.8246	596.11148	846.51531	0.3972643	126305.32
MX12AB054-12	2784.0	H	<86.8609	57.809958	102031.96	179022.89	<18.5774	147998.95	529.13523	314.99391	2050.6108	<0.23723	125856.39
MX12AB054-13	2784.0	H	<104.6218	59.141331	107144.56	183856.84	<28.3078	161998.85	162.91596	904.23998	1075.7536	0.5230616	122536.66
MX12AB054-14	2784.0	H	<45.8063	1493.45	104765.33	157018.51	14.998762	153998.91	175.33002	1028.1489	968.62677	1.6597365	111660.98

Sample	Distance (m)	Type	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	V51	Mn55	Co59	Fe57
MX12AB056-1	873.3	H	<48.9742	977.95431	130054.98	163726.43	<15.3014	152998.92	853.54847	272.24156	2377.1635	0.358388	67801.757
MX12AB056-2	873.3	H	<138.4203	177.11839	140267.45	199272.88	119.07767	163998.84	1997.5017	372.99397	3100.7663	<0.27754	77089.114
MX12AB056-3	873.3	H	260.71244	39.690713	166997.17	176675.94	<19.1933	163998.84	589.94674	0.9062952	457.2305	<0.20029	4715.9738
MX12AB056-4	873.3	H	<67.4069	136.98548	139678.54	200794.86	87.085292	166998.82	558.77246	579.51359	2135.6009	<0.32375	75857.283
MX12AB056-5	873.3	H	<81.3458	201.03966	139205.19	200619.09	172.92286	158998.88	1399.7691	482.82326	4136.4694	<0.26147	72632.706
MX12AB056-6	873.3	H	<59.4036	131.15255	136813.97	187571.46	<15.7165	158998.88	400.62024	113.41158	5673.8768	<0.23791	70916.353
MX12AB056-7	873.3	H	<63.7826	157.20689	133376.48	187463.26	<18.0979	152998.92	1374.7092	101.04842	6617.9737	<0.26427	69935.83
MX12AB056-8	873.3	H	<83.9959	321.95772	156529.19	228082.85	<25.3723	183998.7	1234.5454	43.950648	6210.1962	<0.41654	86914.515
MX12AB057-1	403.6	H	<78.4115	478.1465	135804.2	188039	2120.1863	159998.87	1727.4012	457.27793	1834.1301	<0.24762	65808.674
MX12AB057-2	403.6	H	<103.7985	344.70041	133353.19	196383.9	1678.281	159998.87	1066.3875	386.90304	1798.2644	<0.41132	69250.88
MX12AB070-1	997.1	H	<52.9679	463.31427	151577.57	190850.37	17.778642	159998.87	173.38764	61.959765	2761.0299	<0.23971	28102.464
MX12AB070-2	997.1	H	1219.5427	3387.1937	153086.21	217679.91	129.59706	159998.87	191.41889	98.19656	2643.4808	0.7916977	34029.023
MX12AB070-3	997.1	H	<64.3055	718.02322	156656.22	177548.84	13.242133	159998.87	174.72208	105.28509	3108.5355	<0.22903	24692.761
MX12AB070-4	997.1	H	82.263512	675.93067	162119.91	202065.15	1065.7967	159998.87	1701.8947	68.666988	3351.0818	1.397007	85186.635
MX12AB070-5	997.1	H	<73.4638	269.43675	153812.95	232165.02	<15.9035	159998.87	64.767625	18.915521	868.57301	<0.29985	26346.1
MX12AB070-6	997.1	H	<52.8069	729.21683	160760.84	190228.1	<14.3977	159998.87	305.43329	22.82225	4135.9321	<0.23029	21175.399
MX12AB070-7	997.1	H	<57.1348	607.26261	153399.24	181607.38	29.874267	159998.87	234.44841	63.483123	1458.4658	0.1791103	32185.277
MX12AB076-2	207.3	H	<916.7475	132.82101	183367.11	226524.46	190.2165	187998.67	131.11325	<2.0801	5171.279	<1.5166	13582.856
MX12AB076-4	207.3	H	<1184.9763	127.63536	154501.72	311281.83	<158.228	178998.73	191.20703	13.492541	2679.8634	<1.3243	64235.645
MX12AB076-6	207.3	H	<1038.3535	270.1932	178319.12	237138.85	1883.7341	181998.71	255.74388	82.277323	6999.728	<1.2283	48789.537
MX12AB078-1	375.8	H	<1015.8887	419.04546	133039.51	188835.47	<97.5902	158998.88	937.4924	184.38704	5053.0303	<1.2217	67396.515
MX12AB078-2	375.8	H	7807.2636	4892.263	214986.81	290883.98	17865.446	199998.59	3887.2104	275.6843	4344.5411	1.5385988	112600.4
MX12AB078-3	375.8	H	<1076.5442	303.48906	188351.36	236273.09	648.26699	229998.37	2003.0859	159.34392	6270.7998	<1.174	82277.45
MX12AB078-4	375.8	H	<1161.2164	890.9417	148687.23	222989.98	2805.5644	176998.75	954.45141	364.08174	3558.9414	<1.2528	83792.216
MX12AB078-5	375.8	H	<814.7507	208.17994	143274.93	205255.7	849.88883	171998.78	1391.6003	324.03199	4176.9363	<0.83674	62740.132
MX12AB078-6	375.8	H	<882.544	1009.661	174355.02	227902.03	10972.838	169998.8	1612.6583	144.54948	10325.84	<1.1653	60948.45
MX12AB078-7	375.8	H	992.83595	628.37389	157077.13	186289.51	6305.9957	170998.79	1795.0341	121.1223	8815.2307	<1.0831	58118.081
MX12AB078-8	375.8	H	<1309.1422	2797.4827	201933.34	250970.97	21919.672	168998.81	2534.7135	131.9644	10369.7	1.0461415	73078.983
MX12AB078-9	375.8	H	<1417.0856	1574.769	171707.08	221000.78	4624.0749	169998.8	1295.3593	75.52794	4806.4259	<2.2715	74982.75
MX12AB078-11	375.8	H	16878.876	271.70604	191951.98	294027.72	505.58461	170998.79	172.54404	<2.9013	868.66428	<2.3483	12724.606
MX12AB078-13	375.8	H	1203.2518	696.60149	163490.89	224592.04	761.24577	179998.73	4517.9147	34.657817	2275.6235	5.1115264	60016.143

Sample	Distance (m)	Type	Na23	Mg24	Al27	Si29	K39	Ca43	Ti47	V51	Mn55	Co59	Fe57
MX12AB078-15	375.8	H	<1422.3219	288.47479	147505.13	217111.57	<150.8892	177998.74	2245.7425	58.326406	5433.7691	<0.96237	77116.074
MX12AB079-4	498.2	H	6848.0145	24.51604	194092.3	184453.59	62.593933	169998.8	472.77912	5.9471633	161.7686	<0.60805	3211.6311
MX12AB079-6	498.2	H	6590.1517	536.56777	179381.86	230321.1	46.120516	169998.8	4821.7145	60.179763	2817.5317	0.4838365	53114.681
MX12AB079-7	498.2	H	<217.6205	54.209933	183703.75	240271.03	<52.5066	169998.8	41.563649	1.3715063	1051.9464	<0.65716	7457.6928
MX12AB079-8	498.2	H	<183.972	524.63644	132115.58	165413.78	329.32596	169998.8	25661.072	183.89756	1029.0059	0.6594416	52012.548
MX12AB081-1	748.5	H	<229.8219	397.05935	186694.55	197809.23	310.73907	169998.8	684.22738	150.79531	401.25339	<0.3965	15276.203
MX12AB081-2	748.5	H	<199.2312	30.47247	181705.47	206141.06	<50.9467	169998.8	102.43926	<0.61018	1811.7505	<0.2819	7483.3122
MX12AB081-3	748.5	H	<233.7692	26.783406	185145.92	172599.24	<43.755	169998.8	90.367341	0.890198	2956.892	<0.30036	6441.9384
MX12AB081-6	748.5	H	<219.1244	162.01989	162970.06	206248.39	<50.0464	169998.8	377.76433	80.850641	7603.7301	<0.50058	58250.115
MX12AB094	246.9	H	351.52514	98.840053	182579.45	194406.99	223.16565	169998.8	205.12333	8.5944894	3297.3885	<0.42524	22486.006
MX12AB094	246.9	H	242.92055	3663.7464	98721.891	164946.68	<31.0788	169998.8	2600.4987	298.83535	5214.2806	4.0538404	111217.87
MX12AB094	246.9	H	<302.563	5789.0941	162473.64	288571.16	84.08325	169998.8	4346.1688	500.05669	8485.5648	6.9589993	193428.01
MX12AB094	246.9	H	<396.9733	6583.5794	163637.39	320040.15	<96.539	169998.8	6487.3345	587.21283	9092.338	7.1935118	219113.18
MX12AB096-2	120.9	H	<194.5013	1841.5853	133875.21	177569.77	2029.9653	169998.8	6106.8375	384.19045	1775.0512	0.8345131	99458.082
MX12AB096-4	120.9	H	<200.534	357.2749	163151.86	189885.76	112.05939	169998.8	1180.9786	568.88756	3920.5883	<0.50648	68329.613

Sample	Distance (m)	Type	Cu65	Zn66	As75	Sr88	Y89	Zr90	Mo95	Ag107	Sn118	Sb121	Ba137	La139
MX12AB003-1	628.4	H	<2.602	36.641412	<1.4447	13.059947	216.55278	81.060459	<0.72035	<0.26957	345.44502	1.519796	3.9298193	0.1854091
MX12AB003-2	628.4	H	<2.4793	21.047158	<1.8794	0.235645	20.858266	14.111899	0.517648	<0.23512	374.08306	0.1771613	<0.75656	<0.087253
MX12AB009-1	359.9	H	<3.2455	14.829558	11.111499	2143.2049	2.0968321	30.997147	<0.72457	<0.52187	0.4255578	0.7259807	2.8998285	7.4867089
MX12AB009-2	359.9	H	<5.2876	29.355054	<2.3735	1643.4545	3.0029674	1.5221196	<0.72273	<0.552	<0.53905	<0.66292	2.2228244	11.471593
MX12AB009-3	359.9	H	<3.8893	6.0187808	4.4382526	4764.0332	1.861898	3.6628047	<0.59003	<0.32148	<0.30702	<0.45829	19.959311	28.017231
MX12AB009-4	359.9	H	<4.4123	17.090905	3.0677916	4723.7292	2.969793	14.114709	<1.0069	<0.51226	<0.33028	<0.28715	28.683264	31.416335
MX12AB009-5	359.9	H	<3.3596	22.016555	2.1933901	3868.5884	1.3989477	26.049302	<0.57252	<0.34043	<0.3059	0.4359336	1.7893389	23.898716
MX12AB009-6	359.9	H	<3.3221	8.3606967	4.9527905	4034.5218	1.3297338	7.7037828	<0.65688	<0.41118	<0.31951	<0.22468	6.9337374	18.283381
MX12AB009-7	359.9	H	<4.0054	24.777973	12.408459	2936.3222	2.5082343	42.453932	<0.68576	<0.38834	4.2683708	42.002794	2.6748623	11.710265
MX12AB009-8	359.9	H	<5.4307	33.696334	14.861087	1823.7632	2.2410141	23.648829	<1.1037	<0.73914	<0.50405	<0.74354	<0.78878	17.265289
MX12AB009-9	359.9	H	<25.3569	58.160222	6.8091906	2017.8409	0.710399	3.0727923	<2.7329	<1.8739	<1.9272	<1.9205	<3.693	22.971312
MX12AB009-10	359.9	H	<3.6319	14.338155	10.086881	1716.44	1.1124986	28.757227	0.5176975	<0.3835	0.5860291	0.7471229	<0.92196	9.9485251
MX12AB009-11	359.9	H	<2.6425	11.443753	21.1314	2832.4675	5.5608197	3.6066427	<0.67629	<0.36178	1.0057534	2.5946342	<1.1692	28.222904
MX12AB010-1	446.4	H	<3.4099	21.85244	<1.6453	2865.2611	1.272502	0.2452153	<0.43746	<0.33351	7.7132383	4.1265839	<1.0934	1.1806272
MX12AB010-2	446.4	H	11.974257	85.534091	<1.8318	4154.1763	24.964451	<0.3101	<0.77926	<0.27554	8.0664175	2.8411896	15.165527	5.3425508
MX12AB022-1	2824.7	H	<2.9748	2.2194134	1.5436051	18622.716	97.050461	21.240228	<0.52791	<0.48334	7.757615	0.6530196	54.301949	42.238821
MX12AB022-2	2824.7	H	5.9032689	47.863963	<4.0566	14604.396	49.686446	14.875217	<1.3753	<0.80329	2.6164183	1.5650665	67.567655	8.4395405
MX12AB022-3	2824.7	H	6.8981929	<2.889	2.6435655	8722.4701	91.246125	16.706416	<0.85861	<0.54233	2.5416051	0.806401	42.115224	9.9973042
MX12AB022-4	2824.7	H	<5.0568	<2.7214	<2.651	19261.111	46.201421	14.186867	<0.71225	<0.50928	3.3268129	1.0036488	56.862193	25.52386
MX12AB022-5	2824.7	H	5.2298429	3.5280101	2.1039797	11053.828	41.987081	6.9992196	<0.46445	<0.31179	1.8703028	1.5012434	37.924091	4.9522576
MX12AB022-6	2824.7	H	<3.1297	3.3323687	2.7374811	12974.035	56.461873	57.603414	<0.57578	<0.36169	4.816933	0.6702248	15.886796	5.9521906
MX12AB022-7	2824.7	H	<6.3911	<3.6561	<2.9534	9900.5397	14.842993	13.140621	<0.6618	<0.66071	0.9528988	0.9667864	30.823869	1.0835
MX12AB022-8	2824.7	H	8.8270496	4.8492396	3.0408369	6510.774	31.978725	24.008127	<1.2115	<0.65278	1.0784562	1.3066267	17.935967	1.693535
MX12AB022-9	2824.7	H	<4.6582	<4.125	3.0674477	24451.131	18.328074	5.4907012	<0.70168	<0.57539	2.5294026	<0.70568	74.758947	0.6267404
MX12AB022-10	2824.7	H	<3.3661	2.5139149	2.5607615	9201.4293	18.264327	15.019237	<0.5571	<0.33612	1.2749338	1.371028	36.418927	0.6876003
MX12AB022-11	2824.7	H	<4.0031	<3.3233	4.8307538	19544.723	26.657519	13.090145	<1.0935	<0.64334	3.3846271	1.0844744	39.041543	2.4737134
MX12AB022-12	2824.7	H	<5.1444	<3.2823	2.5464153	6640.3577	22.320265	14.932775	<0.85064	<0.69619	1.1505387	<0.65058	6.5052859	0.3385321
MX12AB027-1	425.4	H	<6.9785	4.5163049	<4.3668	5123.0655	7.778581	7.8467943	<1.8879	<0.482	6.1425476	<0.6292	14.938132	3.6293662
MX12AB027-2	425.4	H	<2.8865	1.2049719	2.6536802	3831.917	31.185922	8.0674962	0.4458799	<0.16091	0.2229736	0.3077328	17.464589	26.292772
MX12AB027-3	425.4	H	<2.0554	5.0693794	7.6953072	2103.0515	3.8490531	18.344641	<0.53824	<0.21245	1.9887972	1.0457305	4.2039267	6.1762148

Sample	Distance (m)	Type	Cu65	Zn66	As75	Sr88	Y89	Zr90	Mo95	Ag107	Sn118	Sb121	Ba137	La139
MX12AB027-4	425.4	H	<3.692	4.7058863	10.275647	2261.8906	0.5028389	2.4293844	<0.96175	<0.34762	<0.39475	<0.21892	<0.79925	10.247328
MX12AB027-5	425.4	H	<2.346	4.402294	5.4905183	5315.3516	1.3352279	5.2217535	<0.45955	<0.16371	<0.33399	<0.3932	25.844949	6.4242962
MX12AB027-6	425.4	H	<2.9985	13.203918	11.793361	1419.147	2.4621729	27.732875	<0.56615	<0.32013	4.4568303	0.9062599	19.40387	5.5723521
MX12AB027-7	425.4	H	<3.2876	2.0204028	0.8975222	3785.9467	2.538701	5.2358017	<0.47285	<0.23995	<0.29558	<0.13802	3.1675713	11.639746
MX12AB027-8	425.4	H	<3.3999	18.453379	2.6669486	2015.8115	0.604209	<0.24571	<0.63429	<0.32702	<0.30425	<0.4652	4.2100173	5.1616772
MX12AB027-9	425.4	H	<6.6934	3.5568199	6.9157392	2863.4476	1.6731976	6.0926729	<2.2478	<0.5735	<0.70137	<0.38377	4.8484454	10.265425
MX12AB027-10	425.4	H	<2.7803	5.4534727	5.1647062	2978.4615	14.245373	38.65162	0.4077132	0.147547	0.9197638	<0.31639	3.9322306	10.779933
MX12AB027-11	425.4	H	<5.0335	20.556902	8.0686698	2645.1289	1.9570404	6.6089506	<0.91085	<0.24957	0.5034986	2.2670307	11.138909	30.503634
MX12AB027-12	425.4	H	<3.2289	9.6868154	7.3293804	4152.0905	11.429938	8.3532109	0.4704542	<0.32616	2.7779618	99.214593	2.792957	14.020681
MX12AB028-3	481.4	H	<3.5588	6.0397255	6.3115153	3474.9797	1.0212082	10.239197	<0.90235	<0.25545	<0.28935	<0.35464	7.3438406	21.013704
MX12AB029-1	481.4	H	<3.5596	191.75667	<2.5094	2375.3777	23.941002	1.3054786	113.78587	<0.46977	15.683675	3.2511887	37.862798	17.660655
MX12AB029-2	481.4	H	<1.7912	4.3372171	4.060353	2357.8173	7.4298684	2.5211161	<0.50377	<0.23525	<0.22044	0.4765362	8.7310823	7.1211458
MX12AB029-3	481.4	H	<5.333	6.7866255	<4.6591	2371.3633	<0.21059	<0.38548	<1.1177	<0.39689	6.6071222	<0.61473	5.6978745	<0.23591
MX12AB029-4	481.4	H	<8.8932	46.790165	<7.8346	1741.6465	18.133049	39.506915	<2.2568	<1.4173	60.284274	1.8274681	23.063133	13.9021
MX12AB029-5	481.4	H	<7.1594	18.23903	2.4021652	2356.5115	<0.31395	0.8734704	<0.81235	<0.55238	11.183583	<0.7328	3.8272563	0.4393314
MX12AB029-6	481.4	H	8.690726	10.050517	1.794088	2444.4209	1.6641389	4.3069974	0.8021531	<0.16888	0.7502953	2.4006366	3.6504728	26.776068
MX12AB029-7	481.4	H	<6.729	10.358637	2.2801094	4168.0928	11.639913	15.405582	1.8058799	<0.56991	21.779221	<0.62155	61.239247	124.24396
MX12AB029-8	481.4	H	<3.8712	1.5500336	<3.3287	3019.1666	1.141507	1.7648166	<0.60518	<0.44833	2.8449321	<0.32478	9.2155497	1.5804086
MX12AB029-9	481.4	H	<3.3399	14.265792	1.6947811	1598.1058	10.862193	5.025311	<1.014	<0.36297	25.078505	1.0622777	12.697989	26.810377
MX12AB029-10	481.4	H	<4.1589	10.626234	<3.6038	2567.6904	4.3914038	2.3473792	<0.95117	<0.51688	10.994485	<0.61292	12.077628	20.938576
MX12AB029-11	481.4	H	<15.3708	19.868256	<5.1188	1887.6704	2.4063995	27.767006	<1.3006	<1.0891	<0.69533	1.0313076	34.743149	30.329855
MX12AB029-12	481.4	H	<4.6117	17.725953	<4.5278	2438.6301	8.91454	8.6446967	0.7561794	<0.511	1.9969748	0.670794	368.54321	12.503425
MX12AB032-1	546.7	H	<5.3306	<3.2521	<4.1851	1383.6765	3.2815339	3.2151916	<1.1422	<0.46533	0.4578643	<0.76872	3.0773198	4.9712898
MX12AB032-2	546.7	H	<3.1469	4.2465553	<2.6714	1302.4092	2.298914	3.0648293	<0.68841	<0.22222	0.5207801	<0.57876	2.7729277	1.5511031
MX12AB032-5	546.7	H	<3.5746	10.71281	<2.5931	1302.3649	2.520459	5.4305816	<0.58712	<0.24612	0.380839	<0.35672	2.5397036	8.1196572
MX12AB033-2	134.0	H	8.4222434	2.8645165	<1.7	2989.6268	0.7227639	0.4524435	<0.5917	0.2087035	<0.29091	<0.16801	2.7602276	1.5102756
MX12AB033-3	134.0	H	3.3713092	3.499196	1.9104003	2508.865	2.4360837	1.0584231	<0.27334	<0.18106	0.1857407	<0.2155	1.3158627	13.529587
MX12AB033-4	134.0	H	<3.576	26.03137	1.0438454	1957.3593	0.3152619	0.7380854	<0.57451	<0.51567	0.4167045	0.2818598	25.571697	2.8228003
MX12AB033-6	134.0	H	<4.0752	9.9366897	3.070845	3229.5032	1.131925	28.586021	<1.0353	<0.38463	0.2408648	<0.37382	7.8792103	19.022254
MX12AB039-1	403.7	H	<4.9022	4.2399754	<2.51	930.9793	3.1718401	10.115076	<0.97814	<0.84221	<0.28561	<0.58129	2.4306136	1.4080095

Sample	Distance (m)	Type	Cu65	Zn66	As75	Sr88	Y89	Zr90	Mo95	Ag107	Sn118	Sb121	Ba137	La139
MX12AB039-2	403.7	H	<15.4186	8.6791025	<6.6134	1323.7484	3.1182604	1.4203805	<2.6555	<1.3116	<1.2254	<1.309	<3.0532	3.2112565
MX12AB039-3	403.7	H	8.236236	4.3743253	<3.5607	1185.1844	1.521358	2.4623799	<0.77784	<0.62992	0.2925384	0.4027774	2.6624643	0.706168
MX12AB039-4	403.7	H	<2.6242	<1.2611	<2.0917	1781.7871	5.4409652	0.5881021	<0.3611	<0.31	13.826534	<0.40697	<0.87954	1.4488981
MX12AB039-5	403.7	H	<5.5584	4.7119117	<4.2576	2359.2506	19.557707	3.1393091	<1.2744	<0.53837	17.652086	<0.52577	2.1042783	12.412639
MX12AB039-6	403.7	H	<4.6716	2.0492434	<3.6929	923.04604	<0.14054	0.2409141	<0.46752	<0.4384	1.435138	<0.4844	5.166488	<0.14572
MX12AB039-7	403.7	H	<2.9347	5.1611007	<1.8311	976.98105	5.6367561	10.265587	<0.47483	<0.29172	0.9114671	<0.2684	0.8994831	0.851208
MX12AB040	187.3	H	<4.3869	20.749167	<2.3324	5576.5294	1.5506274	0.5152125	<0.6331	<0.26801	0.2888608	0.6441156	7.8521812	8.2725736
MX12AB040	187.3	H	<19.0973	5170.6284	<7.8779	91.290089	8.126595	14.253314	<2.981	<1.1284	7.2617227	<1.7622	29.691439	<0.66577
MX12AB040	187.3	H	<79.1969	11031.039	<33.1551	115.96411	19.24536	1377.771	<8.6005	<4.4083	6.3227211	<4.2161	43.571222	<0.997
MX12AB040	187.3	H	<4.3895	32.098082	3.2260011	3164.1008	3.1286206	8.1060222	<0.34544	<0.20414	<0.27052	7.7839261	5.4024162	17.970493
MX12AB041	198.2	H	<6.8699	<4.3235	<5.0283	4288.2249	24.969589	2.9918932	0.9681408	<0.56998	1.0646986	1.6778691	17.690461	10.028961
MX12AB041	198.2	H	<8.6696	<5.7007	<4.8837	3001.5919	28.854837	7.396301	<1.2814	<0.54524	0.7959835	14.666607	17.55222	16.228799
MX12AB041	198.2	H	<6.9783	<4.5279	<4.5318	5266.759	133.86939	4.5661591	<1.1706	<0.48008	1.9195192	1.5128103	2.9389482	82.388079
MX12AB041	198.2	H	11.168144	3.0601853	<7.0939	2771.3987	72.577612	1.0321418	<1.1622	<0.46189	0.4362212	9.5731782	7.0381067	52.720322
MX12AB041	198.2	H	<6.9195	3.04904	<7.7029	4880.7793	1.6257097	3.5891207	<1.1709	<0.57489	0.4454337	<0.43966	4.9921395	4.6928823
MX12AB041	198.2	H	<8.8859	<10.1754	4.8328776	3734.1476	3.1303784	3.0344409	<1.8694	<0.83272	1.197098	0.9054892	19.410108	33.334176
MX12AB054-1	2784.0	H	2.6695871	1.4217715	2.8960988	5279.091	56.025386	30.239862	<0.32185	<0.13389	1.288839	1.2668288	11.920425	2.8895794
MX12AB054-2	2784.0	H	2.0089508	<1.1183	1.7421839	4426.5848	140.08559	14.741793	<0.21694	<0.23034	2.0196974	0.4127175	6.1319047	9.4063061
MX12AB054-3	2784.0	H	1.2632281	<1.4291	1.7357565	3602.7518	65.791285	7.7260134	<0.18091	<0.20949	0.95548	0.4295138	7.0470899	3.0856074
MX12AB054-4	2784.0	H	2.9281177	<0.99191	<0.94988	8046.8121	24.528431	4.2205514	<0.38199	<0.1689	1.7058782	0.8954117	12.113122	0.8496912
MX12AB054-5	2784.0	H	2.563086	0.9334092	1.9778459	9156.6772	16.529343	2.1255255	<0.31406	<0.16821	0.8434733	0.7333458	21.688328	0.2861127
MX12AB054-6	2784.0	H	4.0328975	<1.3248	1.7218954	15961.591	18.626225	2.4909633	<0.25629	<0.15168	0.6011507	0.8938199	32.207162	0.1858845
MX12AB054-7	2784.0	H	2.8895547	1.5658482	2.0523211	11086.943	53.597288	17.201886	<0.32322	<0.13372	1.6011295	2.048125	44.753239	2.5672413
MX12AB054-8	2784.0	H	2.9674161	<1.5549	2.0876871	25482.636	51.160465	13.897954	<0.33375	<0.19766	1.9641201	1.1406446	78.063532	4.7321311
MX12AB054-9	2784.0	H	1.3381384	1.2340787	1.2719566	12381.717	25.243453	10.209429	<0.25041	<0.16827	1.6531606	1.0188272	21.758737	1.1357633
MX12AB054-10	2784.0	H	1.7368643	1.2589425	1.0468283	5185.4904	77.244399	8.2787833	<0.32582	<0.17469	1.1596679	0.7987422	16.942901	0.5673362
MX12AB054-11	2784.0	H	1.4264767	1.1280603	1.2295643	7141.8476	41.943972	26.353859	<0.301	<0.13778	0.8777325	0.9219077	20.556349	0.9377685
MX12AB054-12	2784.0	H	<2.077	1.057544	<1.3517	10818.392	68.053898	10.528505	<0.31278	<0.24687	1.6461351	0.8998791	15.132016	2.5877464
MX12AB054-13	2784.0	H	<1.8521	1.8735083	<1.4289	230.95858	48.691167	15.866532	<0.54199	<0.30363	1.8007723	0.583188	30.500641	3.5538961
MX12AB054-14	2784.0	H	<1.3035	7.0634561	<0.72625	478.93292	80.783775	26.268713	<0.28138	<0.13806	1.8535403	0.4679721	31.783865	5.727363

Sample	Distance (m)	Type	Cu65	Zn66	As75	Sr88	Y89	Zr90	Mo95	Ag107	Sn118	Sb121	Ba137	La139
MX12AB056-1	873.3	H	<1.2697	18.383331	<1.1727	4270.045	1.7495853	3.661486	<0.21743	<0.14818	116.06966	<0.21137	4.0758467	1.0884105
MX12AB056-2	873.3	H	<3.7239	6.1982399	<1.9116	3934.2157	4.8122329	4.15026	<0.75295	<0.3777	74.165404	<0.3347	13.182386	0.1723542
MX12AB056-3	873.3	H	<1.607	11.269386	<0.87845	1903.6451	1.1574505	17.038159	<0.4243	<0.29366	0.2530598	<0.10063	2.1880581	26.284753
MX12AB056-4	873.3	H	<1.9834	8.7381625	<1.6422	3054.2992	17.897837	7.1585749	<0.45252	<0.24157	89.436729	<0.24834	4.5687662	0.9855889
MX12AB056-5	873.3	H	<2.8275	8.8626797	1.7061289	4025.3468	19.919683	30.096346	<0.29737	<0.24664	122.10283	<0.19175	21.124905	14.55024
MX12AB056-6	873.3	H	<1.5752	12.447618	18.354894	1443.6796	22.221907	10.658799	<0.30642	<0.22967	5.2114578	0.698742	0.6212256	34.631905
MX12AB056-7	873.3	H	<1.8307	17.414512	16.745622	1736.35	6.1563309	12.800566	<0.34229	<0.17028	7.025685	5.5102077	1.2637299	5.9996596
MX12AB056-8	873.3	H	<2.6561	20.704062	16.160523	1943.9071	3.1312146	7.647412	<0.4091	<0.34544	1.4328439	0.5226034	1.3134129	2.4624125
MX12AB057-1	403.6	H	<1.2373	12.937777	<1.0731	2353.27	14.275712	5.9516729	<0.28563	<0.21122	45.638313	1.4470898	24.584514	1.5277918
MX12AB057-2	403.6	H	1.4794688	10.621446	<1.7519	2673.5691	12.518137	9.8115242	<0.47922	<0.29329	63.72812	0.1564798	19.179442	0.7640971
MX12AB070-1	997.1	H	<1.7784	2.54081	1.6067192	2154.3978	17.82006	14.460751	<0.36432	<0.18341	4.8437864	0.1440601	2.5993425	0.3851603
MX12AB070-2	997.1	H	3.1182791	17.932193	3.2749685	1815.7862	7.8622465	14.270349	<0.81001	<0.4318	3.6342244	<0.44362	11.674331	9.9220633
MX12AB070-3	997.1	H	<1.249	5.8587684	1.6484579	1887.3504	17.921001	14.417985	<0.32798	<0.16415	3.2158561	<0.13252	4.8217715	1.596938
MX12AB070-4	997.1	H	214.92062	66.871355	4.8472759	2606.8791	9.0211107	19.279808	41.271683	<0.28723	5.8375758	0.3920573	39.714119	2.0713259
MX12AB070-5	997.1	H	<1.9997	2.0689394	<1.233	2364.5443	0.9729836	0.3643313	<0.24331	<0.15753	3.2887559	<0.15622	2.4144623	0.1186056
MX12AB070-6	997.1	H	1.4709462	3.0377537	2.2526563	2698.2473	3.5823921	19.006419	<0.22654	<0.1453	3.5115473	0.2717487	5.6905716	0.1334914
MX12AB070-7	997.1	H	12.323382	7.5632608	1.298556	1453.0355	17.866913	17.796658	0.7874297	<0.18334	5.5938981	0.2672121	2.4751674	0.4704028
MX12AB076-2	207.3	H	<8.1107	31.929761	15.316387	3416.984	4.4546065	14.707285	<1.4439	<0.60785	<0.51597	<0.70368	6.9205948	59.272748
MX12AB076-4	207.3	H	<10.8926	11.761699	6.5807947	5452.2486	334.37263	13.98486	<1.2348	<0.8697	3.1241648	27.510975	<2.5352	25.744883
MX12AB076-6	207.3	H	<13.0088	14.540103	7.322746	3671.3094	6.478278	13.886317	<1.4556	<0.72135	3.5652275	4.5346949	46.968468	14.205646
MX12AB078-1	375.8	H	<8.0924	14.624189	20.649568	1851.931	7.6194302	23.780921	<1.4094	<0.75803	6.7074288	15.131209	2.2241672	3.2341709
MX12AB078-2	375.8	H	<9.9472	92.84253	5.0025398	2685.9551	28.028242	18.619988	<1.3257	<0.93436	13.163736	3.2950532	320.8665	20.855563
MX12AB078-3	375.8	H	<9.3239	19.221249	10.928093	3040.3436	5.5212761	33.881244	<2.0285	<0.70982	5.1588146	3.7218413	19.001221	4.9808957
MX12AB078-4	375.8	H	<10.1394	12.361525	9.1544096	3232.4279	40.006006	16.989675	<1.5371	<0.8691	26.242026	0.4853109	155.29725	6.0853905
MX12AB078-5	375.8	H	<8.0929	9.5780466	7.3908641	2952.2735	22.907912	12.472067	<0.99687	<0.49118	19.495993	2.7743298	75.642339	7.9473986
MX12AB078-6	375.8	H	<8.5507	11.631931	5.5653058	3872.1531	13.247201	28.392084	<1.1325	<0.69131	9.8221403	7.3524982	466.52547	3.588632
MX12AB078-7	375.8	H	<6.9753	5.5238153	6.1886974	3321.69	8.0630275	41.637551	<1.3261	<0.4979	17.999794	18.018939	225.48091	9.3089181
MX12AB078-8	375.8	H	<16.406	23.763164	<10.6395	3976.2687	12.136862	53.675893	1.5563096	<1.1314	23.821094	2.4462298	420.74319	11.118377
MX12AB078-9	375.8	H	<12.7409	18.380603	11.613162	2399.9891	5.1537749	39.422962	<1.1825	<1.0124	6.3746298	2.9698442	62.614426	13.69321
MX12AB078-11	375.8	H	<15.864	39.424496	6.0832532	3264.5056	3.4864545	7.705086	<2.7694	<1.4224	<0.78476	<1.415	47.194721	26.972819

Sample	Distance (m)	Type	Cu65	Zn66	As75	Sr88	Y89	Zr90	Mo95	Ag107	Sn118	Sb121	Ba137	La139
MX12AB078-13	375.8	H	<10.0837	17.261472	6.4491115	3355.982	4.2208205	18.855444	1.1449047	<0.93664	3.5704027	<0.61724	7.3806977	19.885323
MX12AB078-15	375.8	H	<10.7938	15.158234	13.190665	2342.7296	8.9058279	40.877396	<1.6173	<0.96399	3.7303784	2.0083001	<2.6334	6.1423206
MX12AB079-4	498.2	H	<6.3499	25.502326	<2.6071	2400.5483	0.9844568	13.188662	<0.94953	<0.46748	0.1887407	<0.27668	8.6692752	16.75709
MX12AB079-6	498.2	H	<3.1602	14.315435	4.5108354	3183.93	3.0813571	39.511624	<0.28685	<0.2411	1.3910459	<0.23518	9.9333098	34.772107
MX12AB079-7	498.2	H	<2.9875	17.511714	11.804648	1769.7629	2.2883151	2.371066	<0.66426	<0.2977	0.1067985	1.0118699	0.7173868	15.540957
MX12AB079-8	498.2	H	<3.207	5.6310593	<1.4282	3079.9092	0.9958266	1.0721415	<0.22214	<0.2131	4.1885705	<0.21537	24.599372	1.185645
MX12AB081-1	748.5	H	<3.6825	6.9685503	<0.96677	2081.7114	<0.12073	0.308297	<0.37241	<0.23145	1.4376086	<0.29077	4.7629338	0.2112892
MX12AB081-2	748.5	H	<3.2223	19.048572	3.3210349	3449.8814	2.5724134	13.300807	<0.34798	<0.20251	0.1923128	2.1949687	2.9522293	18.730863
MX12AB081-3	748.5	H	<4.0204	14.847963	3.9583468	3196.0797	3.5449989	14.301029	<0.29518	<0.26968	<0.16266	3.324893	3.3198754	19.776369
MX12AB081-6	748.5	H	<3.9226	8.7042604	9.7317954	3103.4969	6.914004	14.026341	<0.45067	<0.16569	0.2502145	3.9686955	4.1344801	7.1321615
MX12AB094	246.9	H	2.3489405	15.449304	3.6624764	2743.2731	4.2386096	15.974137	<0.304	<0.15153	0.6032003	1.9785634	3.2633042	40.651908
MX12AB094	246.9	H	<1.9062	232.84476	17.215251	460.0668	1910.7905	10.084165	<0.35893	<0.15767	14.4721	<0.25815	2.9829809	31846.794
MX12AB094	246.9	H	<4.4446	420.70274	29.960504	673.67748	2487.7493	16.424875	0.4251783	<0.1776	25.566706	<0.26764	4.9309653	52636.544
MX12AB094	246.9	H	<7.8835	504.71307	34.358305	670.44792	2630.3833	21.322706	<0.58887	<0.50874	25.804953	<0.55198	15.25392	70338.077
MX12AB096-2	120.9	H	<2.4497	23.465246	2.5773512	3507.969	23.813631	6.8117274	<0.33537	<0.29509	1.1987279	<0.29864	77.64228	7.2062702
MX12AB096-4	120.9	H	<3.7609	8.5579583	10.790717	4402.1195	5.7473682	17.31184	<0.51624	<0.17141	6.4636519	5.9023141	15.218866	4.5065522

Sample	Distance (m)	Type	Ce140	Eu153	Gd157	Yb172	Lu175	Hf178	Ta181	Au197	Tl205	Pb208	Bi209	Th232	U238
MX12AB003-1	628.4	H	0.8161662	1.3996047	19.215592	7.7225591	0.4985751	2.8852905	7.2556806	<0.15988	1.8131561	<0.32512	<0.053237	<0.035154	3.1253536
MX12AB003-2	628.4	H	0.4094208	1.5267775	2.6959652	0.5588265	<0.052506	0.2651842	1.447154	<0.13756	<0.092044	<0.092825	<0.048387	<0.029961	3.0991533
MX12AB009-1	359.9	H	12.867734	4.3268981	0.5437036	<0.22615	<0.049406	0.7483275	<0.066311	<0.27346	<0.17857	16.261585	1.7787796	0.1868085	0.4119889
MX12AB009-2	359.9	H	20.229948	8.9504523	0.9335415	<0.41952	<0.094886	<0.23964	<0.048572	<0.41296	<0.12822	27.478023	0.0809946	0.1140049	0.1375417
MX12AB009-3	359.9	H	40.302148	9.0449296	0.4879104	<0.36147	0.0414533	0.2195561	<0.043963	<0.26202	<0.10253	109.52791	<0.077951	0.3454164	0.3333031
MX12AB009-4	359.9	H	62.992928	8.9215305	1.9681723	0.5120734	<0.060657	0.3703911	<0.067509	<0.17943	<0.11309	90.349066	<0.049523	0.6150631	0.7736848
MX12AB009-5	359.9	H	31.59441	7.2039385	<0.32226	0.1696411	0.0334835	0.9348116	<0.058304	<0.29117	<0.092675	63.161716	<0.089733	0.2056208	0.3389206
MX12AB009-6	359.9	H	26.627323	7.6983199	0.5230286	<0.21734	<0.047518	0.3388559	<0.043843	<0.2733	<0.097505	138.40767	<0.078447	0.2543414	0.3522254
MX12AB009-7	359.9	H	16.84645	6.8495345	<0.45446	<0.19425	<0.042483	0.9747893	0.0706342	<0.21909	<0.1259	42.954449	15.159496	1.4144746	0.6367105
MX12AB009-8	359.9	H	22.734443	9.557304	0.5733985	<0.37776	<0.073971	0.9151272	<0.060685	<0.47841	<0.15093	38.909232	0.8506487	0.2425015	0.7061319
MX12AB009-9	359.9	H	34.408547	9.9711192	<1.6606	<1.0496	<0.23987	<0.89981	<0.20362	<1.1736	<0.44352	30.116879	<0.29693	0.2186177	0.3210656
MX12AB009-10	359.9	H	14.109932	5.9983247	<0.36398	<0.24296	<0.027498	0.7493774	<0.080033	<0.31893	<0.13108	15.554684	<0.086003	<0.048287	0.3512231
MX12AB009-11	359.9	H	41.862538	12.413154	0.8309613	0.2728666	0.0563506	0.1742474	<0.079183	<0.31831	<0.19869	45.244544	<0.086228	0.4955696	0.776207
MX12AB010-1	446.4	H	0.9558701	0.4177982	<0.48005	0.1787386	0.0388019	<0.060506	0.1090152	<0.22325	<0.081949	12.81671	0.9611873	0.7643658	0.1095638
MX12AB010-2	446.4	H	7.2813865	1.0706692	0.8861079	4.575131	0.6622716	<0.18635	<0.063096	<0.32482	<0.12789	33.960424	0.8047847	1.8577655	0.0993625
MX12AB022-1	2824.7	H	77.980139	10.962646	22.522311	6.6940176	0.7638077	0.7945368	<0.074627	<0.28296	<0.17051	12.691531	0.4220062	0.1355483	1.8869513
MX12AB022-2	2824.7	H	16.752653	5.2156146	11.318853	1.4317908	0.183717	0.3990131	<0.079808	<0.54576	<0.28504	18.400444	<0.21733	<0.14917	0.4887782
MX12AB022-3	2824.7	H	20.596888	6.4053709	13.191272	3.690639	0.4311137	0.5871483	<0.051149	<0.3189	<0.18963	13.261196	<0.14454	0.0918961	0.8321875
MX12AB022-4	2824.7	H	62.128432	4.2479119	12.773546	2.6083186	0.3830242	0.5247449	<0.054288	<0.24921	<0.094969	13.223722	0.2984095	1.6871301	0.8516218
MX12AB022-5	2824.7	H	9.9595214	3.0223152	6.2006702	2.1975191	0.2752412	0.3191039	<0.039045	<0.21059	<0.085353	11.98836	0.0931045	0.0639991	0.4959316
MX12AB022-6	2824.7	H	18.083239	2.5063684	8.0820905	3.3573492	0.3735597	2.2795895	<0.050091	<0.21337	<0.13661	18.002815	0.2199151	0.1905218	0.442778
MX12AB022-7	2824.7	H	1.5991523	0.6160109	2.0802529	0.7619346	0.1269591	<0.3982	<0.088381	<0.52815	<0.13724	12.694298	0.2034474	<0.11425	0.2228983
MX12AB022-8	2824.7	H	2.3720451	1.0606944	3.8362322	1.9666814	0.2600573	0.8347367	<0.10257	<0.40491	<0.19708	11.761177	0.1666834	<0.070649	0.4975689
MX12AB022-9	2824.7	H	0.3451013	0.4443196	1.8647747	0.9411527	0.0846158	0.2340031	<0.084301	<0.46051	<0.13364	19.184023	0.462838	<0.087024	0.4585223
MX12AB022-10	2824.7	H	0.7308876	0.353148	1.3175445	1.509367	0.2126693	0.4101671	<0.032598	<0.24719	<0.09705	12.658278	0.1650274	<0.071601	0.3694649
MX12AB022-11	2824.7	H	5.2712112	1.1185254	3.969592	1.8605578	0.3088835	<0.25822	<0.074128	<0.41609	<0.13982	13.789608	0.5015514	<0.047563	0.8744804
MX12AB022-12	2824.7	H	0.643434	0.5741874	1.0578933	1.4459592	0.1104928	0.2764633	<0.15282	<0.41248	<0.19131	10.875581	<0.11567	<0.1135	0.5095289
MX12AB027-1	425.4	H	3.701264	7.1700986	<0.8199	<0.55059	<0.15149	<0.34629	0.1977534	<0.61572	<0.18913	25.177517	0.7465837	0.1552837	0.5030485
MX12AB027-2	425.4	H	46.557081	6.3858596	4.9122827	2.6099559	0.2916225	0.6537351	0.7856954	<0.12542	<0.13256	32.227242	<0.053008	10.596948	10.577808
MX12AB027-3	425.4	H	9.427472	2.9438449	0.7152492	0.2846833	0.0494987	0.3644412	0.3543965	<0.1159	<0.13501	19.025292	0.5183052	0.1324112	0.3158073

Sample	Distance (m)	Type	Ce140	Eu153	Gd157	Yb172	Lu175	Hf178	Ta181	Au197	Tl205	Pb208	Bi209	Th232	U238
MX12AB027-4	425.4	H	15.33606	2.5355739	0.678666	<0.22788	<0.087513	<0.18046	<0.051641	<0.17863	<0.10912	22.254099	<0.094815	0.0975572	0.1808085
MX12AB027-5	425.4	H	9.0507259	7.8403687	<0.40814	<0.13463	0.027341	0.2357904	<0.092026	<0.21338	<0.060926	65.170842	<0.08528	0.0342684	0.1750941
MX12AB027-6	425.4	H	10.078115	4.182963	0.3205641	0.4037449	0.0514003	1.5677415	0.0852289	<0.12605	<0.066448	16.95204	6.1527948	0.075317	0.2796188
MX12AB027-7	425.4	H	18.486672	5.1576723	1.2520597	<0.23755	<0.047585	0.2056096	<0.058757	<0.256	<0.077889	15.457366	<0.0489	0.101989	0.1992237
MX12AB027-8	425.4	H	9.3136209	2.2519644	<0.72657	<0.29264	<0.083044	<0.18954	<0.075704	<0.24599	<0.10548	12.202932	<0.055425	<0.058781	<0.17333
MX12AB027-9	425.4	H	16.447299	4.8414197	<0.79018	<0.65333	<0.11936	0.3219774	<0.088439	0.2924723	<0.2815	19.386131	<0.13473	0.1787621	<0.15404
MX12AB027-10	425.4	H	19.227166	2.4018626	2.1219894	1.7720047	0.2023867	1.6456212	<0.034421	<0.33731	<0.09816	19.097672	2.7229756	11.171527	8.0425379
MX12AB027-11	425.4	H	48.476879	9.0929969	0.9856098	<0.20947	0.1117948	0.3446396	0.1170205	<0.41315	<0.13898	26.305524	0.0583662	0.1867467	0.5203512
MX12AB027-12	425.4	H	24.239821	15.618846	1.695905	1.331551	0.1748657	0.2614067	<0.052573	<0.1543	<0.082159	97.622993	35.967299	0.2231217	1.2061708
MX12AB028-3	481.4	H	33.578408	7.4237922	0.5629259	<0.28974	0.0394454	0.3408026	<0.10606	<0.25939	<0.15464	87.86834	<0.11024	0.131821	0.1333009
MX12AB029-1	481.4	H	44.224129	4.3687113	3.6738361	3.2430294	0.273277	<0.21813	18.190792	<0.32265	0.8478947	58.986158	0.4995377	<0.06833	2.7941901
MX12AB029-2	481.4	H	13.391428	6.5172198	1.2170816	1.0978555	0.0852996	0.1129251	<0.035272	<0.18001	0.0786263	13.385283	0.4346364	0.1808653	1.0857335
MX12AB029-3	481.4	H	<0.095894	1.4491819	<0.38889	<0.27957	<0.081035	<0.32391	<0.074816	<0.33428	<0.19166	13.17869	0.9923486	<0.11416	<0.069701
MX12AB029-4	481.4	H	32.581145	6.8596144	3.1440406	0.9878246	0.361966	2.1581128	0.2811373	<0.79014	<0.54955	48.458768	10.136768	0.5463889	17.557698
MX12AB029-5	481.4	H	0.6159281	1.7026861	<0.47454	<0.52247	<0.1094	<0.1954	<0.091471	<0.25248	<0.13021	16.651826	1.2517782	<0.12832	0.2402555
MX12AB029-6	481.4	H	39.272136	8.0156045	<0.58715	0.2381336	<0.055365	0.2313705	<0.035522	<0.23487	<0.12575	6.981172	0.3065391	0.9345434	0.6231207
MX12AB029-7	481.4	H	178.07157	32.023297	3.6772677	1.3402889	0.2569142	0.8696757	1.0533176	<0.36381	0.9931391	39.535629	3.1602397	11.064836	9.5187421
MX12AB029-8	481.4	H	1.8137133	1.876592	0.4603224	0.1903658	<0.040747	0.1531432	0.0421538	<0.29795	<0.16418	12.87983	0.3813502	<0.093692	0.1890637
MX12AB029-9	481.4	H	53.12453	5.5957157	2.3681578	0.9165045	0.1283885	0.1822227	0.7185682	<0.17849	0.1364173	35.450348	3.8442195	27.117803	36.986585
MX12AB029-10	481.4	H	42.762174	4.7492008	2.1378665	0.5672323	0.0697484	<0.16718	0.4594152	<0.4653	<0.18016	21.510887	2.6772527	4.0867299	1.8834082
MX12AB029-11	481.4	H	48.059392	2.6609161	<1.1557	0.8723379	<0.13319	0.6173037	<0.21785	<0.86379	<0.42643	17.923089	0.626027	1.649542	6.5499948
MX12AB029-12	481.4	H	28.900871	3.8114469	2.9234688	0.2574324	<0.076462	<0.21712	2.7187582	<0.21499	0.8237965	9.7974428	0.279127	<0.093746	0.5233497
MX12AB032-1	546.7	H	6.4715436	1.3672185	0.868049	0.73294	0.1073823	0.3087331	<0.082925	<0.19578	<0.15499	4.2254058	<0.11429	2.8972035	0.5213306
MX12AB032-2	546.7	H	4.1645934	0.8675018	0.6222774	0.3268127	<0.057616	<0.15389	<0.074923	<0.29361	<0.13855	2.9651989	0.086174	1.3142766	0.4611504
MX12AB032-5	546.7	H	18.480225	0.7939336	0.6379215	<0.24387	0.0443442	0.4639556	<0.024214	<0.22687	<0.12918	4.5278967	0.0788869	2.5969778	0.3714111
MX12AB033-2	134.0	H	2.4119684	12.071214	<0.29874	<0.25939	<0.032851	<0.11899	<0.033009	<0.15095	<0.085577	7.4346775	0.3639074	<0.064011	<0.085282
MX12AB033-3	134.0	H	15.074667	13.93987	0.549229	<0.27356	<0.036686	<0.10345	<0.049609	<0.19215	<0.082266	11.01774	0.4764443	0.137783	0.3394649
MX12AB033-4	134.0	H	3.8952738	2.8792366	<0.37076	<0.19795	<0.070748	<0.2336	0.1071448	<0.2721	<0.080031	10.460343	0.1255908	<0.049595	0.1980986
MX12AB033-6	134.0	H	30.633384	7.2996912	<0.57601	<0.15509	<0.051301	1.1355365	<0.045101	<0.28117	<0.095915	26.284224	0.1082386	0.2564998	0.5247452
MX12AB039-1	403.7	H	3.0940262	0.6924725	<0.41912	<0.36885	0.1195952	0.4651322	<0.09	<0.51085	<0.15737	7.6738298	0.3215294	0.549195	1.6172676

Sample	Distance (m)	Type	Ce140	Eu153	Gd157	Yb172	Lu175	Hf178	Ta181	Au197	Tl205	Pb208	Bi209	Th232	U238
MX12AB039-2	403.7	H	6.2318696	0.3994026	<1.1379	<0.33993	<0.14312	<0.57478	<0.24443	<1.1725	<0.31967	14.244703	0.8797619	6.8536455	0.3975809
MX12AB039-3	403.7	H	2.0964245	0.4238953	<0.55691	<0.37	<0.048289	<0.22088	<0.10731	<0.3167	<0.2607	27.90638	2.3640246	0.0657061	0.3793256
MX12AB039-4	403.7	H	4.1564989	2.0057261	0.6155824	0.7162861	0.1265461	<0.15866	0.0437243	<0.27925	<0.085826	1.0320265	0.0849822	<0.083717	0.1355289
MX12AB039-5	403.7	H	27.078465	3.0257039	2.8396019	1.4297744	0.2671939	0.2614119	<0.098357	<0.33897	0.1248556	2.1867431	<0.13184	0.1051155	0.2573006
MX12AB039-6	403.7	H	<0.20898	0.5955305	<0.36438	<0.32093	<0.060983	<0.19891	<0.05647	<0.2833	<0.1151	4.5752169	1.1405128	<0.040921	<0.073204
MX12AB039-7	403.7	H	3.1761743	0.7097252	0.2887029	0.8349035	0.1682683	0.3675867	<0.043216	<0.21405	<0.063458	2.8884344	0.6556689	0.1364994	0.7993414
MX12AB040	187.3	H	13.868993	16.202067	0.2819268	0.2823941	<0.044549	0.067087	0.0336561	<0.25765	0.0986399	9.5167765	<0.058842	<0.030958	0.7497942
MX12AB040	187.3	H	0.420613	1.240182	1.321459	1.0600713	<0.20921	<1.4581	41.137424	<0.64789	<0.42557	<0.79411	0.1769775	<0.40299	0.6458851
MX12AB040	187.3	H	<0.96865	1.241606	<4.8256	<4.0878	<0.43718	21.536491	28.014558	<2.4225	<1.0931	0.6955591	<1.863	2.7399895	12.636358
MX12AB040	187.3	H	30.886616	7.7383017	0.9264091	<0.24874	<0.032163	0.1850368	<0.065881	<0.18602	<0.10479	27.939462	0.5725609	0.1663675	1.3067093
MX12AB041	198.2	H	22.18772	13.942697	3.1032745	1.8556018	0.2208207	<0.4098	<0.11259	<0.26527	<0.21755	5.4772981	0.3078905	0.4455436	0.9704343
MX12AB041	198.2	H	23.585203	32.411146	3.2448166	3.75021	0.4278625	0.7440762	<0.055287	<0.4254	<0.2681	9.6508009	1.5108146	0.233003	1.1161826
MX12AB041	198.2	H	132.55382	23.361525	18.498417	11.055429	1.1072833	<0.39005	<0.10489	<0.395	<0.14984	5.0654744	0.4113177	0.3953621	4.7401091
MX12AB041	198.2	H	87.578184	39.370575	9.7400938	4.5703535	0.3868978	<0.63484	<0.13869	<0.54522	<0.23708	11.476193	3.800389	2.1907203	2.188477
MX12AB041	198.2	H	8.104709	3.8871339	<0.53862	0.5241484	<0.092049	0.3570474	<0.115	<0.40354	<0.19187	5.3766585	<0.19121	0.3507654	0.9420618
MX12AB041	198.2	H	52.815007	9.1400076	1.0990016	<0.52363	<0.11319	<0.52274	<0.18644	<0.73604	<0.24389	6.7280314	0.1896	<0.29624	1.1575115
MX12AB054-1	2784.0	H	8.3546808	1.5272893	4.7382932	3.8890494	0.4801617	1.3446294	<0.047703	<0.074148	<0.046577	6.7935942	<0.048623	<0.058568	0.5417699
MX12AB054-2	2784.0	H	20.901008	8.0135383	30.742125	6.0133597	0.5608155	0.5808102	<0.034435	<0.15117	<0.077047	6.8304288	<0.060836	<0.035903	1.3845613
MX12AB054-3	2784.0	H	8.5853785	2.9367492	9.48565	3.1158681	0.3463515	0.3862056	<0.022696	<0.11486	<0.075106	5.5508067	<0.057595	0.0398986	0.5291168
MX12AB054-4	2784.0	H	1.4893397	0.5601199	1.4673818	1.0319531	0.1236436	0.1257312	<0.025751	<0.13321	<0.076605	17.48985	0.0669282	<0.05758	0.3354711
MX12AB054-5	2784.0	H	0.5435265	0.1834975	0.4141397	0.8328849	0.1537148	0.0763685	<0.025988	<0.23767	<0.040235	10.170407	0.0607227	<0.031403	0.4782948
MX12AB054-6	2784.0	H	0.3123543	0.2841098	0.1881892	0.9249308	0.1164276	<0.11419	<0.023673	<0.13158	<0.059483	11.96673	0.0664371	<0.023664	0.3406144
MX12AB054-7	2784.0	H	4.0077558	0.876824	2.3942812	3.2660649	0.4673518	0.588746	<0.034713	<0.14906	<0.037598	13.239361	0.0878724	<0.024153	0.880445
MX12AB054-8	2784.0	H	7.7394463	1.7558573	4.9653009	1.9853065	0.2415219	0.5664112	<0.03112	<0.14545	<0.032469	19.873972	0.1529016	0.1537523	0.8660852
MX12AB054-9	2784.0	H	2.6086278	0.9751913	2.2025463	1.0278336	0.1545441	0.3880139	<0.031151	<0.15336	<0.04298	11.074878	0.0817891	<0.048582	0.4263082
MX12AB054-10	2784.0	H	1.1078455	1.0938966	4.0576971	5.021986	0.6012752	0.2715971	<0.030533	<0.1087	<0.039623	7.5904011	0.0413502	<0.036604	0.6107624
MX12AB054-11	2784.0	H	2.0795181	0.6160571	1.5720383	3.6135415	0.4717523	0.758651	0.0221116	<0.094715	<0.041454	5.786476	<0.044391	<0.019842	0.3659071
MX12AB054-12	2784.0	H	5.3362029	2.0273396	6.146472	4.4612154	0.5013603	0.4289261	<0.052615	<0.19112	<0.10323	9.8630138	0.1335452	<0.053511	0.9128304
MX12AB054-13	2784.0	H	7.8963909	1.2322573	2.1153291	5.2142813	0.5965309	0.7509212	<0.023065	<0.21431	<0.068358	4.791771	<0.070869	<0.058705	0.2158686
MX12AB054-14	2784.0	H	13.524366	2.6967404	5.1623576	6.1357849	0.7809164	1.2951889	<0.030364	<0.10574	<0.054279	5.8543344	<0.0387	0.0685221	0.5433366

Sample	Distance (m)	Type	Ce140	Eu153	Gd157	Yb172	Lu175	Hf178	Ta181	Au197	Tl205	Pb208	Bi209	Th232	U238
MX12AB056-1	873.3	H	2.1761134	2.4533205	<0.17268	0.1921408	0.0239512	<0.11214	0.0400594	<0.12185	<0.048275	23.291468	0.1192336	<0.029282	0.214057
MX12AB056-2	873.3	H	0.5595575	2.6477642	<0.4688	<0.26241	<0.057578	<0.2503	0.130738	<0.30312	<0.12929	32.819413	<0.12994	<0.07378	0.2123489
MX12AB056-3	873.3	H	43.83956	8.3412574	0.3248606	0.1178416	<0.031441	0.9219004	<0.031773	<0.15408	<0.077607	3.7365327	<0.036131	0.0660747	0.1552448
MX12AB056-4	873.3	H	1.8361085	3.3754934	2.6665698	0.7017538	0.0784563	0.1961789	<0.059062	<0.22216	<0.070485	30.516188	<0.08639	<0.048193	0.4972221
MX12AB056-5	873.3	H	20.045285	10.466146	2.846336	1.6499776	0.1907133	1.2117757	0.0459731	<0.16444	<0.095843	46.931512	0.3104549	0.0857093	0.8418733
MX12AB056-6	873.3	H	49.974754	18.067197	3.1758081	1.6360425	0.1765899	0.617031	<0.029675	0.061855	<0.054669	55.124391	4.860235	0.1091486	0.6429346
MX12AB056-7	873.3	H	7.2555359	7.2990502	0.5609066	0.5078692	0.1026844	0.8200231	0.0329508	<0.10087	<0.068742	88.987796	17.02354	0.1576599	0.4768255
MX12AB056-8	873.3	H	4.5707503	4.832674	0.3472823	0.3743075	<0.035768	0.2034135	0.1100042	<0.19347	<0.087139	57.664981	5.1779466	0.115562	<0.09419
MX12AB057-1	403.6	H	3.9062556	5.0896536	1.9221146	0.7846972	0.1042994	0.3578003	0.0533187	<0.13849	0.1893256	14.416856	0.6493307	<0.049023	0.6559676
MX12AB057-2	403.6	H	2.7748658	8.5911879	0.6739843	0.6487402	0.0690962	0.2329806	<0.066113	<0.16537	0.1169712	14.676364	0.7740176	0.0631898	0.7648784
MX12AB070-1	997.1	H	0.9458299	0.5063047	0.4028132	3.1086341	0.4655838	0.7715399	<0.022549	<0.12538	<0.057268	4.523311	0.7882547	0.0951709	2.3685417
MX12AB070-2	997.1	H	13.145004	0.8180364	<0.5409	1.2056922	0.1971844	0.6955628	0.0347228	<0.26313	<0.14034	28.485185	8.2802838	0.2728572	2.8464256
MX12AB070-3	997.1	H	2.839159	1.0825568	0.6466041	3.141699	0.4684937	0.901238	<0.036952	<0.08948	<0.047323	4.5060032	1.8468435	0.28195	5.5161587
MX12AB070-4	997.1	H	7.0125835	0.8235182	1.116001	1.6274042	0.1721873	0.7346336	<0.034788	<0.19894	<0.060334	12.165078	198.71613	21.065089	2.3606424
MX12AB070-5	997.1	H	0.4104996	0.4915386	<0.21001	0.2179281	<0.034788	<0.12682	<0.040559	<0.13432	<0.06522	1.9594072	4.5345122	0.1212442	<0.057841
MX12AB070-6	997.1	H	0.1351226	0.6297258	<0.20891	0.6602013	0.1244215	0.826617	<0.031113	<0.13172	<0.050205	5.7932442	1.469791	<0.043764	0.5494822
MX12AB070-7	997.1	H	1.4937358	0.4709968	0.4377875	3.3528878	0.4693695	1.325106	<0.026464	<0.17672	0.0428899	5.1440424	7.4989711	0.5881635	2.2117824
MX12AB076-2	207.3	H	79.221915	20.695929	2.2274459	<0.6577	0.1004324	0.3943744	<0.14674	<0.49315	<0.31145	53.835114	0.7462113	0.2666106	0.4354463
MX12AB076-4	207.3	H	39.372625	34.660534	16.028677	42.573085	6.7958593	3.7942055	0.2445512	<0.95898	<0.21111	29.211349	5.4294281	35.163403	47.827162
MX12AB076-6	207.3	H	26.383089	8.0987938	1.4796628	1.059706	0.195252	<0.51717	<0.19427	<0.8123	<0.21783	84.797733	12.841369	<0.30406	1.1255621
MX12AB078-1	375.8	H	5.0427183	3.8402676	1.2533249	<0.79493	<0.10903	1.396679	0.1513288	<0.68495	<0.24847	60.184635	14.006139	<0.19024	0.9234285
MX12AB078-2	375.8	H	45.720472	18.950461	3.0797343	1.5416806	<0.16876	0.8467164	0.2426389	<0.66554	1.513689	36.887293	0.4717244	0.8633166	11.111785
MX12AB078-3	375.8	H	7.2150313	6.0117924	<1.417	1.0059858	<0.10929	1.8061702	<0.30616	<0.74168	<0.38212	49.420669	5.0212935	<0.34089	0.6549522
MX12AB078-4	375.8	H	16.675227	4.7826877	3.981988	3.0164126	0.3162401	1.0217137	0.1299026	<0.72782	<0.33129	37.526592	2.6002107	0.6810015	1.4635517
MX12AB078-5	375.8	H	14.620966	9.9055389	1.5057497	1.6103161	0.2576438	0.6238943	0.3986038	<0.46352	<0.30841	40.325351	8.4205755	0.6076679	4.4725476
MX12AB078-6	375.8	H	8.8318475	10.037248	1.0860152	1.189152	0.200072	0.9668078	<0.18451	<0.57983	1.0121379	91.666827	17.63185	0.8391067	6.6863477
MX12AB078-7	375.8	H	15.350489	9.0850842	<0.89523	0.95421	0.1439453	0.9547641	0.068211	<0.42679	0.9115735	57.520544	22.827852	1.0600538	2.6759037
MX12AB078-8	375.8	H	19.257773	12.11379	1.807081	1.4577727	0.2782549	1.0906955	<0.30219	<1.0478	2.1306653	55.813556	11.070033	<0.21744	3.4724712
MX12AB078-9	375.8	H	18.557713	6.3642456	<1.5525	0.8595024	<0.20744	<0.7307	0.2236619	<0.66326	<0.38204	50.571854	4.036805	0.5256891	1.5981889
MX12AB078-11	375.8	H	42.322025	8.9051365	<0.91767	<0.9147	<0.19109	<0.96856	0.1760027	<0.74077	<0.28416	39.992095	<0.34833	0.420737	2.5463638

Sample	Distance (m)	Type	Ce140	Eu153	Gd157	Yb172	Lu175	Hf178	Ta181	Au197	Tl205	Pb208	Bi209	Th232	U238
MX12AB078-13	375.8	H	34.130096	7.5176853	<1.4706	<0.70017	<0.24015	<0.64327	0.4315454	<0.7793	<0.23476	29.547263	<0.38802	0.4566045	1.8868741
MX12AB078-15	375.8	H	13.073339	7.4092285	<1.171	<1.1488	0.2156654	2.1354073	1.9152235	<0.83293	<0.51077	64.184416	11.583863	0.8531965	1.7064453
MX12AB079-4	498.2	H	26.728513	5.4317531	0.3239718	<0.18192	0.0370328	0.3122592	<0.043507	<0.12756	<0.1262	8.4592816	<0.12034	0.0562983	0.1368187
MX12AB079-6	498.2	H	49.468468	8.4928745	1.1982178	0.2833919	0.0607985	0.9940376	0.1453848	<0.16494	<0.061606	30.300422	<0.053193	0.5480809	1.1679108
MX12AB079-7	498.2	H	23.620851	16.129259	0.8043813	0.1401939	<0.029019	0.2601237	<0.016608	<0.21158	<0.084123	21.290716	0.0645903	0.410451	0.5908308
MX12AB079-8	498.2	H	2.8948	4.4984729	0.2193033	<0.18226	0.0274232	<0.084089	1.6626215	<0.095154	<0.07207	12.365305	<0.022317	0.0841441	0.4729374
MX12AB081-1	748.5	H	0.1321461	0.8543575	<0.21974	<0.082029	<0.058368	<0.2421	<0.027372	<0.15544	<0.089538	6.6134789	<0.085978	<0.029703	<0.053335
MX12AB081-2	748.5	H	30.046421	10.998069	1.0188054	0.2861775	<0.029091	0.4207467	<0.02809	<0.13177	<0.085634	34.531951	0.5336304	0.7136537	1.3821824
MX12AB081-3	748.5	H	28.119968	12.704381	1.5904418	0.3046109	0.0472725	0.5340239	<0.035454	<0.11911	<0.080708	21.070277	0.2444294	0.2679152	0.9827667
MX12AB081-6	748.5	H	12.88426	4.8186031	1.1870678	0.6159425	0.1018384	0.3258501	<0.033883	<0.083881	<0.060443	110.21054	43.709831	14.083953	15.81762
MX12AB094	246.9	H	57.395872	21.323921	1.2602382	0.4787999	0.0790662	0.6680879	<0.037551	<0.19933	0.0669076	34.512001	3.1064087	0.2814186	1.5482398
MX12AB094	246.9	H	65189.079	521.13649	2172.4321	61.85018	7.0771526	0.6011945	0.0579279	<0.13572	<0.068009	88.109344	0.7945079	9051.37	282.80617
MX12AB094	246.9	H	109625.22	885.06608	3570.429	62.222246	6.2421747	0.7301211	<0.039854	<0.10229	<0.071021	158.3821	1.2373919	15651.276	440.9141
MX12AB094	246.9	H	137605.15	760.5143	3539.6644	76.459886	8.2906343	1.2595264	<0.07661	<0.36781	<0.14952	175.58015	1.2409767	16909.693	527.91241
MX12AB096-2	120.9	H	12.259529	3.9411197	3.6866065	1.4671346	0.1877696	0.1984297	1.3367993	<0.11173	0.0881428	14.068726	<0.056763	0.1569094	0.8436715
MX12AB096-4	120.9	H	7.4668763	11.564324	0.5460456	0.2991776	0.0378954	0.5565397	<0.026695	<0.15968	<0.086566	57.424438	11.645522	0.333859	1.2220292

Distance is distance from center of deposit

H = hydrothermal