SEDIMENTARY RECORD OF TECTONIC GROWTH ALONG A CONVERGENT MARGIN: INSIGHTS FROM DETRITAL ZIRCON GEOCHRONOLOGY OF MESOZOIC SEDIMENTARY BASINS AND MODERN RIVERS IN SOUTH-CENTRAL ALASKA

by

Cooper R. Fasulo

A Thesis

Submitted to the Faculty of Purdue University

In Partial Fulfillment of the Requirements for the degree of

Master of Science

Department of Earth, Atmospheric, and Planetary Sciences

West Lafayette, Indiana

December 2019

THE PURDUE UNIVERSITY GRADUATE SCHOOL

STATEMENT OF COMMITTEE APPROVAL

Dr. Christopher Andronicos, Chair

Department of Earth, Atmospheric, and Planetary Sciences

Dr. Kenneth Ridgway

Department of Earth, Atmospheric, and Planetary Sciences

Dr. Nathaniel Lifton

Department of Earth, Atmospheric, and Planetary Sciences

Approved by:

Dr. Daniel Cziczo, Head of Graduate Program

ACKNOWLEDGMENTS

I would first like to thank my advisor Dr. Ken Ridgway for allowing me the opportunity to attend graduate school at Purdue University. I thank Ken for the opportunity to conduct research and field work in an amazing part of the world and to the opportunity to conduct my graduate studies at an amazing institution. Ken's guidance and expertise, both in terms of research as well as career pathways, have been invaluable to me and I can never thank him enough. I would also like to thank my thesis committee: Dr. Chris Andronicos and Dr. Nat Lifton, for their constructive criticisms and valuable discussions on my thesis. I thank Dr. Jeff Trop (Bucknell University) and Dr. Brian Hampton (New Mexico State University) for their valuable feedback on various presentations, posters, and manuscripts I have written on my thesis research. I would like to thank Dr. Jeff Benowitz at University of Alaska-Fairbanks for allowing us to stay at his home in Alaska during field work preparations. I would also like to thank the staff at the University of Arizona's LaserChron facility for their assistance with sample preparation and analysis.

I thank my funding sources for their financial support during my time at Purdue. I thank the Alaska Geological Society and the Department of Earth, Atmospheric, and Planetary Sciences at Purdue (Cedric Newby Award).

I had the fortunate opportunity to intern at ExxonMobil in Houston, Texas and I would like to acknowledge my coworkers in the Gulf of Mexico New Opportunities team for their constant support and guidance during my internship. Specifically, I thank my supervisor Chris Lamon and mentor Ashlee Henig for treating me as an equal member of the team and for their immense insight into the petroleum industry.

I would like to thank the members of the Basin Analysis group, both past and present. I thank Wai Allen, Tim Henderson, Mariah Romero, Brandon Keough, Erin Donaghy, and Hannah Weaver for their assistance with sample analysis at the University of Arizona's LaserChron Center as well as their feedback and discussions on various aspects of my research. The EAPS graduate student community has been tremendous to me and I am grateful to have gained many friends in my time here at Purdue. I thank Grant Bonnette, Carlisle Wishard, Carolyn Gleason Joe McConeghey, Ali Meyer, Jordyn Miller, Nick Benz, Chris Calvelage, Marie Henderson, and Will Odom. Lastly, I would like to thank my loving girlfriend Sarah Sams, who has supported and encouraged me throughout this whole process.

TABLE OF CONTENTS

LIST OF TABLES 7
LIST OF FIGURES 8
ABSTRACT 10
CHAPTER 1. Introduction 11
1.1 Chapter 2 Background and Research Objectives 11
1.2 Chapter 3 Background and Research Objectives 14
CHAPTER 2. DETRITAL ZIRCON GEOCHRONOLOGY AND HF ISOTOPE GEOCHEMISTRY OF MESOZOIC SEDIMENTARY BASINS IN SOUTH-CENTRAL ALASKA: INSIGHTS INTO REGIONAL SEDIMENT TRANSPORT, BASIN DEVELOPMENT, AND TECTONICS ALONG THE NW CORDILLERAN MARGIN 18
2.1 Introduction 18
2.2 Geologic and Tectonic Framework 19
2.2.1 Wrangellia Composite Terrane 19
2.2.2 Wrangell Mountains Basin 19
2.2.3 Nutzotin Basin 20
2.2.4 Wellesly Basin 21
2.2.5 Yukon Composite Terrane 21
2.2.6 Major Strike-Slip Faults 22
2.3 Methods 23
2.3.1 Sample Collection 23
2.3.2 U-Pb Detrital Zircon Analysis 23
2.3.3 Hf Detrital Zircon Isotope Geochemistry 24
2.4 Results 25
2.4.1 Nutzotin Basin 25
2.4.2 Wrangell Mountains Basin 27
2.4.3 Wellesly Basin 29
2.5 Provenance Interpretation 29
2.5.1 Potential Primary Magmatic Sources of Sediment on the Wrangellia composite terrane 30

2.5.2 Potential Primary Magmatic Sources of Sediment on the Yukon composite terrane 31
2.5.3 Provenance of the Nutzotin Basin 33
2.5.4 Provenance of the Wrangell Mountains Basin 34
2.5.5 Provenance of the Wellesly Basin 36
2.6 Discussion 37
2.6.1 New Insights into the Nutzotin Basin 37
2.6.2 New Insights into the Wrangell Mountains Basin 39
2.6.3 Implications for Strike-Slip Displacement on the Denali Fault 41
2.6.4 Regional Sediment Transport, Basin Development, and Tectonics along the Mesozoic Southern Alaska Margin 43
2.6.5 Implications for Subduction Polarity along the Mesozoic Convergent Margin 47
2.7 Conclusions 48
CHAPTER 3. DETRITAL ZIRCON GEOCHRONOLOGY OF MODERN RIVER SEDIMENT IN SOUTH-CENTRAL ALASKA: INSIGHTS INTO MESOZOIC TO CENOZOIC MAGMATISM ALONG THE SOUTHERN ALASKA CONVERGENT MARGIN 69
3.1 Introduction 69
3.2 Background 70
3.2.1 Regional Geologic Framework 70
3.2.2 Modern River Watersheds 71
3.3 Methodology 72
3.3.1 Sampling Methodology 72
3.3.2 U-Pb Detrital Zircon Geochronology 73
3.4 Results 73
3.4.1 Tanana River Watershed 74
3.4.2 Matanuska-Susitna River Watershed 75
3.4.3 Copper River Watershed 76
3.5 Provenance 77
3.5.1 Tanana River Watershed 77
3.5.2 Matanuska-Susitna River Watershed 78
3.5.3 Copper River Watershed 80
3.6 Discussion 81

3.6.1 Controls on Detrital Zircon Presence in South-Central Alaska Watersheds 81
3.6.2 Characterizing the Magmatic Record of South-Central Alaska 83
3.6.3 Implications for Magmatism along the Northern Cordilleran Margin 86
3.6.4 Study Limitations and Future Work 88
3.7 Conclusions 90
REFERENCES 103
APPENDIX A. BEDROCK AND MODERN RIVER DETRITAL ZIRCON SAMPLE LIST FOR SOUTH-CENTRAL ALASKA 124
APPENDIX B. U-PB DETRITAL ZIRCON ANALYSES FOR JURASSIC-CRETACEOUS SEDIMENTARY BASINS IN SOUTH-CENTRAL ALASKA 128
APPENDIX C. HF ISOTOPE COMPOSITIONS OF DETRITAL ZIRCONS FOR JURASSIC-CRETACEOUS SEDIMENTARY BASINS IN SOUTH-CENTRAL ALASKA 194
APPENDIX D. U-PB DETRITAL ZIRCON ANALYSES FOR MODERN RIVERS IN SOUTH-CENTRAL ALASKA 201

LIST OF TABLES

Table 2.1. Bedrock detrital zircon sample list for south-central Alaska. 68

Table 3.1. Modern river detrital zircon sample list for south-central Alaska. 102

LIST OF FIGURES

Figure 1.1. (A-C) End-member models for early Cretaceous paleogeography 16

Figure 1.2. Simplified geologic map of south-central Alaska……17

Figure 2.1. Terrane map of the Northern Cordillera……50

Figure 2.2. Simplified geologic map of south-central Alaska. 51

Figure 2.3. Stratigraphic chart of Mesozoic sedimentary basins in south-central Alaska..... 52

Figure 2.4. (A-B) Geologic map and cross section of the Wrangell Mountains basin. 53

Figure 2.5. (A-B) Geologic map and cross section of the Nutzotin and Wellesly basins. 55

Figure 2.6. Stratigraphic cross section of the Nutzotin Mountains sequence. 56

Figure 2.7. (A-C) Normalized age distribution (relative age probability) plots of detrital zircon ages for the Nutzotin, Wrangell Mountains, and Wellesly basins 58

Figure 2.8. U-Pb and Hf isotope compositions of detrital zircons for the Nutzotin and Wellesly basins..... 59

Figure 2.9. Normalized age distribution (relative age probability) plots of detrital zircon ages for the Wellesly and Kahiltna basins. 61

Figure 2.10. Geologic map showing potential amounts of strike-slip displacement along the Denali Fault. 62

Figure 2.11. Normalized age distribution (relative age probability) plots of Jurassic-Cretaceous strata of the Nutzotin and Wrangell Mountains basins 63

Figure 2.12. (A-C) Normalized age distribution (relative age probability) plots of regional Jurassic-lower Cretaceous sedimentary strata and regional paleogeographic reconstructions..... 65

Figure 2.13. (A-C) Normalized age distribution (relative age probability) plots of regional Cretaceous sedimentary strata and regional paleogeographic reconstructions. 67

Figure 3.1. Topographic map of south-central Alaska. 92

Figure 3.2. Generalized geologic map of south-central Alaska..... 94

Figure 3.3. Normalized age distribution (relative age probability) plots of detrital zircon ages for the Tanana River Watershed. 95

Figure 3.4. Normalized age distribution (relative age probability) plots of detrital zircon ages for the Matanuska-Susitna River Watershed. 96

Figure 3.5. Normalized age distribution (relative age probability) plots of detrital zircon ages for the Copper River Watershed..... 97

Figure 3.6. Regional geologic map of south-central Alaska showing first-order plutonic sources. 99

Figure 3.7. Detrital zircon age distribution of modern rivers and corresponding magmatic events 100

Figure 3.8. Detrital zircon age distributions of modern rivers in south-central Alaska compared to western Alaska Peninsula forearc strata and Coast Mountains batholith magmatic flux curve . 101

ABSTRACT

This study presents new detrital zircon geochronologic data from Jurassic to Cretaceous sedimentary basins and modern rivers in south-central Alaska in order to examine the sedimentary record of magmatism and tectonics associated with the Mesozoic to Cenozoic growth of the southern Alaska convergent margin. Jurassic to Cretaceous strata of the Wrangell Mountains, Nutzotin, and Wellesly basins formed coeval with the Mesozoic accretion of the Wrangellia composite terrane (WCT) to the continental margin. New detrital zircon data from the Wrangell Mountains and Nutzotin basins demonstrate that these basins were derived primarily from sources associated with the WCT, with little to no derivation from continental margin sources. Detrital zircon ages from the Wrangell Mountains and Nutzotin basins are very similar, suggesting that these basins may have initially formed in a connected retroarc basin system. New detrital zircon data from the Wellesly basin show that the basin was source chiefly from continental margin sources. These ages show that the Wellesly basin is not related to the Nutzotin basin as previously suggested, and may be genetically related to the Kahiltna basin; this suggests that ~330-390 km of post-collisional strike-slip offset occurred along the Denali Fault. Comparing our new data with a regional detrital zircon database from similar-aged depocenters shows that there is a strong provenance and temporal link between outboard and inboard depocenters, with these depocenters being sourced from the same magmatic arcs from the late Jurassic to the late Cretaceous. Our findings from these comparisons are most consistent with a scenario where the WCT was accreted to the margin along an eastward-dipping subduction zone, in contrast to recent suggestions that the accretion was the result of westward-dipping subduction. New and previously published detrital zircon ages from the Tanana, Matanuska-Susitna, and Copper River watersheds in south-central Alaska document the major magmatic episodes that occurred along the southern Alaska convergent margin. These magmatic episodes display a periodicity that is similar to documented cyclic magmatic patterns in other regions along the Cordilleran margin, suggesting similar processes may be occurring margin-wide. The magmatic record of south-central Alaska can also be compared with the magmatic record of other regions in the northern Cordillera such as the Coast Plutonic Complex in British Columbia and the western Alaska Peninsula, which shows a spatial and temporal relationship of magmatism along the entire northern Cordilleran margin.

CHAPTER 1. INTRODUCTION

This thesis investigates the Mesozoic to Cenozoic tectonic growth of the southern Alaska convergent margin by utilizing detrital zircon geochronology of Jurassic-Cretaceous sedimentary basins as well as modern river sediment in south-central Alaska. The findings from this work provide new insights into the tectonics, magmatism and sedimentary basin development during the protracted growth of this convergent margin through processes such as terrane accretion, spreading ridge subduction, and flat-slab subduction. This first chapter presents a general background and addresses the primary research objectives of each of the subsequent chapters. The second chapter addresses detrital zircon geochronology of Jurassic-Cretaceous sedimentary basins in south-central Alaska and implications for sediment provenance linkages and the tectonic configuration along the Mesozoic southern Alaska convergent margin. Chapter 2 has been submitted for publication to *Geosphere* and is coauthored with my advisor Kenneth Ridgway (Purdue University) and Jeffrey Trop (Bucknell University). The third chapter addresses detrital zircon geochronology of modern river sediment in southern Alaska. The main focus of this work is to determine whether modern rivers are faithful recorders of the magmatic and tectonic events that have shaped the southern Alaska convergent margin from the Mesozoic to Cenozoic. Chapter 3 will be submitted for publication to the *Canadian Journal of Earth Sciences* and will be coauthored with my advisor Kenneth Ridgway. Note that the because of the publication format used herein for each chapter, overlap of introductory and background material in each chapter may occur.

1.1 Chapter 2 Background and Research Objectives

The southern Alaska convergent margin is considered a type locality for studying the growth of continents along a convergent margin (Coney et al., 1980, Plafker and Berg, 1994). From the Mesozoic to the present-day, this margin has been modified by multiple episodes of accretion of allochthonous terrane assemblages, subduction-related magmatism, spreading ridge subduction, and flat-slab subduction (Plafker and Berg, 1994; Bradley et al., 2003; Trop and Ridgway, 2007; Ridgway et al., 2012). Studies of sedimentary basins along this margin have shown that these strata contain the sedimentological archive of these convergent margin processes and thus have proven useful for understanding the tectonic evolution and configuration of southern

Alaska (Ridgway et al., 1997; 2002; Trop et al., 2002, 2005; Manuszak et al., 2007; Trop and Ridgway, 2007; Finzel et al., 2015). Specifically, Jurassic-Cretaceous sedimentary basins throughout south-central Alaska are well exposed and record the collision of the Wrangellia composite terrane to the continental margin (Plafker and Berg, 1994). The accretion of the Wrangellia composite terrane is considered one of the largest additions of juvenile crust to a continental margin (Nokleberg et al., 1985). While this collisional event has been the subject of several prior studies (e.g., Kapp and Gehrels, 1998; Gehrels et al., 2009; Hampton et al., 2010; Hults et al., 2013; Beranek et al., 2017; Stevens Goddard et al., 2018), the configuration of this collision has remained contentious.

Multiple models have been proposed to explain the accretion of the Wrangellia composite terrane. These models differ in terms of the tectonic setting of sedimentary basins that formed coeval with accretion, as well as the polarity of subduction that accommodated this accretion. The first set of models, which are based primarily on geologic studies of the upper plate of the convergent margin, argue that the accretion of the Wrangellia composite terrane occurred along an eastward-dipping (northward-dipping in present day coordinates) subduction zone (Fig. 1.1a and 1.1b). In these scenarios, an eastward-dipping subduction zone was present along the outboard margin of the Wrangellia composite terrane as well as along the continental margin and that this collision led to the closure of the intervening marine basin (e.g., Pavlis et al., 2019). Variations of this model include: (1) middle Jurassic collision of the Wrangellia composite terrane followed by transtensional opening of the backarc region (McClelland et al., 1992; Gehrels et al., 2009; Yokelson et al., 2015), and (2) late Jurassic to late Cretaceous diachronous north-to-south closure of the marine basin (Kalbas et al., 2007; Hampton et al., 2010; Stevens Goddard et al., 2018; Box et al., 2019). Regardless of the timing of collision and the mechanism for closure of the intervening marine basin, both variations agree that eastward-dipping subduction persisted along the outboard margin throughout the Jurassic-Cretaceous.

A second, new intriguing group of geophysical models suggests that the Wrangellia composite terrane formed over a westward-dipping (southward-dipping in present day coordinates) subduction zone far-removed from the North American continent (Fig. 1.1c). These models are based on tomographic imaging of near-vertical anomalies in the lower mantle beneath eastern North America and the Atlantic Ocean. These seismically imaged features are interpreted as representing portions of subducted oceanic crust related to west-dipping subduction at stationary,

oceanic trenches that were located far west of the Jurassic-early Cretaceous North American continent. These interpretations require the existence of a 4,000-7,000 km wide and 10,000 km long basin(s) that is not presently accounted for in most tectonic and paleogeographic models of the North American Cordillera. In these models, a westward-dipping subduction zone formed along the inboard (continent-ward) margin of the Wrangellia composite terrane and consumed the large ocean basin between the early and middle Cretaceous time (Sigloch and Mihalynuk, 2013, 2017; Spencer et al., 2019). In this scenario, strata located along the inboard margin of the Wrangellia composite terrane would have formed in an intraoceanic forearc setting, as opposed to a retroarc setting required in the eastward-dipping subduction models. Also according to this new model, rocks of the Chugach accretionary prism, which are presently located along the outboard (ocean-ward) margin of the Wrangellia composite terrane and have been well documented as having formed due to eastward-dipping subduction, did not share a connection with the Wrangellia composite terrane until the middle Cretaceous. This scenario has been argued as being inconsistent with geologic evidence from the upper plate of this margin that support eastward-dipping subduction since the middle Jurassic (e.g., Amato et al., 2013; Monger, 2014; Yokelson et al., 2015; Pavlis et al., 2019).

Chapter 2 of this thesis addresses the tectonic configuration of the Mesozoic convergent margin by utilizing detrital zircon geochronology of Jurassic-Cretaceous sedimentary basins exposed in south-central Alaska. A better understanding of the tectonic setting of sedimentary basins along the margin serves as a geologic test of the ideas presented in models for this configuration. Detrital zircon geochronology of sedimentary strata along convergent margins have proved insightful for studying the sedimentary record of tectonic growth along the Cordilleran margin (e.g., Laskowski et al., 2013; Surpless et al., 2014; Orme and Surpless, 2019). Recently, studies that have coupled U-Pb ages and Hf isotope compositions of detrital zircons have shown that coupled detrital zircon analysis can place tighter constraints on sediment provenance as well as provide insights into the crustal evolution of a convergent margin (Gehrels and Pecha, 2014; Yokelson et al., 2015; Reid et al., 2018).

The main focus of chapter 2 is on Jurassic-Cretaceous strata of the Wrangell Mountains, Nutzotin, and Wellesly basins, which are all exposed in the eastern part of south-central Alaska (Fig. 1.2). These basins formed coevally with the accretion of the Wrangellia composite terrane, with the Wrangell Mountains and Nutzotin basin forming on Wrangellia and the Wellesly basin

forming on the continental margin. Previous studies have examined the relationship between these basins from a lithologic and biostratigraphic perspective (e.g., Richter, 1976; Trop et al., 2002; Manuszak et al., 2007); however, a detailed geochronologic and provenance record of these basins within a stratigraphic framework is currently lacking. This study presents new detrital geochronologic data from the three basins. Our new detrital zircon datasets will allow us to (1) document the provenance of sediment and constrain the depositional age of each of the three basins, and (2) compare our dataset to the growing regional detrital zircon database of other similar-aged sedimentary basins in south-central Alaska. These comparisons will provide new insights into the provenance and temporal linkages between the sedimentary basins located on the inboard (continent-ward) margin of the Wrangellia composite terrane and basins located on the outboard (ocean-ward) margin. The potential linkages between these basins are important for discerning the configuration of the convergent margin during the Mesozoic accretion of the Wrangellia composite terrane. Our new data also have implications for post-collision displacement along major dextral strike-slip faults which span across south-central Alaska.

1.2 Chapter 3 Background and Research Objectives

The focus of chapter 3 of this thesis concerns the use of detrital zircon geochronology of modern river sediment throughout south-central Alaska to understand the magmatic history along the southern Alaska convergent margin. Detrital zircon studies of modern river sediment have become more common in recent years for understanding (1) how faithful modern rivers are in reflecting potential sediment source areas in a given watershed, and (2) understanding the magmatic history associated with tectonic growth in both ancient and modern convergent and collisional settings (e.g., Cawood et al., 2003; Amidon et al., 2005; Saylor et al., 2013; Bradley et al., 2015; Lease et al., 2016; Pepper et al., 2016; Capaldi et al., 2017; Carrapa et al., 2017; Jackson et al., 2019). In modern watersheds, the potential source areas for detrital zircons within a given sample are known, allowing for a more efficient characterization of the detrital zircon age distribution. In south-central Alaska, modern rivers are actively draining regions that expose sedimentary, plutonic, and volcanic rocks that are the products of the tectonic growth of the southern Alaska convergent margin. Thus, utilizing detrital zircon geochronology on modern rivers in south-central Alaska can provide insight into the entire tectonic and magmatic history along this margin.

In Chapter 3, we present new detrital zircon geochronology data from modern river sediment in south-central Alaska's three largest watersheds: the Tanana River, Matanuska-Susitna River, and Copper River watersheds. Our new data, combined with previously published modern river detrital zircon data, will be used to (1) determine the first-order provenance signature of each of the three watersheds, (2) assess the spatial and temporal sensitivity of the modern river provenance record, and (3) characterize the major magmatic episodes in south-central Alaska and compare this record to the magmatic record along the length of the Northern Cordillera. The findings from this study provide new insights into the Mesozoic to Cenozoic magmatic history of south-central Alaska, while also laying the foundation for future studies that utilize modern river sediment to unravel the growth of the southern Alaska convergent margin.

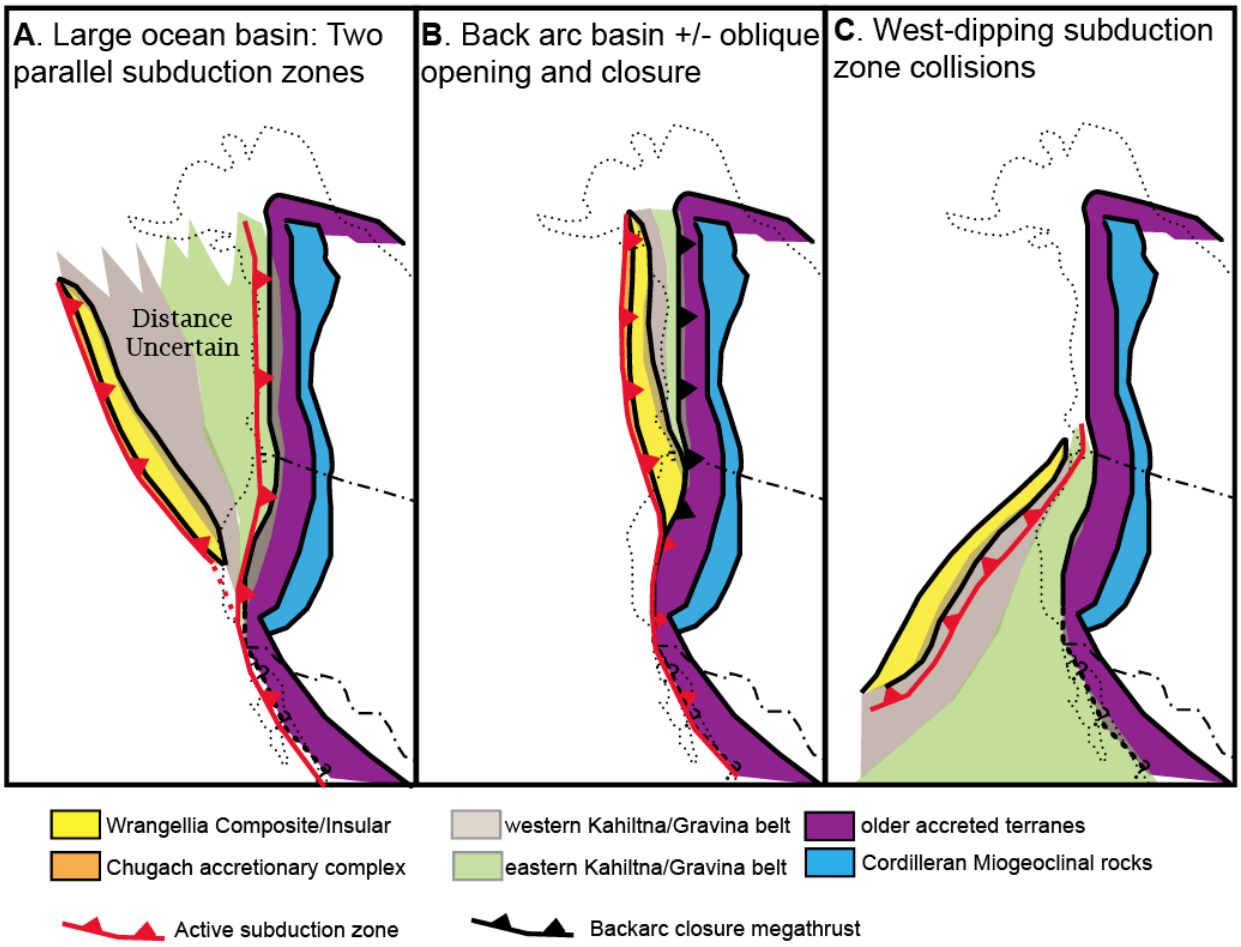


Figure 1.1. (A-C) End-member models for the early Cretaceous tectonic configuration of the Northern Cordilleran margin. See text for detailed descriptions of each of the models. Modified from Pavlis et al. (2019).

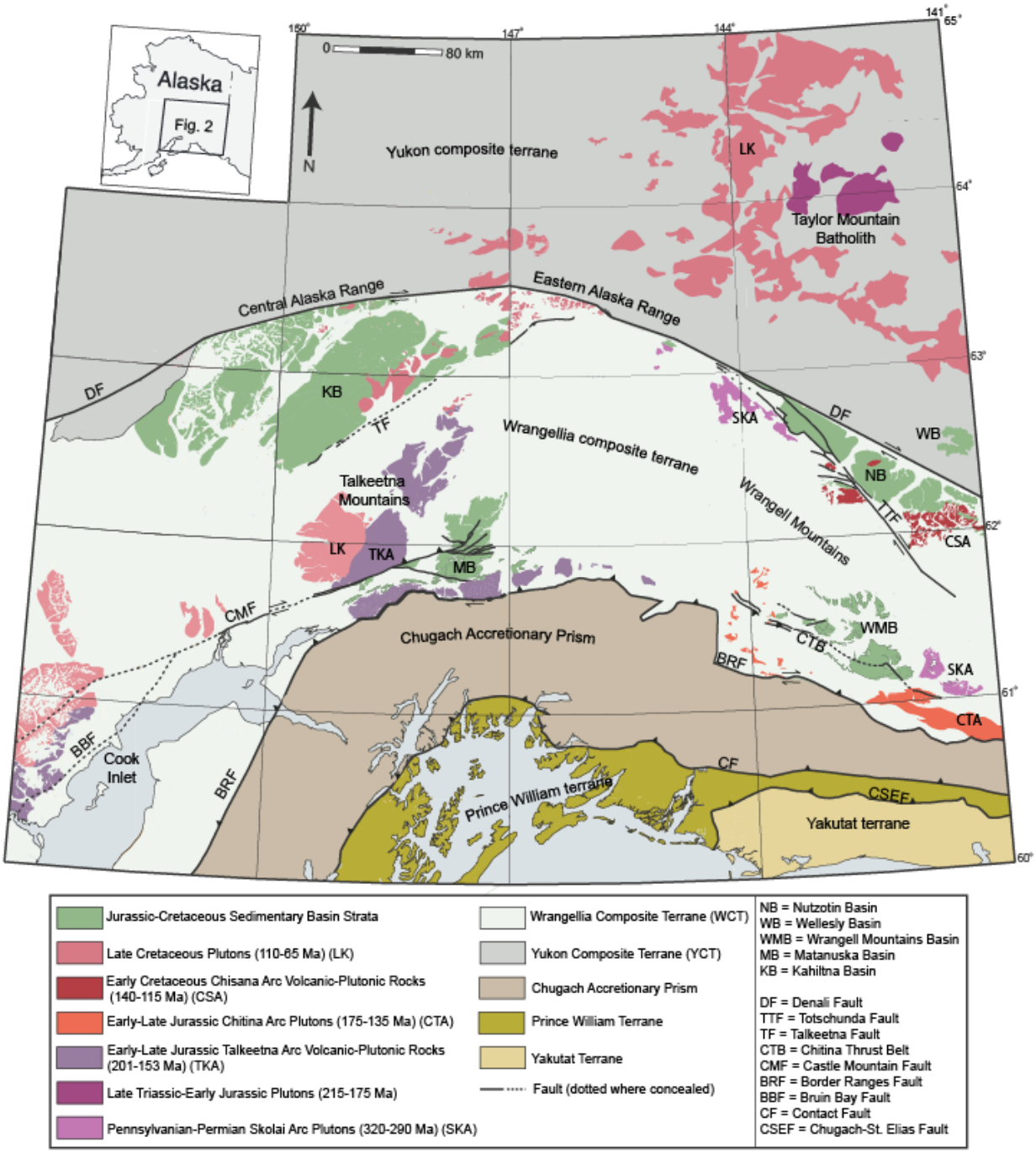


Figure 1.2. Generalized geologic and tectonic map of south-central Alaska showing the generalized distribution of terrane assemblages, Mesozoic sedimentary strata and magmatic arc plutons. Modified from Trop and Ridgway (2007).

CHAPTER 2. DETRITAL ZIRCON GEOCHRONOLOGY AND HF ISOTOPE GEOCHEMISTRY OF MESOZOIC SEDIMENTARY BASINS IN SOUTH-CENTRAL ALASKA: INSIGHTS INTO REGIONAL SEDIMENT TRANSPORT, BASIN DEVELOPMENT, AND TECTONICS ALONG THE NW CORDILLERAN MARGIN

2.1 Introduction

Sedimentary strata along convergent margins provide a record of subduction-related magmatism, oceanic plateau and arc collisional processes, and regional sediment transport pathways (e.g., Dickinson, 1974; Ingersoll, 1979; Plafker and Berg, 1994; Surpless et al., 2014; Stevens Goddard et al., 2018). Recent advances in techniques such as detrital zircon geochronology and Hf isotope analyses have proved insightful for studying the tectonic and sedimentary configuration of ancient convergent margins (Hampton et al., 2010; Yokelson et al., 2015; Reid et al., 2018). In this study, we apply these techniques to better evaluate the Mesozoic geologic development of the Northern Cordillera. This convergent margin was the product of multiple protracted collisional events involving allochthonous oceanic plateau and island arc assemblages, and post-collision strike-slip deformation (Plafker and Berg, 1994; Nelson et al., 2013). In southern Alaska, Mesozoic sedimentary basins are interpreted to record the collision of the oceanic Wrangellia composite terrane with the former North American continental margin (Fig. 2.1; Nokleberg et al., 1985; Plafker and Berg, 1994; Trop and Ridgway, 2007). The tectonic configuration of this collisional event has remained contentious (e.g., Pavlis et al., 2019), with models proposed to explain this event differing on the polarity of subduction (i.e. eastward-dipping vs. westward-dipping) and the tectonic setting of sedimentary basins that formed coevally with this collision.

This study presents new U-Pb detrital zircon geochronology and Hf isotope data from the Jurassic-Cretaceous Nutzotin basin, Wrangell Mountains basin, and Wellesly basin in south-central Alaska. We integrate our data with previously published detrital zircon data from coeval accretionary prism, forearc basin, and retroarc basin assemblages exposed in southern Alaska. Results of our analysis have a bearing on the Mesozoic timing of deposition and deformation in the upper plate, the Mesozoic spatial configuration of tectonic elements of the upper plate, as well as the regional provenance of sediment. Our study presents a geologic test for ongoing debates

regarding the Mesozoic configuration of the Cordilleran margin, which center on the timing of terrane collision, the tectonic setting of sedimentary basins along the inboard (continental margin) and outboard (oceanic) margins of the terrane, the polarity of subduction along the margin, and the amount of post-collisional displacement on regionals strike-slip faults; all of which are important for understanding the tectonic growth of western North America.

2.2 Geologic and Tectonic Framework

2.2.1 Wrangellia Composite Terrane

The Wrangellia terrane extends discontinuously from south-central Alaska to Vancouver Island in southwestern British Columbia (Fig. 2.1; Jones et al., 1977; Nokleberg et al., 1994; Plafker and Berg, 1994). The terrane consists of late Paleozoic island arc-type rocks and marine strata, and early Mesozoic oceanic plateau basaltic flows and carbonate rocks (Plafker and Berg, 1994; Greene et al., 2009; Beranek et al., 2014). Wrangellia, along with the Peninsular terrane of southwestern and south-central Alaska, and the Alexander terrane of southeastern Alaska and British Columbia, make up the Wrangellia composite terrane (WCT; Insular terrane of Monger et al., 1982; Plafker and Berg, 1994). Intruding the Wrangellia composite terrane in south-central Alaska is a series of plutonic rocks that represents the remnants of magmatic arcs that range in age from Pennsylvanian to the latest Cretaceous (Fig. 2.2; Monger et al., 1982; Plafker et al., 1989; Plafker and Berg, 1994). The age ranges and tectonic setting of these plutonic rocks are discussed in more detail later in the “Provenance Interpretation” section of this thesis. The specific timing of collision of the Wrangellia composite terrane with the Mesozoic continental margin remains controversial, with studies suggesting that collision occurred sometime between the middle Jurassic to late Cretaceous and may have been diachronous (McClelland et al., 1992; Trop et al., 2002, 2005; Gehrels et al., 2009; Hampton et al., 2010; Beranek et al., 2017; Stevens Goddard et al., 2018).

2.2.2 Wrangell Mountains Basin

Middle Jurassic-upper Cretaceous strata of the Wrangell Mountains basin are exposed in the southern Wrangell Mountains (Fig. 2.2). The Wrangell Mountains basin is composed of a ~7 km thick succession of marine siliciclastic strata that rest disconformably upon Triassic-early

Jurassic carbonate strata of Wrangellia (MacKevett, 1969; MacKevett et al., 1978; Trop et al., 2002). The stratigraphy of the Wrangell Mountains basin is shown in Figures 2.3 and 2.4, and the reader is referred to MacKevett (1969; 1978) and Trop et al. (2002) for detailed lithologic descriptions and biostratigraphic age determinations. Marine middle to late Jurassic strata in the basin, which includes the Nizina Mountain and Root Glacier Formations and the Kotsina Conglomerate, have been deformed by late Jurassic-early Cretaceous shortening (Trop et al., 2002). An angular unconformity separates the Jurassic strata from the relatively undeformed lower Cretaceous shallow marine strata of the Berg Creek and Kuskalana Pass Formations (Fig. 2.3 and 2.4b; MacKevett et al., 1978). Another unconformity separates lower Cretaceous strata from lower to upper Cretaceous marine strata in the basin, which includes the Kennicott, Moonshine Creek, Shultze, Chititu, and MacColl Ridge Formations (Fig. 2.3; Jones and MacKevett, 1969; MacKevett, 1978; Trop et al., 1999). Age constraints for the majority of the Cretaceous strata are based primarily on biostratigraphic ranges of marine megafauna, whereas the age of the MacColl Ridge Formation, the stratigraphically youngest Mesozoic unit in the basin, is based on $^{40}Ar/^{39}Ar$ dating of volcanic tuffs (Jones and MacKevett, 1969; Trop et al., 1999). Jurassic strata of the Wrangell Mountains basin have been previously interpreted as having formed in a marine retroarc basin, based on their position inboard (north) of early Jurassic-early Cretaceous plutons. Cretaceous strata of the Wrangell Mountains basin have been previously interpreted as having formed in a forearc basin, based on their position outboard (south) of late early to late Cretaceous plutons and volcanic rocks (Fig. 2.2 and 2.4a; Trop et al., 2002).

2.2.3 Nutzotin Basin

The Nutzotin basin consists of a ~6 km thick succession of upper Jurassic-lower Cretaceous sedimentary and volcanic strata exposed north of the Wrangell Mountains (Fig. 2.2; Richter, 1976; Manuszak et al., 2007). As shown in Figure 2.3, these strata include the upper Jurassic-lower Cretaceous Nutzotin Mountains sequence, the lower Cretaceous Chisana Formation, and the lower Cretaceous Beaver Lake formation (Fig. 2.3). The Nutzotin Mountains sequence consists of ~3 km of marine mudstone, sandstone, conglomerate, and volcaniclastic strata that were deposited in mainly submarine fan systems (Fig. 2.5a; Manuszak et al., 2007). An Oxfordian-Valanginian age for the Nutzotin Mountains sequence was established based on the presence of sparse marine fossil assemblages (Richter and Jones, 1973). Locally, the Nutzotin Mountains sequence is in

disconformable contact with underlying Triassic volcanic and carbonate rocks of Wrangellia (Fig. 2.5b and 2.6). Jurassic-Cretaceous strata of the Nutzotin basin are interpreted to have been formed in a marine retroarc basin along the inboard margin of the Wrangellia composite terrane (Trop et al., 2002; Manuszak et al., 2007). The Nutzotin Mountains sequence shares a gradational upper contact with the ~2 km thick Chisana Formation (Fig. 2.3; Richter, 1976). The Chisana Formation consists of intermediate-mafic lavas and volcaniclastic deposits that formed in subaqueous to subaerial environments (Fig. 2.5a; Manselle et al., 2018). Above the Chisana Formation is the ~400 m thick Beaver Lake formation (Fig. 2.3; Trop et al., 2019b). The Beaver Lake formation consists of fluvial deposits with well-preserved plant macrofossils, buried trees, and dinosaur trackways, indicative of forested terrestrial depositional environments (Fiorillo et al., 2012; Trop et al., 2019b).

2.2.4 Wellesly Basin

Exposed north of the Denali Fault in east-central Alaska is the Jurassic-Cretaceous Wellesly basin (Figs. 2.1, 2.2, and 2.5a). Strata of the Wellesly basin consist of ~1.5 km of poorly sorted, matrix-supported, pebble-boulder conglomerate interbedded with coarse grained sandstone deposited in a nonmarine(?) setting (Richter, 1976). These poorly exposed strata locally overlie metamorphic rocks of the Yukon composite terrane (Richter, 1976). Prior to our study, strata of the Wellesly basin had only been studied as part of a regional geologic mapping project that tentatively interpreted them as the possible shoreline equivalent to strata of the Nutzotin basin (Richter, 1976).

2.2.5 Yukon Composite Terrane

The Yukon composite terrane is an amalgamated assemblage of Neoproterozoic (?)-late Paleozoic arc-type and basinal metasedimentary, metaplutonic, and metamorphic rocks that formed along the pericratonic Laurentian margin (Mortensen, 1992; Dusel-Bacon et al., 2006; Nelson et al., 2013). The Yukon composite terrane (YCT; Intermontane terrane of Monger et al., 1982; Colpron et al., 2007) is composed of the Cache Creek, Quesnellia, Stikine, and Slide Mountain terranes located in Yukon and British Columbia, and the Yukon Tanana terrane located in Alaska (Fig. 2.1). A series of plutonic rocks that range in age from Devonian to Cretaceous

intrude the Yukon composite terrane in Alaska (Dusel-Bacon et al., 2006, 2009, 2015). The specific age ranges of these plutonic rocks are discussed in more detail in a later section of the paper.

2.2.6 Major Strike-Slip Faults

Post-collisional strike-slip faults have led to reorganization of the southern Alaska convergent margin since the Cretaceous and need to be considered in studies of this convergent margin. The southernmost strike-slip fault system is the Border Ranges fault, which juxtaposes the Chugach accretionary prism against the Wrangellia composite terrane (Fig. 2.2). The Border Ranges fault is a reactivated Mesozoic subduction zone thrust that has accommodated at least ~130 km of dextral strike-slip between the Cretaceous to Paleogene (Pavlis, 1982; Roeske et al., 2003; Pavlis and Roeske, 2007). Bounding the Wrangellia composite terrane to the north is the Denali fault, which juxtaposes the Wrangellia composite terrane against the Yukon composite terrane. The Denali fault is a dextral strike-slip fault that spans ~2000 km across the Northern Cordillera. Estimates of late Cretaceous-Cenozoic displacement for the Denali fault are ~370 to 450 km, which are based in large part on the interpreted correlation between the Nutzotin Mountains sequence and the Dezadeash Formation, located in southwestern Yukon (Fig. 2.1). These estimates assume that the now two distinct outcrop belts represent a single sedimentary basin that has subsequently been offset by the Denali fault during the late Cretaceous-Cenozoic time (Eisbacher, 1976; Nokleberg et al., 1985; Lowey, 1998). Recent studies also indicate that more than ~150 km of this displacement may have occurred since the Oligocene (Trop et al., 2019a). Merging with the Denali fault in eastern Alaska is the Totschunda fault (Fig. 2.2). The Totschunda fault is also a dextral strike-slip fault that extends for at least 200 km in a southeastward direction from the Denali fault (Fig. 2.5a; Richter and Matson, 1971). The total displacement history along the Totschunda fault is unclear; however, the fault is interpreted to have been active since ca. 25 Ma coinciding with the collision of the Yakutat microplate with the margin (Milde et al., 2013). Middle Cretaceous dikes injected into the fault zone record an earlier phase of deformation interpreted as coinciding with accretion of Wrangellia (Trop et al., 2019b). Finally, separating the Yukon composite terrane and parautochthonous rocks of the Ancestral Continental margin is the Tintina fault (Fig. 2.1). The Tintina fault records dextral strike-slip, with late Cretaceous to Paleogene displacement estimates of ~400 to 430 km (Gabriesle et al., 2006).

2.3 Methods

2.3.1 Sample Collection

A total of fourteen samples were collected for detrital zircon analysis. These include: eight samples from the Nutzotin Mountains sequence in the Nutzotin basin, five samples from strata in the Wrangell Mountains basin (Root Glacier Formation, Kotsina Conglomerate, Kennicott Formation, Moonshine Creek Formation, and MacColl Ridge Formation), and one sample from the Wellesly basin. Locations of collected samples are denoted in Figs. 2.3, 2.4a, and 2.5a. A summary of analyzed samples and corresponding geochronology data are listed in Table 2.1. With the exception of two samples (062718CF-02 and 071718KR-01), the samples collected for detrital zircon analysis are "composite" samples, meaning that they represent multiple fist-sized sandstone samples collected from one measured section, rather than a discrete sandstone bed. These "composite" samples were originally collected for sandstone petrography studies (Manuszak, 2000; Trop et al., 2002) prior to the advent and application of laser ablation inductively coupled plasma mass spectrometry to U-Pb geochronologic studies of detrital zircons. It is also important to note that sample CG-DZ-1/2/3 is a composite of three individual samples collected from the Moonshine Creek Formation in the Wrangell Mountains basin.

2.3.2 U-Pb Detrital Zircon Analysis

U-Pb detrital zircon analysis of sample CG-DZ-1/2/3 was conducted using laser ablation inductively coupled plasma mass spectrometry (LA-ICPMS) at the Pacific Centre for Isotopic and Geochemical Research (PCIGR) at the University of British Columbia using a Resonetics RESOlution M-50-LR attached to an Agilent 7700x quadrupole ICP-MS. Ablation of individual zircon grains resulted in a 34 µm spot diameter and a 15 µm pit depth in each grain. U-Pb detrital zircon analysis of the rest of the samples was conducted at the University of Arizona LaserChron Center. U-Pb detrital zircon ages were obtained using LA-ICPMS with a Thermo Element2 single collector ICP-MS following the methods outlined by Gehrels et al. (2008). A 20 µm spot diameter resulted from laser ablation analysis, leaving a 15 µm pit depth in each grain. Number of analyses varied between 79 and 315 per sample, depending on the number of zircon grains in each sample. For zircon grains with ages <1.0 Ga, the $^{206}Pb/^{238}U$ ages are reported. Conversely, the $^{206}Pb/^{207}Pb$ ages are for zircon grains >1.0 Ga, due to the $^{206}Pb/^{207}Pb$ ages being less sensitive to Pb loss that

is more common in older systems (Gehrels et al., 2008; Gehrels, 2012). Results from the analysis are plotted on normalized age distribution (relative age probability) plots (Fig. 2.7a-c). Peaks shown on the age distribution plots were determined using the program Age-Pick from the program Isoplot designed by Ludwig (2003). Peak ages were calculated using clusters of three or more grain of overlapping age within 2σ error, with the youngest peak age represent the maximum depositional age (MDA) for the sample. This method is a conservative approach to approximating detrital zircon maximum depositional ages (e.g. Dickinson and Gehrels, 2009), and we note that the true depositional age of our sample may be younger than or equal to the detrital zircon maximum depositional age. A total of 2,777 new U-Pb detrital zircon ages are reported for strata of the Wrangell Mountains, Nutzotin, and Wellesly basins.

2.3.3 Hf Detrital Zircon Isotope Geochemistry

Hf isotope geochemical analysis of detrital zircons were conducted by laser ablation inductively coupled plasma spectrometry (LA-ICPMS) using a Nu multi-collector ICP-MS following the methods presented in Gehrels and Pecha (2014). Single zircon grains were laser ablated with a 40 µm spot diameter over the preexisting pit used for U-Pb analysis, so that the Hf compositions corresponds to a U-Pb crystallization age. Hf analyses were conducted for zircons from each of the main age groups in each sample. For our analysis, positive $\varepsilon Hf_{(t)}$ values are considered "juvenile" (derived from magmas associated with mantle components), and negative $\varepsilon Hf_{(t)}$ values are considered "evolved" (derived from magmas associated with older continental components; Bahlburg et al., 2011). A total of 124 new Hf isotope compositions for the Nutzotin and Wellesly basins are reported in this study. Hf isotope compositions were not analyzed for strata of the Wrangell Mountains basin. Results from the analyses are plotted on an Hf evolution diagram (Fig. 2.8). The Hf evolution diagrams show the $\varepsilon Hf_{(t)}$ values for all analyzed samples, which represents the $^{176}Hf/^{177}Hf$ ratio at the time of crystallization relative to the chondritic uniform reservoir (CHUR, Bouvier et al., 2008).

2.4 Results

2.4.1 Nutzotin Basin

Samples LC1-COMP and 062718CF-02 were collected from the stratigraphically lowest part of the Nutzotin Mountains sequence dominated by black shale with thin sandstone beds (FA2; Fig. 2.6). LC1-COMP (n=312) contains predominantly Mesozoic detrital zircon age signatures with subordinate Paleozoic ages (Precambrian (pC) =0%, Paleozoic (Pz) =2%, Mesozoic (Mz) =98%). The sample yields a MDA of 155 Ma (Fig. 2.7a). Hf isotope compositions were not analyzed for sample LC1-COMP. Sample 062718CF-02 (n=315) yields detrital zircon ages that are almost entirely Mesozoic (pC=<1%, Pz=2%, Mz=98%). Based on the peak age, the MDA of this sample is 154 Ma (Fig. 2.7a). $\varepsilon Hf_{(t)}$ values for sample 062718CF-02 (n=19) yield juvenile compositions (+14.9 to +3.0) for detrital zircons between 169-149 Ma (Fig. 2.8).

Sample BR1-COMP (n=119) was collected from normal graded sandstone that represent FA3 of the Nutzotin Mountains sequence (Fig. 2.6). The sample contains detrital zircon ages that range from Precambrian to Mesozoic (pC=<1%, Pz=1%, Mz=99%), but are dominated by Mesozoic grains. BR1-COMP exhibits predominantly Jurassic detrital zircon ages, with a MDA of 154 Ma (Fig. 2.7a). $\varepsilon Hf_{(t)}$ values for sample BR1-COMP (n=18) are shown for zircons with ages from 171-148 Ma in Figure 2.8 and range from juvenile to slightly evolved (+11 to -0.5). Sample 071718KR-01 (n=315) was collected from an exposure of the Nutzotin Mountains sequence in the Slate Creek region of the eastern Alaska Range (Fig. 2.5a). Prior to our study, this exposure had not been assigned a facies association based on the stratigraphic framework of Manuszak et al. (2007). Based on the lithology of the exposure, which consists predominantly of shale with minor sandstone, we assign this sample to facies association 2 (FA2). The sample contains a detrital zircon age distribution that is entirely Mesozoic (pC=0%, Pz=0%, Mz=100%). All detrital zircon ages in the sample range from 164-143 Ma. The MDA of sample 071718KR-01 is 151 Ma (Fig. 2.7a). $\varepsilon Hf_{(t)}$ values for detrital zircon ages between 160-145 Ma in sample 071718KR-01 (n=16) yield juvenile compositions (+11.9 to +4.0; Fig. 2.8).

Samples MC1-COMP and MM1-COMP were collected from two sections of predominantly conglomerate and sandstone in the Nutzotin Mountains sequence (FA1; Fig. 2.6). Sample MC1-COMP (n=312) yields detrital zircon ages that range from Precambrian to Mesozoic (pC=<1%, Pz=1%, Mz=99%). The MDA of sample MC1-COMP is 145 Ma (Fig. 2.7a). Hf compositions were not analyzed for this sample. Sample MM1-COMP (n=230) contains detrital

zircon ages ranging from Paleozoic to Mesozoic (pC=0%, Pz=24%, Mz=76%). MM1-COMP yields a MDA of 144 Ma. The sample also exhibits a larger population of Paleozoic ages than the other samples, with a Pennsylvanian peak age of 301 Ma (Fig. 2.7a). $\varepsilon Hf_{(t)}$ values for sample MM1-COMP (n=23) are reported for both Mesozoic and Paleozoic zircon populations. Mesozoic zircons between 154-138 Ma yield $\varepsilon Hf_{(t)}$ values that are entirely juvenile (+14.3 to +5.7), whereas Paleozoic zircons between 306-297 Ma yield $\varepsilon Hf_{(t)}$ values that are juvenile to slightly evolved (+6.2 to -0.6; Fig. 2.8).

Sample KNC1-COMP was collected from tabular sandstone beds in the middle part of the Nutzotin Mountains sequence (FA4; Fig. 2.6). KNC1-COMP (n=87) shows detrital zircon ages that range from Paleozoic to Mesozoic (pC=0%, Pz=2%, Mz=98%). The age distribution of the sample yields a MDA of 144 Ma (Fig. 2.7a). Hf compositions were not measured for this sample. Sample BON-COMP was collected from the stratigraphically highest known section of the Nutzotin Mountains sequence (FA5; Fig. 2.6). BON-COMP (n=314) yields detrital zircon ages that range from Precambrian to Mesozoic (pC=<1%, Pz=2%, Mz=98%). The sample exhibits two Cretaceous peak ages at 133 Ma and 140 Ma, the younger of which is interpreted as the MDA of the sample (Fig. 2.7a). $\varepsilon Hf_{(t)}$ values for detrital zircons between 152-127 Ma in BON-COMP (n=24) yield entirely juvenile compositions (+15.1 to +6.8; Fig. 2.8).

Prior to our study, the depositional age of the Nutzotin Mountains sequence was based primarily on biostratigraphic ages of limited marine megafauna (Richter, 1971; Richter and Jones, 1973; Richter and Schmoll, 1973; Richter, 1976) and a limited amount (n=10) of detrital zircon ages (Manuszak et al., 2007). The stratigraphic configuration shown in Figure 6 was constructed based on the geologic mapping of Manuszak et al. (2007). Our new detrital zircon ages from the Nutzotin Mountains sequence provide an opportunity to evaluate and strengthen the chronostratigraphic framework for this 3 km-thick stratigraphy. Two samples (LC1-COMP and 062718CF-02) were collected from the lower part of the Nutzotin Mountains sequence in the hanging wall of the regional thrust belt (FA2), while two samples (MC1-COMP and MM1-COMP) were collected from the lower part of the Nutzotin Mountains sequence that is in depositional contact with the Wrangellia composite terrane (FA1; Fig. 2.6). Biostratigraphic ages reported for FA1 and FA2 of the Nutzotin Mountains sequence range between Oxfordian to Tithonian (164-145 Ma; Richter, 1971; Richter and Schmoll, 1973). MDAs from FA2 and FA1 are between 155-154 Ma and 145-144 Ma, respectively, and lie within the established biostratigraphic age range.

Two samples were collected from the middle part of the Nutzotin Mountains sequence (BR1-COMP from FA3 and KNC1-COMP from FA4; Fig. 2.6). Biostratigraphic ages from this part of the sequence are between Tithonian to Valanginian (152-133 Ma; Richter, 1976). The MDA for FA3 is 154 Ma, which is slightly older than the established biostratigraphic age, while the MDA for FA4 (144 Ma) falls within the biostratigraphic age range. Finally, one sample (BON-COMP) was collected from the stratigraphically youngest part of the Nutzotin Mountains sequence (FA5), which ranges in age between Tithonian to Valanginian (152-133 Ma) based on biostratigraphic ages (Fig. 2.6; Richter, 1971; Richter and Jones, 1973). The MDA for FA5 is 133 Ma, which is in agreement with the biostratigraphic age range. The detrital zircon maximum depositional ages reported here for the Nutzotin Mountains sequence are generally consistent with the previously reported biostratigraphic ages and stratigraphic interpretation of Manuszak et al. (2007). This suggests that our approach using detrital zircon ages to approximate depositional ages is valid for the Nutzotin Mountains sequence. However, we note that the true depositional age of the Nutzotin Mountains sequence may be younger than or equal to the detrital zircon maximum depositional ages (Dickinson and Gehrels, 2009).

2.4.2 Wrangell Mountains Basin

ROOT1-COMP was collected from the upper Jurassic Root Glacier Formation in the Wrangell Mountains basin (Fig. 2.3). Sample ROOT1-COMP (n=97) yields a detrital zircon age distribution that is predominantly Mesozoic with minor Paleozoic and Precambrian grains (pC =1%, Pz =1%, Mz =98%). A peak age of 152 is interpreted as the MDA of ROOT1-COMP (Fig. 2.7b). Sample KOT-COMP is from the upper Jurassic Kotsina Conglomerate (Fig. 2.3), which is age-equivalent to the Root Glacier Formation (Trop et al., 2002). KOT-COMP (n=79) contains detrital zircon ages that are almost entirely Mesozoic (pC =0%, Pz =1%, Mz =99%). The age distribution yields a maximum depositional age of 159 Ma (Fig. 2.7b).

Sample KUS1-COMP was collected from the lower Cretaceous Kennicott Formation (Fig. 2.3). KUS1-COMP (n=107) yields detrital zircon ages that range from Precambrian to Mesozoic (pC =4%, Pz =30%, Mz =66%). The age distribution in the sample yields three major peaks at 153, 300, and 307 Ma (Fig. 2.7b). Based on the youngest peak age, the maximum depositional age for the sample is interpreted as 153 Ma.

Sample CG-DZ-1/2/3 is a composite of three individual samples collected from the upper Cretaceous Moonshine Creek Formation (Fig. 2.3) CG-DZ-1/2/3 (n=239) displays primarily Mesozoic and Paleozoic detrital zircon ages with few Precambrian grains (pC=<1%, Pz=35%, Mz=64%). The sample yields four major peak ages at 104, 116, 150, and 299 Ma, with subordinate peaks at 224, 439, and 463 Ma (Fig. 2.7b). Based on the youngest peak age, the MDA for sample CG-DZ-1/2/3 is 104 Ma. Finally, sample MAC-COMP was collected from the upper Cretaceous MacColl Ridge Formation (Fig. 2.3). Detrital zircon ages from sample MAC-COMP (n=100) yield primarily Mesozoic ages with subordinate Paleozoic and Precambrian ages (pC=3%, Pz=5%, Mz=92%). MAC-COMP yields a total of nine peak ages, with the youngest peak age at 76 Ma, and older subordinate peak ages of 85, 104, 119, 142, 146, 153, 157, and 196 Ma (Fig. 2.7b). The peak age of 76 Ma is interpreted to be the maximum depositional age for MAC1-COMP.

Published age constraints for strata of the Wrangell Mountains basin are based on biostratigraphic ages of abundant marine megafauna as well as radiometric age dating of plutonic clasts and volcanic tuff beds (MacKevett, 1978; Trop et al., 1999, 2002). Biostratigraphic ages for the Root Glacier Formation indicate an Oxfordian-Tithonian depositional age (164-145 Ma; MacKevett, 1969). The maximum depositional age for the unit based on detrital zircons is 152 Ma, which lies in the biostratigraphic age range for the formation. Age constraints for the Kotsina Conglomerate are based on: (1) radiometric age dating of hornblende in a granitic clast in the unit, which yields a $^{40}Ar/^{39}Ar$ age of 152.8 +/- 1.1 Ma, and (2) stratigraphic relationships that indicate the Kotsina Conglomerate is age-equivalent to the Root Glacier Formation (Oxfordian-Tithonian; Trop et al., 2002). The detrital zircon maximum depositional age for unit is 159 Ma, which lies within the established stratigraphic age constraints. Biostratigraphic ages for the lower Cretaceous Kennicott Formation indicate an Albian (113-100.5 Ma) age for the formation. The maximum depositional age based on detrital zircons for the Kennicott Formation is 153 Ma, which is older than the biostratigraphic age range. Given the abundance of marine megafauna in the Kennicott Formation in the sampled region (Grantz et al., 1966; Winkler et al., 1981), an Albian depositional age seems likely. Biostratigraphic ages for the upper Cretaceous Moonshine Creek Formation indicate a Cenomanian (~100-94 Ma) depositional age. The detrital zircon maximum depositional age for the Moonshine Creek Formation is 104 Ma, which is older than the biostratigraphic age range, but is still generally consistent with prior age constraints. Finally, age constraints from the upper Cretaceous MacColl Ridge Formation are based primarily on: (1) palynology which yields

a Campanian (84-72 Ma) biostratigraphic age, and (2) radiometric age dating of volcanic tuff beds near the top of the formation, which yield $^{40}Ar/^{39}Ar$ ages of 79.4 +/- 0.7 and 77.9 +/- 2.1 Ma (Campanian; Trop et al., 1999). The detrital zircon maximum depositional age for the MacColl Ridge Formation is 76 Ma, which is consistent with palynologic and radiometric ages for the unit. Overall, our detrital zircon maximum depositional ages for the Wrangell Mountains basin are broadly consistent with published biostratigraphic age constraints. However, our MDAs for the basinal strata may be older than the true depositional ages, especially in the case for the Kennicott Formation, which will be discussed in greater detail below.

2.4.3 Wellesly Basin

Sample WM1-COMP (n=150) was collected from sandstone interbedded with conglomerate of the Wellesly basin (Fig. 2.3). Due to the limited exposures of the Wellesly strata, the stratigraphic position of the sample is uncertain. WM1-COMP shows a detrital zircon age spectrum from Precambrian to Mesozoic (pC=13%, Pz=31%, Mz=56%). A total of nineteen peak ages are present in the sample: two Cretaceous peak ages at 126 and 133 Ma; four Jurassic peak ages at 147, 172, 187, and 200 Ma; one Triassic peak at 218 Ma; six Paleozoic peak ages at 265, 328, 368, 382, and 413 Ma; and six Precambrian peak ages at 1037, 1135, 1223, 1482, 1649, and 1849 Ma (Fig. 2.7c). The MDA of sample WM1-COMP is interpreted as 126 Ma, based on the youngest peak age. There had been no previous age data reported from the Wellesly basin. Richter (1976) had tentatively assigned it a Jurassic-Cretaceous age due to its geographic proximity to the better dated Nutzotin Mountains sequence (Fig. 2.2). $\varepsilon Hf_{(t)}$ values for Mesozoic detrital zircon grains with ages from 197-158 yield an array of juvenile to evolved signatures (+9.6 to -14.4). $\varepsilon Hf_{(t)}$ for Paleozoic zircons with ages 326, 355, and 390 Ma yield slightly juvenile to evolved signatures (+1.5 to -6.3). Finally, $\varepsilon Hf_{(t)}$ values for two Paleoproterozoic grains with ages of 1820 and 1853 Ma yield both slightly juvenile to slightly evolved signatures (+2.4 and -2.0, respectively; Fig. 2.8).

2.5 Provenance Interpretation

Detrital zircon ages from the Nutzotin basin, Wrangell Mountains basin, and Wellesly basin overlap in age with magmatic sources from both the accreted oceanic rocks of the Wrangellia

composite terrane and continental margin rocks of the Yukon composite terrane. This section summarizes potential magmatic sources from both composite terranes, as well as interprets the provenance for detrital zircons in the studied units. The Wrangellia composite terrane, and subsequently the overlying sedimentary basins, have undergone significant dextral displacement since the late Cretaceous. Paleomagnetic studies of the MacColl Ridge Formation in the Wrangell Mountains basin (see Fig. 2.3 for stratigraphic location) indicate that the unit formed at a more southerly latitude, around southern British Columbia (Stamatakos et al., 2001). Conversely, other studies have postulated that the WCT was positioned ~3000 km to the south around present day Baja California during late Cretaceous time, which is known as the Baja-B.C. hypothesis (Wynne et al., 1995; Irving et al., 1996; Cowan et al., 1997; Hollister and Andronicos, 1997; Garver and Davidson, 2015). Because the MacColl Ridge Formation is within our study area, and the fact that the majority of the detrital zircon ages in our dataset are accounted for in magmatic sources in the Northern Cordillera, we focus on magmatic sources in British Columbia, Yukon, and Alaska for the detrital zircons in the studied units. We do, however, consider implications of our data for greater distances of tectonic transport later in this paper.

2.5.1 Potential Primary Magmatic Sources of Sediment on the Wrangellia composite terrane

The majority of magmatic sources associated with the Wrangellia composite terrane range between late Paleozoic to late Mesozoic in age. Late Paleozoic magmatic sources in south-central Alaska include Pennsylvanian-Permian plutons of the Skolai arc (320-290 Ma), which are exposed in Wrangell Mountains, as well as parts of the eastern Alaska Range (SKA in Fig. 2.2). U-Pb zircon ages of the Skolai arc plutons yield ages between 310-284 Ma (Gardner et al., 1988; Beard and Barker, 1989; Beranek et al., 2014). Nd isotope compositions from Pennsylvanian plutons associated with the arc exposed in the St. Elias Mountains yield signatures indicative of mixing of mantle and crustal material (Beranek et al., 2014).

Jurassic-early Cretaceous magmatic sources of the Wrangellia composite terrane in south-central Alaska include volcanic-plutonic rocks associated with the Talkeetna (201-153 Ma), Chitina (175-135 Ma), and Chisana arcs (130-115 Ma). Talkeetna arc plutons are exposed in the southern Talkeetna Mountains (TKA in Fig. 2.2), and yield U-Pb zircon ages of 201-181 Ma and 177-153 Ma (Rioux et al., 2007, 2010). Nd isotopic compositions of Talkeetna arc plutons indicate

a juvenile source for the magmas, which is consistent with an oceanic arc interpretation for the arc (Rioux et al., 2010). Plutons of the Chitina arc are primarily exposed in the Chitina Valley south of the Wrangell Mountains (CTA in Fig. 2.2). U-Pb zircon ages from the Chitina arc yield ages of 153-150 Ma, while detrital zircon ages from modern river sands draining from Chitina arc plutons yield ages between 156-130 Ma (Plafker et al., 1989; Roeske et al., 2003; Day et al., 2016; Trop et al., 2016). The Chitina arc is interpreted as an oceanic arc that may be the southeastern continuation of the Talkeetna arc to the northwest (Plafker et al., 1989; Trop et al., 2005). Nd isotope compositions of sedimentary and volcaniclastic strata in the Dezadeash Formation in southwestern Yukon that are interpreted to have been chiefly sourced from the Chitina arc indicate that Chitina arc magmas were derived primarily from mantle material with mixing of older crustal material (Lowey, 2011, 2018). The Chisana arc is exposed north of the Wrangell Mountains (CSA in Fig. 2.2). U-Pb zircon and $^{40}Ar/^{39}Ar$ ages of Chisana arc volcanic and plutonic rocks range between 126-113 Ma, and isotopic compositions indicate that magma was derived from primitive melts in a subduction-related arc setting (Snyder and Hart, 2007; Graham et al., 2016; Manselle, 2019). Late Cretaceous magmatic sources include a suite of granitic plutons exposed directly north of the Nutzotin basin that yield 94-92 Ma K-Ar ages (Fig. 2.5; Richter, 1976) and in the Talkeetna Mountains, which yield U-Pb zircon ages of 79-67 Ma (LK in Fig. 2.2; Bleick et al., 2012). The latter suite is part of an extensive late Cretaceous arc system (Kluane arc of Plafker and Berg, 1994), which may be the northern limit of the Coast plutonic complex exposed in British Columbia (Fig. 2.1).

Precambrian magmatic sources are lacking on the Wrangellia terrane, but Neoproterozoic-Cambrian plutons are exposed on the Alexander terrane, which is located in the southern part as well as to the southeast of our study area (Fig. 2.1; Gehrels and Saleeby, 1987). However, secondary (reworked) sources may include sedimentary strata of the Alexander terrane, which has been shown to contain Precambrian zircons (White et al., 2016).

2.5.2 Potential Primary Magmatic Sources of Sediment on the Yukon composite terrane

Magmatic sources that intrude the Yukon composite terrane in Alaska, Yukon, and British Columbia range in age from Paleozoic to Mesozoic. Paleozoic magmatic sources include Devonian-Mississippian (376-320 Ma) plutons that intrude the Yukon Tanana, Quesnellia-Slide Mountain, and Stikinia terranes (Mortensen, 1990; Dusel-Bacon et al., 2004, 2006). Nd isotopic

compositions from these plutons indicate evolved signatures representing melting of older crustal material (Mortensen, 1992). Permian plutonic sources include 275-255 Ma plutons that intrude the Quesnellia-Slide Mountain terrane in Yukon and British Columbia (Mortensen, 1990).

Mesozoic magmatic sources include late Triassic-early Jurassic (215-175 Ma) plutonic rocks intruding the Yukon Tanana terrane (Fig. 2.2; Aleinikoff et al., 1981). U-Pb zircon ages from the Taylor Mountain batholith exposed in eastern Alaska yield ages between 216-181 Ma (Dusel-Bacon et al., 2009, 2015; Day et al., 2014). Pb isotopic compositions of these plutons indicate a mixture of mantle and crustal components during melting (Dusel-Bacon et al., 2015). Cretaceous plutons intrude the Yukon Tanana terrane in eastern Alaska and yield ages between 112 and 66 Ma (Foster et al., 1994; Dusel-Bacon et al., 2015).

A potential more distal source, based on the current position of the study area, also includes the Coast Plutonic Complex of southeastern Alaska and British Columbia (Fig. 2.1). Plutons of the Coast Plutonic Complex intrude both the Wrangellia and Yukon composite terranes; plutons intruding the Wrangellia composite terrane yield U-Pb zircon ages of ~160-140 Ma, ~120-100 Ma, and ~100-80 Ma, whereas plutons intruding the Yukon composite terrane yield U-Pb ages of 190-110 Ma and 100-50 Ma (Gehrels et al., 2009). $\varepsilon Hf_{(t)}$ values of plutons of the Coast Plutonic Complex range between +9 to +2 for plutons intruding the Wrangellia composite terrane and +13 to +1 for plutons intruding the Yukon composite terrane, which indicates derivation from primarily juvenile melts with minor crustal input (Cecil et al., 2011). The Coast Plutonic Complex was positioned closer to the basins in this study, due to several hundred kilometers of post-late-Cretaceous dextral displacement along the Denali Fault system (Nokleberg et al., 1985). The plutons also document a prominent magmatic lull between 140-120 Ma that is also present throughout the Northern Cordillera (Armstrong, 1988; Gehrels et al., 2009).

Secondary sources for Precambrian detrital zircons include reworked detrital zircons from magmatic sources in western Canada as well as from sources on the Canadian Shield (Gehrels et al., 1995; Linde et al., 2017). Recycled zircons from the Grenville orogen may also serve as a secondary source, as previous studies have noted Grenville-aged (1350-950 Ma) detritus in the northern Cordillera (Rainbird et al., 1997). Grenville detritus is interpreted to have been reworked from continental-scale clastic wedges that accumulated across western Laurentia during the Neoproterozoic (Rainbird et al., 2012).

2.5.3 Provenance of the Nutzotin Basin

The detrital zircons from the Nutzotin Mountains sequence indicate that deposition in the basin occurred mainly between 155-133 Ma, and that sediment was primarily derived from Mesozoic sources with very minor input from Paleozoic sources. Precambrian zircons make up ~1% of the grains in the Nutzotin Mountains sequence (Fig. 2.7a). Potential sources for these minor Precambrian zircons could be metasedimentary strata of the Yukon composite terrane or Paleozoic strata of the Alexander terrane, as strata of both terranes contain abundant Precambrian detrital zircons (Pecha et al., 2016; White et al., 2016). We interpret that these sparse Precambrian grains were derived from the Alexander terrane, based on the stratigraphic relationship between the Nutzotin Mountains sequence and underlying Wrangellia terrane as well as predominant eastward- to northeastward-directed paleocurrent indicators (Manuszak et al., 2007). The relative paucity of Precambrian zircons in the Nutzotin Mountains sequence is important, in that it precludes continental margin rocks of the Yukon composite terrane from being a significant source of sediment to the basin.

Paleozoic detrital zircons (491-268 Ma) constitute ~4% of the total detrital zircon population in the Nutzotin Mountains sequence (Fig. 2.7a). Of these Paleozoic zircons, 85% overlap in age with plutons of the Skolai arc (320-290 Ma). $\varepsilon Hf_{(t)}$ values for Paleozoic detrital zircons in the Nutzotin Mountains sequence (306-297 Ma) yield predominantly intermediate compositions (Fig. 2.8; +6.2 to -0.6). Hf compositions from these detrital zircons overlap with Nd isotopic compositions from Pennsylvanian plutons of the St. Elias Mountains, which indicate a mixture of mantle and crustal melts (e.g., Beranek et al., 2014).

Jurassic (199-145 Ma) detrital zircons constitute 72% of the total population of zircons in the Nutzotin Mountains sequence (Fig. 2.7a). 91% of all detrital zircon ages overlap with ages from the plutonic suite of the Chitina arc (175-135 Ma), that are exposed to the south of the basin (Fig. 2.2). Seven of our samples yield maximum depositional ages that overlap with the Chitina arc. $\varepsilon Hf_{(t)}$ values from detrital zircons overlapping in age with the Chitina arc (169-135 Ma) yield an array of juvenile and intermediate compositions (Fig. 2.8; +14.9 to -0.5), consistent with a magma source that was derived from both mantle and crustal sources. The overlap in detrital zircon ages, isotopic compositions, and the regional proximity of the arc to the Nutzotin Mountains sequence, makes the Chitina arc plutons likely the predominant source for detrital zircons in the basin; the overlap in age and unimodal age distribution of our samples suggests that plutons of the

Chitina arc were rapidly exhumed and eroded and deposited in the basin. The documentation of thick-bedded, cobble conglomerate in parts of the Nutzotin Mountains sequence (measured sections MM1 and MC1 in Fig. 2.6), with large outsized clasts derived from the Wrangellia terrane, is also suggestive of proximal sources of sediment (e.g., Manuszak et al., 2007). Other potential sources of sediment include the Jurassic Talkeetna arc (201-153 Ma) exposed to the southwest of the basin in the Talkeetna Mountains (Fig. 2.2). Ages from the Chitina arc (175-135 Ma) overlap with reported ages from the Talkeetna arc (201-153 Ma). In terms of detrital zircons that could strictly be sourced only from the Talkeetna arc (201-175 Ma), less than 1% of all grains overlap with this age range. This suggests that the Chitina arc was a more likely source of detrital zircons relative to the Talkeetna arc.

Cretaceous (145-124 Ma) detrital zircons account for ~23% of the age distribution of the Nutzotin Mountains sequence (Fig. 2.7a). These ages overlap with both the Chitina arc as well as the Chisana arc (130-115 Ma); plutons of this arc system are exposed directly south of the Nutzotin Mountains sequence (Fig. 2.2). Of the Cretaceous age distribution, 145-135 Ma detrital zircons (~83%) match well with the Chitina arc whereas <135 Ma (17%) match with the Chisana arc. $\varepsilon Hf_{(t)}$ values for detrital zircons derived from the Chisana arc (135-127 Ma) yield predominantly juvenile signatures (Fig. 2.8; +15.1 to +6.8), which is consistent with previous interpretations that the Chisana arc developed as an oceanic arc built upon overthickened crust of Wrangellia (Snyder and Hart, 2007; Manselle, 2019). Based on these ages and compositions, we interpret that during Cretaceous deposition in the Nutzotin basin, the Chitina arc was still a major source of detrital zircons, while the Chisana arc became the primary source of detrital zircons during the later stages of deposition in the basin (Fig. 2.7).

2.5.4 Provenance of the Wrangell Mountains Basin

Similar to the Nutzotin basin, the Wrangell Mountains basin contains few Precambrian grains, approximately ~1% of the total age distribution. These sparse Precambrian grains were most likely reworked from Paleozoic strata of the Alexander terrane (e.g., White et al., 2016). The majority of detrital zircon ages in the Wrangell Mountains basin overlap in age with local magmatic sources proximal to the basin. Paleozoic detrital zircon ages (484-257 Ma) constitute approximately ~19% of the total age distribution of samples from the Wrangell Mountains basin (Fig. 2.6). The majority of these Paleozoic zircons, approximately 84%, overlap with ages of

plutons of the Skolai arc. Regionally, plutons of the Skolai arc in the southern Wrangell Mountains are in close proximity to the Wrangell Mountains basin and modern rivers in this region yield abundant ~320 to ~275 Ma detrital zircon ages that suggest nearly continuous middle Pennsylvanian to early Permian magmatism (Fig. 2.2; Bliss et al., 2017). We interpret the Skolai arc as being the dominant source of Paleozoic zircons in the Wrangell Mountains basin.

Jurassic (198-145 Ma) detrital zircons dominate the age distribution for samples of the Wrangell Mountains basin, accounting for approximately 52% of the grains (Fig. 2.7b). The majority of detrital zircon ages from the Wrangell Mountains basin overlap with pluton ages of the Chitina arc (175-135 Ma); these plutons are mainly exposed directly south of the basin (CTA in Fig. 2.2). Major peak ages of 152, 159, 153, and 150 Ma in samples from the Root Glacier Formation, Kotsina Conglomerate, Kennicott Formation, and Moonshine Creek Formations, respectively, overlap with magmatic activity in the Chitina arc. Volcanic flows and tuffs in the Root Glacier Formation as well as Jurassic granitic clasts in the Kotsina Conglomerate are also indicative of a proximal arc source (Trop et al., 2002). We interpret the Chitina arc as being the predominant source of detrital zircons for the Wrangell Mountains basin during Jurassic and early Cretaceous deposition. Plutons of the Talkeetna arc (201-153 Ma) in the Talkeetna Mountains are exposed along-strike to the northwest of the basin (Fig. 2.2). In terms of detrital zircon grains that could only be sourced from the Talkeetna arc, only 2% of the grains fall within this range (grains between 201-175 Ma); suggesting that the arc was not a major source of sediment to the basin.

Cretaceous detrital zircons (145-74 Ma) account for 28% of the total age distribution in the Wrangell Mountains basin (Fig. 2.7b). 145-135 Ma detrital zircons (19%) overlap with plutons of the Chitina arc, indicating that the arc was still a major contributor of sediment for the basin. Early Cretaceous plutons of the Chisana arc (130-115 Ma) are exposed to the north of the basin (CSA in Fig. 2.2). 26% of the Cretaceous detrital zircons, which are primarily concentrated in the lower Cretaceous Moonshine Creek Formation, overlap in age with the Chisana arc, indicating that the arc was a major sediment source during the beginning of late Cretaceous deposition in the basin. The Moonshine Creek Formation also contains abundant 114-82 Ma detrital zircons, which overlap with middle to late Cretaceous plutons that intrude the Wrangellia and Yukon composite terranes in south-central Alaska north of the basin (Fig. 2.3). Southeast-directed paleoflow indicators for the Moonshine Creek Formation are consistent with derivation from this Cretaceous arc source (Trop et al., 2002). Late Cretaceous detrital zircons (100-74 Ma) from the MacColl

Ridge Formation also overlap with this Cretaceous arc source; however, paleoflow indicators from the MacColl Ridge Formation indicate northward sediment dispersal (Trop et al., 1999). Late Cretaceous rocks of the Valdez Group in the Chugach accretionary prism are presently exposed to the south of the Wrangell Mountains basin, and contain abundant late Cretaceous detrital zircons (Amato et al., 2013). The paleoflow data in combination with a nearby source of sediment south of the basin indicates that much of the late Cretaceous detrital zircons in the MacColl Ridge Formation may have been shed from the Chugach accretionary prism.

2.5.5 Provenance of the Wellesly Basin

The Wellesly basin overlies Paleozoic metasedimentary rocks of the Yukon composite terrane (Fig. 2.2 and 2.5a). Conglomerate clasts in strata of the Wellesly basin are dominated by vesicular basalt, chert, and andesite clasts. Similar rock types have been noted in underlying metasedimentary strata of the Yukon composite terrane (Richter, 1976). The compositional data and stratigraphic relationship indicates that the Wellesly basin may have been sourced from plutonic and metasedimentary rocks associated with the Yukon composite terrane. Precambrian zircons account for 13% of the total age distribution in the Wellesly basin with sparse ages ranging between 1.8 to 0.5 Ga (Fig. 2.6). These zircons were likely recycled from older sedimentary strata in the Northern Cordillera, such as Paleozoic-Triassic passive margin strata where Precambrian detrital zircon populations have been recognized (Fig. 2.1; Gehrels et al., 1995; Gehrels and Pecha, 2014).

Paleozoic detrital zircon ages (498-254 Ma) account for 11% of the total age distribution in the Wellesly Mountain basin (Fig. 2.7c). Devonian-Mississippian (376-320 Ma) and Permian (275-255 Ma) plutons that intrude the Yukon composite terrane may be potential, but limited, sources of sediment input into the Wellesly basin. $\varepsilon Hf_{(t)}$ values from Paleozoic zircons (Fig. 2.8; 0 to -6) indicate more evolved sources, consistent with Paleozoic plutonic sources on the Yukon Composite terrane that yield isotopically evolved signatures (Mortensen, 1992).

Middle Triassic-middle Jurassic detrital zircon ages (240-168 Ma) constitute the majority of the total zircon population, with 63% of the total population falling within this range (Fig. 2.7c). Plutons associated with the Taylor Mountain batholith (216-181 Ma) are exposed north of the basin (Fig. 2.2). Major peak ages between 218-187 Ma overlap with the Taylor Mountain batholith. $\varepsilon Hf_{(t)}$ values of detrital zircons between 197-182 Ma yield juvenile to evolved compositions (Fig. 2.8;

+9.6 to -14.4), which is consistent with mantle and crustal derived magmas of the Taylor Mountains batholith (Dusel-Bacon et al., 2015). More distal potential sources include volcanic rocks and plutons associated with the Talkeetna arc. However, Nd isotopic compositions from the Talkeetna arc plutons are primarily juvenile (Rioux et al., 2007), whereas $\varepsilon Hf_{(t)}$ values from the Wellesly basin display a wide range of isotopic compositions, making the Talkeetna arc an unlikely source for the basin. This makes the Taylor Mountain batholith the likely dominant source of sediment for the Wellesly basin.

Late Jurassic-early Cretaceous (167-126 Ma) detrital zircon ages account for 13% of the total age distribution in sample WM1-COMP (Fig. 2.7c). A pluton of this age has been recently documented in the Yukon composite terrane (M. Colpron, personal communication, 2019). Another potential distal source may be plutons of the eastern portion of the Coast plutonic complex, where U-Pb ages between 150-120 Ma have been reported (Gehrels et al., 2009; Mahoney et al., 2009). Conversely, documented magmatic sources of this age associated with the Wrangellia composite terrane included both the Chitina (175-135 Ma) and Chisana arcs (130-115 Ma; Fig. 2.2). $\varepsilon Hf_{(t)}$ values of detrital zircons between 167-158 Ma in WM1-COMP yield juvenile to evolved signatures (+6.7 to -5.5; Fig. 2.8), which is inconsistent with predominantly juvenile isotopic compositions from plutons intruding the Wrangellia composite terrane. Therefore, we interpret the Jurassic-Cretaceous plutons associated with the Yukon composite terrane as a sediment source for the Wellesly basin.

2.6 Discussion

2.6.1 New Insights into the Nutzotin Basin

Our new detrital zircon data from the Nutzotin Mountains sequence offers new insight into the timing of Mesozoic basin development and the depositional and deformational history of the Nutzotin basin. The data also provide a test for the original stratigraphic model for the basin proposed by Manuszak et al. (2007) that was primarily based on stratigraphic correlation and limited biostratigraphic data. The oldest part of the stratigraphy, based on detrital zircon maximum depositional ages, are distal submarine fan strata of facies association 2 (FA2) from the northwestern part of the basin which have MDAs of 155-154 Ma (Fig. 2.6). From a regional mapping perspective (Richter, 1976; Manuszak et al., 2007), these strata are located in the hanging

wall of a thrust fault system that juxtaposes these strata with proximal submarine fan strata of facies association 1 (FA1) that have a MDA between 145-144 Ma (Fig. 2.6). The proximal submarine fan strata of FA1 consist of conglomerate with outsized, meters-scale limestone clasts (Manuszak et al., 2007). Clast compositions of conglomerate and northward-directed paleoflow measurements indicate that sediment dispersal was directed away from the northern margin of the Wrangellia terrane in this first stage of basin development (Kozinski, 1985; Manuszak et al., 2007). Our detrital zircon data from FA1 and FA2, in combination with previous sedimentological studies, show that by 145 Ma exhumation and erosion of the Wrangellia terrane along with subsidence of the Nutzotin basin had commenced. The middle part of the Nutzotin Mountains sequence consists of over 1000 m of tabular sandstone and subordinate clast-supported, pebble conglomerate of facies association 3 and 4 (FA3 and FA4 on Fig. 2.6). Clast compositions in conglomerate in these facies associations record a relative up-section increase in metabasalt relative to limestone clasts, reflecting exhumation and erosion of deeper levels of the Wrangellia terrane (Manuszak et al., 2007). Our detrital zircon data from FA3 and FA4 indicate that the sediment contribution from igneous rocks of the Chitina arc, built along the southern margin of the Wrangellia terrane, was important to the Nutzotin basin. The youngest MDA that we have documented from FA3 and FA4 is 144 Ma. When combined with the oldest MDA of 155 Ma from the lower part of the stratigraphy, the Nutzotin basin contains a record of a major influx of sand and gravel size detritus from 155-144 Ma; most of this sediment was derived from Wrangellia and related plutons of the Chitina arc. The final stage of basin development recorded by the Nutzotin Mountains sequence, is represented by mainly fossiliferous shale with thin interbeds of sandstone of facies association 5 (Fig. 2.6). This facies association is characterized by abundant nontransported, open-marine bivalve macrofauna and has been interpreted as being deposited in shallow-marine environments above storm wave base (Manuszak et al., 2007). The MDA of this upper part of the stratigraphy is 133 Ma (Fig. 2.6). The increase in Cretaceous detrital zircons in FA5 (57% in sample BON-COMP) documented in our dataset (Fig. 2.7a) indicate that sediment was still being derived from the Chitina arc along with introduction of sediment from plutons of the Chisana arc. Volcanic-plutonic rocks of this age are best exposed along the southern and eastern margins of the Nutzotin basin (Fig. 2.5a). Based on MDAs, the 3 km-thick Nutzotin Mountains sequence was deposited over a period of ~22 Ma, by predominantly submarine fan depositional systems with minor shelf environments. The upper part of the stratigraphy, FA5, is interbedded with thin basaltic to andesitic

lava flows that increase upsection towards the gradational contact with the Chisana Formation (Fig. 2.3; Manuszak et al., 2007). The Chisana Formation consists of 3 km of lower Cretaceous (Hauterivian-Aptian) lava flows, tuff, mudstone, and volcaniclastic breccia (Richter, 1976; Sandy and Blodgett, 1996) with depositional ages between 121-117 Ma (Manselle et al., 2018; Trop et al., 2019b). The Nutzotin Mountains sequence and the Chisana Formation are deformed by thrust faults (Fig. 2.5b) and are intruded by undeformed plutons with U-Pb ages between 126-113 Ma (Richter, 1976; Manuszak et al 2007; Graham et al., 2016). The youngest strata in the Nutzotin basin are the fluvial strata of the Beaver Lake formation which are deformed by broad open folds. These strata consist chiefly of conglomerate with minor sandstone and mudstone (Trop et al., 2019b). Biostratigraphic age determinations and U-Pb ages of detrital zircons indicate that the strata were deposited between ~117-98 Ma and derived chiefly from Chisana arc sources (Trop et al., 2019b). These ages, in conjunction with our detrital zircon dataset from the Nutzotin Mountains sequence, show that the development of the entire Nutzotin basin occurred between 155-98 Ma.

2.6.2 New Insights into the Wrangell Mountains Basin

Our detrital zircon data, combined with previously reported sedimentological and structural data (Trop et al., 2002), provide additional insights into the depositional and tectonic history of the Wrangell Mountains basin. The Upper Jurassic Root Glacier Formation and the Kotsina Conglomerate have maximum depositional ages based on detrital zircons of 152 and 159 Ma, respectively (Fig. 2.7b). Previous biostratigraphic data indicate that these strata are Oxfordian-Tithonian in age (MacKevett, 1969), suggesting that the MDAs are a close representation of the depositional ages. The Root Glacier Formation consists of mudstone, sandstone and conglomerate representing submarine fan and slope environments, whereas the Kotsina Conglomerate consists of pebble-boulder conglomerate representing fan-delta environments (Trop et al., 2002). Clast compositions of conglomerate in both units consist primarily of metabasalt and limestone derived from volcanic and carbonate strata of the Wrangellia composite terrane (Trop et al., 2002). Our detrital zircon ages from both units yield a combined major age population between 166-144 Ma that matches closely with ages of plutonic rocks of the Chitina arc (175-135 Ma) exposed directly to the southeast of the basin. This interpretation is consistent with northward-directed, paleoflow indicators in the upper Jurassic strata (Trop et al., 2002). The Root Glacier Formation and Kotsina

Conglomerate are interpreted to have formed coevally with displacement on the Chitina thrust belt (CTB in Fig. 2.2). This northwest-trending thrust belt juxtaposes Wrangellia terrane rocks against Jurassic strata of the Wrangell Mountains basin (Gardner et al., 1986; Trop et al., 2002). During late Jurassic shortening, the Chitina thrust belt exhumed rocks of the Chitina arc and Wrangellia terrane that were eroded and deposited in the retroforeland setting of the Wrangell Mountains basin (Trop et al., 2002).

Lower Cretaceous strata of the Kennicott and Moonshine Creek Formations overlie deformed Jurassic strata along an angular unconformity (Fig. 2.4b), and consist of conglomerate, sandstone, and mudstone that were deposited in nearshore to offshore marine environments (Trop et al., 2002). Clast compositions of conglomerate from both formations indicate derivation from the Wrangellia composite terrane and paleoflow measurements indicate south- to southeastward sediment dispersal (Trop et al., 2002). Detrital zircon ages for the lower Cretaceous Kennicott Formation yield two major age populations: 310-289 Ma and 160-142 Ma (Fig. 2.7b), which overlap in age with plutons of the Skolai (320-290 Ma) and Chitina (175-135 Ma) currently exposed south of the basin (Fig. 2.2). Another potential source for the Jurassic detrital zircons is Jurassic intrabasinal strata that were deformed and eroded prior to deposition of the Cretaceous strata across the angular unconformity (Fig. 2.7b). Note that detrital zircon ages from the Root Glacier Formation and Kotsina Conglomerate are similar to ages for the Kennicott Formation (Fig. 2.7b). Jurassic strata are currently exposed north of the Kennicott Formation, which combined with southward paleoflow measurements (Trop et al., 2002), suggest that erosion and reworking of Jurassic strata in the basin during the Cretaceous was very likely. Detrital zircon ages from the Moonshine Creek Formation exhibit similar Pennsylvanian-Permian and late Jurassic-early Cretaceous populations between 317-284 Ma and 169-136 Ma, which overlap in age with plutons of the Skolai and Chitina arcs, as well detrital zircon ages in the older intrabasinal strata. Major Cretaceous populations range between 125-113 Ma and 111-96 Ma, which overlap with plutons of the Chisana arc as well as middle to late Cretaceous plutons exposed throughout southern Alaska located north of the basin (Fig. 2.2). These populations, combined with southeastward paleoflow indicators, document the introduction of Cretaceous arc detritus into the basin, while remnant Paleozoic and Jurassic plutons, as well as older intrabasinal strata, were being eroded.

The stratigraphically youngest Mesozoic unit in the basin, the MacColl Ridge Formation, is exposed in the southeastern part of the Wrangell Mountains basin (Fig. 2.4a). The MacColl

Ridge Formation consists of conglomerate, sandstone, mudstone and tuff deposited in submarine fan environments (Trop et al., 1999). Paleoflow measurements indicate primarily northward sediment dispersal, and clast compositions of conglomerate consist of metabasalt, granite and limestone indicative of derivation from plutonic, volcanic, and carbonate rocks of the Wrangellia composite terrane (Trop et al., 1999, 2002). Volcanic tuff beds in the MacColl Ridge Formation are interpreted to represent derivation from a newly established Cretaceous arc source north of the basin (Kluane arc of Plafker and Berg, 1994; Trop et al., 1999, 2002). The maximum depositional age based on detrital zircons for the MacColl Ridge Formation is 76 Ma, which is consistent with $^{40}Ar/^{39}Ar$ radiometric ages of 79.4 +/- 0.7 Ma and 77.9 +/- 2.1 Ma for volcanic tuffs in the unit (Trop et al., 1999). The large Cretaceous detrital zircon age population (94-75 Ma; Fig. 2.7b) is similar to large populations of upper Cretaceous detrital zircons that have been documented in coeval upper Cretaceous strata of the Matanuska basin and Chugach accretionary prism (see locations in Fig. 2.2). These large populations are interpreted to reflect a regional introduction of sediment from a late Cretaceous arc system (Kluane arc) built along the southern Alaska convergent margin (Amato et al., 2013; Stevens Goddard et al., 2018).

2.6.3 Implications for Strike-Slip Displacement on the Denali Fault

The Wellesly basin strata are exposed east of the Denali Fault in the study area, and stratigraphically overlie Paleozoic metasedimentary strata of the Yukon composite terrane (Figs. 2.1 and 2.2). The Wellesly basin had been interpreted as the proximal equivalent to the more distal Nutzotin basin west of the Denali Fault (Fig. 2.2; Richter, 1976). Comparing detrital zircon ages and Hf compositions from the two basins demonstrate that the basins have a very different provenance. Detrital zircon ages from the Nutzotin basin are dominated by unimodal peak ages between 155-133 Ma (Fig. 2.7a), and Hf compositions that are predominantly juvenile to slightly evolved (+15.1 to -0.6; Fig. 2.8). Conversely, detrital zircon ages from the Wellesly basin are dominated by multiple peak ages that are clustered between 218-172 Ma (Fig. 2.7c), display a higher concentration of Precambrian detrital zircons, and have Hf compositions that are primarily juvenile to highly evolved (+9.6 to -14.4; Fig. 2.8). Based on this comparison, we propose that the Wellesly and Nutzotin basins are unrelated. Instead, the Wellesly basin appears to be more genetically linked to the Jurassic-Cretaceous Kahiltna basin, currently exposed in the Talkeetna Mountains and Alaska Range in south-central Alaska (Fig. 2.2). Detrital zircon ages from the

Wellesly basin and Kahiltna assemblage in the Talkeetna Mountains and Alaska Range display dominant age populations between 215-170 Ma and similar subordinate Paleozoic ages (Fig. 2.9). However, the Kahiltna assemblage in the Alaska Range displays significantly more Precambrian ages that the Wellesly basin. We suggest that the Wellesly basin is more similar to the Kahiltna assemblage in the Talkeetna as opposed to the Alaska Range. Maximum depositional ages for the Kahiltna strata range between 124-115 Ma (Fig. 2.9; Hampton et al., 2010), which are slightly younger than the MDA of 126 Ma for the Wellesly basin. This difference may suggest that the Wellesly strata may represent the older part of the interpreted Kahiltna-Wellesly basin system. Both basins are currently situated along the Denali Fault, which is interpreted to have undergone ~370 km of late Cretaceous-Cenozoic offset based on the correlation of the Nutzotin and Dezadeash basins to the south (Fig. 2.10; Eisbacher, 1976; Nokleberg et al., 1985; Lowey, 1998), with ~150 km of displacement possibly occurring since Oligocene time (Trop et al., 2019a). Restoring the Wellesly and Kahiltna basins along the Denali Fault results in a minimum offset estimate of ~330-390 km. Given the scale of the Kahiltna assemblage in the Talkeetna Mountains, we include a range of possible offset markers on Figure 2.10. For reference, we also compared detrital zircon ages between the Nutzotin and Dezadeash basins. Both basins have been previously interpreted as proximal-distal equivalents within the same connected basin (Eisbacher, 1976; Nokleberg et al., 1985; Lowey, 1998, 2018). Detrital zircons ages from both basins exhibit unimodal age distributions with major late Jurassic populations between 165-145 Ma (Fig. 2.10; Lowey, 2018). This is consistent with both basins sharing a similar source of sediment and thus corroborates previous interpretations suggesting these basins were offset along the Denali Fault. Future work needs to be undertaken to better confirm the correlation between the Wellesly and Kahiltna basins, however, our initial comparisons are consistent with previously postulated ~370 km of late Cretaceous-Cenozoic offset along the Denali Fault.

Our data also have implications regarding displacement along the Totschunda fault system. Isolated exposures of the Nutzotin basin occur along the Denali-Totschunda fault system in the eastern Alaska Range (Fig. 2.5a). We speculate that these exposures of the Nutzotin basin formed as part of the main basin that have since been transported along the Denali-Totschunda fault system. Detrital zircon ages from one sample at the Slate Creek locality (Fig. 2.5a) compare favorably to detrital zircon ages from the Nutzotin basin proper (Fig. 2.7a). Restoring the Slate Creek location to the junction of the Totschunda and Denali faults (Fig. 2.5a) provides a minimum offset estimate

of ~75 km. This estimate is generally consistent with recent studies suggesting ~85 km of offset since ca. 18 Ma (Berkelhammer et al., 2019), although some studies postulate that much of this offset could have occurred since ca. 6 Ma (Allen et al., 2018).

2.6.4 Regional Sediment Transport, Basin Development, and Tectonics along the Mesozoic Southern Alaska Margin

The Jurassic-Cretaceous Nutzotin and Wrangell Mountains basins are located along the inboard (continent-ward) and outboard (ocean-ward) margins of the Wrangellia composite terrane, respectively (Fig. 2.2). Correlations between the two basins have been made on the basis of (1) proximity of the two basins, (2) both basins depositionally overlying the Wrangellia terrane, (3) similar upper Jurassic lithologies indicating submarine depositional environments, and (4) detrital compositions indicating that both basins were being sourced with sediment from strata and plutons associated with Wrangellia (Trop et al., 2002; Manuszak et al., 2007; Trop and Ridgway, 2007). Our new detrital zircon geochronologic data set allows us to further explore the provenance and temporal links between the two basins.

Following the stratigraphic and depositional models of Trop et al. (2002) and Manuszak et al. (2007), our detrital zircon provenance data are consistent with upper Jurassic strata in the Wrangell Mountains basin (the Root Glacier Formation and Kotsina Conglomerate) that represent more proximal submarine fan facies being coeval with the Jurassic strata in the Nutzotin basin that represent more medial to distal submarine fan facies. Detrital zircon ages from upper Jurassic-lower Cretaceous strata in both basins are shown in Fig. 2.11. Note that the age distributions are nearly identical, with major Jurassic peak ages between 160-145 Ma in both basins. The detrital zircon populations indicate that the Chitina arc was the dominant source of sediment for both of the basins. Plutons of the Chitina arc are currently exposed south of the Wrangell Mountains and Nutzotin basins, suggesting that both basins formed in a retroarc position (see Fig. 2.12b). As shown in Figure 2.3, late Jurassic-early Cretaceous deposition in the Wrangell Mountains basin was marked by development of several unconformities whereas deposition in the Nutzotin basin was apparently more continuous. These unconformities have been interpreted to be the product of shortening along the Chitina thrust belt (CTB in Fig. 2.2). This shortening is also interpreted to have produced accommodation related to flexural subsidence of the Nutzotin basin as well as

sediment erosion and transport from the more proximal Wrangell Mountains basin to the more distal Nutzotin basin (Trop et al., 2002).

From a more regional perspective, strata of the Nutzotin and Wrangell Mountains basins are generally equivalent in age to Jurassic-Cretaceous sedimentary strata of the Matanuska and Kahiltna basins, as well as metasedimentary and metavolcanic rocks of the Chugach accretionary prism (Fig. 2.3). The Matanuska and Kahiltna basins are exposed to the south and north of the Talkeetna Mountains in south-central Alaska, respectively, and represent forearc/intra-arc and retroarc strata relative to the adjacent Talkeetna magmatic arc (Fig. 2.2; Trop and Ridgway, 2007). The Chugach accretionary prism is exposed outboard of these strata along the southern Alaska margin, and represents part of a paleo-subduction complex associated with eastward-dipping subduction underneath the Wrangellia composite terrane (Pavlis, 1982; Plafker et al., 1994). To better document the Mesozoic tectonic configuration and spatial distribution of sedimentary basins along the southern Alaska convergent margin, we have integrated our comparison of detrital zircon ages of the Nutzotin and Wrangell Mountains basins with previously reported sedimentological and detrital zircon data from the Chugach accretionary prism, and Matanuska and Kahiltna basins as shown in Figures 2.12a and 2.13a.

During late Jurassic time, the outboard margin of the Wrangellia composite terrane was characterized by marine deposition in the Matanuska and Wrangell Mountains basins (Fig. 2.12a; Trop et al., 2002, 2005; Trop and Ridgway, 2007). In the Matanuska basin, predominantly coarse-grained fan-delta and shelfal deposits of the Naknek Formation are interpreted to have been deposited in a forearc basin setting, due to their position outboard of plutonic rocks of the Talkeetna arc and inboard of the Chugach accretionary prism (Fig. 2.12b; Trop et al., 2005). Coeval forearc basin strata located along-strike in the southern Wrangell Mountains have not been recognized; in this region plutonic rocks of the Chitina arc are juxtaposed directly against the accretionary prism (Fig. 2.2). The “missing” forearc basin in this region has been interpreted to have been tectonically removed by a period of subduction erosion that occurred during the late Jurassic-early Cretaceous (Trop et al., 2002, 2005; Clift et al., 2005). In contrast, upper Jurassic strata of the Wrangell Mountains basin (Root Glacier Formation and Kotsina Conglomerate) are located in a retroarc basin position relative to the coeval Chitina plutons (Fig. 2.2). These strata also record marine deposition in submarine fan and fan-delta environments (Trop et al., 2002). Detrital zircon ages from upper Jurassic strata of the Matanuska and Wrangell Mountains basins

are shown in Figure 2.12a. Both basins display unimodal age distributions, with predominantly late Jurassic zircon ages ranging between 181-136 Ma (Matanuska basin) and 166-144 Ma (Wrangell Mountains basin; Fig. 2.12a). Conglomerates from both basins yield granitic clasts with late Jurassic isotope ages (Trop et al., 2002; 2005). A similar late Jurassic detrital zircon age signature occurs in the middle-late Jurassic mélange (Potter Creek Assemblage) of the Chugach accretionary prism, with the dominant age population ranging between 203-148 Ma (Fig. 2.12a; Amato et al., 2013). Detrital zircon provenance analysis of the Matanuska basin (Trop et al., 2005; Trop, 2008; Reid et al., 2018; Stevens Goddard et al., 2018), the Wrangell Mountains basin (this study), and the Chugach accretionary prism (Amato et al., 2013) indicate that the primary magmatic source of sediment for all of these basins are the Talkeetna and Chitina arcs (Fig. 2.12a). The Talkeetna and Chitina arcs are interpreted to represent a single magmatic arc system built upon the Wrangellia composite terrane above an eastward-dipping subduction zone (Plafker et al., 1989; 1994; Rioux et al., 2007). Marine deposition along the outboard margin of the Wrangellia composite terrane during the late Jurassic was coeval with the beginning stages of marine deposition along the inboard margin, represented by submarine fan strata in both the Kahiltna and Nutzotin retroarc basins (Fig. 2.12b; Trop and Ridgway, 2007). Detrital zircon ages of upper Jurassic strata in both basins yield primarily late Jurassic detrital zircon ages that match best with the ages of the Talkeetna-Chitina arc (Fig. 2.12a). Hf isotope compositions reported in this study from the Nutzotin basin also compare favorably to reported compositions from the Matanuska basin, which are consistent with sediment derivation from the Talkeetna-Chitina arc (see Fig. 4 in Reid et al., 2018). Collectively, the regional detrital zircon database indicates that during the late Jurassic, strata on both the inboard and outboard margins of the Wrangellia composite terrane (i.e. from the retroarc basins to the accretionary prism) were being sourced from a single arc system (Fig. 2.12a).

Beginning in the early Cretaceous (~130 Ma), the locus of magmatism migrated inboard, with the emplacement of plutons associated with the Chisana arc (130-115 Ma; Fig. 2.12c). Detrital zircon ages in both the Nutzotin and Kahiltna marine basins overlap with the Chisana arc, indicating that the arc was a primary source of sediment for the inboard basins (Fig. 2.12a). Conversely, the outboard basins were characterized by a depositional hiatus, with Jurassic strata in both the Matanuska and Wrangell Mountains basins being exhumed due to shortening (Fig. 2.4b and 2.12c; Trop et al., 2002, 2005). This depositional hiatus is marked by prominent late Jurassic-

early Cretaceous unconformities present in the outboard basins as well as in the Chugach accretionary prism, and represent potentially ~40-30 Ma of nondeposition and erosion in the outboard basins (Fig. 2.3). The unconformities in the outboard basins have been previously attributed to a period of subduction erosion possibly caused by subduction of an oceanic spreading ridge during the early Cretaceous (Pavlis et al., 1988; Clift et al., 2005; Trop and Ridgway, 2007; Amato et al., 2013; Stevens Goddard et al., 2018; Mahar et al., 2019).

Deposition in the outboard basins began again in the early Cretaceous (early Albian), with marine deposition in the Matanuska basin (lower Matanuska Formation) and the Wrangell Mountains basin (Kennicott Formation), as well as renewed growth of the Chugach accretionary prism (McHugh Creek Assemblage; Fig. 2.13b; Trop and Ridgway, 2007). Detrital zircon ages from the lower Matanuska Formation in the Matanuska basin and the McHugh Creek Assemblage in the Chugach accretionary prism show more multimodal age distributions than those documented in the Jurassic strata, with a dominant middle Cretaceous detrital zircon age signature between 110-90 Ma as well as minor Jurassic ages (Fig. 2.13a; Amato et al., 2013; Reid et al., 2018; Stevens Goddard et al., 2018). The multimodal age distributions exhibited by lower Cretaceous strata in both the Matanuska basin and Chugach accretionary prism are interpreted to reflect (1) continued exhumation and erosion of the remnant Talkeetna-Chitina arc and reworking of Jurassic sedimentary strata in the forearc basin, and (2) the introduction of a new middle Cretaceous magmatic arc (Kluane arc) that intruded both the inboard and outboard terranes (Fig. 2.13b; Amato et al., 2013; Stevens Goddard et al., 2018). In contrast to the Matanuska basin and Chugach accretionary prism, lower Cretaceous strata in the Wrangell Mountains basin (Kennicott Formation) exhibit a detrital zircon age spectrum much like the upper Jurassic strata in the basin (Fig. 2.13a). Middle Cretaceous strata (Moonshine Creek Formation) stratigraphically above the Kennicott Formation document the introduction of sediment from an early Cretaceous arc (Chisana arc) as well as a middle Cretaceous arc system. This suggests that the Wrangell Mountains basin was initially depositionally isolated from the new sources of sediment in the Albian, then ultimately linked with inboard sediment sources in the Cenomanian provided by the Chisana arc.

Finally, during the late Cretaceous, deposition in the inboard margin ceased and the inboard basins were deformed and exhumed (Fig. 2.13c; Manuszak et al., 2007; Trop and Ridgway, 2007). Exhumation of the inboard basin was coeval with continued marine deposition in the outboard basins (upper Matanuska Formation in the Matanuska basin and MacColl Ridge Formation in the

Wrangell Mountains basin), as well as rapid and extensive growth of the Chugach accretionary prism (Valdez Group; Fig. 2.13c; Trop, 2008). Detrital zircon ages from outboard upper Cretaceous strata display dominant late Cretaceous age populations as well as minor early Jurassic-early Cretaceous ages (Fig. 2.13a; Stevens Goddard et al., 2018). Granitic clasts in the Matanuska Formation yield late Jurassic and late Cretaceous zircon ages (Trop, 2008). These detrital zircon trends suggest that across the outboard margin, erosion of remnant Jurassic-Cretaceous arc sources and older basin strata continued to supply minor sediment to the basins, whereas the late Cretaceous arc system (Kluane arc of Plafker and Berg, 1994) became a dominant source of sediment along the southern Alaska convergent margin.

2.6.5 Implications for Subduction Polarity along the Mesozoic Convergent Margin

The results of our study have implications for recent models proposed for the Mesozoic tectonic configuration of the Northern Cordilleran margin. Much of the debate centers on the polarity of subduction along the late Jurassic-early Cretaceous margin. The most accepted interpretation for the last several decades has been that this convergent margin was the product of eastward-dipping subduction outboard of the Wrangellia composite terrane (McClelland et al., 1992; Plafker and Berg, 1994; Plafker et al., 1994; Kalbas et al., 2007; Gehrels et al., 2009; Hampton et al., 2010; Pavlis et al., 2019). A new intriguing model based on seismic anomalies in the deep mantle has postulated that the margin formed due to westward-dipping subduction along the inboard margin of the Wrangellia composite terrane (Sigloch and Mihalynuk, 2013, 2017; Spencer et al., 2019). Our new detrital zircon datasets from the Nutzotin and Wrangell Mountains basins, in conjunction with the regional framework from previously published detrital zircon datasets, indicate a strong provenance and temporal link between all major Mesozoic tectonic elements of the southern Alaska convergent margin. This regional provenance link is important because it ties the south-verging accretionary prism (Chugach accretionary prism) to the forearc basin (Matanuska basin), to the Chitina and Chisana arcs, and to the retroarc basins (Wrangell Mountains and Nutzotin basins). This spatial configuration from outboard accretionary prism to retroarc basins is the hallmark of recognizing subduction polarity in ancient convergent margins (e.g., Burchfiel and Davis, 1972; Dickinson, 1974; Pavlis et al., 2019). Results of our study indicate that there were common sources of sediment from late Jurassic to late Cretaceous time for all the major depocenters along this part of the convergent margin along an east-dipping (north in present-

day coordinates) subduction zone. In the west-dipping models, the Chugach accretionary prism, for example, is unrelated to late Jurassic-early Cretaceous sedimentary basins on the Wrangellia composite terrane. Our data does not preclude hundreds of kilometers of displacement along major faults in our study area (e.g., Border Ranges fault, Denali fault, etc.), but it does require that the basins were proximal enough to share regional major sources of sediment. More research needs to be completed on this question, but collectively our findings are most consistent with a Mesozoic tectonic configuration in which the accretionary prism, magmatic arcs, and sedimentary basins formed over an eastward-dipping subduction zone along the outboard margin of the Wrangellia composite terrane, similar to the modern configuration of the convergent margin.

2.7 Conclusions

New U-Pb detrital zircon ages from the Nutzotin Mountains sequence yield a predominant unimodal age distribution with major peak ages between 155-133 Ma and provide a more rigorous chronostratigraphic framework for this little studied ~3 km thick unit. Detrital zircon Hf results display primarily juvenile to slightly evolved compositions (+15.1 to -0.6). Our results are consistent with detrital zircons being derived mainly from late Jurassic-early Cretaceous arc sources (Chitina and Chisana arcs) that intrude/overlie the Wrangellia composite terrane, and little to no sediment contribution from continental sources.

New U-Pb detrital zircon ages from the Root Glacier Formation, Kotsina Conglomerate, and Kennicott Formation of the Wrangell Mountains basin yield unimodal age spectra with major peak ages between 159-152 Ma, consistent with derivation from plutons associated with the Wrangellia composite terrane (Chitina arc). Detrital zircon ages from the Moonshine Creek Formation yields major peak ages between 150-104 Ma, consistent with derivation from the Chitina arc as well as the Chisana arc which also intrudes the Wrangellia composite terrane. Detrital zircon ages from the MacColl Ridge Formation display a multimodal age distribution with a major late Cretaceous peak age at 76 Ma, with subordinate peak ages between 196-104 Ma. These ages are consistent with detrital zircon derivation from a newly developed late Cretaceous arc system that intrudes both the Wrangellia and Yukon composite terranes as well as from remnant Jurassic-early Cretaceous arc rocks and reworking of older basinal strata.

New U-Pb detrital zircon ages from the Wellesly basin document a multimodal age distribution with dominant peak ages between 200-172 Ma with subordinate peak ages between 147-126 Ma. Detrital zircon Hf results display a wide range of juvenile to highly evolved compositions (+9.6 to -14.4). These results are consistent with sediment sources from the Mesozoic continental margin represented by the Yukon composite terrane.

Detrital zircon data from the Wellesly and Nutzotin basins are inconsistent with a previous tentative interpretation that the two basins are proximal-to-distal equivalents. Instead the provenance of the Wellesly basin appears similar to the Kahiltna basin, indicating that the two basins may have been offset ~330 km or more along the Denali Fault.

The similarity in detrital zircon age distributions in upper Jurassic strata in both the Nutzotin and Wrangell Mountains basins suggest that the two basins were once depositionally connected within the Wrangellia composite terrane, and were subsequently separated by Mesozoic regional shortening and Cenozoic volcanism.

The comparison between our new detrital zircon data and previously published data from strata of Mesozoic forearc basins, retroarc basins, and the accretionary prism exposed along the southern Alaska convergent margin show that the inboard and outboard basins share a strong provenance and temporal link during the late Jurassic-late Cretaceous. It also documents a progressive shift in regional sediment sources, from a late Jurassic-early Cretaceous provenance characterized by a single arc system (Jurassic-early Cretaceous Talkeetna-Chitina arc) to a provenance from an active Cretaceous arc system (Chisana and Kluane arcs) and a remnant Jurassic arc system. The strong provenance and temporal links between the outboard and inboard basins are inconsistent with models that involve late Jurassic-early Cretaceous westward-dipping subduction inboard of the Wrangellia composite terrane and instead are more consistent with an eastward-dipping subduction zone outboard of the Wrangellia composite terrane.

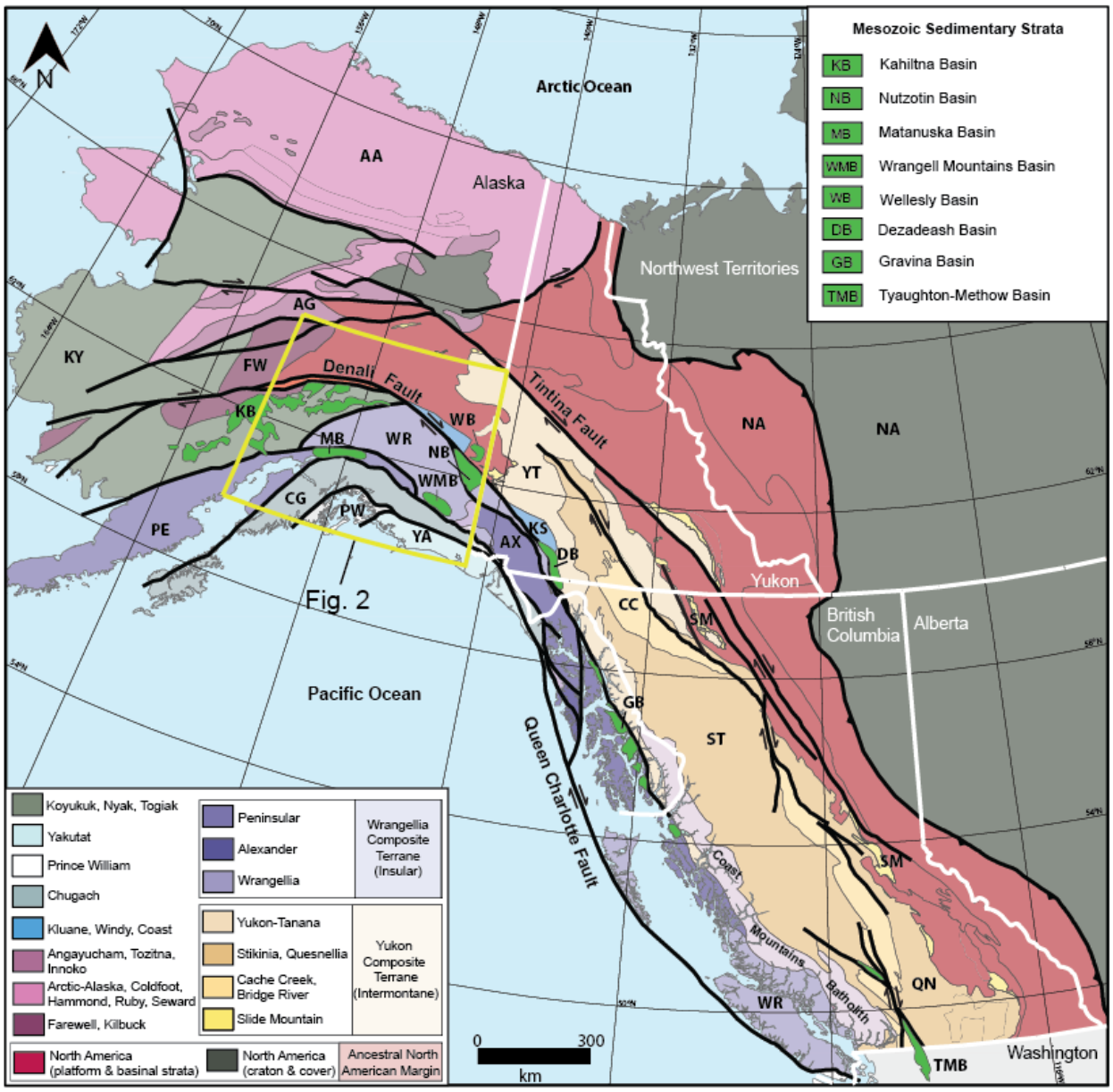


Figure 2.1. Map of the Northern Cordillera showing terrane assemblages. Locations of Jurassic-Cretaceous sedimentary basins are also shown (in green). The yellow box indicates the location of Figure 2.2. Modified from Nelson et al. (2013).

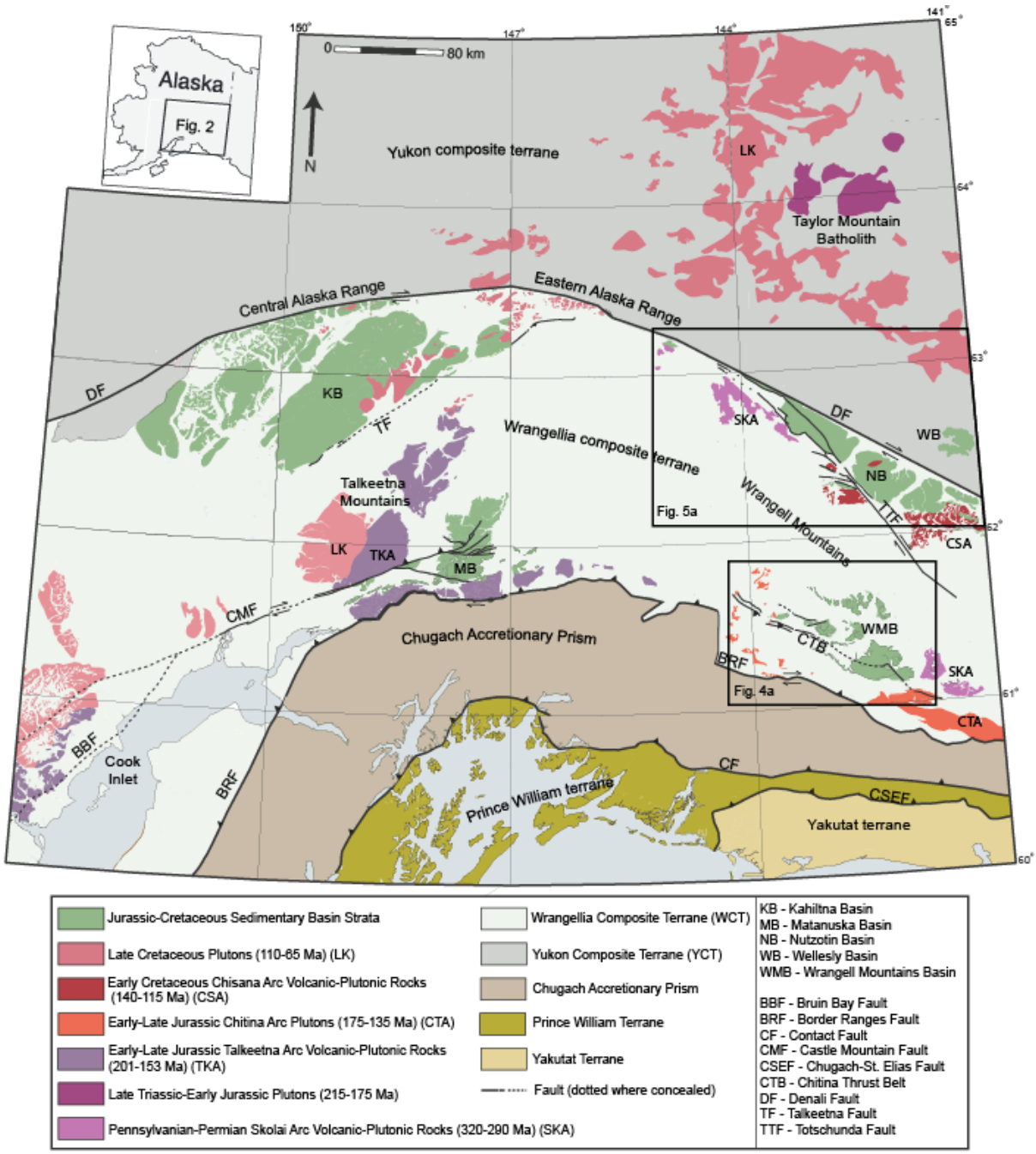


Figure 2.2. Generalized geologic and tectonic map of south-central and east-central Alaska showing the generalized distribution of terrane assemblages, Mesozoic sedimentary strata and magmatic arc plutons. Locations of Figures 2.4a and 2.5a are indicated by the inset rectangles. Modified from Trop and Ridgway (2007).

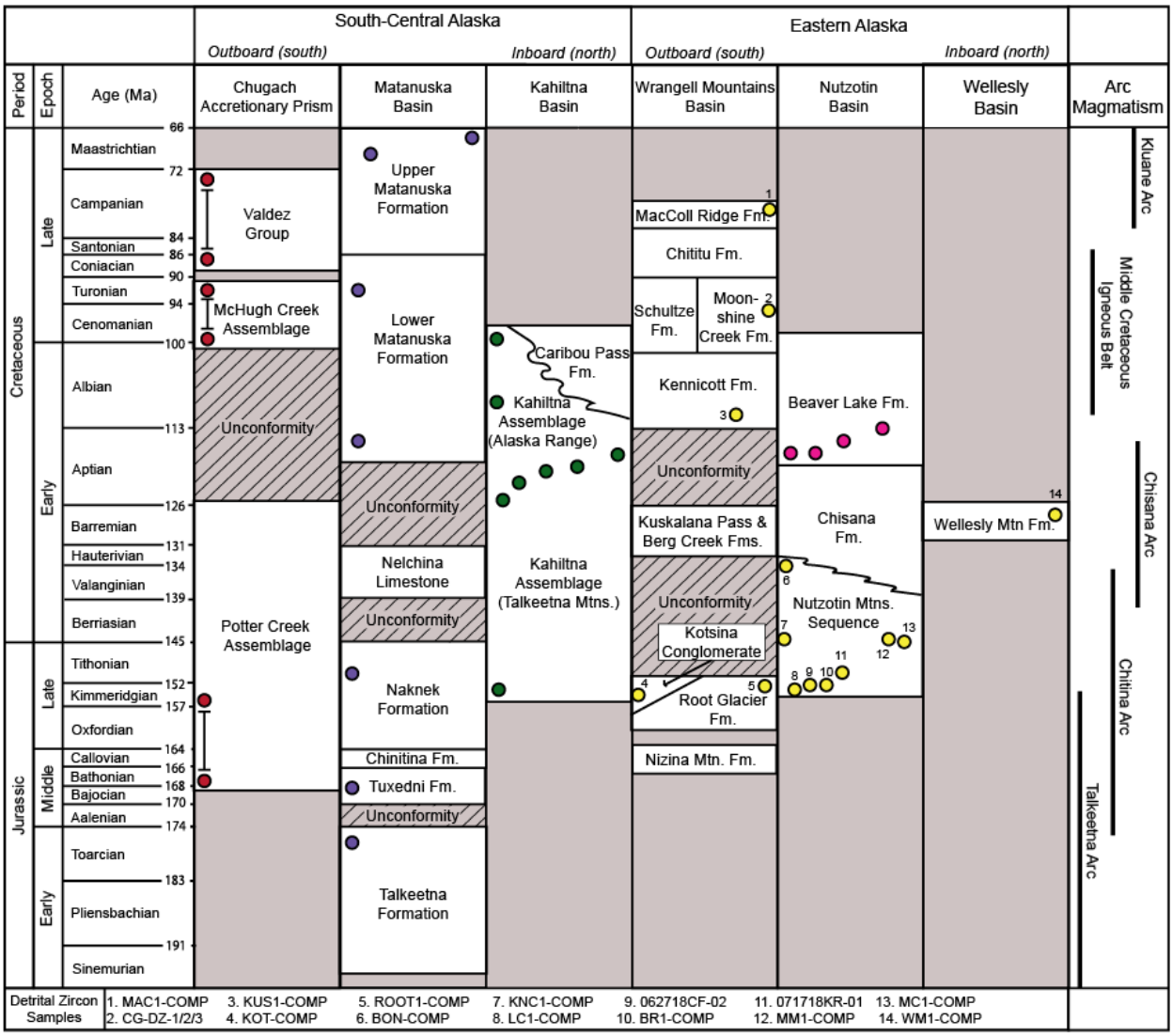


Figure 2.3. Stratigraphic chart showing the age ranges of studied units (Wrangell Mountains basin, Nutzotin basin, and Wellesly basin) as well as units of the accretionary prism (Chugach accretionary prism), and forearc basin (Matanuska basin), and retroarc basin (Kahiltna basin). Age ranges for magmatic arcs are also included. Locations of detrital zircon samples analyzed in this study are indicates by the lettered yellow circles. Detrital zircon samples from the Chugach accretionary prism (from Amato et al. 2013) the Matanuska forearc basin (Stevens Goddard et al. 2018), Kahiltna retroarc basin (Hampton et al., 2010), and Beaver Lake formation in the Nutzotin basin (Trop et al., 2019b) that are used for regional comparisons in the discussion section are denoted by the red, purple, green, and pink circles, respectively.

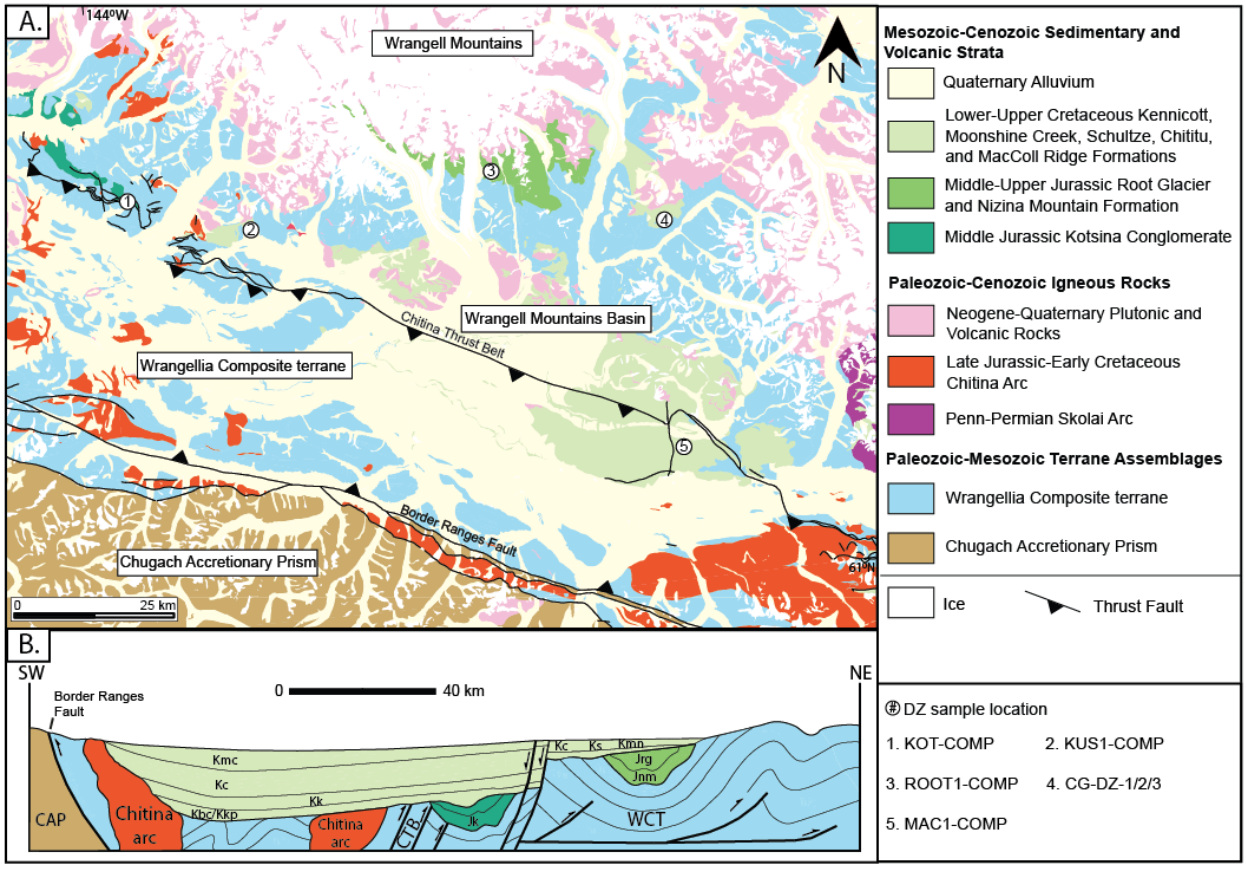
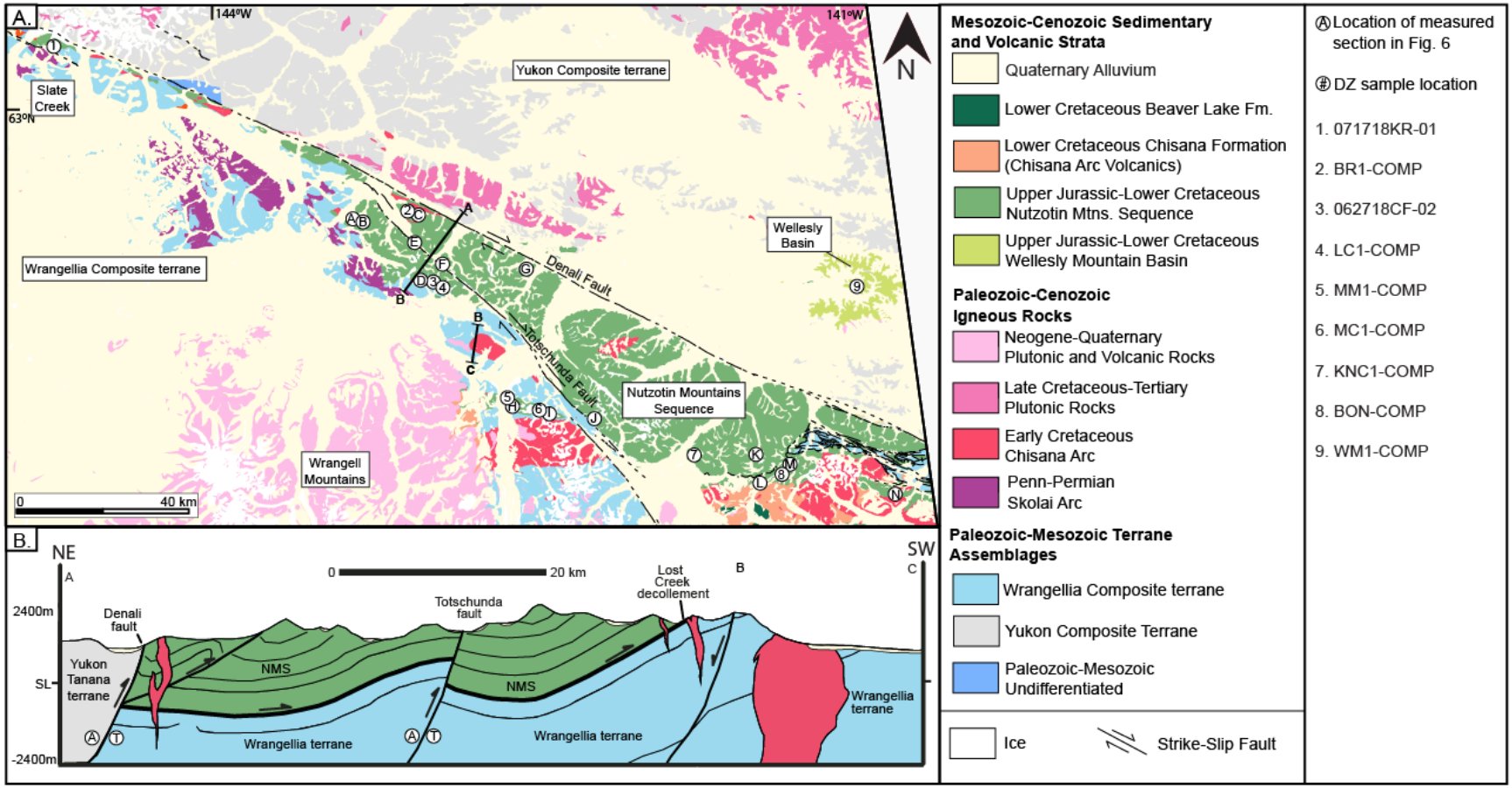


Figure 2.4. (A) Geologic map of the Wrangell Mountains basin. Locations of detrital zircon samples are denoted by the numbered green circles. Adapted from Wilson et al. (2015). (B) Schematic cross section of the Wrangell Mountains basin showing the stratigraphic and structural configuration of Jurassic and Cretaceous strata in the basin. Note that the cross section does not represent a specific line on the geologic map. Adapted from Trop et al. (2002).

Figure 2.5. (A) Geologic map of the Nutzotin and Wellesly basins. Locations of collected detrital zircon samples are denoted by the numbered white circles. Locations of measured stratigraphic sections from Manuszak et al. (2007) are denoted by the lettered white circles. Adapted from Wilson et al. (2015). (B) Cross section of the Nutzotin Mountains sequence in the Nutzotin basin showing the structural configuration of the strata. Location of cross section line in shown in (a). Adapted from Manuszak et al. (2007).


A.
144°W
141°W
63°N
Slate Creek
Yukon Composite terrane
Wellesly Basin
Wrangellia Composite terrane
Denali Fault
Totschunda Fault
Nutzotin Mountains Sequence
Wrangell Mountains
0
40 km
N
B.
NE
SW
0
20 km
2400m
SL
-2400m
Denali fault
Totschunda fault
Lost Creek decollement
Yukon Tanana terrane
NMS
Wrangellia terrane
Mesozoic-Cenozoic Sedimentary and Volcanic Strata
Quaternary Alluvium
Lower Cretaceous Beaver Lake Fm.
Lower Cretaceous Chisana Formation (Chisana Arc Volcanics)
Upper Jurassic-Lower Cretaceous Nutzotin Mtns. Sequence
Upper Jurassic-Lower Cretaceous Wellesly Mountain Basin
Paleozoic-Cenozoic Igneous Rocks
Neogene-Quaternary Plutonic and Volcanic Rocks
Late Cretaceous-Tertiary Plutonic Rocks
Early Cretaceous Chisana Arc
Penn-Permian Skolai Arc
Paleozoic-Mesozoic Terrane Assemblages
Wrangellia Composite terrane
Yukon Composite Terrane
Paleozoic-Mesozoic Undifferentiated
Ice
Strike-Slip Fault
Location of measured section in Fig. 6
DZ sample location
1. 071718KR-01
2. BR1-COMP
3. 062718CF-02
4. LC1-COMP
5. MM1-COMP
6. MC1-COMP
7. KNC1-COMP
8. BON-COMP
9. WM1-COMP

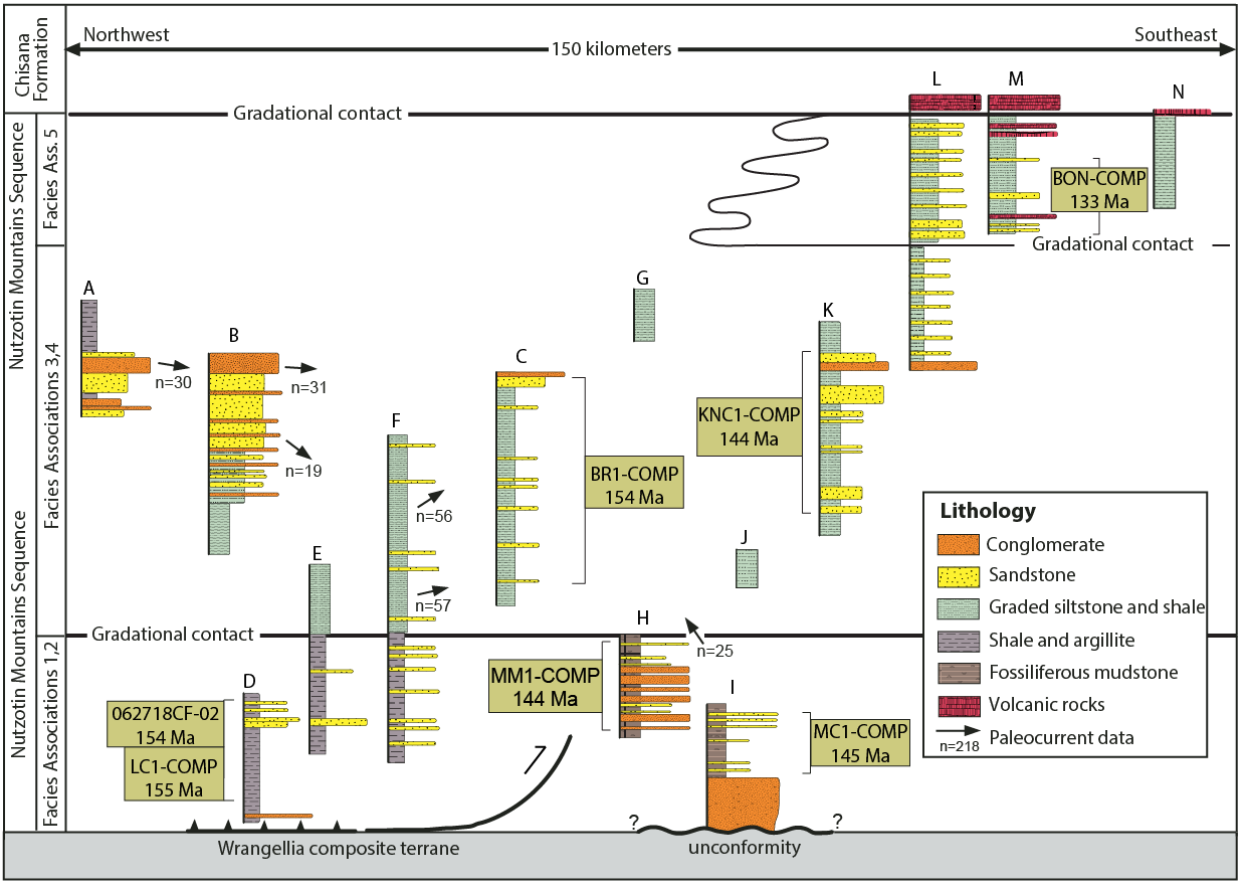
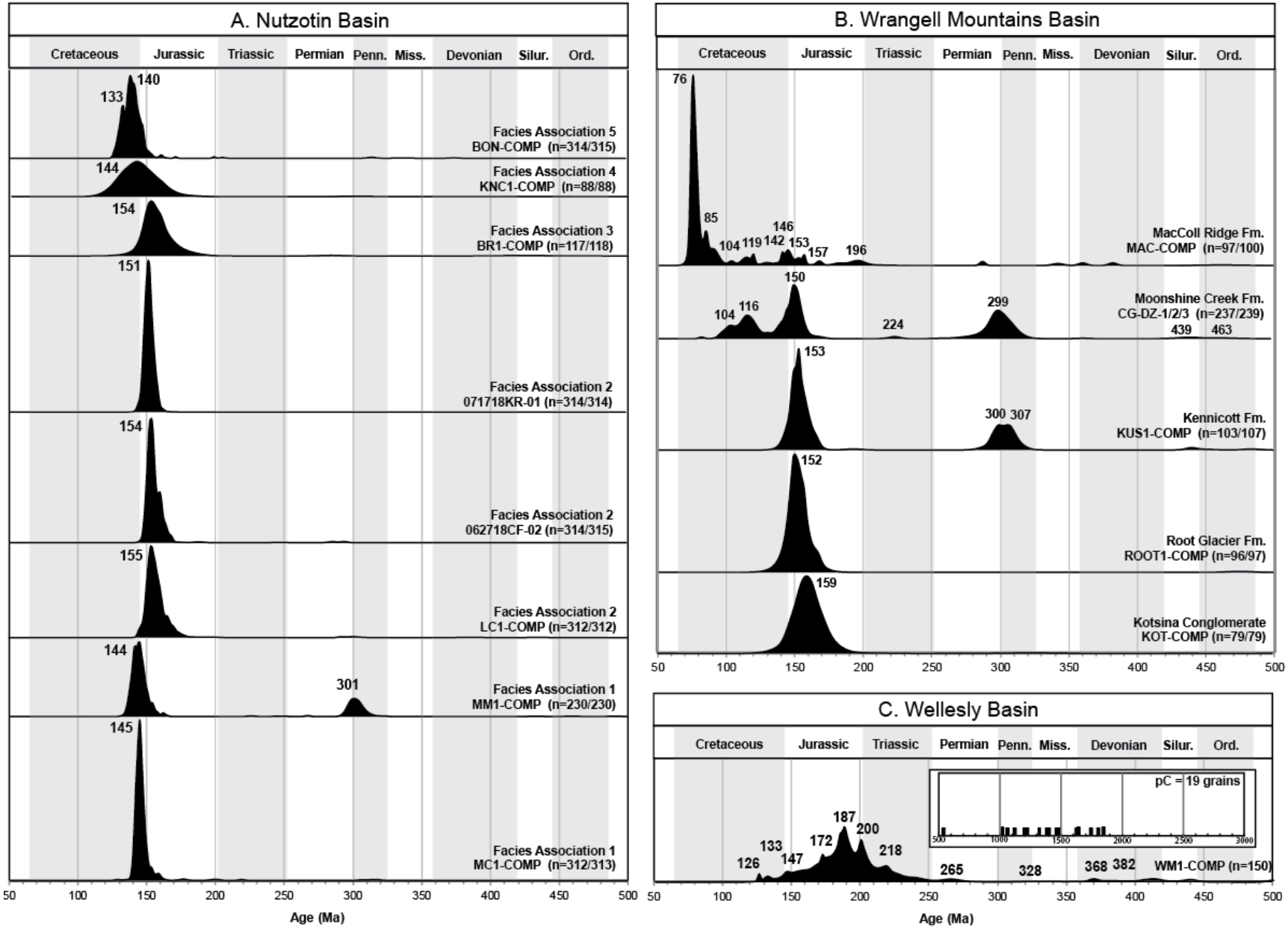


Figure 2.6. Modified stratigraphic cross section of the Nutzotin Mountains sequence from Manuszak et al. (2007) displaying the detrital zircon maximum depositional ages (MDA) of each sample (brown text box) from the Nutzotin Mountains sequence. Lithofacies descriptions, paleocurrent data, and stratigraphic correlations are reported in Manuszak et al., (2007). Letters above measured sections correspond to lettered circles in Figure 2.5a.

Figure 2.7. Normalized distribution diagram for (A) the Nutzotin Mountains sequence in the Nutzotin basin, (B) Jurassic-Cretaceous strata of the Wrangell Mountains basin, and (C) Jurassic-Cretaceous strata of the Wellesly basin. Inset diagram in (C) denotes detrital zircon ages >500 Ma. Age peaks are noted with numerical values. Number of constituent analyses are shown on each plot.


A. Nutzotin Basin
Cretaceous
Jurassic
Triassic
Permian
Penn.
Miss.
Devonian
Silur.
Ord.
133
140
Facies Association 5
BON-COMP (n=314/315)
144
Facies Association 4
KNC1-COMP (n=88/88)
154
Facies Association 3
BR1-COMP (n=117/118)
151
Facies Association 2
071718KR-01 (n=314/314)
154
Facies Association 2
062718CF-02 (n=314/315)
155
Facies Association 2
LC1-COMP (n=312/312)
144
301
Facies Association 1
MM1-COMP (n=230/230)
145
Facies Association 1
MC1-COMP (n=312/313)
50
100
150
200
250
300
350
400
450
500
Age (Ma)
B. Wrangell Mountains Basin
76
85
104
119
142
146
153
157
196
MacColl Ridge Fm.
MAC-COMP (n=97/100)
104
116
150
224
299
Moonshine Creek Fm.
CG-DZ-1/2/3 (n=237/239)
439
463
153
300
307
Kennicott Fm.
KUS1-COMP (n=103/107)
152
Root Glacier Fm.
ROOT1-COMP (n=96/97)
159
Kotsina Conglomerate
KOT-COMP (n=79/79)
C. Wellesly Basin
pC = 19 grains
126
133
147
172
187
200
218
265
328
368
382
WM1-COMP (n=150)

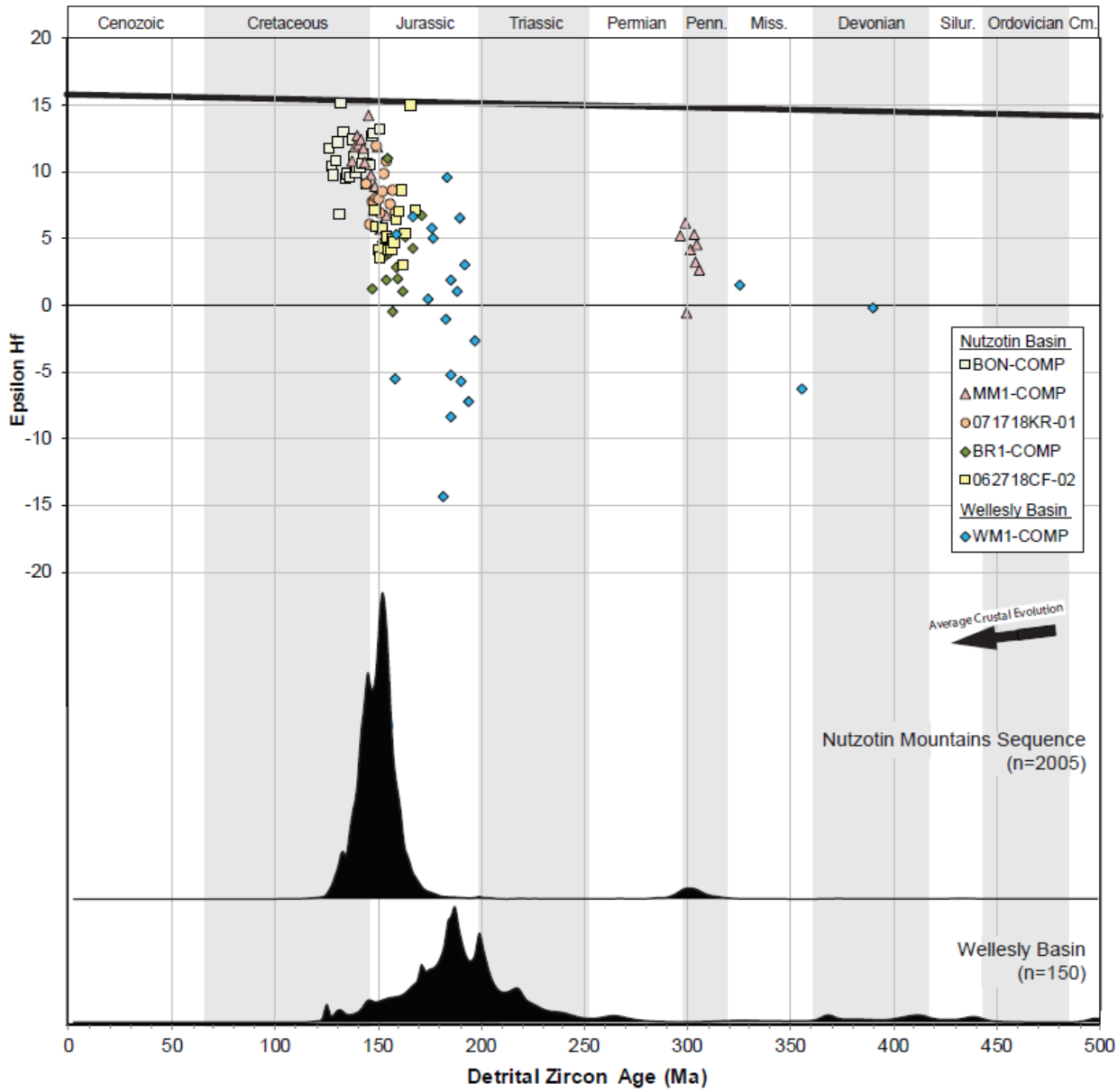
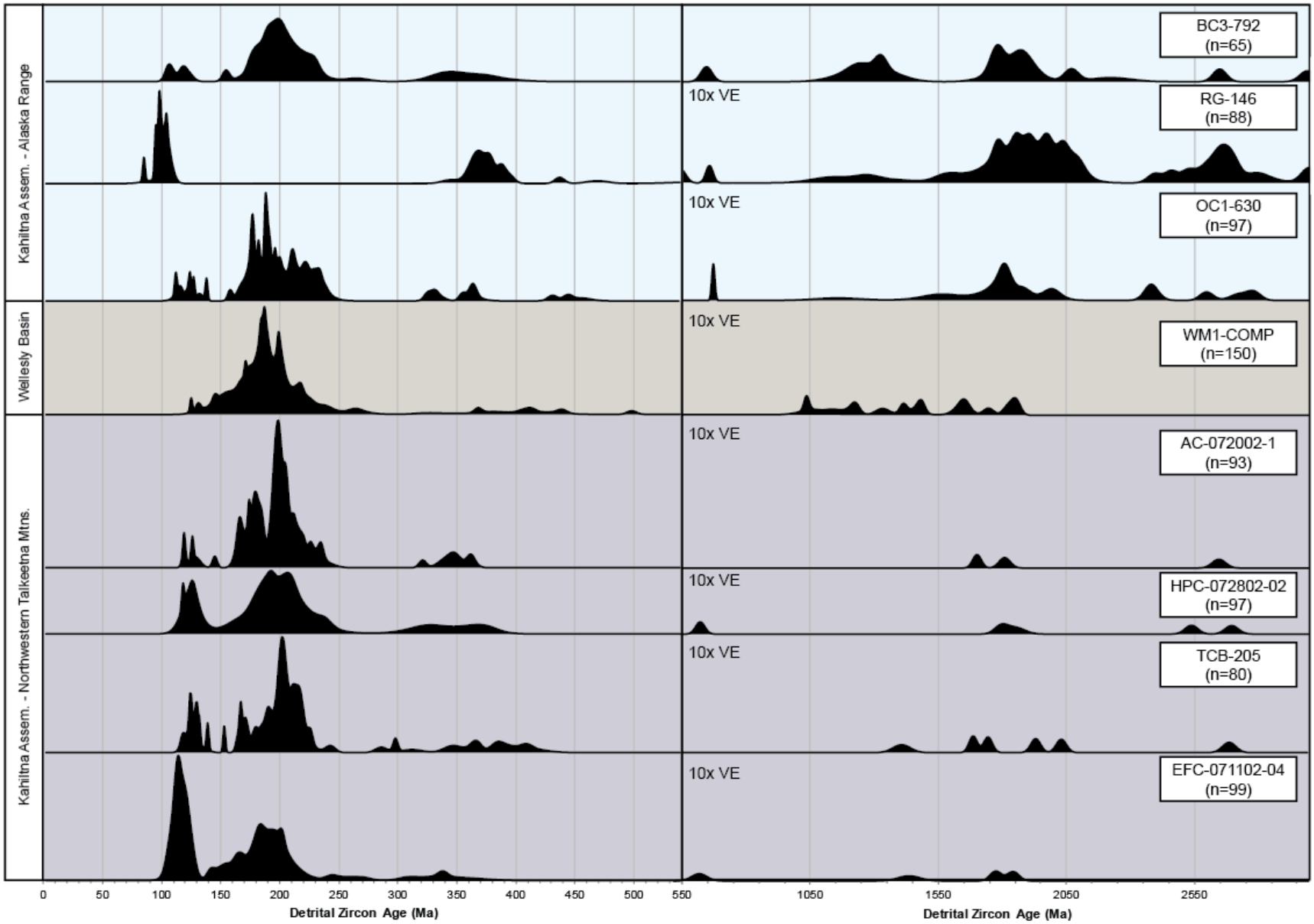


Figure 2.8. U-Pb ages and Hf isotope compositions from the Nutzotin Mountains sequence of the Nutzotin basin (varied colors) and Wellesly basin (purple). Lower plot shows the U-Pb detrital zircon age distributions of both basins. Upper plot shows Hf isotope compositions from analyzed samples from each basin. DM = depleted mantle (from Vervoort and Blichert-Toft, 1999). CHUR = chondritic uniform reservoir (from Bouvier et al. 2008). Average crustal evolution arrow assumes present day $^{176}Lu/^{177}Hf = 0.0115$ (Vervoort and Patchett, 1996).

Figure 2.9. Normalized distribution plot of detrital zircon ages from the Kahiltna assemblage of the central Alaska Range (Hampton et al., 2010), the Wellesly basin (this study), and the Kahiltna assemblage of the northwestern Talkeetna Mountains (Hampton et al., 2010). Note that the detrital zircon age distribution of ages >500 Ma have been 10x vertical exaggeration.


Kahiltna Assem. - Alaska Range
Wellesly Basin
Kahiltna Assem. - Northwestern Talkeetna Mtns.
BC3-792
(n=65)
RG-146
(n=88)
OC1-630
(n=97)
WM1-COMP
(n=150)
AC-072002-1
(n=93)
HPC-072802-02
(n=97)
TCB-205
(n=80)
EFC-071102-04
(n=99)
10x VE
0
50
100
150
200
250
300
350
400
450
500
550
1050
1550
2050
2550
Detrital Zircon Age (Ma)
Detrital Zircon Age (Ma)

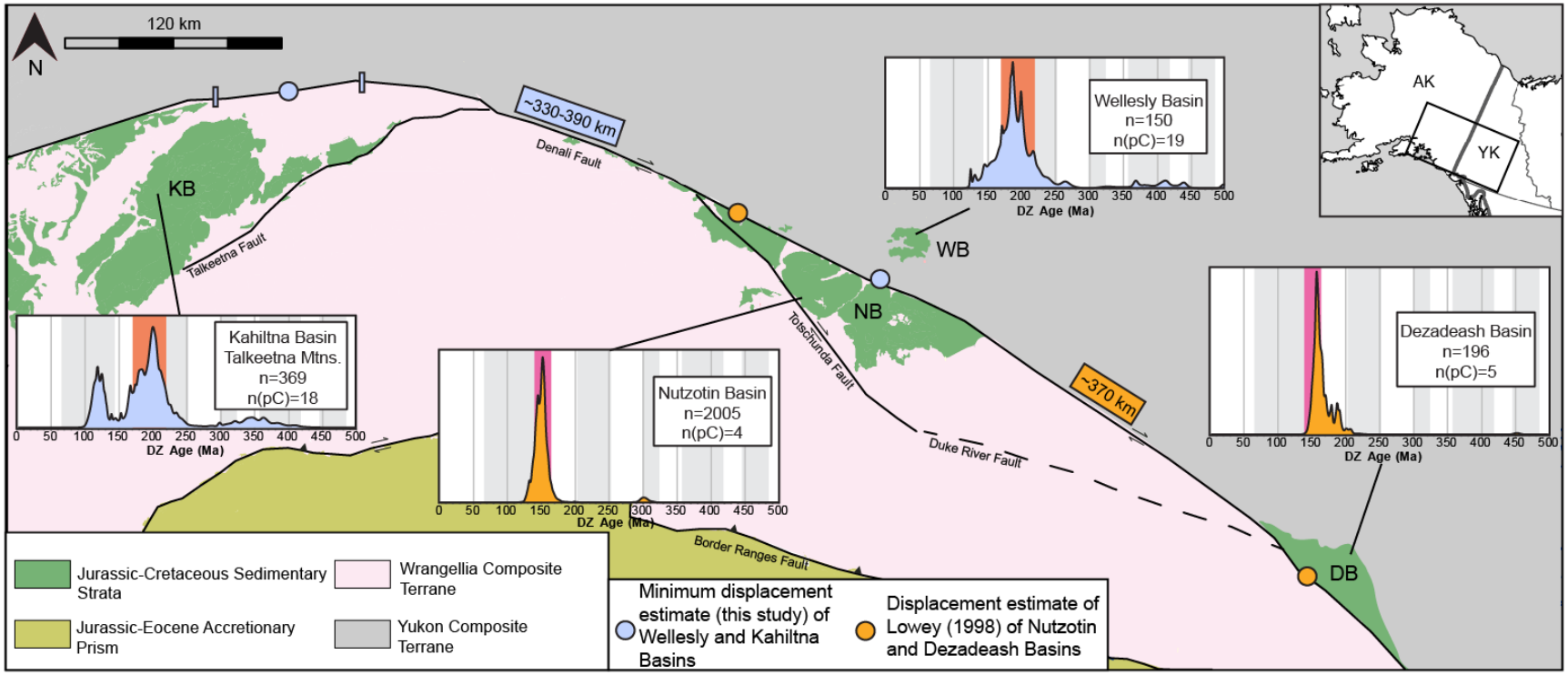


Figure 2.10. Simplified geologic map of portions of southern Alaska and Yukon showing correlations between the Wellesly and Kahiltna basins, and the Nutzotin and Dezadeash basins, along the Denali Fault. Inset are detrital zircon age spectra of the Kahiltna basin (Hampton et al., 2010), Wellesly basin (this study), Nutzotin basin (this study), and Dezadeash basin (Lowey, 2018). Plots are color-coded blue and orange to signify specific correlation. The blue and orange dots signify the proposed displacement estimates for each basin along the Denali Fault. The range shown by the bars on the blue dot proximal to the Kahiltna basin is based on the east-west distribution of the Kahiltna assemblage in the Talkeetna Mountains. This range is intended to show the uncertainty in the location in this offset point.

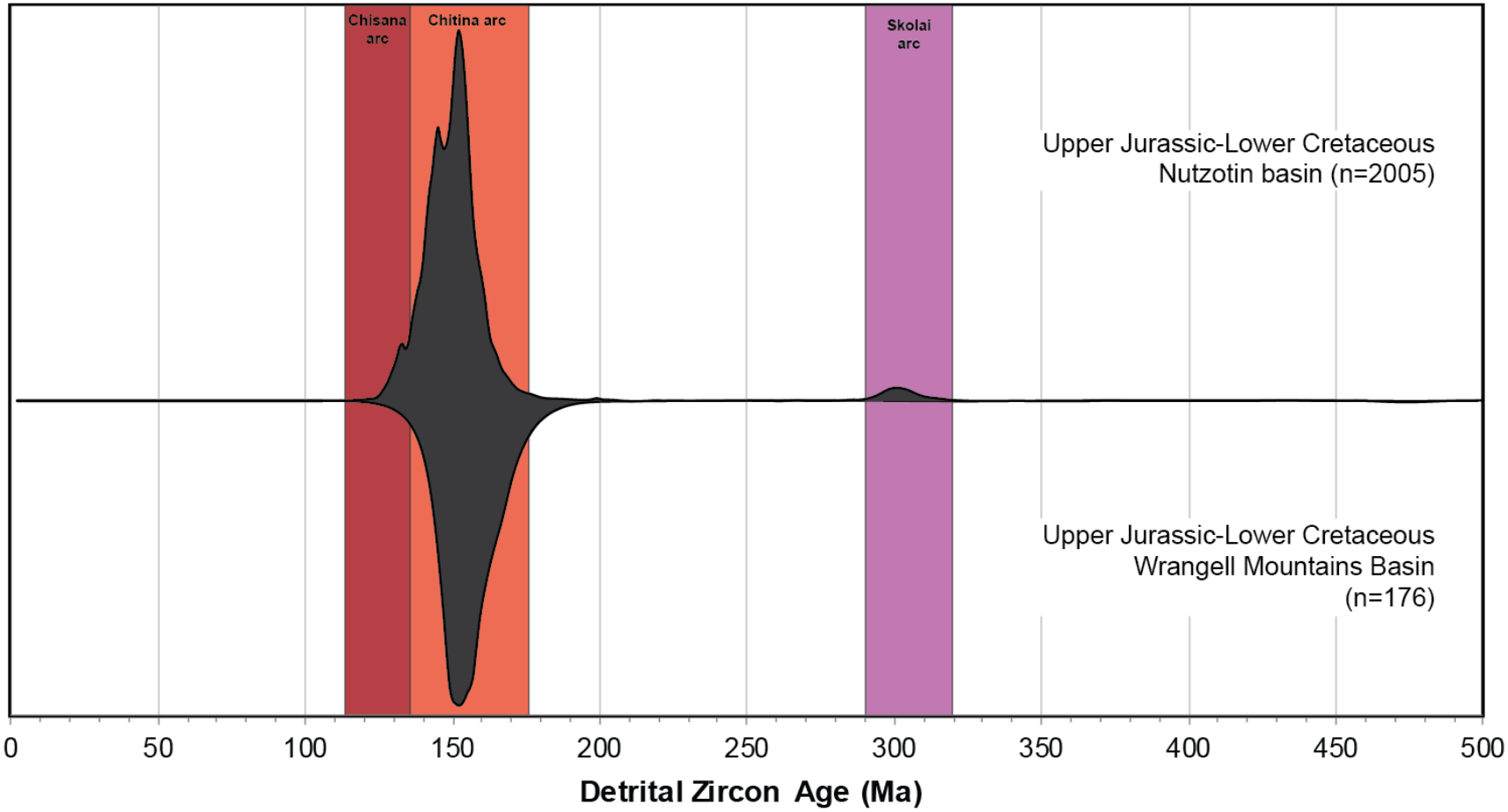


Figure 2.11. Normalized distribution diagram comparing U-Pb detrital zircon age distribution of upper Jurassic-lower Cretaceous strata of the Nutzotin and Wrangell Mountains basins (this study). Note that the distribution of the Wrangell Mountains basin is inverted for this comparison. Vertical columns represent ages of magmatic arcs that intrude the Wrangellia terrane (see Fig. 2 for locations of these arcs).

Figure 2.12. (A) Normalized distribution diagram comparing U-Pb detrital zircon age distribution of upper Jurassic-lower Cretaceous strata of the Kahiltna basin (Hampton et al., 2010), Nutzotin and Wrangell Mountains basins (this study), upper Jurassic-lower Cretaceous strata of the Matanuska basin (Reid et al. 2018; Stevens Goddard et al. 2018), and middle Jurassic-lower Cretaceous rocks of the Chugach accretionary prism (Amato et al. 2013). Dashed rectangle represents the overlap between magmatic activity in the Chitina and Talkeetna arcs (175-153 Ma). (B) and (C) are paleogeographic reconstructions of the late Jurassic-early Cretaceous (160-130 Ma) tectonic evolution of southern Alaska. See text for discussion. Modified from Trop and Ridgway (2007).

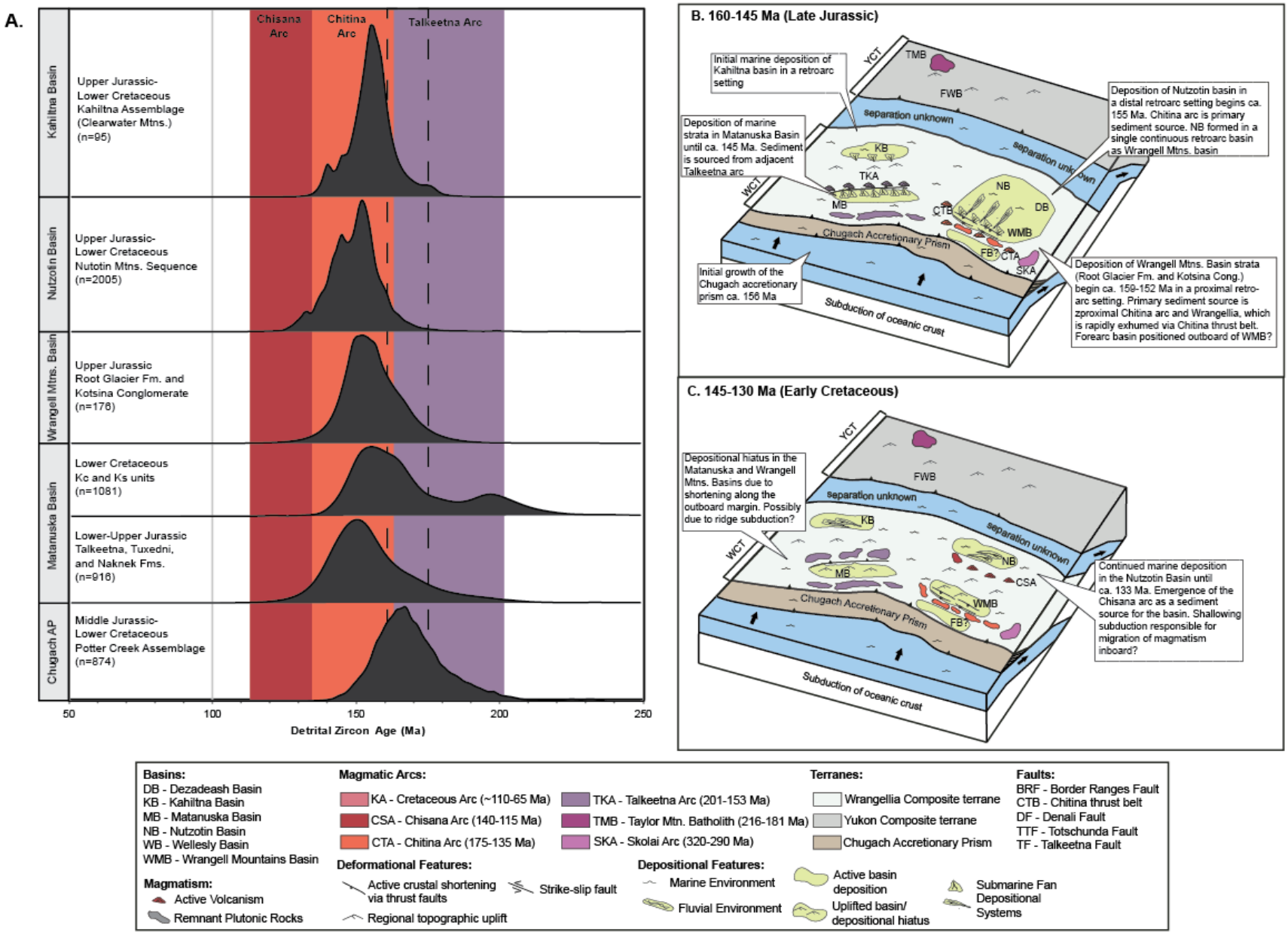

A.
Chisana Arc
Chitina Arc
Talkeetna Arc
Kahiltna Basin
Upper Jurassic-Lower Cretaceous Kahiltna Assemblage (Clearwater Mtns.) (n=95)
Nutzotin Basin
Upper Jurassic-Lower Cretaceous Nutotin Mtns. Sequence (n=2005)
Wrangell Mtns. Basin
Upper Jurassic Root Glacier Fm. and Kotsina Conglomerate (n=178)
Matanuska Basin
Lower Cretaceous Kc and Ks units (n=1081)
Lower-Upper Jurassic Talkeetna, Tuxedni, and Naknek Fms. (n=916)
Chugach AP
Middle Jurassic-Lower Cretaceous Potter Creek Assemblage (n=874)
50
100
150
200
250
Detrital Zircon Age (Ma)
B. 160-145 Ma (Late Jurassic)
Initial marine deposition of Kahiltna basin in a retroarc setting
Deposition of marine strata in Matanuska Basin until ca. 145 Ma. Sediment is sourced from adjacent Talkeetna arc
Deposition of Nutzotin basin in a distal retroarc setting begins ca. 155 Ma. Chitina arc is primary sediment source. NB formed in a single continuous retroarc basin as Wrangell Mtns. basin
Deposition of Wrangell Mtns. Basin strata (Root Glacier Fm. and Kotsina Cong.) begin ca. 159-152 Ma in a proximal retro-arc setting. Primary sediment source is zproximal Chitina arc and Wrangellia, which is rapidly exhumed via Chitina thrust belt. Forearc basin positioned outboard of WMB?
Initial growth of the Chugach accretionary prism ca. 156 Ma
YCT
WCT
TMB
FWB
separation unknown
KB
TKA
MB
NB
DB
CTB
WMB
FB?
CTA
SKA
Chugach Accretionary Prism
Subduction of oceanic crust
C. 145-130 Ma (Early Cretaceous)
Depositional hiatus in the Matanuska and Wrangell Mtns. Basins due to shortening along the outboard margin. Possibly due to ridge subduction?
Continued marine deposition in the Nutzotin Basin until ca. 133 Ma. Emergence of the Chisana arc as a sediment source for the basin. Shallowing subduction responsible for migration of magmatism inboard?
YCT
WCT
FWB
separation unknown
KB
MB
NB
CSA
WMB
FB?
Chugach Accretionary Prism
Subduction of oceanic crust
Basins:
DB - Dezadeash Basin
KB - Kahiltna Basin
MB - Matanuska Basin
NB - Nutzotin Basin
WB - Wellesly Basin
WMB - Wrangell Mountains Basin
Magmatism:
Active Volcanism
Remnant Plutonic Rocks
Magmatic Arcs:
KA - Cretaceous Arc (~110-65 Ma)
CSA - Chisana Arc (140-115 Ma)
CTA - Chitina Arc (175-135 Ma)
TKA - Talkeetna Arc (201-153 Ma)
TMB - Taylor Mtn. Batholith (216-181 Ma)
SKA - Skolai Arc (320-290 Ma)
Deformational Features:
Active crustal shortening via thrust faults
Strike-slip fault
Regional topographic uplift
Terranes:
Wrangellia Composite terrane
Yukon Composite terrane
Chugach Accretionary Prism
Depositional Features:
Marine Environment
Fluvial Environment
Active basin deposition
Uplifted basin/ depositional hiatus
Submarine Fan Depositional Systems
Faults:
BRF - Border Ranges Fault
CTB - Chitina thrust belt
DF - Denali Fault
TTF - Totschunda Fault
TF - Talkeetna Fault

Figure 2.13. (A) Normalized distribution diagram comparing U-Pb detrital zircon age distribution of lower to upper Cretaceous strata of the Kahiltna basin (Hampton et al., 2010), Nutzotin basin (Trop et al., 2019b) Wrangell Mountains basin (this study), Matanuska basin (Reid et al. 2018; Stevens Goddard et al. 2018), and Chugach accretionary prism (Amato et al. 2013). Dashed rectangle represents the overlap between magmatic activity in the Chitina and Talkeetna arcs (175-153 Ma). (B) and (C) are paleogeographic reconstructions of the early Cretaceous-late Cretaceous (130-65 Ma) tectonic evolution of southern Alaska. See text for discussion. Modified from Trop and Ridgway (2007). See Figure 2.12 for explanation of symbols and abbreviations.

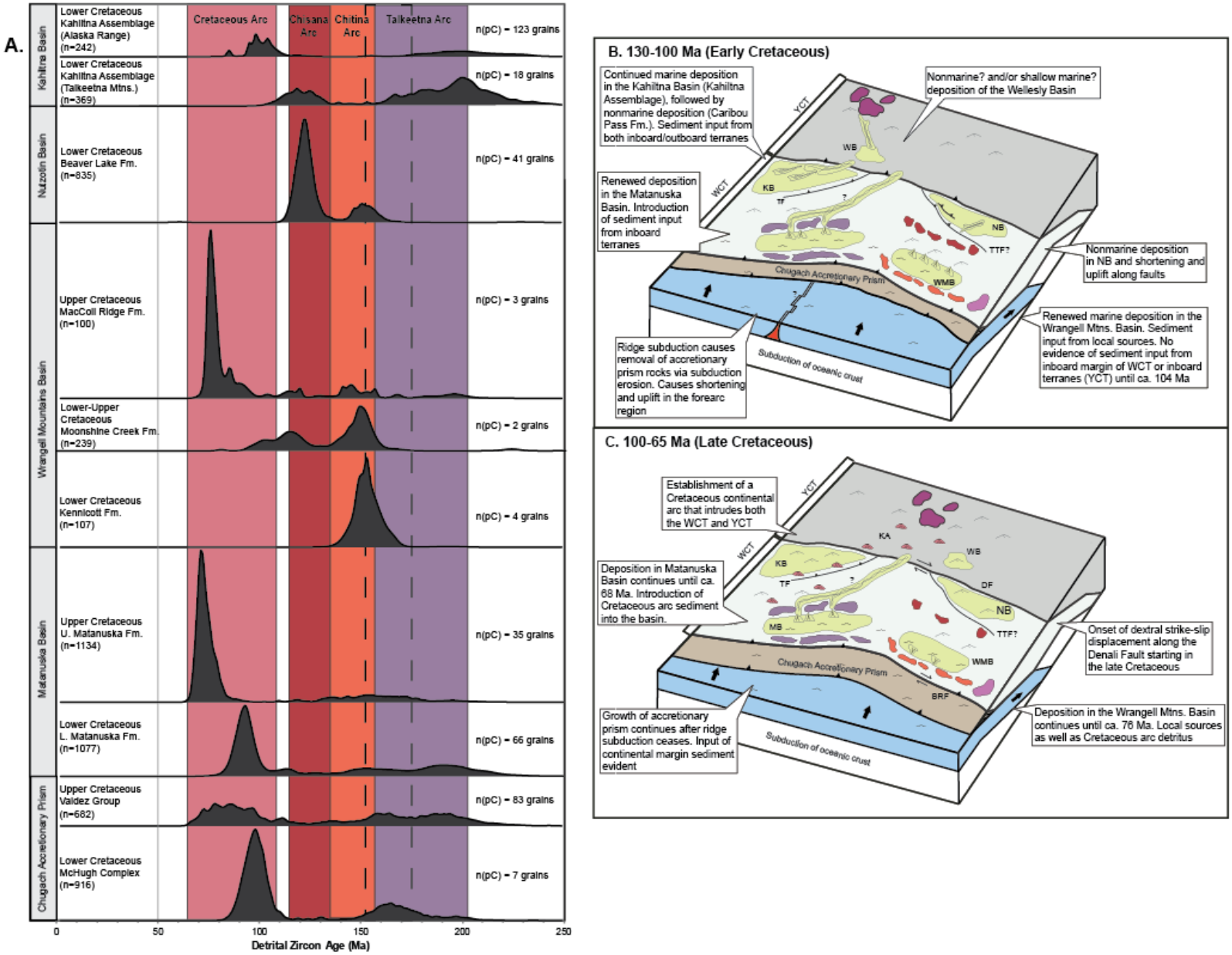

A.
Kahiltna Basin
Nutzotin Basin
Wrangell Mountains Basin
Matanuska Basin
Chugach Accretionary Prism
Lower Cretaceous Kahiltna Assemblage (Alaska Range) (n=242)
Lower Cretaceous Kahiltna Assemblage (Talkeetna Mtns.) (n=369)
Lower Cretaceous Beaver Lake Fm. (n=835)
Upper Cretaceous MacColl Ridge Fm. (n=100)
Lower-Upper Cretaceous Moonshine Creek Fm. (n=239)
Lower Cretaceous Kennicott Fm. (n=107)
Upper Cretaceous U. Matanuska Fm. (n=1134)
Lower Cretaceous L. Matanuska Fm. (n=1077)
Upper Cretaceous Valdez Group (n=682)
Lower Cretaceous McHugh Complex (n=916)
Cretaceous Arc
Chisana Arc
Chitina Arc
Talkeetna Arc
n(pC) = 123 grains
n(pC) = 18 grains
n(pC) = 41 grains
n(pC) = 3 grains
n(pC) = 2 grains
n(pC) = 4 grains
n(pC) = 35 grains
n(pC) = 66 grains
n(pC) = 83 grains
n(pC) = 7 grains
0
50
100
150
200
250
Detrital Zircon Age (Ma)
B. 130-100 Ma (Early Cretaceous)
Continued marine deposition in the Kahiltna Basin (Kahiltna Assemblage), followed by nonmarine deposition (Caribou Pass Fm.). Sediment input from both inboard/outboard terranes
Nonmarine? and/or shallow marine? deposition of the Wellesly Basin
Renewed deposition in the Matanuska Basin. Introduction of sediment input from inboard terranes
Nonmarine deposition in NB and shortening and uplift along faults
Renewed marine deposition in the Wrangell Mtns. Basin. Sediment input from local sources. No evidence of sediment input from inboard margin of WCT or inboard terranes (YCT) until ca. 104 Ma
Ridge subduction causes removal of accretionary prism rocks via subduction erosion. Causes shortening and uplift in the forearc region
YCT
WCT
WB
KB
TF
NB
TTF?
WMB
Chugach Accretionary Prism
Subduction of oceanic crust
C. 100-65 Ma (Late Cretaceous)
Establishment of a Cretaceous continental arc that intrudes both the WCT and YCT
Deposition in Matanuska Basin continues until ca. 68 Ma. Introduction of Cretaceous arc sediment into the basin.
Onset of dextral strike-slip displacement along the Denali Fault starting in the late Cretaceous
Growth of accretionary prism continues after ridge subduction ceases. Input of continental margin sediment evident
Deposition in the Wrangell Mtns. Basin continues until ca. 76 Ma. Local sources as well as Cretaceous arc detritus
YCT
WCT
KA
WB
KB
TF
DF
NB
MB
TTF?
WMB
BRF
Chugach Accretionary Prism
Subduction of oceanic crust

Table 2.1. Detrital zircon sample locations and analytical information

SAMPLE	UNIT/FACIES ASSOCIATION (FA***)	LATITUDE (°N)*	LONGITUDE (°W)*	NUMBER OF U-PB ANALYSES	NUMBER OF HF ANALYSES
MAC-COMP	MacColl Ridge Fm.	61.1890	142.3620	100	NA**
CG-DZ-1/2/3	Moonshine Creek Fm.	61.5072	142.3439	239	NA
KUS1-COMP	Kennicott Fm.	61.5550	143.5680	107	NA
ROOT1-COMP	Root Glacier Fm.	61.5980	142.8490	97	NA
KOT-COMP	Kotsina Conglomerate	61.6178	143.9447	79	NA
BON-COMP	Nutzotin Mtns. Sequence (FA5)	62.1250	141.8167	315	24
KNC1-COMP	Nutzotin Mtns. Sequence (FA4)	62.1725	141.2550	88	NA
MM1-COMP	Nutzotin Mtns. Sequence (FA1)	62.3306	142.8136	230	23
MC1-COMP	Nutzotin Mtns. Sequence (FA1)	62.3347	142.8339	313	NA
071718KR-01	Nutzotin Mtns. Sequence (FA2)	63.1702	144.7971	315	16
BR1-COMP	Nutzotin Mtns. Sequence (FA3)	62.7169	143.0219	118	18
062718CF-01	Nutzotin Mtns. Sequence (FA2)	62.5773	143.1280	315	19
LC1-COMP	Nutzotin Mtns. Sequence (FA2)	62.5992	143.1428	315	NA
WM1-COMP	Wellesly Mtn. Fm.	62.1480	147.2883	150	24

*Latitudes and Longitudes reported in decimal degrees
**NA – not applicable
*** Facies Association of Manuszak et al. (2007)

CHAPTER 3. DETRITAL ZIRCON GEOCHRONOLOGY OF MODERN RIVER SEDIMENT IN SOUTH-CENTRAL ALASKA: INSIGHTS INTO MESOZOIC TO CENOZOIC MAGMATISM ALONG THE SOUTHERN ALASKA CONVERGENT MARGIN

3.1 Introduction

Detrital zircon studies of modern rivers have become increasing utilized in regions where both ancient and active collisional and convergent processes are important components in the growth of a convergent margin (e.g., Lease et al., 2016; Pepper et al., 2016; Capaldi et al., 2017; Finzel, 2019). The application of detrital zircon ages from modern rivers to characterize major magmatic and provenance trends in a region is useful in that (1) the potential source areas and tectonic setting of a given watershed are better known relative to ancient tectonic settings, allowing for efficient characterization of age distributions in these source areas, and (2) in regions that have an extensive history of magmatism, a more complete magmatic record may be documented. The southern Alaska convergent margin has a long history of upper plate magmatism that was punctuated by multiple episodes of terrane accretion, spreading ridge subduction, and flat slab subduction (Plafker and Berg, 1994; Haeussler et al., 2003; Trop and Ridgway, 2007; Ridgway et al., 2012). However, south-central Alaska does not have an extensive geochronologic database for igneous rocks associated with this magmatic history, especially when compared to well-dated regions along the northern Cordilleran margin such as the Coast Plutonic Complex in British Columbia (Gehrels et al., 2009; Cecil et al., 2018). In south-central Alaska, modern rivers actively drain igneous rocks associated with the Mesozoic to Cenozoic magmatic history along the margin. Thus, we utilize detrital zircons from these modern rivers as proxies for the magmatism that has occurred throughout the history of tectonic growth along this margin.

This study focuses on modern rivers from the three major watersheds in south-central Alaska: the Tanana River, Matanuska-Susitna River, and Copper River watersheds (Fig. 3.1). Each of the watersheds drain potential source areas that include plutonic, volcanic and sedimentary rocks that are the products of the tectonic evolution of the southern Alaska convergent margin. These watersheds also contain regions where there is little information about the age of source rocks that sediment is being eroded from, which include much of the high mountainous regions of south-central Alaska that are inaccessible and heavily glaciated. We present new U-Pb detrital zircon

ages from each of the watersheds and integrate them with previously published ages from the same watersheds to (1) document the modern provenance record in each of the three watersheds, (2) examine the spatial and temporal archive of the modern river detrital zircon record, (3) characterize the major Mesozoic-Cenozoic magmatic and tectonic events based on our detrital zircon populations, and (4) examine the temporal trends of the magmatic record along the northern Cordilleran margin by comparing the magmatic record of south-central Alaska with the magmatic record of the western Alaska Peninsula and Coast Mountains batholith in British Columbia. We also consider how factors such as surface topography and zircon fertility may impact our results and interpretations, which have implications for sediment provenance studies of detrital zircons in general. Lastly, we discuss limitations of our approach of using modern rivers to document the magmatic and sediment provenance trends in our study area as well as discuss future research directions utilizing modern river detrital zircon ages in convergent margin settings.

3.2 Background

3.2.1 Regional Geologic Framework

The outboard (ocean-ward) margin of south-central Alaska has experienced continued convergence and subduction since at least the Jurassic. The middle Jurassic to latest Cretaceous period along the margin was defined by the accretion of the Wrangellia composite terrane (Fig. 3.2; Insular terrane) to the inboard Yukon composite terrane (Fig. 3.2; Intermontane terrane; McClelland et al., 1992; Plafker and Berg, 1994; Trop et al., 2002; Manuszak et al., 2007; Stevens Goddard et al., 2018). Along the outboard margin of this terrane, normal subduction is interpreted to have been sustained until at least the late Cretaceous time (Plafker et al., 1994). Subduction along the outboard margin of the Wrangellia composite terrane is interpreted to have accommodated the formation of accretionary prism rocks associated with the Chugach terrane (Fig. 3.2; Pavlis, 1982; Amato et al., 2013) as well as the development of early Jurassic to late Cretaceous magmatic arc assemblages that are extensively exposed throughout south-central Alaska (Fig. 3.2; Plafker et al., 1989; Hudson, 1994; Moll-Stalcup, 1994; Plafker and Berg, 1994; Hart et al., 2004; Rioux et al., 2007; Snyder and Hart, 2007).

Beginning in the Paleocene and extending into the early Eocene, the margin was further modified by subduction of a spreading ridge that migrated from west to east. Subduction of this

spreading ridge is interpreted to have halted arc magmatism on the upper plate, and emplaced slab-window plutonic rocks in the forearc and accretionary prism regions (Bradley et al., 2003; Haeussler et al., 2003; Sisson et al., 2003; Cole et al., 2006). Following spreading ridge subduction, the outboard margin was characterized by a return to normal subduction until at least the late Eocene (Plafker et al., 1994).

After this short period of normal subduction, the Yakutat microplate, a ~11-30 km thick oceanic plateau, collided with the outboard margin of south-central Alaska beginning in the late Eocene to early Oligocene (Fig. 3.2; Ferris et al., 2003; Eberhart-Phillips et al., 2006; Worthington et al., 2008; Finzel et al., 2011). Collision and subduction of the thick, buoyant Yakutat microplate prompted the transition from normal subduction to flat slab subduction underneath south-central Alaska, which continues to drive orogenic processes to the present day (Finzel et al., 2011; Arkle et al., 2013; Terhune et al., 2019). Effects of flat slab subduction of the Yakutat microplate on the upper plate of this margin include increased exhumation and surface uplift (Hoffman and Armstrong, 2008; Arkle et al., 2013; Terhune et al., 2019), basin inversion and enhanced sediment accumulation rates to adjacent depocenters (Finzel et al., 2011, 2016; Brennan and Ridgway, 2015), cessation of magmatism directly above the zone of flat slab subduction (Finzel et al., 2011; Trop et al., 2012; Brueseke et al., 2019), and rerouting of drainage systems (Benowitz et al., 2019). Active volcanic arcs in southern Alaska, including the Aleutian-Alaska Peninsula volcanic arc and the Wrangell volcanic belt, abruptly end where the Yakutat microplate is being subducted (Richter et al., 1990; Bradley et al., 2003; Trop et al., 2012; Brueseke et al., 2019).

3.2.2 Modern River Watersheds

The modern Tanana River watershed encompasses a total area of ~110,000 km^2, and drains the eastern and central Alaska Range in the southern part of the watershed and the Yukon Tanana Uplands in the northern part (Fig. 3.1). Detrital geochronologic and thermochronologic data have demonstrated that the modern-day drainage system of the Tanana River watershed was established between the early Miocene-Pliocene (Brennan and Ridgway, 2015; Benowitz et al., 2019). Located to the south of the Alaska Range are the modern-day Matanuska-Susitna River watershed and Copper River watershed, which drain into the Cook Inlet and Gulf of Alaska, respectively (Fig. 3.1). The Matanuska-Susitna River watershed encompasses a total area of ~65,000 km^2 and includes parts of the central and southwestern Alaska Range, the Talkeetna Mountains, and the

western portion of the Chugach Mountains (Fig. 3.1). The Copper River watershed has a total area of ~62,000 km^2, which includes the eastern Alaska Range in the northern part, the Wrangell Mountains and St. Elias Mountains in the eastern part, and the Chugach Mountains in the southern part (Fig. 3.1). Similar to the Tanana River watershed, the current drainage systems of the Matanuska-Susitna and Copper River watersheds are interpreted to have been established by the Miocene-Pliocene, based on detrital geochronologic and thermochronologic studies (Finzel et al., 2015).

3.3 Methodology

3.3.1 Sampling Methodology

Modern river samples were collected from multiple locations along the main river systems as well as from the main trunk rivers within each of the watersheds. Each sample represents several kilograms of sediment that were collected from the modern riverbanks or bars of each river. The geographic location of each sample presented in this study is denoted by the yellow circles on Fig. 3.2. Sample descriptions are also displayed in Table 1. The purple circles on Fig. 3.2 denote the location of previously published modern river samples.

Eight samples were collected from various rivers within the Tanana River watershed (Fig. 3.2). Samples 072709KR-07 and 072709KR-02 were collected from the lower and upper portions of the Nenana River, respectively (1 and 2 Fig. 3.2). Samples 072709KR-06 and 072709KR-05 were collected from the Tanana River (3 and 4 on Fig. 3.2). Samples 072709KR-04 and 072709KR-01 were collected from the Delta River (5 and 6 on Fig. 3.2). Finally, samples 071511KR-02 and 071511KR-01 were collected from the Gerstle and Johnson Rivers, respectively, which both drain the eastern Alaska Range to the north (7 and 8 on Fig. 3.2).

Four samples were collected from the Matanuska-Susitna River watershed (Fig. 3.2). Sample 073009KR-02 was collected from the Chickaloon River, which drains south from the Talkeetna Mountains (9 of Fig. 3.2). Sample 073009KR-01 was collected from the Matanuska River (10 on Fig. 3.2). Samples 072809KR-04 and 072809KR-05 were collected from the Chulitna River and the Susitna River, respectively (11 and 12 on Fig. 3.2).

A total of five samples were collected within the Copper River watershed (Fig. 3.2). Sample 072609KR-05 was collected near the confluence of the Chistochina River, which drains

the eastern Alaska Range, and Copper River (13 on Fig. 3.2). Sample 072609KR-06 was collected from the upper portions of the Copper River (14 on Fig. 3.2). Sample 072609KR-04 was collected near the confluence of the Tazlina River, which drains north from the Chugach Mountains, and the Copper River (15 on Fig. 3.2). Sample 072609KR-01 was collected from the Tonsina River, which drains north from the Chugach Mountains (16 on Fig. 3.2). Finally, sample 072609KR-02 was collected from the lower portions of the Copper River near the confluence with the Chitina River (17 on Fig. 3.2).

3.3.2 U-Pb Detrital Zircon Geochronology

U-Pb analysis of detrital zircons of 17 modern river samples were conducted using laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS) at the University of Arizona LaserChron Center using a Thermo Element2 single collector ICP-MS following the analytical procedures outlined by Gehrels et al. (2008). Analyses were conducted using a 20 µm spot diameter for laser ablation analysis. Analyses per sample varied between n=53 and n=100 depending on the number of zircons in each sample. For analyses younger than 1.0 Ga, the $^{206}Pb/^{238}U$ ages are reported, whereas for analyses older than 1.0 Ga, $^{206}Pb/^{207}Pb$ ages are reported. The results of the analyses are displayed on normalized age distribution (relative age probability) plots shown in Figures 3.3-3.5 for each watershed. Peak ages were calculated using the Age-Pick program in Isoplot (Ludwig, 2003), where each individual peak age was calculated using clusters of three or more detrital zircon grains overlapping in age within 2σ error.

3.4 Results

A total of 1551 new U-Pb detrital zircon ages from 17 modern river samples are reported in this study. Figures 3.3-3.5 display relative age probability plots of the detrital zircon age spectra for each modern river sample, as well as a composite of all detrital zircon ages within the drainage basin (from this study and previously published data). The following sections highlight the general trends of detrital zircon ages for each of the three studied drainage basins.

3.4.1 Tanana River Watershed

Sample 071511KR-01 (n=53) from the Johnson River draining the eastern Alaska Range (Fig. 2) contains sparse Cenozoic (2%) and Mesozoic (2%) detrital zircon ages, while yielding abundant Paleozoic (22%) and Precambrian (74%) ages (Fig. 3). The sample yields one major Paleozoic age population between 378-358 Ma (Fig. 3), and four major Precambrian age populations between 2.8-2.5 Ga, 2.1-1.8 Ga, 1.6-1.4 Ga, and 1.2-1.0 Ga. Sample 071511KR-02 (n=99) from the Gerstle River draining the eastern Alaska Range (Fig. 3.2) almost an entirely Precambrian age distribution (99%), with only one Cenozoic age (Fig. 3.3). Major Precambrian age populations center between 2.8-2.5 Ga, 2.1-1.8 Ga, and 1.4-1.0 Ga. Sample 072709KR-01 (n=100) from the upper Delta River (Fig. 3.2) contains Cenozoic (2%), Mesozoic (31%), and Paleozoic (67%) detrital zircon ages (Fig. 3.3). The sample yields two major age populations between 340-290 Ma and 132-114 Ma (Fig. 3.3). Sample 072709KR-04 (n=84) from the lower Delta River (Fig. 2) displays Cenozoic (14%), Mesozoic (16%), Paleozoic (13%), and Precambrian (53%) detrital zircon ages (Fig. 3.3). The sample contains major Mesozoic and Cenozoic age populations between 111-92 Ma and 39-34 Ma, and a major Paleozoic populations between 378-360 Ma (Fig. 3.3). Precambrian grains are abundant in the sample, and constitute major age populations between 2.1-1.8 Ga and 1.4-1.0 Ga.

Sample 072709KR-05 (n=90) from the eastern part of the Tanana River within the study area (Fig. 3.3) and contains Mesozoic (14%), Paleozoic (8%), and Precambrian (78%) detrital zircon ages (Fig. 3.3). Mesozoic and Paleozoic ages are sparse but generally range between 396-302 Ma and 121-107 Ma (Fig. 3.3). Precambrian detrital zircon ages dominate the sample, with major age populations ranging between 2.8-2.5 Ga, 2.1-1.8 Ga, and 1.4-1.0 Ga. Sample 072709KR-06 (n=96) from the western portion of the Tanana River in the study area (Fig. 3.2) shows Cenozoic (12%), Mesozoic (19%), Paleozoic (8%), and Precambrian (61%) detrital zircon ages (Fig. 3.3). Major Mesozoic and Cenozoic age populations range between 102-89 Ma, 58-53 Ma, and 41-35 Ma (Fig. 3.3). Sample 072709KR-02 (n=93) from the upper Nenana River (Fig. 3.2) displays primarily Cenozoic (31%) and Mesozoic (65%) ages, with sparse Paleozoic (2%) and Precambrian (2%) ages (Fig. 3.3). This sample yields major age populations between 101-92 Ma, 67-53 Ma, and 41-35 Ma (Fig. 3.3). Sample 072709KR-07 (n=100) from the lower Nenana River (Fig. 3.2) contains Cenozoic (13%), Mesozoic (49%), Paleozoic (5%), and Precambrian (33%) detrital zircon ages (Fig. 3.3). Major Mesozoic and Cenozoic age populations in the sample range

between 103-89 Ma and 39-37 Ma (Fig. 3.3). Major Precambrian age populations range between 2.7-2.5 Ga, 2.1-1.8 Ga, and 1.4-1.0 Ga.

Our new modern river detrital zircon data from the Tanana River basin, combined with samples published by Trop et al. (2019a, 2019b; see Fig. 3.2 for locations of these samples), have a total detrital zircon age distribution (n=1018) that displays Cenozoic (14%), Mesozoic (34%), Paleozoic (13%), and Precambrian (39%) ages (Fig. 3.3). The basin yields major age populations between 333-290 Ma, 126-107 Ma, 103-89 Ma, 70-53 Ma, 41-34 Ma, and 9-5 Ma (Fig. 3). Precambrian ages account for the majority of the distribution, and yield dominant age populations between 2.8-2.5 Ga, 2.1-1.8 Ga, and 1.4-1.0 Ga.

3.4.2 Matanuska-Susitna River Watershed

Sample 072809KR-05 (n=92) from the Susitna River (Fig. 2) yields Precambrian (8%), Paleozoic (6%), Mesozoic (37%), and Cenozoic (49%) detrital zircon ages (Fig. 4). This sample yields primarily two major age populations between 105-91 Ma and 61-52 Ma (Fig. 4). Sample 072809KR-04 (n=89) from the Chulitna River (Fig. 2) shows Precambrian (8%), Paleozoic (4%), Mesozoic (20%), and Cenozoic (68%) detrital zircon ages (Fig. 4). Major age populations in this sample range between 106-89 Ma and 68-49 Ma (Fig. 4). Sample 073009KR-02 (n=95) from the Chickaloon River (Fig. 2) contains only Mesozoic (96%) and Cenozoic (4%) detrital zircon ages (Fig. 4). This sample yields one dominant age population between 177-144 Ma (Fig. 4). Finally, sample 073009KR-01 (n=90) from the Matanuska River (Fig. 2) has Precambrian (5%), Paleozoic (2%), Mesozoic (82%), and Cenozoic (11%) detrital zircon ages (Fig. 4). The sample exhibits major age populations between 184-148 Ma, 110-105 Ma, and 74-60 Ma (Fig. 4).

Our new modern river samples from the Matanuska-Susitna River basin add to a growing detrital zircon dataset including modern river samples that drain the western Alaska Range, central Alaska Range, and Talkeetna Mountains (Fig. 2; Finzel et al., 2016; Lease et al., 2016; Finzel and Enkelmann, 2017; Trop et al., 2019a). The total detrital zircon age distribution (n=3330) for the Matanuska-Susitna River basin displays Precambrian (2%), Paleozoic (2%), Mesozoic (61%), and Cenozoic (34%) detrital zircon ages (Fig. 4). The basin displays major detrital zircon age populations of 203-140 Ma, 115-81 Ma, 80-50 Ma, and 46-34 Ma (Fig. 4). Subordinate Paleozoic detrital zircon ages are primarily Silurian (433-419 Ma), Devonian (416-359 Ma), Mississippian

(356-327 Ma), and Permian (292-260 Ma; Fig. 4). Precambrian ages are also sparse, but generally occur between 2.8-2.5 Ga, 2.1-1.7 Ga, and 1.4-1.0 Ga.

3.4.3 Copper River Watershed

Sample 072609KR-05 (n=103) from the Chistochina River draining the eastern Alaska Range (Fig. 2) yields Precambrian (31%), Paleozoic (7%), Mesozoic (54%), and Cenozoic (8%) detrital zircon ages (Fig. 5). Major Mesozoic and Cenozoic age populations within the sample occur between 64-46 Ma, 110-93 Ma, and 127-119 Ma (Fig. 5). Paleozoic grains are sparse, and are primarily Devonian and Pennsylvanian in age (Fig. 5). Precambrian grains are abundant, with ages clustering between 2.7-2.6 Ga, and 1.8-1.6 Ga. Sample 072609KR-06 (n=97) from the upper Copper River yield equal portions of Precambrian (32%), Paleozoic (34%), and Mesozoic (30%), with sparse Cenozoic ages (4%; Fig. 5). The sample is dominated by a Mesozoic age population between 106-94 Ma and a Paleozoic population between 311-292 Ma (Fig. 2). Major Precambrian populations occur ca. 2.6 and 1.8 Ga, with subordinate ages between 1.4-1.0 Ga.

Sample 072609KR-04 (n=88) from the Tazlina River draining the Chugach Mountains (Fig. 2) displays Precambrian (4%), Paleozoic (22%), Mesozoic (72%), and Cenozoic (2%) detrital zircon ages (Fig. 5). The sample documents major age populations between 78-71 Ma, 104-91 Ma, 160-127 Ma, and 315-294 Ma (Fig. 5). Sample 072609KR-01 (n=99) from the Tonsina River also draining the Chugach Mountains shows Precambrian (18%), Paleozoic (12%), and Mesozoic (70%) ages (Fig. 5). The sample yields a dominate age population between 80-70 Ma, with subordinate populations between 111-98 Ma, 163-155 Ma, 199-185 Ma, and 370-355 Ma (Fig. 5). Precambrian grains are aged between 689-567 Ma, 1.9-1.7 Ga, and 2.7-2.6 Ga. Sample 072609KR-02 (n=83) from the lower Copper River (Fig. 2) contains Precambrian (10%), Paleozoic (17%), Mesozoic (67%), and Cenozoic (6%) detrital zircon ages (Fig. 5). Major age populations in the sample occur between 76-48 Ma, 98-93 Ma, 132-106 Ma, 163-140 Ma, and 320-297 Ma (Fig. 5). Precambrian grains are sparse, but are primarily clustered between 2.0-1.8 Ga.

Combining our five new modern river samples with one sample reported in Day et al. (2016) from the Chitina River (Fig. 2), the total detrital zircon age distribution (n=538) for the Copper River basin yields predominantly Mesozoic ages with subordinate Precambrian, Paleozoic, and Cenozoic ages (Fig. 5; Cz=3%, Mz=63%, Pz=15%, pC = 19%). Detrital zircon ages from the Copper River basin yield five major <500 Ma age populations: 309-293 Ma, 161-140 Ma, 132-

117 Ma, 111-90 Ma, and 80-68 Ma (Fig. 5). The basin also contains abundant Precambrian detrital zircons, with age mainly clustering between 2.8-2.5 Ga, 2.2-1.7 Ga, and 1.4-1.0 Ga.

3.5 Provenance

Figure 3.6 shows a generalized geologic map of south-central Alaska highlighting the primary <250 Ma plutonic and volcanic sources for detrital zircons in each of the watersheds. Also displayed are composite plots of each of the three watersheds showing detrital zircon ages <250 Ma. While the primary focus of our provenance analysis as well as the subsequent sections in this chapter are concerned with these <250 Ma detrital zircon ages, we do consider sources for detrital zircons >250 Ma in the overall age distribution.

3.5.1 Tanana River Watershed

The Tanana River watershed contains <250 Ma major age populations of 126-107 Ma, 103-89 Ma, 70-53 Ma, 41-34 Ma, and 9-5 Ma (Fig. 3.3 and 3.6). The early to middle Cretaceous (126-107 Ma) age population matches well with 126-113 Ma plutons associated with the Chisana arc that are exposed in the eastern Alaska Range in the headwaters of the watershed (Fig. 3.6). One sample from the upper Delta River that drains the eastern Alaska Range further to the northwest contains a significant population of early to middle Cretaceous detrital zircons that overlap in age with the Chisana arc plutons (Fig. 3.3). This may suggest the presence of undated plutons of this age in this part of the eastern Alaska Range. The middle Cretaceous (103-89 Ma) detrital zircon ages become more pronounced moving downstream in the watershed (Fig. 3.3). These detrital zircons were likely sourced from an extensive belt of middle Cretaceous plutonic rocks (110-85 Ma; middle Cretaceous igneous belt of Plafker and Berg, 1994) that are exposed upstream in the watershed (Fig. 3.6; Hudson, 1994; Hart et al., 2004; Dusel-Bacon et al., 2015). Also more prevalent in the downstream samples is a population of 70-53 Ma detrital zircons (Fig. 3.3). This population of zircons were most likely derived from a suite of late Cretaceous to early Eocene plutonic rocks (75-56 Ma, Alaska Range-Talkeetna Mountains magmatic belt; Moll-Stalcup, 1994; Cole et al., 2007; Cole and Chung, 2013) exposed in the central Alaska Range (Fig. 3.6). Another possible source for these zircons are sedimentary strata of the Tanana basin exposed north of the central Alaska Range (Fig. 3.2), and the Colorado Creek basin, exposed south of the Central Alaska

Range (Fig. 3.2); both basins contain numerous detrital zircons with ages between 75-50 Ma (Brennan and Ridgway, 2015; Trop et al., 2019a). Late Eocene (41-34 Ma) were likely sourced from a suite of small Eocene plutons that are exposed in the central and eastern Alaska Range within the watershed (Fig. 3.6; Reed and Lanphere, 1973; Moll-Stalcup, 1994; Hung, 2008). The late Miocene (9-5 Ma) detrital zircon age population was most likely sourced from volcanic rocks associated with a younger phase of volcanism in the Wrangell arc (30-0 Ma), which are currently exposed in the Wrangell Mountains at the headwaters of the watershed (Fig. 3.6; Richter et al., 1990; Preece and Hart, 2004; Trop et al., 2012; Brueseke et al., 2019). Overall, <250 Ma detrital zircon ages from modern river sediments in the Tanana River watershed appear to reflect derivation from predominantly first-order plutonic sources, with a smaller contribution from second-order sedimentary sources.

Detrital zircon ages >250 Ma constitute a significant percentage of the detrital zircon age distribution of the Tanana River watershed, with nearly 52% of grains being older than 250 Ma (Fig. 3.3). The Tanana River watershed contains a significant age population between 330-290 Ma (Fig. 3.6). We attribute this population as being derived from plutonic rocks of the Skolai arc (320-290 Ma) or metasedimentary rocks that were derived from the arc, all of which are exposed in the eastern Alaska Range (Beard and Barker, 1989; Nokleberg et al., 2015). Precambrian detrital zircon grains constitute the largest percentage of the Tanana River watershed age distribution (39%; Fig. 3.3), and yield major age populations between 2.8-2.5 Ga, 2.1-1.8 Ga, and 1.4-1.0 Ga. The source of these Precambrian grains are likely from Neoproterozoic-early Paleozoic metasedimentary basinal strata associated with the parautochthonous continental margin of North America, which are extensively exposed in the Tanana River watershed. These strata contain similar detrital zircon age populations between 2.7-2.6 Ga, 1.9-1.8 Ga, and 1.6-0.9 Ga (Dusel-Bacon et al., 2017), making them likely sources of these detrital zircons in the modern river samples.

3.5.2 Matanuska-Susitna River Watershed

The Matanuska-Susitna River watershed shows predominantly <250 Ma age populations (94% of the total age distribution) between 203-140 Ma, 115-81 Ma, 80-50 Ma, and 46-34 Ma (Fig. 3.4 and 3.6). The late Triassic to early Cretaceous (203-140 Ma) detrital zircon population overlaps in age with early Jurassic to early Cretaceous plutons of the Talkeetna (201-153 Ma) and

Chitina (175-135 Ma) arcs (Fig. 3.6; Plafker et al., 1989; Plafker and Berg, 1994; Rioux et al., 2007). Plutons of the Talkeetna arc are exposed extensively throughout the Talkeetna Mountains, and are likely primary first-cycle sources of these zircons in the watershed. Plutons of the Chitina arc, however, are primarily exposed outside of the Matanuska-Susitna River watershed in the southern Wrangell Mountains (Fig. 3.6). The prevalence of detrital zircons (153-140 Ma) that overlap in age with the Chitina arc likely reflect erosion of sedimentary strata associated with the Kahiltna assemblage in the central and western Alaska ranges and the northwestern Talkeetna Mountains (Fig. 3.2), the Matanuska basin exposed in the southern Talkeetna Mountains (Fig. 3.2), and the Chugach accretionary prism, exposed in the Chugach Mountains (Fig. 3.2); all three regions have been shown to contain detrital zircon ages that were sourced from Chitina arc plutons (Hampton et al., 2010; Amato et al., 2013; Stevens Goddard et al., 2018; Reid et al., 2018; Box et al., 2019). Middle to late Cretaceous (115-81 Ma) detrital zircons overlap in age with sparse middle to late Cretaceous plutons that are exposed in the Talkeetna Mountains and central Alaska Range (Fig. 3.6; Wilson et al., 2015), which may indicate a first-cycle source for these zircons. An extensive belt of middle Cretaceous (110-85 Ma) plutons are exposed in the Yukon Tanana Uplands, which lie well outside of the watershed (Fig. 3.6; Dusel-Bacon et al., 2015). We interpret this middle to late Cretaceous age population as being sourced from Cretaceous strata of the Kahiltna and Matanuska basins as well as the Chugach accretionary prism (Fig. 3.2), which contain detrital zircons that are interpreted as being derived from this middle Cretaceous plutonic suite (Hampton et al., 2010; Stevens Goddard et al., 2018; Box et al., 2019). The late Cretaceous to early Eocene (80-50 Ma) detrital zircon age population can be attributed to an extensive suite of similar aged plutons of the Alaska Range-Talkeetna Mountains magmatic belt (75-56 Ma) that are exposed throughout the watershed (Fig. 3.6; Cole et al., 2007; Cole and Chung, 2013). Finally, middle to late Eocene (46-34 Ma) detrital zircons overlap in age with spatially limited Eocene to Oligocene (40-30 Ma) plutons that are exposed in the central Alaska Range (Fig. 3.6; Moll-Stalcup, 1994; Wilson et al., 2015). In summary, detrital zircons from the Matanuska-Susitna River watershed likely reflect derivation from both first-order plutonic sources as well as second-order sedimentary sources.

3.5.3 Copper River Watershed

Detrital zircon ages from modern river sediments from the Copper River watershed yield <250 Ma age populations of 161-140 Ma, 132-117 Ma, 111-90 Ma, and 80-68 Ma (Fig. 3.5). Late Jurassic to early Cretaceous (161-140 Ma) detrital zircons in the watershed overlap in age with plutons associated with the Chitina arc (175-135 Ma), which are exposed south of the Wrangell Mountains in the eastern part of the watershed (Fig. 3.6). These plutons were likely the predominant first-order sources for these zircons. Other possible sources for this age population include recycled zircons from sedimentary strata of the Wrangell Mountains basin and Chugach accretionary prism (Fig. 3.2), which both contain significant populations of late Jurassic to early Cretaceous detrital zircons (Amato et al., 2013; Day et al., 2016; Fasulo and Ridgway, 2019). Early Cretaceous plutons that may have sourced 132-117 Ma detrital zircons in the Copper River watershed are lacking, aside from sparse Cretaceous-aged plutons that have been mapped in the eastern Alaska Range (Nokleberg et al., 2015; Wilson et al., 2015). These plutons may be a possible source of early to middle Cretaceous detrital zircons present in our sample from the Chistochina River, which drains the eastern Alaska Range (Fig. 3.2). The source for early Cretaceous detrital zircons from samples further downstream are most likely reworked sedimentary strata of the Chugach accretionary prism and Wrangell Mountains basin (Fig. 3.2), which contain similar aged detrital zircons (Amato et al., 2013; Fasulo and Ridgway, 2019). Similar to early Cretaceous plutons, middle Cretaceous plutons are also lacking in the Copper Watershed (Fig. 3.6); however, the watershed contains abundant middle Cretaceous (111-90 Ma) detrital zircons (Fig. 3.5). These detrital zircons appear to be more strongly represented in the more upstream samples, which drain from the eastern Alaska Range (Fig. 3.5). Middle Cretaceous plutons are present in the eastern Alaska Range just outside of the watershed boundary (Fig. 3.6). We postulate that middle Cretaceous detrital zircons in the Copper River watershed are being transported into the watershed by glaciers that are extensive throughout the eastern Alaska Range (Fig. 3.2). Finally, late Cretaceous (80-68 Ma) detrital zircons are most abundant in two samples that drain the Chugach accretionary prism in the Chugach Mountains, the Tazlina and Tonsina Rivers (Fig. 3.2). Late Cretaceous accretionary prism rocks contain abundant detrital zircons between 80-68 Ma (Gross Almonte et al., 2019), and are the predominant source for late Cretaceous zircons in the watershed. Overall, while the Tanana and Matanuska-Susitna River watershed <250 Ma detrital zircons are likely derived from predominantly first-order plutonic

sources exposed in the watershed, <250 Ma detrital zircons in the Copper River watershed appear to be predominantly reworked from older sedimentary strata.

Detrital zircons >250 Ma constitute a significant percentage of the total age distribution (34%; Fig. 3.5). The Copper River watershed contains Pennsylvanian-Permian (309-293 Ma) detrital zircons that were likely derived from plutonic and metasedimentary rocks associated with the Skolai Pennsylvanian-Permian Skolai Group, which are exposed in the eastern Alaska Range in the north of the watershed (Nokleberg et al., 2015). Precambrian detrital zircons are also abundant, and display age populations of 2.8-2.5 Ga, 2.2-1.7 Ga, and 1.4-1.0 Ga (Fig. 3.5). These populations are similar to those found in the Tanana River watershed, which are attributed to being sourced from Precambrian to Paleozoic metasedimentary rocks exposed in the Yukon Tanana Uplands (Fig. 3.2). Similar rocks are exposed in the eastern Alaska Range in the upper reaches of the watershed (Fig. 3.2; Wilson et al., 2015), making these rocks a likely source for these Precambrian detrital zircons.

3.6 Discussion

3.6.1 Controls on Detrital Zircon Presence in South-Central Alaska Watersheds

Regionally, our detrital zircon dataset from the Tanana, Matanuska-Susitna, and Copper River watersheds are reflective of the major <200 Ma plutonic and volcanic assemblages exposed in south-central Alaska. However, as shown on Figure 3.6, major detrital zircon populations are not captured locally by individual watersheds. For instance, in the Tanana River watershed, prominent zircon populations between 200-140 Ma are generally lacking, whereas in the other two watersheds these zircons are captured. In the Matanuska-Susitna River watershed, major zircon populations are lacking between 130-115 Ma and 30-0 Ma whereas in the Tanana River watershed they are present. Finally, in the Copper River watershed, zircons that are <40 Ma are absent, whereas in the other two watersheds they are present. One of the major first-order controls on the differences between the detrital zircon populations between the three watersheds appears to be topography. As shown in Figure 3.1, the northwest-flowing Tanana watershed is divided from the south-flowing Matanuska-Susitna and Copper River watersheds by the central and eastern Alaska Range. The lack of 200-140 Ma detrital zircons in the Tanana watershed can be accounted by this topographic barrier, as the major Jurassic-early Cretaceous plutonic and volcanic assemblages (i.e.,

Talkeetna and Chitina arc plutons) are presently exposed south of the Alaska Range. Another interesting comparison can be made between the Matanuska-Susitna and Copper River watershed. Both watersheds are situated in a similar tectonic setting south of the Alaska Range and flow to the south (Figure 3.1). However, as displayed in Figure 3.6, the <250 Ma detrital zircon age spectra of the two watersheds are different. Even though the two basins are in the same tectonic setting, our detrital zircon ages suggest that the topographic divide between the two watersheds (i.e., the eastern Talkeetna Mountains) exerts significant control on the drainage patterns in each watershed, and therefore presence of major detrital zircon populations.

Another controlling factor in zircon presence in south-central Alaska watersheds appears to be zircon fertility. Previous studies have noted the potential impact of zircon fertility (i.e., zircon abundance) in interpreting detrital zircon provenance (e.g., Moecher and Samson, 2006; Dickinson, 2008; Spencer et al., 2018). Due to the nature of our study, which utilizes detrital zircons that were derived from plutonic and volcanic assemblages in south-central Alaska, our interpretation of the magmatic record of south-central Alaska is biased towards magmatic phases that produced zircon-fertile rocks (i.e., felsic and intermediate plutonic and volcanic rocks) as opposed to zircon-poor rocks such as mafic igneous rocks. This is significant in a region such as south-central Alaska which has a magmatic history involving both felsic and mafic magmatism. Most notable of these mafic phases are rocks of the early Oligocene to modern Wrangell volcanic belt (Wrangell arc of Brueseke et al., 2019), which extends for nearly 500 km in the eastern portion of south-central Alaska, Yukon, and parts of British Columbia (Fig. 3.2 and 3.6). Rocks of the Wrangell volcanic belt are predominantly mafic in composition and geochronologic studies show that these rocks formed beginning ca. 30 Ma (Richter et al., 1990; Preece and Hart, 2004; Trop et al., 2012; Berkelhammer et al., 2019; Brueseke et al., 2019). These rocks are also extensively exposed in the Copper River watershed (Fig. 3.1 and 3.6); however, <30 Ma detrital zircons in this watershed are nearly absent. The Wrangell volcanic belt represents a significant spatial and temporal phase of magmatism along the Northern Cordilleran margin. Due to the low zircon fertility of Wrangell volcanic belt rocks, our detrital zircon record ultimately does not capture the full extent of this major magmatic phase.

Zircon-rich magmatic phases are represented in our dataset by the large detrital zircon populations of 110-85 and 80-50 Ma, which are the only two populations that are present in all three watersheds (Fig. 3.6). The phases of 110-85 and 80-50 Ma magmatism are documented by

the middle Cretaceous igneous belt exposed in the Yukon Tanana Uplands and the late Cretaceous-Eocene Alaska Range-Talkeetna magmatic belt exposed in the central Alaska Range, respectively (Fig. 3.6). Geochronologic and geochemical studies of plutons in both belts indicate that these plutons were emplaced due to high degrees of crustal melting during or following phases of crustal thickening associated with the accretion of the Wrangellia composite terrane to the continental margin (Hudson, 1994; Hart et al., 2004; Cole et al., 2007; Carrion et al., 2012; Cole and Chung, 2013; Dusel-Bacon et al., 2015). In both instances, melting of thickened crustal rocks would have produced zircon-fertile magmatism on the upper plate of the margin. As a result, the modern river detrital zircon record of south-central Alaska is dominated by zircons representing these two periods of zircon-fertile magmatism.

In summary, our detrital zircon provenance analysis of each of the three watersheds in south-central Alaska show the control that both topography and zircon fertility have in affecting the presence or absence of detrital zircon age populations in adjacent watersheds that are in similar tectonic settings. The local variations in detrital zircon presence in each watershed also shows the limitations an individual watershed has when attempting to characterize the regional magmatic record, in that major magmatic phases may be missed altogether if they are not reflected in the detrital zircon record of a watershed. Regional datasets are thus required to more accurately characterize the major periods in magmatism. This also has implications for detrital zircon studies of ancient sedimentary basins, where the provenance of sediment for a basin in inferred from the presence of major age populations that correspond to known active or remnant magmatic arcs. If samples within a basin are more localized, it may be likely to miss potential sources of sediment, thus leading to a potentially misleading detrital zircon provenance interpretation.

3.6.2 Characterizing the Magmatic Record of South-Central Alaska

As a whole, our regional detrital zircon dataset from modern rivers in south-central Alaska provide new insights into the history of magmatism along the southern Alaska convergent margin. The detrital zircon ages reported herein yield major <200 Ma age populations of 200-140 Ma, 125-113 Ma, 105-85 Ma, 80-50 Ma, 45-35 Ma, and 10-5 Ma (Fig. 3.7), which match well with documented periods of silicic magmatism in south-central Alaska based on ages of plutonic and

volcanic rocks. In this section, we explore the major phases of silicic magmatic addition to the upper plate of the margin as they are recorded in the modern river detrital zircon record.

The first major phase of silicic magmatism recorded in our dataset occurs between 200-140 Ma (Fig. 3.7). This age population records magmatism in the Talkeetna and Chitina arcs (201-153 Ma and 175-135 Ma); these arcs have been interpreted as representing a single oceanic arc system built upon the Wrangellia composite terrane during a period of normal subduction along the outboard margin of the terrane (Plafker et al., 1989; Plafker and Berg, 1994; Rioux et al., 2007). Following a period of decreased magmatism between ca. 140 and 125 Ma, another phase of magmatic addition occurs between 125-113 Ma (Fig. 3.7). This phase represents magmatism associated with the Chisana arc (130-115 Ma), which is interpreted as an oceanic arc formed due to continued normal subduction along the outboard margin of the Wrangellia composite terrane (Plafker and Berg, 1994; Snyder and Hart, 2007). The major phase of magmatism in the Talkeetna-Chitina arc system occurred prior to the accretion of the Wrangellia composite terrane to the continental margin while magmatism in the Chisana arc occurred coevally with accretion (Plafker and Berg, 1994). The cessation in magmatic activity in the Chisana arc coincides with the timing of late stage suturing of the Wrangellia composite terrane to the continental margin, evidenced by ca. 117 Ma subaerial exposure of retroarc strata within the suture zone between Wrangellia and the continental margin and documented Precambrian detrital zircons in these strata (Hampton et al., 2017; Trop et al., 2019b), as well as middle Cretaceous thrust faults that caused shortening of these retroarc strata (Manuszak et al., 2007; Trop and Ridgway, 2007).

Following another short magmatic lull, magmatism appears to have renewed between ca. 105-85 Ma (Fig. 3.7). This phase of magmatism reflects the initiation of continental arc magmatism attributed to continued normal subduction along the convergent margin, represented by an extensive suite of 110-85 Ma plutonic rocks exposed throughout the Yukon Tanana Uplands that were emplaced following a period of crustal thickening associated with continued accretion of the Wrangellia composite terrane with the margin (Fig. 3.6; Moll-Stalcup, 1994; Hart et al., 2004; Dusel-Bacon et al., 2015; Stevens Goddard et al., 2018). Another brief decrease in magmatism is accompanied by a gradual increase in magmatism between 80-50 Ma, with peak magmatism, based on the detrital ages, occurring ca. 72 and 58 Ma (Fig. 3.7). This period of magmatism coincides with activity in the Alaska Range-Talkeetna Mountains magmatic belt (75-56 Ma), which is interpreted to represent syn-collisional arc magmatism during the terminal phase

of suturing of Wrangellia to the continental margin (Cole et al., 2007; Trop and Ridgway, 2007). Towards the end of this phase, subduction of a spreading ridge underneath the margin occurred (ca. 61-50 Ma), which caused the emplacement of slab-window igneous rocks in the forearc region (Bradley et al., 2003; Haeussler et al., 2003).

Normal subduction underneath south-central Alaska is interpreted to have briefly renewed following ridge subduction (Plafker et al., 1994; Finzel et al., 2011), which is accompanied by a brief pulse in magmatism between 45-35 Ma (Fig. 3.7). This phase of magmatism is reflected by spatially limited plutons in the central Alaska Range (40-30 Ma; Fig. 3.6), which coincide with initiation of Aleutian and Meshik arc magmatism on the western Alaska Peninsula (Jicha et al., 2006; Finzel and Ridgway, 2017). The decrease in magmatism after this brief phase coincides with the beginning of flat-slab subduction of the Yakutat microplate underneath the margin, which is interpreted to have caused cessation in magmatism directly above the flat-slab region (Finzel et al. 2011; Ridgway et al., 2012). The last major phase in silicic magmatism, according to the detrital zircon archive in modern rivers, occurs between ca. 10-5 Ma (Fig. 3.7). This period of magmatism reflects a younger phase of magmatism in the Wrangell arc. Arc magmatism older than 10 Ma has been noted in the Wrangell arc (Trop et al., 2012; Berkelhammer et al., 2019; Brueseke et al., 2019), however, this signal is not captured in our detrital zircon dataset. The absence of this older magmatic phase may be attributed to (1) sampling of modern rivers that do not drain the older parts of the arc, and (2) zircon fertility, given that the majority of Wrangell arc volcanic rocks are more mafic in composition (Richter et al., 1990; Berkelhammer et al., 2019).

In summary, detrital zircon ages from modern rivers in south-central Alaska provide a documentation of the major phases of silicic magmatism on the upper plate of this convergent margin during the past 200 m.y. that matches well with the major arc systems documented by the dating of plutonic and volcanic rocks in south-central Alaska (Moll-Stalcup, 1994; Plafker and Berg, 1994). Peak magmatism in these arc systems, based on our detrital zircon record, occurs ca. 170, 150, 118, 95, 72, 58, 36, and 7 Ma (Fig. 3.7). The overall pattern of these ages suggests that silicic magmatism along this margin was highly episodic, with the periodicity of these magmatic episodes ranging between ~14 and 32 m.y with an average periodicity of ~23 m.y. The cyclicity displayed in our detrital zircon record shows similarities to cyclical patterns that have been documented in other regions along the Cordilleran margin. For instance, studies in the central Andes have documented periods of high-flux magmatism in the last 200 m.y that have an apparent

cyclicity of ~25-45 m.y. (Haschke et al., 2006; DeCelles et al., 2015). Studies of North American Cordilleran arcs, such the Sierra Nevada batholith in southern California and Coast Plutonic Complex in British Columbia document <200 Ma high-flux magmatism with an apparent cyclicity of ~25-50 m.y (Barton, 1996; Ducea, 2001; Ducea and Barton, 2007; DeCelles et al., 2009; Gehrels et al., 2009; Girardi et al., 2012). The similarity in magmatic cyclicity displayed in our modern river detrital zircon record in south-central Alaska (14-32 m.y.) to the magmatic cyclicity documented in the central Andes (25-45 m.y.) and North American Cordilleran arcs (25-50 m.y.) suggest that the entire Cordilleran margin was impacted by similar cyclical convergent margin processes. Multiple studies have explored potential causes for cyclicity along convergent margins (e.g., Haschke et al., 2002, 2006; Kay et al., 2005; DeCelles et al., 2009, 2015; Gibert et al., 2012; DeCelles and Graham, 2015; Paterson and Ducea, 2015; Beranek et al., 2017), with explanations varying from lower plate controls, such as plate convergence velocity and the geometry and age of the down-going slab, to upper plate controls, such as retroarc shortening and crustal delamination. Our detrital zircon data from modern rivers in south-central Alaska alone is not sufficient for characterizing the potential tectonic processes that may be causing the apparent magmatic cyclicity. However, the fact that our data does exhibit cyclicity that is comparable to other areas along the Cordilleran margin warrants future studies to test the orogenic cyclicity model in south-central Alaska.

3.6.3 Implications for Magmatism along the Northern Cordilleran Margin

Detrital zircon ages of modern river sediment in south-central Alaska document the major stages of Mesozoic and Cenozoic magmatism along the southern Alaska convergent margin. This magmatic record can be compared with the magmatic records of other regions in the northern Cordillera, such as the western Alaska Peninsula and the Coast Plutonic Complex of British Columbia, to examine the spatial and temporal relationships in magmatism along the entire northern Cordilleran margin. The magmatic record of the western Alaska Peninsula is documented by detrital zircon ages from forearc basin strata exposed in the region (Finzel and Ridgway, 2017). The magmatic record of the Coast Plutonic Complex is based on a magmatic flux curve derived from the age and volume of exposed plutons in the region (Gehrels et al., 2009). The three datasets used for comparison in this section are shown in Figure 3.8.

The Coast Plutonic Complex shows a period of high-flux magmatism in the late Jurassic (160-140 Ma; Fig. 3.8). Detrital zircon ages of the Alaska Peninsula and south-central Alaska exhibit similar peaks between 180-140 Ma (Fig. 3.8), suggesting that middle-late Jurassic magmatism was widespread along the northern Cordilleran margin. This widespread Jurassic magmatism coincides with a period of extensive normal subduction along the margin (van der Heyden, 1992; Gehrels et al., 2009). All three datasets show a general lack of magmatic activity between 140-120 Ma (Fig. 3.8), which coincides with a well-documented magmatic lull throughout the Northern Cordillera (Armstrong, 1988; Gehrels et al., 2009). This magmatic lull has been interpreted to reflect (1) initial collision of the Wrangellia composite terrane with the continental margin (Ridgway et al., 2002; Hampton et al., 2007; Stevens Goddard et al., 2018) or (2) a period of oblique sinistral displacement along the margin (Chardon et al., 1999; Chardon, 2003; Butler et al., 2006). Widespread magmatism appears to have recommenced between 120-80 Ma based on the three magmatic records (Fig. 3.8), with the emplacement of widespread plutons in south-central Alaska and the Coast Plutonic Complex that are coincident with regional metamorphism, crustal thickening and shortening associated with continued juxtaposition of the Wrangellia composite terrane against the continental margin (Rubin et al., 1990; Gehrels et al., 2009; Wolf et al., 2010). The magmatic records of south-central Alaska and the Coast Plutonic Complex document significant magmatism between 80-50 Ma, with the Coast Plutonic Complex yielding a period of high flux magmatism ca. 55-48 Ma (Fig. 3.8; Gehrels et al., 2009). Magmatism during this period is associated with the widespread emplacement of late Cretaceous to Eocene plutons in the Coast Plutonic Complex in a transpressional regime followed by widespread extension (Andronicos et al., 2003; Hollister and Andronicos, 2006; Gehrels et al., 2009) and late Cretaceous to Eocene plutons in the Alaska Range and Talkeetna Mountains in south-central Alaska (Moll-Stalcup, 1994; Cole et al., 2007).

The magmatic record of both the Alaska Peninsula and Coast Plutonic Complex lack evidence for abundant magmatic activity during the time after ca. 48 Ma (Fig. 3.8). In the Coast Plutonic Complex, the margin transitioned from a convergent to transform boundary as the Pacific plate transitioned to NW-directed plate motion (Gehrels et al., 2009). In the Alaska Peninsula, late Eocene to present arc magmatism is interpreted to have been active in the Aleutian arc (Jicha et al., 2006); however, the relatively more mafic composition of Aleutian volcanic rocks may impact zircon abundance along this part of the margin (Wilson et al., 1999), which would help explain the

relative lack of magmatic activity shown by the Alaska Peninsula forearc basin detrital record (Fig. 3.8). Our detrital data from south-central Alaska shows active magmatism during this time (Fig. 3.8). The major detrital zircon age population of ca. 45-35 Ma in south-central Alaska reflects a brief period of magmatism during a period of normal subduction along the margin (Plafker et al., 1994). Following this brief period, flat-slab subduction of the Yakutat microplate commenced, which halted magmatism above the flat-slab region (Finzel et al., 2011). Active arc magmatism in the Wrangell arc along the eastern edge of the flat-slab has been documented since ca. 30 Ma (Berkelhammer et al., 2019; Brueseke et al., 2019), and is documented in the modern river detrital record with peak magmatism between 10-5 Ma (Fig. 3.8). The lack of older Wrangell arc magmatism in the detrital record may also be reconciled by zircon abundance, where mafic volcanic rocks of the Wrangell arc would not yield abundant zircons (Berkelhammer et al., 2019). In general, our comparison of the magmatic record of south-central Alaska with the magmatic record of the western Alaska Peninsula and Coast Plutonic Complex in British Columbia shows a spatial and temporal relationship between the major periods of magmatism and magmatic lulls along the entire northern Cordillera margin that is readily documented in igneous, ancient sedimentary, and modern sedimentary geochronologic datasets.

3.6.4 Study Limitations and Future Work

Overall, our study has shown the utility of applying detrital zircon geochronology of modern river sediment to document the major periods of silicic magmatism during the tectonic growth of the southern Alaska convergent margin. While we believe that the record of these events are well accounted for in our dataset, we note that limitations in our study, such as sample density and small-n datasets, may ultimately bias our results and interpretations. Our detrital zircon study of modern rivers in south-central Alaska utilizes samples, both new and previously published, from the three main watersheds in the region: the Tanana, Matanuska-Susitna, and Copper River. However, given the number of similar studies that have been conducted in the Matanuska-Susitna region, the total number of samples (N) and therefore analyses (n) for the Matanuska-Susitna River watershed (N=23 and n=3330) are significantly more than those for the Tanana River watershed (N=11 and n=1018) and Copper River watershed (N=6 and n=538). This makes statistically significant comparisons between the age distributions of each watershed difficult, as they would be primarily skewed towards the Matanuska-Susitna watershed. The greater number of samples,

and therefore number of analyses, also favors first-order plutonic sources in the Matanuska-Susitna watershed to exhibit a much stronger signal in the composite detrital zircon age spectra. This is especially significant given that the major sources in the Matanuska-Susitna watershed are not entirely present in the other two watersheds, meaning that the significant age distributions in the other two watersheds may be diluted in the combined distribution. Our study also utilizes small-n datasets for new samples reported herein, which range between 53 and 100 constituent analyses (average n=91). Recent studies have demonstrated that small-n datasets (n=100) may not be sufficient in accurately characterizing source regions and comparing relative proportions of detrital zircon populations between samples (Gehrels, 2012; Pullen et al., 2014; Saylor and Sundell, 2016). Detrital zircon studies of Mesozoic-Cenozoic strata in the Cook Inlet basin in south-central Alaska, however, have argued that an expanded large-n (n=300) dataset does not show a significant difference in the presence of both major and minor age populations, given the small number of age groups present within the distribution (Finzel et al., 2016; Finzel, 2019). Given that our modern river samples have a variety of age groups within the overall age distribution, a large-n dataset may be warranted to better constrain our results and interpretations.

Even with these limitations, our study has shown the potential that detrital zircon studies of modern river sediment in Alaska have in understanding the magmatic history associated with the tectonic growth of the northwestern Cordilleran margin. Our study also provides a foundation for future directed research using similar but more extensive sampling and analytical techniques. Firstly, the acquisition of larger-n datasets and an increase in the number of samples within each watershed will allow for a more complete characterization of minor source areas in each watershed. Secondly, the use of new statistical approaches to more accurately model the relative contributions of different sources in detrital zircon datasets may prove invaluable in partitioning potential source regions in south-central Alaska watersheds (Saylor et al., 2013; Sundell and Saylor, 2017). Lastly, the coupling of U-Pb geochronology with Hf isotope geochemistry of detrital zircons on these modern river sediments could help reconstruct both the magmatic history as well as the crustal evolution of the southern Alaska convergent margin. Pepper et al. (2016) demonstrated the power of this coupled approach on reconstructing the magmatic and crustal evolution record along the Andean convergent margin in South America. A similar approach along the northwestern Cordilleran margin could be similarly insightful, given the rich and complex history of magmatism and crustal orogenesis that has occurred.

3.7 Conclusions

Detrital zircon ages from new and previously published samples from modern rivers draining the major watersheds in south-central Alaska are shown to be sensitive recorders of the magmatic and tectonic events that shaped the southern Alaska convergent margin. Detrital zircons from these modern rivers yield major Mesozoic-Cenozoic detrital zircon age populations between 200-140, 125-113, 105-85, 80-50, 45-35, and 10-5 Ma. These major age populations are consistent with the ages of plutonic and volcanic sources within each watershed. The major detrital zircon age populations are also indicative of the major phases of magmatic addition to the upper plate of the Alaska margin during the Mesozoic to Cenozoic. Peak magmatism within each of these major magmatic phases, based on our detrital zircon dataset, occur ca. 170, 150, 118, 95, 72, 58, 36, and 7 Ma. Our detrital zircon dataset from modern rivers demonstrate that magmatism in south-central Alaska was highly episodic, with periodicity between peak magmatism ranging between ~13 to 32 m.y with an average periodicity of ~23 m.y. This apparent cyclicity in south-central Alaska magmatism is similar to the cyclicity documented in other regions along the entire Cordilleran margin, suggesting that similar cyclical tectonic processes may have impacted the southern Alaska convergent margin. The magmatic record of south-central Alaska, when compared with the magmatic record of other regions along the northern Cordilleran margin such as the western Alaska Peninsula and the Coast Plutonic Complex in British Columbia, demonstrate a spatial and temporal relationship of major periods of magmatic additions as well as magmatic lulls along the entire northern Cordilleran margin. While the dataset presented herein demonstrates the utility of detrital zircon geochronology of modern river sediment for examining the entire record of magmatism associated with the tectonic development of a convergent margin, we note that limitations such as sampling density and small-n datasets may ultimately bias some of our results and interpretations. While our datasets demonstrate that modern rivers are faithful recorders of the magmatic evolution of a convergent margin, they also show the need for a more comprehensive regional dataset to capture all of the magmatic events along the margin. This has implications for detrital zircon studies of ancient sedimentary basins, in that a lack of regional sampling within a basin may not capture the record of magmatism occurring during the time of basin development. We also recommend that future studies of modern rivers in south-central Alaska be undertaken using more extensive sampling strategies, as well as incorporating new analytical techniques such as coupled U-Pb and Hf isotope detrital zircon geochronology, which could prove insightful in a more detailed

understanding the magmatic and crustal evolution history associated with the past ~200 m.y of tectonic growth along the southern Alaska convergent margin.

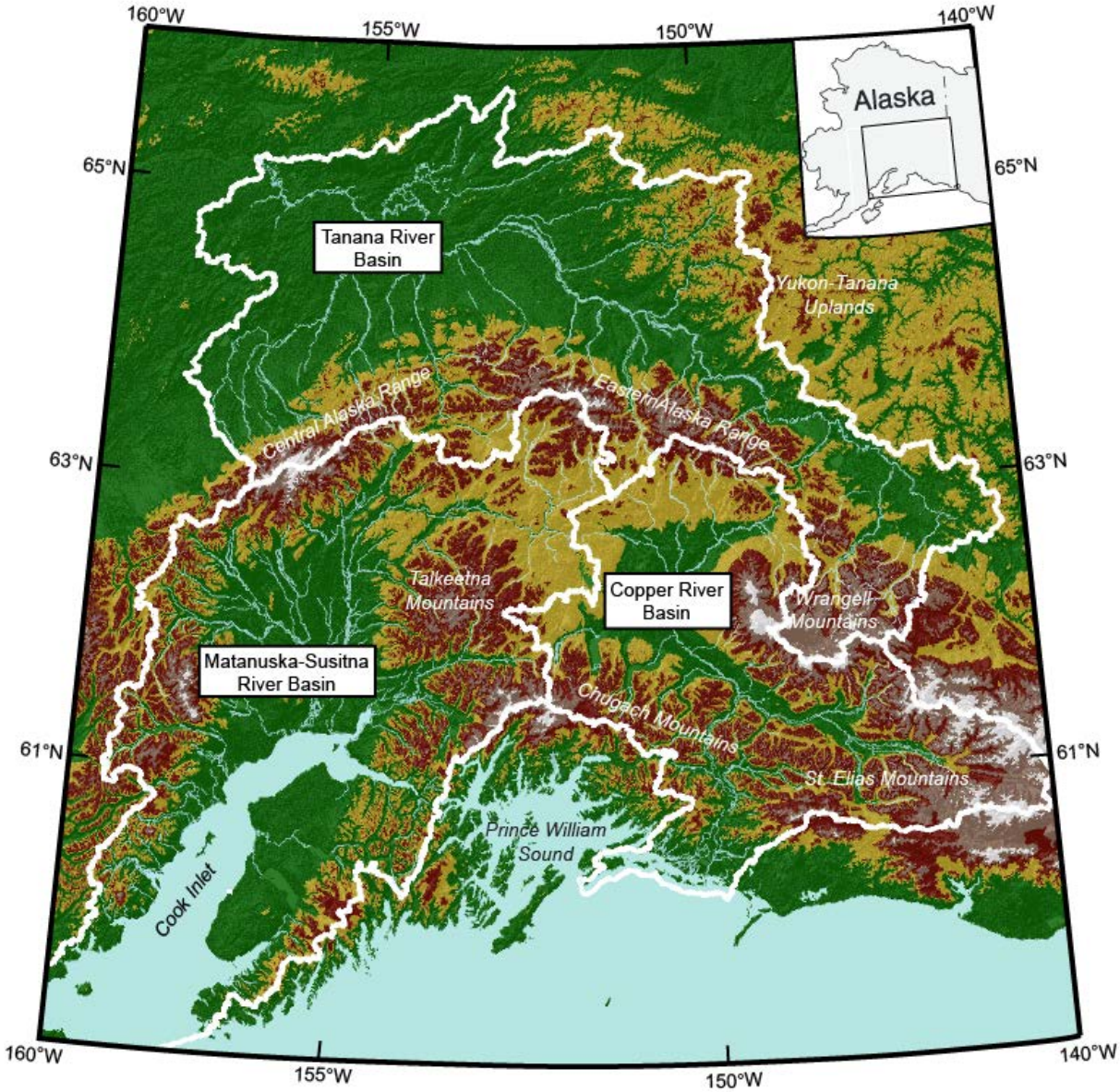
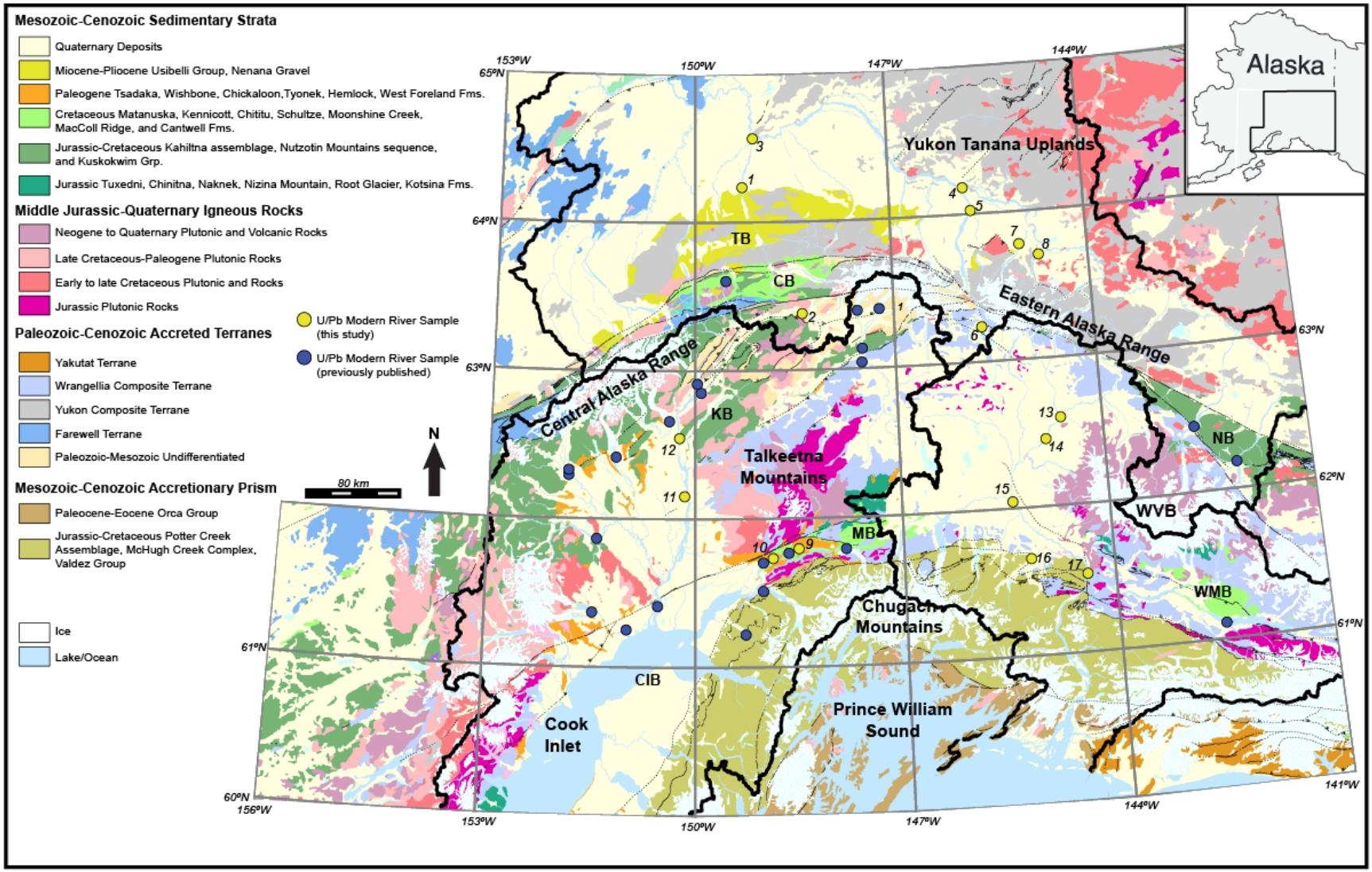


Figure 3.1. Topographic map of south-central Alaska showing the locations of the Tanana, Matanuska-Susitna, and Copper River watersheds as well as the main physiographical features in the region. The white outlines indicate the watershed boundaries.

Figure 3.2. Generalized geologic map of south-central Alaska shows the distribution of generalized stratigraphic units, major accreted terranes, and igneous and volcanic belts. The watershed boundaries for the Tanana River, Matanuska-Susitna River, and Copper River watersheds are shown in black. Locations of new U-Pb detrital zircon samples reported in this study are denoted by the yellow dots. Locations of previously published U-Pb detrital zircon samples are shown in blue. See text for references. CB – Cantwell basin, CIB – Cook Inlet basin, KB – Kahiltna basin, NB – Nutzotin basin, MB – Matanuska basin, TB – Tanana basin, WMB – Wrangell Mountains basin, WVB – Wrangell Volcanic belt. Geology adapted from Wilson et al. (2015).


Mesozoic-Cenozoic Sedimentary Strata
Quaternary Deposits
Miocene-Pliocene Usibelli Group, Nenana Gravel
Paleogene Tsadaka, Wishbone, Chickaloon,Tyonek, Hemlock, West Foreland Fms.
Cretaceous Matanuska, Kennicott, Chititu, Schultze, Moonshine Creek, MacColl Ridge, and Cantwell Fms.
Jurassic-Cretaceous Kahiltna assemblage, Nutzotin Mountains sequence, and Kuskokwim Grp.
Jurassic Tuxedni, Chinitna, Naknek, Nizina Mountain, Root Glacier, Kotsina Fms.
Middle Jurassic-Quaternary Igneous Rocks
Neogene to Quaternary Plutonic and Volcanic Rocks
Late Cretaceous-Paleogene Plutonic Rocks
Early to late Cretaceous Plutonic and Rocks
Jurassic Plutonic Rocks
Paleozoic-Cenozoic Accreted Terranes
Yakutat Terrane
Wrangellia Composite Terrane
Yukon Composite Terrane
Farewell Terrane
Paleozoic-Mesozoic Undifferentiated
Mesozoic-Cenozoic Accretionary Prism
Paleocene-Eocene Orca Group
Jurassic-Cretaceous Potter Creek Assemblage, McHugh Creek Complex, Valdez Group
Ice
Lake/Ocean
U/Pb Modern River Sample (this study)
U/Pb Modern River Sample (previously published)
80 km
N
Alaska
Yukon Tanana Uplands
Eastern Alaska Range
Central Alaska Range
Talkeetna Mountains
Chugach Mountains
Prince William Sound
Cook Inlet
TB
CB
KB
MB
CIB
NB
WVB
WMB
153°W
150°W
147°W
144°W
141°W
156°W
65°N
64°N
63°N
62°N
61°N
60°N
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17

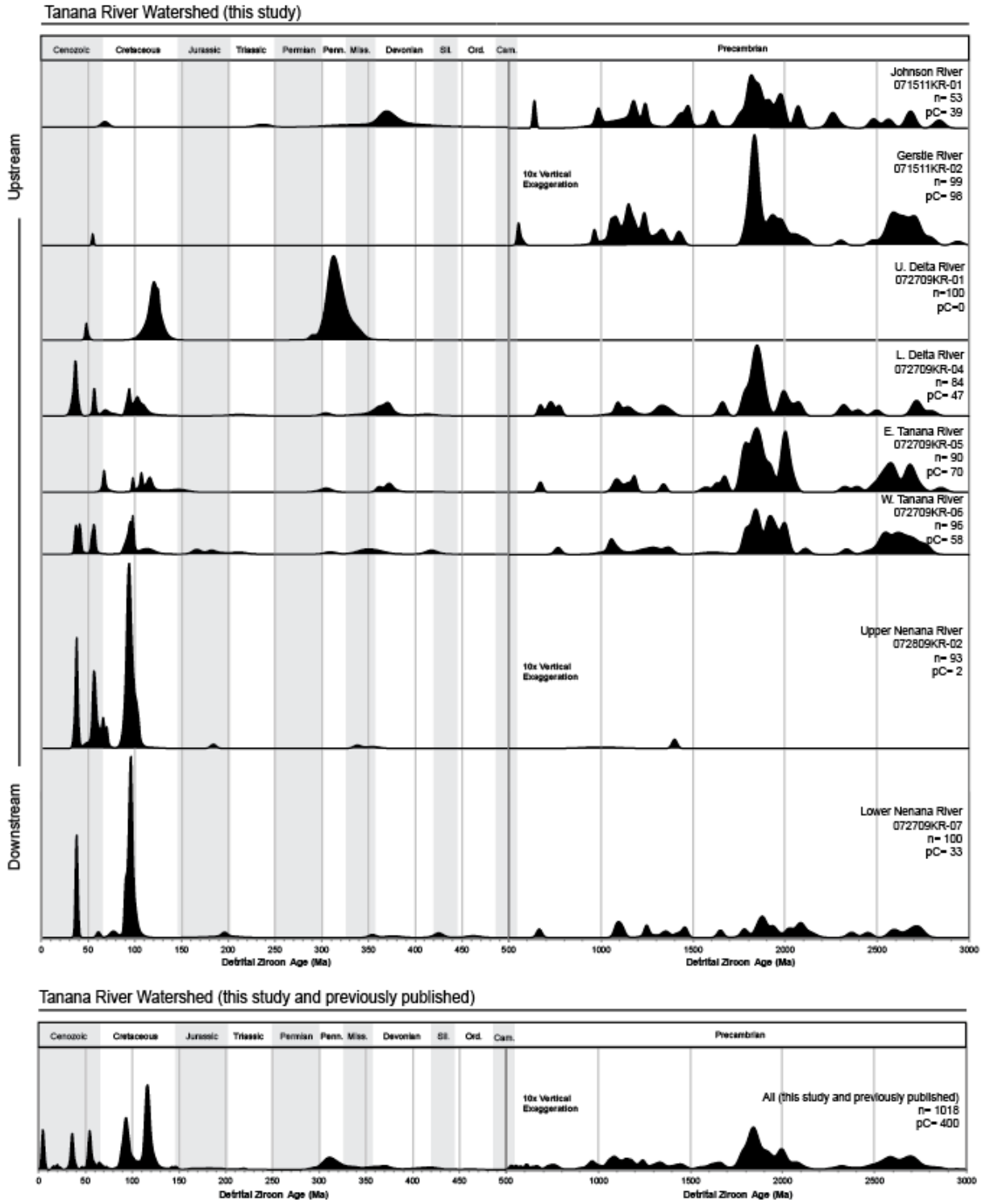


Figure 3.3. Normalized distribution plot of modern river detrital zircon samples from the Matanuska-Susitna River watershed. The top plot includes the new detrital zircon ages presented in this study, while the bottom plot is a composite of all detrital zircon ages from this study as well as from samples presented by Trop et al. (2019a and 2019b).

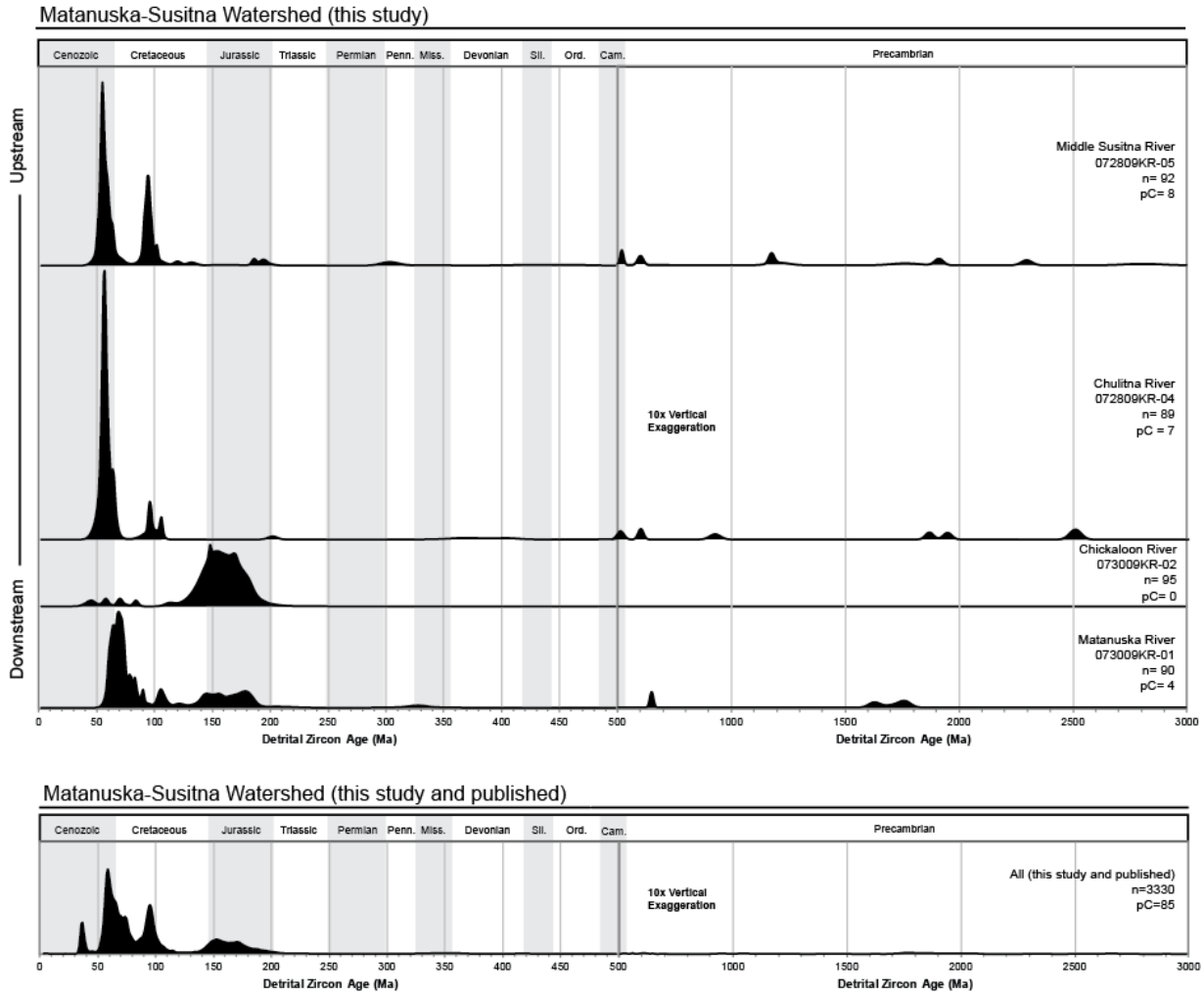


Figure 3.4. Normalized distribution plot of modern river detrital zircon samples from the Matanuska-Susitna River watershed. The top plot includes the new detrital zircon ages presented in this study, while the bottom plot is a composite of all detrital zircon ages from this study combined with previously published ages from Finzel et al. (2016), Lease et al. (2016), Finzel and Enkelmann (2017), and Trop et al. (2019). Note that the detrital zircon age spectra >500 Ma is 10x vertically exaggerated.

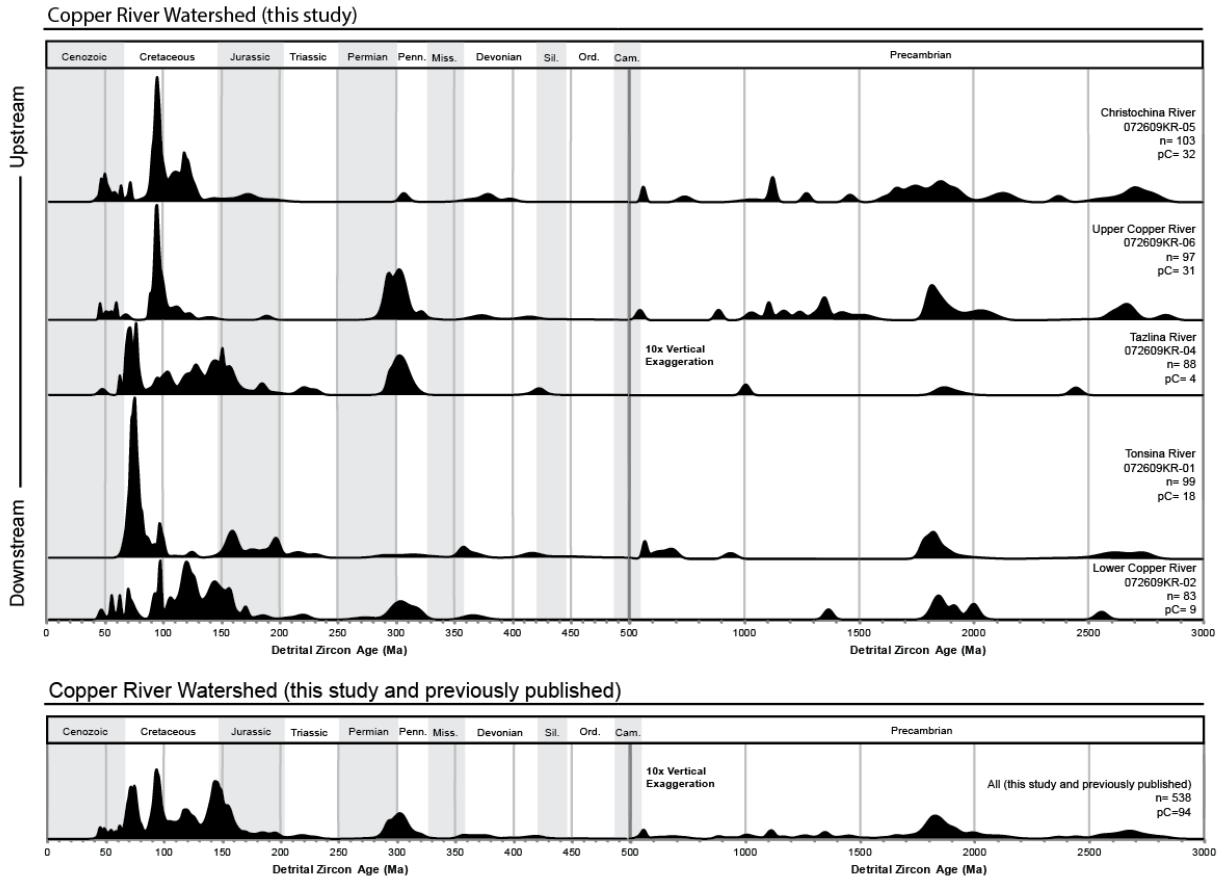
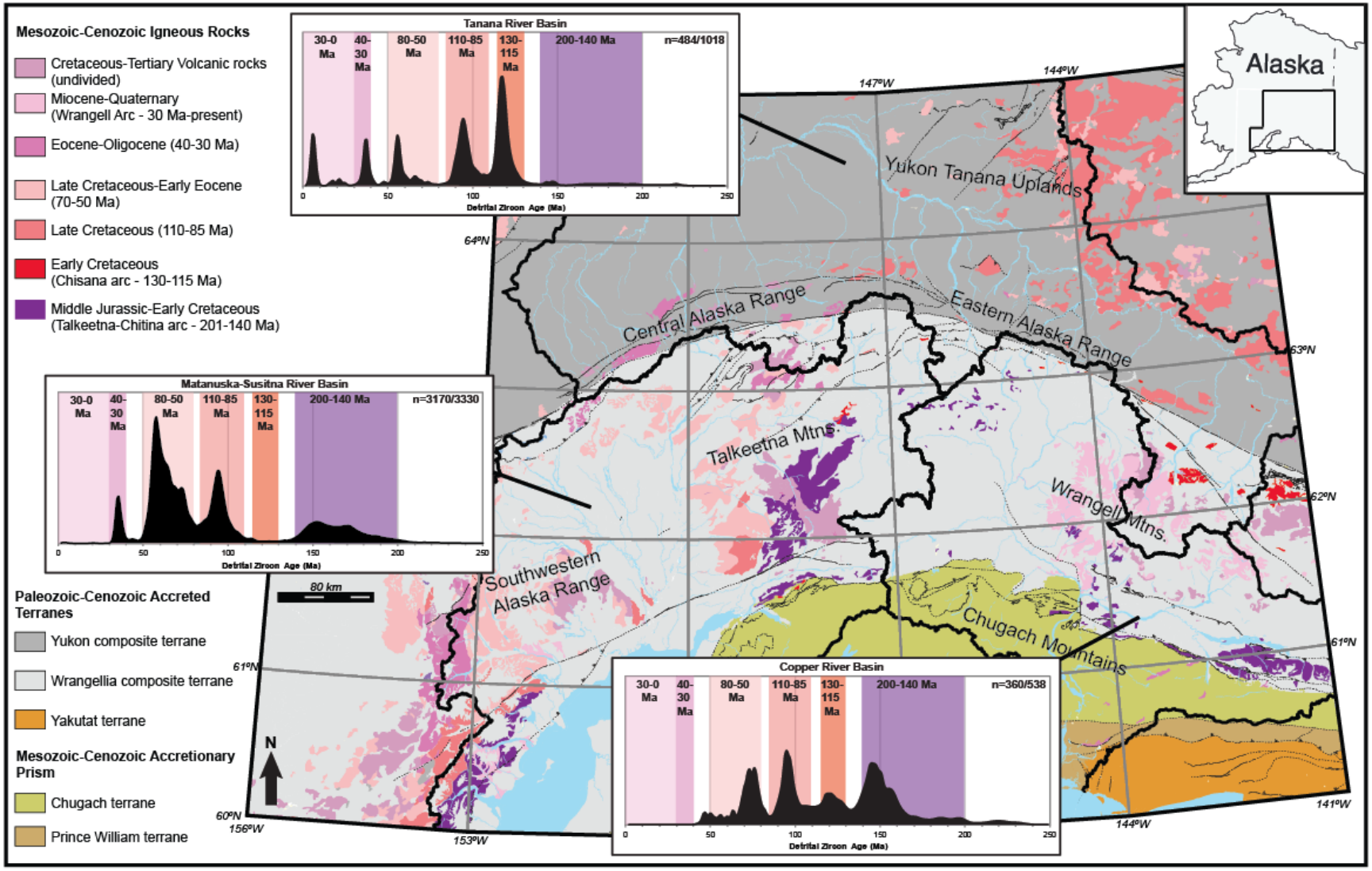


Figure 3.5. Normalized distribution plot of modern river detrital zircon samples from the Copper River watershed. The top plot includes the new detrital zircon ages presented in this study, while the bottom plot is a composite of all detrital zircon ages from this study as well as one sample from Day et al. (2016). Note that the detrital zircon age spectra >500 Ma is 10x vertically exaggerated.

Figure 3.6. Generalized geologic map of south-central Alaska showing the distribution of major <250 Ma first-order plutonic and volcanic sources in each of the watersheds. Composite detrital zircon age distributions for each of the watersheds are shown in the inset plots. Geology adapted from Wilson et al. (2015).


Mesozoic-Cenozoic Igneous Rocks
Cretaceous-Tertiary Volcanic rocks (undivided)
Miocene-Quaternary (Wrangell Arc - 30 Ma-present)
Eocene-Oligocene (40-30 Ma)
Late Cretaceous-Early Eocene (70-50 Ma)
Late Cretaceous (110-85 Ma)
Early Cretaceous (Chisana arc - 130-115 Ma)
Middle Jurassic-Early Cretaceous (Talkeetna-Chitina arc - 201-140 Ma)
Paleozoic-Cenozoic Accreted Terranes
Yukon composite terrane
Wrangellia composite terrane
Yakutat terrane
Mesozoic-Cenozoic Accretionary Prism
Chugach terrane
Prince William terrane
Tanana River Basin
30-0 Ma
40-30 Ma
80-50 Ma
110-85 Ma
130-115 Ma
200-140 Ma
n=484/1018
Detrital Zircon Age (Ma)
Matanuska-Susitna River Basin
n=3170/3330
Copper River Basin
n=360/538
Alaska
Yukon Tanana Uplands
Central Alaska Range
Eastern Alaska Range
Talkeetna Mtns.
Wrangell Mtns.
Southwestern Alaska Range
Chugach Mountains
80 km
N
64°N
63°N
62°N
61°N
60°N
147°W
144°W
141°W
156°W
153°W

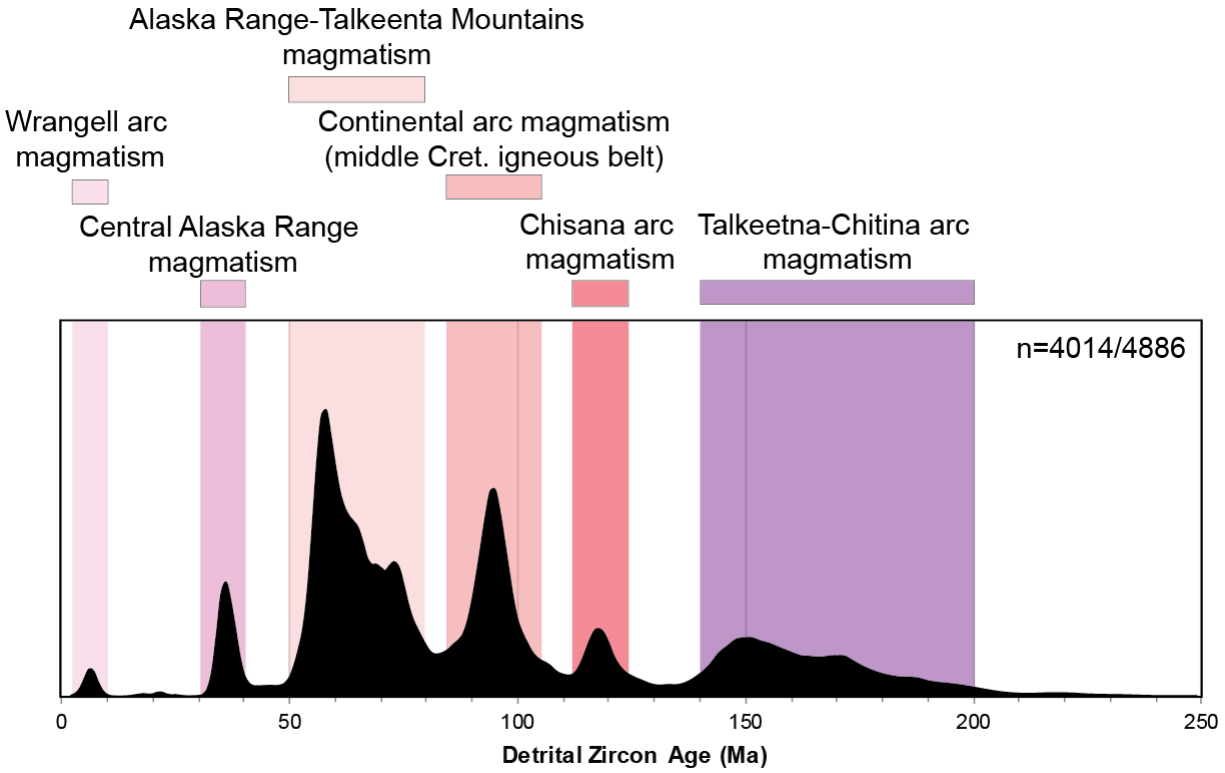


Figure 3.7. Detrital zircon age distribution of modern river sediments in south-central Alaska for ages <250 Ma showing the relationship between major detrital zircon age populations and major periods of magmatism in south-central Alaska.

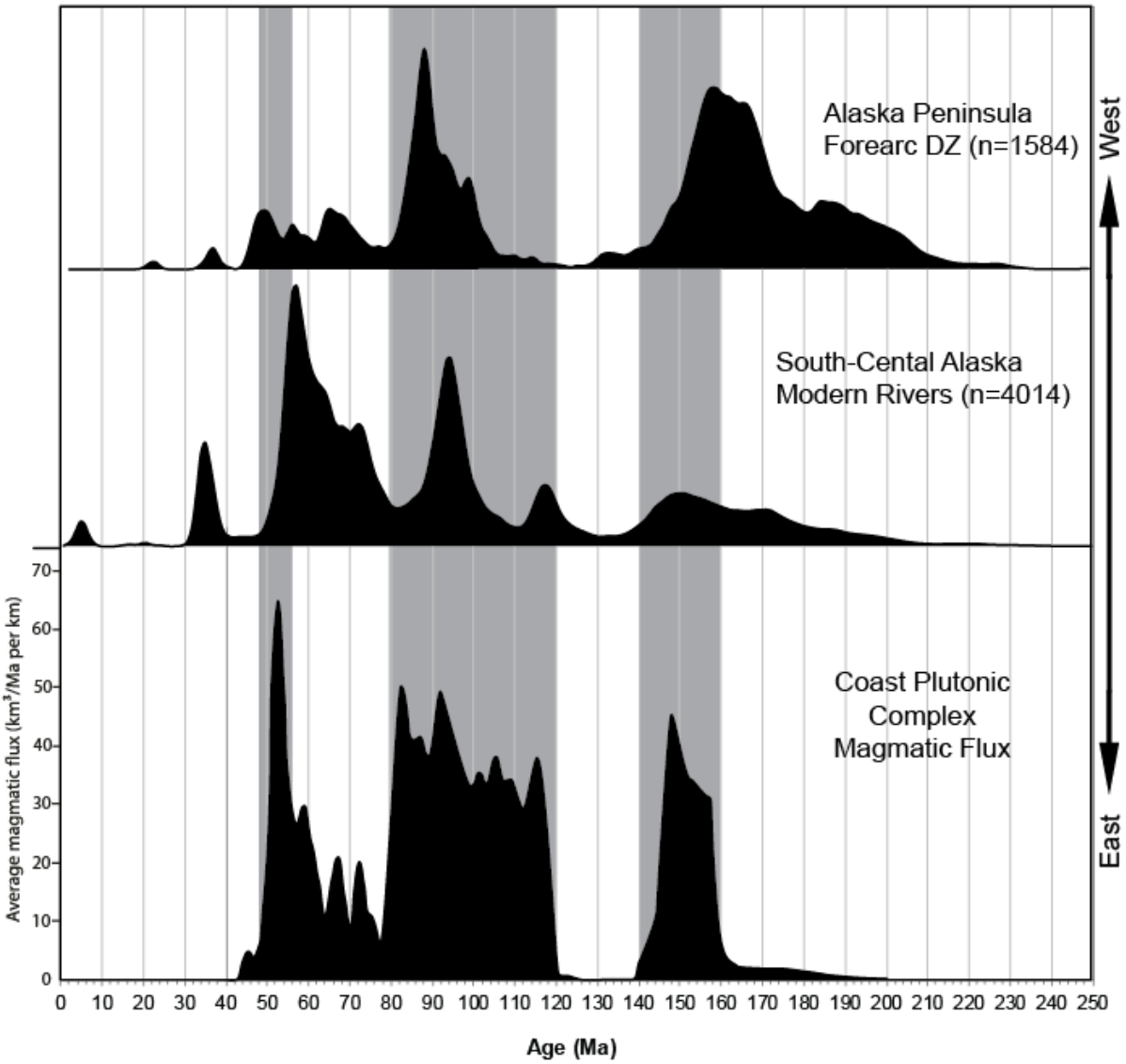


Figure 3.8. Normalized distribution plot of detrital zircon ages from Jurassic to Miocene strata from the western Alaska Peninsula forearc basin (Finzel and Ridgway, 2017), modern river sediments from south-central Alaska (this study), and the magmatic flux curve from the Coast Mountains batholith in British Columbia (Gehrels et al., 2009).

Table 3.1. Modern river detrital zircon sample locations and analytical information

SAMPLE	RIVER	FIGURE 3.2*	LATITUDE (°N)**	LONGITUDE (°W)**	NUMBER OF U-PB ANALYSES
072709KR-07	Lower Nenana R.	1	64.2169	149.2810	100
072809KR-02	Upper Nenana R.	2	63.3787	148.4022	93
072709KR-06	Western Tanana R.	3	64.5659	149.0731	96
072709KR-05	Eastern Tanana R.	4	64.1560	145.8485	90
072709KR-04	Lower Delta R.	5	64.0444	145.7413	84
072709KR-01	Upper Delta R.	6	63.2677	145.6830	100
071511KR-01	Johnson R.	7	63.8034	144.9585	53
071511KR-02	Gerstle R.	8	63.7021	144.7470	99
073009KR-02	Chickaloon R.	9	61.7858	148.4547	95
073009KR-01	Matanuska R.	10	61.7492	148.6366	90
072809KR-04	Chulitna R.	11	62.5663	150.6669	89
072809KR-05	Susitna R.	12	62.1758	150.1784	92
072609KR-02	Lower Copper R.	13	61.5277	144.4062	83
072609KR-01	Tonsina R.	14	61.6499	145.1878	99
072609KR-04	Tazlina R.	15	62.0559	145.4281	88
072609KR-06	Upper Copper R.	16	62.4686	144.8406	97
072609KR-05	Christochina R.	17	62.6003	144.6428	103

*Sample location on Figure 3.2
**Latitude and Longitude are reported in decimal degrees

REFERENCES

Aleinikoff, J.N., Dusel-Bacon, C., and Foster, H.L., 1981, Geochronologic studies in the Yukon Tanana Upland, east-central Alaska, *in* Albert, N.R.D., and Hudson, T., eds., The United States Geological Survey in Alaska: Accomplishments during 1979: U.S. Geological Survey Circular 823-B, p. B34–B37.

Allen, W.K., Ridgway, K.D., Benowitz, J.A., Fasulo, C.R., Keough, B.M., Warfel, T.S., Fitzgerald, P.G., Gillis, R.J., and Trop, J.M., 2018, Cenozoic basin development and strike-slip displacement along the Denali Fault system, eastern Alaska Range, Alaska: a provenance approach: Geological Society of America, Abstracts with Programs, v. 50, No. 6.

Amato, J.M., Pavlis, T.L., Clift, P.D., Kochelek, E.J., Hecker, J.P., Worthman, C.M., and Day, E.M., 2013, Architecture of the Chugach accretionary complex as revealed by detrital zircon ages and lithologic variations: Evidence for Mesozoic subduction erosion in south-central Alaska: Geological Society of America Bulletin, v. 125, p. 1891–1911.

Amidon, W.H., Burbank, D.W., and Gehrels, G.E., 2005, Construction of detrital mineral populations: Insights from mixing of U-Pb zircon ages in Himalayan rivers: Basin Research, v. 17, p. 463–485.

Andronicos, C.L., Chardon, D.H., Hollister, L.S., Gehrels, G.E., and Woodsworth, G.J., 2003, Strain partitioning in an obliquely convergent orogen, plutonism, and synorogenic collapse: Coast Mountains batholith, British Columbia, Canada: Tectonics, v. 22, no. 2, 24 p.

Arkle, J.C., Armstrong, P.A., Haeussler, P.J., Prior, M.G., Hartman, S.K., Sendziak, L., and Brush, J.A., 2013, Focused exhumation in the syntaxis of the western Chugach Mountains and Prince William Sound, Alaska: Geological Society of America Bulletin, v. 125, p. 776–793.

Armstrong, R.L., 1988, Mesozoic and early Cenozoic magmatic evolution of the Canadian Cordillera, *in* Clark, S.P., Burchfiel, B.C., and Suppe, J., eds., Processes in Continental Lithospheric Deformation: Geological Society of America Special Paper 218, p. 55–91.

Bahlburg, H., Vervoort, J.D., DuFrane, S.A., Carlotto, V., Reimann, C., and Cardenas, J., 2011, The U-Pb and Hf isotope evidence of detrital zircons of the Ordovician Ollantaytambo Formation, southern Peru, and the Ordovician provenance and paleogeography of southern Peru and northern Bolivia: Journal of South American Earth Sciences, v. 32, p. 196–209.

Barton, M.D., 1996, Granitic magmatism and metallogeny of southwestern North America: Transactions of the Royal Society of Edinburgh–Earth Sciences, v. 87, p. 261–280.

Beard, J.S., and Barker, F., 1989, Petrology and tectonic significance of gabbros, tonalites, shoshonites, and anorthosites in a late Paleozoic arc root complex in the Wrangellia Terrane, southern Alaska: The Journal of Geology, v. 6, p. 667–683.

Benowitz, J.A., Davis, K., and Roeske, S., 2019, A river runs through it both ways across time: $^{40}Ar/^{39}Ar$ detrital and bedrock muscovite geochronology constraints on the Neogene paleodrainage history of the Nenana River system, Alaska Range: Geosphere, v. 15, p. 682–701.

Beranek, L.P., van Staal, C.R., McClelland, W.C., Joyce, N., and Israel, S., 2014, Late Paleozoic assembly of the Alexander-Wrangellia-Peninsular composite terrane, Canadian and Alaskan Cordillera: Geological Society of America Bulletin, v. 126, p. 1531–1550.

Beranek, L.P., McClelland, W.C., van Staal, C.R., Israel, S., and Gordee, S.M., 2017, Late Jurassic flare-up of the Coast Mountains arc system, NW Canada, and dynamic linkages across the northern Cordilleran orogeny: Tectonics, v. 36, p. 877–901.

Berkelhammer, S.E., Brueseke, M.E., Benowitz, J.A., Trop, J.M., Davis, K., Layer, P.W., and Weber, M., 2019, Geochemical and geochronological records of tectonic changes along a flat-slab arc-transform junction: Circa 30 Ma to ca. 19 Ma Sonya Creek volcanic field, Wrangell Arc, Alaska: Geosphere, v. 15, p. 1–31.

Bleick, H.A., Till, A.B., Bradley, D.C., O'Sullivan, P.B., Wooden, J.L., Bradley, D.B., Taylor, T.A., Friedman, S.B., and Hults, C.P., 2012, Early Tertiary exhumation of the flank of a forearc basin, southwest Talkeetna Mountains, Alaska: U.S. Geological Survey Open-File Report 2012–1232.

Bliss, B., Trop, J.M., and Benowitz, J.A., 2017, Paleozoic magmatism in the Wrangellia terrane constrained by U-Pb geochronology of modern river detrital zircons, Wrangell Mountains, Alaskan Cordillera: Geological Society of America Abstracts with Programs, v. 49, no. 6.

Bouvier, A., Vervoort, J.D., and Patchett, P.J., 2008, The Lu-Hf and Sm-Nd isotopic composition of CHUR: Constraints from unequilibrated chondrites and implications for the bulk composition of terrestrial planets: Earth and Planetary Science Letters, v. 273, p. 48–57.

Box, S.E., Karl, S.M., Jones, J.V., III, Bradley, D.C., Haeussler, P.J., and O'Sullivan, P.B., 2019, Detrital zircon geochronology along a structural transect across the Kahiltna assemblage

in the western Alaska Range: Implications for emplacement of the Alexander-Wrangellia-Peninsular terrane against North America: Geosphere, v. 15, p. 1774-1808.

Bradley, D.C., O'Sullivan, P., and Bradley, L.M., 2015, Detrital zircons from modern sands in New England and the timing of Neoproterozoic to Mesozoic magmatism: American Journal of Science, v. 315, p. 460–485.

Bradley, D., Kusky, T., Haeussler, P., Goldfarb, R., Miller, M., Dumoulin, J., Nelson, S., and Karl, S., 2003, Geologic signature of early Tertiary ridge subduction in Alaska, *in* Sisson, V.B., Roeske, S., and Pavlis, T.L., eds., Geology of a Transpressional Orogen Developed during Ridge-Trench Interaction along the North Pacific Margin: Geological Society of America Special Paper 375, p. 19–49.

Burchfiel, B.C., and Davis, G.A., 1972, Structural framework and evolution of the southern part of the Cordilleran orogeny, Western United States: American Journal of Science, v. 272, p. 97–118.

Butler, R.F., Gehrels, G.E., Hart, W., Davidson, C., and Crawford, M.L., 2006, Paleomagnetism of Late Jurassic to mid-Cretaceous plutons near Prince Rupert, British Columbia, *in* Haggart, J.W., Enkin, R.J., and Monger, J.W.H., eds., Paleogeography of the North American Cordillera: Evidence For and Against Large- Scale Displacements: Geological Association of Canada Special Paper 46, p. 171–200.

Capaldi, T.N., Horton, B.K, McKenzie, N.R., Stockli, D.F., and Odlum, M.L., 2017, Sediment provenance in contractional orogens: The detrital zircon record from modern rivers in the Andean fold-thrust belt and foreland basin system of western Argentina: Earth and Planetary Sciences, v. 479, p. 83-97.

Carrapa, B., Faiz bin Hassim, M., Kapp, P., DeCelles, P., and Gehrels, G., 2017, Tectonic and erosional history of southern Tibet recorded by detrital chronological signatures along the Yarlung River drainage: Geological Society of America Bulletin, v. 129, p. 570– 581.

Carrion, L., Birsic, E., Cole, R.B., and Chung, S.L., 2012, Bimodal hypabyssal intrusions following granitic pluton emplacement in a collisional terrane suture zone, northern Talkeetna Mountains, South-Central Alaska: Geological Society of America Abstracts with Programs, v. 44, no. 7.

Cawood, P.A., Nemchin, A.A., Freeman, M., and Sircombe, K., 2003, Linking source and sedimentary basin: Detrital zircon record of sediment flux along a modern river system and

implications for provenance studies: Earth and Planetary Science Letters, v. 210, p. 259–268.

Cecil, M.R., Gehrels, G.E., Ducea, M.N., and Patchett, P.J., 2011, U-Pb-Hf characterization of the central Coast Mountains batholith: Implications for petrogenesis and crustal architecture: Lithosphere, v. 3, p. 247–260.

Cecil, M.R., Rusmore, M.E., Gehrels, G.E., Woodsworth, G.J., Stowell, H.H., Yokelson, I.N., Chisom, C., Trautman, M., Homan, E., 2018, Along-strike variation in the magmatic tempo of the Coast Mountains batholith, British Columbia, and implications for processes controlling episodicity in arcs: Geochemistry, Geophysics, Geosystems, v. 19, p. 4274–4289.

Chardon, D., 2003, Strain partitioning and batholith emplacement at the root of a transpressive magmatic arc: Journal of Structural Geology, v. 25, p. 91–107.

Chardon, D., Andronicos, C.L., and Hollister, L.S., 1999, Large-scale transpressive shear zone patterns and displacements within magmatic arcs: The Coast Plutonic Complex, British Columbia: Tectonics, v. 18, p. 278–292.

Clift, P.D., Pavlis, T.L., DeBari, S.M., Draut, A.E., Rioux, M.E., and Kelemen, P.B., 2005, Subduction erosion of the Jurassic Talkeetna-Bonanza arc and the Mesozoic accretionary tectonics of western North America: Geology, v. 33, p. 881–884.

Cole, R.B., and Chung, S.L., 2013, Late Cretaceous to Eocene progression of arc and collisional magmatism in south-central Alaska: Geological Society of America Abstracts with Programs, v. 45, no. 7.

Cole, R.B., Nelson, S.W., Layer, P.W., and Oswald, P.J., 2006, Eocene volcanism above a depleted mantle slab window in southern Alaska: Geological Society of America Bulletin, v. 118, p. 140–158.

Cole, R.B., Layer, P.W., Hooks, B., Cyr, A., and Turner, J., 2007, Magmatism and deformation in a terrane suture zone south of the Denali Fault, northern Talkeetna Mountains, Alaska, *in* Ridgway, K.D., Trop, J.M., Glen, J.M.G., O'Neill, J.M., eds., Tectonic Growth of a Collisional Continental Margin: Crustal Evolution of Southern Alaska: Geological Society of America Special Paper 431, p. 477–506.

Colpron, M., Nelson, J.L., and Murphy, D.C., 2007, Northern Cordilleran terranes and their interactions through time: GSA Today, v. 17, p. 4–10.

Coney, P. J., Jones, D. L., and Monger, J. W., 1980, Cordilleran suspect terranes: Nature, v. 288, p. 329.

Cowan, D.S., Brandon, M.T., and Garver, J.I., 1997, Geologic test of hypotheses for large coastwise displacement—A critique illustrated by the Baja British Columbia hypothesis: American Journal of Science, v. 297, p. 117–173.

Day, E.M., Pavlis, T.L., and Amato, J.M., 2016, Detrital zircon ages indicate an Early Cretaceous episode of blueschist-facies metamorphism in southern Alaska: Implications for the Mesozoic paleogeography of the northern Cordillera: Lithosphere, v. 8, p. 451–462.

Day, W.C., O'Neill, J.M., Dusel-Bacon, C., Aleinikoff, J.N., and Siron, C.R., 2014, Geologic map of the Kechumstuk fault zone in the Mount Veta area, Fortymile mining district, east-central Alaska (No. 3291). US Geological Survey.

DeCelles, P.G., and Graham, S.A., 2015, Cyclical processes in the North American Cordilleran orogenic system: Geology, v. 43, p. 499–502.

DeCelles, P.G., Ducea, M.N., Kapp, P., and Zandt, G., 2009, Cyclicity in Cordilleran orogenic systems: Nature Geoscience, v. 2, p. 251–257.

DeCelles, P.G., Zandt, G., Beck, S.L., Currie, C.A., Ducea, M.N., Kapp, P., Gehrels, G.E., Carrapa, B., Quade, J., and Schoenbohm, L.M., 2015, Cyclical orogenic processes in the central Cenozoic Andes, *in* DeCelles, P.G., Ducea, M.N., Carrapa, B., and Kapp, P.A. eds., Geodynamics of a Cordilleran Orogenic System: The Central Andes of Argentina and Northern Chile: Geological Society of America Memoir 212, p. 459–490.

Dickinson, W.R., 1974, Plate tectonics and sedimentation in Dickinson, W.R., ed., Tectonics and Sedimentation: Society of Economic Paleontologists and Mineralogists, v. 22, p. 1–27.

Dickinson, W.R., 2008, Impact of differential zircon fertility of granitoid basement rocks in North America on age populations of detrital zircons and implications for granite petrogenesis: Earth and Planetary Science Letters, v. 275, p. 80–92.

Dickinson, W. R., and Gehrels, G. E, 2009, Use of U-Pb ages of detrital zircons to infer maximum depositional ages of strata: A test against a Colorado Plateau Mesozoic database, Earth Planet. Sci. Lett., v. 288, p. 115–125.

Ducea, M., 2001, The California arc: Thick granitic batholiths, eclogitic residues, lithospheric-scale thrusting, and magmatic flare-ups: GSA Today, v. 11, p. 4–10.

Ducea, M.N., and Barton, M.D., 2007, Igniting flare-up events in Cordilleran arcs: Geology, v. 35, p. 1047–1050.

Dusel-Bacon, C., Aleinikoff, J.N., Day, W.C., and Mortensen, J.K., 2015, Mesozoic magmatism and timing of epigenetic Pb-Zn-Ag mineralization in the western Fortymile mining district, east-central Alaska: U-Pb zircon geochronology, whole-rock geochemistry, and Pb isotopes: Geosphere, v. 11, p. 786–822.

Dusel-Bacon, C., Hopkins, M.J., Mortensen, J.K., Dashevsky, S.S., Bressler, J.R., and Day, W.C., 2006, Paleozoic tectonic and metallogenic evolution of the pericratonic rocks of east-central Alaska and adjacent Yukon Territory, *in* Colpron, M., and Nelson, J.L., eds., Paleozoic Evolution and Metallogeny of Pericratonic Terranes at the Ancient Pacific Margin of North America, Canadian and Alaskan Cordillera: Geological Association of Canada Special Paper 45, p. 25–74.

Dusel-Bacon, C., and Williams, I.S., 2009, Zircon U-Pb evidence for prolonged mid-Paleozoic plutonism and the ages of crustal sources in east-central Alaska: Canadian Journal of Earth Sciences, v. 46, p. 21–39.

Dusel-Bacon, C., Wooden, J.L., and Hopkins, M.J., 2004, U-Pb zircon and geochemical evidence for bimodal mid-Paleozoic magmatism and syngenetic base-metal mineralization in the Yukon-Tanana terrane, Alaska: Geological Society of America Bulletin, v. 116, p. 989–1015.

Dusel-Bacon, C., Holm-Denoma, C.S., Jones, J.V., III, Aleinikoff, J.N., and Mortensen, J.K., 2017, Detrital zircon geochronology of quartzose metasedimentary rocks from parautochthonous North America, east-central Alaska: Lithosphere, v. 9, p. 927–952.

Eberhart-Phillips, D., Christensen, D.H., Brocher, T.M., Hansen, R., Ruppert, N.A., Haeussler, P.J., and Abers, G.A., 2006, Imaging the transition from Aleutian subduction to Yakutat collision in central Alaska, with local earthquakes and active source data: Journal of Geophysical Research. Solid Earth, v. 111.

Eisbacher, G.H., 1976, Sedimentology of the Dezadeash flysch and its implications for strike-slip faulting along the Denali fault, Yukon Territory and Alaska: Canadian Journal of Earth Sciences, v. 13, p. 1495–1513.

Fasulo, C.R., and Ridgway, K.D., 2019, Stratigraphic framework, detrital zircon provenance, and regional tectonic configuration of Mesozoic sedimentary basins of east-central Alaska: Geological Society of America, Abstracts with Programs, vol. 51, No. 5.

Ferris, A., Abers, G.A., Christensen, D.H., and Veenstra, E., 2003, High resolution image of the subducted Pacific (?) plate beneath central Alaska, 50–150 km depth: Earth and Planetary Science Letters, v. 214, p. 575–588.

Finzel, E.S., 2019, Partitioning Pervasive Detrital Geochronologic Age Distributions in the Southern Alaskan Forearc: Front. Earth Sci., v. 7, no. 217.

Finzel, E.S., and Enkelmann, E., 2017, Miocene-Recent sediment flux in the south-central Alaskan fore-arc basin governed by flat-slab subduction: Geochem. Geophys. Geosyst., v. 18, p. 1739–1760.

Finzel, E.S., and Ridgway, K.D., 2017, Links between sedimentary basin development and Pacific Basin plate kinematics recorded in Jurassic to Miocene strata on the western Alaska Peninsula: Lithosphere, v. 9, p. 58-77.

Finzel, E.S., Trop, J.M., Ridgway, K.D., and Enkelmann, E., 2011, Upper-plate proxies for flat-slab subduction processes in southern Alaska: Earth and Planetary Science Letters, v. 303, p. 348–360.

Finzel, E.S., Ridgway, K.D., and Trop, J.M., 2015, Provenance signature of changing plate boundary conditions along a convergent margin: Detrital record of spreading-ridge and flat-slab subduction processes, Cenozoic forearc basins, Alaska: Geosphere, v. 11, p. 823–849.

Finzel, E.S., Enkelmann, E., Falkowski, S., and Hedeen, T., 2016, Long-term fore-arc basin evolution in response to changing subduction styles in southern Alaska: Tectonics, v. 35, p. 1735–1759.

Fiorillo, A.R., Adams, T.L. and Kobayashi, Y., 2012, New sedimentological, palaeobotanical, and dinosaur ichnological data on the palaeoecology of an unnamed Late Cretaceous rock unit in Wrangell-St. Elias National Park and Preserve, Alaska, USA: Cretaceous Research, v. 37, p. 291–299.

Foster, H.L., Keith, T.E.C., and Menzie, W.D., 1994, Geology of the Yukon-Tanana area of east-central Alaska, *in* Plafker, G., and Berg, H.C., eds., The geology of Alaska: Boulder, Colorado, Geological Society of America, Geology of North America, v. G-1, p. 205–240.

Gabrielse, H., Murphy, D.C., and Mortensen, J.K., 2006, Cretaceous and Cenozoic orogen-parallel displacements, magmatism and paleogeography in the northern Canadian Cordillera: Geological Association of Canada Special Paper 46, p. 255–276.

Gardner, M.C., MacKevett, E.M., and McClelland, W.D., 1986, The Chitina fault system of southern Alaska—An Early Cretaceous collisional suture zone: Geological Society of America Abstracts with Programs, v. 18, p. 108.

Gardner, M.C., Bergman, S.C., Cushing, G.W., MacKevett, E.M., Jr., Plafker, G., Campbell, R.B., Dodds, C.J., McClelland, W.C., and Mueller, P.A., 1988, Pennsylvanian pluton stitching of Wrangellia and the Alexander terrane, Wrangell Mountains, Alaska: Geology, v. 16, p. 967–971.

Garver, J.I., and Davidson, C., 2015, Southwestern Laurentian zircons in the upper Cretaceous flysch of the Chugach-Prince William terrane in Alaska: American Journal of Science, v. 315, p. 537–556.

Gehrels, G., 2012, Detrital zircon U-Pb geochronology: Current methods and new opportunities, *in* Busby, C., and Azor, A., eds., Tectonics of Sedimentary Basins: Recent Advances: Wiley-Blackwell Publishing, p. 45–62.

Gehrels, G.E., and Pecha, M., 2014, Detrital zircon U-Pb geochronology and Hf isotope geochemistry of Paleozoic and Triassic passive margin strata of western North America: Geosphere, v. 10, p. 49–65.

Gehrels, G.E., Valencia, V., Ruiz, J., 2008, Enhanced precision, accuracy, efficiency, and spatial resolution of U-Pb ages by laser ablation–multicollector–inductively coupled plasma–mass spectrometry: Geochemistry, Geophysics, Geosystems, v. 9, Q03017.

Gehrels, G. E., Dickinson, W. R., Ross, G. M., Stewart, J. H., and Howell, D. G., 1995, Detrital zircon reference for Cambrian to Triassic miogeoclinal strata of western North America: Geology, v. 23, p. 831-834.

Gehrels, G.E., Rusmore, M., Woodsworth, G., Crawford, M., Andronicos, C., Hollister, L., Patchett, J., Ducea, M., Butler, R., Klepeis, K., Davidson, C., Mahoney, B., Friedman, R., Haggard, J., Crawford, W., Pearson, D., and Girardi, J., 2009, U-Th-Pb geochronology of the Coast Mountains batholith in north-coastal British Columbia: Constraints on age, petrogenesis, and tectonic evolution: Geological Society of America Bulletin, v. 121, p. 1341–1361.

Gibert, G., Gerbault, M., Hassani, R., and Tric, E., 2012, Dependency of slab geometry on absolute velocities and conditions for cyclicity: Insights from numerical modeling: Geophysical Journal International, v. 189, p. 747–760.

Girardi, J.D., Patchett, P.J., Ducea, M.N., Gehrels, G.E., Cecil, M.R., Rusmore, M.E., Woodsworth, G.J., Pearson, D.M., Manthei, C., and Wetmore, P., 2012, Elemental and isotopic evidence for granitoid genesis from deep-seated sources in the Coast Mountains batholith, British Columbia: Journal of Petrology, v. 53, p. 1505–1536.

Graham, G.E., Kelley, K.D., Holm-Denoma, C.S., Ayuso, R.A., Kokaly, R.F., Hoefen, T.M., and Selby, D., 2016, Geochronology of Early Cretaceous porphyry Cu deposits in Eastern Alaska, *in* 35th International Geological Congress. Cape Town, South Africa. August 27 – September 4, 2016.

Grantz, A., Jones, D.L., and Lanphere, M.A., 1966, Stratigraphy, paleontology, and isotopic ages of upper Mesozoic rocks in the southwestern Wrangell Mountains, Alaska: U.S. Geological Survey Professional Paper 550-C, p. 39–47.

Greene, A.R., Scoates, J.S., Weis, D., and Israel, S., 2009, Geochemistry of Triassic flood basalts from the Yukon (Canada) segment of the accreted Wrangellia oceanic plateau: Lithos, v. 110, p. 1–19.

Gross Almonte, N., Fisher, W.S., Malik, A.M., Garver, J.I., and Davidson, C., 2019, Age and provenance of the upper Cretaceous to Paleocene Valdez Group of the Chugach terrane from the Richardson Highway and northern Prince William Sound, Alaska: Geological Society of America, Abstracts with Programs, vol. 51, no. 4.

Haeussler, P.J., Bradley, D.C., Wells, R.E., and Miller, M.L., 2003, Life and death of the Resurrection plate: Evidence for its existence and subduction in the northeastern Pacific in Paleocene–Eocene time: Geological Society of America Bulletin, v. 115, p. 867–880.

Hampton, B.A., Ridgway, K.D., and Gehrels, G.E., 2010, A detrital record of Mesozoic island arc accretion and exhumation in the North American Cordillera: U-Pb geochronology of the Kahiltna basin, southern Alaska: Tectonics, 29, TC4015.

Hampton, B.A., Jacobs, M.R., and Stopka, C.J., 2017, U-Pb detrital geochronology and Hf isotopic analyses from Upper Cretaceous strata of the northern Talkeetna Mountains, southern Alaska: Sediment dispersal and magmatism during the final accretionary phase of the

Wrangellia composite terrane: Geological Society of America, Abstracts with Programs, v. 49, no. 6.

Hart, C.J.R., Goldfarb, R., Lewis, L.L., and Mair, J.L., 2004, The Northern Cordillera Mid-Cretaceous plutonic province: Ilmenite/magnetite-series granitoids and intrusion-related mineralization: Resource Geology, v. 54, p. 253–280.

Haschke, M.R., Scheuber, E., Günther, A., and Reutter, K.J., 2002, Evolutionary cycles during the Andean orogeny: Repeated slab breakoff and flat subduction?: Terra Nova, v. 14, p. 49–55.

Haschke, M., Gunther, A., Melnick, D., Echtler, H., Reutter, K.J., Scheuber, E., and Oncken, O., 2006, Central and southern Andean tectonic evolution inferred from arc magmatism, *in* Oncken, O., Chong, G., Franz, G., Giese, P., Götze, H.-J., Ramos, H.-J., Strecker, M.R., and Wigger, P., eds., The Andes—Active Subduction Orogeny: Frontiers in Earth Sciences: Berlin, Springer-Verlag, v. 1, p. 337–353.

Hoffman, M.D., and Armstrong, P.A., 2006, Miocene exhumation of the southern Talkeetna Mountains, south central Alaska, based on apatite (U-Th)/He thermochronology: Geological Society of America, Abstracts with Programs, v. 38, p. 9.

Hollister, L.S., and Andronicos, C., 1997, A candidate for the Baja British Columbia fault system in the Coast Plutonic Complex: GSA Today, v. 7, p. 1–7.

Hollister, L.S., and Andronicos, C., 2006, Formation of new continental crust in Western British Columbia during transpression and transtension: Earth and Planetary Science Letters, v. 249, p. 29–38.

Hudson, T.L., 1994, Crustal melting events in Alaska, *in* Plafker, G., and Berg, H. C., eds., The Geology of Alaska: Boulder, Colorado, Geological Society of America, The Geology of North America, v. G-1, p. 657–670.

Hults, C.P., Wilson, F.H., Donelick, R.A., and O'Sullivan, P.B., 2013, Two flysch belts having distinctly different provenance suggest no stratigraphic link between the Wrangellia composite terrane and the paleo-Alaskan margin: Lithosphere, v. 5, p. 575–594.

Hung, C.H., 2008, Zircon U-Pb ages and geochemical characteristics of the McKinley sequence and associated plutons, central Alaska Range [M.S. thesis]: Taiwan, National Taiwan University, 78 p.

Ingersoll, R.V., 1979, Evolution of the Late Cretaceous fore-arc basin, northern and central California: Geological Society of America Bulletin, v. 90, p. 813-826.

Irving, E., Wynne, P.J, Thorkelson, D.J, and Schiarizza, P., 1996, Large (1000 to 4000 km) northward movements of tectonic domains in the northern Cordillera, 83 to 45 Ma: J. Geophys. Res., v. 101, p. 17,901–17,916.

Jackson, L.J., Horton, B.K., and Vallejo, C., 2019, Detrital zircon U-Pb geochronology of modern Andean rivers in Ecuador: Fingerprinting tectonic provinces and assessing downstream propagation of provenance signals: Geosphere, v. 15, p. 1943-1957.

Jicha, B.R., Scholl, D.W., Singer, B.S., Yogodzinski, G.M., and Kay, S.M., 2006, Revised age of Aleutian island arc formation implies high rate of magma production: Geology, v. 34, p. 661–664.

Jones, D.L., and MacKevett, E.M., Jr., 1969, Summary of Jurassic stratigraphy in part of the McCarthy Quadrangle, Alaska: U.S. Geological Survey Bulletin 1274-K, 19 p.

Jones, D.L., Silberling, N.J., and Hillhouse, J., 1977, Wrangellia: A displaced terrane in northwestern North America: Canadian Journal of Earth Sciences, v. 14, p. 2565–2577.

Kalbas, J.L., Ridgway, K.D., and Gehrels, G.E., 2007, Stratigraphy, depositional systems, and provenance of the Lower Cretaceous Kahiltna assemblage, western Alaska Range: Basin development in response to oblique collision, *in* Ridgway, K.D., Trop, J.M., Glen, J.M.G., and O'Neill, J.M., eds., Tectonic Growth of a Collisional Continental Margin: Crustal Evolution of Southern Alaska: Geology Society of America Special Paper 431, p. 307–343.

Kapp, P.A., and Gehrels, G.E., 1998, Detrital zircon constraints on the tectonic evolution of the Gravina belt, southeastern Alaska: Canadian Journal of Earth Sciences, v. 35, p. 253-268.

Kay, S.M., Godoy, E., and Kurtz, A., 2005, Episodic arc migration, crustal thickening, subduction erosion, and magmatism in the south-central Andes: Geological Society of America Bulletin, v. 117, p. 67–88,

Kozinski, J., 1985, Sedimentology and Tectonic Significance of the Nutzotin Mountains Sequence (M. S. thesis, State University of New York at Albany).

Laskowski, A.K., DeCelles, P.G., and Gehrels, G.E., 2013, Detrital zircon geochronology of Cordilleran retroarc foreland basin strata, western North America: Tectonics, v. 32, p. 1027–1048.

Lease, R.O., Haeussler, P.J., and O'Sullivan, P., 2016, Changing exhumation patterns during Cenozoic growth and glaciation of the Alaska Range: Insights from detrital thermochronology and geochronology: Tectonics, v. 35.

Linde, G.M., Trexler, J.H., Cashman, P.H., Gehrels, G., and Dickinson, W.R., 2017, Three-dimensional evolution of the Early Paleozoic western Laurentian Margin: New insights from detrital zircon U-Pb geochronology and Hf isotope geochemistry of the Harmony Formation of Nevada. Tectonics, v. 36, p. 2347-2369.

Lowey, G.W., 1998, A new estimate of the amount of displacement on the Denali fault system based on the occurrence of carbonate megaboulders in the Dezadeash Formation (Jura-Cretaceous), Yukon, and the Nutzotin Mountains sequence (Jura-Cretaceous), Alaska: Bulletin of Canadian Petroleum Geology, v. 46, p. 379–386.

Lowey, G., 2011, Volcaniclastic gravity flow deposits in the Dezadeash Formation (Jura-Cretaceous), Yukon, Canada: Implications regarding the tectonomagmatic evolution of the Chitina arc in the northern Cordillera of North America: Lithos, v. 125, p. 86–100.

Lowey, G., 2018, Provenance analysis of the Dezadeash Formation (Jurassic–Cretaceous), Yukon, Canada: implications regarding a linkage between the Wrangellia composite terrane and the western margin of Laurasia: Canadian Journal of Earth Sciences, v. 56, p. 77-100.

Ludwig, K.R., 2003, Isoplot 3.00, a geochronological toolkit for Microsoft Excel: Berkeley 1392 Geochronology Center, Special Publication No. 4a, Berkeley, California.

MacKevett, E.M., Jr., 1969, Three newly named Jurassic formations in the McCarthy C-5 Quadrangle, Alaska: U.S. Geological Survey Bulletin 1274-A, p. A37-A49.

MacKevett, E.M., Jr., 1978, Geologic map of the McCarthy quadrangle, Alaska: U.S. Geological Survey Miscellaneous Investigation Series, I-1032, 1:250,000 scale.

MacKevett, E.M., Jr. Smith, J.G., Jones, D.L., and Winkler, G.R., 1978, Geologic map of the McCarthy C-8 Quadrangle: U.S. Geological Survey Geologic Quadrangle Map GQ-1418, 1 sheet, scale 1:63 360.

Manselle, P., Brueseke, M.E., Trop, J.M., Benowitz, J.A., Snyder, D.C.., and Hart, W.K., 2018, Mid-Cretaceous volcanism and fluvial-deltaic sedimentation associated with accretion if the Wrangellia Composite terrane, Chisana arc, Gravina-Nutzotin belt, Alaska, Geological Society of America Abstracts with programs, v. 50, no. 6.

Manselle, P., 2019, Physical volcanology, sedimentology and geochemistry of the Mid-Cretaceous Chisana Formation, south-central Alaska: implications for models of Wrangellia composite terrane accretion: MS thesis, Kansas State University, Manhattan, KS, 105 p.

Manuszak, J.D., 2000, Sedimentary and structural record of Late Jurassic–Early Cretaceous collisional tectonics, Nutzotin and Mentasta Mountains, east-central Alaska: [M.S. thesis]: West Lafayette, Indiana, Purdue University, 291 p.

Manuszak, J.D., Ridgway, K.D., Trop, J.M., and Gehrels, G.E., 2007, Sedimentary record of the tectonic growth of a collisional continental margin: Upper Jurassic–Lower Cretaceous Nutzotin Mountains sequence, eastern Alaska Range, Alaska, *in* Ridgway, K.D., Trop, J.M., Glen, J.M.G., and O'Neill, J.M., eds., Tectonic Growth of a Collisional Continental Margin: Crustal Evolution of Southern Alaska: Geological Society of America Special Paper 431, p. 345–377.

Mahar, M.A., Pavlis, T.L, Bowman, J.R, Conrad, W.K, and Goodell, P.C, 2019, Early Cretaceous ridge subduction beneath southern Alaska: Insights from zircon U-Pb geochronology, hafnium, and oxygen isotopic compositions of the Western Chugach tonalite-trondhjemite suite: GSA Bulletin, v. 131, p. 521–546.

McClelland, W.C., Gehrels, G.E., and Saleeby, J.B., 1992, Upper Jurassic– Lower Cretaceous basinal strata along the Cordilleran margin: Implications for the accretionary history of the Alexander-Wrangellia-Peninsular terrane: Tectonics, v. 11, p. 823–835.

Milde, E.R., Fitzgerald, P.G., and Benowitz, J.A., 2013, Applying low-temperature thermochronology to constrain the tectonic history of the strike-slip Totschunda fault system, southeastern Alaska, Geological Society of America Abstracts with Programs, v. 45.

Moecher, D.P., and Samson, S.D., 2006, Differential zircon fertility of source terranes and natural bias in the detrital zircon record: Implications for sedimentary provenance analysis: Earth and Planetary Science Letters, v. 247, p. 252–266.

Moll-Stalcup, E.J., 1994, Latest Cretaceous and Cenozoic magmatism in mainland Alaska, *in* Plafker, G., and Berg, H.C., eds., The Geology of Alaska: Boulder, Colorado, Geological Society of America, Geology of North America, v. G-1, p. 589–619.

Monger, J.W.H., 2014, Logan Medallist 1. Seeking the suture: The Coast-Cascade conundrum: Geoscience Canada, v. 41, p. 379–20.

Monger, J.W.H., Price, R.A., and Tempelman-Kluit, D.J., 1982, Tectonic accretion and the origin of two metamorphic and plutonic welts in the Canadian Cordillera: Geology, v. 10, p. 70–75.

Mortensen, J. K., 1990, Geology and U–Pb geochronology of the Klondike District, west-central Yukon Territory: Canadian Journal of Earth Sciences, v. 27, p. 903-914.

Mortensen, J.K., 1992, Pre-mid-Mesozoic tectonic evolution of the Yukon-Tanana terrane, Yukon and Alaska: Tectonics, v. 11, p. 836–853.

Nelson, J.L., Colpron, M., and Israel, S., 2013, The Cordillera of British Columbia, Yukon, and Alaska: Tectonics and metallogeny, *in* Colpron, M., et al., eds., Tectonics, terranes, metallogeny and discovery: The North American Cordillera and similar accretionary settings: Society of Economic Geologists Special Publication 17, p. 53–109.

Nokleberg, W.J., Jones, D.L., and Silberling, N.J., 1985, Origin and tectonic evolution of the Maclaren and Wrangellia terranes, eastern Alaska Range, Alaska: Geological Society of America Bulletin, v. 96, p. 1251–1270.

Nokleberg, W.J., Plafker, G., and Wilson, F.H., 1994, Geology of south-central Alaska, *in* Plafker, G., and Berg, H.C., eds., The geology of Alaska: Boulder, Colorado, Geological Society of America, Geology of North America, v. G-1, p. 311–365.

Nokleberg, W.J., Aleinikoff, J.N., Bond, G.C., Ferrians, O.J., Jr., Herzon, P.L., Lange, I.M., Miyaoka, R.T., Richter, D.H., Schwab, C.E., Silva, S.R., Smith, T.E., and Zehner, R.E., 2015, Geologic maps of the eastern Alaska Range, Alaska (44 quadrangles, 1:63,360 scale), with descriptions and interpretations of map units: Alaska Division of Geological & Geophysical Surveys Report of Investigation 2015-6, 64 p., 45 sheets, scale 1:63,360.

Paterson, S.R., and Ducea, M.N., 2015, Arc magmatic tempos: Gathering the evidence: Elements v. 11, p. 91–98.

Pavlis, T.L., 1982, Origin and age of the Border Ranges fault of southern Alaska and its bearing on the late Mesozoic tectonic evolution of Alaska: Tectonics, v. 1, p. 343–368.

Pavlis, T.L., and Roeske, S.M., 2007, The Border Ranges fault system, southern Alaska, *in* Ridgway, K.D., Trop, J.M., Glen, J.M.G., and O'Neill, J.M., eds., Tectonic Growth of a Collisional Continental Margin: Crustal Evolution of Southern Alaska: Geological Society of America Special Paper 431, p. 95–127.

Pavlis, T.L., Monteverde, D.H., Bowman, J.R., Rubenstone, J.L., and Reason, M.D., 1988, Early Cretaceous near-trench plutonism in southern Alaska: A tonalite-trondhjemite intrusive complex injected during ductile thrusting along the Border Ranges fault system: Tectonics, v. 7, p. 1179–1199.

Pavlis, T.L., Amato, J.M., Trop, J.M., Ridgway, K.D., Roeske, S.M., and Gehrels, G.E., 2019, Subduction polarity in ancient arcs: A call to integrate geology and geophysics to decipher the Mesozoic tectonic history of the Northern Cordillera of North America: GSA Today, v. 29.

Pecha, M.E., Gehrels, G.E., McClelland, W.C., Giesler, D., White, C., and Yokelson, I., 2016, Detrital zircon U-Pb geochronology and Hf isotope geochemistry of the Yukon-Tanana terrane, Coast Mountains, southeast Alaska: Geosphere, v. 12, p. 1556–1574.

Pepper, M., Gehrels, G., Pullen, A., Ibanez-Mejia, M., Ward, K.M., and Kapp, P., 2016, Magmatic history and crustal genesis of western South America: Constraints from U-Pb ages and Hf isotopes of detrital zircons in modern rivers: Geosphere, v. 12, p. 1532–1555.

Plafker, G., and Berg, H.C., 1994, Overview of the geology and tectonic evolution of Alaska, *in* Plafker, G., and Berg, G.C., eds., The Geology of Alaska: Boulder, Colorado, Geological Society of America, Geology of North America, v. G-1, p. 989–1021.

Plafker, G., Nokleberg, W.J., and Lull, J.S., 1989, Bedrock geology and tectonic evolution of the Wrangellia, Peninsular, and Chugach terranes along the Trans-Alaska Crustal Transect in the Chugach Mountains and southern Copper River basin, Alaska: Journal of Geophysical Research, v. 94, p. 4255–4295.

Plafker, G., Moore, J.C., and Winkler, G.R., 1994, Geology of the southern Alaska margin, *in* Plafker, G., and Berg, H.G., eds., The Geology of Alaska: Boulder, Colorado, Geological Society of America, Geology of North America, v. G-1, p. 389–450.

Preece, S.J., and Hart, W.K., 2004, Geochemical variation in the <5 Ma Wrangell Volcanic Field, Alaska: Implications for the magmatic and tectonic development of a complex continental arc system: Tectonophysics, v. 392, p. 165–191.

Pullen, A., Ibanez-Mejia, M., Gehrels, G., Ibanez-Mejia, J., and Pecha, M., 2014, What happens when n= 1000? Creating large-n geochronological datasets with LA-ICP-MS for geologic investigations: J. Analyt. Atom. Spectrom., v. 29, p. 971–980.

Orme, D.A., Surpless, K.D., 2019, The birth of a forearc: the basal Great Valley Group, California: Geology: v. 47, p. 757-761.

Rainbird, R., Cawood, P., and Gehrels, G., 2012, The great Grenvillian sedimentation episode: record of supercontinent Rodinia's assembly. Tectonics of Sedimentary Basins: Recent Advances, Oxford, UK, Blackwell Science, p. 583-601.

Rainbird, R.H., McNicoll, V.J., Theriault, R.J., Heaman, L.M., Abbott, J.G., Long, D.G.F., and Thorkelson, D.J., 1997, Pan-continental river system draining Grenville Orogen recorded by U-Pb and Sm-Nd geochronology of Neoproterozoic quartzarenites and mudrocks, northwestern Canada: The Journal of Geology, v. 105, p. 1-17.

Reed, B.L., and Lanphere, M.A., 1973, Alaska-Aleutian Range batholith; Geochronology, chemistry, and relation to circum-Pacific plutonism: Geological Society of America Bulletin, v. 84, p. 2583–2610.

Reid, M., Finzel, E.S., Enkelmann, E., and McClelland, W.C., 2018, Detrital zircon provenance of Upper Jurassic–Upper Cretaceous forearc basin strata on the Insular terranes, south-central Alaska, *in* Ingersoll, R.V., Lawton, T.F., and Graham, S.A., eds., Tectonics, Sedimentary Basins, and Provenance: A Celebration of William R. Dickinson's Career: Geological Society of America Special Paper 540, p. 1–20.

Richter, D.H., 1971, Reconnaissance geologic map of the Nabesna A-2 Quadrangle, Alaska: U.S. Geological Survey Map I-655, scale 1:63,360.

Richter, D.H., 1976, Geologic map of the Nabesna Quadrangle, Alaska: U.S. Geological Survey Miscellaneous Investigations Series, Map I-932, 1 sheet, scale 1:250,000.

Richter, D.H., and Matson, N.A., Jr., 1971, Quaternary faulting in the eastern Alaska Range: Geological Society of America Bulletin, v. 82, p. 1529–1540.

Richter, D.H., and Jones, D.L., 1973, Structure and stratigraphy of the eastern Alaska Range, Alaska: American Association of Petroleum Geologists Memoir, v. 19, p. 408–420.

Richter, D.H., and Schmoll, H., 1973, Geologic map of the Nabesna C-5 Quadrangle, Alaska: U.S. Geological Survey Map GQ-1062, scale 1:63,360.

Richter, D.H., Smith, J.G., Lanphere, M.A., Dalrymple, G.B., Reed, B.L., and Shew, N., 1990, Age and progression of volcanism, Wrangell volcanic field, Alaska: Bulletin of Volcanology, v. 53, p. 29–44.

Ridgway, K.D., Trop, J.M., and Sweet, A.R., 1997, Thrust-top basin formation along a suture zone, Cantwell basin, Alaska Range: Implications for development of the Denali fault system: Geological Society of America Bulletin, v. 109, p. 505–523.

Ridgway, K.D., Trop, J.M., Nokleberg, W.J., Davidson, C.M., and Eastham, K.R., 2002, Mesozoic and Cenozoic tectonics of the eastern and central Alaska Range: Progressive basin development and deformation in a suture zone: Geological Society of America Bulletin, v. 114, p. 1480–1504.

Ridgway, K.D., Trop, J.M., and Finzel, E.S., 2012, Modification of continental forearc basins by flat-slab subduction processes: A case study from southern Alaska, *in* Busby, C., and Azor, A., eds., Tectonics of Sedimentary Basins: Recent Advances: Oxford, UK, Blackwell Science, p. 327–346.

Rioux, M.R., Hacker, B.R., Mattinson, J., Kelemen, P., Blusztajn, J., and Gehrels, G.E., 2007, Magmatic development of an intra-oceanic arc: High precision U-Pb zircon and whole-rock isotopic analyses from the accreted Talkeetna arc, south-central Alaska: Geological Society of America Bulletin, v. 119, p. 1168–1184.

Rioux, M.R., Mattinson, J., Hacker, B.R., Kelemen, P., Blusztajn, J., Hanghoj, K., and Gehrels, G.E., 2010, Intermediate to felsic middle crust in the accreted Talkeetna arc, the Alaska Peninsula and Kodiak Island, Alaska: An analogue for low-velocity middle crust in modern arcs: Tectonics, v. 29, p. 1029–1045.

Roeske, S.M., Snee, L.W., and Pavlis, T.L., 2003, Dextral-slip reactivation of an arc-forearc boundary during Late Cretaceous–Early Eocene oblique convergence in the northern Cordillera, *in* Sisson V.B, Roeske, S.M, and Pavlis, T.L., eds., Geology of a transpressional orogeny developed during Ridge-Trench interaction along the North Pacific margin, Geological Society of America Special Paper 371, p. 141–170.

Saylor, J.E., and Sundell, K.E., 2016, Quantifying comparison of large detrital geochronology data sets: Geosphere, v. 12, p. 203–220.

Saylor, J.E., Knowles, J.N., Horton, B.K., Nie, J.S., and Mora, A., 2013, Mixing of source populations recorded in detrital zircon U-Pb age spectra of modern river sands: Journal of Geology, v. 121, p. 17–33.

Sandy, M.R., and Blodgett, R.B., 1996, *Peregrinella* (Brachiopoda; Rhynchonellida) from the Early Cretaceous, Wrangellia terrane, Alaska, *in* Copper, P., and Jin, J., eds., Brachiopods,

Proceedings of the Third International Brachiopod Congress: A.A. Balkema/Rotterdam/Brookfield, p. 239–242.

Short, E., Snyder, D. C., Trop, J. M., Hart, W. K., & Layer, P. W., 2005, New findings on Early Cretaceous volcanism within the allochthonous Wrangellia terrane, south-central Alaska: Stratigraphic, geochronologic, and geochemical data from the Chisana Formation, Nutzotin Mountains: Geological Society of America Abstracts with Programs v. 37.

Sigloch, K., and Mihalynuk, M.G., 2013, Intra-oceanic subduction shaped the assembly of Cordilleran North America: Nature, v. 496, p. 50–56.

Sigloch, K., and Mihalynuk, M.G., 2017, Mantle and geological evidence for a Late Jurassic–Cretaceous suture spanning North America: Geological Society of America Bulletin, v. 129, p. 1489–1520.

Sisson, V.B., Poole, A.R., Burner, H.C., Pavlis, T.L., Copeland, P., Donelick, R.A., and McClelland, W., 2003, Geochemical and geochronologic constraints for genesis of a tonalite-trondhjemite suite and associated mafic intrusive rocks in the eastern Chugach Mountains, Alaska: A record of ridge-transform subduction, *in* Sisson, V.B., Roeske, S.M., and Pavlis, T.L., eds., Geology of a Transpressional Orogen Developed during Ridge-Trench Interaction along the North Pacific Margin: Geological Society of America Special Publication 371, p. 293–326.

Snyder, D.C., and Hart, W.K., 2007, Source reservoirs for Cretaceous magmatism within the Wrangellia Terrane *in* Ridgway, K.D., Trop, J.M., Glen, J.M.G., and O'Neill, J.M., eds., Tectonic growth of a collisional continental margin: Crustal evolution of southern Alaska, Geological Society of America Special Paper, v. 431, p. 379–399.

Spencer, C.J., Kirkland, C.L., and Roberts, N.M., 2018, Implications of erosion and bedrock composition on zircon fertility: Examples from South America and Western Australia: Terra Nova, v. 30, p. 289–295.

Spencer, C.J., Murphy, J.B., Hoiland, C.W., Johnston, S.T., Mitchell, R.N., and Collins, W.J., 2019, Evidence for whole mantle convection driving Cordilleran tectonics: Geophysical Research Letters, v. 46, p. 4239–4248.

Stamatakos, J.A., Trop, J.M., and Ridgway, K.D., 2001, Late Cretaceous paleography of Wrangellia: Paleomagnetism of the MacColl Ridge Formation, southern Alaska, re-visited: Geology, v. 29, p. 947–950.

Stevens Goddard, A.L., Trop, J.M., and Ridgway, K.D., 2018, Detrital zircon record of a Mesozoic collisional forearc basin in south central Alaska: The tectonic transition from an oceanic to continental arc: Tectonics, v. 37.

Sundell, K., and Saylor, J., 2017, Unmixing detrital geochronology age distributions: Geochem. Geophys. Geosyst. v. 18, p. 2872–2886.

Surpless, K.D., Sickmann, Z.T., and Koplitz, T.A., 2014, East-derived strata in the Methow basin record rapid mid-Cretaceous uplift of the southern Coast Mountains batholith: Canadian Journal of Earth Sciences, v. 51, p. 339–357.

Terhune, P.J., Benowitz, J.A., Trop, J.M., O'Sullivan, P.B., Gillis, R.J., and Freymueller, J.T., 2019, Cenozoic tectono-thermal history of the southern Talkeetna Mountains, Alaska: insights into a potentially alternating convergent and transform plate margin: Geosphere v. 15, p. 1–38.

Trop, J.M., 2008, Latest Cretaceous forearc basin development along an accretionary convergent margin: South-central Alaska: Geological Society of America Bulletin, v. 120, p. 207-224.

Trop, J.M., and Ridgway, K.D., 2007, Mesozoic and Cenozoic tectonic growth of southern Alaska: A sedimentary basin perspective, *in* Ridgway, K.D., Trop, J.M., Glen, J.M.G., and O'Neil, J.M., eds., Tectonic Growth of a Collisional Continental Margin: Crustal Evolution of Southern Alaska, Geological Society of America Special Paper 431, p. 55–94.

Trop, J.M., Ridgway, K.D., Sweet, A.R., and Layer, P.W., 1999, Submarine fan deposystems and tectonics of a Late Cretaceous forearc basin along an accretionary convergent plate boundary, MacColl Ridge Formation, Wrangell Mountains, Alaska: Canadian Journal of Earth Sciences, v. 36, p. 433–458.

Trop, J.M., Ridgway, K.D., Manuszak, J.D., and Layer, P., 2002, Mesozoic sedimentary-basin development on the allochthonous Wrangellia composite terrane, Wrangell Mountains basin, Alaska: A long-term record of terrane migration and arc construction: Geological Society of America Bulletin, v. 114, p. 693–717.

Trop, J.M., Szuch, D.A., Rioux, M., and Blodgett, R.B., 2005, Sedimentology and provenance of the Upper Jurassic Naknek Formation, Talkeetna Mountains, Alaska: Bearing on the accretionary tectonic history of the Wrangellia composite terrane: Geological Society of America Bulletin, v. 117, p. 570–588.

Trop, J.M., Hart, W.K., Snyder, D., and Idleman, B., 2012, Miocene basin development and volcanism along a strike-slip to flat-slab subduction transition: Stratigraphy, geochemistry, and geochronology of the central Wrangell volcanic belt, Yakutat-North America collision zone: Geosphere, v. 8, p. 805–834.

Trop, J.M., Benowitz, J., Cole, R.B., and O'Sullivan, P., 2019a, Cretaceous to Miocene magmatism, sedimentation, and exhumation within the Alaska Range suture zone: A polyphase reactivated terrane boundary: Geosphere, v. 15, p. 1066–1101.

Trop, J.M., Benowitz, J.A., Koepp, D., Sunderlin, D., Brueseke, M., Layer, P., and Fitzgerald, P., 2019b, Stitch in the Ditch: Nutzotin Mountains (Alaska) fluvial strata and a dike record ~117–114 Ma accretion of Wrangellia with western North America and initiation of the Totschunda fault: Geosphere, v. 16, p. 1-29.

Trop, J.M., Benowitz, J., Davis, K.N., Layer, P.W., and Brueseke, M., 2016, U-Pb and ^{40}Ar-^{39}Ar detrital geochronology of modern river sediments in the Wrangell Mountains, Alaska: Improved constraints on the age and tectonic evolution of Jurassic–Quaternary magmatism: Geological Society of America, Abstracts with Programs, v. 48.

van der Heyden, P., 1992, A Middle Jurassic to early Tertiary Andean-Sierran arc model for the Coast belt of British Columbia: Tectonics, v. 11, p. 82–97.

Vervoort, J.D., and Patchett, P.J., 1996, Behavior of hafnium and neodymium isotopes in the crust: constraints from Precambrian crustally derived granites: Geochimica et Cosmochimica Acta, v. 60, p. 3717-3733.

Vervoort, J.D., and Blichert-Toft, J., 1999, Evolution of the depleted mantle: Hf isotope evidence from juvenile rocks through time. Geochimica et Cosmochimica Acta, v. 63, p. 533-556.

White, C., Gehrels, G.E., Pecha, M., Giesler, D., Yokelson, I., McClelland, W.C., and Butler, R.F., 2016, U-Pb and Hf isotope analysis of detrital zircons from Paleozoic strata of the southern Alexander terrane (southeast Alaska): Lithosphere, v. 8, p. 83-96.

Wilson, F.H., Detterman, R.L., and DuBois, G., 1999, Digital Data for the Geologic Map of the Alaska Peninsula, Southwest Alaska, and the Alaska Peninsula Terrane: U.S. Geological Survey Open-File Report 99–317.

Wilson, F.H., Hults, C.P., Mull, C.G, and Karl, S.M, comps., 2015, Geologic map of Alaska: U.S. Geological Survey Scientific Investigations Map 3340, pamphlet 196 p., 2 sheets, scale 1:1,584,000.

Winkler, G.R., Silbermann, M.L., Grantz, A., Miller, R.J., and MacKevett, E.M., Jr., 1981, Geologic map and summary geochronology of the Valdez Quadrangle, southern Alaska: U.S. Geological Survey Open File Report 80–892-A, 1 sheet, scale 1:250 000.

Wolf, D.E., Andronicos, C.L., Vervoort, J.D., Mansfield, M.R., and Chardon, D., 2010, Application of Lu-Hf garnet dating to unravel the relationships between deformation, metamorphism and plutonism: An example from the Prince Rupert area, British Columbia: Tectonophysics, v. 485, p. 62–77.

Worthington, L.L., Van Avendonk, H.J., Gulick, S.P., Christeson, G.L., and Pavlis, T.L., 2012, Crustal structure of the Yakutat Terrane and the evolution of subduction and collision in southern Alaska: Journal of Geophysical Research, v. 117, B01102.

Wynne, P.J., Irving, E., Maxson, J.A., and Kleinspehn, K.L, 1995, Paleomagnetism of the Upper Cretaceous strata of Mount Tatlow: Evidence for 3000 km of northward displacement of the eastern Coast Belt, British Columbia: J. Geophys. Res., v. 100, p. 6073–6091.

Yokelson, I., Gehrels, G.E., Pecha, M., Giesler, D., White, C., and McClelland, W.C., 2015, U-Pb and Hf isotope analysis of detrital zircons from Mesozoic strata of the Gravina belt, southeast Alaska: Tectonics, v. 34, p. 2052–2066.

APPENDIX A. BEDROCK AND MODERN RIVER DETRITAL ZIRCON SAMPLE LIST FOR SOUTH-CENTRAL ALASKA

Summary table that includes geographic and analytical information for all bedrock and modern river detrital zircon samples collected for this study. Samples that were analyzed for U-Pb geochronology and Hf isotope geochemistry are denoted with an “X”.

Sample	Formation/River	Lithology	Geographic Location	GPS Location		Analysis Completed	
				Latitude	Longitude	U-Pb	Lu-Hf
BON-COMP	Nutzotin Mtns. Sequence	Sandstone	Nutzotin Mountains, Wrangell-St. Elias National Park, AK	62.1250	141.8167	X	X
KNC1-COMP	Nutzotin Mtns. Sequence	Sandstone	Nutzotin Mountains, Wrangell-St. Elias National Park, AK	62.1725	141.2550	X	
MM1-COMP	Nutzotin Mtns. Sequence	Sandstone	Nutzotin Mountains, Wrangell-St. Elias National Park, AK	62.3306	142.8136	X	X
MC1-COMP	Nutzotin Mtns. Sequence	Sandstone	Nutzotin Mountains, Wrangell-St. Elias National Park, AK	62.3347	142.8339	X	
BR1-COMP	Nutzotin Mtns. Sequence	Sandstone	Nutzotin Mountains, Wrangell-St. Elias National Park, AK	62.7169	143.0219	X	X
LC1-COMP	Nutzotin Mtns. Sequence	Sandstone	Nutzotin Mountains, Wrangell-St. Elias National Park, AK	62.5992	143.1428	X	
062618CF-01	Nutzotin Mtns. Sequence	Sandstone	Nutzotin Mountains, Wrangell-St. Elias National Park, AK	62.6284	143.2603	X	
062718CF-01	Nutzotin Mtns. Sequence	Sandstone	Nutzotin Mountains, Wrangell-St. Elias National Park, AK	62.5848	143.1423		
062718CF-02	Nutzotin Mtns. Sequence	Sandstone	Nutzotin Mountains, Wrangell-St. Elias National Park, AK	62.5773	143.1280	X	X
062818CF-01	Lost Creek	Unconsolidated sand	Along Nabesna Road, Wrangell-St. Elias National Park, AK	62.5142	143.1757	X	
062818CF-02	Trail Creek	Unconsolidated sand	Along Nabesna Road, Wrangell-St. Elias National Park, AK	62.5235	143.2217		
071618KR-01	Nutzotin Mtns. Sequence	Sandstone	Slate Creek, eastern Alaska Range, AK	63.1607	144.7666		
071718KR-01	Nutzotin Mtns. Sequence	Sandstone	Slate Creek, eastern Alaska Range, AK	63.1702	144.7971	X	X
MAC-COMP	MacColl Ridge Fm.	Sandstone	MacColl Ridge, Wrangell-St. Elias National Park, AK	61.1890	142.3620	X	

CG-DZ-1/2/3	Moonshine Creek Fm.	Sandstone	Contact Gulch, Wrangell-St. Elias National Park, AK	61.5072	142.3439	X	
KUS1-COMP	Kennicott Fm.	Sandstone	Kuskalana Pass, Wrangell-St. Elias National Park, AK	61.5550	143.5680	X	
ROOT1-COMP	Root Glacier Fm.	Sandstone	Root Glacier, Wrangell-St. Elias National Park, AK	61.5980	142.8490	X	
KOT-COMP	Kotsina Conglomerate	Sandstone	Wrangell Mountains, Wrangell-St. Elias National Park, AK	61.6178	143.9447	X	
WM1-COMP	Wellesly Mtn. Fm.	Sandstone	Wellesly Mountain, north of Nutzotin Mountains, AK	62.1480	147.2883	X	X
072609KR-01	Tonsina River	Unconsolidated sand	Richardson Highway north of Chugach Mountains, AK	61.6499	145.1878	X	
072609KR-02	Lower Copper River	Unconsolidated sand	Along McCarthy Road, Wrangell-St. Elias National Park, AK	61.5277	144.4062	X	
072609KR-04	Tazlina River	Unconsolidated sand	Near town of Glennallen, AK	62.0559	145.4281	X	
072609KR-05	Christochina River	Unconsolidated sand	Near town of Christochina, AK	62.4686	144.8406	X	
072609KR-06	Upper Copper River	Unconsolidated sand	Near town of Christochina, AK	62.6003	144.6428	X	
072709KR-01	Upper Delta River	Unconsolidated sand	Richardson Highway in Alaska Range, AK	63.2677	145.6830	X	
072709KR-04	Lower Delta River	Unconsolidated sand	Near town of Delta Junction, AK	64.0444	145.7413	X	
072709KR-05	Eastern Tanana River	Unconsolidated sand	Near town of Big Delta, AK	64.1560	145.8485	X	
072709KR-06	Western Tanana River	Unconsolidated sand	Near town of Nenana, AK	64.5659	149.0731	X	
072709KR-07	Lower Nenana River	Unconsolidated sand	Tatlanika Campground along Parks Highway, Denali National Park, AK	64.2169	149.2810	X	

072809KR-01	Upper Susitna River	Unconsolidated sand	Along Denali Highway, eastern Alaska Range, AK	63.1050	145.1878	X	
072809KR-02	Upper Nenana River	Unconsolidated sand	Along the Denali Highway, Denali National Park, AK	63.3787	148.4022	X	
072809KR-04	Chulitna River	Unconsolidated sand	Along Parks Highway, Denali National Park, AK	62.5663	150.6669	X	
072809KR-05	Middle Susitna River	Unconsolidated sand	Along Parks Highway, Denali National Park, AK	62.1758	150.1784	X	
073009KR-01	Matanuska River	Unconsolidated sand	Matanuska Valley, AK	61.7492	148.6366	X	
073009KR-02	Chickaloon River	Unconsolidated sand	Matanuska Valley, AK	61.7858	148.4547	X	
071511KR-01	Johnson River	Unconsolidated sand	North side of the eastern Alaska Range, AK	63.8034	144.9585	X	
071511KR-02	Gerstle River	Unconsolidated sand	North side of the eastern Alaska Range, AK	63.7021	144.7470	X	
CHIL1	Chilkat River	Unconsolidated sand	Near Tukgoho Mountain along Haines Highway, SE AK	59.2924	135.7099	X	
DON1	Donjek River	Unconsolidated sand	Along Alcan Highway, Yukon Territory	61.7039	139.7018	X	
KLUK1	Kluktu River	Unconsolidated sand	Along Haines Road, SE AK	59.4286	136.2694	X	
WHITE1	White River	Unconsolidated sand	Along Alcan Highway, Yukon Territory	62.0180	140.5109	X	

APPENDIX B. U-PB DETRITAL ZIRCON ANALYSES FOR JURASSIC-CRETACEOUS SEDIMENTARY BASINS IN SOUTH-CENTRAL ALASKA

The data tables that follow include all raw measured isotopic ratios and calculated ages for all detrital zircon samples of Jurassic-Cretaceous sedimentary basins in south-central Alaska that are presented in Chapter 2 of this thesis. Beside for analyses of sample CG-DZ-1/2/3, all analyses were conducted at the University of Arizona LaserChron Center. Analyses for sample CG-DZ-1/2/3 were conducted at the Pacific Centre for Isotopic and Geochemical Research (PCIGR) at the University of British Columbia.

Nutzotin Mountains Sequence – BON-COMP (FA5)

						Isotope ratios						Apparent ages (Ma)							
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
BON-COMP (FA5)																			
-Bon Composite Spot 78	348	46399	2.9	20.1681	1.4	0.1355	1.6	0.0198	0.9	0.56	126.6	1.1	129.1	2.0	174.5	31.8	126.6	1.1	NA
-Bon Composite Spot 206	341	103848	3.3	19.9933	1.1	0.1371	1.7	0.0199	1.3	0.77	127.0	1.7	130.5	2.1	194.8	25.7	127.0	1.7	NA
-Bon Composite Spot 285	274	142426	2.3	19.5321	1.4	0.1407	1.9	0.0199	1.2	0.64	127.3	1.5	133.7	2.3	248.7	32.9	127.3	1.5	NA
-Bon Composite Spot 204	945	92436	2.2	20.5590	1.0	0.1340	1.8	0.0200	1.5	0.84	127.6	2.0	127.7	2.2	129.5	23.7	127.6	2.0	NA
-Bon Composite Spot 196	285	40498	2.1	18.9717	1.4	0.1455	1.7	0.0200	0.9	0.55	127.8	1.2	137.9	2.2	315.3	32.6	127.8	1.2	NA
-Bon Composite Spot 203	342	8610	5.5	21.4189	1.5	0.1291	1.8	0.0201	1.0	0.57	128.0	1.3	123.3	2.1	32.2	35.7	128.0	1.3	NA
-Bon Composite Spot 310	276	236152	3.7	20.4746	1.5	0.1354	2.0	0.0201	1.2	0.63	128.4	1.6	128.9	2.4	139.2	35.7	128.4	1.6	NA
-Bon Composite Spot 127	320	60958	2.7	20.1358	1.2	0.1377	1.6	0.0201	1.1	0.67	128.4	1.3	131.0	1.9	178.2	27.2	128.4	1.3	NA
-Bon Composite Spot 211	180	17501	2.9	19.6034	1.8	0.1422	2.3	0.0202	1.4	0.62	129.1	1.8	135.0	2.9	240.4	40.8	129.1	1.8	NA
-Bon Composite Spot 93	251	43474	4.4	20.1100	1.6	0.1388	1.9	0.0203	1.0	0.54	129.3	1.3	132.0	2.4	181.2	37.9	129.3	1.3	NA
-Bon Composite Spot 12	206	9815	4.2	21.2008	1.8	0.1317	2.2	0.0203	1.3	0.59	129.3	1.7	125.6	2.6	56.7	41.8	129.3	1.7	NA
-Bon Composite Spot 181	278	25697	3.5	21.0969	1.1	0.1324	1.7	0.0203	1.3	0.76	129.4	1.6	126.3	2.0	68.4	25.7	129.4	1.6	NA
-Bon Composite Spot 207	178	3772	3.2	21.5905	4.4	0.1295	4.6	0.0203	1.1	0.25	129.4	1.5	123.6	5.3	13.1	106.6	129.4	1.5	NA
-Bon Composite Spot 124	275	72926	3.9	20.3365	1.6	0.1377	2.0	0.0203	1.1	0.56	129.6	1.4	131.0	2.4	155.1	38.6	129.6	1.4	NA
-Bon Composite Spot 270	258	8151	4.5	21.0988	2.5	0.1328	2.7	0.0203	1.2	0.43	129.8	1.5	126.6	3.2	68.2	58.5	129.8	1.5	NA
-Bon Composite Spot 284	194	48594	4.7	20.5964	1.5	0.1365	1.8	0.0204	1.0	0.55	130.2	1.3	130.0	2.2	125.2	34.9	130.2	1.3	NA
-Bon Composite Spot 156	315	15003	2.3	19.1554	1.6	0.1468	1.9	0.0204	1.0	0.52	130.2	1.2	139.1	2.4	293.4	36.1	130.2	1.2	NA
-Bon Composite Spot 175	302	268984	3.4	19.9451	1.0	0.1411	1.6	0.0204	1.2	0.78	130.3	1.6	134.0	2.0	200.4	22.7	130.3	1.6	NA
-Bon Composite Spot 64	435	59989	2.7	20.1489	1.4	0.1397	1.6	0.0204	0.9	0.52	130.3	1.1	132.8	2.1	176.7	32.8	130.3	1.1	NA
-Bon Composite Spot 186	344	137516	3.1	20.3846	1.2	0.1383	1.5	0.0205	0.9	0.61	130.5	1.2	131.5	1.9	149.5	28.7	130.5	1.2	NA
-Bon Composite Spot 79	316	15190	3.8	20.7920	1.7	0.1358	2.2	0.0205	1.4	0.64	130.7	1.8	129.3	2.7	102.9	40.0	130.7	1.8	NA
-Bon Composite Spot 199	195	37165	4.3	17.8147	2.3	0.1587	2.7	0.0205	1.3	0.50	130.9	1.7	149.6	3.8	456.7	51.9	130.9	1.7	NA
-Bon Composite Spot 97	349	7763	2.6	20.1409	1.8	0.1404	2.0	0.0205	0.9	0.43	130.9	1.1	133.4	2.5	177.6	42.9	130.9	1.1	NA
-Bon Composite Spot 80	157	18530	4.2	19.6598	2.1	0.1440	2.4	0.0205	1.1	0.45	131.1	1.4	136.6	3.0	233.7	49.0	131.1	1.4	NA
-Bon Composite Spot 49	361	49490	2.7	19.4390	1.1	0.1456	1.7	0.0205	1.3	0.76	131.1	1.7	138.1	2.2	259.8	24.9	131.1	1.7	NA
-Bon Composite Spot 217	271	151763	3.6	20.3191	1.5	0.1395	1.7	0.0206	0.9	0.53	131.3	1.2	132.6	2.1	157.1	34.0	131.3	1.2	NA
-Bon Composite Spot 158	355	30903	2.0	20.4725	1.3	0.1386	1.6	0.0206	0.9	0.55	131.4	1.2	131.8	2.0	139.4	31.6	131.4	1.2	NA
-Bon Composite Spot 146	172	30626	4.9	20.7385	1.8	0.1370	2.3	0.0206	1.4	0.61	131.6	1.8	130.4	2.8	109.0	42.5	131.6	1.8	NA
-Bon Composite Spot 8	312	10518	3.4	14.3708	3.6	0.1982	3.7	0.0207	1.1	0.30	131.9	1.5	183.6	6.3	915.3	73.2	131.9	1.5	NA
-Bon Composite Spot 153	391	111849	4.8	18.7241	1.6	0.1522	1.9	0.0207	1.0	0.55	131.9	1.4	143.8	2.5	345.1	35.7	131.9	1.4	NA
-Bon Composite Spot 304	324	14295	2.8	19.9938	1.1	0.1426	1.4	0.0207	0.9	0.64	132.0	1.2	135.3	1.8	194.7	25.3	132.0	1.2	NA
-Bon Composite Spot 305	303	112005	4.3	20.2972	1.1	0.1404	1.5	0.0207	1.0	0.70	132.0	1.3	133.4	1.8	159.6	24.7	132.0	1.3	NA
-Bon Composite Spot 239	241	29254	3.9	20.3185	1.5	0.1405	1.9	0.0207	1.2	0.62	132.2	1.5	133.5	2.3	157.1	34.0	132.2	1.5	NA
-Bon Composite Spot 112	345	24282	3.6	20.4171	1.2	0.1399	1.5	0.0207	1.0	0.62	132.2	1.3	132.9	1.9	145.8	28.2	132.2	1.3	NA
-Bon Composite Spot 306	278	12634	4.0	20.2761	1.2	0.1409	1.6	0.0207	1.0	0.62	132.2	1.3	133.8	2.0	162.0	29.0	132.2	1.3	NA
-Bon Composite Spot 90	415	76886	3.0	20.6535	1.1	0.1384	1.5	0.0207	1.0	0.66	132.3	1.3	131.6	1.9	118.7	26.9	132.3	1.3	NA
-Bon Composite Spot 2	260	5883	2.3	20.5646	1.8	0.1391	1.9	0.0208	0.9	0.44	132.4	1.1	132.2	2.4	128.9	41.2	132.4	1.1	NA
-Bon Composite Spot 193	227	14863	3.6	20.1929	1.9	0.1417	2.2	0.0208	1.1	0.49	132.5	1.4	134.5	2.8	171.6	44.6	132.5	1.4	NA
-Bon Composite Spot 25	174	5615	3.2	20.9556	1.8	0.1365	2.1	0.0208	1.1	0.53	132.5	1.4	129.9	2.6	84.4	42.3	132.5	1.4	NA
-Bon Composite Spot 227	251	17081	3.1	20.6786	1.7	0.1385	2.1	0.0208	1.2	0.56	132.6	1.5	131.7	2.5	115.9	40.1	132.6	1.5	NA
-Bon Composite Spot 95	525	25597	1.9	21.0282	1.5	0.1363	1.9	0.0208	1.3	0.66	132.7	1.7	129.8	2.4	76.1	34.6	132.7	1.7	NA

-Bon Composite Spot 281	732	130238	4.3	19.9444	1.0	0.1437	1.5	0.0208	1.1	0.76	132.7	1.5	136.4	1.9	200.5	22.3	132.7	1.5	NA
-Bon Composite Spot 15	274	9040	3.3	18.3775	1.5	0.1560	1.8	0.0208	1.1	0.57	132.8	1.4	147.2	2.5	387.2	33.8	132.8	1.4	NA
-Bon Composite Spot 160	213	10594	3.1	20.5556	1.4	0.1396	1.7	0.0208	1.0	0.55	132.8	1.3	132.7	2.2	129.9	34.1	132.8	1.3	NA
-Bon Composite Spot 192	144	74409	3.5	21.0585	2.3	0.1363	2.5	0.0208	1.1	0.43	132.9	1.4	129.8	3.0	72.7	53.6	132.9	1.4	NA
-Bon Composite Spot 19	279	45063	3.2	19.1525	1.3	0.1499	1.6	0.0208	1.0	0.62	132.9	1.3	141.9	2.1	293.7	28.9	132.9	1.3	NA
-Bon Composite Spot 29	212	77642	5.2	20.8377	1.3	0.1378	1.7	0.0208	1.1	0.64	133.0	1.5	131.1	2.1	97.8	31.1	133.0	1.5	NA
-Bon Composite Spot 41	433	35677	2.8	20.5617	1.1	0.1398	1.7	0.0209	1.3	0.78	133.1	1.8	132.9	2.1	129.2	24.8	133.1	1.8	NA
-Bon Composite Spot 280	397	29711	3.0	13.6469	4.2	0.2106	4.4	0.0209	1.2	0.27	133.1	1.6	194.1	7.8	1020.7	85.8	133.1	1.6	NA
-Bon Composite Spot 236	241	83902	2.5	20.2226	1.2	0.1421	1.5	0.0209	0.8	0.55	133.1	1.1	135.0	1.8	168.2	28.5	133.1	1.1	NA
-Bon Composite Spot 314	593	106642	2.4	19.0941	1.2	0.1506	1.5	0.0209	1.0	0.65	133.1	1.3	142.4	2.0	300.7	26.5	133.1	1.3	NA
-Bon Composite Spot 246	166	15406	4.2	18.5815	1.9	0.1548	2.3	0.0209	1.2	0.53	133.1	1.6	146.1	3.1	362.4	43.8	133.1	1.6	NA
-Bon Composite Spot 33	209	19761	2.7	20.2246	1.3	0.1423	1.6	0.0209	0.9	0.58	133.3	1.2	135.1	2.0	167.9	29.7	133.3	1.2	NA
-Bon Composite Spot 159	237	11905	3.3	20.8873	1.5	0.1378	1.9	0.0209	1.2	0.64	133.3	1.6	131.1	2.4	92.1	34.8	133.3	1.6	NA
-Bon Composite Spot 219	158	7077	4.0	19.4717	1.7	0.1479	2.1	0.0209	1.2	0.58	133.3	1.6	140.0	2.8	255.8	39.5	133.3	1.6	NA
-Bon Composite Spot 69	110	4659	9.1	21.1809	2.2	0.1361	2.5	0.0209	1.1	0.44	133.4	1.4	129.5	3.0	59.0	53.3	133.4	1.4	NA
-Bon Composite Spot 209	281	5950	3.1	14.3356	4.5	0.2013	4.6	0.0209	1.1	0.25	133.6	1.5	186.2	7.9	920.3	92.3	133.6	1.5	NA
-Bon Composite Spot 84	438	17836	3.0	20.0583	1.5	0.1439	1.8	0.0209	1.0	0.56	133.6	1.3	136.5	2.3	187.2	34.3	133.6	1.3	NA
-Bon Composite Spot 105	199	8047	3.3	20.3926	1.5	0.1415	1.8	0.0209	1.0	0.57	133.6	1.3	134.4	2.2	148.6	34.4	133.6	1.3	NA
-Bon Composite Spot 75	413	192712	3.4	18.6672	1.3	0.1547	1.5	0.0210	0.8	0.53	133.7	1.0	146.1	2.0	352.0	28.8	133.7	1.0	NA
-Bon Composite Spot 189	427	9794	3.1	20.0615	1.7	0.1440	2.2	0.0210	1.5	0.66	133.8	1.9	136.6	2.8	186.8	38.9	133.8	1.9	NA
-Bon Composite Spot 224	352	94198	3.5	20.3489	1.3	0.1420	1.8	0.0210	1.2	0.69	133.8	1.6	134.8	2.3	153.6	30.6	133.8	1.6	NA
-Bon Composite Spot 57	699	16868	2.1	19.2020	1.5	0.1506	1.7	0.0210	0.9	0.52	133.9	1.2	142.5	2.3	287.8	33.4	133.9	1.2	NA
-Bon Composite Spot 23	221	13009	2.7	20.3636	1.5	0.1421	1.8	0.0210	0.9	0.51	133.9	1.2	134.9	2.2	151.9	35.6	133.9	1.2	NA
-Bon Composite Spot 136	275	9474	2.9	18.4052	1.9	0.1573	2.1	0.0210	1.1	0.49	134.0	1.4	148.3	3.0	383.9	41.9	134.0	1.4	NA
-Bon Composite Spot 101	372	93642	2.9	19.6667	1.2	0.1472	1.4	0.0210	0.8	0.57	134.0	1.1	139.5	1.9	232.9	27.4	134.0	1.1	NA
-Bon Composite Spot 70	502	38552	2.0	20.2407	0.9	0.1431	1.4	0.0210	1.1	0.80	134.1	1.5	135.8	1.8	166.1	20.4	134.1	1.5	NA
-Bon Composite Spot 20	272	6194	2.2	21.3732	1.7	0.1356	1.9	0.0210	0.8	0.43	134.1	1.1	129.1	2.3	37.3	40.9	134.1	1.1	NA
-Bon Composite Spot 77	296	10606	2.8	20.0968	2.0	0.1444	2.4	0.0211	1.2	0.53	134.3	1.7	137.0	3.0	182.7	46.5	134.3	1.7	NA
-Bon Composite Spot 194	157	11251	3.3	20.6405	2.6	0.1409	3.0	0.0211	1.5	0.51	134.6	2.0	133.8	3.8	120.2	60.5	134.6	2.0	NA
-Bon Composite Spot 261	264	9099	3.1	21.2509	2.0	0.1369	2.5	0.0211	1.5	0.59	134.7	1.9	130.3	3.0	51.1	47.5	134.7	1.9	NA
-Bon Composite Spot 276	637	47325	3.9	20.2666	0.9	0.1437	1.4	0.0211	1.1	0.78	134.8	1.5	136.3	1.8	163.1	20.7	134.8	1.5	NA
-Bon Composite Spot 85	140	7179	3.8	21.6909	1.9	0.1343	2.3	0.0211	1.2	0.53	134.8	1.6	127.9	2.7	1.9	46.4	134.8	1.6	NA
-Bon Composite Spot 38	321	6366	2.5	15.3418	2.8	0.1900	3.1	0.0212	1.3	0.40	135.0	1.7	176.7	5.0	779.3	59.8	135.0	1.7	NA
-Bon Composite Spot 62	393	91367	3.7	20.0191	1.3	0.1458	1.7	0.0212	1.1	0.65	135.1	1.5	138.2	2.2	191.8	30.0	135.1	1.5	NA
-Bon Composite Spot 235	158	5570	3.6	21.2242	1.6	0.1376	2.1	0.0212	1.4	0.65	135.2	1.9	130.9	2.6	54.0	38.5	135.2	1.9	NA
-Bon Composite Spot 187	286	13422	3.5	21.2724	2.0	0.1374	2.3	0.0212	1.0	0.45	135.3	1.4	130.7	2.8	48.6	48.6	135.3	1.4	NA
-Bon Composite Spot 143	116	8266	2.4	20.1261	1.8	0.1453	2.2	0.0212	1.1	0.53	135.4	1.5	137.8	2.8	179.3	42.8	135.4	1.5	NA
-Bon Composite Spot 263	502	107482	1.8	20.4293	0.8	0.1433	1.4	0.0212	1.2	0.81	135.5	1.6	135.9	1.8	144.4	19.7	135.5	1.6	NA
-Bon Composite Spot 154	371	189005	2.2	20.0332	1.2	0.1463	1.4	0.0213	0.8	0.57	135.6	1.1	138.6	1.9	190.1	27.4	135.6	1.1	NA
-Bon Composite Spot 216	459	42413	2.4	20.8930	1.2	0.1403	1.5	0.0213	1.0	0.62	135.7	1.3	133.3	1.9	91.5	28.7	135.7	1.3	NA
-Bon Composite Spot 89	327	119536	2.5	19.5062	0.9	0.1504	1.3	0.0213	1.0	0.74	135.8	1.3	142.3	1.7	251.8	19.9	135.8	1.3	NA
-Bon Composite Spot 168	489	43411	4.4	20.6301	1.4	0.1425	1.9	0.0213	1.3	0.69	136.0	1.8	135.2	2.4	121.4	32.2	136.0	1.8	NA
-Bon Composite Spot 157	164	34164	3.0	20.8584	1.7	0.1409	2.2	0.0213	1.3	0.60	136.1	1.7	133.9	2.7	95.4	40.9	136.1	1.7	NA
-Bon Composite Spot 114	153	12626	3.6	17.7473	2.6	0.1657	2.8	0.0213	0.9	0.34	136.1	1.3	155.7	4.0	465.1	58.0	136.1	1.3	NA
-Bon Composite Spot 140	494	19709	1.9	20.5928	1.2	0.1428	1.8	0.0213	1.4	0.76	136.1	1.8	135.6	2.3	125.6	27.6	136.1	1.8	NA
-Bon Composite Spot 14	261	8267	58.9	20.3982	1.4	0.1443	1.8	0.0214	1.1	0.60	136.2	1.5	136.8	2.3	148.0	33.8	136.2	1.5	NA
-Bon Composite Spot 24	67	46032	3.0	21.0023	2.3	0.1401	2.7	0.0214	1.4	0.54	136.2	1.9	133.2	3.4	79.1	54.0	136.2	1.9	NA

-Bon Composite Spot 201	163	3904	4.8	13.5836	7.2	0.2167	7.2	0.0214	1.2	0.17	136.2	1.6	199.1	13.1	1030.1	144.7	136.2	1.6	NA
-Bon Composite Spot 213	245	62108	2.5	20.6587	1.4	0.1425	1.8	0.0214	1.1	0.64	136.2	1.5	135.2	2.3	118.1	32.6	136.2	1.5	NA
-Bon Composite Spot 27	238	86309	2.5	19.9821	1.3	0.1474	1.7	0.0214	1.1	0.66	136.3	1.5	139.6	2.3	196.1	30.1	136.3	1.5	NA
-Bon Composite Spot 36	196	10531	4.2	20.4407	2.3	0.1441	2.6	0.0214	1.3	0.48	136.3	1.7	136.7	3.3	143.1	53.8	136.3	1.7	NA
-Bon Composite Spot 210	146	6006	3.0	21.5543	1.8	0.1366	2.0	0.0214	1.0	0.51	136.3	1.4	130.0	2.5	17.1	42.2	136.3	1.4	NA
-Bon Composite Spot 297	119	6720	2.2	21.0128	1.5	0.1402	1.9	0.0214	1.2	0.63	136.3	1.7	133.2	2.4	77.9	35.9	136.3	1.7	NA
-Bon Composite Spot 98	146	12786	1.8	19.5108	2.2	0.1510	2.4	0.0214	0.8	0.36	136.3	1.1	142.8	3.1	251.3	50.5	136.3	1.1	NA
-Bon Composite Spot 144	325	79347	2.7	20.0331	1.4	0.1470	1.7	0.0214	0.9	0.56	136.3	1.3	139.3	2.2	190.2	32.4	136.3	1.3	NA
-Bon Composite Spot 252	180	2985	2.8	22.5126	1.4	0.1309	1.6	0.0214	0.9	0.53	136.4	1.2	124.9	1.9	NA	NA	136.4	1.2	NA
-Bon Composite Spot 226	121	93837	4.5	19.9954	2.0	0.1475	2.5	0.0214	1.4	0.57	136.5	1.9	139.7	3.2	194.5	47.3	136.5	1.9	NA
-Bon Composite Spot 212	140	6988	2.7	20.1229	2.2	0.1467	2.5	0.0214	1.1	0.43	136.6	1.4	139.0	3.2	179.7	52.1	136.6	1.4	NA
-Bon Composite Spot 87	142	42417	3.3	19.9966	1.8	0.1476	2.1	0.0214	1.1	0.53	136.6	1.5	139.8	2.7	194.4	41.5	136.6	1.5	NA
-Bon Composite Spot 214	91	6581	5.7	20.6042	3.4	0.1433	3.6	0.0214	1.1	0.32	136.7	1.5	136.0	4.5	124.3	79.5	136.7	1.5	NA
-Bon Composite Spot 4	130	74476	3.5	19.6611	1.9	0.1504	2.2	0.0215	1.1	0.51	136.8	1.5	142.3	2.9	233.6	43.5	136.8	1.5	NA
-Bon Composite Spot 240	199	25951	2.5	20.4818	1.9	0.1444	2.3	0.0215	1.4	0.60	136.9	1.9	137.0	3.0	138.4	43.5	136.9	1.9	NA
-Bon Composite Spot 117	155	3619	4.5	22.2132	4.1	0.1332	4.4	0.0215	1.5	0.35	137.0	2.1	127.0	5.3	NA	NA	137.0	2.1	NA
-Bon Composite Spot 96	341	70678	2.9	20.6308	1.2	0.1436	1.5	0.0215	0.9	0.62	137.1	1.2	136.2	1.9	121.3	27.6	137.1	1.2	NA
-Bon Composite Spot 86	167	139114	2.4	19.5648	1.9	0.1515	2.1	0.0215	0.9	0.41	137.1	1.2	143.2	2.8	244.9	44.5	137.1	1.2	NA
-Bon Composite Spot 292	203	73526	3.5	20.7168	1.4	0.1431	1.9	0.0215	1.2	0.67	137.2	1.7	135.8	2.4	111.5	32.9	137.2	1.7	NA
-Bon Composite Spot 103	138	12184	3.8	21.8054	1.7	0.1360	2.0	0.0215	1.1	0.52	137.2	1.4	129.5	2.5	NA	NA	137.2	1.4	NA
-Bon Composite Spot 176	342	33569	2.2	20.1154	1.2	0.1474	1.7	0.0215	1.2	0.69	137.2	1.6	139.6	2.2	180.6	28.3	137.2	1.6	NA
-Bon Composite Spot 291	137	20852	2.0	19.7761	2.1	0.1500	2.5	0.0215	1.4	0.57	137.3	1.9	141.9	3.3	220.1	47.8	137.3	1.9	NA
-Bon Composite Spot 248	191	44055	2.5	20.2085	1.7	0.1468	2.1	0.0215	1.3	0.60	137.3	1.7	139.1	2.8	169.8	39.7	137.3	1.7	NA
-Bon Composite Spot 279	183	26686	3.2	20.8058	1.5	0.1426	1.9	0.0215	1.3	0.66	137.3	1.7	135.4	2.5	101.3	34.6	137.3	1.7	NA
-Bon Composite Spot 102	472	33424	1.7	20.7216	1.2	0.1432	2.0	0.0215	1.6	0.79	137.3	2.2	135.9	2.6	110.9	29.3	137.3	2.2	NA
-Bon Composite Spot 72	82	4649	2.6	19.2094	3.7	0.1545	3.9	0.0215	1.3	0.34	137.3	1.8	145.9	5.3	287.0	83.7	137.3	1.8	NA
-Bon Composite Spot 265	217	18321	3.6	19.2463	1.4	0.1543	1.7	0.0215	1.0	0.58	137.4	1.3	145.7	2.2	282.6	30.9	137.4	1.3	NA
-Bon Composite Spot 202	308	9214	2.2	20.9041	1.0	0.1421	1.6	0.0216	1.2	0.76	137.5	1.6	134.9	2.0	90.2	24.5	137.5	1.6	NA
-Bon Composite Spot 161	406	45886	2.0	20.2194	1.1	0.1471	1.4	0.0216	0.9	0.65	137.7	1.3	139.4	1.9	168.5	25.4	137.7	1.3	NA
-Bon Composite Spot 147	87	4901	3.0	20.8798	3.6	0.1427	3.8	0.0216	1.3	0.35	137.9	1.8	135.5	4.9	93.0	85.1	137.9	1.8	NA
-Bon Composite Spot 290	211	160144	2.7	20.2667	1.3	0.1470	1.7	0.0216	1.0	0.60	137.9	1.4	139.3	2.2	163.1	31.4	137.9	1.4	NA
-Bon Composite Spot 113	320	9587	2.4	20.6816	1.6	0.1441	1.8	0.0216	0.9	0.49	137.9	1.2	136.7	2.3	115.5	37.5	137.9	1.2	NA
-Bon Composite Spot 35	143	4712	3.1	21.0249	1.6	0.1420	2.1	0.0217	1.4	0.65	138.1	1.9	134.8	2.7	76.5	37.9	138.1	1.9	NA
-Bon Composite Spot 44	107	8094	2.0	17.2579	3.6	0.1730	3.8	0.0217	1.5	0.38	138.2	2.0	162.0	5.8	526.7	78.0	138.2	2.0	NA
-Bon Composite Spot 99	1399	44106	3.8	20.4732	0.9	0.1459	1.5	0.0217	1.2	0.81	138.2	1.6	138.3	1.9	139.4	20.2	138.2	1.6	NA
-Bon Composite Spot 171	89	56744	2.2	20.6489	2.2	0.1447	2.5	0.0217	1.3	0.51	138.3	1.8	137.2	3.2	119.3	50.9	138.3	1.8	NA
-Bon Composite Spot 22	880	231833	2.9	20.5031	1.0	0.1458	1.8	0.0217	1.5	0.83	138.3	2.1	138.2	2.3	135.9	23.8	138.3	2.1	NA
-Bon Composite Spot 155	94	3169	2.2	23.3185	2.2	0.1282	2.6	0.0217	1.4	0.52	138.4	1.8	122.5	3.0	NA	NA	138.4	1.8	NA
-Bon Composite Spot 264	96	23811	2.6	20.5408	2.2	0.1456	2.6	0.0217	1.3	0.51	138.4	1.8	138.0	3.3	131.6	51.6	138.4	1.8	NA
-Bon Composite Spot 170	131	29233	2.6	20.7755	1.6	0.1439	2.0	0.0217	1.3	0.62	138.4	1.7	136.6	2.6	104.8	37.7	138.4	1.7	NA
-Bon Composite Spot 307	300	18514	2.6	20.1268	1.3	0.1486	1.6	0.0217	1.0	0.62	138.4	1.4	140.7	2.1	179.3	29.3	138.4	1.4	NA
-Bon Composite Spot 218	77	47927	2.2	18.2850	2.3	0.1636	2.7	0.0217	1.3	0.49	138.4	1.8	153.9	3.8	398.6	52.6	138.4	1.8	NA
-Bon Composite Spot 46	503	30550	2.1	20.7108	1.2	0.1445	1.8	0.0217	1.4	0.75	138.5	1.9	137.0	2.3	112.2	28.8	138.5	1.9	NA
-Bon Composite Spot 139	78	4713	2.3	21.7532	2.7	0.1376	3.1	0.0217	1.5	0.49	138.5	2.1	130.9	3.8	NA	NA	138.5	2.1	NA
-Bon Composite Spot 110	101	27583	3.1	20.9740	2.7	0.1427	2.9	0.0217	1.2	0.40	138.5	1.6	135.5	3.7	82.3	63.0	138.5	1.6	NA
-Bon Composite Spot 7	138	11668	2.0	20.1592	1.8	0.1485	2.0	0.0217	0.9	0.44	138.5	1.2	140.6	2.6	175.5	41.4	138.5	1.2	NA
-Bon Composite Spot 52	89	14998	2.8	19.3931	3.2	0.1544	3.4	0.0217	1.3	0.37	138.6	1.8	145.8	4.7	265.2	73.2	138.6	1.8	NA

-Bon Composite Spot 255	128	40032	1.8	21.0961	1.8	0.1420	2.1	0.0217	1.1	0.52	138.6	1.5	134.8	2.7	68.5	43.0	138.6	1.5	NA
-Bon Composite Spot 180	117	15066	2.6	17.7107	2.3	0.1692	2.7	0.0217	1.3	0.48	138.6	1.8	158.7	3.9	469.6	51.4	138.6	1.8	NA
-Bon Composite Spot 151	796	133993	3.2	20.0350	0.8	0.1496	1.2	0.0217	1.0	0.77	138.7	1.3	141.5	1.6	189.9	18.4	138.7	1.3	NA
-Bon Composite Spot 296	126	4762	2.5	20.6650	2.8	0.1450	3.0	0.0217	1.1	0.38	138.7	1.6	137.5	3.8	117.4	64.9	138.7	1.6	NA
-Bon Composite Spot 242	130	7232	2.0	21.0998	1.9	0.1420	2.2	0.0217	1.1	0.52	138.7	1.6	134.9	2.8	68.1	45.1	138.7	1.6	NA
-Bon Composite Spot 141	232	5905	2.5	18.4017	1.7	0.1629	2.0	0.0217	1.1	0.55	138.7	1.5	153.2	2.9	384.3	37.8	138.7	1.5	NA
-Bon Composite Spot 311	131	38793	2.2	20.5261	2.1	0.1461	2.3	0.0218	1.1	0.46	138.7	1.5	138.4	3.0	133.3	49.1	138.7	1.5	NA
-Bon Composite Spot 274	119	4091	3.1	22.2085	2.2	0.1350	2.5	0.0218	1.1	0.43	138.8	1.5	128.6	3.0	NA	NA	138.8	1.5	NA
-Bon Composite Spot 92	113	17753	2.7	20.6518	2.3	0.1453	2.7	0.0218	1.5	0.55	138.8	2.0	137.7	3.5	118.9	53.4	138.8	2.0	NA
-Bon Composite Spot 257	129	30457	3.3	20.2880	1.9	0.1479	2.3	0.0218	1.3	0.57	138.9	1.8	140.1	3.0	160.7	44.7	138.9	1.8	NA
-Bon Composite Spot 288	134	5408	2.4	18.8292	4.0	0.1594	4.1	0.0218	1.1	0.27	138.9	1.5	150.2	5.8	332.5	90.0	138.9	1.5	NA
-Bon Composite Spot 45	82	4862	3.2	21.2985	3.9	0.1409	4.1	0.0218	1.4	0.33	138.9	1.9	133.9	5.1	45.8	92.1	138.9	1.9	NA
-Bon Composite Spot 267	244	43377	1.8	18.1164	2.5	0.1657	2.7	0.0218	0.9	0.35	138.9	1.3	155.7	3.9	419.3	56.3	138.9	1.3	NA
-Bon Composite Spot 309	118	7859	3.5	22.1783	2.2	0.1354	2.7	0.0218	1.5	0.56	138.9	2.1	128.9	3.3	NA	NA	138.9	2.1	NA
-Bon Composite Spot 271	139	133080	2.3	19.7738	1.6	0.1519	2.0	0.0218	1.2	0.59	139.0	1.6	143.6	2.7	220.4	37.2	139.0	1.6	NA
-Bon Composite Spot 130	143	4651	2.1	19.2893	1.6	0.1558	1.9	0.0218	1.1	0.57	139.1	1.5	147.1	2.6	277.5	36.1	139.1	1.5	NA
-Bon Composite Spot 172	121	22928	2.9	16.9790	3.5	0.1771	3.8	0.0218	1.3	0.35	139.1	1.8	165.6	5.8	562.3	77.3	139.1	1.8	NA
-Bon Composite Spot 118	148	16387	3.6	20.4654	1.9	0.1470	2.3	0.0218	1.3	0.56	139.2	1.8	139.3	3.0	140.2	44.8	139.2	1.8	NA
-Bon Composite Spot 59	154	4678	3.3	21.3835	2.2	0.1408	2.5	0.0218	1.2	0.49	139.3	1.7	133.7	3.1	36.2	51.6	139.3	1.7	NA
-Bon Composite Spot 42	96	21827	2.3	18.9408	1.6	0.1590	1.9	0.0218	0.9	0.51	139.3	1.3	149.8	2.6	319.1	36.3	139.3	1.3	NA
-Bon Composite Spot 133	117	12082	3.6	20.9406	2.5	0.1439	2.8	0.0219	1.1	0.41	139.4	1.5	136.5	3.5	86.1	59.9	139.4	1.5	NA
-Bon Composite Spot 142	115	3476	2.1	21.7661	2.0	0.1384	2.4	0.0219	1.3	0.55	139.4	1.8	131.7	2.9	NA	NA	139.4	1.8	NA
-Bon Composite Spot 251	118	23007	1.9	20.8871	1.6	0.1443	2.1	0.0219	1.3	0.65	139.5	1.9	136.9	2.7	92.1	37.6	139.5	1.9	NA
-Bon Composite Spot 43	121	7718	2.8	20.9177	2.2	0.1441	2.4	0.0219	0.9	0.39	139.5	1.3	136.7	3.1	88.7	52.7	139.5	1.3	NA
-Bon Composite Spot 55	177	17732	2.3	19.7400	1.6	0.1528	1.9	0.0219	1.0	0.54	139.5	1.4	144.4	2.5	224.3	36.7	139.5	1.4	NA
-Bon Composite Spot 215	284	35222	2.8	20.1457	1.7	0.1497	2.4	0.0219	1.6	0.68	139.6	2.2	141.7	3.1	177.1	40.4	139.6	2.2	NA
-Bon Composite Spot 163	146	104708	2.6	19.9234	1.7	0.1515	2.0	0.0219	1.0	0.48	139.6	1.3	143.2	2.7	202.9	40.6	139.6	1.3	NA
-Bon Composite Spot 1	1180	24615	5.7	20.8868	0.9	0.1445	1.4	0.0219	1.0	0.76	139.6	1.4	137.0	1.7	92.2	20.9	139.6	1.4	NA
-Bon Composite Spot 256	83	2687	2.9	24.1498	3.1	0.1250	3.4	0.0219	1.4	0.41	139.7	1.9	119.6	3.8	NA	NA	139.7	1.9	NA
-Bon Composite Spot 123	141	10337	2.4	19.6337	1.4	0.1539	1.7	0.0219	1.0	0.58	139.8	1.3	145.3	2.2	236.8	31.1	139.8	1.3	NA
-Bon Composite Spot 17	106	2968	2.8	17.3642	3.4	0.1741	3.6	0.0219	1.3	0.35	139.9	1.8	163.0	5.5	513.2	74.7	139.9	1.8	NA
-Bon Composite Spot 6	75	8494	2.7	20.6101	2.9	0.1467	3.1	0.0219	1.3	0.41	139.9	1.8	139.0	4.1	123.6	67.2	139.9	1.8	NA
-Bon Composite Spot 241	697	23838	1.6	20.7380	1.0	0.1459	1.6	0.0220	1.2	0.77	140.0	1.7	138.3	2.0	109.1	24.0	140.0	1.7	NA
-Bon Composite Spot 109	70	6989	3.0	21.2071	3.6	0.1428	3.8	0.0220	1.2	0.32	140.1	1.7	135.5	4.9	56.0	86.6	140.1	1.7	NA
-Bon Composite Spot 178	144	3360	2.9	22.0380	1.9	0.1374	2.2	0.0220	1.1	0.49	140.1	1.5	130.7	2.7	NA	NA	140.1	1.5	NA
-Bon Composite Spot 223	100	8483	2.7	20.6872	3.1	0.1464	3.2	0.0220	0.9	0.26	140.1	1.2	138.7	4.2	114.8	73.4	140.1	1.2	NA
-Bon Composite Spot 200	199	5503	2.9	18.6252	2.5	0.1627	2.8	0.0220	1.3	0.45	140.2	1.8	153.1	4.0	357.1	56.7	140.2	1.8	NA
-Bon Composite Spot 244	131	3200	2.4	19.0528	2.2	0.1591	2.7	0.0220	1.5	0.57	140.2	2.1	149.9	3.7	305.6	49.8	140.2	2.1	NA
-Bon Composite Spot 30	135	7665	2.1	19.5291	2.2	0.1552	2.4	0.0220	1.0	0.42	140.2	1.4	146.5	3.3	249.1	49.8	140.2	1.4	NA
-Bon Composite Spot 249	93	2250	2.4	23.6578	2.2	0.1281	2.7	0.0220	1.5	0.56	140.2	2.1	122.4	3.1	NA	NA	140.2	2.1	NA
-Bon Composite Spot 250	421	50078	3.8	20.7101	1.1	0.1464	1.8	0.0220	1.5	0.81	140.3	2.0	138.7	2.3	112.3	25.0	140.3	2.0	NA
-Bon Composite Spot 148	107	14906	2.7	20.2807	2.1	0.1495	2.3	0.0220	1.0	0.42	140.3	1.3	141.5	3.0	161.5	48.9	140.3	1.3	NA
-Bon Composite Spot 149	133	8536	2.4	18.5637	2.4	0.1634	2.7	0.0220	1.2	0.46	140.3	1.7	153.6	3.9	364.6	54.3	140.3	1.7	NA
-Bon Composite Spot 166	109	4208	3.0	20.7732	4.3	0.1460	4.5	0.0220	1.3	0.30	140.3	1.9	138.4	5.9	105.1	102.2	140.3	1.9	NA
-Bon Composite Spot 188	233	30263	2.8	19.7570	1.4	0.1536	1.8	0.0220	1.1	0.63	140.4	1.6	145.1	2.4	222.3	32.2	140.4	1.6	NA
-Bon Composite Spot 66	132	7934	2.1	21.5592	2.5	0.1408	2.9	0.0220	1.4	0.47	140.5	1.9	133.8	3.6	16.6	61.2	140.5	1.9	NA
-Bon Composite Spot 278	108	3568	2.6	19.9273	2.2	0.1524	2.4	0.0220	1.0	0.42	140.5	1.4	144.1	3.3	202.4	50.9	140.5	1.4	NA

-Bon Composite Spot 286	85	3437	2.6	19.9437	3.3	0.1524	3.6	0.0221	1.4	0.38	140.6	1.9	144.0	4.8	200.5	77.6	140.6	1.9	NA
-Bon Composite Spot 31	253	28411	2.9	20.5318	1.3	0.1480	1.7	0.0221	1.0	0.60	140.6	1.4	140.2	2.2	132.6	31.7	140.6	1.4	NA
-Bon Composite Spot 16	547	47773	1.8	20.2644	1.2	0.1500	1.7	0.0221	1.2	0.72	140.6	1.7	141.9	2.2	163.3	27.3	140.6	1.7	NA
-Bon Composite Spot 83	122	83030	3.2	21.2073	2.0	0.1434	2.3	0.0221	1.1	0.49	140.7	1.6	136.0	2.9	56.0	47.5	140.7	1.6	NA
-Bon Composite Spot 56	95	38119	2.7	18.2315	2.6	0.1668	3.0	0.0221	1.5	0.51	140.7	2.2	156.6	4.4	405.1	58.1	140.7	2.2	NA
-Bon Composite Spot 225	394	15305	13.0	20.3262	1.3	0.1498	1.6	0.0221	0.9	0.54	140.9	1.2	141.7	2.1	156.3	31.4	140.9	1.2	NA
-Bon Composite Spot 182	155	12417	1.7	18.7906	1.9	0.1621	2.3	0.0221	1.3	0.56	140.9	1.8	152.5	3.3	337.1	43.7	140.9	1.8	NA
-Bon Composite Spot 294	150	28132	3.3	21.0081	1.7	0.1451	2.0	0.0221	1.0	0.52	141.0	1.5	137.6	2.6	78.4	41.2	141.0	1.5	NA
-Bon Composite Spot 137	106	18249	2.4	21.5429	1.8	0.1415	2.2	0.0221	1.4	0.61	141.1	1.9	134.4	2.8	18.4	42.5	141.1	1.9	NA
-Bon Composite Spot 91	107	9697	3.7	20.8629	1.9	0.1462	2.1	0.0221	0.9	0.45	141.1	1.3	138.5	2.7	94.9	44.6	141.1	1.3	NA
-Bon Composite Spot 129	152	8367	5.2	19.5353	1.7	0.1561	2.0	0.0221	1.1	0.53	141.1	1.5	147.3	2.8	248.4	39.4	141.1	1.5	NA
-Bon Composite Spot 221	117	9804	2.7	18.2236	2.2	0.1674	2.6	0.0221	1.3	0.51	141.1	1.8	157.2	3.7	406.1	49.2	141.1	1.8	NA
-Bon Composite Spot 128	114	15111	2.9	21.8647	2.0	0.1395	2.3	0.0221	1.1	0.49	141.2	1.6	132.6	2.8	NA	NA	141.2	1.6	NA
-Bon Composite Spot 88	142	5158	3.4	21.4011	1.4	0.1426	2.0	0.0221	1.4	0.69	141.2	1.9	135.4	2.5	34.3	34.3	141.2	1.9	NA
-Bon Composite Spot 229	92	19442	2.6	20.9822	2.2	0.1456	2.5	0.0222	1.3	0.51	141.3	1.8	138.0	3.2	81.3	51.5	141.3	1.8	NA
-Bon Composite Spot 50	215	85765	2.5	20.0517	1.5	0.1525	1.8	0.0222	1.0	0.58	141.5	1.5	144.1	2.4	188.0	34.0	141.5	1.5	NA
-Bon Composite Spot 122	102	388373	3.2	19.7911	2.2	0.1546	2.4	0.0222	1.0	0.42	141.5	1.4	145.9	3.3	218.3	51.6	141.5	1.4	NA
-Bon Composite Spot 222	339	17152	2.2	20.4281	1.2	0.1498	1.6	0.0222	1.0	0.63	141.6	1.4	141.8	2.1	144.5	28.7	141.6	1.4	NA
-Bon Composite Spot 82	790	57497	4.7	19.7400	0.9	0.1551	1.8	0.0222	1.6	0.86	141.7	2.2	146.4	2.5	224.3	21.4	141.7	2.2	NA
-Bon Composite Spot 179	79	6824	2.8	21.8516	2.5	0.1402	2.9	0.0222	1.5	0.52	141.8	2.1	133.2	3.6	NA	NA	141.8	2.1	NA
-Bon Composite Spot 243	150	4389	3.3	21.6776	1.6	0.1414	2.0	0.0222	1.2	0.61	141.8	1.7	134.3	2.5	3.4	38.4	141.8	1.7	NA
-Bon Composite Spot 313	130	52726	3.6	17.2932	1.9	0.1772	2.3	0.0222	1.2	0.52	141.8	1.7	165.7	3.5	522.2	42.3	141.8	1.7	NA
-Bon Composite Spot 39	208	7099	2.8	17.4650	3.5	0.1755	3.7	0.0222	1.2	0.33	141.8	1.7	164.2	5.6	500.5	77.1	141.8	1.7	NA
-Bon Composite Spot 233	108	2164	2.4	18.0901	2.3	0.1695	2.5	0.0222	1.1	0.44	141.8	1.6	159.0	3.7	422.5	50.7	141.8	1.6	NA
-Bon Composite Spot 121	442	24892	2.5	20.3034	1.1	0.1511	1.9	0.0223	1.5	0.82	141.9	2.2	142.9	2.5	158.9	25.0	141.9	2.2	NA
-Bon Composite Spot 47	388	78630	1.3	20.3786	1.3	0.1505	1.5	0.0223	0.7	0.47	141.9	1.0	142.4	1.9	150.2	30.2	141.9	1.0	NA
-Bon Composite Spot 165	472	54568	3.7	20.2864	1.1	0.1513	1.3	0.0223	0.8	0.62	142.0	1.2	143.0	1.8	160.8	24.6	142.0	1.2	NA
-Bon Composite Spot 65	80	3991	2.4	21.4595	4.2	0.1430	5.1	0.0223	3.0	0.58	142.0	4.2	135.7	6.5	27.7	99.9	142.0	4.2	NA
-Bon Composite Spot 269	78	2822	2.5	21.2605	3.3	0.1444	3.4	0.0223	1.1	0.32	142.0	1.5	136.9	4.4	50.0	77.6	142.0	1.5	NA
-Bon Composite Spot 26	113	507111	3.5	19.6919	2.1	0.1559	2.4	0.0223	1.1	0.47	142.0	1.6	147.1	3.2	229.9	47.8	142.0	1.6	NA
-Bon Composite Spot 303	107	24563	2.9	17.2069	2.1	0.1785	2.4	0.0223	1.2	0.48	142.1	1.6	166.8	3.7	533.2	46.7	142.1	1.6	NA
-Bon Composite Spot 13	316	20943	2.6	20.5144	1.0	0.1497	1.6	0.0223	1.3	0.79	142.1	1.8	141.7	2.2	134.6	23.9	142.1	1.8	NA
-Bon Composite Spot 169	92	2987	2.9	21.1199	2.5	0.1454	2.8	0.0223	1.2	0.42	142.1	1.6	137.9	3.6	65.8	59.7	142.1	1.6	NA
-Bon Composite Spot 145	221	6746	3.3	21.2213	1.4	0.1448	1.7	0.0223	1.0	0.59	142.1	1.4	137.3	2.2	54.4	33.1	142.1	1.4	NA
-Bon Composite Spot 173	107	158030	2.0	18.5115	2.0	0.1661	2.5	0.0223	1.5	0.59	142.2	2.1	156.0	3.6	370.9	45.5	142.2	2.1	NA
-Bon Composite Spot 302	88	2754	2.5	16.1095	4.7	0.1909	4.8	0.0223	1.1	0.22	142.3	1.5	177.4	7.8	675.8	100.3	142.3	1.5	NA
-Bon Composite Spot 275	219	7645	2.6	20.9021	1.5	0.1471	2.0	0.0223	1.3	0.66	142.3	1.8	139.4	2.6	90.4	35.1	142.3	1.8	NA
-Bon Composite Spot 220	95	5788	2.3	18.8193	2.5	0.1634	2.7	0.0223	1.2	0.42	142.3	1.6	153.7	3.9	333.6	56.2	142.3	1.6	NA
-Bon Composite Spot 183	125	54768	3.5	20.4056	1.7	0.1508	2.1	0.0223	1.2	0.56	142.4	1.6	142.6	2.8	147.1	40.4	142.4	1.6	NA
-Bon Composite Spot 100	115	10590	2.7	18.3948	2.0	0.1674	2.4	0.0223	1.4	0.58	142.4	2.0	157.1	3.5	385.1	44.5	142.4	2.0	NA
-Bon Composite Spot 232	402	68625	2.4	20.8225	1.2	0.1479	1.4	0.0223	0.8	0.54	142.4	1.1	140.0	1.9	99.5	28.6	142.4	1.1	NA
-Bon Composite Spot 237	103	7778	3.3	20.8020	2.4	0.1481	2.7	0.0224	1.1	0.41	142.5	1.5	140.2	3.5	101.8	57.9	142.5	1.5	NA
-Bon Composite Spot 0	92	2909	3.4	21.5765	2.1	0.1429	2.4	0.0224	1.1	0.47	142.6	1.6	135.6	3.1	14.6	51.2	142.6	1.6	NA
-Bon Composite Spot 111	108	53651	2.9	20.4103	1.8	0.1510	2.2	0.0224	1.1	0.52	142.6	1.6	142.8	2.9	146.6	43.3	142.6	1.6	NA
-Bon Composite Spot 277	71	4785	3.1	20.6961	2.3	0.1490	2.7	0.0224	1.4	0.52	142.7	2.0	141.1	3.5	113.9	54.1	142.7	2.0	NA
-Bon Composite Spot 5	1541	107064	1.1	20.4147	0.8	0.1512	1.5	0.0224	1.3	0.85	142.8	1.8	142.9	2.0	146.1	18.9	142.8	1.8	NA
-Bon Composite Spot 10	197	66825	1.9	19.2835	1.4	0.1601	1.8	0.0224	1.1	0.61	142.8	1.5	150.8	2.5	278.2	31.9	142.8	1.5	NA

-Bon Composite Spot 120	182	23583	3.1	19.7522	2.0	0.1564	2.1	0.0224	0.8	0.40	142.9	1.2	147.6	2.9	222.9	45.2	142.9	1.2	NA
-Bon Composite Spot 272	130	7623	2.8	20.2395	2.5	0.1527	2.7	0.0224	1.0	0.36	142.9	1.3	144.3	3.6	166.2	58.3	142.9	1.3	NA
-Bon Composite Spot 293	341	65423	1.8	20.3638	1.1	0.1518	1.5	0.0224	1.0	0.68	143.0	1.4	143.5	2.0	151.9	25.8	143.0	1.4	NA
-Bon Composite Spot 287	92	4578	2.5	21.1943	2.1	0.1460	2.5	0.0225	1.4	0.55	143.1	1.9	138.4	3.2	57.4	50.0	143.1	1.9	NA
-Bon Composite Spot 245	299	174655	2.2	19.7178	1.5	0.1569	1.8	0.0225	1.0	0.53	143.2	1.3	148.0	2.5	226.9	35.1	143.2	1.3	NA
-Bon Composite Spot 76	59	1775	2.8	22.7536	5.5	0.1360	5.6	0.0225	1.2	0.22	143.2	1.7	129.5	6.9	NA	NA	143.2	1.7	NA
-Bon Composite Spot 61	67	3317	2.2	18.9105	3.0	0.1637	3.2	0.0225	1.2	0.37	143.2	1.7	154.0	4.6	322.7	67.7	143.2	1.7	NA
-Bon Composite Spot 283	123	5203	3.7	21.0284	1.5	0.1475	1.9	0.0225	1.2	0.64	143.4	1.7	139.7	2.5	76.1	35.0	143.4	1.7	NA
-Bon Composite Spot 51	116	9595	3.9	20.3737	2.1	0.1523	2.5	0.0225	1.3	0.53	143.6	1.9	144.0	3.3	150.8	49.4	143.6	1.9	NA
-Bon Composite Spot 195	187	6512	2.9	19.5409	2.4	0.1590	2.6	0.0225	1.0	0.38	143.7	1.4	149.8	3.7	247.7	55.9	143.7	1.4	NA
-Bon Composite Spot 71	130	10447	4.2	15.2473	4.8	0.2038	5.0	0.0225	1.3	0.26	143.7	1.8	188.3	8.6	792.2	101.4	143.7	1.8	NA
-Bon Composite Spot 289	543	29603	1.8	20.3525	1.2	0.1528	1.6	0.0226	1.1	0.69	143.8	1.6	144.4	2.2	153.2	27.9	143.8	1.6	NA
-Bon Composite Spot 104	854	109644	1.6	20.2452	0.8	0.1539	1.4	0.0226	1.2	0.81	144.1	1.7	145.3	1.9	165.6	19.6	144.1	1.7	NA
-Bon Composite Spot 177	128	7806	2.4	17.6258	1.7	0.1768	1.9	0.0226	1.0	0.51	144.1	1.4	165.3	2.9	480.3	36.5	144.1	1.4	NA
-Bon Composite Spot 115	2559	744690	1.2	20.4931	0.7	0.1522	1.4	0.0226	1.1	0.84	144.2	1.6	143.8	1.8	137.1	17.4	144.2	1.6	NA
-Bon Composite Spot 40	146	17638	2.9	19.1064	1.6	0.1633	2.0	0.0226	1.3	0.62	144.3	1.8	153.6	2.9	299.2	36.5	144.3	1.8	NA
-Bon Composite Spot 134	106	28508	2.1	19.2181	2.4	0.1625	2.7	0.0227	1.2	0.45	144.4	1.7	152.9	3.8	285.9	54.9	144.4	1.7	NA
-Bon Composite Spot 295	105	7184	2.1	21.0601	2.0	0.1483	2.4	0.0227	1.4	0.59	144.5	2.0	140.4	3.2	72.6	46.6	144.5	2.0	NA
-Bon Composite Spot 37	827	26277	2.6	20.6082	0.7	0.1516	1.4	0.0227	1.2	0.86	144.5	1.7	143.3	1.9	123.9	17.3	144.5	1.7	NA
-Bon Composite Spot 48	106	16554	2.5	20.0160	2.1	0.1561	2.4	0.0227	1.2	0.48	144.5	1.7	147.3	3.4	192.1	49.9	144.5	1.7	NA
-Bon Composite Spot 135	147	8832	3.5	20.1341	1.9	0.1552	2.3	0.0227	1.3	0.58	144.6	1.9	146.5	3.1	178.4	43.8	144.6	1.9	NA
-Bon Composite Spot 312	462	113809	2.1	19.8931	1.0	0.1571	1.4	0.0227	1.0	0.68	144.6	1.4	148.2	1.9	206.4	24.0	144.6	1.4	NA
-Bon Composite Spot 254	104	5093	2.5	21.6154	2.0	0.1446	2.3	0.0227	1.1	0.49	144.6	1.6	137.2	2.9	10.3	47.2	144.6	1.6	NA
-Bon Composite Spot 81	75	10657	2.8	21.1417	2.5	0.1479	3.1	0.0227	1.7	0.57	144.7	2.5	140.1	4.0	63.4	60.5	144.7	2.5	NA
-Bon Composite Spot 268	78	4663	3.9	15.9594	3.0	0.1961	3.1	0.0227	0.9	0.30	144.7	1.3	181.8	5.2	695.7	63.7	144.7	1.3	NA
-Bon Composite Spot 150	221	25342	3.0	20.4289	1.7	0.1533	2.1	0.0227	1.2	0.58	144.8	1.8	144.8	2.9	144.4	40.7	144.8	1.8	NA
-Bon Composite Spot 191	146	28914	9.3	17.2197	1.8	0.1818	2.2	0.0227	1.2	0.53	144.8	1.7	169.6	3.4	531.6	40.2	144.8	1.7	NA
-Bon Composite Spot 184	503	20771	3.3	20.5377	1.3	0.1529	1.9	0.0228	1.3	0.70	145.3	1.9	144.5	2.5	132.0	31.3	145.3	1.9	NA
-Bon Composite Spot 94	592	44957	1.3	20.1705	1.1	0.1557	1.5	0.0228	1.0	0.69	145.3	1.5	147.0	2.1	174.2	26.0	145.3	1.5	NA
-Bon Composite Spot 230	175	15685	3.0	19.2398	1.8	0.1633	2.0	0.0228	1.0	0.49	145.3	1.4	153.6	2.9	283.4	40.2	145.3	1.4	NA
-Bon Composite Spot 298	98	5523	2.6	15.9627	2.7	0.1971	2.9	0.0228	1.0	0.33	145.5	1.4	182.7	4.8	695.3	57.5	145.5	1.4	NA
-Bon Composite Spot 231	97	6989	1.4	15.1129	2.5	0.2082	2.8	0.0228	1.3	0.45	145.5	1.8	192.1	4.8	810.8	51.6	145.5	1.8	NA
-Bon Composite Spot 258	173	101460	2.4	20.6855	1.7	0.1521	2.0	0.0228	1.2	0.58	145.5	1.7	143.8	2.7	115.1	39.5	145.5	1.7	NA
-Bon Composite Spot 116	89	5146	2.1	14.4757	2.2	0.2175	2.5	0.0228	1.3	0.52	145.6	1.9	199.9	4.6	900.2	44.4	145.6	1.9	NA
-Bon Composite Spot 301	383	40158	2.1	20.1259	1.0	0.1566	1.5	0.0229	1.1	0.73	145.8	1.6	147.7	2.1	179.4	24.1	145.8	1.6	NA
-Bon Composite Spot 228	206	12006	3.0	15.3501	2.1	0.2054	2.4	0.0229	1.3	0.53	145.8	1.9	189.7	4.2	778.1	43.1	145.8	1.9	NA
-Bon Composite Spot 9	85	65576	3.2	19.0825	2.0	0.1653	2.2	0.0229	0.8	0.38	145.9	1.2	155.3	3.2	302.1	46.4	145.9	1.2	NA
-Bon Composite Spot 300	574	476582	2.2	20.4123	0.9	0.1550	1.6	0.0230	1.3	0.81	146.3	1.8	146.3	2.1	146.4	21.7	146.3	1.8	NA
-Bon Composite Spot 164	158	14621	2.8	13.0602	4.2	0.2424	4.3	0.0230	1.1	0.26	146.4	1.7	220.4	8.6	1109.1	83.6	146.4	1.7	NA
-Bon Composite Spot 247	148	3793	1.8	13.6622	5.2	0.2318	5.3	0.0230	1.4	0.25	146.4	2.0	211.6	10.2	1018.4	104.6	146.4	2.0	NA
-Bon Composite Spot 205	101	117975	3.2	20.3494	2.0	0.1556	2.3	0.0230	1.1	0.48	146.4	1.6	146.8	3.2	153.6	47.9	146.4	1.6	NA
-Bon Composite Spot 125	157	7222	2.0	13.5458	4.9	0.2338	5.2	0.0230	1.7	0.34	146.5	2.5	213.3	10.0	1035.8	99.1	146.5	2.5	NA
-Bon Composite Spot 119	2673	255557	1.4	20.2709	0.9	0.1563	1.5	0.0230	1.2	0.81	146.5	1.7	147.5	2.0	162.6	20.1	146.5	1.7	NA
-Bon Composite Spot 67	90	11854	2.6	19.6753	2.6	0.1612	2.8	0.0230	1.1	0.40	146.6	1.6	151.7	4.0	231.9	60.2	146.6	1.6	NA
-Bon Composite Spot 58	1065	413026	1.2	20.3583	1.1	0.1558	1.9	0.0230	1.5	0.80	146.7	2.2	147.0	2.6	152.5	26.7	146.7	2.2	NA
-Bon Composite Spot 152	704	51098	1.6	20.0508	0.9	0.1584	1.6	0.0231	1.3	0.83	146.9	1.9	149.3	2.2	188.1	20.2	146.9	1.9	NA
-Bon Composite Spot 262	779	24541	1.9	20.5860	0.7	0.1545	1.3	0.0231	1.1	0.82	147.1	1.6	145.9	1.8	126.5	17.4	147.1	1.6	NA

-Bon Composite Spot 238	253	14712	1.9	20.1346	1.4	0.1582	1.6	0.0231	0.9	0.54	147.3	1.3	149.1	2.3	178.3	32.3	147.3	1.3	NA
-Bon Composite Spot 73	835	118317	1.1	20.1561	1.0	0.1581	1.6	0.0231	1.2	0.75	147.4	1.7	149.0	2.2	175.9	24.4	147.4	1.7	NA
-Bon Composite Spot 11	456	24665	1.6	18.9311	1.0	0.1684	1.4	0.0231	1.0	0.69	147.4	1.4	158.0	2.1	320.2	23.3	147.4	1.4	NA
-Bon Composite Spot 32	170	409458	2.4	20.0240	1.8	0.1594	2.1	0.0232	1.0	0.49	147.6	1.5	150.2	2.9	191.2	42.6	147.6	1.5	NA
-Bon Composite Spot 185	515	20181	1.6	20.3838	0.8	0.1566	1.4	0.0232	1.2	0.82	147.6	1.7	147.7	1.9	149.6	18.8	147.6	1.7	NA
-Bon Composite Spot 253	1083	63339	0.9	20.2976	0.8	0.1573	1.2	0.0232	0.8	0.73	147.6	1.2	148.3	1.6	159.5	18.4	147.6	1.2	NA
-Bon Composite Spot 108	573	14189	1.4	20.1731	0.8	0.1585	1.2	0.0232	0.8	0.72	147.8	1.2	149.4	1.6	173.9	19.0	147.8	1.2	NA
-Bon Composite Spot 34	319	33799	2.1	19.2264	1.1	0.1663	1.5	0.0232	1.0	0.68	147.9	1.5	156.2	2.2	284.9	25.8	147.9	1.5	NA
-Bon Composite Spot 273	620	505951	2.8	20.2253	0.8	0.1582	1.5	0.0232	1.3	0.84	148.0	1.8	149.1	2.1	167.8	18.5	148.0	1.8	NA
-Bon Composite Spot 174	660	39447	1.9	20.4520	0.9	0.1569	1.4	0.0233	1.1	0.78	148.4	1.7	148.0	2.0	141.8	21.1	148.4	1.7	NA
-Bon Composite Spot 132	457	15114	2.3	21.2278	1.3	0.1512	1.9	0.0233	1.4	0.72	148.4	2.0	143.0	2.6	53.7	31.9	148.4	2.0	NA
-Bon Composite Spot 74	459	14170	1.5	20.7831	1.0	0.1544	1.3	0.0233	0.9	0.67	148.4	1.3	145.8	1.8	104.0	22.7	148.4	1.3	NA
-Bon Composite Spot 266	107	15013	3.2	20.3615	2.0	0.1577	2.2	0.0233	1.1	0.50	148.4	1.6	148.7	3.1	152.2	45.7	148.4	1.6	NA
-Bon Composite Spot 234	3404	729858	1.2	20.4063	0.5	0.1574	1.0	0.0233	0.8	0.88	148.5	1.2	148.4	1.3	147.0	10.9	148.5	1.2	NA
-Bon Composite Spot 197	83	5374	2.7	20.1303	2.5	0.1598	2.8	0.0233	1.3	0.46	148.8	1.9	150.6	4.0	178.8	58.8	148.8	1.9	NA
-Bon Composite Spot 259	465	19751	1.5	20.4495	0.9	0.1574	1.3	0.0234	0.9	0.70	148.8	1.4	148.4	1.8	142.1	22.2	148.8	1.4	NA
-Bon Composite Spot 308	105	2471	2.8	13.6729	3.3	0.2356	3.5	0.0234	1.2	0.34	149.0	1.7	214.8	6.7	1016.9	66.1	149.0	1.7	NA
-Bon Composite Spot 68	385	13259	1.7	21.0460	1.2	0.1534	1.6	0.0234	1.0	0.64	149.3	1.5	144.9	2.1	74.1	28.8	149.3	1.5	NA
-Bon Composite Spot 3	184	7595	2.0	19.0988	2.0	0.1699	2.3	0.0235	1.2	0.49	150.0	1.7	159.3	3.4	300.2	46.3	150.0	1.7	NA
-Bon Composite Spot 63	266	23835	1.9	17.1070	2.4	0.1903	2.6	0.0236	1.0	0.38	150.5	1.5	176.9	4.2	545.9	52.3	150.5	1.5	NA
-Bon Composite Spot 53	343	14015	1.7	19.1535	1.1	0.1709	1.5	0.0237	0.9	0.64	151.3	1.4	160.2	2.2	293.6	25.9	151.3	1.4	NA
-Bon Composite Spot 282	168	18104	3.3	20.7609	1.8	0.1580	2.9	0.0238	2.3	0.79	151.6	3.4	149.0	4.0	106.4	42.1	151.6	3.4	NA
-Bon Composite Spot 107	458	42079	1.7	20.5444	1.1	0.1597	1.6	0.0238	1.2	0.74	151.7	1.8	150.5	2.2	131.2	25.6	151.7	1.8	NA
-Bon Composite Spot 198	250	13841	1.8	17.5495	2.1	0.1874	2.3	0.0239	1.0	0.44	152.1	1.6	174.4	3.7	489.9	46.0	152.1	1.6	NA
-Bon Composite Spot 190	91	10371	1.8	11.9848	3.9	0.2748	4.1	0.0239	1.3	0.33	152.3	2.0	246.6	9.0	1278.6	75.6	152.3	2.0	NA
-Bon Composite Spot 18	93	3382	3.5	14.1678	4.0	0.2345	4.2	0.0241	1.2	0.28	153.6	1.8	213.9	8.1	944.5	82.1	153.6	1.8	NA
-Bon Composite Spot 21	689	52789	0.9	20.0664	1.0	0.1665	1.5	0.0242	1.1	0.73	154.4	1.7	156.4	2.2	186.2	24.0	154.4	1.7	NA
-Bon Composite Spot 138	332	107338	1.9	20.4033	1.3	0.1669	1.9	0.0247	1.4	0.71	157.3	2.1	156.7	2.8	147.4	31.5	157.3	2.1	NA
-Bon Composite Spot 299	121	5369	2.0	19.8366	1.5	0.1753	1.8	0.0252	1.0	0.56	160.7	1.6	164.0	2.7	213.0	33.8	160.7	1.6	NA
-Bon Composite Spot 208	717	433787	2.7	20.1618	0.8	0.1732	1.2	0.0253	0.9	0.76	161.3	1.5	162.2	1.8	175.2	18.3	161.3	1.5	NA
-Bon Composite Spot 167	86	13041	3.7	19.9185	2.0	0.1761	2.4	0.0255	1.4	0.56	162.0	2.2	164.7	3.7	203.4	46.4	162.0	2.2	NA
-Bon Composite Spot 54	376	10434	2.1	20.2941	1.0	0.1834	1.3	0.0270	0.8	0.60	171.7	1.3	170.9	2.0	159.9	24.2	171.7	1.3	NA
-Bon Composite Spot 260	179	16403	2.6	18.3269	1.5	0.2358	1.8	0.0314	1.0	0.56	199.0	2.0	215.0	3.5	393.4	33.6	199.0	2.0	NA
-Bon Composite Spot 106	167	16275	3.7	20.4609	1.7	0.2179	2.1	0.0324	1.1	0.55	205.3	2.3	200.2	3.8	140.8	40.4	205.3	2.3	NA
-Bon Composite Spot 162	852	56737	1.3	19.0356	0.6	0.3612	1.2	0.0499	1.0	0.84	313.8	3.0	313.1	3.2	307.7	14.7	313.8	3.0	NA
-Bon Composite Spot 131	408	77454	3.2	19.3212	1.0	0.3563	1.4	0.0499	1.0	0.72	314.2	3.2	309.4	3.8	273.7	22.6	314.2	3.2	NA
-Bon Composite Spot 60	59	11537	3.0	16.9754	3.0	0.4354	3.4	0.0536	1.5	0.45	336.8	5.0	367.0	10.5	562.8	66.1	336.8	5.0	NA
-Bon Composite Spot 28	111	6845	3.4	19.1164	1.5	0.4303	1.8	0.0597	0.9	0.52	373.7	3.4	363.4	5.5	298.0	34.7	373.7	3.4	NA
-Bon Composite Spot 126	40	45254	1.2	5.5499	0.8	12.5585	1.6	0.5057	1.4	0.86	2638.3	29.9	2647.1	15.1	2653.8	13.4	2653.8	13.4	99.4

Nutzotin Mountains Sequence – KNC1-COMP (FA4)

						Isotope ratios						Apparent ages (Ma)							
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
KNC1-COMP (FA4)																			
NUT-KNG1-COMP-74	537	20043	4.3	20.4828	3.3	0.1306	5.9	0.0194	4.9	0.83	123.9	6.0	124.7	7.0	139.3	78.2	123.9	6.0	NA
NUT-KNG1-COMP-105	82	6945	5.0	20.1556	32.1	0.1377	32.6	0.0201	6.0	0.18	128.5	7.6	131.0	40.1	176.9	765.3	128.5	7.6	NA
NUT-KNG1-COMP-104	97	13452	4.2	23.3453	43.0	0.1198	43.8	0.0203	8.1	0.18	129.4	10.3	114.9	47.6	-177.2	1118.8	129.4	10.3	NA
NUT-KNG1-COMP-61	180	10706	6.7	23.1064	39.7	0.1216	40.8	0.0204	9.6	0.24	130.0	12.4	116.5	44.9	-151.6	1019.5	130.0	12.4	NA
NUT-KNG1-COMP-35	88	7113	6.0	22.6374	38.0	0.1253	39.2	0.0206	9.7	0.25	131.3	12.5	119.9	44.4	-100.9	964.9	131.3	12.5	NA
NUT-KNG1-COMP-82	220	9296	3.5	19.9479	12.9	0.1426	14.4	0.0206	6.4	0.44	131.7	8.3	135.4	18.3	201.1	301.5	131.7	8.3	NA
NUT-KNG1-COMP-15	488	44588	2.6	19.7146	5.1	0.1446	8.0	0.0207	6.1	0.77	131.9	8.0	137.2	10.2	228.3	117.4	131.9	8.0	NA
NUT-KNG1-COMP-102	220	8129	4.9	21.0635	12.9	0.1354	14.4	0.0207	6.5	0.45	132.0	8.5	128.9	17.4	73.2	306.6	132.0	8.5	NA
NUT-KNG1-COMP-101	114	18908	7.0	22.3417	23.1	0.1282	24.1	0.0208	7.1	0.29	132.6	9.3	122.5	27.9	-68.7	570.1	132.6	9.3	NA
NUT-KNG1-COMP-41	143	15420	9.4	20.7612	30.1	0.1380	30.3	0.0208	3.3	0.11	132.6	4.4	131.3	37.3	107.5	724.7	132.6	4.4	NA
NUT-KNG1-COMP-71	513	22814	3.9	20.5300	5.6	0.1399	7.3	0.0208	4.7	0.65	132.9	6.2	132.9	9.1	133.9	130.8	132.9	6.2	NA
NUT-KNG1-COMP-73	182	16632	4.8	18.9781	16.3	0.1514	17.3	0.0208	5.9	0.34	133.0	7.8	143.2	23.1	315.5	371.8	133.0	7.8	NA
NUT-KNG1-COMP-42	422	30367	3.1	19.7209	5.5	0.1476	8.2	0.0211	6.1	0.74	134.6	8.1	139.8	10.7	227.6	126.8	134.6	8.1	NA
NUT-KNG1-COMP-103	80	4568	6.4	16.6868	29.4	0.1745	30.5	0.0211	8.3	0.27	134.7	11.0	163.3	46.1	600.9	648.9	134.7	11.0	NA
NUT-KNG1-COMP-53	313	7525	6.7	23.1088	12.3	0.1261	13.2	0.0211	4.8	0.36	134.8	6.4	120.5	15.0	-151.8	306.0	134.8	6.4	NA
NUT-KNG1-COMP-25	355	17299	9.7	22.0512	11.5	0.1332	12.2	0.0213	4.2	0.35	135.9	5.7	126.9	14.6	-36.8	279.5	135.9	5.7	NA
NUT-KNG1-COMP-76	171	6422	3.5	23.0966	13.9	0.1274	16.7	0.0213	9.1	0.55	136.1	12.3	121.7	19.1	-150.5	347.1	136.1	12.3	NA
NUT-KNG1-COMP-52	218	11534	8.3	20.2019	5.8	0.1461	7.9	0.0214	5.4	0.68	136.6	7.2	138.5	10.2	171.6	135.5	136.6	7.2	NA
NUT-KNG1-COMP-34	141	6859	10.1	24.7462	34.0	0.1193	35.1	0.0214	8.7	0.25	136.6	11.7	114.5	38.0	-324.7	894.7	136.6	11.7	NA
NUT-KNG1-COMP-54	324	25541	4.5	20.5018	14.5	0.1441	16.0	0.0214	6.6	0.41	136.7	8.9	136.7	20.4	137.1	342.7	136.7	8.9	NA
NUT-KNG1-COMP-43	207	6197	5.2	19.8366	20.5	0.1490	22.1	0.0214	8.2	0.37	136.8	11.2	141.1	29.1	214.1	478.5	136.8	11.2	NA
NUT-KNG1-COMP-79	184	21868	2.6	20.4088	12.6	0.1456	14.4	0.0215	7.0	0.49	137.4	9.6	138.0	18.6	147.8	295.7	137.4	9.6	NA
NUT-KNG1-COMP-45	306	13239	6.2	19.6898	9.5	0.1514	11.0	0.0216	5.4	0.49	137.9	7.4	143.1	14.6	231.2	220.8	137.9	7.4	NA
NUT-KNG1-COMP-69	212	11091	3.2	21.2185	15.8	0.1407	18.1	0.0217	8.9	0.49	138.1	12.1	133.7	22.7	55.8	378.4	138.1	12.1	NA
NUT-KNG1-COMP-21	346	17516	7.8	20.1083	7.7	0.1493	9.7	0.0218	5.9	0.61	138.9	8.1	141.3	12.8	182.4	179.6	138.9	8.1	NA
NUT-KNG1-COMP-85	167	5920	2.5	21.0115	15.7	0.1449	17.6	0.0221	8.0	0.45	140.8	11.1	137.4	22.6	79.1	375.0	140.8	11.1	NA
NUT-KNG1-COMP-63	86	5024	5.0	21.5571	34.4	0.1412	35.8	0.0221	10.0	0.28	140.8	13.9	134.1	45.0	17.8	848.6	140.8	13.9	NA
NUT-KNG1-COMP-83	483	60822	2.9	20.8882	8.1	0.1459	10.4	0.0221	6.5	0.62	141.0	9.0	138.3	13.4	93.0	191.8	141.0	9.0	NA
NUT-KNG1-COMP-24	118	17347	7.2	28.2278	46.3	0.1081	47.1	0.0221	8.6	0.18	141.1	12.0	104.2	46.7	-675.1	1339.1	141.1	12.0	NA
NUT-KNG1-COMP-72	184	7123	8.0	20.9328	27.1	0.1460	28.1	0.0222	7.5	0.27	141.3	10.4	138.4	36.4	88.0	653.0	141.3	10.4	NA
NUT-KNG1-COMP-44	655	23569	5.7	20.7952	4.6	0.1470	5.9	0.0222	3.6	0.61	141.4	5.1	139.3	7.7	103.6	109.7	141.4	5.1	NA
NUT-KNG1-COMP-81	119	4720	4.5	19.0191	10.5	0.1608	13.3	0.0222	8.1	0.61	141.4	11.3	151.4	18.7	310.7	239.8	141.4	11.3	NA
NUT-KNG1-COMP-56	201	10527	3.6	20.6985	16.6	0.1480	18.0	0.0222	7.1	0.39	141.6	9.9	140.1	23.6	114.6	393.5	141.6	9.9	NA
NUT-KNG1-COMP-110	114	9087	1.8	24.9473	26.6	0.1229	27.5	0.0222	7.3	0.26	141.8	10.2	117.7	30.6	-345.5	695.2	141.8	10.2	NA
NUT-KNG1-COMP-91	232	12697	2.0	20.1080	15.7	0.1526	16.0	0.0222	3.2	0.20	141.8	4.6	144.2	21.6	182.4	367.9	141.8	4.6	NA
NUT-KNG1-COMP-31	357	19707	24.1	20.1455	10.1	0.1524	13.2	0.0223	8.4	0.64	141.9	11.8	144.0	17.7	178.1	236.4	141.9	11.8	NA
NUT-KNG1-COMP-3	380	25317	4.2	20.1423	6.1	0.1529	6.9	0.0223	3.2	0.46	142.4	4.5	144.4	9.3	178.5	143.4	142.4	4.5	NA
NUT-KNG1-COMP-23	398	26986	3.4	22.1899	10.0	0.1388	11.3	0.0223	5.4	0.47	142.4	7.6	132.0	14.0	-52.1	243.3	142.4	7.6	NA
NUT-KNG1-COMP-33	312	26632	3.6	20.6477	9.0	0.1499	11.2	0.0224	6.7	0.60	143.1	9.5	141.8	14.8	120.4	212.2	143.1	9.5	NA
NUT-KNG1-COMP-84	438	27935	1.2	21.2400	8.3	0.1458	11.7	0.0225	8.3	0.71	143.2	11.8	138.2	15.2	53.3	197.5	143.2	11.8	NA
NUT-KNG1-COMP-75	174	8498	3.2	21.8811	14.4	0.1420	15.5	0.0225	5.9	0.38	143.7	8.4	134.8	19.6	-18.1	349.2	143.7	8.4	NA

NUT-KNG1-COMP-78	739	30781	1.8	20.7050	4.2	0.1504	8.2	0.0226	7.0	0.86	144.0	10.0	142.3	10.8	113.9	98.6	144.0	10.0	NA
NUT-KNG1-COMP-68	90	7373	5.2	22.2975	21.5	0.1397	22.4	0.0226	6.0	0.27	144.0	8.6	132.8	27.9	-63.9	530.7	144.0	8.6	NA
NUT-KNG1-COMP-99	123	4100	1.5	20.7575	20.4	0.1504	22.0	0.0226	8.4	0.38	144.4	12.0	142.3	29.3	107.9	485.6	144.4	12.0	NA
NUT-KNG1-COMP-109	417	41991	1.9	20.7433	8.2	0.1507	9.3	0.0227	4.4	0.47	144.5	6.3	142.6	12.4	109.5	194.0	144.5	6.3	NA
NUT-KNG1-COMP-100	329	21592	1.5	21.4057	8.7	0.1465	9.8	0.0227	4.4	0.45	145.0	6.3	138.8	12.7	34.7	208.8	145.0	6.3	NA
NUT-KNG1-COMP-107	165	9479	1.9	25.7048	24.0	0.1220	24.1	0.0227	2.5	0.10	145.0	3.6	116.9	26.7	-423.3	636.9	145.0	3.6	NA
NUT-KNG1-COMP-39	194	18535	4.1	19.5331	15.9	0.1607	17.9	0.0228	8.3	0.46	145.1	12.0	151.3	25.2	249.6	367.3	145.1	12.0	NA
NUT-KNG1-COMP-77	177	19845	3.0	28.3947	22.6	0.1107	23.0	0.0228	4.4	0.19	145.3	6.3	106.6	23.3	-691.4	632.8	145.3	6.3	NA
NUT-KNG1-COMP-70	593	20258	7.8	19.9647	4.2	0.1582	9.8	0.0229	8.9	0.90	146.0	12.8	149.1	13.6	199.1	97.2	146.0	12.8	NA
NUT-KNG1-COMP-4	141	6048	3.7	25.4697	25.6	0.1241	27.1	0.0229	8.7	0.32	146.1	12.6	118.8	30.4	-399.2	677.3	146.1	12.6	NA
NUT-KNG1-COMP-80	571	33289	1.6	20.6781	8.4	0.1530	10.0	0.0229	5.6	0.55	146.3	8.1	144.6	13.5	116.9	197.3	146.3	8.1	NA
NUT-KNG1-COMP-13	105	4902	4.8	16.7894	17.7	0.1896	18.3	0.0231	4.7	0.26	147.2	6.9	176.3	29.6	587.7	385.7	147.2	6.9	NA
NUT-KNG1-COMP-12	258	10575	8.7	20.2752	10.1	0.1576	14.1	0.0232	9.8	0.69	147.7	14.3	148.6	19.4	163.1	236.9	147.7	14.3	NA
NUT-KNG1-COMP-106	200	10362	1.5	22.1974	13.7	0.1453	13.9	0.0234	2.3	0.17	149.0	3.4	137.7	17.9	-52.9	335.5	149.0	3.4	NA
NUT-KNG1-COMP-60	332	17201	3.1	20.5585	10.8	0.1569	13.9	0.0234	8.8	0.63	149.1	12.9	148.0	19.1	130.6	254.3	149.1	12.9	NA
NUT-KNG1-COMP-32	376	13504	8.7	20.4940	7.0	0.1575	9.4	0.0234	6.3	0.67	149.1	9.3	148.5	13.0	138.0	163.7	149.1	9.3	NA
NUT-KNG1-COMP-93	239	11619	2.2	22.0367	12.7	0.1466	14.4	0.0234	6.8	0.47	149.3	10.1	138.9	18.7	-35.2	309.8	149.3	10.1	NA
NUT-KNG1-COMP-67	138	13616	2.7	21.1226	21.5	0.1531	22.5	0.0235	6.8	0.30	149.5	10.1	144.7	30.4	66.6	516.1	149.5	10.1	NA
NUT-KNG1-COMP-8	86	3182	4.1	29.7928	41.0	0.1086	42.0	0.0235	9.0	0.21	149.5	13.3	104.7	41.8	-826.6	1211.7	149.5	13.3	NA
NUT-KNG1-COMP-37	256	17821	3.3	23.6956	9.5	0.1367	13.3	0.0235	9.3	0.70	149.6	13.7	130.1	16.2	-214.5	239.2	149.6	13.7	NA
NUT-KNG1-COMP-96	269	23719	1.6	20.3041	13.8	0.1603	14.3	0.0236	3.6	0.25	150.4	5.4	151.0	20.0	159.8	324.3	150.4	5.4	NA
NUT-KNG1-COMP-46	170	13237	3.5	21.2213	18.4	0.1535	19.6	0.0236	6.7	0.34	150.6	9.9	145.0	26.5	55.4	442.2	150.6	9.9	NA
NUT-KNG1-COMP-28	163	8754	3.5	23.4907	16.7	0.1388	17.8	0.0237	6.2	0.35	150.7	9.2	132.0	22.0	-192.7	419.7	150.7	9.2	NA
NUT-KNG1-COMP-11	638	30172	6.8	20.3564	5.1	0.1607	7.7	0.0237	5.8	0.75	151.2	8.7	151.3	10.8	153.8	118.9	151.2	8.7	NA
NUT-KNG1-COMP-94	450	36532	1.5	20.6689	4.5	0.1587	7.2	0.0238	5.6	0.78	151.5	8.4	149.5	10.0	118.0	107.1	151.5	8.4	NA
NUT-KNG1-COMP-98	211	12942	1.8	20.2460	15.4	0.1623	16.6	0.0238	6.2	0.37	151.8	9.3	152.7	23.5	166.5	360.6	151.8	9.3	NA
NUT-KNG1-COMP-27	100	4928	4.4	29.9354	42.8	0.1099	43.7	0.0239	8.5	0.19	152.0	12.7	105.8	43.9	-840.2	1273.6	152.0	12.7	NA
NUT-KNG1-COMP-51	141	7010	3.4	20.9725	15.7	0.1570	17.1	0.0239	6.9	0.40	152.2	10.4	148.1	23.6	83.5	374.2	152.2	10.4	NA
NUT-KNG1-COMP-92	147	9621	3.0	18.7770	15.9	0.1755	18.4	0.0239	9.3	0.50	152.3	13.9	164.2	27.9	339.8	362.6	152.3	13.9	NA
NUT-KNG1-COMP-87	230	12408	3.4	22.0795	18.1	0.1505	18.8	0.0241	5.3	0.28	153.5	8.0	142.4	25.0	-40.0	441.9	153.5	8.0	NA
NUT-KNG1-COMP-89	69	4282	2.4	23.6684	41.2	0.1413	41.7	0.0243	6.4	0.15	154.5	9.7	134.2	52.5	-211.6	1075.1	154.5	9.7	NA
NUT-KNG1-COMP-26	368	12824	4.8	21.9209	6.9	0.1534	8.7	0.0244	5.3	0.61	155.3	8.1	144.9	11.7	-22.5	167.5	155.3	8.1	NA
NUT-KNG1-COMP-88	180	9164	2.5	21.3181	17.5	0.1578	17.7	0.0244	2.6	0.15	155.4	4.0	148.8	24.5	44.6	420.7	155.4	4.0	NA
NUT-KNG1-COMP-5	125	5342	4.8	22.0045	13.6	0.1539	15.1	0.0246	6.5	0.43	156.4	10.0	145.3	20.4	-31.7	330.9	156.4	10.0	NA
NUT-KNG1-COMP-97	62	3798	3.4	17.5788	34.9	0.1928	35.9	0.0246	8.2	0.23	156.5	12.7	179.0	58.9	487.2	793.1	156.5	12.7	NA
NUT-KNG1-COMP-90	480	26266	2.0	20.0662	5.3	0.1696	6.5	0.0247	3.7	0.57	157.2	5.7	159.1	9.5	187.3	124.0	157.2	5.7	NA
NUT-KNG1-COMP-17	68	4482	1.2	26.2367	45.6	0.1303	46.2	0.0248	7.7	0.17	157.9	12.0	124.4	54.1	-477.2	1263.4	157.9	12.0	NA
NUT-KNG1-COMP-29	235	13115	3.0	20.1529	12.6	0.1702	15.2	0.0249	8.4	0.56	158.4	13.2	159.6	22.4	177.2	294.9	158.4	13.2	NA
NUT-KNG1-COMP-40	85	8889	3.4	15.4996	88.0	0.2227	88.4	0.0250	8.0	0.09	159.4	12.6	204.2	164.9	758.6	2558.8	159.4	12.6	NA
NUT-KNG1-COMP-108	610	70603	2.2	20.7152	4.6	0.1688	5.2	0.0254	2.5	0.48	161.4	4.0	158.4	7.7	112.7	108.7	161.4	4.0	NA
NUT-KNG1-COMP-47	130	5955	4.9	23.3999	18.4	0.1507	20.0	0.0256	7.9	0.39	162.8	12.6	142.5	26.6	-183.0	462.7	162.8	12.6	NA
NUT-KNG1-COMP-50	152	10160	1.9	23.5222	13.1	0.1521	13.7	0.0259	3.9	0.29	165.1	6.4	143.7	18.3	-196.0	328.9	165.1	6.4	NA
NUT-KNG1-COMP-20	462	18346	2.9	20.0657	5.6	0.1785	6.5	0.0260	3.3	0.50	165.3	5.3	166.8	10.0	187.3	130.9	165.3	5.3	NA
NUT-KNG1-COMP-30	164	569	5.9	18.5844	21.7	0.1980	23.4	0.0267	8.7	0.37	169.8	14.6	183.5	39.3	363.0	494.3	169.8	14.6	NA
NUT-KNG1-COMP-7	770	48469	3.5	19.9448	4.2	0.1954	7.2	0.0283	5.9	0.82	179.7	10.4	181.2	11.9	201.4	96.6	179.7	10.4	NA
NUT-KNG1-COMP-49	69	6823	1.4	20.8582	13.3	0.3172	13.9	0.0480	4.1	0.29	302.1	12.0	279.7	33.9	96.5	315.1	302.1	12.0	NA
NUT-KNG1-COMP-59	549	113160	2.0	18.2842	1.5	0.5259	5.9	0.0697	5.7	0.96	434.6	23.8	429.1	20.5	399.6	34.6	434.6	23.8	NA

Nutzotin Mountains Sequence – MM1-COMP (FA1)

						Isotope ratios						Apparent ages (Ma)							
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
MM1-COMP (FA1)																			
-MM1-Comp Spot 142	23	2104	3.9	21.5850	5.2	0.1337	5.4	0.0209	1.5	0.28	133.6	2.0	127.4	6.5	13.7	124.4	133.6	2.0	NA
-MM1-Comp Spot 65	52	4112	2.9	21.5107	2.9	0.1358	3.2	0.0212	1.2	0.37	135.2	1.6	129.3	3.8	22.0	70.7	135.2	1.6	NA
-MM1-Comp Spot 46	55	1526	2.3	24.5952	2.1	0.1191	2.6	0.0213	1.5	0.58	135.6	2.0	114.3	2.8	NA	NA	135.6	2.0	NA
-MM1-Comp Spot 43	62	13934	3.3	20.5589	2.3	0.1435	2.6	0.0214	1.3	0.50	136.6	1.8	136.2	3.4	129.5	54.0	136.6	1.8	NA
-MM1-Comp Spot 57	77	3819	4.4	21.6902	2.2	0.1361	2.6	0.0214	1.4	0.54	136.6	1.9	129.6	3.2	2.0	53.4	136.6	1.9	NA
-MM1-Comp Spot 22	207	8816	2.2	20.0970	2.0	0.1479	2.3	0.0216	1.2	0.51	137.5	1.6	140.0	3.0	182.7	46.7	137.5	1.6	NA
-MM1-Comp Spot 160	122	35609	3.9	6.6957	9.0	0.4440	9.1	0.0216	1.2	0.13	137.6	1.6	373.1	28.3	2337.7	154.0	137.6	1.6	NA
-MM1-Comp Spot 238	316	18792	6.5	20.6557	1.1	0.1443	1.8	0.0216	1.4	0.77	137.9	1.9	136.9	2.3	118.4	27.1	137.9	1.9	NA
-MM1-Comp Spot 201	74	8866	1.9	20.2446	1.9	0.1474	2.3	0.0217	1.3	0.56	138.1	1.8	139.6	3.0	165.6	44.3	138.1	1.8	NA
-MM1-Comp Spot 83	145	1108722	4.0	20.1207	1.6	0.1487	2.0	0.0217	1.2	0.59	138.5	1.6	140.8	2.6	179.9	37.7	138.5	1.6	NA
-MM1-Comp Spot 205	90	13853	1.7	20.9271	2.3	0.1431	2.7	0.0217	1.3	0.49	138.6	1.8	135.8	3.4	87.6	55.2	138.6	1.8	NA
-MM1-Comp Spot 60	65	7805	2.9	21.5836	2.8	0.1387	3.1	0.0217	1.3	0.41	138.6	1.7	131.9	3.9	13.9	68.5	138.6	1.7	NA
-MM1-Comp Spot 121	78	8677	5.9	20.6897	2.5	0.1452	2.9	0.0218	1.4	0.47	139.0	1.9	137.6	3.7	114.6	60.1	139.0	1.9	NA
-MM1-Comp Spot 80	176	117969	1.6	19.9556	1.6	0.1505	2.2	0.0218	1.4	0.65	139.0	1.9	142.4	2.9	199.2	38.3	139.0	1.9	NA
-MM1-Comp Spot 41	52	3217	2.8	21.8438	3.1	0.1377	3.5	0.0218	1.5	0.44	139.2	2.1	131.0	4.3	NA	NA	139.2	2.1	NA
-MM1-Comp Spot 206	63	24092	3.4	19.9168	2.2	0.1511	2.5	0.0218	1.0	0.41	139.2	1.4	142.9	3.3	203.6	52.0	139.2	1.4	NA
-MM1-Comp Spot 140	120	11236	4.8	20.4139	1.6	0.1476	2.0	0.0219	1.1	0.57	139.4	1.5	139.7	2.6	146.2	37.7	139.4	1.5	NA
-MM1-Comp Spot 211	91	12597	4.9	19.7515	1.9	0.1526	2.4	0.0219	1.5	0.62	139.5	2.1	144.2	3.2	223.0	43.4	139.5	2.1	NA
-MM1-Comp Spot 68	123	3746	4.1	21.3061	3.4	0.1415	3.7	0.0219	1.5	0.41	139.5	2.1	134.4	4.6	44.9	80.2	139.5	2.1	NA
-MM1-Comp Spot 196	522	265717	4.7	20.3720	1.0	0.1480	1.9	0.0219	1.6	0.86	139.5	2.2	140.1	2.5	151.0	22.4	139.5	2.2	NA
-MM1-Comp Spot 136	102	2852	3.5	22.3086	2.9	0.1352	3.1	0.0219	1.2	0.39	139.6	1.7	128.8	3.8	NA	NA	139.6	1.7	NA
-MM1-Comp Spot 76	209	92991	3.2	20.4644	1.0	0.1475	1.8	0.0219	1.5	0.82	139.6	2.0	139.7	2.3	140.3	24.1	139.6	2.0	NA
-MM1-Comp Spot 118	248	9012	2.6	21.2142	1.6	0.1423	1.9	0.0219	1.1	0.57	139.7	1.5	135.1	2.4	55.2	37.4	139.7	1.5	NA
-MM1-Comp Spot 62	80	10101	4.5	21.4916	2.9	0.1408	3.3	0.0220	1.5	0.45	140.0	2.0	133.8	4.1	24.1	69.9	140.0	2.0	NA
-MM1-Comp Spot 169	175	18538	2.9	20.4792	1.6	0.1479	1.9	0.0220	1.0	0.52	140.1	1.4	140.0	2.5	138.7	38.6	140.1	1.4	NA
-MM1-Comp Spot 4	148	14432	7.1	20.7359	1.7	0.1460	2.2	0.0220	1.4	0.65	140.1	2.0	138.4	2.8	109.3	39.1	140.1	2.0	NA
-MM1-Comp Spot 98	109	13562	4.2	20.4580	1.6	0.1483	2.2	0.0220	1.5	0.68	140.3	2.1	140.4	2.9	141.1	38.1	140.3	2.1	NA
-MM1-Comp Spot 86	51	9246	4.0	20.3056	2.3	0.1496	2.6	0.0220	1.3	0.50	140.5	1.8	141.5	3.4	158.6	52.8	140.5	1.8	NA
-MM1-Comp Spot 151	82	9515	3.7	21.7819	2.5	0.1395	2.9	0.0221	1.5	0.50	140.6	2.0	132.6	3.6	NA	NA	140.6	2.0	NA
-MM1-Comp Spot 67	163	5269	9.2	21.1248	3.2	0.1439	3.5	0.0221	1.3	0.37	140.6	1.8	136.5	4.5	65.2	77.3	140.6	1.8	NA
-MM1-Comp Spot 138	67	10168	2.8	21.5050	2.3	0.1414	2.5	0.0221	1.2	0.46	140.7	1.6	134.3	3.2	22.6	54.0	140.7	1.6	NA
-MM1-Comp Spot 165	261	79997	7.4	20.2627	1.0	0.1503	1.5	0.0221	1.1	0.73	140.9	1.5	142.2	2.0	163.5	24.5	140.9	1.5	NA
-MM1-Comp Spot 18	159	27999	8.6	20.0753	1.4	0.1518	2.1	0.0221	1.5	0.71	141.0	2.1	143.5	2.8	185.2	33.8	141.0	2.1	NA
-MM1-Comp Spot 66	85	5611	1.9	20.9835	2.0	0.1454	2.7	0.0221	1.7	0.64	141.1	2.4	137.8	3.4	81.2	48.6	141.1	2.4	NA
-MM1-Comp Spot 100	159	43004	2.4	20.3114	1.4	0.1502	2.0	0.0221	1.3	0.68	141.2	1.9	142.1	2.6	158.0	33.5	141.2	1.9	NA
-MM1-Comp Spot 227	105	8869	1.7	20.3940	2.2	0.1497	2.6	0.0221	1.3	0.52	141.2	1.9	141.6	3.4	148.4	51.3	141.2	1.9	NA
-MM1-Comp Spot 85	109	3896	7.6	21.4760	1.6	0.1422	2.1	0.0222	1.3	0.63	141.3	1.9	135.0	2.7	25.8	39.2	141.3	1.9	NA
-MM1-Comp Spot 27	83	7023	1.9	19.9386	3.2	0.1532	3.3	0.0222	1.0	0.31	141.3	1.4	144.8	4.5	201.1	73.2	141.3	1.4	NA
-MM1-Comp Spot 10	262	26135	2.9	20.6870	1.3	0.1478	1.7	0.0222	1.1	0.64	141.4	1.6	140.0	2.3	114.9	31.4	141.4	1.6	NA
-MM1-Comp Spot 29	429	50582	8.8	20.2234	1.0	0.1512	1.5	0.0222	1.1	0.75	141.5	1.6	143.0	2.0	168.1	23.3	141.5	1.6	NA
-MM1-Comp Spot 218	127	4589	2.9	21.3553	1.7	0.1432	2.2	0.0222	1.3	0.62	141.5	1.9	135.9	2.8	39.4	41.1	141.5	1.9	NA

-MM1-Comp Spot 54	145	5476	7.3	21.2743	2.9	0.1438	3.1	0.0222	1.2	0.38	141.6	1.7	136.5	4.0	48.4	69.3	141.6	1.7	NA
-MM1-Comp Spot 124	206	33641	7.8	20.4542	1.4	0.1497	1.8	0.0222	1.1	0.63	141.7	1.6	141.7	2.3	141.5	32.0	141.7	1.6	NA
-MM1-Comp Spot 119	176	11573	5.4	20.6097	1.7	0.1486	2.0	0.0222	1.0	0.52	141.7	1.4	140.7	2.6	123.7	39.4	141.7	1.4	NA
-MM1-Comp Spot 36	157	153920	7.8	20.0652	1.5	0.1527	1.9	0.0222	1.2	0.64	141.7	1.7	144.3	2.6	186.4	34.3	141.7	1.7	NA
-MM1-Comp Spot 173	78	4336	4.2	21.4226	3.2	0.1432	3.5	0.0223	1.3	0.37	141.9	1.8	135.9	4.4	31.8	77.8	141.9	1.8	NA
-MM1-Comp Spot 197	301	16524	4.5	20.5135	1.3	0.1496	1.7	0.0223	1.1	0.67	141.9	1.6	141.5	2.2	134.7	29.5	141.9	1.6	NA
-MM1-Comp Spot 141	74	58373	3.5	20.3278	1.8	0.1510	2.4	0.0223	1.6	0.65	142.0	2.2	142.8	3.2	156.0	43.2	142.0	2.2	NA
-MM1-Comp Spot 152	235	216717	10.7	20.1535	1.3	0.1524	2.0	0.0223	1.6	0.78	142.1	2.2	144.0	2.7	176.2	29.4	142.1	2.2	NA
-MM1-Comp Spot 161	151	90220	1.4	19.9540	1.2	0.1539	1.6	0.0223	1.0	0.61	142.1	1.4	145.4	2.1	199.3	28.8	142.1	1.4	NA
-MM1-Comp Spot 177	110	3638	5.0	22.1987	1.7	0.1384	2.1	0.0223	1.2	0.57	142.2	1.6	131.6	2.5	NA	NA	142.2	1.6	NA
-MM1-Comp Spot 232	79	2434	8.8	23.3061	2.2	0.1318	2.8	0.0223	1.8	0.63	142.2	2.5	125.8	3.3	NA	NA	142.2	2.5	NA
-MM1-Comp Spot 24	81	2128	4.2	23.6779	2.2	0.1298	2.7	0.0223	1.6	0.60	142.2	2.3	123.9	3.2	NA	NA	142.2	2.3	NA
-MM1-Comp Spot 127	175	31172	8.2	20.4461	1.4	0.1504	2.0	0.0223	1.4	0.71	142.3	2.0	142.3	2.7	142.5	34.0	142.3	2.0	NA
-MM1-Comp Spot 217	267	9530	6.8	21.0546	1.4	0.1461	2.1	0.0223	1.6	0.76	142.3	2.3	138.5	2.7	73.2	32.4	142.3	2.3	NA
-MM1-Comp Spot 32	265	29220	7.7	20.2721	1.4	0.1519	2.1	0.0223	1.6	0.76	142.4	2.3	143.6	2.9	162.4	32.5	142.4	2.3	NA
-MM1-Comp Spot 107	78	7707	2.1	20.9716	2.8	0.1468	3.1	0.0223	1.4	0.44	142.4	2.0	139.1	4.1	82.5	66.6	142.4	2.0	NA
-MM1-Comp Spot 129	146	9422	8.4	21.0999	1.7	0.1460	2.0	0.0224	1.1	0.54	142.5	1.5	138.4	2.6	68.0	39.7	142.5	1.5	NA
-MM1-Comp Spot 148	139	8231	7.4	20.7035	1.5	0.1489	1.8	0.0224	1.0	0.57	142.6	1.4	140.9	2.3	113.0	34.7	142.6	1.4	NA
-MM1-Comp Spot 223	95	7739	2.5	20.1982	1.6	0.1527	2.2	0.0224	1.4	0.66	142.7	2.0	144.3	2.9	171.0	38.4	142.7	2.0	NA
-MM1-Comp Spot 213	230	115905	1.4	19.8623	0.8	0.1554	1.7	0.0224	1.5	0.87	142.8	2.1	146.7	2.3	210.0	18.8	142.8	2.1	NA
-MM1-Comp Spot 52	226	24918	4.3	20.0438	1.0	0.1540	1.8	0.0224	1.5	0.82	142.8	2.1	145.5	2.4	188.9	23.8	142.8	2.1	NA
-MM1-Comp Spot 116	186	257925	7.3	19.9868	1.2	0.1545	1.9	0.0224	1.5	0.78	142.9	2.1	145.9	2.6	195.5	27.5	142.9	2.1	NA
-MM1-Comp Spot 26	127	12197	3.8	20.3000	1.4	0.1521	1.9	0.0224	1.3	0.66	142.9	1.8	143.8	2.6	159.3	33.8	142.9	1.8	NA
-MM1-Comp Spot 45	303	108132	6.5	20.6937	1.3	0.1493	1.9	0.0224	1.3	0.69	142.9	1.8	141.3	2.5	114.2	31.7	142.9	1.8	NA
-MM1-Comp Spot 168	487	35283	1.5	20.5933	1.2	0.1500	1.7	0.0224	1.2	0.73	142.9	1.8	141.9	2.2	125.6	27.1	142.9	1.8	NA
-MM1-Comp Spot 61	48	6019	5.6	19.9458	3.3	0.1550	3.6	0.0224	1.6	0.43	143.0	2.2	146.3	4.9	200.3	76.1	143.0	2.2	NA
-MM1-Comp Spot 19	70	14964	3.6	20.2253	2.2	0.1529	2.9	0.0224	1.8	0.64	143.0	2.6	144.4	3.9	167.9	51.5	143.0	2.6	NA
-MM1-Comp Spot 221	146	5095	7.6	21.5451	1.6	0.1436	2.0	0.0224	1.3	0.63	143.1	1.8	136.2	2.6	18.2	37.6	143.1	1.8	NA
-MM1-Comp Spot 70	103	4137	6.1	21.7191	4.2	0.1425	4.4	0.0225	1.2	0.28	143.2	1.8	135.3	5.5	NA	NA	143.2	1.8	NA
-MM1-Comp Spot 81	139	7487	2.0	20.8877	1.8	0.1482	2.3	0.0225	1.4	0.62	143.2	2.0	140.3	3.0	92.1	43.2	143.2	2.0	NA
-MM1-Comp Spot 87	402	58847	2.2	20.0044	1.0	0.1548	1.7	0.0225	1.4	0.81	143.2	2.0	146.1	2.3	193.5	23.3	143.2	2.0	NA
-MM1-Comp Spot 233	124	15803	7.2	20.2394	1.5	0.1532	1.9	0.0225	1.2	0.62	143.5	1.7	144.8	2.6	166.2	35.7	143.5	1.7	NA
-MM1-Comp Spot 6	70	88477	2.7	19.6961	1.8	0.1575	2.4	0.0225	1.5	0.62	143.5	2.1	148.5	3.2	229.4	42.5	143.5	2.1	NA
-MM1-Comp Spot 64	177	51471	4.7	20.1511	1.4	0.1542	1.9	0.0225	1.3	0.67	143.7	1.8	145.6	2.6	176.4	33.2	143.7	1.8	NA
-MM1-Comp Spot 135	131	22407	7.2	20.2476	1.5	0.1535	1.8	0.0225	1.1	0.58	143.7	1.5	145.0	2.5	165.3	34.7	143.7	1.5	NA
-MM1-Comp Spot 178	519	135182	3.4	20.0298	0.9	0.1552	1.5	0.0226	1.3	0.82	143.8	1.8	146.5	2.1	190.5	20.7	143.8	1.8	NA
-MM1-Comp Spot 113	99	5272	3.0	22.6229	2.0	0.1375	2.3	0.0226	1.1	0.49	143.9	1.6	130.8	2.9	NA	NA	143.9	1.6	NA
-MM1-Comp Spot 97	52	34056	4.2	20.0685	2.3	0.1552	2.7	0.0226	1.4	0.51	144.1	1.9	146.5	3.6	186.0	53.6	144.1	1.9	NA
-MM1-Comp Spot 40	84	8862	5.3	18.2564	4.3	0.1707	4.5	0.0226	1.3	0.29	144.1	1.9	160.0	6.6	402.1	95.4	144.1	1.9	NA
-MM1-Comp Spot 230	64	8143	2.4	20.9531	2.6	0.1488	2.9	0.0226	1.3	0.44	144.2	1.8	140.8	3.8	84.6	61.0	144.2	1.8	NA
-MM1-Comp Spot 25	295	42391	8.3	20.6776	1.5	0.1508	2.0	0.0226	1.4	0.68	144.3	2.0	142.7	2.7	116.0	34.6	144.3	2.0	NA
-MM1-Comp Spot 15	63	3204	7.9	22.7591	3.7	0.1371	3.9	0.0226	1.2	0.31	144.3	1.8	130.5	4.8	NA	NA	144.3	1.8	NA
-MM1-Comp Spot 109	105	11784	3.4	20.6145	1.9	0.1515	2.3	0.0227	1.4	0.58	144.5	1.9	143.2	3.1	123.1	44.8	144.5	1.9	NA
-MM1-Comp Spot 159	68	11178	4.4	20.3572	1.9	0.1534	2.3	0.0227	1.3	0.57	144.5	1.9	145.0	3.1	152.7	44.7	144.5	1.9	NA
-MM1-Comp Spot 222	100	168298	6.5	19.9901	1.8	0.1563	2.0	0.0227	0.8	0.42	144.5	1.2	147.5	2.8	195.2	43.0	144.5	1.2	NA
-MM1-Comp Spot 48	126	12529	4.5	20.4262	2.1	0.1532	2.5	0.0227	1.3	0.52	144.7	1.8	144.7	3.3	144.7	49.2	144.7	1.8	NA
-MM1-Comp Spot 104	93	7269	5.4	20.2375	1.7	0.1546	2.1	0.0227	1.3	0.60	144.7	1.8	146.0	2.9	166.4	39.8	144.7	1.8	NA

-MM1-Comp Spot 239	311	57943	2.2	20.0632	0.9	0.1561	1.5	0.0227	1.2	0.80	144.9	1.7	147.3	2.1	186.6	21.3	144.9	1.7	NA
-MM1-Comp Spot 234	261	17287	5.3	20.5736	1.5	0.1523	2.1	0.0227	1.4	0.68	144.9	2.0	144.0	2.8	127.9	36.0	144.9	2.0	NA
-MM1-Comp Spot 182	267	10615	6.5	21.0616	1.4	0.1489	1.9	0.0228	1.3	0.67	145.0	1.8	140.9	2.5	72.4	33.2	145.0	1.8	NA
-MM1-Comp Spot 156	85	7037	5.2	21.5989	2.3	0.1452	2.7	0.0228	1.3	0.48	145.0	1.8	137.7	3.4	12.1	56.3	145.0	1.8	NA
-MM1-Comp Spot 228	109	7605	5.1	21.0038	1.9	0.1494	2.4	0.0228	1.5	0.64	145.1	2.2	141.3	3.2	78.9	44.3	145.1	2.2	NA
-MM1-Comp Spot 58	132	85054	5.6	20.0200	2.1	0.1568	2.7	0.0228	1.7	0.63	145.2	2.4	147.9	3.7	191.7	48.4	145.2	2.4	NA
-MM1-Comp Spot 21	66	3948	4.8	22.2282	3.2	0.1413	3.5	0.0228	1.3	0.37	145.3	1.9	134.2	4.4	NA	NA	145.3	1.9	NA
-MM1-Comp Spot 132	122	10200	7.1	20.3044	1.5	0.1547	1.9	0.0228	1.3	0.65	145.3	1.8	146.1	2.7	158.8	34.8	145.3	1.8	NA
-MM1-Comp Spot 31	104	19459	4.4	20.4250	1.9	0.1538	2.2	0.0228	1.1	0.51	145.3	1.6	145.3	2.9	144.8	43.9	145.3	1.6	NA
-MM1-Comp Spot 71	67	5926	3.9	20.6492	2.3	0.1522	2.5	0.0228	0.9	0.38	145.3	1.3	143.8	3.3	119.2	53.5	145.3	1.3	NA
-MM1-Comp Spot 77	184	9999	2.9	20.4469	1.5	0.1537	2.0	0.0228	1.4	0.67	145.4	2.0	145.2	2.8	142.4	35.5	145.4	2.0	NA
-MM1-Comp Spot 200	110	104991	4.8	20.8528	1.4	0.1508	1.9	0.0228	1.3	0.68	145.4	1.9	142.6	2.6	96.1	33.2	145.4	1.9	NA
-MM1-Comp Spot 172	123	18645	4.5	20.9139	1.7	0.1503	2.3	0.0228	1.4	0.63	145.4	2.1	142.2	3.0	89.1	41.4	145.4	2.1	NA
-MM1-Comp Spot 88	192	24199	4.8	20.6452	1.4	0.1523	1.7	0.0228	1.0	0.58	145.4	1.4	144.0	2.3	119.7	33.4	145.4	1.4	NA
-MM1-Comp Spot 143	310	16022	6.0	20.4635	1.4	0.1537	1.9	0.0228	1.3	0.66	145.5	1.8	145.2	2.6	140.4	33.6	145.5	1.8	NA
-MM1-Comp Spot 2	298	52994	8.3	20.4000	1.2	0.1542	1.8	0.0228	1.3	0.73	145.5	1.9	145.6	2.4	147.7	28.9	145.5	1.9	NA
-MM1-Comp Spot 198	168	6171	5.4	21.0531	1.3	0.1495	1.9	0.0228	1.4	0.74	145.6	2.1	141.5	2.5	73.3	30.7	145.6	2.1	NA
-MM1-Comp Spot 224	277	145879	3.9	20.5411	1.5	0.1533	1.8	0.0228	1.0	0.55	145.6	1.5	144.8	2.5	131.6	36.1	145.6	1.5	NA
-MM1-Comp Spot 176	238	7505	3.9	21.2123	1.7	0.1485	2.4	0.0229	1.8	0.73	145.7	2.6	140.6	3.2	55.4	39.8	145.7	2.6	NA
-MM1-Comp Spot 167	43	2803	5.0	21.9245	3.4	0.1440	3.6	0.0229	1.4	0.38	146.0	2.0	136.6	4.7	NA	NA	146.0	2.0	NA
-MM1-Comp Spot 16	141	5922	6.4	21.1736	2.8	0.1491	3.0	0.0229	1.3	0.41	146.0	1.8	141.1	4.0	59.8	66.0	146.0	1.8	NA
-MM1-Comp Spot 237	136	84663	3.2	19.7320	1.8	0.1600	2.2	0.0229	1.3	0.58	146.0	1.9	150.7	3.1	225.2	41.7	146.0	1.9	NA
-MM1-Comp Spot 166	32	8500	4.8	18.9260	3.1	0.1671	3.3	0.0229	1.2	0.37	146.2	1.7	156.9	4.8	320.8	69.4	146.2	1.7	NA
-MM1-Comp Spot 42	122	15251	2.1	20.2300	1.8	0.1564	2.2	0.0230	1.4	0.62	146.3	2.0	147.6	3.1	167.3	41.0	146.3	2.0	NA
-MM1-Comp Spot 37	324	86922	6.4	20.1761	0.9	0.1569	1.7	0.0230	1.5	0.84	146.4	2.1	147.9	2.4	173.5	22.0	146.4	2.1	NA
-MM1-Comp Spot 194	185	19792	4.9	20.5831	1.8	0.1539	2.4	0.0230	1.6	0.66	146.5	2.3	145.4	3.3	126.8	42.7	146.5	2.3	NA
-MM1-Comp Spot 214	89	4841	5.0	21.1859	1.8	0.1496	2.3	0.0230	1.4	0.61	146.6	2.1	141.6	3.1	58.4	43.7	146.6	2.1	NA
-MM1-Comp Spot 137	320	92201	3.1	20.1898	1.2	0.1571	1.6	0.0230	1.0	0.65	146.7	1.5	148.1	2.2	172.0	28.5	146.7	1.5	NA
-MM1-Comp Spot 139	1115	47965	13.2	20.2568	0.9	0.1566	1.4	0.0230	1.1	0.79	146.7	1.6	147.7	1.9	164.2	20.1	146.7	1.6	NA
-MM1-Comp Spot 44	112	21790	1.9	20.0928	1.6	0.1581	2.0	0.0230	1.1	0.57	146.9	1.6	149.0	2.7	183.2	37.3	146.9	1.6	NA
-MM1-Comp Spot 122	151	1680895	5.6	20.4182	1.4	0.1556	1.8	0.0230	1.1	0.63	146.9	1.6	146.8	2.4	145.7	32.3	146.9	1.6	NA
-MM1-Comp Spot 96	65	7653	3.7	20.3087	2.9	0.1564	3.3	0.0230	1.4	0.43	146.9	2.0	147.6	4.5	158.3	69.0	146.9	2.0	NA
-MM1-Comp Spot 95	139	25620	2.9	20.5915	1.7	0.1543	1.9	0.0231	0.8	0.44	147.0	1.2	145.7	2.5	125.8	39.1	147.0	1.2	NA
-MM1-Comp Spot 93	422	19307	5.4	20.8271	1.0	0.1527	1.6	0.0231	1.2	0.75	147.1	1.7	144.3	2.1	99.0	24.4	147.1	1.7	NA
-MM1-Comp Spot 69	127	15394	5.0	20.9006	1.9	0.1523	2.3	0.0231	1.2	0.54	147.2	1.8	144.0	3.0	90.6	45.1	147.2	1.8	NA
-MM1-Comp Spot 108	149	30204	6.6	20.5533	1.5	0.1549	2.1	0.0231	1.4	0.69	147.2	2.1	146.2	2.8	130.2	34.9	147.2	2.1	NA
-MM1-Comp Spot 30	315	37968	4.1	20.6014	1.3	0.1546	1.7	0.0231	1.1	0.67	147.3	1.7	145.9	2.3	124.6	29.5	147.3	1.7	NA
-MM1-Comp Spot 183	270	11281	7.1	20.9788	1.3	0.1519	1.7	0.0231	1.2	0.68	147.4	1.7	143.6	2.3	81.7	30.0	147.4	1.7	NA
-MM1-Comp Spot 51	388	46064	4.9	20.2752	1.0	0.1572	1.7	0.0231	1.4	0.82	147.4	2.1	148.2	2.4	162.1	23.1	147.4	2.1	NA
-MM1-Comp Spot 192	220	12509	8.3	20.2630	1.8	0.1577	2.4	0.0232	1.5	0.62	147.8	2.1	148.7	3.3	163.5	43.0	147.8	2.1	NA
-MM1-Comp Spot 73	187	5681	3.9	20.9725	2.6	0.1524	2.8	0.0232	1.1	0.40	147.8	1.7	144.0	3.8	82.4	61.6	147.8	1.7	NA
-MM1-Comp Spot 193	508	12711	5.2	20.7921	0.9	0.1539	1.6	0.0232	1.3	0.82	148.0	1.9	145.4	2.2	102.9	21.8	148.0	1.9	NA
-MM1-Comp Spot 207	830	87793	11.4	20.4087	0.9	0.1568	1.7	0.0232	1.5	0.85	148.0	2.2	147.9	2.4	146.8	21.4	148.0	2.2	NA
-MM1-Comp Spot 134	74	15925	2.1	21.2275	2.1	0.1509	2.4	0.0232	1.3	0.54	148.1	1.9	142.7	3.2	53.7	49.1	148.1	1.9	NA
-MM1-Comp Spot 125	933	33886	22.9	20.4913	0.9	0.1563	1.3	0.0232	1.0	0.74	148.1	1.5	147.5	1.8	137.3	21.1	148.1	1.5	NA
-MM1-Comp Spot 114	272	11994	6.1	19.3622	1.6	0.1654	1.9	0.0232	1.1	0.57	148.1	1.6	155.4	2.8	268.8	36.6	148.1	1.6	NA
-MM1-Comp Spot 210	198	6702	3.4	20.9698	2.4	0.1528	2.9	0.0232	1.6	0.54	148.1	2.3	144.4	3.9	82.7	57.3	148.1	2.3	NA

-MM1-Comp Spot 103	457	24127	3.6	20.5399	1.1	0.1561	1.9	0.0233	1.6	0.82	148.2	2.3	147.3	2.6	131.7	25.0	148.2	2.3	NA
-MM1-Comp Spot 157	243	100393	2.5	20.1968	1.2	0.1588	1.8	0.0233	1.4	0.75	148.3	2.0	149.7	2.5	171.1	28.0	148.3	2.0	NA
-MM1-Comp Spot 216	169	13658	5.9	21.0168	1.6	0.1528	1.9	0.0233	1.1	0.58	148.5	1.6	144.4	2.6	77.4	36.9	148.5	1.6	NA
-MM1-Comp Spot 144	196	8663	5.1	21.3860	1.2	0.1501	1.8	0.0233	1.3	0.73	148.5	1.9	142.0	2.4	35.9	29.5	148.5	1.9	NA
-MM1-Comp Spot 150	64	9237	6.6	21.1971	2.1	0.1515	2.4	0.0233	1.2	0.50	148.5	1.8	143.3	3.3	57.1	50.4	148.5	1.8	NA
-MM1-Comp Spot 53	30	5420	2.3	21.1808	3.3	0.1518	3.6	0.0233	1.5	0.42	148.7	2.2	143.5	4.9	59.0	78.7	148.7	2.2	NA
-MM1-Comp Spot 123	64	160838	1.6	20.2865	2.2	0.1587	2.7	0.0234	1.6	0.59	148.9	2.3	149.6	3.7	160.8	50.6	148.9	2.3	NA
-MM1-Comp Spot 226	51	4563	4.1	21.1704	2.0	0.1523	2.6	0.0234	1.7	0.66	149.0	2.6	143.9	3.5	60.1	46.8	149.0	2.6	NA
-MM1-Comp Spot 17	232	103799	8.0	20.0987	1.3	0.1607	1.7	0.0234	1.1	0.64	149.3	1.6	151.3	2.4	182.5	31.3	149.3	1.6	NA
-MM1-Comp Spot 149	867	48184	2.1	20.5997	1.0	0.1568	1.5	0.0234	1.1	0.74	149.3	1.7	147.9	2.1	124.8	24.3	149.3	1.7	NA
-MM1-Comp Spot 215	205	16538	3.4	20.2119	1.4	0.1598	2.1	0.0234	1.6	0.76	149.3	2.4	150.5	3.0	169.4	32.3	149.3	2.4	NA
-MM1-Comp Spot 79	86	5666	4.9	20.9477	2.3	0.1544	2.5	0.0235	1.1	0.42	149.5	1.6	145.8	3.4	85.3	53.4	149.5	1.6	NA
-MM1-Comp Spot 133	267	27445	5.3	20.0846	1.4	0.1613	2.0	0.0235	1.4	0.72	149.8	2.1	151.9	2.8	184.1	31.7	149.8	2.1	NA
-MM1-Comp Spot 33	216	60988	2.0	20.4973	1.4	0.1584	2.0	0.0236	1.4	0.71	150.1	2.1	149.3	2.8	136.6	32.9	150.1	2.1	NA
-MM1-Comp Spot 102	587	56828	28.3	20.3749	0.9	0.1593	1.5	0.0236	1.2	0.82	150.1	1.8	150.1	2.1	150.7	20.0	150.1	1.8	NA
-MM1-Comp Spot 49	154	19385	4.8	20.0840	1.5	0.1618	2.1	0.0236	1.4	0.67	150.2	2.1	152.3	2.9	184.2	36.0	150.2	2.1	NA
-MM1-Comp Spot 110	285	11312	8.2	20.5494	1.3	0.1586	2.1	0.0237	1.6	0.78	150.7	2.4	149.5	2.9	130.6	30.5	150.7	2.4	NA
-MM1-Comp Spot 112	456	217718	4.6	20.2549	1.3	0.1611	1.9	0.0237	1.4	0.74	150.8	2.1	151.6	2.7	164.4	29.9	150.8	2.1	NA
-MM1-Comp Spot 190	661	129677	1.8	20.1469	1.0	0.1619	1.7	0.0237	1.3	0.79	150.8	2.0	152.4	2.4	176.9	24.1	150.8	2.0	NA
-MM1-Comp Spot 89	143	4451	3.1	21.9740	3.9	0.1486	4.0	0.0237	1.2	0.29	151.0	1.7	140.7	5.3	NA	NA	151.0	1.7	NA
-MM1-Comp Spot 84	203	31191	2.5	20.2170	1.3	0.1617	1.8	0.0237	1.3	0.71	151.2	1.9	152.2	2.6	168.8	30.0	151.2	1.9	NA
-MM1-Comp Spot 35	70	6193	6.2	20.3244	2.6	0.1610	3.1	0.0237	1.7	0.56	151.2	2.6	151.5	4.4	156.5	60.5	151.2	2.6	NA
-MM1-Comp Spot 131	276	6180	1.3	21.4536	1.2	0.1527	1.5	0.0238	0.9	0.60	151.4	1.4	144.3	2.1	28.4	29.2	151.4	1.4	NA
-MM1-Comp Spot 128	90	11741	2.4	20.7320	2.2	0.1585	2.4	0.0238	1.2	0.47	151.9	1.7	149.4	3.4	109.8	50.9	151.9	1.7	NA
-MM1-Comp Spot 189	389	20177	4.1	20.9224	1.1	0.1573	1.6	0.0239	1.2	0.73	152.2	1.8	148.4	2.3	88.2	26.6	152.2	1.8	NA
-MM1-Comp Spot 184	85	65233	2.3	20.5363	1.9	0.1610	2.3	0.0240	1.3	0.57	152.8	2.0	151.6	3.3	132.1	44.8	152.8	2.0	NA
-MM1-Comp Spot 219	247	19284	2.8	18.2966	1.8	0.1811	2.4	0.0240	1.6	0.65	153.1	2.4	169.0	3.7	397.1	40.8	153.1	2.4	NA
-MM1-Comp Spot 147	199	37064	5.6	20.1840	1.1	0.1653	1.5	0.0242	1.0	0.67	154.2	1.5	155.3	2.2	172.6	26.4	154.2	1.5	NA
-MM1-Comp Spot 120	127	7371	3.0	20.7491	1.7	0.1608	2.0	0.0242	1.0	0.51	154.2	1.5	151.4	2.8	107.8	40.3	154.2	1.5	NA
-MM1-Comp Spot 72	99	9099	2.4	21.2892	1.6	0.1567	1.9	0.0242	1.1	0.56	154.2	1.6	147.8	2.6	46.8	37.7	154.2	1.6	NA
-MM1-Comp Spot 111	79	64652	2.7	20.3137	2.1	0.1646	2.4	0.0243	1.2	0.50	154.5	1.8	154.7	3.4	157.7	48.6	154.5	1.8	NA
-MM1-Comp Spot 56	66	3478	2.6	21.8710	2.4	0.1533	2.9	0.0243	1.7	0.57	154.9	2.6	144.8	3.9	NA	NA	154.9	2.6	NA
-MM1-Comp Spot 153	686	65328	15.2	20.3018	1.0	0.1662	1.5	0.0245	1.1	0.76	156.0	1.7	156.1	2.2	159.0	23.0	156.0	1.7	NA
-MM1-Comp Spot 155	481	42248	3.7	20.3103	0.9	0.1668	1.3	0.0246	0.9	0.73	156.5	1.4	156.6	1.8	158.1	20.2	156.5	1.4	NA
-MM1-Comp Spot 163	526	22366	13.6	20.4306	1.0	0.1672	1.7	0.0248	1.4	0.83	157.8	2.2	157.0	2.5	144.2	22.4	157.8	2.2	NA
-MM1-Comp Spot 126	648	30221	7.8	20.2267	1.0	0.1689	1.6	0.0248	1.3	0.80	157.9	2.0	158.5	2.4	167.7	22.3	157.9	2.0	NA
-MM1-Comp Spot 162	293	10285	2.5	19.0493	2.4	0.1803	2.7	0.0249	1.2	0.45	158.7	1.9	168.3	4.1	306.1	54.1	158.7	1.9	NA
-MM1-Comp Spot 117	422	130145	2.6	20.2699	1.2	0.1730	1.7	0.0255	1.2	0.72	162.0	1.9	162.1	2.5	162.7	27.1	162.0	1.9	NA
-MM1-Comp Spot 174	247	9258	3.6	20.8000	1.1	0.1694	1.7	0.0256	1.3	0.76	162.7	2.0	158.9	2.4	102.0	25.8	162.7	2.0	NA
-MM1-Comp Spot 23	150	19531	3.5	19.9687	1.3	0.1788	2.0	0.0259	1.5	0.74	164.9	2.4	167.0	3.0	197.6	30.8	164.9	2.4	NA
-MM1-Comp Spot 208	285	18584	5.8	20.0085	1.3	0.2461	1.9	0.0357	1.4	0.73	226.3	3.0	223.4	3.7	193.0	29.5	226.3	3.0	NA
-MM1-Comp Spot 59	1840	630253	1.3	18.7369	0.7	0.2878	2.8	0.0391	2.7	0.97	247.4	6.6	256.8	6.4	343.6	15.7	247.4	6.6	NA
-MM1-Comp Spot 91	314	35417	2.0	18.3933	1.1	0.3175	1.6	0.0424	1.1	0.69	267.5	2.8	280.0	3.8	385.3	25.5	267.5	2.8	NA
-MM1-Comp Spot 204	732	77974	1.8	19.1178	0.7	0.3380	1.4	0.0469	1.2	0.88	295.3	3.4	295.6	3.5	297.9	15.0	295.3	3.4	NA
-MM1-Comp Spot 47	1147	139885	1.9	19.0421	0.6	0.3404	1.4	0.0470	1.2	0.89	296.2	3.5	297.4	3.5	306.9	14.1	296.2	3.5	NA
-MM1-Comp Spot 55	795	144803	3.3	18.8621	0.9	0.3442	1.5	0.0471	1.2	0.82	296.7	3.6	300.3	3.9	328.5	19.6	296.7	3.6	NA
-MM1-Comp Spot 3	442	96344	2.6	19.0909	1.0	0.3402	1.7	0.0471	1.4	0.81	296.8	4.0	297.3	4.4	301.1	22.6	296.8	4.0	NA

-MM1-Comp Spot 7	552	52794	4.0	19.1854	0.6	0.3387	1.3	0.0472	1.1	0.88	297.0	3.2	296.2	3.2	289.8	13.8	297.0	3.2	NA
-MM1-Comp Spot 28	1193	284379	2.8	18.8148	0.6	0.3455	1.1	0.0472	0.9	0.82	297.1	2.7	301.3	2.9	334.2	14.5	297.1	2.7	NA
-MM1-Comp Spot 12	1750	283695	3.0	18.7262	0.8	0.3488	1.6	0.0474	1.4	0.86	298.5	4.0	303.8	4.1	344.9	17.9	298.5	4.0	NA
-MM1-Comp Spot 158	410	199093	3.3	18.9887	0.7	0.3442	1.6	0.0474	1.5	0.92	298.6	4.4	300.3	4.3	313.3	15.0	298.6	4.4	NA
-MM1-Comp Spot 187	1155	115277	2.9	18.8752	0.8	0.3464	1.4	0.0474	1.2	0.82	298.8	3.4	302.0	3.7	326.9	18.5	298.8	3.4	NA
-MM1-Comp Spot 191	645	198367	2.3	18.9887	0.7	0.3444	1.3	0.0475	1.0	0.81	298.9	3.0	300.5	3.3	313.3	16.9	298.9	3.0	NA
-MM1-Comp Spot 145	666	58718	4.2	19.3064	0.9	0.3388	1.4	0.0475	1.1	0.77	298.9	3.2	296.3	3.6	275.4	20.7	298.9	3.2	NA
-MM1-Comp Spot 75	355	243543	1.7	18.4380	0.7	0.3548	1.4	0.0475	1.2	0.87	298.9	3.6	308.3	3.8	379.8	15.8	298.9	3.6	NA
-MM1-Comp Spot 179	771	88140	2.8	18.8360	0.9	0.3474	1.2	0.0475	0.9	0.72	299.0	2.6	302.7	3.2	331.6	19.6	299.0	2.6	NA
-MM1-Comp Spot 186	1298	96403	2.7	18.8963	0.7	0.3469	1.2	0.0476	1.0	0.81	299.6	2.8	302.4	3.1	324.4	15.9	299.6	2.8	NA
-MM1-Comp Spot 130	975	574545	2.6	18.9811	0.7	0.3454	1.5	0.0476	1.3	0.87	299.6	3.7	301.3	3.8	314.2	16.7	299.6	3.7	NA
-MM1-Comp Spot 212	1240	87441	3.5	18.8954	0.8	0.3473	1.6	0.0476	1.4	0.86	299.9	4.0	302.7	4.2	324.5	18.4	299.9	4.0	NA
-MM1-Comp Spot 181	1358	344072	2.8	18.8407	0.8	0.3483	1.3	0.0476	1.1	0.82	299.9	3.2	303.5	3.5	331.1	17.2	299.9	3.2	NA
-MM1-Comp Spot 11	1317	227318	3.5	18.8770	0.8	0.3479	1.4	0.0477	1.2	0.82	300.1	3.5	303.1	3.8	326.7	18.7	300.1	3.5	NA
-MM1-Comp Spot 82	773	2643498	2.2	18.9118	0.8	0.3486	1.2	0.0478	1.0	0.78	301.3	2.8	303.7	3.2	322.6	17.3	301.3	2.8	NA
-MM1-Comp Spot 13	738	65572	2.7	19.2276	0.7	0.3434	1.3	0.0479	1.0	0.83	301.7	3.1	299.7	3.3	284.8	16.4	301.7	3.1	NA
-MM1-Comp Spot 38	1377	619482	3.2	18.9490	0.6	0.3485	1.2	0.0479	1.0	0.86	301.7	3.1	303.6	3.2	318.1	13.9	301.7	3.1	NA
-MM1-Comp Spot 115	689	60722	1.5	19.2306	0.9	0.3436	1.8	0.0479	1.5	0.85	301.8	4.4	299.9	4.6	284.4	21.3	301.8	4.4	NA
-MM1-Comp Spot 188	373	30762	3.1	18.8039	1.2	0.3516	1.6	0.0480	1.1	0.68	302.1	3.2	305.9	4.2	335.5	26.3	302.1	3.2	NA
-MM1-Comp Spot 34	422	261393	5.4	18.7804	0.8	0.3522	1.3	0.0480	1.0	0.77	302.2	3.0	306.4	3.5	338.3	18.9	302.2	3.0	NA
-MM1-Comp Spot 8	326	59751	4.8	19.1873	0.9	0.3456	1.5	0.0481	1.2	0.80	302.9	3.6	301.4	4.0	289.6	21.1	302.9	3.6	NA
-MM1-Comp Spot 180	356	136057	2.9	18.9928	0.9	0.3493	1.5	0.0481	1.2	0.80	303.0	3.6	304.2	4.0	312.8	20.7	303.0	3.6	NA
-MM1-Comp Spot 220	48	6302	2.4	18.8089	1.9	0.3530	2.3	0.0482	1.2	0.54	303.3	3.7	307.0	6.0	334.9	43.3	303.3	3.7	NA
-MM1-Comp Spot 175	364	141272	3.3	18.9183	1.0	0.3510	1.6	0.0482	1.3	0.80	303.3	3.8	305.5	4.2	321.8	22.1	303.3	3.8	NA
-MM1-Comp Spot 50	652	291408	5.5	18.9541	0.8	0.3509	1.4	0.0483	1.2	0.82	303.8	3.5	305.4	3.8	317.4	18.8	303.8	3.5	NA
-MM1-Comp Spot 146	272	117496	3.0	18.9558	0.9	0.3510	1.5	0.0483	1.2	0.79	303.9	3.6	305.5	4.0	317.2	21.5	303.9	3.6	NA
-MM1-Comp Spot 63	585	490617	4.0	18.8929	0.7	0.3524	1.5	0.0483	1.3	0.88	304.1	3.9	306.5	4.0	324.8	16.0	304.1	3.9	NA
-MM1-Comp Spot 225	681	105968	4.4	18.8063	0.8	0.3541	1.6	0.0483	1.4	0.86	304.2	4.0	307.8	4.2	335.2	18.3	304.2	4.0	NA
-MM1-Comp Spot 0	531	81024	5.0	18.8723	0.8	0.3529	1.6	0.0483	1.4	0.87	304.2	4.2	306.9	4.3	327.3	17.9	304.2	4.2	NA
-MM1-Comp Spot 5	391	62008	3.0	19.1234	0.9	0.3485	1.6	0.0484	1.3	0.82	304.4	4.0	303.6	4.2	297.2	21.1	304.4	4.0	NA
-MM1-Comp Spot 154	436	375740	4.0	19.2981	0.7	0.3455	1.4	0.0484	1.1	0.84	304.6	3.4	301.4	3.6	276.4	17.1	304.6	3.4	NA
-MM1-Comp Spot 209	377	57180	3.4	19.0089	0.9	0.3510	1.8	0.0484	1.5	0.86	304.7	4.6	305.5	4.7	310.9	21.1	304.7	4.6	NA
-MM1-Comp Spot 20	1028	145975	4.3	18.9135	0.8	0.3532	1.3	0.0485	1.0	0.80	305.2	3.1	307.2	3.5	322.4	17.9	305.2	3.1	NA
-MM1-Comp Spot 195	514	292759	3.9	18.9074	0.9	0.3539	1.5	0.0486	1.2	0.82	305.6	3.7	307.7	4.0	323.0	19.5	305.6	3.7	NA
-MM1-Comp Spot 92	860	153898	3.5	19.2292	0.9	0.3481	1.4	0.0486	1.1	0.79	305.7	3.3	303.3	3.7	284.6	19.6	305.7	3.3	NA
-MM1-Comp Spot 39	336	74043	3.8	19.0430	0.8	0.3515	1.3	0.0486	1.0	0.81	305.7	3.1	305.9	3.4	306.8	17.1	305.7	3.1	NA
-MM1-Comp Spot 199	552	74227	2.2	18.7643	0.7	0.3575	1.7	0.0487	1.5	0.90	306.3	4.5	310.3	4.5	340.3	16.7	306.3	4.5	NA
-MM1-Comp Spot 101	902	85014	8.5	18.9651	0.8	0.3549	1.7	0.0488	1.5	0.89	307.4	4.6	308.4	4.6	316.1	17.9	307.4	4.6	NA
-MM1-Comp Spot 231	356	51726	2.4	19.2468	0.7	0.3508	1.3	0.0490	1.1	0.82	308.3	3.2	305.3	3.4	282.5	17.1	308.3	3.2	NA
-MM1-Comp Spot 164	96	19254	1.9	18.5612	1.4	0.3641	1.9	0.0490	1.2	0.65	308.6	3.6	315.3	5.0	364.9	31.7	308.6	3.6	NA
-MM1-Comp Spot 9	663	99960	1.4	19.2500	0.8	0.3521	1.4	0.0492	1.1	0.81	309.5	3.4	306.3	3.7	282.2	19.0	309.5	3.4	NA
-MM1-Comp Spot 229	299	123828	2.3	18.8794	0.9	0.3605	1.8	0.0494	1.5	0.87	310.7	4.7	312.6	4.8	326.4	20.0	310.7	4.7	NA
-MM1-Comp Spot 171	490	84085	4.3	19.0348	0.6	0.3593	1.2	0.0496	1.0	0.84	312.2	3.1	311.7	3.2	307.8	14.8	312.2	3.1	NA
-MM1-Comp Spot 14	300	76068	4.4	19.0168	0.7	0.3630	1.3	0.0501	1.1	0.84	315.1	3.2	314.5	3.4	309.9	15.5	315.1	3.2	NA
-MM1-Comp Spot 1	1122	490254	2.0	18.6631	1.0	0.3791	1.5	0.0513	1.2	0.76	322.7	3.7	326.4	4.3	352.5	22.6	322.7	3.7	NA
-MM1-Comp Spot 185	293	79536	4.0	17.9021	0.9	0.5357	1.7	0.0696	1.5	0.85	433.6	6.2	435.6	6.2	445.8	20.3	433.6	6.2	97.3
-MM1-Comp Spot 105	270	37661	4.4	17.4782	1.0	0.5824	1.7	0.0739	1.3	0.81	459.4	5.9	466.0	6.2	498.9	21.4	459.4	5.9	92.1
-MM1-Comp Spot 74	41	9257	1.9	17.9453	1.4	0.6078	1.9	0.0791	1.2	0.65	491.0	5.7	482.2	7.1	440.4	31.5	491.0	5.7	111.5

Nutzotin Mountains Sequence – MC1-COMP (FA1)

						Isotope ratios						Apparent ages (Ma)							
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
MC1-COMP (FA1)																			
-MC1-COMP Spot 52	999	51536	1.0	20.1309	0.8	0.1386	2.5	0.0202	2.3	0.95	129.2	3.0	131.8	3.0	178.8	18.3	129.2	3.0	NA
-MC1-COMP Spot 25	33	1807	6.9	23.4784	4.8	0.1258	5.1	0.0214	1.7	0.33	136.7	2.3	120.3	5.8	NA	NA	136.7	2.3	NA
-MC1-COMP Spot 205	146	306924	5.5	19.3673	1.7	0.1563	1.9	0.0220	1.0	0.52	140.1	1.4	147.5	2.6	268.2	37.9	140.1	1.4	NA
-MC1-COMP Spot 133	513	416343	2.5	20.5370	0.9	0.1477	1.4	0.0220	1.2	0.80	140.3	1.6	139.9	1.9	132.0	20.3	140.3	1.6	NA
-MC1-COMP Spot 198	116	7213	4.8	20.8235	1.9	0.1461	2.3	0.0221	1.3	0.57	140.7	1.8	138.4	2.9	99.4	43.9	140.7	1.8	NA
-MC1-COMP Spot 118	328	64462	3.8	20.1046	0.9	0.1513	1.4	0.0221	1.1	0.78	140.8	1.5	143.1	1.9	181.8	20.9	140.8	1.5	NA
-MC1-COMP Spot 91	454	44587	5.1	20.1337	0.9	0.1513	1.6	0.0221	1.3	0.84	140.9	1.8	143.1	2.1	178.4	20.2	140.9	1.8	NA
-MC1-COMP Spot 251	237	30586	2.5	19.3785	1.7	0.1575	2.2	0.0221	1.5	0.66	141.2	2.1	148.5	3.1	266.9	38.3	141.2	2.1	NA
-MC1-COMP Spot 169	118	5081	4.0	20.9822	1.3	0.1455	1.6	0.0222	0.9	0.58	141.3	1.3	137.9	2.0	81.3	30.1	141.3	1.3	NA
-MC1-COMP Spot 45	238	53774	2.9	20.6149	1.3	0.1482	2.0	0.0222	1.5	0.77	141.3	2.1	140.3	2.6	123.1	30.1	141.3	2.1	NA
-MC1-COMP Spot 11	70	6162	4.9	20.6220	3.1	0.1482	3.2	0.0222	0.9	0.29	141.3	1.3	140.3	4.2	122.3	73.0	141.3	1.3	NA
-MC1-COMP Spot 87	170	7800	4.3	19.0836	3.1	0.1601	3.4	0.0222	1.4	0.41	141.3	1.9	150.8	4.7	302.0	69.7	141.3	1.9	NA
-MC1-COMP Spot 120	106	4069	4.7	21.9685	1.9	0.1391	2.4	0.0222	1.5	0.61	141.4	2.1	132.3	3.0	NA	NA	141.4	2.1	NA
-MC1-COMP Spot 155	105	16220	3.9	20.0300	1.5	0.1527	1.8	0.0222	1.1	0.58	141.5	1.5	144.3	2.5	190.5	34.9	141.5	1.5	NA
-MC1-COMP Spot 311	129	48615	5.3	19.5496	1.4	0.1567	1.8	0.0222	1.1	0.64	141.7	1.6	147.8	2.4	246.7	31.4	141.7	1.6	NA
-MC1-COMP Spot 41	364	94467	3.4	20.1104	1.0	0.1524	1.7	0.0222	1.4	0.82	141.8	1.9	144.0	2.2	181.1	22.4	141.8	1.9	NA
-MC1-COMP Spot 196	392	50004	3.5	19.7683	0.9	0.1551	1.6	0.0222	1.2	0.80	141.8	1.8	146.4	2.1	221.0	21.5	141.8	1.8	NA
-MC1-COMP Spot 286	402	220947	2.8	20.1335	0.9	0.1524	1.6	0.0223	1.4	0.83	141.9	1.9	144.0	2.2	178.5	21.0	141.9	1.9	NA
-MC1-COMP Spot 30	242	9760	4.6	20.7617	1.3	0.1479	1.8	0.0223	1.3	0.70	142.1	1.8	140.1	2.4	106.4	31.0	142.1	1.8	NA
-MC1-COMP Spot 248	259	68560	4.1	20.2822	1.1	0.1516	1.6	0.0223	1.1	0.71	142.2	1.6	143.3	2.1	161.3	25.9	142.2	1.6	NA
-MC1-COMP Spot 165	170	24659	4.5	20.3749	1.6	0.1509	2.1	0.0223	1.3	0.64	142.3	1.9	142.7	2.8	150.7	37.5	142.3	1.9	NA
-MC1-COMP Spot 221	316	69770	3.1	20.1451	1.1	0.1527	1.8	0.0223	1.4	0.77	142.3	1.9	144.3	2.4	177.1	26.4	142.3	1.9	NA
-MC1-COMP Spot 287	167	14742	5.4	20.1591	1.7	0.1526	2.1	0.0223	1.2	0.59	142.3	1.7	144.2	2.8	175.5	38.5	142.3	1.7	NA
-MC1-COMP Spot 175	108	42706	4.2	20.8329	1.8	0.1477	2.2	0.0223	1.2	0.53	142.4	1.6	139.9	2.8	98.3	43.2	142.4	1.6	NA
-MC1-COMP Spot 178	331	48224	2.4	20.1525	1.1	0.1527	1.7	0.0223	1.2	0.75	142.4	1.8	144.3	2.2	176.3	25.8	142.4	1.8	NA
-MC1-COMP Spot 206	121	10484	5.3	19.9454	1.7	0.1543	2.1	0.0223	1.3	0.60	142.4	1.8	145.7	2.8	200.3	38.4	142.4	1.8	NA
-MC1-COMP Spot 102	142	37752	4.4	20.0158	1.2	0.1539	1.6	0.0224	1.1	0.68	142.5	1.6	145.4	2.2	192.2	28.2	142.5	1.6	NA
-MC1-COMP Spot 186	334	18706	4.3	20.2762	1.2	0.1520	1.7	0.0224	1.3	0.73	142.5	1.8	143.6	2.3	162.0	27.4	142.5	1.8	NA
-MC1-COMP Spot 61	57	3367	7.2	21.9487	2.7	0.1405	3.1	0.0224	1.4	0.46	142.7	2.0	133.5	3.8	NA	NA	142.7	2.0	NA
-MC1-COMP Spot 16	133	11407	5.8	21.2398	1.7	0.1452	2.2	0.0224	1.3	0.59	142.7	1.8	137.7	2.8	52.3	41.5	142.7	1.8	NA
-MC1-COMP Spot 68	138	13072	5.8	20.7345	1.5	0.1488	2.2	0.0224	1.5	0.70	142.7	2.1	140.8	2.8	109.5	36.6	142.7	2.1	NA
-MC1-COMP Spot 114	164	67098	7.7	20.2136	1.4	0.1526	1.7	0.0224	0.9	0.55	142.7	1.3	144.2	2.2	169.2	32.5	142.7	1.3	NA
-MC1-COMP Spot 173	125	6233	2.2	19.6212	2.1	0.1573	2.5	0.0224	1.4	0.58	142.7	2.0	148.3	3.5	238.3	47.5	142.7	2.0	NA
-MC1-COMP Spot 27	91	23736	3.9	20.5331	2.3	0.1503	2.6	0.0224	1.3	0.49	142.7	1.8	142.2	3.5	132.5	54.0	142.7	1.8	NA
-MC1-COMP Spot 189	77	4273	5.7	21.3153	3.6	0.1448	3.9	0.0224	1.4	0.35	142.8	1.9	137.3	5.0	43.8	86.5	142.8	1.9	NA
-MC1-COMP Spot 7	143	29090	5.0	20.9754	1.4	0.1471	1.8	0.0224	1.2	0.65	142.8	1.7	139.4	2.4	82.1	33.1	142.8	1.7	NA
-MC1-COMP Spot 188	763	297900	4.0	20.1986	0.9	0.1528	1.7	0.0224	1.4	0.83	142.8	2.0	144.4	2.2	170.9	21.6	142.8	2.0	NA
-MC1-COMP Spot 158	109	334092	3.3	19.4116	1.6	0.1590	2.0	0.0224	1.2	0.61	142.8	1.7	149.8	2.8	263.0	36.6	142.8	1.7	NA
-MC1-COMP Spot 214	67	10953	5.2	20.7420	2.5	0.1489	2.8	0.0224	1.4	0.49	142.8	2.0	140.9	3.7	108.7	58.4	142.8	2.0	NA
-MC1-COMP Spot 78	488	97128	4.6	19.9524	0.9	0.1548	1.7	0.0224	1.4	0.84	142.8	2.0	146.1	2.3	199.5	21.7	142.8	2.0	NA
-MC1-COMP Spot 176	257	103780	2.9	20.0887	1.1	0.1537	1.7	0.0224	1.3	0.76	142.8	1.8	145.2	2.3	183.7	26.1	142.8	1.8	NA

-MC1-COMP Spot 231	101	19203	3.3	20.2609	1.5	0.1525	2.0	0.0224	1.4	0.67	142.9	1.9	144.1	2.7	163.7	34.8	142.9	1.9	NA
-MC1-COMP Spot 100	287	11112	3.0	20.5456	1.1	0.1504	1.5	0.0224	1.0	0.67	142.9	1.4	142.3	2.0	131.1	26.5	142.9	1.4	NA
-MC1-COMP Spot 235	291	64245	4.0	19.8703	1.0	0.1555	1.6	0.0224	1.2	0.77	143.0	1.7	146.8	2.2	209.1	23.6	143.0	1.7	NA
-MC1-COMP Spot 148	96	18593	4.6	20.0547	1.7	0.1541	2.2	0.0224	1.3	0.61	143.0	1.9	145.6	3.0	187.6	40.4	143.0	1.9	NA
-MC1-COMP Spot 204	137	30576	3.0	20.1559	1.6	0.1534	1.9	0.0224	1.0	0.54	143.0	1.5	144.9	2.6	175.9	38.3	143.0	1.5	NA
-MC1-COMP Spot 219	243	14042	3.1	20.4461	1.0	0.1512	1.4	0.0224	1.1	0.73	143.0	1.5	143.0	1.9	142.5	23.0	143.0	1.5	NA
-MC1-COMP Spot 199	164	17106	4.8	20.0282	1.5	0.1544	2.0	0.0224	1.3	0.64	143.0	1.8	145.8	2.7	190.7	35.3	143.0	1.8	NA
-MC1-COMP Spot 299	99	19445	4.6	20.6048	1.9	0.1501	2.2	0.0224	1.0	0.47	143.0	1.5	142.0	2.9	124.3	45.7	143.0	1.5	NA
-MC1-COMP Spot 147	138	459453	5.1	20.2093	1.5	0.1531	2.2	0.0224	1.6	0.72	143.1	2.2	144.6	2.9	169.7	35.5	143.1	2.2	NA
-MC1-COMP Spot 159	192	33889	4.3	20.2820	1.1	0.1526	1.6	0.0225	1.2	0.74	143.1	1.7	144.2	2.1	161.3	25.2	143.1	1.7	NA
-MC1-COMP Spot 233	334	44000	3.3	20.4960	1.0	0.1511	1.6	0.0225	1.2	0.75	143.2	1.7	142.8	2.1	136.7	24.6	143.2	1.7	NA
-MC1-COMP Spot 258	172	9900	3.6	20.8233	1.3	0.1487	1.8	0.0225	1.2	0.68	143.2	1.7	140.8	2.3	99.4	30.8	143.2	1.7	NA
-MC1-COMP Spot 72	105	26557	4.2	20.6425	1.7	0.1500	2.0	0.0225	1.1	0.54	143.2	1.5	141.9	2.7	120.0	40.5	143.2	1.5	NA
-MC1-COMP Spot 57	147	32228	3.3	20.2078	1.9	0.1532	3.0	0.0225	2.2	0.76	143.2	3.2	144.8	4.0	169.9	45.3	143.2	3.2	NA
-MC1-COMP Spot 211	208	98618	3.6	19.5590	1.4	0.1584	1.8	0.0225	1.1	0.63	143.3	1.6	149.3	2.4	245.6	31.6	143.3	1.6	NA
-MC1-COMP Spot 2	310	22748	2.1	20.1109	1.1	0.1540	1.7	0.0225	1.3	0.75	143.3	1.8	145.5	2.3	181.1	26.7	143.3	1.8	NA
-MC1-COMP Spot 85	109	34381	5.9	20.0202	1.5	0.1548	2.4	0.0225	1.8	0.77	143.3	2.6	146.1	3.2	191.7	35.2	143.3	2.6	NA
-MC1-COMP Spot 246	255	8416	2.6	21.1080	1.2	0.1469	1.7	0.0225	1.3	0.72	143.4	1.8	139.1	2.2	67.1	28.4	143.4	1.8	NA
-MC1-COMP Spot 239	167	23080	3.3	20.7765	1.4	0.1492	1.8	0.0225	1.0	0.58	143.4	1.5	141.2	2.3	104.7	33.8	143.4	1.5	NA
-MC1-COMP Spot 261	762	87389	2.8	20.2407	1.0	0.1532	1.6	0.0225	1.2	0.75	143.4	1.7	144.7	2.1	166.1	24.1	143.4	1.7	NA
-MC1-COMP Spot 37	101	19810	4.3	19.8171	1.6	0.1565	1.9	0.0225	1.2	0.60	143.5	1.7	147.6	2.7	215.3	35.9	143.5	1.7	NA
-MC1-COMP Spot 157	370	13841	3.4	20.7750	1.0	0.1493	1.6	0.0225	1.2	0.78	143.5	1.7	141.3	2.0	104.8	22.9	143.5	1.7	NA
-MC1-COMP Spot 28	133	24326	5.5	20.3317	1.6	0.1526	2.1	0.0225	1.3	0.62	143.5	1.8	144.2	2.8	155.6	37.8	143.5	1.8	NA
-MC1-COMP Spot 66	236	29792	6.1	20.3264	1.3	0.1527	1.7	0.0225	1.1	0.64	143.6	1.5	144.3	2.3	156.2	30.5	143.6	1.5	NA
-MC1-COMP Spot 210	326	18432	2.4	20.4729	1.1	0.1516	1.6	0.0225	1.2	0.76	143.6	1.7	143.3	2.2	139.4	25.1	143.6	1.7	NA
-MC1-COMP Spot 3	493	62192	4.5	20.0887	0.8	0.1545	1.6	0.0225	1.4	0.86	143.6	2.0	145.9	2.2	183.7	19.6	143.6	2.0	NA
-MC1-COMP Spot 89	281	53628	2.2	20.1213	1.2	0.1543	1.7	0.0225	1.2	0.70	143.6	1.6	145.7	2.3	179.9	27.7	143.6	1.6	NA
-MC1-COMP Spot 216	413	226558	2.4	20.2041	0.8	0.1537	1.7	0.0225	1.4	0.87	143.7	2.1	145.2	2.2	170.3	18.9	143.7	2.1	NA
-MC1-COMP Spot 116	275	90589	2.5	20.1280	1.1	0.1543	1.5	0.0225	1.0	0.66	143.7	1.4	145.7	2.0	179.1	26.3	143.7	1.4	NA
-MC1-COMP Spot 103	182	10641	4.4	20.9158	1.4	0.1485	1.7	0.0225	0.9	0.52	143.7	1.2	140.6	2.2	88.9	34.0	143.7	1.2	NA
-MC1-COMP Spot 49	115	8044	7.2	21.2183	1.7	0.1465	2.0	0.0226	1.1	0.55	143.8	1.6	138.8	2.6	54.7	40.3	143.8	1.6	NA
-MC1-COMP Spot 26	77	8322	6.2	20.6939	1.6	0.1502	2.1	0.0226	1.4	0.67	143.8	2.0	142.1	2.8	114.1	37.1	143.8	2.0	NA
-MC1-COMP Spot 125	190	15536	4.8	20.5901	1.2	0.1510	1.7	0.0226	1.2	0.69	143.8	1.7	142.8	2.3	126.0	28.9	143.8	1.7	NA
-MC1-COMP Spot 171	467	61830	6.5	20.3611	0.8	0.1528	1.6	0.0226	1.3	0.84	143.9	1.9	144.4	2.1	152.2	19.8	143.9	1.9	NA
-MC1-COMP Spot 237	154	6628	5.2	21.1085	1.9	0.1474	2.4	0.0226	1.5	0.62	143.9	2.1	139.6	3.1	67.1	45.0	143.9	2.1	NA
-MC1-COMP Spot 149	283	2046575	3.5	20.4766	1.3	0.1519	1.8	0.0226	1.1	0.65	143.9	1.6	143.6	2.3	138.9	31.3	143.9	1.6	NA
-MC1-COMP Spot 197	1002	32784	4.7	20.3980	0.8	0.1525	1.5	0.0226	1.2	0.84	143.9	1.7	144.1	2.0	148.0	18.8	143.9	1.7	NA
-MC1-COMP Spot 13	172	14864	3.6	20.9324	1.7	0.1486	2.1	0.0226	1.2	0.56	143.9	1.7	140.7	2.7	87.0	40.8	143.9	1.7	NA
-MC1-COMP Spot 76	178	27799	3.8	19.6529	1.2	0.1583	1.6	0.0226	1.0	0.65	143.9	1.5	149.2	2.2	234.6	27.7	143.9	1.5	NA
-MC1-COMP Spot 50	103	8172	3.5	20.1422	1.5	0.1546	1.8	0.0226	1.0	0.57	144.1	1.5	146.0	2.5	177.5	35.0	144.1	1.5	NA
-MC1-COMP Spot 301	142	14586	4.1	20.5667	1.6	0.1515	2.0	0.0226	1.2	0.58	144.1	1.7	143.2	2.7	128.7	38.7	144.1	1.7	NA
-MC1-COMP Spot 208	95	11176	4.7	20.2871	1.7	0.1536	2.2	0.0226	1.4	0.62	144.1	1.9	145.1	2.9	160.7	40.0	144.1	1.9	NA
-MC1-COMP Spot 143	102	15146	5.3	20.2893	1.8	0.1536	2.2	0.0226	1.3	0.60	144.2	1.9	145.1	3.0	160.5	41.9	144.2	1.9	NA
-MC1-COMP Spot 97	210	59146	3.3	20.3651	1.0	0.1532	1.6	0.0226	1.3	0.78	144.3	1.8	144.7	2.2	151.8	24.0	144.3	1.8	NA
-MC1-COMP Spot 212	72	30003	5.2	20.3229	2.0	0.1535	2.4	0.0226	1.3	0.55	144.3	1.9	145.0	3.2	156.6	46.5	144.3	1.9	NA
-MC1-COMP Spot 93	74	6429	5.2	20.6406	2.3	0.1511	2.6	0.0226	1.2	0.47	144.3	1.7	142.9	3.5	120.2	54.0	144.3	1.7	NA
-MC1-COMP Spot 224	507	368853	2.6	19.8099	0.8	0.1575	1.3	0.0226	1.0	0.77	144.3	1.4	148.5	1.8	216.1	19.1	144.3	1.4	NA

-MC1-COMP Spot 263	359	35346	2.5	19.8803	1.3	0.1570	1.9	0.0226	1.5	0.75	144.3	2.1	148.1	2.7	207.9	29.9	144.3	2.1	NA
-MC1-COMP Spot 123	134	9663	4.4	20.2239	2.0	0.1544	2.3	0.0227	1.1	0.50	144.5	1.6	145.8	3.1	168.0	46.7	144.5	1.6	NA
-MC1-COMP Spot 257	379	101974	2.7	19.7959	1.2	0.1578	1.8	0.0227	1.3	0.72	144.5	1.8	148.8	2.4	217.8	28.3	144.5	1.8	NA
-MC1-COMP Spot 70	211	4568	4.0	21.3305	1.6	0.1465	2.1	0.0227	1.3	0.64	144.5	1.9	138.8	2.7	42.1	38.1	144.5	1.9	NA
-MC1-COMP Spot 268	762	391941	2.3	20.3601	0.8	0.1535	1.6	0.0227	1.4	0.86	144.5	2.0	145.0	2.2	152.4	19.3	144.5	2.0	NA
-MC1-COMP Spot 215	321	49414	3.0	20.0833	1.3	0.1556	2.0	0.0227	1.5	0.75	144.5	2.1	146.9	2.7	184.3	30.5	144.5	2.1	NA
-MC1-COMP Spot 220	277	24157	4.7	20.4422	1.2	0.1529	1.6	0.0227	1.0	0.63	144.5	1.4	144.5	2.1	142.9	29.1	144.5	1.4	NA
-MC1-COMP Spot 304	49	6251	6.4	21.8637	2.8	0.1430	3.3	0.0227	1.6	0.50	144.6	2.3	135.7	4.2	NA	NA	144.6	2.3	NA
-MC1-COMP Spot 95	200	11765	6.0	20.5197	1.3	0.1523	1.6	0.0227	1.0	0.60	144.6	1.4	144.0	2.2	134.0	30.7	144.6	1.4	NA
-MC1-COMP Spot 162	128	12258	2.9	20.9105	2.1	0.1495	2.5	0.0227	1.3	0.54	144.6	1.9	141.5	3.3	89.5	49.4	144.6	1.9	NA
-MC1-COMP Spot 300	270	768185	3.6	20.6319	0.9	0.1515	1.6	0.0227	1.3	0.82	144.6	1.9	143.3	2.2	121.2	21.8	144.6	1.9	NA
-MC1-COMP Spot 65	289	35748	2.3	20.1783	0.9	0.1549	1.3	0.0227	1.0	0.75	144.6	1.4	146.3	1.8	173.3	20.3	144.6	1.4	NA
-MC1-COMP Spot 75	175	22686	3.0	20.3613	1.6	0.1536	1.8	0.0227	0.9	0.50	144.6	1.3	145.1	2.4	152.2	36.5	144.6	1.3	NA
-MC1-COMP Spot 288	135	20505	4.3	20.1806	1.7	0.1550	2.3	0.0227	1.6	0.69	144.7	2.3	146.4	3.2	173.0	39.0	144.7	2.3	NA
-MC1-COMP Spot 136	156	23681	3.4	20.5586	1.6	0.1522	2.2	0.0227	1.4	0.65	144.7	2.0	143.9	2.9	129.5	38.4	144.7	2.0	NA
-MC1-COMP Spot 184	308	28766	3.6	20.6135	1.2	0.1519	1.8	0.0227	1.3	0.74	144.8	1.9	143.6	2.4	123.3	27.7	144.8	1.9	NA
-MC1-COMP Spot 126	161	10390	4.8	20.9129	1.7	0.1497	2.0	0.0227	1.0	0.52	144.8	1.5	141.7	2.6	89.2	40.4	144.8	1.5	NA
-MC1-COMP Spot 59	798	56117	3.8	20.3636	0.7	0.1538	1.5	0.0227	1.3	0.88	144.8	1.9	145.2	2.0	151.9	16.5	144.8	1.9	NA
-MC1-COMP Spot 15	173	18632	1.5	19.6286	1.5	0.1595	1.9	0.0227	1.2	0.62	144.8	1.7	150.3	2.7	237.4	35.3	144.8	1.7	NA
-MC1-COMP Spot 156	440	18577	2.3	20.4653	1.1	0.1530	1.8	0.0227	1.5	0.80	144.9	2.1	144.6	2.4	140.3	25.1	144.9	2.1	NA
-MC1-COMP Spot 131	126	13332	4.4	20.7930	1.6	0.1506	1.9	0.0227	1.0	0.52	144.9	1.4	142.5	2.5	102.8	37.5	144.9	1.4	NA
-MC1-COMP Spot 56	848	76127	5.1	20.0488	1.0	0.1562	1.7	0.0227	1.4	0.82	144.9	1.9	147.4	2.3	188.3	22.4	144.9	1.9	NA
-MC1-COMP Spot 187	126	63326	4.7	20.0218	1.5	0.1565	2.2	0.0227	1.5	0.71	144.9	2.2	147.6	3.0	191.5	35.7	144.9	2.2	NA
-MC1-COMP Spot 101	322	10181	5.3	20.9623	1.3	0.1495	2.1	0.0227	1.6	0.78	144.9	2.3	141.5	2.7	83.6	30.8	144.9	2.3	NA
-MC1-COMP Spot 129	367	89045	3.1	20.5938	0.9	0.1522	1.5	0.0227	1.2	0.81	145.0	1.8	143.8	2.1	125.5	21.5	145.0	1.8	NA
-MC1-COMP Spot 112	114	6742	4.7	21.9670	2.2	0.1427	3.0	0.0227	2.0	0.66	145.0	2.8	135.4	3.8	NA	NA	145.0	2.8	NA
-MC1-COMP Spot 202	227	117406	2.9	20.0782	1.0	0.1561	1.4	0.0227	1.1	0.73	145.0	1.5	147.3	2.0	184.9	23.1	145.0	1.5	NA
-MC1-COMP Spot 109	114	9344	5.0	20.5656	2.4	0.1525	2.5	0.0227	0.9	0.35	145.0	1.3	144.1	3.4	128.8	56.2	145.0	1.3	NA
-MC1-COMP Spot 260	182	23973	2.8	20.2536	1.3	0.1548	1.7	0.0228	1.1	0.63	145.0	1.5	146.2	2.3	164.6	30.8	145.0	1.5	NA
-MC1-COMP Spot 17	112	14449	4.4	20.6066	1.5	0.1522	1.9	0.0228	1.2	0.63	145.0	1.7	143.8	2.5	124.1	34.6	145.0	1.7	NA
-MC1-COMP Spot 289	794	40941	2.3	20.4962	0.7	0.1530	1.3	0.0228	1.1	0.83	145.1	1.6	144.6	1.8	136.7	17.5	145.1	1.6	NA
-MC1-COMP Spot 69	161	9681	4.6	20.8712	1.9	0.1503	2.3	0.0228	1.3	0.57	145.1	1.9	142.2	3.0	93.9	44.4	145.1	1.9	NA
-MC1-COMP Spot 117	175	30505	4.4	20.5867	1.3	0.1524	1.8	0.0228	1.1	0.65	145.1	1.6	144.0	2.4	126.4	31.5	145.1	1.6	NA
-MC1-COMP Spot 285	175	10046	5.8	20.9270	1.9	0.1499	2.2	0.0228	1.2	0.53	145.1	1.7	141.8	3.0	87.6	45.3	145.1	1.7	NA
-MC1-COMP Spot 139	78	93858	5.7	20.2268	1.6	0.1551	2.1	0.0228	1.3	0.64	145.1	1.9	146.4	2.9	167.7	37.7	145.1	1.9	NA
-MC1-COMP Spot 240	101	8562	6.4	21.5650	2.1	0.1455	2.3	0.0228	1.1	0.47	145.1	1.6	137.9	3.0	15.9	49.5	145.1	1.6	NA
-MC1-COMP Spot 244	596	60644	2.1	20.1792	0.8	0.1556	1.6	0.0228	1.4	0.88	145.2	2.0	146.8	2.2	173.2	18.0	145.2	2.0	NA
-MC1-COMP Spot 145	126	20082	5.8	20.9512	1.9	0.1498	2.2	0.0228	1.0	0.46	145.2	1.4	141.8	2.9	84.9	45.4	145.2	1.4	NA
-MC1-COMP Spot 264	262	45416	3.8	20.4004	1.5	0.1539	2.3	0.0228	1.7	0.74	145.2	2.4	145.3	3.1	147.7	36.0	145.2	2.4	NA
-MC1-COMP Spot 106	255	50231	4.9	20.8565	1.4	0.1505	1.9	0.0228	1.2	0.66	145.2	1.8	142.4	2.5	95.6	33.3	145.2	1.8	NA
-MC1-COMP Spot 273	271	47039	2.9	20.0197	1.2	0.1569	1.7	0.0228	1.3	0.74	145.3	1.9	148.0	2.4	191.7	27.0	145.3	1.9	NA
-MC1-COMP Spot 276	186	36528	3.1	20.0489	1.1	0.1568	1.7	0.0228	1.2	0.72	145.3	1.7	147.9	2.3	188.3	26.6	145.3	1.7	NA
-MC1-COMP Spot 247	181	13849	4.2	20.8830	1.5	0.1505	1.9	0.0228	1.2	0.60	145.4	1.7	142.4	2.6	92.6	36.5	145.4	1.7	NA
-MC1-COMP Spot 105	410	54063	3.3	20.6767	1.0	0.1520	1.7	0.0228	1.4	0.82	145.4	2.0	143.7	2.3	116.1	23.0	145.4	2.0	NA
-MC1-COMP Spot 271	119	21317	4.8	20.1398	1.7	0.1561	2.0	0.0228	1.1	0.55	145.4	1.6	147.3	2.8	177.7	39.2	145.4	1.6	NA
-MC1-COMP Spot 5	119	19929	4.0	20.8090	1.7	0.1511	1.9	0.0228	1.0	0.49	145.4	1.4	142.8	2.6	101.0	40.0	145.4	1.4	NA
-MC1-COMP Spot 222	78	6018	4.7	21.3156	2.1	0.1475	2.4	0.0228	1.2	0.48	145.4	1.7	139.7	3.2	43.8	51.0	145.4	1.7	NA

-MC1-COMP Spot 1	536	27506	2.4	20.5459	1.0	0.1530	1.6	0.0228	1.2	0.77	145.4	1.8	144.6	2.2	131.0	24.3	145.4	1.8	NA
-MC1-COMP Spot 58	127	73125	5.7	20.0017	1.7	0.1572	2.0	0.0228	1.0	0.48	145.4	1.4	148.3	2.7	193.8	40.1	145.4	1.4	NA
-MC1-COMP Spot 67	252	17967	3.1	20.1955	1.3	0.1557	1.8	0.0228	1.2	0.70	145.5	1.8	147.0	2.4	171.3	29.9	145.5	1.8	NA
-MC1-COMP Spot 255	273	16310	4.5	20.9505	1.4	0.1501	1.8	0.0228	1.2	0.66	145.5	1.7	142.0	2.4	85.0	32.7	145.5	1.7	NA
-MC1-COMP Spot 190	317	92123	51.5	20.0363	1.0	0.1570	1.5	0.0228	1.2	0.77	145.5	1.7	148.1	2.1	189.8	22.7	145.5	1.7	NA
-MC1-COMP Spot 20	82	7973	4.1	20.3781	2.0	0.1544	2.4	0.0228	1.2	0.51	145.5	1.7	145.8	3.2	150.2	47.3	145.5	1.7	NA
-MC1-COMP Spot 228	478	29668	1.8	20.4479	0.9	0.1539	1.5	0.0228	1.2	0.79	145.6	1.8	145.4	2.1	142.2	22.0	145.6	1.8	NA
-MC1-COMP Spot 207	102	20669	5.1	20.0020	2.1	0.1574	2.4	0.0228	1.1	0.44	145.6	1.5	148.4	3.3	193.8	49.7	145.6	1.5	NA
-MC1-COMP Spot 310	80	21861	4.8	20.0089	1.6	0.1573	2.1	0.0228	1.3	0.65	145.6	1.9	148.4	2.8	193.0	36.2	145.6	1.9	NA
-MC1-COMP Spot 177	111	67606	4.1	20.1948	1.5	0.1559	1.9	0.0228	1.2	0.62	145.6	1.7	147.1	2.6	171.4	35.0	145.6	1.7	NA
-MC1-COMP Spot 166	145	43931	3.4	20.5531	1.8	0.1532	2.1	0.0228	1.2	0.55	145.6	1.7	144.7	2.9	130.2	42.1	145.6	1.7	NA
-MC1-COMP Spot 86	121	25833	5.0	20.2456	1.5	0.1555	1.9	0.0228	1.0	0.56	145.6	1.5	146.8	2.5	165.5	36.1	145.6	1.5	NA
-MC1-COMP Spot 104	129	12558	2.4	20.5149	2.0	0.1535	2.3	0.0228	1.2	0.51	145.6	1.7	145.0	3.1	134.6	47.0	145.6	1.7	NA
-MC1-COMP Spot 73	74	2594	1.6	22.3893	1.9	0.1407	2.4	0.0229	1.4	0.60	145.7	2.1	133.6	3.0	NA	NA	145.7	2.1	NA
-MC1-COMP Spot 31	131	14221	4.1	20.1580	2.0	0.1563	2.6	0.0229	1.7	0.65	145.7	2.4	147.4	3.5	175.6	45.6	145.7	2.4	NA
-MC1-COMP Spot 34	84	17094	5.2	20.7261	1.9	0.1520	2.3	0.0229	1.2	0.54	145.7	1.8	143.7	3.1	110.4	45.5	145.7	1.8	NA
-MC1-COMP Spot 283	109	3496	5.9	22.1103	1.8	0.1425	2.0	0.0229	1.0	0.47	145.7	1.4	135.3	2.5	NA	NA	145.7	1.4	NA
-MC1-COMP Spot 168	141	34552	2.5	19.9248	1.2	0.1582	1.7	0.0229	1.2	0.69	145.8	1.7	149.1	2.4	202.7	28.9	145.8	1.7	NA
-MC1-COMP Spot 238	551	46340	3.1	20.5059	0.9	0.1537	1.7	0.0229	1.4	0.84	145.8	2.0	145.2	2.3	135.6	21.3	145.8	2.0	NA
-MC1-COMP Spot 111	153	7780	4.0	20.5067	1.7	0.1537	2.0	0.0229	1.1	0.54	145.8	1.6	145.2	2.7	135.5	40.3	145.8	1.6	NA
-MC1-COMP Spot 22	103	70492	4.5	19.6589	1.5	0.1604	2.0	0.0229	1.3	0.65	145.8	1.9	151.0	2.8	233.8	34.8	145.8	1.9	NA
-MC1-COMP Spot 96	602	69580	2.7	20.1734	0.9	0.1563	1.4	0.0229	1.1	0.77	145.8	1.6	147.5	1.9	173.9	20.8	145.8	1.6	NA
-MC1-COMP Spot 150	80	30971	4.6	19.6869	2.0	0.1602	2.6	0.0229	1.7	0.63	145.8	2.4	150.8	3.7	230.5	46.9	145.8	2.4	NA
-MC1-COMP Spot 132	91	50387	5.5	19.9787	1.6	0.1578	2.1	0.0229	1.3	0.62	145.8	1.9	148.8	2.9	196.5	38.1	145.8	1.9	NA
-MC1-COMP Spot 192	90	8170	4.5	20.7671	1.6	0.1519	2.0	0.0229	1.2	0.60	145.8	1.8	143.6	2.7	105.7	38.4	145.8	1.8	NA
-MC1-COMP Spot 32	139	33516	4.9	20.3172	1.7	0.1552	1.9	0.0229	0.9	0.48	145.9	1.3	146.5	2.6	157.3	39.5	145.9	1.3	NA
-MC1-COMP Spot 167	421	260724	2.7	20.4771	1.0	0.1540	1.5	0.0229	1.2	0.77	145.9	1.7	145.5	2.1	138.9	23.0	145.9	1.7	NA
-MC1-COMP Spot 23	314	118007	3.5	19.8698	0.9	0.1587	2.0	0.0229	1.7	0.88	145.9	2.5	149.6	2.7	209.1	21.8	145.9	2.5	NA
-MC1-COMP Spot 293	320	19231	5.6	20.0296	1.3	0.1575	1.8	0.0229	1.2	0.70	145.9	1.8	148.5	2.4	190.6	29.4	145.9	1.8	NA
-MC1-COMP Spot 203	119	57451	7.4	19.2948	1.5	0.1635	2.0	0.0229	1.3	0.65	145.9	1.8	153.7	2.8	276.8	33.9	145.9	1.8	NA
-MC1-COMP Spot 298	528	88266	1.6	20.1876	1.0	0.1563	1.6	0.0229	1.3	0.79	145.9	1.8	147.4	2.2	172.2	23.5	145.9	1.8	NA
-MC1-COMP Spot 259	767	161144	3.1	20.4240	0.8	0.1545	1.5	0.0229	1.3	0.87	145.9	1.9	145.8	2.1	145.0	18.0	145.9	1.9	NA
-MC1-COMP Spot 55	220	23949	3.6	20.4234	1.0	0.1545	1.6	0.0229	1.3	0.77	145.9	1.8	145.8	2.2	145.0	24.6	145.9	1.8	NA
-MC1-COMP Spot 138	77	3753	4.7	21.2702	2.1	0.1484	2.4	0.0229	1.3	0.53	145.9	1.9	140.5	3.2	48.9	49.2	145.9	1.9	NA
-MC1-COMP Spot 88	209	13827	5.3	20.2732	1.3	0.1557	1.8	0.0229	1.3	0.70	146.0	1.8	146.9	2.5	162.3	30.2	146.0	1.8	NA
-MC1-COMP Spot 303	155	21671	5.4	19.7358	1.3	0.1599	1.9	0.0229	1.3	0.71	146.0	1.9	150.6	2.6	224.8	30.7	146.0	1.9	NA
-MC1-COMP Spot 51	128	822672	4.2	20.3409	1.7	0.1552	2.0	0.0229	1.1	0.56	146.0	1.6	146.5	2.7	154.6	38.9	146.0	1.6	NA
-MC1-COMP Spot 225	649	42215	3.1	20.4830	0.9	0.1541	1.6	0.0229	1.4	0.84	146.0	2.0	145.5	2.2	138.2	20.4	146.0	2.0	NA
-MC1-COMP Spot 24	119	10111	5.5	20.5350	1.7	0.1537	2.2	0.0229	1.3	0.60	146.0	1.9	145.2	2.9	132.3	41.1	146.0	1.9	NA
-MC1-COMP Spot 29	233	86162	2.8	20.3009	1.6	0.1555	2.8	0.0229	2.3	0.83	146.0	3.4	146.8	3.8	159.2	36.4	146.0	3.4	NA
-MC1-COMP Spot 6	80	9228	4.7	21.9356	2.9	0.1440	3.2	0.0229	1.3	0.41	146.1	1.9	136.6	4.1	NA	NA	146.1	1.9	NA
-MC1-COMP Spot 195	286	182461	4.9	19.7453	0.9	0.1600	1.8	0.0229	1.6	0.86	146.1	2.3	150.7	2.6	223.7	21.6	146.1	2.3	NA
-MC1-COMP Spot 256	280	42023	4.4	20.4548	1.5	0.1545	1.9	0.0229	1.1	0.62	146.2	1.7	145.9	2.5	141.5	34.3	146.2	1.7	NA
-MC1-COMP Spot 191	217	4631	4.3	21.4933	3.5	0.1471	3.7	0.0229	1.2	0.32	146.2	1.7	139.3	4.8	24.0	83.2	146.2	1.7	NA
-MC1-COMP Spot 274	125	7517	3.7	20.3327	1.7	0.1556	2.0	0.0229	1.0	0.51	146.3	1.5	146.8	2.7	155.5	40.2	146.3	1.5	NA
-MC1-COMP Spot 124	180	68215	4.8	20.6702	1.3	0.1530	1.7	0.0229	1.1	0.65	146.3	1.6	144.6	2.3	116.8	30.6	146.3	1.6	NA
-MC1-COMP Spot 153	52	9266	5.3	20.3444	2.1	0.1555	2.5	0.0230	1.3	0.53	146.3	1.9	146.7	3.4	154.1	49.1	146.3	1.9	NA

-MC1-COMP Spot 281	384	91871	4.3	20.4493	1.0	0.1547	1.7	0.0230	1.4	0.80	146.3	2.0	146.1	2.3	142.1	23.8	146.3	2.0	NA
-MC1-COMP Spot 135	179	23386	4.9	20.1177	1.3	0.1573	1.6	0.0230	0.9	0.60	146.3	1.4	148.3	2.2	180.3	29.4	146.3	1.4	NA
-MC1-COMP Spot 142	143	10675	4.3	20.5172	1.3	0.1542	1.8	0.0230	1.3	0.69	146.3	1.8	145.7	2.5	134.3	31.0	146.3	1.8	NA
-MC1-COMP Spot 110	81	11036	4.8	20.5531	1.9	0.1540	2.3	0.0230	1.3	0.58	146.4	1.9	145.4	3.1	130.2	44.0	146.4	1.9	NA
-MC1-COMP Spot 226	77	5446	6.3	21.1932	2.5	0.1494	2.8	0.0230	1.1	0.41	146.4	1.7	141.4	3.7	57.5	60.1	146.4	1.7	NA
-MC1-COMP Spot 151	248	32971	4.6	20.8739	1.0	0.1518	1.8	0.0230	1.5	0.84	146.5	2.2	143.5	2.4	93.6	23.4	146.5	2.2	NA
-MC1-COMP Spot 54	142	13406	4.1	20.6359	1.4	0.1535	2.1	0.0230	1.6	0.74	146.5	2.3	145.0	2.9	120.7	34.1	146.5	2.3	NA
-MC1-COMP Spot 83	395	273452	2.2	20.4637	1.1	0.1548	1.6	0.0230	1.2	0.74	146.5	1.7	146.2	2.2	140.4	25.3	146.5	1.7	NA
-MC1-COMP Spot 236	199	12013	4.2	20.7614	1.7	0.1527	2.0	0.0230	1.1	0.54	146.6	1.5	144.3	2.6	106.4	39.1	146.6	1.5	NA
-MC1-COMP Spot 90	143	5893	5.4	20.8381	1.4	0.1521	1.7	0.0230	1.0	0.59	146.6	1.4	143.8	2.3	97.7	32.2	146.6	1.4	NA
-MC1-COMP Spot 19	253	14560	4.5	20.6483	1.2	0.1536	1.6	0.0230	1.1	0.67	146.6	1.5	145.1	2.1	119.3	27.8	146.6	1.5	NA
-MC1-COMP Spot 290	128	11663	3.9	21.2518	1.7	0.1492	2.1	0.0230	1.2	0.57	146.7	1.7	141.2	2.7	51.0	40.7	146.7	1.7	NA
-MC1-COMP Spot 179	160	28197	4.7	20.0596	1.5	0.1581	1.9	0.0230	1.1	0.57	146.7	1.6	149.0	2.6	187.0	36.0	146.7	1.6	NA
-MC1-COMP Spot 183	315	70434	3.7	20.1883	1.2	0.1571	1.9	0.0230	1.4	0.75	146.7	2.1	148.2	2.6	172.1	29.0	146.7	2.1	NA
-MC1-COMP Spot 252	212	26265	3.5	20.3392	1.7	0.1560	2.1	0.0230	1.3	0.59	146.7	1.8	147.2	2.9	154.8	40.3	146.7	1.8	NA
-MC1-COMP Spot 278	292	36526	2.9	20.3977	1.4	0.1555	1.9	0.0230	1.2	0.67	146.7	1.8	146.8	2.5	148.0	32.3	146.7	1.8	NA
-MC1-COMP Spot 262	153	2921	3.8	22.2535	5.4	0.1426	5.6	0.0230	1.6	0.29	146.8	2.3	135.4	7.1	NA	NA	146.8	2.3	NA
-MC1-COMP Spot 18	128	7530	4.3	21.0493	1.7	0.1508	2.3	0.0230	1.5	0.67	146.8	2.2	142.6	3.0	73.8	40.1	146.8	2.2	NA
-MC1-COMP Spot 241	96	4470	4.2	20.9656	2.2	0.1514	2.8	0.0230	1.7	0.63	146.8	2.5	143.2	3.7	83.2	51.0	146.8	2.5	NA
-MC1-COMP Spot 144	111	16188	6.0	20.0605	1.8	0.1583	2.2	0.0230	1.3	0.59	146.8	1.9	149.2	3.1	186.9	41.3	146.8	1.9	NA
-MC1-COMP Spot 62	514	66719	6.2	20.0242	1.0	0.1585	1.9	0.0230	1.7	0.86	146.8	2.4	149.4	2.7	191.2	22.6	146.8	2.4	NA
-MC1-COMP Spot 280	147	58997	3.2	20.3247	1.5	0.1562	2.0	0.0230	1.3	0.66	146.8	1.9	147.4	2.8	156.4	36.0	146.8	1.9	NA
-MC1-COMP Spot 307	250	13093	2.4	19.7805	1.3	0.1605	1.8	0.0230	1.2	0.68	146.8	1.7	151.2	2.5	219.6	29.8	146.8	1.7	NA
-MC1-COMP Spot 223	125	305157	5.9	19.9415	1.6	0.1593	2.0	0.0230	1.1	0.56	146.9	1.6	150.1	2.8	200.8	37.8	146.9	1.6	NA
-MC1-COMP Spot 306	216	49369	3.1	20.4139	1.1	0.1556	1.7	0.0230	1.3	0.77	146.9	1.9	146.8	2.3	146.2	25.1	146.9	1.9	NA
-MC1-COMP Spot 134	121	61478	3.3	20.5415	1.5	0.1547	2.1	0.0231	1.5	0.72	146.9	2.2	146.0	2.9	131.5	34.6	146.9	2.2	NA
-MC1-COMP Spot 53	676	100619	1.7	20.1663	0.9	0.1576	1.5	0.0231	1.2	0.81	146.9	1.8	148.6	2.1	174.7	20.7	146.9	1.8	NA
-MC1-COMP Spot 64	103	6605	4.0	20.3774	2.1	0.1559	2.5	0.0231	1.3	0.51	147.0	1.9	147.1	3.4	150.3	50.3	147.0	1.9	NA
-MC1-COMP Spot 163	133	203939	4.3	20.0695	1.8	0.1585	2.2	0.0231	1.2	0.56	147.1	1.8	149.3	3.1	185.9	43.0	147.1	1.8	NA
-MC1-COMP Spot 10	151	5420	1.8	21.1594	1.3	0.1503	1.7	0.0231	1.2	0.67	147.1	1.7	142.2	2.3	61.3	30.9	147.1	1.7	NA
-MC1-COMP Spot 313	160	12284	3.8	21.0672	1.9	0.1510	2.5	0.0231	1.6	0.63	147.1	2.3	142.8	3.4	71.8	46.4	147.1	2.3	NA
-MC1-COMP Spot 234	124	19187	3.5	20.5522	1.6	0.1548	1.9	0.0231	1.1	0.58	147.2	1.6	146.2	2.6	130.3	37.3	147.2	1.6	NA
-MC1-COMP Spot 46	304	61026	2.5	20.6291	1.1	0.1543	1.7	0.0231	1.2	0.74	147.2	1.8	145.7	2.3	121.5	26.4	147.2	1.8	NA
-MC1-COMP Spot 242	337	78903	3.7	20.0868	1.1	0.1585	1.8	0.0231	1.5	0.81	147.2	2.2	149.4	2.5	183.9	24.7	147.2	2.2	NA
-MC1-COMP Spot 217	234	318963	5.1	20.3242	1.3	0.1567	1.9	0.0231	1.3	0.71	147.3	1.9	147.8	2.6	156.5	30.6	147.3	1.9	NA
-MC1-COMP Spot 284	250	154865	3.8	20.4890	0.9	0.1555	1.6	0.0231	1.3	0.82	147.3	1.9	146.8	2.2	137.6	22.0	147.3	1.9	NA
-MC1-COMP Spot 122	147	56717	5.4	19.8183	1.6	0.1608	1.8	0.0231	1.0	0.52	147.3	1.4	151.4	2.6	215.2	36.3	147.3	1.4	NA
-MC1-COMP Spot 137	184	163427	3.7	20.2068	1.3	0.1577	1.8	0.0231	1.3	0.72	147.3	1.9	148.7	2.6	170.0	29.7	147.3	1.9	NA
-MC1-COMP Spot 98	286	166308	4.5	20.4918	1.3	0.1555	1.8	0.0231	1.2	0.66	147.4	1.7	146.8	2.4	137.2	31.3	147.4	1.7	NA
-MC1-COMP Spot 194	320	44449	3.0	20.3786	1.2	0.1565	1.7	0.0231	1.2	0.72	147.5	1.8	147.6	2.3	150.2	27.7	147.5	1.8	NA
-MC1-COMP Spot 269	290	99224	3.3	20.2828	1.1	0.1572	1.7	0.0231	1.3	0.76	147.5	1.9	148.3	2.3	161.2	25.8	147.5	1.9	NA
-MC1-COMP Spot 38	275	37268	4.0	20.5806	1.2	0.1550	1.5	0.0231	1.0	0.63	147.5	1.4	146.3	2.1	127.1	28.4	147.5	1.4	NA
-MC1-COMP Spot 174	126	22930	4.2	20.0114	1.4	0.1594	2.0	0.0231	1.3	0.67	147.5	1.9	150.2	2.7	192.7	33.7	147.5	1.9	NA
-MC1-COMP Spot 92	352	24800	3.5	20.5577	1.2	0.1552	1.7	0.0232	1.3	0.74	147.6	1.9	146.5	2.4	129.7	27.5	147.6	1.9	NA
-MC1-COMP Spot 218	419	115747	4.3	20.4956	1.0	0.1557	1.8	0.0232	1.5	0.83	147.6	2.1	146.9	2.4	136.8	23.6	147.6	2.1	NA
-MC1-COMP Spot 312	112	13524	2.2	20.4308	1.0	0.1562	1.7	0.0232	1.3	0.80	147.6	1.9	147.4	2.3	144.2	23.5	147.6	1.9	NA
-MC1-COMP Spot 146	191	100699	4.1	20.1958	1.1	0.1581	1.6	0.0232	1.2	0.72	147.6	1.7	149.0	2.3	171.3	26.5	147.6	1.7	NA

-MC1-COMP Spot 209	248	23639	2.9	20.4140	1.4	0.1565	1.6	0.0232	0.8	0.51	147.7	1.2	147.6	2.2	146.2	32.3	147.7	1.2	NA
-MC1-COMP Spot 180	236	50912	2.8	20.4338	1.0	0.1563	1.5	0.0232	1.1	0.74	147.7	1.6	147.5	2.0	143.9	23.7	147.7	1.6	NA
-MC1-COMP Spot 80	541	40930	3.1	20.4780	1.0	0.1560	1.7	0.0232	1.4	0.80	147.7	2.1	147.2	2.4	138.8	24.4	147.7	2.1	NA
-MC1-COMP Spot 39	146	61315	4.4	20.2012	1.8	0.1582	2.1	0.0232	1.1	0.51	147.8	1.6	149.1	3.0	170.6	42.8	147.8	1.6	NA
-MC1-COMP Spot 254	172	20517	3.0	20.8120	1.3	0.1536	1.6	0.0232	0.9	0.57	147.8	1.3	145.1	2.2	100.7	31.0	147.8	1.3	NA
-MC1-COMP Spot 265	94	220747	3.1	20.8414	1.8	0.1534	2.3	0.0232	1.5	0.65	147.8	2.2	144.9	3.2	97.3	42.0	147.8	2.2	NA
-MC1-COMP Spot 47	77	36965	3.4	19.7621	2.0	0.1618	2.5	0.0232	1.4	0.56	147.9	2.0	152.3	3.5	221.7	46.9	147.9	2.0	NA
-MC1-COMP Spot 84	226	27210	4.5	20.4000	1.4	0.1568	1.8	0.0232	1.1	0.64	147.9	1.7	147.9	2.5	147.7	32.6	147.9	1.7	NA
-MC1-COMP Spot 4	220	205466	4.2	20.0276	1.1	0.1597	1.6	0.0232	1.1	0.70	147.9	1.6	150.4	2.2	190.8	26.6	147.9	1.6	NA
-MC1-COMP Spot 82	376	104405	2.8	20.2823	1.2	0.1577	1.7	0.0232	1.2	0.73	147.9	1.8	148.7	2.3	161.3	27.0	147.9	1.8	NA
-MC1-COMP Spot 227	103	14578	2.3	20.1579	2.1	0.1588	2.3	0.0232	1.0	0.43	148.0	1.4	149.6	3.2	175.6	47.8	148.0	1.4	NA
-MC1-COMP Spot 127	174	26326	4.6	20.1620	1.4	0.1588	1.7	0.0232	1.0	0.56	148.0	1.4	149.6	2.4	175.2	33.5	148.0	1.4	NA
-MC1-COMP Spot 35	253	13029	5.1	20.5965	1.5	0.1555	2.0	0.0232	1.2	0.63	148.1	1.8	146.7	2.7	125.2	36.3	148.1	1.8	NA
-MC1-COMP Spot 71	153	18799	3.7	19.5876	1.5	0.1635	1.9	0.0232	1.2	0.62	148.1	1.7	153.8	2.7	242.2	34.5	148.1	1.7	NA
-MC1-COMP Spot 44	343	29523	3.6	20.3196	1.2	0.1577	1.9	0.0232	1.4	0.75	148.2	2.1	148.7	2.6	157.0	28.7	148.2	2.1	NA
-MC1-COMP Spot 9	202	95336	4.9	20.4487	1.1	0.1567	1.6	0.0233	1.2	0.71	148.2	1.7	147.8	2.2	142.1	26.7	148.2	1.7	NA
-MC1-COMP Spot 267	323	19246	2.9	19.9694	1.2	0.1605	1.7	0.0233	1.2	0.72	148.2	1.8	151.2	2.4	197.5	27.4	148.2	1.8	NA
-MC1-COMP Spot 309	184	10031	3.3	20.4688	1.4	0.1569	1.7	0.0233	0.9	0.54	148.5	1.3	148.0	2.3	139.8	33.5	148.5	1.3	NA
-MC1-COMP Spot 160	272	40424	2.6	20.4017	1.2	0.1575	1.7	0.0233	1.3	0.73	148.5	1.8	148.5	2.4	147.6	27.5	148.5	1.8	NA
-MC1-COMP Spot 130	102	15280	4.6	20.1406	1.8	0.1596	2.1	0.0233	1.2	0.56	148.6	1.8	150.3	3.0	177.7	41.0	148.6	1.8	NA
-MC1-COMP Spot 296	384	49940	4.3	20.1968	0.9	0.1592	1.9	0.0233	1.6	0.87	148.7	2.4	150.0	2.6	171.1	21.9	148.7	2.4	NA
-MC1-COMP Spot 170	304	119171	3.5	20.1125	1.0	0.1599	1.6	0.0233	1.3	0.77	148.7	1.9	150.6	2.3	180.9	24.4	148.7	1.9	NA
-MC1-COMP Spot 193	307	16392	3.7	20.6390	1.1	0.1559	1.6	0.0233	1.1	0.70	148.7	1.6	147.1	2.2	120.4	26.9	148.7	1.6	NA
-MC1-COMP Spot 305	209	234691	3.0	20.0272	1.4	0.1606	2.0	0.0233	1.4	0.69	148.7	2.0	151.2	2.8	190.8	33.4	148.7	2.0	NA
-MC1-COMP Spot 113	169	18010	4.3	20.8249	1.1	0.1545	1.7	0.0233	1.3	0.75	148.7	1.9	145.9	2.3	99.2	26.4	148.7	1.9	NA
-MC1-COMP Spot 79	206	28208	4.6	20.7480	1.3	0.1551	1.8	0.0233	1.3	0.72	148.8	1.9	146.4	2.5	107.9	30.4	148.8	1.9	NA
-MC1-COMP Spot 294	93	35145	4.2	20.0999	2.1	0.1602	2.9	0.0234	1.9	0.67	148.9	2.8	150.9	4.0	182.4	49.9	148.9	2.8	NA
-MC1-COMP Spot 43	166	31719	2.7	20.1424	1.5	0.1599	1.9	0.0234	1.2	0.63	148.9	1.8	150.6	2.6	177.4	34.2	148.9	1.8	NA
-MC1-COMP Spot 253	173	20174	4.6	20.5854	1.3	0.1565	1.6	0.0234	0.9	0.57	149.0	1.4	147.6	2.2	126.5	31.5	149.0	1.4	NA
-MC1-COMP Spot 14	316	52457	2.6	20.4857	0.9	0.1573	1.5	0.0234	1.2	0.78	149.0	1.7	148.4	2.1	137.9	21.8	149.0	1.7	NA
-MC1-COMP Spot 291	308	70417	4.2	20.1369	1.2	0.1601	1.5	0.0234	1.0	0.62	149.1	1.4	150.8	2.2	178.1	28.1	149.1	1.4	NA
-MC1-COMP Spot 272	199	148218	3.7	19.9552	1.5	0.1616	1.8	0.0234	1.0	0.57	149.1	1.5	152.1	2.5	199.2	33.8	149.1	1.5	NA
-MC1-COMP Spot 275	198	10633	4.3	20.6983	2.1	0.1558	2.3	0.0234	1.0	0.45	149.1	1.5	147.0	3.2	113.6	48.8	149.1	1.5	NA
-MC1-COMP Spot 121	187	120558	2.5	19.8405	1.5	0.1627	2.0	0.0234	1.3	0.66	149.2	1.9	153.0	2.8	212.5	33.9	149.2	1.9	NA
-MC1-COMP Spot 74	149	6638	4.4	20.6314	1.3	0.1566	1.9	0.0234	1.3	0.72	149.3	2.0	147.7	2.5	121.3	30.4	149.3	2.0	NA
-MC1-COMP Spot 108	226	25865	1.4	20.6752	1.1	0.1564	1.8	0.0235	1.4	0.79	149.5	2.1	147.5	2.4	116.2	25.6	149.5	2.1	NA
-MC1-COMP Spot 201	218	16193	3.0	20.4656	1.4	0.1580	1.8	0.0235	1.2	0.64	149.5	1.7	148.9	2.5	140.2	33.1	149.5	1.7	NA
-MC1-COMP Spot 182	156	8042	3.8	20.3680	1.6	0.1588	1.9	0.0235	1.1	0.56	149.6	1.6	149.7	2.6	151.5	36.5	149.6	1.6	NA
-MC1-COMP Spot 308	143	32985	4.3	20.2338	1.7	0.1601	2.0	0.0235	1.1	0.57	149.8	1.7	150.8	2.8	166.9	38.6	149.8	1.7	NA
-MC1-COMP Spot 266	154	10784	4.4	20.2699	1.8	0.1600	2.1	0.0235	1.2	0.54	149.9	1.7	150.7	3.0	162.7	41.8	149.9	1.7	NA
-MC1-COMP Spot 94	83	64749	4.1	18.9463	2.2	0.1713	2.6	0.0235	1.3	0.52	150.1	2.0	160.6	3.9	318.4	50.4	150.1	2.0	NA
-MC1-COMP Spot 119	134	31894	3.1	20.1310	1.2	0.1613	1.7	0.0236	1.2	0.69	150.1	1.8	151.8	2.4	178.8	29.0	150.1	1.8	NA
-MC1-COMP Spot 33	338	23869	5.3	20.2875	1.1	0.1600	1.7	0.0236	1.2	0.75	150.1	1.9	150.7	2.3	160.7	25.8	150.1	1.9	NA
-MC1-COMP Spot 282	171	1667138	4.8	20.2131	1.4	0.1607	1.7	0.0236	1.1	0.61	150.1	1.6	151.3	2.4	169.3	32.1	150.1	1.6	NA
-MC1-COMP Spot 140	153	8153	4.6	21.0702	1.4	0.1543	1.8	0.0236	1.1	0.60	150.3	1.6	145.7	2.4	71.4	33.3	150.3	1.6	NA
-MC1-COMP Spot 230	468	114167	2.3	20.4235	1.0	0.1594	1.6	0.0236	1.3	0.78	150.5	1.9	150.2	2.2	145.0	23.5	150.5	1.9	NA
-MC1-COMP Spot 48	168	100894	2.1	20.3451	1.3	0.1601	1.8	0.0236	1.3	0.71	150.6	1.9	150.8	2.5	154.0	30.1	150.6	1.9	NA

-MC1-COMP Spot 232	200	16226	2.1	20.2482	1.3	0.1609	1.8	0.0236	1.2	0.67	150.6	1.8	151.5	2.5	165.2	31.1	150.6	1.8	NA
-MC1-COMP Spot 181	242	40887	3.2	20.3423	1.1	0.1602	1.4	0.0236	0.9	0.66	150.6	1.4	150.9	2.0	154.4	25.0	150.6	1.4	NA
-MC1-COMP Spot 154	279	44968	1.8	19.7395	1.6	0.1663	1.9	0.0238	1.1	0.58	151.8	1.7	156.2	2.8	224.4	36.3	151.8	1.7	NA
-MC1-COMP Spot 152	226	12644	4.3	20.4999	1.1	0.1602	1.6	0.0238	1.1	0.68	151.8	1.6	150.9	2.2	136.3	26.7	151.8	1.6	NA
-MC1-COMP Spot 200	263	35015	4.7	20.0317	1.1	0.1640	1.5	0.0238	1.0	0.66	151.9	1.4	154.2	2.1	190.3	25.8	151.9	1.4	NA
-MC1-COMP Spot 213	321	62926	1.8	20.0440	1.0	0.1640	1.6	0.0238	1.3	0.81	151.9	2.0	154.2	2.3	188.9	22.3	151.9	2.0	NA
-MC1-COMP Spot 0	427	22199	1.6	19.4353	1.2	0.1692	2.0	0.0239	1.6	0.80	152.0	2.4	158.7	2.9	260.2	27.7	152.0	2.4	NA
-MC1-COMP Spot 245	232	11984	4.3	20.8705	1.6	0.1577	2.4	0.0239	1.8	0.74	152.2	2.7	148.7	3.3	94.0	37.5	152.2	2.7	NA
-MC1-COMP Spot 21	138	7803	1.7	20.3112	1.7	0.1630	2.1	0.0240	1.1	0.55	153.0	1.7	153.3	3.0	158.0	40.7	153.0	1.7	NA
-MC1-COMP Spot 314	218	27919	2.6	20.3565	1.2	0.1630	1.7	0.0241	1.2	0.72	153.3	1.8	153.3	2.4	152.7	27.3	153.3	1.8	NA
-MC1-COMP Spot 12	314	47866	2.8	20.6679	1.2	0.1606	1.6	0.0241	1.1	0.68	153.4	1.7	151.2	2.3	117.1	27.7	153.4	1.7	NA
-MC1-COMP Spot 99	1513	82642	23.1	20.2101	0.7	0.1643	1.4	0.0241	1.2	0.88	153.5	1.9	154.5	2.0	169.6	15.5	153.5	1.9	NA
-MC1-COMP Spot 292	344	104312	2.1	19.8861	0.9	0.1670	1.5	0.0241	1.2	0.80	153.5	1.8	156.8	2.2	207.2	20.8	153.5	1.8	NA
-MC1-COMP Spot 229	121	9067	2.8	20.6243	1.6	0.1616	2.0	0.0242	1.2	0.61	154.1	1.9	152.1	2.9	122.0	37.9	154.1	1.9	NA
-MC1-COMP Spot 172	233	28229	2.2	20.4855	1.1	0.1628	1.8	0.0242	1.4	0.77	154.1	2.1	153.2	2.6	137.9	26.9	154.1	2.1	NA
-MC1-COMP Spot 164	286	44082	1.7	20.2936	0.9	0.1649	1.7	0.0243	1.5	0.87	154.6	2.3	154.9	2.5	160.0	20.4	154.6	2.3	NA
-MC1-COMP Spot 295	646	120619	2.6	20.6697	0.8	0.1619	1.4	0.0243	1.2	0.81	154.7	1.8	152.4	2.1	116.9	19.9	154.7	1.8	NA
-MC1-COMP Spot 42	137	8561	1.8	20.7188	1.6	0.1627	2.0	0.0245	1.2	0.62	155.8	1.9	153.0	2.8	111.3	36.9	155.8	1.9	NA
-MC1-COMP Spot 302	154	29488	2.1	20.0925	1.7	0.1686	2.0	0.0246	1.1	0.54	156.5	1.7	158.2	3.0	183.2	40.3	156.5	1.7	NA
-MC1-COMP Spot 77	645	59746	5.2	20.5511	0.7	0.1653	1.5	0.0247	1.3	0.88	157.0	2.0	155.4	2.1	130.4	16.4	157.0	2.0	NA
-MC1-COMP Spot 60	456	17702	1.4	19.0719	1.5	0.1790	2.2	0.0248	1.5	0.70	157.8	2.4	167.2	3.3	303.4	35.1	157.8	2.4	NA
-MC1-COMP Spot 243	221	12025	3.0	21.0720	1.5	0.1623	1.9	0.0248	1.1	0.58	158.0	1.7	152.7	2.6	71.2	35.8	158.0	1.7	NA
-MC1-COMP Spot 270	137	11993	2.2	20.6721	1.6	0.1657	2.1	0.0248	1.4	0.66	158.2	2.2	155.6	3.0	116.6	37.0	158.2	2.2	NA
-MC1-COMP Spot 250	110	9460	3.1	20.4711	2.5	0.1677	2.8	0.0249	1.1	0.38	158.6	1.7	157.4	4.0	139.6	59.7	158.6	1.7	NA
-MC1-COMP Spot 141	274	59234	2.0	20.3251	1.0	0.1703	1.4	0.0251	0.9	0.67	159.9	1.5	159.7	2.1	156.4	24.1	159.9	1.5	NA
-MC1-COMP Spot 128	169	818896	2.9	20.2401	1.6	0.1719	2.0	0.0252	1.1	0.57	160.7	1.8	161.0	3.0	166.1	38.5	160.7	1.8	NA
-MC1-COMP Spot 297	164	11249	3.5	20.0345	1.9	0.1746	2.4	0.0254	1.5	0.62	161.6	2.4	163.4	3.6	190.0	43.6	161.6	2.4	NA
-MC1-COMP Spot 161	576	56362	2.4	20.0847	0.8	0.1753	1.5	0.0255	1.3	0.84	162.6	2.0	164.0	2.3	184.1	19.2	162.6	2.0	NA
-MC1-COMP Spot 249	175	27164	3.6	20.5122	1.4	0.1867	2.4	0.0278	1.9	0.82	176.7	3.4	173.8	3.8	134.9	32.1	176.7	3.4	NA
-MC1-COMP Spot 40	196	14695	12.6	20.3043	1.4	0.1890	1.9	0.0278	1.3	0.67	177.0	2.3	175.8	3.1	158.8	33.5	177.0	2.3	NA
-MC1-COMP Spot 277	298	78473	2.1	19.7146	1.0	0.2188	1.6	0.0313	1.2	0.77	198.7	2.4	200.9	2.9	227.3	23.5	198.7	2.4	NA
-MC1-COMP Spot 185	337	30914	4.3	19.9345	0.9	0.2203	1.7	0.0319	1.5	0.86	202.2	3.0	202.2	3.2	201.6	21.0	202.2	3.0	NA
-MC1-COMP Spot 115	203	247013	2.8	18.6811	1.3	0.2553	1.8	0.0346	1.3	0.69	219.3	2.7	230.9	3.7	350.3	29.5	219.3	2.7	NA
-MC1-COMP Spot 63	1915	405206	3.6	18.9930	0.7	0.3550	1.4	0.0489	1.2	0.87	307.9	3.6	308.5	3.7	312.8	15.2	307.9	3.6	NA
-MC1-COMP Spot 279	683	180090	4.6	18.6924	0.9	0.3686	1.9	0.0500	1.6	0.87	314.5	5.0	318.6	5.1	349.0	20.7	314.5	5.0	NA
-MC1-COMP Spot 8	211	43314	2.0	18.7184	0.8	0.3717	1.4	0.0505	1.1	0.81	317.5	3.5	320.9	3.9	345.9	18.9	317.5	3.5	NA
-MC1-COMP Spot 81	151	92081	2.1	13.1395	0.6	1.9803	1.2	0.1888	1.1	0.88	1114.8	11.0	1108.8	8.3	1097.0	11.8	1097.0	11.8	101.6

Nutzotin Mountains Sequence – 071718KR-01 (FA2)

						Isotope ratios						Apparent ages (Ma)							
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
071718KR-01 (FA2)																			
-071718KR-01 Spot 0	277	38447	1.9	20.3346	1.2	0.1521	2.1	0.0224	1.7	0.81	143.1	2.4	143.8	2.9	155.2	29.1	143.1	2.4	NA
-071718KR-01 Spot 9	181	42687	2.5	20.6839	1.4	0.1504	1.7	0.0226	1.0	0.59	143.9	1.4	142.3	2.3	115.3	32.6	143.9	1.4	NA
-071718KR-01 Spot 41	178	9582	2.9	20.8321	1.2	0.1504	1.6	0.0227	1.1	0.67	144.9	1.5	142.3	2.1	98.4	28.1	144.9	1.5	NA
-071718KR-01 Spot 121	157	28296	2.6	20.8034	1.2	0.1506	1.6	0.0227	1.1	0.69	144.9	1.6	142.5	2.2	101.7	28.0	144.9	1.6	NA
-071718KR-01 Spot 290	164	100981	2.6	20.6700	1.5	0.1518	2.1	0.0228	1.4	0.68	145.1	2.0	143.5	2.8	116.8	35.9	145.1	2.0	NA
-071718KR-01 Spot 241	223	9187	3.0	20.6655	1.2	0.1521	1.5	0.0228	0.9	0.61	145.4	1.3	143.8	2.0	117.4	27.2	145.4	1.3	NA
-071718KR-01 Spot 261	97	5069	3.5	21.1832	1.8	0.1485	2.0	0.0228	1.0	0.49	145.5	1.4	140.6	2.7	58.7	42.2	145.5	1.4	NA
-071718KR-01 Spot 23	163	7857	3.8	20.7349	2.3	0.1521	2.6	0.0229	1.2	0.48	145.9	1.8	143.8	3.5	109.4	53.2	145.9	1.8	NA
-071718KR-01 Spot 256	145	9791	3.1	20.7053	1.9	0.1533	2.2	0.0230	1.2	0.55	146.8	1.8	144.8	3.0	112.8	44.3	146.8	1.8	NA
-071718KR-01 Spot 211	144	130215	2.5	20.4098	1.4	0.1556	1.7	0.0230	1.1	0.63	146.9	1.6	146.9	2.4	146.6	31.8	146.9	1.6	NA
-071718KR-01 Spot 2	135	71235	2.4	20.0134	1.1	0.1588	1.6	0.0231	1.2	0.72	147.0	1.7	149.7	2.3	192.4	26.4	147.0	1.7	NA
-071718KR-01 Spot 31	271	47243	1.9	19.9141	1.0	0.1596	1.5	0.0231	1.2	0.76	147.0	1.7	150.4	2.2	204.0	23.2	147.0	1.7	NA
-071718KR-01 Spot 178	449	113726	2.3	20.3664	1.2	0.1563	1.8	0.0231	1.4	0.76	147.2	2.0	147.4	2.5	151.6	27.2	147.2	2.0	NA
-071718KR-01 Spot 195	124	105876	3.7	20.3729	1.4	0.1563	1.9	0.0231	1.3	0.68	147.3	1.9	147.5	2.7	150.9	33.3	147.3	1.9	NA
-071718KR-01 Spot 102	113	49425	2.8	19.7175	1.8	0.1615	2.1	0.0231	1.2	0.55	147.3	1.7	152.0	3.0	226.9	41.1	147.3	1.7	NA
-071718KR-01 Spot 131	121	4290	3.1	21.5764	1.4	0.1477	1.8	0.0231	1.1	0.60	147.3	1.6	139.8	2.4	14.6	34.7	147.3	1.6	NA
-071718KR-01 Spot 30	249	17797	2.7	20.8235	1.4	0.1531	1.7	0.0231	1.0	0.58	147.4	1.5	144.6	2.4	99.4	33.6	147.4	1.5	NA
-071718KR-01 Spot 246	95	90370	4.0	19.8293	1.6	0.1608	2.0	0.0231	1.3	0.63	147.5	1.9	151.4	2.8	213.9	36.4	147.5	1.9	NA
-071718KR-01 Spot 101	146	9049	3.2	21.3254	1.4	0.1496	1.7	0.0231	1.0	0.57	147.5	1.4	141.5	2.3	42.7	33.5	147.5	1.4	NA
-071718KR-01 Spot 213	133	4864	3.2	22.1946	1.2	0.1437	1.7	0.0231	1.1	0.67	147.5	1.7	136.4	2.2	NA	NA	147.5	1.7	NA
-071718KR-01 Spot 84	131	6047	2.5	21.3284	1.6	0.1496	2.0	0.0232	1.1	0.57	147.6	1.6	141.6	2.6	42.4	38.7	147.6	1.6	NA
-071718KR-01 Spot 297	115	5715	3.5	21.7613	1.3	0.1468	1.8	0.0232	1.2	0.65	147.7	1.7	139.1	2.3	NA	NA	147.7	1.7	NA
-071718KR-01 Spot 271	91	5965	2.5	21.0586	3.1	0.1518	3.3	0.0232	1.1	0.34	147.8	1.7	143.5	4.5	72.7	74.3	147.8	1.7	NA
-071718KR-01 Spot 263	111	4100	3.5	21.3023	2.0	0.1502	2.5	0.0232	1.4	0.58	147.9	2.1	142.1	3.3	45.3	48.1	147.9	2.1	NA
-071718KR-01 Spot 133	65	21567	3.6	20.6857	2.4	0.1547	2.7	0.0232	1.2	0.44	147.9	1.7	146.0	3.6	115.1	56.3	147.9	1.7	NA
-071718KR-01 Spot 96	223	19640	2.4	20.2706	1.2	0.1578	1.6	0.0232	1.1	0.68	147.9	1.6	148.8	2.2	162.6	27.3	147.9	1.6	NA
-071718KR-01 Spot 161	127	4533	3.6	21.8743	1.6	0.1463	2.0	0.0232	1.2	0.60	148.0	1.7	138.7	2.6	NA	NA	148.0	1.7	NA
-071718KR-01 Spot 65	131	105869	3.3	20.7947	1.8	0.1540	2.2	0.0232	1.3	0.59	148.1	1.9	145.5	3.0	102.6	41.6	148.1	1.9	NA
-071718KR-01 Spot 289	117	10079	2.9	20.9724	1.7	0.1528	2.0	0.0232	1.0	0.51	148.1	1.5	144.3	2.7	82.5	40.1	148.1	1.5	NA
-071718KR-01 Spot 140	165	30012	2.9	17.8922	1.6	0.1792	1.9	0.0233	1.0	0.54	148.3	1.5	167.4	3.0	447.0	36.4	148.3	1.5	NA
-071718KR-01 Spot 203	158	17012	2.5	20.7414	1.5	0.1546	2.0	0.0233	1.3	0.63	148.3	1.8	146.0	2.7	108.7	36.2	148.3	1.8	NA
-071718KR-01 Spot 90	135	52793	3.3	20.0617	1.4	0.1599	1.7	0.0233	0.9	0.57	148.3	1.4	150.6	2.3	186.8	32.2	148.3	1.4	NA
-071718KR-01 Spot 170	170	48452	2.7	19.9798	1.7	0.1607	2.0	0.0233	1.1	0.55	148.5	1.6	151.3	2.8	196.3	38.5	148.5	1.6	NA
-071718KR-01 Spot 119	154	11765	2.4	21.0895	1.5	0.1524	1.9	0.0233	1.1	0.60	148.6	1.7	144.0	2.5	69.3	35.6	148.6	1.7	NA
-071718KR-01 Spot 257	161	25565	3.7	20.5117	1.4	0.1567	1.6	0.0233	0.8	0.51	148.6	1.2	147.8	2.2	134.9	32.2	148.6	1.2	NA
-071718KR-01 Spot 29	61	12221	3.8	19.9607	1.9	0.1610	2.4	0.0233	1.4	0.59	148.6	2.1	151.6	3.3	198.6	44.2	148.6	2.1	NA
-071718KR-01 Spot 190	164	6113	2.5	21.0670	1.2	0.1526	1.7	0.0233	1.1	0.67	148.6	1.6	144.2	2.2	71.8	29.4	148.6	1.6	NA
-071718KR-01 Spot 252	272	22568	2.1	20.5979	1.3	0.1561	2.3	0.0233	1.9	0.83	148.6	2.9	147.3	3.2	125.0	30.9	148.6	2.9	NA
-071718KR-01 Spot 141	314	93209	2.0	20.0853	1.2	0.1601	1.7	0.0233	1.3	0.74	148.7	1.9	150.8	2.4	184.1	27.3	148.7	1.9	NA
-071718KR-01 Spot 103	77	4181	3.5	21.9482	2.6	0.1465	2.8	0.0233	1.0	0.37	148.7	1.5	138.8	3.6	NA	NA	148.7	1.5	NA
-071718KR-01 Spot 19	263	15009	2.4	21.1576	1.3	0.1520	1.7	0.0233	1.1	0.62	148.7	1.6	143.7	2.3	61.5	32.0	148.7	1.6	NA

-071718KR-01 Spot 199	231	22953	2.7	20.4753	1.4	0.1571	1.9	0.0233	1.3	0.69	148.8	1.9	148.2	2.6	139.1	32.0	148.8	1.9	NA
-071718KR-01 Spot 135	188	30891	2.4	20.3365	1.3	0.1582	1.6	0.0233	1.0	0.61	148.8	1.5	149.1	2.2	155.1	29.9	148.8	1.5	NA
-071718KR-01 Spot 194	85	4223	3.9	21.1430	1.8	0.1522	2.2	0.0233	1.3	0.58	148.8	1.9	143.9	3.0	63.2	43.1	148.8	1.9	NA
-071718KR-01 Spot 24	158	13405	2.6	20.7540	1.7	0.1551	2.1	0.0234	1.1	0.55	148.8	1.7	146.4	2.8	107.3	40.9	148.8	1.7	NA
-071718KR-01 Spot 142	166	8418	3.2	21.1910	1.5	0.1519	1.8	0.0234	1.0	0.54	148.8	1.4	143.6	2.4	57.8	35.9	148.8	1.4	NA
-071718KR-01 Spot 69	173	17304	3.0	20.6072	1.6	0.1562	1.9	0.0234	1.0	0.55	148.9	1.5	147.4	2.6	124.0	36.7	148.9	1.5	NA
-071718KR-01 Spot 68	105	4356	2.8	21.8978	1.5	0.1472	1.8	0.0234	1.1	0.61	149.0	1.7	139.4	2.4	NA	NA	149.0	1.7	NA
-071718KR-01 Spot 225	115	13178	2.4	20.9132	1.9	0.1542	2.3	0.0234	1.2	0.53	149.1	1.8	145.6	3.1	89.2	45.9	149.1	1.8	NA
-071718KR-01 Spot 236	172	22408	2.8	20.3282	1.3	0.1586	1.9	0.0234	1.4	0.72	149.1	2.0	149.5	2.7	156.0	31.3	149.1	2.0	NA
-071718KR-01 Spot 204	154	23400	2.1	20.6606	1.5	0.1561	2.2	0.0234	1.6	0.74	149.1	2.4	147.3	3.0	117.9	35.0	149.1	2.4	NA
-071718KR-01 Spot 111	135	67777	2.3	19.7192	1.9	0.1636	2.4	0.0234	1.4	0.59	149.1	2.1	153.8	3.4	226.8	44.8	149.1	2.1	NA
-071718KR-01 Spot 63	126	11027	2.3	20.1207	1.9	0.1603	2.2	0.0234	1.1	0.49	149.2	1.6	151.0	3.1	180.0	44.9	149.2	1.6	NA
-071718KR-01 Spot 35	149	6218	3.2	20.9617	1.5	0.1539	1.9	0.0234	1.1	0.59	149.2	1.6	145.4	2.5	83.7	35.7	149.2	1.6	NA
-071718KR-01 Spot 249	166	17033	2.6	20.9941	1.5	0.1538	2.0	0.0234	1.3	0.65	149.3	1.9	145.3	2.7	80.0	35.3	149.3	1.9	NA
-071718KR-01 Spot 193	126	7373	3.8	21.0613	1.4	0.1533	1.8	0.0234	1.1	0.62	149.3	1.7	144.9	2.5	72.4	34.1	149.3	1.7	NA
-071718KR-01 Spot 116	228	34749	2.8	20.5303	1.1	0.1573	1.6	0.0234	1.1	0.68	149.3	1.6	148.4	2.1	132.8	26.8	149.3	1.6	NA
-071718KR-01 Spot 187	144	4721	2.3	21.5231	1.6	0.1501	2.0	0.0234	1.2	0.58	149.4	1.7	142.0	2.7	20.6	39.3	149.4	1.7	NA
-071718KR-01 Spot 51	161	9207	3.0	21.1658	2.2	0.1527	2.4	0.0234	0.8	0.36	149.4	1.3	144.3	3.2	60.6	52.4	149.4	1.3	NA
-071718KR-01 Spot 169	121	3650	3.1	22.1626	1.7	0.1458	1.8	0.0234	0.7	0.40	149.4	1.1	138.2	2.4	NA	NA	149.4	1.1	NA
-071718KR-01 Spot 109	138	18866	2.2	20.5674	1.8	0.1573	2.2	0.0235	1.3	0.58	149.5	1.9	148.3	3.1	128.6	42.6	149.5	1.9	NA
-071718KR-01 Spot 162	252	11227	2.4	20.8552	1.1	0.1551	1.5	0.0235	1.1	0.70	149.5	1.6	146.4	2.1	95.8	25.7	149.5	1.6	NA
-071718KR-01 Spot 139	215	14767	2.5	20.2310	1.2	0.1599	1.7	0.0235	1.2	0.71	149.6	1.8	150.6	2.3	167.2	27.4	149.6	1.8	NA
-071718KR-01 Spot 82	136	13975	2.4	20.6271	1.3	0.1568	1.8	0.0235	1.2	0.68	149.6	1.8	147.9	2.5	121.7	31.6	149.6	1.8	NA
-071718KR-01 Spot 85	121	6355	2.5	21.7879	2.8	0.1485	3.0	0.0235	1.1	0.37	149.6	1.6	140.6	3.9	NA	NA	149.6	1.6	NA
-071718KR-01 Spot 78	191	64384	2.6	20.3885	1.2	0.1587	1.5	0.0235	0.8	0.56	149.6	1.2	149.6	2.1	149.1	29.0	149.6	1.2	NA
-071718KR-01 Spot 152	110	10472	2.4	21.1581	1.6	0.1530	2.0	0.0235	1.2	0.61	149.6	1.8	144.5	2.7	61.5	37.7	149.6	1.8	NA
-071718KR-01 Spot 25	140	8036	3.2	20.9692	1.9	0.1544	2.3	0.0235	1.3	0.57	149.7	2.0	145.8	3.2	82.8	45.2	149.7	2.0	NA
-071718KR-01 Spot 114	85	12190	2.3	20.4169	1.6	0.1585	2.0	0.0235	1.1	0.56	149.7	1.6	149.4	2.7	145.8	38.3	149.7	1.6	NA
-071718KR-01 Spot 81	70	20470	2.9	20.3233	1.8	0.1593	2.2	0.0235	1.3	0.59	149.7	1.9	150.1	3.1	156.6	41.9	149.7	1.9	NA
-071718KR-01 Spot 255	194	109298	3.2	20.5668	1.5	0.1574	1.7	0.0235	0.9	0.53	149.7	1.4	148.4	2.4	128.6	35.0	149.7	1.4	NA
-071718KR-01 Spot 233	136	31000	3.4	20.3347	1.5	0.1592	1.9	0.0235	1.1	0.57	149.7	1.6	150.0	2.6	155.2	36.3	149.7	1.6	NA
-071718KR-01 Spot 144	167	11241	3.1	20.7598	1.1	0.1560	1.5	0.0235	0.9	0.64	149.8	1.4	147.2	2.0	106.6	26.3	149.8	1.4	NA
-071718KR-01 Spot 107	99	40263	3.6	20.8468	1.7	0.1554	2.0	0.0235	1.1	0.53	149.8	1.6	146.7	2.7	96.7	40.0	149.8	1.6	NA
-071718KR-01 Spot 62	116	9922	3.5	20.4696	1.6	0.1583	1.9	0.0235	1.1	0.55	149.8	1.6	149.2	2.7	139.8	38.0	149.8	1.6	NA
-071718KR-01 Spot 179	149	8020	2.2	21.0066	1.7	0.1544	2.0	0.0235	1.0	0.53	149.9	1.5	145.8	2.7	78.6	39.4	149.9	1.5	NA
-071718KR-01 Spot 80	175	5976	3.1	21.4358	1.1	0.1513	1.6	0.0235	1.1	0.71	150.0	1.7	143.1	2.1	30.4	26.8	150.0	1.7	NA
-071718KR-01 Spot 59	99	93805	3.7	20.0784	1.8	0.1616	2.1	0.0235	1.1	0.51	150.0	1.6	152.1	3.0	184.9	41.8	150.0	1.6	NA
-071718KR-01 Spot 94	242	29597	2.8	20.4859	1.4	0.1584	1.8	0.0235	1.2	0.64	150.0	1.7	149.3	2.5	137.9	33.2	150.0	1.7	NA
-071718KR-01 Spot 70	179	13264	2.8	20.8449	1.4	0.1557	1.9	0.0236	1.2	0.65	150.1	1.8	146.9	2.6	96.9	34.0	150.1	1.8	NA
-071718KR-01 Spot 110	187	27946	2.1	20.2543	1.3	0.1603	1.8	0.0236	1.3	0.72	150.1	2.0	150.9	2.6	164.5	29.4	150.1	2.0	NA
-071718KR-01 Spot 245	149	16391	3.2	20.8573	1.8	0.1556	2.1	0.0236	1.1	0.53	150.1	1.6	146.9	2.8	95.5	41.6	150.1	1.6	NA
-071718KR-01 Spot 113	129	39618	2.5	21.0875	1.5	0.1540	2.0	0.0236	1.3	0.66	150.1	2.0	145.4	2.7	69.5	36.1	150.1	2.0	NA
-071718KR-01 Spot 260	77	3650	3.8	21.6649	1.8	0.1499	2.2	0.0236	1.2	0.55	150.1	1.8	141.8	2.9	4.8	43.9	150.1	1.8	NA
-071718KR-01 Spot 40	192	37477	2.5	20.3113	1.3	0.1599	1.8	0.0236	1.3	0.71	150.1	1.9	150.6	2.5	158.0	29.6	150.1	1.9	NA
-071718KR-01 Spot 134	151	7820	2.6	21.0616	1.9	0.1542	2.1	0.0236	0.9	0.44	150.1	1.4	145.6	2.9	72.4	45.3	150.1	1.4	NA
-071718KR-01 Spot 28	192	32925	3.1	20.9635	1.2	0.1549	1.6	0.0236	1.0	0.65	150.1	1.5	146.2	2.2	83.5	28.5	150.1	1.5	NA
-071718KR-01 Spot 180	140	5683	2.8	21.5336	1.4	0.1508	1.8	0.0236	1.1	0.61	150.2	1.6	142.7	2.3	19.4	33.6	150.2	1.6	NA

-071718KR-01 Spot 112	223	11723	2.9	20.6808	1.2	0.1571	1.7	0.0236	1.3	0.73	150.2	1.9	148.1	2.4	115.6	27.5	150.2	1.9	NA
-071718KR-01 Spot 76	84	9157	3.3	21.3399	2.2	0.1522	2.6	0.0236	1.3	0.51	150.2	2.0	143.9	3.5	41.1	53.2	150.2	2.0	NA
-071718KR-01 Spot 71	128	33172	3.3	19.9668	1.5	0.1628	1.8	0.0236	1.1	0.60	150.3	1.7	153.1	2.6	197.8	34.2	150.3	1.7	NA
-071718KR-01 Spot 60	164	87801	2.6	20.1456	1.4	0.1614	1.8	0.0236	1.2	0.67	150.3	1.8	151.9	2.6	177.1	31.8	150.3	1.8	NA
-071718KR-01 Spot 288	129	53455	2.2	20.2031	1.4	0.1609	1.7	0.0236	0.9	0.52	150.3	1.3	151.5	2.3	170.4	33.3	150.3	1.3	NA
-071718KR-01 Spot 38	119	8048	3.3	21.0443	1.6	0.1545	1.9	0.0236	0.9	0.49	150.3	1.4	145.9	2.6	74.4	39.1	150.3	1.4	NA
-071718KR-01 Spot 32	111	7468	2.6	21.5819	1.8	0.1507	2.2	0.0236	1.3	0.58	150.4	1.9	142.5	2.9	14.0	43.2	150.4	1.9	NA
-071718KR-01 Spot 228	224	14914	3.3	20.8395	1.1	0.1561	1.7	0.0236	1.3	0.75	150.4	1.9	147.3	2.3	97.6	26.8	150.4	1.9	NA
-071718KR-01 Spot 45	107	6297	3.8	21.2833	2.2	0.1529	2.4	0.0236	0.9	0.40	150.4	1.4	144.4	3.2	47.5	51.9	150.4	1.4	NA
-071718KR-01 Spot 222	95	109333	3.4	20.1922	1.8	0.1612	2.0	0.0236	1.0	0.50	150.5	1.5	151.8	2.9	171.7	41.3	150.5	1.5	NA
-071718KR-01 Spot 17	143	13026	2.9	20.4578	1.1	0.1592	1.6	0.0236	1.2	0.72	150.5	1.7	150.0	2.3	141.1	26.4	150.5	1.7	NA
-071718KR-01 Spot 89	110	11055	3.5	21.0641	2.1	0.1546	2.3	0.0236	1.0	0.44	150.5	1.5	146.0	3.2	72.1	49.9	150.5	1.5	NA
-071718KR-01 Spot 44	200	24967	2.1	18.6668	2.6	0.1745	2.8	0.0236	1.0	0.35	150.6	1.4	163.3	4.2	352.1	58.7	150.6	1.4	NA
-071718KR-01 Spot 303	139	31846	3.3	20.8402	1.5	0.1563	1.7	0.0236	0.9	0.52	150.6	1.3	147.5	2.4	97.4	34.8	150.6	1.3	NA
-071718KR-01 Spot 67	125	5706	3.6	21.4780	2.0	0.1517	2.3	0.0236	1.1	0.47	150.6	1.6	143.4	3.1	25.6	48.9	150.6	1.6	NA
-071718KR-01 Spot 46	92	16073	3.5	18.9025	3.3	0.1724	3.4	0.0236	0.8	0.24	150.6	1.2	161.5	5.0	323.6	74.1	150.6	1.2	NA
-071718KR-01 Spot 196	155	12208	2.5	20.4816	1.2	0.1592	1.5	0.0237	0.9	0.62	150.7	1.4	150.0	2.1	138.4	27.3	150.7	1.4	NA
-071718KR-01 Spot 251	120	12235	3.0	20.3612	2.0	0.1601	2.3	0.0237	1.1	0.50	150.7	1.7	150.8	3.2	152.2	45.9	150.7	1.7	NA
-071718KR-01 Spot 275	204	32713	2.4	20.1501	1.2	0.1618	1.8	0.0237	1.3	0.73	150.8	2.0	152.3	2.5	176.6	28.4	150.8	2.0	NA
-071718KR-01 Spot 47	122	4289	3.7	21.6697	1.9	0.1505	2.3	0.0237	1.2	0.54	150.8	1.8	142.4	3.0	4.3	46.4	150.8	1.8	NA
-071718KR-01 Spot 311	191	138847	2.3	20.5647	1.2	0.1586	1.8	0.0237	1.4	0.75	150.8	2.0	149.5	2.6	128.9	28.8	150.8	2.0	NA
-071718KR-01 Spot 167	70	30618	3.2	20.3488	1.9	0.1603	2.2	0.0237	1.1	0.52	150.8	1.7	151.0	3.1	153.6	43.9	150.8	1.7	NA
-071718KR-01 Spot 57	235	14333	2.5	20.3697	1.5	0.1602	2.1	0.0237	1.4	0.68	150.9	2.1	150.9	2.9	151.2	35.0	150.9	2.1	NA
-071718KR-01 Spot 122	100	27823	3.4	20.3555	1.2	0.1604	1.6	0.0237	1.0	0.65	150.9	1.6	151.0	2.2	152.9	28.4	150.9	1.6	NA
-071718KR-01 Spot 175	145	95389	3.5	20.4018	1.5	0.1600	1.8	0.0237	1.0	0.54	150.9	1.5	150.7	2.6	147.5	36.0	150.9	1.5	NA
-071718KR-01 Spot 106	99	7400	3.0	21.3690	2.6	0.1528	2.9	0.0237	1.2	0.42	151.0	1.8	144.4	3.9	37.8	63.0	151.0	1.8	NA
-071718KR-01 Spot 242	91	11878	3.8	20.9952	1.7	0.1556	1.9	0.0237	1.0	0.50	151.0	1.4	146.8	2.6	79.9	39.5	151.0	1.4	NA
-071718KR-01 Spot 20	107	31834	3.3	20.6702	1.7	0.1581	2.0	0.0237	1.0	0.50	151.1	1.5	149.0	2.7	116.8	39.9	151.1	1.5	NA
-071718KR-01 Spot 143	143	126420	2.2	20.3867	1.3	0.1603	1.7	0.0237	1.1	0.63	151.1	1.6	151.0	2.4	149.3	31.3	151.1	1.6	NA
-071718KR-01 Spot 268	214	15166	3.4	20.4856	1.7	0.1595	2.1	0.0237	1.3	0.62	151.1	2.0	150.3	3.0	137.9	39.0	151.1	2.0	NA
-071718KR-01 Spot 39	162	11815	3.2	20.8545	1.5	0.1567	1.9	0.0237	1.1	0.59	151.1	1.7	147.8	2.6	95.8	36.6	151.1	1.7	NA
-071718KR-01 Spot 164	129	10400	2.4	21.0177	1.6	0.1555	1.9	0.0237	1.0	0.55	151.1	1.5	146.8	2.5	77.3	36.9	151.1	1.5	NA
-071718KR-01 Spot 306	280	31942	2.4	20.5848	1.2	0.1588	2.2	0.0237	1.8	0.82	151.1	2.7	149.7	3.0	126.6	28.7	151.1	2.7	NA
-071718KR-01 Spot 61	118	8157	3.1	20.8054	2.3	0.1572	2.6	0.0237	1.3	0.51	151.2	2.0	148.2	3.6	101.4	53.6	151.2	2.0	NA
-071718KR-01 Spot 127	112	34006	2.9	20.5141	1.6	0.1595	2.0	0.0237	1.2	0.60	151.2	1.8	150.2	2.8	134.7	38.0	151.2	1.8	NA
-071718KR-01 Spot 227	120	16005	2.4	20.6019	1.4	0.1588	1.8	0.0237	1.2	0.63	151.2	1.7	149.6	2.6	124.6	33.6	151.2	1.7	NA
-071718KR-01 Spot 176	134	15057	2.8	20.7168	1.7	0.1579	2.0	0.0237	1.1	0.56	151.2	1.7	148.9	2.8	111.5	39.0	151.2	1.7	NA
-071718KR-01 Spot 4	153	11928	3.2	19.2676	1.9	0.1699	2.2	0.0237	1.1	0.51	151.3	1.7	159.3	3.2	280.1	43.3	151.3	1.7	NA
-071718KR-01 Spot 148	205	44327	2.4	20.7599	1.1	0.1577	1.6	0.0237	1.2	0.76	151.3	1.9	148.7	2.3	106.6	24.9	151.3	1.9	NA
-071718KR-01 Spot 91	59	50857	3.7	20.9249	2.2	0.1564	2.4	0.0237	1.1	0.45	151.3	1.6	147.6	3.3	87.9	51.4	151.3	1.6	NA
-071718KR-01 Spot 221	171	76064	2.8	20.2557	1.4	0.1616	1.9	0.0238	1.3	0.70	151.3	2.0	152.1	2.7	164.3	31.9	151.3	2.0	NA
-071718KR-01 Spot 182	226	43294	2.6	20.7770	1.0	0.1576	1.4	0.0238	1.0	0.69	151.3	1.5	148.6	2.0	104.6	24.6	151.3	1.5	NA
-071718KR-01 Spot 66	154	117925	2.5	20.2440	1.4	0.1618	1.7	0.0238	1.0	0.61	151.4	1.6	152.3	2.4	165.7	31.9	151.4	1.6	NA
-071718KR-01 Spot 64	123	6184	2.7	20.9030	1.4	0.1567	1.8	0.0238	1.0	0.57	151.4	1.5	147.8	2.4	90.3	34.3	151.4	1.5	NA
-071718KR-01 Spot 100	199	9942	2.5	21.1192	1.5	0.1551	2.0	0.0238	1.3	0.65	151.4	1.9	146.4	2.7	65.9	35.6	151.4	1.9	NA
-071718KR-01 Spot 186	129	15360	3.0	20.5247	1.2	0.1596	1.6	0.0238	1.0	0.65	151.5	1.5	150.4	2.2	133.4	27.8	151.5	1.5	NA
-071718KR-01 Spot 117	198	30673	2.2	20.6522	1.3	0.1587	1.6	0.0238	0.9	0.55	151.5	1.3	149.5	2.2	118.8	31.5	151.5	1.3	NA

-071718KR-01 Spot 33	110	5765	2.8	21.3681	2.6	0.1534	2.8	0.0238	1.2	0.42	151.5	1.8	144.9	3.8	37.9	61.3	151.5	1.8	NA
-071718KR-01 Spot 97	169	13697	2.3	21.0608	1.5	0.1556	1.9	0.0238	1.2	0.61	151.5	1.7	146.9	2.6	72.5	35.2	151.5	1.7	NA
-071718KR-01 Spot 48	102	11806	2.8	20.7763	1.5	0.1578	1.7	0.0238	0.9	0.53	151.5	1.4	148.8	2.4	104.7	35.0	151.5	1.4	NA
-071718KR-01 Spot 214	144	13399	3.5	20.5581	1.6	0.1595	1.9	0.0238	1.1	0.57	151.5	1.6	150.2	2.7	129.6	36.8	151.5	1.6	NA
-071718KR-01 Spot 158	141	41336	2.4	20.3192	1.2	0.1613	1.7	0.0238	1.2	0.72	151.5	1.8	151.9	2.4	157.0	27.2	151.5	1.8	NA
-071718KR-01 Spot 308	238	16666	2.0	20.6727	1.6	0.1586	1.9	0.0238	1.0	0.55	151.6	1.6	149.5	2.7	116.5	37.6	151.6	1.6	NA
-071718KR-01 Spot 150	94	31224	3.1	19.8661	1.6	0.1650	1.9	0.0238	1.1	0.56	151.6	1.6	155.1	2.7	209.6	36.4	151.6	1.6	NA
-071718KR-01 Spot 239	79	1873748	3.4	20.7457	2.0	0.1581	2.3	0.0238	1.2	0.51	151.6	1.8	149.0	3.2	108.2	46.7	151.6	1.8	NA
-071718KR-01 Spot 126	87	4001	3.1	23.3334	1.6	0.1405	2.0	0.0238	1.2	0.59	151.6	1.7	133.5	2.5	NA	NA	151.6	1.7	NA
-071718KR-01 Spot 264	177	5997	2.2	21.1783	1.4	0.1549	1.7	0.0238	1.0	0.57	151.6	1.5	146.2	2.3	59.3	33.1	151.6	1.5	NA
-071718KR-01 Spot 49	118	67680	3.1	20.4030	1.2	0.1608	1.7	0.0238	1.2	0.70	151.7	1.8	151.4	2.4	147.4	28.4	151.7	1.8	NA
-071718KR-01 Spot 99	109	5348	2.2	21.0142	1.7	0.1561	2.2	0.0238	1.3	0.60	151.7	1.9	147.3	3.0	77.7	41.2	151.7	1.9	NA
-071718KR-01 Spot 296	81	3624	3.2	21.9687	2.6	0.1494	2.9	0.0238	1.4	0.47	151.7	2.1	141.4	3.9	NA	NA	151.7	2.1	NA
-071718KR-01 Spot 270	159	17454	2.7	21.2501	1.5	0.1545	1.9	0.0238	1.1	0.59	151.8	1.7	145.9	2.6	51.2	36.4	151.8	1.7	NA
-071718KR-01 Spot 75	255	25855	2.1	20.5036	1.2	0.1602	1.5	0.0238	1.0	0.63	151.8	1.5	150.8	2.2	135.9	28.3	151.8	1.5	NA
-071718KR-01 Spot 305	148	8481	2.6	20.9910	1.2	0.1564	1.7	0.0238	1.2	0.70	151.8	1.8	147.6	2.3	80.3	28.3	151.8	1.8	NA
-071718KR-01 Spot 171	96	6947	3.4	21.0449	1.9	0.1561	2.1	0.0238	1.0	0.46	151.9	1.5	147.3	2.9	74.3	44.3	151.9	1.5	NA
-071718KR-01 Spot 267	68	2993	3.7	23.0111	1.6	0.1428	1.9	0.0238	1.1	0.57	151.9	1.6	135.5	2.4	NA	NA	151.9	1.6	NA
-071718KR-01 Spot 206	106	112608	3.1	19.9108	1.5	0.1651	1.9	0.0239	1.2	0.60	152.0	1.7	155.2	2.8	204.4	35.6	152.0	1.7	NA
-071718KR-01 Spot 151	112	34100	3.2	20.6387	1.5	0.1593	1.9	0.0239	1.3	0.65	152.0	1.9	150.1	2.7	120.4	34.6	152.0	1.9	NA
-071718KR-01 Spot 163	126	19124	3.4	20.0596	1.6	0.1639	2.2	0.0239	1.4	0.65	152.0	2.1	154.1	3.1	187.0	38.2	152.0	2.1	NA
-071718KR-01 Spot 92	134	12016	2.4	20.5341	1.5	0.1602	1.9	0.0239	1.2	0.60	152.0	1.7	150.8	2.7	132.3	36.0	152.0	1.7	NA
-071718KR-01 Spot 13	134	7340	2.6	21.3145	1.3	0.1543	1.5	0.0239	0.8	0.55	152.0	1.3	145.7	2.1	43.9	30.9	152.0	1.3	NA
-071718KR-01 Spot 229	90	29189	3.3	20.5120	1.7	0.1603	2.1	0.0239	1.2	0.58	152.0	1.8	151.0	3.0	134.9	40.5	152.0	1.8	NA
-071718KR-01 Spot 299	91	20911	3.6	20.6926	1.9	0.1590	2.1	0.0239	0.9	0.42	152.0	1.3	149.8	2.9	114.2	44.5	152.0	1.3	NA
-071718KR-01 Spot 136	141	19846	2.5	20.3239	1.4	0.1618	1.8	0.0239	1.2	0.66	152.0	1.8	152.3	2.6	156.5	32.7	152.0	1.8	NA
-071718KR-01 Spot 37	145	11986	3.6	20.6284	2.1	0.1595	2.3	0.0239	1.1	0.46	152.1	1.6	150.2	3.3	121.6	48.8	152.1	1.6	NA
-071718KR-01 Spot 266	87	13139	2.8	21.0801	1.9	0.1560	2.2	0.0239	1.1	0.50	152.1	1.7	147.2	3.1	70.3	46.3	152.1	1.7	NA
-071718KR-01 Spot 166	68	2960	3.5	22.6111	2.3	0.1455	2.7	0.0239	1.4	0.53	152.1	2.1	138.0	3.4	NA	NA	152.1	2.1	NA
-071718KR-01 Spot 7	168	112848	2.6	20.7748	1.2	0.1585	1.6	0.0239	1.1	0.67	152.2	1.6	149.4	2.2	104.9	28.1	152.2	1.6	NA
-071718KR-01 Spot 86	176	161373	2.4	20.4183	1.2	0.1612	1.7	0.0239	1.2	0.69	152.2	1.7	151.8	2.4	145.7	28.5	152.2	1.7	NA
-071718KR-01 Spot 202	150	24352	2.6	20.4160	1.8	0.1613	2.2	0.0239	1.3	0.57	152.2	1.9	151.8	3.1	145.9	42.1	152.2	1.9	NA
-071718KR-01 Spot 205	85	8322	2.3	21.2238	1.5	0.1552	1.9	0.0239	1.0	0.56	152.2	1.6	146.5	2.5	54.1	36.9	152.2	1.6	NA
-071718KR-01 Spot 192	104	12156	2.9	20.8375	2.0	0.1581	2.5	0.0239	1.4	0.58	152.3	2.2	149.0	3.5	97.8	48.2	152.3	2.2	NA
-071718KR-01 Spot 309	138	228311	3.3	20.2829	1.5	0.1624	1.8	0.0239	1.0	0.57	152.3	1.5	152.8	2.5	161.2	34.2	152.3	1.5	NA
-071718KR-01 Spot 132	128	20440	3.2	20.9944	1.2	0.1569	1.5	0.0239	0.9	0.62	152.3	1.4	148.0	2.1	80.0	27.8	152.3	1.4	NA
-071718KR-01 Spot 235	126	18381	2.5	19.8305	1.4	0.1662	1.7	0.0239	1.0	0.59	152.3	1.5	156.1	2.5	213.8	31.9	152.3	1.5	NA
-071718KR-01 Spot 231	111	6758	3.0	21.1451	2.7	0.1559	2.8	0.0239	1.0	0.34	152.3	1.4	147.1	3.9	63.0	63.4	152.3	1.4	NA
-071718KR-01 Spot 286	173	7190	3.2	21.3325	1.3	0.1545	1.8	0.0239	1.1	0.66	152.4	1.7	145.9	2.4	41.9	31.6	152.4	1.7	NA
-071718KR-01 Spot 181	197	8247	2.7	21.2490	1.1	0.1552	1.5	0.0239	1.0	0.69	152.4	1.6	146.5	2.1	51.3	26.0	152.4	1.6	NA
-071718KR-01 Spot 8	167	19674	2.9	20.8751	1.3	0.1580	1.7	0.0239	1.1	0.64	152.5	1.6	148.9	2.4	93.5	30.8	152.5	1.6	NA
-071718KR-01 Spot 73	157	22355	3.0	20.6389	1.5	0.1598	1.9	0.0239	1.2	0.63	152.5	1.8	150.5	2.6	120.4	34.3	152.5	1.8	NA
-071718KR-01 Spot 77	144	15422	2.7	20.3898	1.7	0.1618	2.0	0.0239	1.1	0.55	152.5	1.7	152.3	2.8	148.9	39.2	152.5	1.7	NA
-071718KR-01 Spot 219	111	8571	3.6	21.1833	1.6	0.1558	1.9	0.0239	1.0	0.52	152.5	1.5	147.0	2.6	58.7	38.5	152.5	1.5	NA
-071718KR-01 Spot 3	116	6649	3.5	21.1003	1.6	0.1564	2.0	0.0239	1.1	0.57	152.5	1.7	147.5	2.7	68.0	38.5	152.5	1.7	NA
-071718KR-01 Spot 295	85	91800	2.8	19.5745	1.7	0.1686	2.0	0.0239	1.2	0.58	152.5	1.8	158.2	3.0	243.7	38.2	152.5	1.8	NA
-071718KR-01 Spot 302	111	99565	3.8	20.8305	1.8	0.1584	2.1	0.0239	1.0	0.48	152.5	1.5	149.3	2.9	98.6	42.7	152.5	1.5	NA

-071718KR-01 Spot 55	141	9343	3.3	21.2665	2.1	0.1552	2.3	0.0239	1.1	0.46	152.5	1.6	146.5	3.2	49.3	49.1	152.5	1.6	NA
-071718KR-01 Spot 310	110	6696	2.4	21.6909	1.6	0.1522	1.9	0.0239	1.0	0.53	152.6	1.6	143.8	2.6	1.9	39.7	152.6	1.6	NA
-071718KR-01 Spot 58	103	33799	3.3	20.8817	1.6	0.1581	2.0	0.0240	1.2	0.61	152.6	1.8	149.0	2.8	92.7	37.6	152.6	1.8	NA
-071718KR-01 Spot 184	133	5911	2.6	21.3208	1.8	0.1548	2.0	0.0240	0.9	0.44	152.6	1.3	146.2	2.8	43.2	43.6	152.6	1.3	NA
-071718KR-01 Spot 160	187	41607	2.3	18.3746	1.6	0.1797	1.8	0.0240	0.9	0.52	152.6	1.4	167.8	2.8	387.6	34.9	152.6	1.4	NA
-071718KR-01 Spot 87	180	109247	2.5	20.1975	1.2	0.1635	1.5	0.0240	1.0	0.65	152.6	1.5	153.7	2.2	171.1	27.1	152.6	1.5	NA
-071718KR-01 Spot 153	178	8312	3.3	21.2637	1.3	0.1553	1.8	0.0240	1.2	0.70	152.6	1.9	146.6	2.4	49.7	30.6	152.6	1.9	NA
-071718KR-01 Spot 165	102	7476	2.8	21.5099	2.0	0.1536	2.2	0.0240	1.0	0.46	152.7	1.5	145.1	3.0	22.1	47.2	152.7	1.5	NA
-071718KR-01 Spot 54	150	9680	3.0	20.5875	2.0	0.1605	2.4	0.0240	1.4	0.57	152.7	2.1	151.1	3.4	126.3	46.9	152.7	2.1	NA
-071718KR-01 Spot 83	244	34539	2.3	20.1904	1.1	0.1636	1.7	0.0240	1.3	0.78	152.7	2.0	153.9	2.4	171.9	24.8	152.7	2.0	NA
-071718KR-01 Spot 238	86	3193	3.2	22.0201	5.3	0.1500	5.5	0.0240	1.4	0.26	152.7	2.1	142.0	7.3	NA	NA	152.7	2.1	NA
-071718KR-01 Spot 279	148	4500	3.3	21.5516	1.3	0.1533	1.6	0.0240	1.1	0.65	152.7	1.6	144.8	2.2	17.4	30.1	152.7	1.6	NA
-071718KR-01 Spot 36	153	12136	3.0	21.0428	1.3	0.1570	1.7	0.0240	1.0	0.60	152.7	1.5	148.1	2.3	74.5	31.8	152.7	1.5	NA
-071718KR-01 Spot 188	83	263227	2.4	20.8808	2.1	0.1583	2.4	0.0240	1.2	0.48	152.7	1.8	149.2	3.4	92.9	50.5	152.7	1.8	NA
-071718KR-01 Spot 292	127	10662	2.5	20.6229	1.7	0.1602	2.0	0.0240	0.9	0.47	152.7	1.4	150.9	2.8	122.2	41.0	152.7	1.4	NA
-071718KR-01 Spot 1	189	48995	2.2	19.8941	1.6	0.1661	1.8	0.0240	0.9	0.49	152.8	1.3	156.0	2.6	206.3	36.1	152.8	1.3	NA
-071718KR-01 Spot 232	107	6772	3.1	20.8049	1.3	0.1589	1.7	0.0240	1.1	0.64	152.8	1.7	149.7	2.4	101.5	31.5	152.8	1.7	NA
-071718KR-01 Spot 258	181	118201	3.3	20.3133	1.0	0.1628	1.3	0.0240	0.9	0.66	152.8	1.3	153.1	1.9	157.7	23.3	152.8	1.3	NA
-071718KR-01 Spot 26	212	4470018	3.0	20.1951	1.4	0.1637	2.0	0.0240	1.3	0.68	152.8	2.0	154.0	2.8	171.3	33.5	152.8	2.0	NA
-071718KR-01 Spot 215	140	7782	2.7	20.8587	1.3	0.1585	1.7	0.0240	1.1	0.64	152.8	1.6	149.4	2.3	95.3	30.5	152.8	1.6	NA
-071718KR-01 Spot 88	84	1679663	2.5	19.9895	1.8	0.1655	2.0	0.0240	1.0	0.49	152.9	1.5	155.5	2.9	195.2	40.7	152.9	1.5	NA
-071718KR-01 Spot 189	119	10109	2.6	20.6988	1.6	0.1599	2.0	0.0240	1.2	0.62	153.0	1.9	150.6	2.8	113.6	37.7	153.0	1.9	NA
-071718KR-01 Spot 5	132	21008	2.3	20.6816	1.3	0.1601	1.8	0.0240	1.3	0.73	153.0	2.0	150.7	2.6	115.5	29.8	153.0	2.0	NA
-071718KR-01 Spot 201	145	23093	3.2	20.7221	1.5	0.1597	1.8	0.0240	1.0	0.57	153.0	1.6	150.5	2.5	110.9	35.4	153.0	1.6	NA
-071718KR-01 Spot 224	135	12965	2.7	20.9548	1.7	0.1580	2.0	0.0240	1.1	0.53	153.0	1.6	148.9	2.8	84.4	39.8	153.0	1.6	NA
-071718KR-01 Spot 298	157	41692	2.1	20.1462	1.4	0.1643	1.9	0.0240	1.2	0.65	153.0	1.8	154.5	2.7	177.0	32.8	153.0	1.8	NA
-071718KR-01 Spot 210	153	31172	3.5	20.9369	1.4	0.1582	1.8	0.0240	1.2	0.67	153.1	1.8	149.1	2.5	86.5	32.1	153.1	1.8	NA
-071718KR-01 Spot 272	100	8243	2.8	20.7706	1.8	0.1595	2.1	0.0240	1.1	0.54	153.1	1.7	150.2	3.0	105.3	42.7	153.1	1.7	NA
-071718KR-01 Spot 285	83	3995	3.1	21.5385	2.0	0.1538	2.3	0.0240	1.2	0.52	153.2	1.8	145.3	3.1	18.9	47.0	153.2	1.8	NA
-071718KR-01 Spot 250	126	53104	2.9	20.0687	1.6	0.1651	2.2	0.0240	1.5	0.67	153.2	2.2	155.2	3.1	186.0	37.7	153.2	2.2	NA
-071718KR-01 Spot 156	171	134735	2.6	20.2480	0.9	0.1637	1.3	0.0240	0.9	0.73	153.2	1.4	153.9	1.8	165.2	20.2	153.2	1.4	NA
-071718KR-01 Spot 240	147	53896	2.4	20.6653	1.5	0.1604	1.8	0.0241	1.0	0.55	153.2	1.5	151.1	2.5	117.4	35.3	153.2	1.5	NA
-071718KR-01 Spot 12	137	13623	2.9	21.1053	1.3	0.1571	1.6	0.0241	1.0	0.60	153.2	1.5	148.1	2.3	67.5	31.2	153.2	1.5	NA
-071718KR-01 Spot 237	122	10133	3.4	20.7936	2.2	0.1595	2.5	0.0241	1.2	0.46	153.3	1.8	150.3	3.5	102.7	52.9	153.3	1.8	NA
-071718KR-01 Spot 198	157	55528	2.5	20.3236	1.1	0.1633	1.8	0.0241	1.3	0.76	153.4	2.0	153.6	2.5	156.5	26.7	153.4	2.0	NA
-071718KR-01 Spot 74	96	3791	2.8	21.3954	1.5	0.1551	2.0	0.0241	1.3	0.64	153.4	1.9	146.4	2.7	34.9	36.6	153.4	1.9	NA
-071718KR-01 Spot 130	91	5996	2.9	21.2145	3.0	0.1564	3.2	0.0241	1.2	0.37	153.4	1.8	147.6	4.4	55.1	71.3	153.4	1.8	NA
-071718KR-01 Spot 27	152	20577	3.3	21.1997	1.4	0.1566	1.9	0.0241	1.3	0.69	153.5	2.0	147.7	2.6	56.8	32.4	153.5	2.0	NA
-071718KR-01 Spot 16	145	29877	2.3	20.9699	1.4	0.1584	1.9	0.0241	1.3	0.67	153.5	2.0	149.3	2.7	82.7	34.4	153.5	2.0	NA
-071718KR-01 Spot 226	176	28466	2.6	19.3683	1.7	0.1715	2.0	0.0241	0.9	0.48	153.5	1.4	160.7	2.9	268.1	39.7	153.5	1.4	NA
-071718KR-01 Spot 6	66	7516	3.2	20.6002	1.8	0.1612	2.2	0.0241	1.2	0.54	153.5	1.8	151.8	3.1	124.8	43.0	153.5	1.8	NA
-071718KR-01 Spot 174	128	23908	2.8	20.8548	1.6	0.1593	2.0	0.0241	1.2	0.59	153.5	1.7	150.1	2.7	95.8	37.3	153.5	1.7	NA
-071718KR-01 Spot 15	108	9492	3.6	21.3520	2.4	0.1556	2.6	0.0241	0.9	0.36	153.5	1.4	146.8	3.5	39.8	57.7	153.5	1.4	NA
-071718KR-01 Spot 177	110	6272	3.3	21.3228	1.6	0.1558	2.0	0.0241	1.3	0.64	153.5	2.0	147.0	2.8	43.0	37.3	153.5	2.0	NA
-071718KR-01 Spot 265	103	15861	2.5	20.9525	1.5	0.1586	1.9	0.0241	1.1	0.59	153.6	1.7	149.5	2.6	84.7	36.0	153.6	1.7	NA
-071718KR-01 Spot 276	101	5286	3.4	20.9526	1.6	0.1586	1.9	0.0241	1.1	0.57	153.6	1.7	149.5	2.7	84.7	37.9	153.6	1.7	NA
-071718KR-01 Spot 294	120	26637	3.6	20.4305	1.7	0.1627	2.1	0.0241	1.2	0.56	153.7	1.8	153.1	3.0	144.2	41.0	153.7	1.8	NA

-071718KR-01 Spot 185	111	11355	3.7	20.5644	1.3	0.1617	1.9	0.0241	1.3	0.70	153.7	2.0	152.2	2.7	128.9	31.7	153.7	2.0	NA
-071718KR-01 Spot 277	47	775988	3.3	18.9823	2.5	0.1752	2.8	0.0241	1.2	0.43	153.7	1.8	163.9	4.2	314.1	56.6	153.7	1.8	NA
-071718KR-01 Spot 154	64	25970	3.2	20.7026	2.2	0.1607	2.5	0.0241	1.3	0.53	153.8	2.0	151.3	3.6	113.1	51.2	153.8	2.0	NA
-071718KR-01 Spot 43	102	11687	3.3	21.0281	1.5	0.1582	2.0	0.0241	1.3	0.67	153.8	2.0	149.2	2.8	76.2	35.4	153.8	2.0	NA
-071718KR-01 Spot 304	104	7570	3.3	20.9830	1.6	0.1586	2.0	0.0241	1.1	0.55	153.8	1.6	149.5	2.7	81.3	39.1	153.8	1.6	NA
-071718KR-01 Spot 212	103	6937	3.3	20.7876	3.1	0.1602	3.4	0.0242	1.3	0.38	154.0	2.0	150.9	4.8	103.5	74.2	154.0	2.0	NA
-071718KR-01 Spot 34	230	9886	2.7	20.2938	1.3	0.1642	1.8	0.0242	1.3	0.71	154.0	2.0	154.3	2.6	160.0	29.5	154.0	2.0	NA
-071718KR-01 Spot 14	172	6749	2.8	16.9237	4.0	0.1970	4.2	0.0242	1.3	0.31	154.1	2.0	182.6	7.0	569.4	86.7	154.1	2.0	NA
-071718KR-01 Spot 248	90	7555	3.4	21.0120	1.5	0.1587	2.0	0.0242	1.3	0.66	154.1	2.0	149.6	2.7	78.0	34.8	154.1	2.0	NA
-071718KR-01 Spot 262	98	93430	3.4	20.0391	1.6	0.1664	1.9	0.0242	1.1	0.56	154.1	1.6	156.3	2.8	189.4	36.7	154.1	1.6	NA
-071718KR-01 Spot 287	121	10100	3.1	21.0297	1.6	0.1586	1.9	0.0242	1.1	0.59	154.2	1.8	149.5	2.7	76.0	36.9	154.2	1.8	NA
-071718KR-01 Spot 159	64	13211	3.2	20.4837	1.8	0.1629	2.1	0.0242	1.1	0.52	154.2	1.7	153.2	3.0	138.2	41.6	154.2	1.7	NA
-071718KR-01 Spot 278	98	11787	3.0	20.3973	1.7	0.1636	2.1	0.0242	1.3	0.60	154.2	1.9	153.8	3.0	148.1	39.4	154.2	1.9	NA
-071718KR-01 Spot 42	161	17970	2.4	19.8371	1.6	0.1682	2.0	0.0242	1.2	0.61	154.2	1.8	157.9	2.9	212.9	36.2	154.2	1.8	NA
-071718KR-01 Spot 115	117	15669	2.6	20.9827	1.3	0.1591	1.6	0.0242	1.0	0.61	154.3	1.5	149.9	2.2	81.3	30.0	154.3	1.5	NA
-071718KR-01 Spot 200	138	15020	3.1	20.6243	1.6	0.1619	2.0	0.0242	1.2	0.62	154.3	1.9	152.3	2.8	122.0	36.5	154.3	1.9	NA
-071718KR-01 Spot 146	133	15063	2.6	20.5946	1.4	0.1621	1.8	0.0242	1.2	0.63	154.3	1.8	152.6	2.6	125.4	33.3	154.3	1.8	NA
-071718KR-01 Spot 293	104	14726	3.1	20.6258	1.7	0.1619	2.2	0.0242	1.3	0.60	154.4	2.0	152.4	3.0	121.9	40.5	154.4	2.0	NA
-071718KR-01 Spot 79	170	20720	2.6	20.6352	1.2	0.1619	1.6	0.0242	1.1	0.66	154.4	1.6	152.4	2.3	120.8	28.7	154.4	1.6	NA
-071718KR-01 Spot 274	154	28597	3.1	20.7481	1.5	0.1610	1.8	0.0242	1.0	0.55	154.4	1.5	151.6	2.6	107.9	35.7	154.4	1.5	NA
-071718KR-01 Spot 269	197	26269	2.8	20.3578	1.2	0.1642	1.6	0.0242	1.0	0.61	154.4	1.5	154.3	2.2	152.6	29.2	154.4	1.5	NA
-071718KR-01 Spot 223	149	24361	3.0	20.6927	1.4	0.1615	1.9	0.0243	1.2	0.65	154.5	1.8	152.1	2.6	114.2	33.6	154.5	1.8	NA
-071718KR-01 Spot 314	211	9151	3.0	20.7363	1.3	0.1612	1.7	0.0243	1.1	0.65	154.5	1.7	151.8	2.4	109.3	31.0	154.5	1.7	NA
-071718KR-01 Spot 137	100	5813	3.9	21.5921	1.7	0.1549	1.9	0.0243	0.8	0.42	154.5	1.2	146.2	2.6	12.9	41.5	154.5	1.2	NA
-071718KR-01 Spot 273	118	18303	2.7	20.1009	1.4	0.1664	1.9	0.0243	1.2	0.64	154.6	1.8	156.3	2.7	182.2	33.8	154.6	1.8	NA
-071718KR-01 Spot 50	197	69993	2.9	17.4690	1.5	0.1915	2.6	0.0243	2.1	0.83	154.6	3.3	177.9	4.2	500.0	32.0	154.6	3.3	NA
-071718KR-01 Spot 312	130	45546	2.5	19.6062	1.5	0.1706	1.9	0.0243	1.0	0.55	154.6	1.6	159.9	2.8	240.0	35.7	154.6	1.6	NA
-071718KR-01 Spot 22	198	33008	3.2	20.6950	1.5	0.1617	1.7	0.0243	0.9	0.51	154.6	1.3	152.2	2.4	114.0	35.1	154.6	1.3	NA
-071718KR-01 Spot 283	144	70294	2.5	20.5796	1.5	0.1628	1.9	0.0243	1.2	0.64	154.8	1.9	153.1	2.8	127.2	35.0	154.8	1.9	NA
-071718KR-01 Spot 313	136	9517	3.0	20.8435	1.6	0.1607	2.0	0.0243	1.1	0.56	154.8	1.7	151.4	2.8	97.1	38.4	154.8	1.7	NA
-071718KR-01 Spot 157	135	9410	2.9	20.5771	2.0	0.1629	2.4	0.0243	1.3	0.53	154.9	1.9	153.2	3.4	127.5	47.1	154.9	1.9	NA
-071718KR-01 Spot 218	134	11405	2.9	20.8094	1.3	0.1613	1.6	0.0243	0.9	0.60	155.1	1.4	151.8	2.2	101.0	29.6	155.1	1.4	NA
-071718KR-01 Spot 168	128	23193	3.0	20.7554	1.7	0.1617	2.0	0.0243	1.1	0.56	155.1	1.7	152.2	2.9	107.1	39.7	155.1	1.7	NA
-071718KR-01 Spot 208	171	18014	2.4	20.6959	1.5	0.1622	1.8	0.0244	1.0	0.56	155.1	1.6	152.6	2.6	113.9	35.8	155.1	1.6	NA
-071718KR-01 Spot 220	192	9250	2.6	21.1357	1.0	0.1588	1.5	0.0244	1.1	0.75	155.1	1.8	149.7	2.1	64.0	23.7	155.1	1.8	NA
-071718KR-01 Spot 280	102	9980	2.8	18.5469	2.6	0.1811	2.8	0.0244	1.1	0.38	155.2	1.7	169.0	4.4	366.6	58.5	155.2	1.7	NA
-071718KR-01 Spot 209	91	42564	3.0	20.4169	1.7	0.1645	2.1	0.0244	1.2	0.58	155.2	1.9	154.7	3.0	145.8	40.2	155.2	1.9	NA
-071718KR-01 Spot 105	130	116033	2.6	20.2190	1.2	0.1662	1.7	0.0244	1.2	0.69	155.3	1.8	156.1	2.4	168.6	28.4	155.3	1.8	NA
-071718KR-01 Spot 129	70	25105	3.9	20.6017	1.8	0.1632	2.2	0.0244	1.2	0.54	155.4	1.8	153.5	3.1	124.6	43.2	155.4	1.8	NA
-071718KR-01 Spot 172	119	4988	2.3	21.2000	1.3	0.1586	1.6	0.0244	0.9	0.58	155.4	1.4	149.5	2.2	56.8	30.2	155.4	1.4	NA
-071718KR-01 Spot 128	87	12072	3.1	20.0782	2.5	0.1676	2.7	0.0244	1.1	0.40	155.5	1.7	157.3	4.0	184.9	58.3	155.5	1.7	NA
-071718KR-01 Spot 282	123	4026	2.7	22.2659	1.3	0.1511	1.7	0.0244	1.0	0.59	155.5	1.5	142.9	2.2	NA	NA	155.5	1.5	NA
-071718KR-01 Spot 18	121	11772	2.3	20.9450	1.4	0.1607	1.8	0.0244	1.1	0.64	155.6	1.7	151.4	2.5	85.6	32.2	155.6	1.7	NA
-071718KR-01 Spot 147	156	55633	2.2	20.0768	1.4	0.1677	1.8	0.0244	1.1	0.61	155.6	1.7	157.4	2.6	185.0	32.9	155.6	1.7	NA
-071718KR-01 Spot 254	143	22997	2.5	20.0560	1.5	0.1679	1.7	0.0244	0.9	0.53	155.6	1.4	157.6	2.5	187.5	34.4	155.6	1.4	NA
-071718KR-01 Spot 72	225	8478	2.6	17.7923	1.6	0.1893	2.0	0.0244	1.1	0.56	155.6	1.7	176.0	3.2	459.5	36.1	155.6	1.7	NA
-071718KR-01 Spot 281	136	50323	3.3	20.5973	1.3	0.1637	1.6	0.0245	1.0	0.64	155.8	1.6	153.9	2.3	125.1	29.6	155.8	1.6	NA

-071718KR-01 Spot 300	98	21026	3.2	20.5260	1.3	0.1643	1.8	0.0245	1.2	0.68	155.8	1.9	154.4	2.6	133.3	31.5	155.8	1.9	NA
-071718KR-01 Spot 95	134	12536	3.1	20.2313	1.2	0.1668	1.7	0.0245	1.2	0.70	155.9	1.9	156.6	2.5	167.2	28.9	155.9	1.9	NA
-071718KR-01 Spot 108	108	19892	2.5	20.4375	1.8	0.1652	2.2	0.0245	1.2	0.56	156.1	1.9	155.3	3.1	143.4	42.4	156.1	1.9	NA
-071718KR-01 Spot 230	150	14503	3.3	20.8454	1.4	0.1621	1.7	0.0245	0.9	0.57	156.2	1.5	152.6	2.4	96.8	32.5	156.2	1.5	NA
-071718KR-01 Spot 21	120	9917	2.6	20.7162	1.5	0.1632	1.8	0.0245	1.1	0.61	156.2	1.7	153.5	2.6	111.6	34.5	156.2	1.7	NA
-071718KR-01 Spot 149	134	64736	2.7	20.0079	1.4	0.1689	1.8	0.0245	1.1	0.63	156.2	1.7	158.5	2.6	193.1	31.7	156.2	1.7	NA
-071718KR-01 Spot 247	107	7579	2.5	20.7854	2.0	0.1629	2.3	0.0246	1.2	0.51	156.4	1.8	153.2	3.3	103.7	47.2	156.4	1.8	NA
-071718KR-01 Spot 123	106	15500	3.5	20.6420	1.4	0.1640	1.7	0.0246	1.0	0.57	156.4	1.5	154.2	2.4	120.0	32.5	156.4	1.5	NA
-071718KR-01 Spot 125	99	46284	3.1	20.1776	1.5	0.1679	1.8	0.0246	1.0	0.56	156.5	1.6	157.6	2.7	173.4	35.3	156.5	1.6	NA
-071718KR-01 Spot 301	192	74811	3.1	15.6060	1.4	0.2171	1.7	0.0246	1.0	0.56	156.5	1.5	199.5	3.1	743.3	30.4	156.5	1.5	NA
-071718KR-01 Spot 56	98	11455	2.7	20.0704	1.6	0.1689	2.1	0.0246	1.3	0.63	156.6	2.0	158.4	3.0	185.8	37.4	156.6	2.0	NA
-071718KR-01 Spot 173	226	13783	2.5	17.7202	2.9	0.1914	3.0	0.0246	1.0	0.34	156.7	1.6	177.8	4.9	468.5	63.2	156.7	1.6	NA
-071718KR-01 Spot 155	121	34006	3.4	20.0963	1.2	0.1687	1.6	0.0246	1.1	0.66	156.7	1.6	158.3	2.4	182.8	28.4	156.7	1.6	NA
-071718KR-01 Spot 259	155	113693	2.0	20.6139	1.6	0.1646	1.9	0.0246	1.0	0.54	156.8	1.6	154.7	2.7	123.2	37.8	156.8	1.6	NA
-071718KR-01 Spot 291	132	7630	3.1	20.9185	2.3	0.1624	2.5	0.0246	1.0	0.40	156.9	1.6	152.8	3.6	88.6	54.9	156.9	1.6	NA
-071718KR-01 Spot 207	121	19565	2.7	20.8404	1.4	0.1630	1.9	0.0247	1.3	0.68	157.0	2.0	153.3	2.7	97.4	33.3	157.0	2.0	NA
-071718KR-01 Spot 52	119	6769	3.0	20.8423	1.8	0.1631	2.2	0.0247	1.1	0.52	157.1	1.7	153.4	3.1	97.2	43.4	157.1	1.7	NA
-071718KR-01 Spot 253	72	6854	3.4	20.7247	2.1	0.1640	2.4	0.0247	1.0	0.42	157.1	1.5	154.2	3.4	110.6	50.6	157.1	1.5	NA
-071718KR-01 Spot 284	116	33387	3.3	20.1169	1.5	0.1690	1.7	0.0247	0.9	0.54	157.1	1.4	158.6	2.5	180.4	33.9	157.1	1.4	NA
-071718KR-01 Spot 124	117	18102	3.0	20.8049	1.3	0.1635	1.8	0.0247	1.2	0.67	157.2	1.9	153.8	2.6	101.5	31.8	157.2	1.9	NA
-071718KR-01 Spot 216	134	18618	3.3	21.0202	1.2	0.1621	1.6	0.0247	1.0	0.63	157.5	1.6	152.6	2.2	77.0	29.1	157.5	1.6	NA
-071718KR-01 Spot 98	135	14578	2.1	20.8086	1.3	0.1642	1.9	0.0248	1.3	0.69	157.8	2.0	154.3	2.7	101.1	31.9	157.8	2.0	NA
-071718KR-01 Spot 104	55	4386	3.7	21.8096	2.2	0.1567	2.5	0.0248	1.2	0.49	157.9	1.9	147.8	3.5	NA	NA	157.9	1.9	NA
-071718KR-01 Spot 243	51	14444	3.0	20.4582	2.2	0.1672	2.5	0.0248	1.2	0.49	158.0	1.9	156.9	3.7	141.1	52.0	158.0	1.9	NA
-071718KR-01 Spot 307	163	18730	2.0	20.6738	1.5	0.1656	1.8	0.0248	1.1	0.60	158.1	1.7	155.6	2.7	116.4	35.0	158.1	1.7	NA
-071718KR-01 Spot 120	158	19018	2.7	20.1759	1.2	0.1697	1.6	0.0248	1.0	0.64	158.2	1.6	159.1	2.3	173.6	28.7	158.2	1.6	NA
-071718KR-01 Spot 234	97	11150	2.9	20.9784	1.7	0.1633	2.0	0.0249	1.1	0.54	158.3	1.7	153.6	2.9	81.8	40.7	158.3	1.7	NA
-071718KR-01 Spot 10	108	9966	3.5	21.2846	1.6	0.1611	1.9	0.0249	1.1	0.56	158.4	1.7	151.6	2.7	47.3	38.0	158.4	1.7	NA
-071718KR-01 Spot 118	139	10189	2.8	20.5926	1.3	0.1667	1.7	0.0249	1.1	0.66	158.6	1.8	156.5	2.5	125.6	30.9	158.6	1.8	NA
-071718KR-01 Spot 93	126	28432	3.2	19.3469	1.6	0.1775	1.9	0.0249	1.0	0.53	158.7	1.6	165.9	2.9	270.6	36.7	158.7	1.6	NA
-071718KR-01 Spot 217	225	31806	2.0	20.2724	1.1	0.1695	1.7	0.0249	1.3	0.78	158.8	2.1	159.0	2.5	162.4	25.3	158.8	2.1	NA
-071718KR-01 Spot 191	128	10952	3.3	21.0389	1.3	0.1635	1.7	0.0250	1.2	0.67	158.9	1.8	153.7	2.5	74.9	30.7	158.9	1.8	NA
-071718KR-01 Spot 244	149	16580	3.3	20.3880	1.5	0.1689	2.0	0.0250	1.3	0.67	159.1	2.1	158.5	2.9	149.1	34.4	159.1	2.1	NA
-071718KR-01 Spot 145	124	24148	3.1	20.8256	1.7	0.1656	2.0	0.0250	1.1	0.54	159.3	1.7	155.6	2.9	99.1	39.5	159.3	1.7	NA
-071718KR-01 Spot 53	88	16659	3.5	13.5048	7.2	0.2578	7.3	0.0253	1.3	0.18	160.8	2.1	232.9	15.2	1041.9	144.8	160.8	2.1	NA
-071718KR-01 Spot 138	77	45262	3.2	20.3879	1.5	0.1708	1.7	0.0253	0.9	0.50	160.9	1.4	160.2	2.6	149.1	35.2	160.9	1.4	NA
-071718KR-01 Spot 183	101	64205	2.4	19.9027	1.8	0.1767	2.1	0.0255	1.0	0.49	162.4	1.6	165.2	3.1	205.3	41.7	162.4	1.6	NA
-071718KR-01 Spot 11	57	2456	3.8	23.9154	2.2	0.1489	3.2	0.0258	2.4	0.75	164.4	3.9	140.9	4.3	NA	NA	164.4	3.9	NA

Nutzotin Mountains Sequence – BR1-COMP (FA3)

						Isotope ratios						Apparent ages (Ma)							
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
BR1-COMP (FA3)																			
NUT-BR1-COMP-53	88	3267	2.2	24.2552	37.9	0.1298	38.8	0.0228	8.2	0.21	145.5	11.7	123.9	45.3	-273.4	995.2	145.5	11.7	NA
NUT-BR1-COMP-16	61	2171	4.0	18.7603	42.7	0.1686	44.1	0.0229	10.7	0.24	146.2	15.5	158.2	64.6	341.8	1010.5	146.2	15.5	NA
NUT-BR1-COMP-107	6379	32312	5.7	20.1283	1.4	0.1581	13.8	0.0231	13.7	0.99	147.1	19.9	149.0	19.1	180.1	32.7	147.1	19.9	NA
NUT-BR1-COMP-52	361	24216	2.1	20.8170	10.5	0.1531	10.9	0.0231	3.0	0.27	147.3	4.3	144.6	14.6	101.1	247.7	147.3	4.3	NA
NUT-BR1-COMP-113	137	6241	1.8	21.4466	28.9	0.1489	29.1	0.0232	3.3	0.11	147.6	4.9	140.9	38.3	30.2	705.9	147.6	4.9	NA
NUT-BR1-COMP-43	85	4141	3.5	16.6217	35.7	0.1924	36.5	0.0232	7.9	0.22	147.8	11.5	178.7	59.9	609.4	794.6	147.8	11.5	NA
NUT-BR1-COMP-37	220	4347	1.7	19.9509	17.5	0.1603	17.7	0.0232	2.3	0.13	147.8	3.4	151.0	24.8	200.7	410.1	147.8	3.4	NA
NUT-BR1-COMP-39	1217	34787	4.5	20.3320	2.7	0.1574	3.5	0.0232	2.2	0.63	147.9	3.3	148.4	4.9	156.6	64.3	147.9	3.3	NA
NUT-BR1-COMP-62	202	9955	2.4	22.8871	9.8	0.1409	15.2	0.0234	11.6	0.76	149.0	17.0	133.8	19.0	-127.9	243.2	149.0	17.0	NA
NUT-BR1-COMP-23	193	3710	2.0	17.8490	17.8	0.1818	18.8	0.0235	6.0	0.32	150.0	8.9	169.6	29.4	453.4	398.1	150.0	8.9	NA
NUT-BR1-COMP-29	502	16348	2.4	20.5922	3.4	0.1577	4.8	0.0236	3.4	0.71	150.1	5.0	148.7	6.6	126.8	78.9	150.1	5.0	NA
NUT-BR1-COMP-48	1082	59795	1.9	20.2890	3.4	0.1601	4.1	0.0236	2.3	0.57	150.1	3.4	150.8	5.7	161.5	78.5	150.1	3.4	NA
NUT-BR1-COMP-79	108	5633	1.8	18.4045	15.5	0.1770	16.7	0.0236	6.4	0.38	150.5	9.6	165.5	25.6	384.9	349.0	150.5	9.6	NA
NUT-BR1-COMP-98	365	15745	2.0	21.7536	8.7	0.1498	9.1	0.0236	2.5	0.28	150.6	3.8	141.7	12.0	-4.0	209.9	150.6	3.8	NA
NUT-BR1-COMP-50	191	10193	3.4	18.2041	12.9	0.1793	13.2	0.0237	3.0	0.23	150.8	4.5	167.4	20.4	409.5	289.1	150.8	4.5	NA
NUT-BR1-COMP-111	157	11182	4.1	21.5673	10.2	0.1514	11.8	0.0237	5.9	0.50	150.9	8.8	143.1	15.8	16.7	246.7	150.9	8.8	NA
NUT-BR1-COMP-70	215	13102	4.1	19.0490	13.9	0.1714	14.0	0.0237	1.8	0.13	150.9	2.8	160.6	20.8	307.1	317.2	150.9	2.8	NA
NUT-BR1-COMP-54	688	30622	1.8	20.4385	7.1	0.1600	7.5	0.0237	2.2	0.29	151.1	3.2	150.7	10.4	144.3	167.7	151.1	3.2	NA
NUT-BR1-COMP-20	404	29312	4.3	19.9073	9.7	0.1643	10.2	0.0237	3.1	0.31	151.2	4.7	154.5	14.6	205.8	224.5	151.2	4.7	NA
NUT-BR1-COMP-67	1101	25388	1.3	19.9722	2.8	0.1638	3.5	0.0237	2.1	0.60	151.2	3.2	154.0	5.0	198.2	65.5	151.2	3.2	NA
NUT-BR1-COMP-41	289	14242	3.4	21.2574	6.7	0.1540	7.0	0.0237	2.0	0.28	151.3	3.0	145.5	9.5	51.4	160.8	151.3	3.0	NA
NUT-BR1-COMP-27	249	16823	2.6	19.2399	11.6	0.1708	12.0	0.0238	3.4	0.28	151.8	5.1	160.1	17.8	284.3	265.0	151.8	5.1	NA
NUT-BR1-COMP-97	215	8731	2.0	21.1826	15.0	0.1553	15.2	0.0239	2.3	0.15	152.0	3.5	146.6	20.7	59.8	359.0	152.0	3.5	NA
NUT-BR1-COMP-64	553	25011	1.6	20.0407	3.7	0.1643	6.0	0.0239	4.7	0.79	152.2	7.1	154.5	8.6	190.3	86.4	152.2	7.1	NA
NUT-BR1-COMP-8	174	10854	2.5	19.6465	17.4	0.1677	18.0	0.0239	4.7	0.26	152.2	7.1	157.4	26.3	236.3	404.4	152.2	7.1	NA
NUT-BR1-COMP-78	665	23545	1.8	20.1447	3.3	0.1641	4.1	0.0240	2.5	0.61	152.7	3.8	154.3	5.9	178.2	76.0	152.7	3.8	NA
NUT-BR1-COMP-65	202	14179	2.5	23.0796	20.0	0.1433	20.3	0.0240	3.1	0.15	152.8	4.7	136.0	25.8	-148.7	500.6	152.8	4.7	NA
NUT-BR1-COMP-44	287	2665	1.4	19.2049	9.5	0.1722	9.7	0.0240	2.1	0.21	152.8	3.2	161.3	14.5	288.5	217.7	152.8	3.2	NA
NUT-BR1-COMP-63	189	10238	2.2	20.4343	15.6	0.1620	17.2	0.0240	7.2	0.42	152.9	10.9	152.4	24.4	144.8	368.5	152.9	10.9	NA
NUT-BR1-COMP-45	780	37586	10.0	20.3767	2.9	0.1625	3.8	0.0240	2.5	0.66	153.0	3.8	152.9	5.4	151.4	67.8	153.0	3.8	NA
NUT-BR1-COMP-60	404	19980	6.3	20.8707	8.0	0.1588	9.3	0.0240	4.7	0.50	153.1	7.1	149.6	12.9	95.0	190.2	153.1	7.1	NA
NUT-BR1-COMP-92	216	9669	2.6	19.2625	17.4	0.1721	17.7	0.0240	3.2	0.18	153.1	4.8	161.2	26.4	281.7	400.9	153.1	4.8	NA
NUT-BR1-COMP-110	326	13400	3.2	18.0167	14.7	0.1840	14.9	0.0240	2.7	0.18	153.1	4.1	171.5	23.6	432.6	329.0	153.1	4.1	NA
NUT-BR1-COMP-33	211	8443	4.0	20.7743	8.8	0.1596	10.3	0.0241	5.3	0.52	153.2	8.1	150.4	14.3	106.0	207.5	153.2	8.1	NA
NUT-BR1-COMP-104	586	43224	1.6	21.3155	5.6	0.1564	6.1	0.0242	2.4	0.39	154.0	3.6	147.6	8.3	44.9	133.4	154.0	3.6	NA
NUT-BR1-COMP-68	142	5225	3.8	20.4387	38.3	0.1633	39.1	0.0242	7.6	0.19	154.2	11.5	153.6	55.8	144.3	930.0	154.2	11.5	NA
NUT-BR1-COMP-89	421	11082	2.1	20.6988	11.0	0.1614	11.1	0.0242	1.9	0.17	154.3	3.0	151.9	15.7	114.5	259.0	154.3	3.0	NA
NUT-BR1-COMP-91	392	18309	2.0	20.1649	7.2	0.1658	7.8	0.0242	3.0	0.39	154.4	4.6	155.7	11.3	175.9	168.4	154.4	4.6	NA
NUT-BR1-COMP-57	486	32510	2.3	20.0770	8.1	0.1665	8.7	0.0242	3.3	0.38	154.5	5.1	156.4	12.6	186.0	187.9	154.5	5.1	NA
NUT-BR1-COMP-71	375	12841	4.8	20.0060	8.6	0.1672	8.8	0.0243	2.2	0.25	154.5	3.3	156.9	12.9	194.3	199.6	154.5	3.3	NA
NUT-BR1-COMP-96	382	21813	2.9	19.9322	4.5	0.1678	4.9	0.0243	2.0	0.41	154.5	3.1	157.5	7.2	202.9	104.8	154.5	3.1	NA

NUT-BR1-COMP-112	134	5983	2.1	24.6562	26.7	0.1358	26.9	0.0243	4.0	0.15	154.6	6.1	129.3	32.7	-315.3	693.6	154.6	6.1	NA
NUT-BR1-COMP-66	221	13760	2.1	21.0081	11.3	0.1597	11.7	0.0243	3.1	0.27	155.0	4.8	150.5	16.3	79.4	268.1	155.0	4.8	NA
NUT-BR1-COMP-35	66	2456	2.8	22.0468	103.0	0.1522	103.5	0.0243	10.6	0.10	155.0	16.2	143.9	139.7	-36.4	1087.7	155.0	16.2	NA
NUT-BR1-COMP-42	223	7933	2.8	19.3313	17.1	0.1737	17.3	0.0244	3.2	0.18	155.1	4.8	162.6	26.1	273.5	393.3	155.1	4.8	NA
NUT-BR1-COMP-74	126	9649	2.0	27.0078	21.9	0.1243	22.2	0.0244	3.7	0.17	155.1	5.6	119.0	24.9	-554.6	595.4	155.1	5.6	NA
NUT-BR1-COMP-102	347	19260	3.7	20.6048	11.2	0.1632	11.7	0.0244	3.4	0.29	155.3	5.2	153.5	16.7	125.3	265.3	155.3	5.2	NA
NUT-BR1-COMP-31	220	18916	3.1	19.3392	9.3	0.1740	11.2	0.0244	6.3	0.56	155.5	9.7	162.9	16.9	272.5	213.1	155.5	9.7	NA
NUT-BR1-COMP-26	219	15927	3.7	20.5609	9.2	0.1639	9.5	0.0244	2.3	0.24	155.6	3.5	154.1	13.6	130.3	217.9	155.6	3.5	NA
NUT-BR1-COMP-82	322	35293	3.8	20.0612	9.9	0.1680	11.3	0.0244	5.3	0.47	155.7	8.2	157.7	16.4	187.9	231.2	155.7	8.2	NA
NUT-BR1-COMP-22	189	6382	2.4	26.0332	14.1	0.1297	15.2	0.0245	5.6	0.37	155.9	8.6	123.8	17.7	-456.6	373.8	155.9	8.6	NA
NUT-BR1-COMP-46	152	8680	3.3	20.1157	20.4	0.1678	21.2	0.0245	5.9	0.28	156.0	9.2	157.5	31.0	181.5	479.6	156.0	9.2	NA
NUT-BR1-COMP-83	306	19861	2.7	21.0312	8.2	0.1606	8.8	0.0245	3.2	0.36	156.0	4.9	151.2	12.4	76.8	195.5	156.0	4.9	NA
NUT-BR1-COMP-69	277	6999	2.7	21.1184	10.7	0.1601	10.9	0.0245	2.4	0.22	156.1	3.7	150.8	15.3	67.0	254.8	156.1	3.7	NA
NUT-BR1-COMP-81	259	12601	3.7	20.9974	11.4	0.1611	12.3	0.0245	4.5	0.37	156.2	7.0	151.7	17.3	80.7	271.1	156.2	7.0	NA
NUT-BR1-COMP-47	166	7772	3.2	24.6955	25.8	0.1371	26.4	0.0246	5.4	0.21	156.4	8.4	130.5	32.3	-319.4	671.2	156.4	8.4	NA
NUT-BR1-COMP-116	285	11557	2.2	20.8587	8.0	0.1624	8.7	0.0246	3.4	0.39	156.4	5.2	152.8	12.3	96.4	189.7	156.4	5.2	NA
NUT-BR1-COMP-32	370	4829	2.7	19.1989	8.4	0.1765	9.2	0.0246	3.9	0.42	156.6	6.0	165.1	14.0	289.2	191.4	156.6	6.0	NA
NUT-BR1-COMP-61	177	9844	3.3	20.4713	20.5	0.1656	21.1	0.0246	4.8	0.23	156.6	7.4	155.6	30.4	140.6	486.5	156.6	7.4	NA
NUT-BR1-COMP-18	131	11183	2.0	21.8651	27.8	0.1551	28.1	0.0246	4.0	0.14	156.6	6.2	146.4	38.4	-16.3	684.7	156.6	6.2	NA
NUT-BR1-COMP-86	114	3744	3.9	25.9406	35.2	0.1309	36.0	0.0246	7.5	0.21	156.8	11.6	124.9	42.3	-447.2	950.6	156.8	11.6	NA
NUT-BR1-COMP-76	160	23350	3.4	23.4058	20.7	0.1455	21.3	0.0247	4.8	0.22	157.3	7.4	137.9	27.4	-183.6	522.5	157.3	7.4	NA
NUT-BR1-COMP-51	128	6999	2.4	21.4254	17.0	0.1590	18.0	0.0247	5.7	0.32	157.4	8.9	149.9	25.1	32.6	410.8	157.4	8.9	NA
NUT-BR1-COMP-49	506	18912	3.8	20.0844	4.4	0.1697	5.6	0.0247	3.5	0.63	157.4	5.4	159.2	8.2	185.2	101.4	157.4	5.4	NA
NUT-BR1-COMP-36	203	19535	2.7	22.2997	13.9	0.1531	14.5	0.0248	4.1	0.29	157.7	6.5	144.7	19.6	-64.1	340.9	157.7	6.5	NA
NUT-BR1-COMP-95	335	27542	2.8	20.3056	11.1	0.1682	11.3	0.0248	2.2	0.19	157.7	3.4	157.9	16.5	159.6	259.8	157.7	3.4	NA
NUT-BR1-COMP-114	260	9581	3.8	21.5540	14.5	0.1585	14.7	0.0248	2.8	0.19	157.8	4.3	149.4	20.5	18.2	349.5	157.8	4.3	NA
NUT-BR1-COMP-93	420	14636	1.7	20.2127	9.6	0.1698	10.0	0.0249	2.8	0.27	158.5	4.3	159.2	14.8	170.3	225.3	158.5	4.3	NA
NUT-BR1-COMP-88	213	17912	2.0	19.5792	13.5	0.1753	14.2	0.0249	4.2	0.29	158.5	6.5	164.0	21.4	244.2	312.7	158.5	6.5	NA
NUT-BR1-COMP-55	189	30951	2.3	22.4004	25.1	0.1533	25.9	0.0249	6.2	0.24	158.6	9.8	144.8	34.9	-75.1	622.2	158.6	9.8	NA
NUT-BR1-COMP-103	251	11169	2.2	21.3077	11.1	0.1618	12.7	0.0250	6.2	0.49	159.2	9.8	152.2	18.0	45.7	265.9	159.2	9.8	NA
NUT-BR1-COMP-7	117	3778	3.3	18.1857	21.4	0.1896	21.9	0.0250	4.6	0.21	159.2	7.2	176.3	35.4	411.7	483.5	159.2	7.2	NA
NUT-BR1-COMP-106	180	7303	1.8	21.8364	11.0	0.1581	12.5	0.0250	6.0	0.48	159.4	9.5	149.1	17.3	-13.1	265.6	159.4	9.5	NA
NUT-BR1-COMP-56	415	21190	1.5	20.9295	7.9	0.1653	8.3	0.0251	2.4	0.29	159.8	3.8	155.4	12.0	88.4	188.4	159.8	3.8	NA
NUT-BR1-COMP-100	254	10816	2.8	21.7024	13.1	0.1596	13.6	0.0251	3.7	0.27	160.0	5.9	150.4	19.0	1.7	316.3	160.0	5.9	NA
NUT-BR1-COMP-101	219	4535	3.4	20.5701	15.4	0.1684	19.0	0.0251	11.1	0.58	160.0	17.5	158.0	27.8	129.3	364.3	160.0	17.5	NA
NUT-BR1-COMP-115	91	8335	2.3	33.6612	34.9	0.1029	36.3	0.0251	9.8	0.27	160.0	15.6	99.5	34.4	-1189.1	1107.4	160.0	15.6	NA
NUT-BR1-COMP-19	194	7911	4.1	21.0378	17.1	0.1648	19.0	0.0251	8.3	0.44	160.1	13.1	154.9	27.2	76.1	408.0	160.1	13.1	NA
NUT-BR1-COMP-108	222	14205	2.1	19.4173	8.7	0.1786	10.4	0.0251	5.7	0.55	160.1	9.1	166.8	16.0	263.3	199.2	160.1	9.1	NA
NUT-BR1-COMP-3	387	16694	2.3	20.2600	2.8	0.1712	4.2	0.0252	3.1	0.75	160.1	5.0	160.4	6.2	164.9	64.8	160.1	5.0	NA
NUT-BR1-COMP-99	1483	56397	1.6	20.2332	2.2	0.1719	2.8	0.0252	1.7	0.61	160.6	2.7	161.1	4.2	168.0	52.2	160.6	2.7	NA
NUT-BR1-COMP-72	180	5821	2.4	26.8824	31.9	0.1295	32.0	0.0252	2.8	0.09	160.7	4.5	123.6	37.3	-542.1	873.9	160.7	4.5	NA
NUT-BR1-COMP-77	457	19699	5.0	18.9831	7.9	0.1844	8.0	0.0254	1.6	0.20	161.6	2.5	171.8	12.7	315.0	179.6	161.6	2.5	NA
NUT-BR1-COMP-80	191	20777	3.0	18.8366	14.4	0.1859	14.8	0.0254	3.0	0.21	161.7	4.8	173.1	23.5	332.5	329.0	161.7	4.8	NA
NUT-BR1-COMP-9	118	6957	2.3	20.7381	21.3	0.1693	22.8	0.0255	8.1	0.36	162.1	13.0	158.8	33.6	110.1	508.8	162.1	13.0	NA
NUT-BR1-COMP-94	114	4754	1.8	20.2578	26.1	0.1738	26.8	0.0255	6.2	0.23	162.6	10.0	162.7	40.3	165.1	618.8	162.6	10.0	NA
NUT-BR1-COMP-28	333	22335	2.7	20.4151	11.1	0.1727	11.3	0.0256	2.2	0.20	162.8	3.6	161.8	17.0	147.1	261.3	162.8	3.6	NA
NUT-BR1-COMP-85	96	5197	2.2	20.6649	32.9	0.1708	33.2	0.0256	4.7	0.14	162.9	7.5	160.1	49.3	118.4	794.6	162.9	7.5	NA

NUT-BR1-COMP-34	121	4900	2.4	19.7912	19.9	0.1787	20.3	0.0257	4.1	0.20	163.3	6.6	167.0	31.3	219.3	464.5	163.3	6.6	NA
NUT-BR1-COMP-1	112	6367	3.2	27.8503	36.4	0.1271	37.7	0.0257	9.9	0.26	163.4	16.0	121.5	43.2	-638.0	1025.3	163.4	16.0	NA
NUT-BR1-COMP-21	156	9538	2.6	21.0418	25.7	0.1683	26.7	0.0257	7.0	0.26	163.5	11.4	158.0	39.1	75.6	620.4	163.5	11.4	NA
NUT-BR1-COMP-2	257	13375	3.3	20.9786	10.4	0.1692	11.7	0.0257	5.3	0.46	163.8	8.6	158.7	17.1	82.8	246.9	163.8	8.6	NA
NUT-BR1-COMP-73	102	3966	2.1	22.3123	37.3	0.1595	38.0	0.0258	7.3	0.19	164.3	11.9	150.3	53.2	-65.5	939.8	164.3	11.9	NA
NUT-BR1-COMP-40	85	13354	2.5	25.5601	31.3	0.1393	32.6	0.0258	9.1	0.28	164.3	14.8	132.4	40.5	-408.5	834.6	164.3	14.8	NA
NUT-BR1-COMP-59	243	17646	1.5	21.2712	8.6	0.1674	9.2	0.0258	3.2	0.35	164.4	5.2	157.2	13.4	49.9	206.2	164.4	5.2	NA
NUT-BR1-COMP-30	464	24752	3.0	20.6574	4.9	0.1725	8.2	0.0258	6.6	0.80	164.5	10.7	161.6	12.3	119.3	115.4	164.5	10.7	NA
NUT-BR1-COMP-12	276	17875	3.4	21.9641	12.7	0.1634	13.4	0.0260	4.3	0.32	165.6	7.0	153.6	19.1	-27.2	308.3	165.6	7.0	NA
NUT-BR1-COMP-38	231	8687	3.1	25.6045	23.7	0.1404	24.5	0.0261	6.4	0.26	165.9	10.4	133.4	30.7	-413.0	626.4	165.9	10.4	NA
NUT-BR1-COMP-5	422	20739	2.3	20.6616	11.1	0.1744	13.0	0.0261	6.7	0.52	166.3	11.0	163.2	19.6	118.8	263.3	166.3	11.0	NA
NUT-BR1-COMP-120	53	752	2.0	15.3000	34.4	0.2357	35.7	0.0262	9.9	0.28	166.4	16.2	214.9	69.3	785.9	742.7	166.4	16.2	NA
NUT-BR1-COMP-13	139	7782	2.2	24.7497	37.2	0.1462	37.6	0.0262	5.5	0.15	167.0	9.0	138.5	48.8	-325.0	984.9	167.0	9.0	NA
NUT-BR1-COMP-109	183	7644	2.1	24.4690	25.5	0.1482	26.0	0.0263	5.2	0.20	167.3	8.5	140.3	34.1	-295.8	660.9	167.3	8.5	NA
NUT-BR1-COMP-24	76	9271	6.1	10.5096	194.1	0.3457	194.2	0.0264	7.3	0.04	167.7	12.1	301.5	556.3	1531.1	466.2	167.7	12.1	11.0
NUT-BR1-COMP-10	584	27027	1.8	20.8814	3.5	0.1741	4.3	0.0264	2.6	0.60	167.8	4.3	163.0	6.5	93.8	82.3	167.8	4.3	NA
NUT-BR1-COMP-17	352	13110	1.8	19.4413	8.8	0.1879	9.7	0.0265	4.1	0.42	168.6	6.8	174.9	15.6	260.5	202.7	168.6	6.8	NA
NUT-BR1-COMP-87	375	11844	2.5	21.0665	12.7	0.1737	13.6	0.0265	4.8	0.36	168.8	8.1	162.6	20.5	72.9	304.1	168.8	8.1	NA
NUT-BR1-COMP-11	254	19784	3.7	18.8349	14.2	0.1954	16.7	0.0267	8.9	0.53	169.8	15.0	181.2	27.8	332.8	322.3	169.8	15.0	NA
NUT-BR1-COMP-58	254	14592	3.4	21.2625	15.5	0.1731	16.7	0.0267	6.2	0.37	169.8	10.4	162.1	25.0	50.8	371.4	169.8	10.4	NA
NUT-BR1-COMP-75	294	5207	3.4	18.7294	6.9	0.1982	8.6	0.0269	5.1	0.59	171.3	8.6	183.6	14.4	345.5	156.2	171.3	8.6	NA
NUT-BR1-COMP-6	371	17336	1.5	21.8201	11.4	0.1702	13.4	0.0269	7.1	0.53	171.3	12.1	159.6	19.9	-11.3	275.8	171.3	12.1	NA
NUT-BR1-COMP-118	238	1453	2.1	16.8869	18.9	0.2220	20.5	0.0272	7.9	0.39	172.9	13.5	203.6	37.9	575.1	415.2	172.9	13.5	NA
NUT-BR1-COMP-119	106	3682	3.2	27.4461	27.6	0.1414	28.9	0.0281	8.6	0.30	178.9	15.2	134.3	36.4	-598.1	762.3	178.9	15.2	NA
NUT-BR1-COMP-4	453	28111	1.7	21.0736	6.4	0.1861	7.7	0.0284	4.3	0.56	180.8	7.7	173.3	12.3	72.1	151.8	180.8	7.7	NA
NUT-BR1-COMP-84	1848	181684	2.4	20.0085	1.8	0.2008	4.5	0.0291	4.2	0.92	185.2	7.6	185.8	7.7	194.0	41.9	185.2	7.6	NA
NUT-BR1-COMP-117	493	44459	0.9	19.4117	3.9	0.3205	4.8	0.0451	2.8	0.58	284.5	7.8	282.3	11.9	263.9	90.2	284.5	7.8	NA
NUT-BR1-COMP-25	309	37293	2.5	18.2940	2.6	0.5301	5.7	0.0703	5.0	0.88	438.2	21.2	431.9	19.9	398.4	59.4	438.2	21.2	NA
NUT-BR1-COMP-105	772	7602	0.9	15.8332	1.3	1.0537	2.3	0.1210	1.9	0.82	736.3	13.0	730.7	11.8	713.6	27.3	736.3	13.0	103.2

Nutzotin Mountains Sequence – 062718CF-02 (FA2)

						Isotope ratios						Apparent ages (Ma)							
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
062718CF-02 (FA2)																			
-062718CF-02 Spot 65	473	13321	2.4	20.3940	1.6	0.1557	2.6	0.0230	2.1	0.78	146.9	3.0	147.0	3.6	148.4	38.4	146.9	3.0	NA
-062718CF-02 Spot 80	56	6450	3.3	21.0034	2.8	0.1516	3.2	0.0231	1.4	0.44	147.2	2.0	143.3	4.2	78.9	67.5	147.2	2.0	NA
-062718CF-02 Spot 264	115	5024	3.0	20.9413	2.6	0.1529	2.9	0.0232	1.4	0.47	148.1	2.0	144.5	3.9	86.0	60.5	148.1	2.0	NA
-062718CF-02 Spot 287	75	1936	3.0	24.3450	2.4	0.1317	2.7	0.0233	1.0	0.39	148.2	1.5	125.6	3.1	NA	NA	148.2	1.5	NA
-062718CF-02 Spot 171	129	6377	3.5	20.9657	1.8	0.1535	2.1	0.0234	0.9	0.46	148.8	1.4	145.0	2.8	83.2	43.4	148.8	1.4	NA
-062718CF-02 Spot 213	311	27124	2.7	20.7700	1.4	0.1554	1.6	0.0234	0.9	0.55	149.2	1.3	146.7	2.2	105.4	32.3	149.2	1.3	NA
-062718CF-02 Spot 76	96	5063	3.1	20.4413	1.9	0.1579	2.2	0.0234	1.2	0.53	149.3	1.7	148.9	3.1	143.0	44.6	149.3	1.7	NA
-062718CF-02 Spot 290	103	25349	3.2	20.3605	1.9	0.1586	2.6	0.0234	1.8	0.69	149.3	2.7	149.5	3.6	152.3	44.4	149.3	2.7	NA
-062718CF-02 Spot 150	130	4332	2.8	21.5182	2.3	0.1502	2.7	0.0235	1.3	0.49	149.4	1.9	142.1	3.5	21.2	55.5	149.4	1.9	NA
-062718CF-02 Spot 275	495	22595	2.8	20.1585	1.2	0.1604	2.0	0.0235	1.5	0.78	149.5	2.3	151.0	2.8	175.6	28.9	149.5	2.3	NA
-062718CF-02 Spot 34	160	13278	4.6	20.4487	2.2	0.1581	2.4	0.0235	1.0	0.43	149.5	1.5	149.1	3.3	142.2	50.9	149.5	1.5	NA
-062718CF-02 Spot 182	574	31789	3.1	18.8671	2.4	0.1715	2.6	0.0235	1.1	0.41	149.6	1.6	160.7	3.9	327.9	53.7	149.6	1.6	NA
-062718CF-02 Spot 82	311	26172	1.4	20.4768	1.2	0.1582	1.6	0.0235	1.1	0.70	149.8	1.7	149.1	2.3	138.9	27.3	149.8	1.7	NA
-062718CF-02 Spot 153	140	13792	3.1	20.0260	1.6	0.1618	1.9	0.0235	1.0	0.53	149.8	1.5	152.3	2.7	191.0	37.2	149.8	1.5	NA
-062718CF-02 Spot 11	179	16529	2.2	20.6518	1.7	0.1569	2.1	0.0235	1.2	0.58	149.8	1.8	148.0	2.9	118.9	40.3	149.8	1.8	NA
-062718CF-02 Spot 223	283	6864	2.2	20.7892	1.4	0.1561	1.7	0.0235	1.1	0.63	150.0	1.6	147.3	2.4	103.3	32.1	150.0	1.6	NA
-062718CF-02 Spot 253	265	6991	3.7	20.7074	1.7	0.1568	2.0	0.0236	1.1	0.54	150.1	1.6	147.9	2.8	112.6	39.6	150.1	1.6	NA
-062718CF-02 Spot 66	356	21269	2.6	20.3204	1.4	0.1600	1.9	0.0236	1.2	0.66	150.3	1.8	150.7	2.6	156.9	32.7	150.3	1.8	NA
-062718CF-02 Spot 180	374	14422	4.1	20.4064	1.1	0.1593	1.3	0.0236	0.8	0.62	150.3	1.2	150.1	1.9	147.0	24.7	150.3	1.2	NA
-062718CF-02 Spot 196	422	52616	3.4	20.0138	1.0	0.1625	1.6	0.0236	1.2	0.76	150.3	1.8	152.9	2.3	192.4	24.0	150.3	1.8	NA
-062718CF-02 Spot 144	124	3758	2.7	21.5643	2.1	0.1509	2.3	0.0236	0.9	0.42	150.5	1.4	142.8	3.0	16.0	49.9	150.5	1.4	NA
-062718CF-02 Spot 7	106	4167	4.2	21.0621	4.3	0.1546	4.5	0.0236	1.3	0.28	150.5	1.9	146.0	6.1	72.3	102.4	150.5	1.9	NA
-062718CF-02 Spot 112	224	10022	3.8	20.8736	1.3	0.1561	1.6	0.0236	0.8	0.52	150.6	1.2	147.2	2.2	93.7	31.9	150.6	1.2	NA
-062718CF-02 Spot 155	166	7931	3.3	21.2016	2.7	0.1537	2.8	0.0236	0.9	0.31	150.6	1.3	145.1	3.8	56.6	63.3	150.6	1.3	NA
-062718CF-02 Spot 20	810	141379	2.4	20.5344	1.0	0.1589	1.5	0.0237	1.2	0.76	150.8	1.7	149.7	2.1	132.3	23.7	150.8	1.7	NA
-062718CF-02 Spot 148	169	13874	2.3	21.5300	1.4	0.1517	1.7	0.0237	1.1	0.60	151.0	1.6	143.4	2.3	19.8	33.4	151.0	1.6	NA
-062718CF-02 Spot 47	151	3516	2.4	22.0601	2.0	0.1481	2.2	0.0237	0.9	0.43	151.1	1.4	140.3	2.8	NA	NA	151.1	1.4	NA
-062718CF-02 Spot 69	177	11353	2.7	20.3435	1.6	0.1607	1.9	0.0237	1.0	0.52	151.1	1.4	151.3	2.6	154.2	37.1	151.1	1.4	NA
-062718CF-02 Spot 4	144	2368	1.9	23.4831	1.9	0.1393	2.4	0.0237	1.4	0.61	151.2	2.1	132.4	2.9	NA	NA	151.2	2.1	NA
-062718CF-02 Spot 100	248	11400	2.1	20.4444	1.1	0.1600	1.5	0.0237	1.1	0.69	151.3	1.6	150.7	2.2	142.7	26.4	151.3	1.6	NA
-062718CF-02 Spot 314	941	96513	3.5	20.2817	0.8	0.1614	1.2	0.0237	0.9	0.76	151.3	1.4	151.9	1.8	161.4	19.1	151.3	1.4	NA
-062718CF-02 Spot 194	1130	131593	3.6	20.1905	0.8	0.1622	1.4	0.0238	1.2	0.82	151.4	1.8	152.6	2.1	171.9	19.4	151.4	1.8	NA
-062718CF-02 Spot 134	212	3798	1.9	21.5507	1.9	0.1520	2.2	0.0238	1.0	0.47	151.4	1.5	143.7	2.9	17.5	46.6	151.4	1.5	NA
-062718CF-02 Spot 274	212	8512	2.1	20.8128	1.4	0.1574	1.8	0.0238	1.1	0.60	151.4	1.6	148.4	2.5	100.6	34.2	151.4	1.6	NA
-062718CF-02 Spot 160	124	10894	2.8	20.1604	1.9	0.1625	2.2	0.0238	1.1	0.51	151.5	1.7	152.9	3.2	175.4	44.7	151.5	1.7	NA
-062718CF-02 Spot 308	237	44850	3.2	20.4107	1.3	0.1606	1.7	0.0238	1.0	0.60	151.5	1.5	151.2	2.3	146.5	31.1	151.5	1.5	NA
-062718CF-02 Spot 64	203	3746	2.2	21.9470	1.4	0.1493	1.7	0.0238	0.9	0.52	151.5	1.3	141.3	2.2	NA	NA	151.5	1.3	NA
-062718CF-02 Spot 56	662	12780	2.4	20.7478	0.8	0.1580	1.4	0.0238	1.2	0.82	151.6	1.7	149.0	2.0	108.0	19.1	151.6	1.7	NA
-062718CF-02 Spot 229	151	9942	3.3	20.8475	1.4	0.1573	1.9	0.0238	1.3	0.69	151.6	2.0	148.3	2.7	96.6	32.8	151.6	2.0	NA
-062718CF-02 Spot 146	668	144153	1.8	20.0367	0.8	0.1637	1.4	0.0238	1.2	0.81	151.6	1.7	153.9	2.0	189.7	19.6	151.6	1.7	NA
-062718CF-02 Spot 224	169	15526	1.6	20.5097	1.6	0.1599	2.0	0.0238	1.2	0.60	151.6	1.8	150.6	2.8	135.2	37.1	151.6	1.8	NA

-062718CF-02 Spot 221	145	34036	2.5	20.2356	2.0	0.1621	2.1	0.0238	0.9	0.40	151.6	1.3	152.6	3.0	166.7	45.8	151.6	1.3	NA
-062718CF-02 Spot 306	161	57712	2.1	18.6804	2.1	0.1756	2.3	0.0238	0.9	0.41	151.7	1.4	164.3	3.5	350.5	47.1	151.7	1.4	NA
-062718CF-02 Spot 217	303	3039445	2.8	19.8303	1.3	0.1655	1.6	0.0238	1.0	0.64	151.7	1.5	155.5	2.3	213.8	29.1	151.7	1.5	NA
-062718CF-02 Spot 277	1252	30756	2.2	20.3140	0.8	0.1616	1.5	0.0238	1.3	0.84	151.7	1.9	152.1	2.2	157.7	19.5	151.7	1.9	NA
-062718CF-02 Spot 271	333	53416	3.1	19.8555	1.2	0.1654	1.6	0.0238	1.1	0.68	151.8	1.7	155.4	2.3	210.8	27.5	151.8	1.7	NA
-062718CF-02 Spot 53	211	14909	2.8	20.4253	1.4	0.1609	1.7	0.0238	0.9	0.54	151.9	1.4	151.5	2.4	144.8	33.5	151.9	1.4	NA
-062718CF-02 Spot 115	186	5736	3.1	21.3920	2.4	0.1536	2.6	0.0238	1.0	0.39	151.9	1.5	145.1	3.5	35.2	57.5	151.9	1.5	NA
-062718CF-02 Spot 72	357	40052	2.7	20.7092	1.2	0.1587	1.6	0.0238	1.0	0.63	151.9	1.5	149.6	2.2	112.4	28.6	151.9	1.5	NA
-062718CF-02 Spot 88	229	52459	1.9	20.5559	1.5	0.1599	1.7	0.0239	0.9	0.50	152.0	1.3	150.6	2.4	129.9	35.0	152.0	1.3	NA
-062718CF-02 Spot 92	442	417314	3.2	19.9634	0.9	0.1647	1.6	0.0239	1.3	0.83	152.0	2.0	154.8	2.3	198.3	20.5	152.0	2.0	NA
-062718CF-02 Spot 99	384	21441	2.2	20.3435	1.0	0.1618	1.5	0.0239	1.1	0.71	152.1	1.6	152.3	2.1	154.2	24.3	152.1	1.6	NA
-062718CF-02 Spot 244	464	22764	1.8	20.2745	1.3	0.1624	1.8	0.0239	1.2	0.66	152.2	1.7	152.8	2.5	162.2	30.9	152.2	1.7	NA
-062718CF-02 Spot 222	69	12622	2.7	20.3025	2.8	0.1622	3.0	0.0239	1.1	0.36	152.2	1.6	152.6	4.2	159.0	65.2	152.2	1.6	NA
-062718CF-02 Spot 15	91	3660	4.0	20.6080	2.1	0.1598	2.3	0.0239	1.1	0.48	152.2	1.7	150.5	3.3	123.9	48.4	152.2	1.7	NA
-062718CF-02 Spot 81	236	13877	2.3	20.8976	1.5	0.1576	1.9	0.0239	1.2	0.62	152.3	1.8	148.6	2.6	90.9	34.9	152.3	1.8	NA
-062718CF-02 Spot 143	394	50329	3.0	20.4352	1.2	0.1612	1.9	0.0239	1.5	0.79	152.3	2.3	151.8	2.7	143.7	27.8	152.3	2.3	NA
-062718CF-02 Spot 273	198	8414	3.5	20.6701	2.3	0.1594	2.5	0.0239	1.0	0.41	152.3	1.5	150.2	3.5	116.8	54.2	152.3	1.5	NA
-062718CF-02 Spot 106	383	10802	3.4	20.5006	1.2	0.1608	1.8	0.0239	1.3	0.72	152.4	1.9	151.4	2.5	136.2	29.1	152.4	1.9	NA
-062718CF-02 Spot 63	182	3790	2.9	21.5437	3.0	0.1531	3.2	0.0239	1.0	0.33	152.4	1.6	144.6	4.3	18.3	71.8	152.4	1.6	NA
-062718CF-02 Spot 17	158	7544	2.0	20.3709	1.9	0.1619	2.1	0.0239	0.8	0.38	152.4	1.2	152.3	3.0	151.1	45.2	152.4	1.2	NA
-062718CF-02 Spot 107	325	143528	3.5	19.9408	1.2	0.1654	1.7	0.0239	1.2	0.69	152.4	1.7	155.4	2.4	200.9	28.0	152.4	1.7	NA
-062718CF-02 Spot 129	189	5906	2.8	20.6643	1.5	0.1596	1.8	0.0239	0.9	0.51	152.5	1.4	150.4	2.5	117.5	36.0	152.5	1.4	NA
-062718CF-02 Spot 243	127	4214	2.1	21.4522	2.4	0.1538	2.6	0.0239	1.0	0.39	152.5	1.5	145.3	3.5	28.5	56.6	152.5	1.5	NA
-062718CF-02 Spot 158	146	5592	2.8	21.3745	3.3	0.1544	3.5	0.0239	1.1	0.32	152.5	1.6	145.8	4.7	37.2	78.4	152.5	1.6	NA
-062718CF-02 Spot 139	109	14314	3.1	21.0132	2.1	0.1571	2.3	0.0239	1.1	0.47	152.6	1.6	148.1	3.2	77.8	48.9	152.6	1.6	NA
-062718CF-02 Spot 228	93	11268	3.6	20.3892	1.9	0.1619	2.1	0.0239	0.9	0.44	152.6	1.4	152.3	2.9	149.0	43.7	152.6	1.4	NA
-062718CF-02 Spot 283	622	25024	2.8	20.1345	0.9	0.1639	1.4	0.0239	1.1	0.80	152.6	1.7	154.1	2.0	178.4	20.1	152.6	1.7	NA
-062718CF-02 Spot 168	261	7816	4.4	21.1356	1.5	0.1562	1.8	0.0240	1.1	0.58	152.6	1.6	147.4	2.5	64.0	35.8	152.6	1.6	NA
-062718CF-02 Spot 6	705	24582	2.6	19.8120	1.3	0.1667	1.9	0.0240	1.4	0.73	152.7	2.0	156.6	2.7	215.9	29.7	152.7	2.0	NA
-062718CF-02 Spot 219	293	6243	2.2	21.0313	1.1	0.1571	1.4	0.0240	0.9	0.65	152.7	1.4	148.2	2.0	75.8	25.9	152.7	1.4	NA
-062718CF-02 Spot 187	327	15299	1.9	20.3952	1.5	0.1620	1.9	0.0240	1.1	0.56	152.7	1.6	152.5	2.7	148.3	36.3	152.7	1.6	NA
-062718CF-02 Spot 247	158	18374	2.3	20.0604	1.8	0.1647	2.1	0.0240	1.0	0.48	152.7	1.5	154.8	3.0	186.9	42.4	152.7	1.5	NA
-062718CF-02 Spot 181	100	5957	3.3	20.7678	2.4	0.1591	2.7	0.0240	1.3	0.46	152.8	1.9	149.9	3.8	105.7	57.5	152.8	1.9	NA
-062718CF-02 Spot 199	369	10457	3.3	20.7408	1.8	0.1594	2.0	0.0240	0.9	0.45	152.8	1.4	150.1	2.8	108.7	42.2	152.8	1.4	NA
-062718CF-02 Spot 208	171	63290	2.3	20.0733	1.5	0.1647	1.8	0.0240	1.0	0.56	152.8	1.5	154.8	2.6	185.4	35.5	152.8	1.5	NA
-062718CF-02 Spot 77	192	5520	3.2	21.2448	1.6	0.1556	1.9	0.0240	1.1	0.58	152.8	1.7	146.8	2.6	51.8	37.1	152.8	1.7	NA
-062718CF-02 Spot 124	366	19245	1.9	20.2552	1.1	0.1632	1.5	0.0240	0.9	0.63	152.8	1.4	153.5	2.1	164.4	26.6	152.8	1.4	NA
-062718CF-02 Spot 5	820	97908	2.9	19.8204	1.0	0.1668	1.5	0.0240	1.2	0.76	152.8	1.8	156.6	2.2	214.9	23.4	152.8	1.8	NA
-062718CF-02 Spot 245	125	2988	2.7	21.7238	3.2	0.1522	3.3	0.0240	1.0	0.31	152.9	1.6	143.9	4.5	NA	NA	152.9	1.6	NA
-062718CF-02 Spot 197	239	24879	3.2	20.0141	1.7	0.1652	2.1	0.0240	1.1	0.56	152.9	1.7	155.3	3.0	192.4	39.6	152.9	1.7	NA
-062718CF-02 Spot 303	116	12823	3.3	20.4779	1.7	0.1616	2.1	0.0240	1.2	0.57	152.9	1.8	152.1	2.9	138.8	40.1	152.9	1.8	NA
-062718CF-02 Spot 42	158	7140	3.2	20.6851	2.1	0.1600	2.3	0.0240	0.9	0.41	153.0	1.4	150.7	3.2	115.1	49.0	153.0	1.4	NA
-062718CF-02 Spot 2	453	24102	2.1	20.5168	1.1	0.1614	1.8	0.0240	1.4	0.78	153.0	2.1	151.9	2.5	134.3	26.0	153.0	2.1	NA
-062718CF-02 Spot 178	608	20929	3.2	20.5440	0.9	0.1612	1.6	0.0240	1.3	0.82	153.0	2.0	151.7	2.3	131.2	21.9	153.0	2.0	NA
-062718CF-02 Spot 156	85	10053	3.2	20.3581	2.3	0.1627	2.5	0.0240	0.9	0.37	153.1	1.4	153.0	3.5	152.6	53.9	153.1	1.4	NA
-062718CF-02 Spot 204	121	24369	4.3	19.2314	2.2	0.1722	2.4	0.0240	1.0	0.41	153.1	1.5	161.4	3.6	284.3	51.0	153.1	1.5	NA
-062718CF-02 Spot 162	596	32862	3.1	20.2588	1.0	0.1635	1.6	0.0240	1.3	0.80	153.1	2.0	153.8	2.3	164.0	22.9	153.1	2.0	NA

-062718CF-02 Spot 198	407	15154	2.4	20.0676	1.1	0.1652	1.6	0.0241	1.1	0.70	153.2	1.6	155.2	2.2	186.1	26.1	153.2	1.6	NA
-062718CF-02 Spot 192	899	30549	4.2	20.3974	0.8	0.1625	1.5	0.0241	1.3	0.84	153.2	1.9	152.9	2.2	148.1	19.4	153.2	1.9	NA
-062718CF-02 Spot 215	227	14794	3.3	20.5467	1.7	0.1614	1.9	0.0241	0.9	0.46	153.2	1.3	151.9	2.6	130.9	39.2	153.2	1.3	NA
-062718CF-02 Spot 195	545	12630	3.0	20.8836	1.0	0.1588	1.7	0.0241	1.4	0.80	153.2	2.1	149.6	2.4	92.5	24.5	153.2	2.1	NA
-062718CF-02 Spot 220	618	23498	3.6	20.3037	0.9	0.1633	1.4	0.0241	1.0	0.75	153.3	1.6	153.6	1.9	158.9	20.8	153.3	1.6	NA
-062718CF-02 Spot 8	341	14752	2.4	20.3774	1.3	0.1628	1.7	0.0241	1.0	0.61	153.4	1.5	153.2	2.3	150.3	30.8	153.4	1.5	NA
-062718CF-02 Spot 111	510	202685	2.6	20.0014	0.9	0.1659	1.4	0.0241	1.0	0.74	153.4	1.6	155.9	2.0	193.8	21.4	153.4	1.6	NA
-062718CF-02 Spot 278	788	94180	3.9	20.1934	0.7	0.1644	1.4	0.0241	1.2	0.86	153.4	1.9	154.5	2.0	171.5	16.9	153.4	1.9	NA
-062718CF-02 Spot 173	408	22781	2.4	20.1764	1.0	0.1646	1.4	0.0241	1.0	0.71	153.5	1.6	154.7	2.1	173.5	23.5	153.5	1.6	NA
-062718CF-02 Spot 291	256	40326	4.4	19.8950	1.3	0.1670	1.6	0.0241	0.9	0.55	153.5	1.3	156.8	2.3	206.2	31.0	153.5	1.3	NA
-062718CF-02 Spot 122	202	29191	2.2	20.2230	1.6	0.1643	1.9	0.0241	1.1	0.54	153.6	1.6	154.5	2.8	168.1	38.2	153.6	1.6	NA
-062718CF-02 Spot 203	235	7377	2.2	20.7441	1.4	0.1602	1.7	0.0241	1.0	0.55	153.6	1.4	150.9	2.4	108.4	34.1	153.6	1.4	NA
-062718CF-02 Spot 39	376	18585	2.7	20.4309	1.3	0.1627	1.5	0.0241	0.7	0.50	153.6	1.1	153.1	2.1	144.2	30.5	153.6	1.1	NA
-062718CF-02 Spot 256	210	9891	3.5	20.3399	1.8	0.1635	2.0	0.0241	1.0	0.50	153.7	1.6	153.7	2.9	154.7	41.4	153.7	1.6	NA
-062718CF-02 Spot 135	87	37804	2.8	20.4552	2.3	0.1626	2.6	0.0241	1.1	0.43	153.7	1.7	152.9	3.6	141.4	54.3	153.7	1.7	NA
-062718CF-02 Spot 255	103	4711	3.2	20.8008	1.9	0.1599	2.2	0.0241	1.1	0.49	153.7	1.6	150.6	3.1	101.9	45.6	153.7	1.6	NA
-062718CF-02 Spot 154	263	15179	4.2	20.4717	1.4	0.1625	1.7	0.0241	0.9	0.52	153.7	1.3	152.9	2.4	139.5	33.9	153.7	1.3	NA
-062718CF-02 Spot 238	183	20070	2.1	20.5166	1.4	0.1621	1.6	0.0241	0.9	0.56	153.7	1.4	152.6	2.3	134.3	32.1	153.7	1.4	NA
-062718CF-02 Spot 37	205	39314	2.2	15.9954	3.6	0.2080	3.7	0.0241	0.9	0.23	153.8	1.3	191.9	6.4	691.0	75.8	153.8	1.3	NA
-062718CF-02 Spot 54	303	6148	2.2	21.2794	1.3	0.1563	1.5	0.0241	0.8	0.50	153.8	1.1	147.5	2.1	47.8	31.0	153.8	1.1	NA
-062718CF-02 Spot 299	464	33261	3.9	20.4456	1.1	0.1627	1.5	0.0241	1.0	0.67	153.8	1.5	153.1	2.1	142.5	26.2	153.8	1.5	NA
-062718CF-02 Spot 176	628	21831	3.8	20.1424	0.9	0.1652	1.3	0.0241	0.9	0.70	153.8	1.4	155.2	1.9	177.4	22.0	153.8	1.4	NA
-062718CF-02 Spot 59	242	27519	2.4	20.6518	1.5	0.1612	1.8	0.0241	0.9	0.48	153.8	1.3	151.7	2.5	118.9	36.2	153.8	1.3	NA
-062718CF-02 Spot 313	403	699134	2.6	20.1019	1.3	0.1656	1.8	0.0242	1.3	0.70	153.8	1.9	155.6	2.6	182.1	30.2	153.8	1.9	NA
-062718CF-02 Spot 226	178	35061	3.7	20.6493	1.4	0.1612	1.7	0.0242	0.9	0.52	153.8	1.3	151.8	2.3	119.2	33.3	153.8	1.3	NA
-062718CF-02 Spot 159	259	29087	3.0	20.4248	1.3	0.1631	1.7	0.0242	1.0	0.59	153.9	1.5	153.4	2.4	144.9	31.6	153.9	1.5	NA
-062718CF-02 Spot 174	127	17220	3.7	19.9646	1.7	0.1668	2.0	0.0242	0.9	0.47	153.9	1.4	156.7	2.9	198.1	40.3	153.9	1.4	NA
-062718CF-02 Spot 249	100	9217	2.7	20.8938	2.1	0.1594	2.4	0.0242	1.1	0.46	154.0	1.7	150.2	3.3	91.4	49.8	154.0	1.7	NA
-062718CF-02 Spot 10	668	55187	3.4	20.2129	1.0	0.1648	1.5	0.0242	1.2	0.78	154.0	1.8	154.9	2.2	169.3	22.8	154.0	1.8	NA
-062718CF-02 Spot 152	121	25938	1.9	20.0921	1.8	0.1659	2.0	0.0242	0.9	0.43	154.0	1.3	155.8	2.9	183.3	42.7	154.0	1.3	NA
-062718CF-02 Spot 281	212	1878417	2.6	20.1126	1.5	0.1658	1.8	0.0242	1.1	0.62	154.1	1.7	155.7	2.7	180.9	33.9	154.1	1.7	NA
-062718CF-02 Spot 71	133	5586	2.7	22.0256	2.1	0.1514	2.3	0.0242	0.9	0.40	154.1	1.4	143.2	3.1	NA	NA	154.1	1.4	NA
-062718CF-02 Spot 169	442	18994	3.0	20.5595	1.0	0.1622	1.5	0.0242	1.1	0.74	154.1	1.7	152.6	2.1	129.5	23.2	154.1	1.7	NA
-062718CF-02 Spot 30	214	180377	2.3	19.9772	1.5	0.1670	1.8	0.0242	1.0	0.54	154.1	1.5	156.8	2.6	196.6	35.5	154.1	1.5	NA
-062718CF-02 Spot 101	1270	2102416	3.1	20.4358	0.7	0.1632	1.2	0.0242	0.9	0.78	154.1	1.4	153.5	1.7	143.6	17.6	154.1	1.4	NA
-062718CF-02 Spot 127	578	33448	2.7	20.1327	1.1	0.1657	1.6	0.0242	1.2	0.72	154.2	1.8	155.7	2.4	178.6	26.3	154.2	1.8	NA
-062718CF-02 Spot 183	96	9697	2.4	19.8647	1.8	0.1680	2.0	0.0242	0.9	0.43	154.2	1.3	157.6	3.0	209.8	42.5	154.2	1.3	NA
-062718CF-02 Spot 285	137	3496	3.1	21.8166	1.9	0.1530	2.1	0.0242	0.8	0.38	154.2	1.2	144.5	2.8	NA	NA	154.2	1.2	NA
-062718CF-02 Spot 163	97	14123	3.8	20.5687	2.0	0.1623	2.3	0.0242	1.0	0.44	154.3	1.5	152.7	3.2	128.4	47.8	154.3	1.5	NA
-062718CF-02 Spot 177	1173	37391	1.8	20.3455	0.7	0.1641	1.4	0.0242	1.2	0.86	154.3	1.8	154.3	2.0	154.0	16.6	154.3	1.8	NA
-062718CF-02 Spot 200	332	13844	1.6	20.7562	1.1	0.1609	1.6	0.0242	1.2	0.74	154.3	1.8	151.5	2.2	107.0	25.1	154.3	1.8	NA
-062718CF-02 Spot 170	438	150214	3.2	20.1183	0.8	0.1660	1.6	0.0242	1.4	0.87	154.4	2.2	155.9	2.4	180.2	18.9	154.4	2.2	NA
-062718CF-02 Spot 116	230	28569	2.0	20.1102	1.2	0.1661	1.6	0.0242	1.0	0.64	154.4	1.6	156.0	2.3	181.2	29.1	154.4	1.6	NA
-062718CF-02 Spot 191	188	5417	3.7	21.0341	3.0	0.1588	3.2	0.0242	1.0	0.30	154.4	1.4	149.7	4.4	75.5	72.3	154.4	1.4	NA
-062718CF-02 Spot 207	432	32350	1.5	16.2908	5.0	0.2052	5.3	0.0242	1.8	0.34	154.5	2.7	189.5	9.2	651.8	107.3	154.5	2.7	NA
-062718CF-02 Spot 257	243	86237	2.0	20.3055	1.4	0.1646	1.7	0.0243	1.0	0.57	154.5	1.5	154.7	2.5	158.6	33.4	154.5	1.5	NA
-062718CF-02 Spot 41	233	19875	2.0	20.0632	1.3	0.1666	1.6	0.0243	0.9	0.57	154.5	1.4	156.5	2.3	186.6	31.1	154.5	1.4	NA

-062718CF-02 Spot 93	287	27534	2.1	20.3228	1.4	0.1645	1.7	0.0243	0.9	0.55	154.5	1.4	154.7	2.4	156.6	33.0	154.5	1.4	NA
-062718CF-02 Spot 137	1058	35346	3.0	20.3242	0.7	0.1645	1.4	0.0243	1.2	0.88	154.5	1.9	154.7	2.0	156.5	15.6	154.5	1.9	NA
-062718CF-02 Spot 140	125	10043	2.8	21.2449	1.8	0.1574	2.0	0.0243	0.9	0.46	154.6	1.4	148.4	2.8	51.8	43.1	154.6	1.4	NA
-062718CF-02 Spot 172	334	53153	2.8	20.3154	1.1	0.1646	1.6	0.0243	1.1	0.71	154.6	1.7	154.7	2.2	157.5	25.8	154.6	1.7	NA
-062718CF-02 Spot 110	400	18866	3.5	20.0526	1.1	0.1668	2.0	0.0243	1.7	0.85	154.6	2.6	156.6	2.9	187.8	24.8	154.6	2.6	NA
-062718CF-02 Spot 263	384	231104	3.3	20.0077	1.0	0.1672	1.3	0.0243	0.9	0.70	154.6	1.4	157.0	1.9	193.1	22.3	154.6	1.4	NA
-062718CF-02 Spot 68	674	54994	3.9	20.2748	0.9	0.1651	1.4	0.0243	1.1	0.79	154.7	1.7	155.1	2.1	162.1	20.6	154.7	1.7	NA
-062718CF-02 Spot 9	292	14613	2.1	20.2663	1.5	0.1652	1.8	0.0243	0.9	0.51	154.7	1.4	155.2	2.6	163.1	36.2	154.7	1.4	NA
-062718CF-02 Spot 175	216	26943	2.0	20.1822	1.3	0.1659	1.7	0.0243	1.0	0.63	154.7	1.6	155.9	2.4	172.8	30.4	154.7	1.6	NA
-062718CF-02 Spot 298	782	137645	2.4	20.1750	0.8	0.1660	1.6	0.0243	1.4	0.86	154.8	2.2	155.9	2.4	173.7	19.6	154.8	2.2	NA
-062718CF-02 Spot 142	211	30404	3.0	19.8807	1.6	0.1685	1.9	0.0243	1.0	0.51	154.8	1.5	158.1	2.8	207.9	37.9	154.8	1.5	NA
-062718CF-02 Spot 67	108	40004	3.2	20.7048	2.1	0.1618	2.3	0.0243	0.9	0.40	154.8	1.4	152.3	3.3	112.9	50.3	154.8	1.4	NA
-062718CF-02 Spot 307	370	65354	4.0	19.9934	1.1	0.1676	1.3	0.0243	0.8	0.60	154.9	1.2	157.3	1.9	194.8	24.5	154.9	1.2	NA
-062718CF-02 Spot 258	260	175918	2.1	20.0159	1.4	0.1674	1.7	0.0243	1.0	0.59	154.9	1.6	157.2	2.5	192.2	32.6	154.9	1.6	NA
-062718CF-02 Spot 58	259	11136	3.4	19.4182	1.8	0.1726	2.2	0.0243	1.3	0.58	154.9	1.9	161.7	3.3	262.2	40.8	154.9	1.9	NA
-062718CF-02 Spot 25	184	20518	3.5	19.6351	1.8	0.1708	2.1	0.0243	1.2	0.57	155.0	1.9	160.1	3.2	236.6	40.5	155.0	1.9	NA
-062718CF-02 Spot 78	111	511678	2.0	20.4512	1.8	0.1640	2.2	0.0243	1.3	0.59	155.0	2.0	154.2	3.2	141.9	42.6	155.0	2.0	NA
-062718CF-02 Spot 48	240	11258	3.3	17.9269	2.1	0.1871	2.3	0.0243	1.0	0.44	155.0	1.6	174.2	3.7	442.7	46.8	155.0	1.6	NA
-062718CF-02 Spot 289	281	106344	2.7	20.3345	1.1	0.1650	1.4	0.0243	0.9	0.66	155.0	1.5	155.0	2.1	155.3	25.4	155.0	1.5	NA
-062718CF-02 Spot 282	100	3614	3.3	21.1701	1.8	0.1585	2.1	0.0244	1.2	0.56	155.1	1.8	149.4	2.9	60.2	41.8	155.1	1.8	NA
-062718CF-02 Spot 242	432	39692	2.7	20.1985	0.9	0.1662	1.5	0.0244	1.2	0.80	155.1	1.9	156.1	2.2	171.0	21.5	155.1	1.9	NA
-062718CF-02 Spot 227	247	10496	2.1	20.5475	1.5	0.1634	1.8	0.0244	1.0	0.56	155.1	1.6	153.6	2.6	130.9	35.3	155.1	1.6	NA
-062718CF-02 Spot 61	79	27789	3.7	20.0677	1.8	0.1673	2.3	0.0244	1.3	0.59	155.2	2.0	157.1	3.3	186.1	42.3	155.2	2.0	NA
-062718CF-02 Spot 305	407	7842	3.3	21.0002	1.7	0.1599	2.1	0.0244	1.3	0.62	155.2	2.0	150.6	3.0	79.3	39.8	155.2	2.0	NA
-062718CF-02 Spot 75	660	63310	3.6	20.4606	0.9	0.1641	1.5	0.0244	1.2	0.81	155.2	1.9	154.3	2.2	140.8	21.2	155.2	1.9	NA
-062718CF-02 Spot 91	127	4649	3.1	21.3000	1.9	0.1577	2.1	0.0244	1.0	0.47	155.2	1.5	148.7	2.9	45.6	44.9	155.2	1.5	NA
-062718CF-02 Spot 205	1478	111102	3.3	20.3584	0.7	0.1650	1.4	0.0244	1.2	0.86	155.2	1.8	155.0	2.0	152.5	16.4	155.2	1.8	NA
-062718CF-02 Spot 52	231	7026	2.2	20.8915	2.4	0.1608	2.6	0.0244	0.9	0.34	155.3	1.3	151.4	3.6	91.6	57.0	155.3	1.3	NA
-062718CF-02 Spot 268	171	26550	3.5	20.5936	1.8	0.1632	2.1	0.0244	1.0	0.46	155.3	1.5	153.5	2.9	125.5	43.2	155.3	1.5	NA
-062718CF-02 Spot 90	321	6621	2.5	21.1548	1.2	0.1590	1.7	0.0244	1.2	0.73	155.4	1.9	149.8	2.4	61.9	27.7	155.4	1.9	NA
-062718CF-02 Spot 55	575	43079	1.9	20.5912	1.0	0.1634	1.7	0.0244	1.3	0.80	155.5	2.0	153.7	2.4	125.8	23.8	155.5	2.0	NA
-062718CF-02 Spot 96	228	10164	2.4	19.8149	2.2	0.1698	2.4	0.0244	1.0	0.41	155.5	1.5	159.3	3.5	215.6	50.5	155.5	1.5	NA
-062718CF-02 Spot 234	359	36459	2.3	20.5264	1.4	0.1640	1.7	0.0244	1.0	0.58	155.5	1.5	154.2	2.5	133.3	33.2	155.5	1.5	NA
-062718CF-02 Spot 297	144	5285	2.6	21.5958	1.9	0.1559	2.0	0.0244	0.8	0.38	155.6	1.2	147.1	2.8	12.5	45.5	155.6	1.2	NA
-062718CF-02 Spot 3	1026	43816	3.0	20.0357	0.9	0.1681	1.4	0.0244	1.1	0.78	155.6	1.6	157.7	2.0	189.9	20.1	155.6	1.6	NA
-062718CF-02 Spot 62	312	31805	3.4	20.6274	1.4	0.1633	1.7	0.0244	1.0	0.60	155.6	1.6	153.5	2.4	121.7	31.9	155.6	1.6	NA
-062718CF-02 Spot 32	475	58185	2.3	20.1329	0.9	0.1673	1.6	0.0244	1.3	0.81	155.6	2.0	157.0	2.3	178.5	22.0	155.6	2.0	NA
-062718CF-02 Spot 151	246	12459	3.5	20.3544	1.6	0.1654	1.8	0.0244	0.9	0.49	155.6	1.3	155.5	2.6	153.0	36.4	155.6	1.3	NA
-062718CF-02 Spot 261	217	6625	2.3	21.2577	1.6	0.1584	1.9	0.0244	1.0	0.55	155.6	1.6	149.3	2.6	50.3	37.2	155.6	1.6	NA
-062718CF-02 Spot 311	331	181809	3.5	19.9705	1.3	0.1687	1.6	0.0244	0.9	0.58	155.7	1.4	158.3	2.4	197.4	30.6	155.7	1.4	NA
-062718CF-02 Spot 239	231	22594	2.0	19.7716	1.5	0.1704	1.8	0.0245	1.0	0.54	155.7	1.5	159.8	2.6	220.6	34.4	155.7	1.5	NA
-062718CF-02 Spot 102	282	23643	2.4	20.6765	1.2	0.1630	1.6	0.0245	1.1	0.68	155.7	1.7	153.3	2.3	116.1	27.5	155.7	1.7	NA
-062718CF-02 Spot 128	252	7967	2.3	20.8196	2.4	0.1619	2.6	0.0245	0.9	0.35	155.7	1.4	152.4	3.7	99.8	57.6	155.7	1.4	NA
-062718CF-02 Spot 241	542	10484	3.7	20.5921	1.5	0.1637	1.9	0.0245	1.2	0.64	155.8	1.9	153.9	2.7	125.7	34.6	155.8	1.9	NA
-062718CF-02 Spot 29	132	14671	5.1	20.5644	1.8	0.1639	2.1	0.0245	1.1	0.52	155.8	1.7	154.1	3.1	128.9	43.1	155.8	1.7	NA
-062718CF-02 Spot 240	262	138978	4.4	19.7437	1.0	0.1708	1.5	0.0245	1.2	0.75	155.8	1.8	160.1	2.3	223.9	23.3	155.8	1.8	NA
-062718CF-02 Spot 145	401	26882	3.1	20.0855	1.3	0.1680	1.6	0.0245	0.8	0.51	155.9	1.2	157.6	2.3	184.0	31.3	155.9	1.2	NA

-062718CF-02 Spot 266	1873	77276	2.8	20.1990	0.8	0.1670	1.5	0.0245	1.2	0.82	155.9	1.9	156.8	2.2	170.9	19.8	155.9	1.9	NA
-062718CF-02 Spot 293	233	73721	4.9	19.8609	0.9	0.1699	1.4	0.0245	1.1	0.76	155.9	1.7	159.3	2.1	210.2	21.3	155.9	1.7	NA
-062718CF-02 Spot 214	160	5633	2.7	21.3235	1.4	0.1583	1.8	0.0245	1.2	0.66	155.9	1.9	149.2	2.5	42.9	32.5	155.9	1.9	NA
-062718CF-02 Spot 22	216	8077	2.3	20.9723	1.7	0.1609	2.0	0.0245	1.0	0.52	156.0	1.6	151.5	2.8	82.5	40.9	156.0	1.6	NA
-062718CF-02 Spot 97	177	7554	2.2	20.6741	2.4	0.1633	2.5	0.0245	0.9	0.35	156.0	1.4	153.6	3.6	116.4	56.1	156.0	1.4	NA
-062718CF-02 Spot 108	166	4676	2.4	20.0721	1.9	0.1682	2.2	0.0245	1.1	0.48	156.0	1.6	157.8	3.2	185.6	44.7	156.0	1.6	NA
-062718CF-02 Spot 218	189	9739	3.0	20.2437	1.7	0.1668	2.0	0.0245	1.2	0.57	156.0	1.8	156.6	3.0	165.7	39.3	156.0	1.8	NA
-062718CF-02 Spot 186	595	69382	4.9	19.9953	1.1	0.1689	1.7	0.0245	1.3	0.74	156.1	1.9	158.5	2.5	194.5	26.4	156.1	1.9	NA
-062718CF-02 Spot 211	597	25917	4.2	20.2081	1.0	0.1671	1.4	0.0245	1.0	0.71	156.1	1.6	156.9	2.1	169.8	23.7	156.1	1.6	NA
-062718CF-02 Spot 98	139	131921	2.8	18.9002	1.7	0.1788	2.0	0.0245	1.0	0.52	156.1	1.6	167.0	3.0	323.9	38.1	156.1	1.6	NA
-062718CF-02 Spot 79	168	6678	2.0	21.2309	1.5	0.1592	1.9	0.0245	1.2	0.64	156.1	1.9	150.0	2.7	53.3	35.0	156.1	1.9	NA
-062718CF-02 Spot 216	470	238726	2.4	20.2649	0.8	0.1668	1.4	0.0245	1.1	0.81	156.2	1.8	156.6	2.0	163.3	19.0	156.2	1.8	NA
-062718CF-02 Spot 296	344	21146	2.9	19.9892	1.3	0.1692	1.6	0.0245	0.9	0.58	156.3	1.4	158.7	2.3	195.3	29.7	156.3	1.4	NA
-062718CF-02 Spot 302	208	6302	1.9	20.8165	1.3	0.1625	1.6	0.0245	0.9	0.57	156.3	1.4	152.9	2.3	100.1	31.3	156.3	1.4	NA
-062718CF-02 Spot 254	148	32725	2.7	20.1881	1.5	0.1676	1.8	0.0245	1.0	0.57	156.3	1.6	157.3	2.6	172.2	34.1	156.3	1.6	NA
-062718CF-02 Spot 252	149	69477	2.4	19.7764	1.8	0.1711	2.2	0.0246	1.3	0.56	156.4	1.9	160.4	3.3	220.0	42.8	156.4	1.9	NA
-062718CF-02 Spot 295	282	22579	2.5	20.6686	1.4	0.1638	1.7	0.0246	1.0	0.57	156.4	1.5	154.0	2.4	117.0	32.3	156.4	1.5	NA
-062718CF-02 Spot 33	137	4559	2.9	21.4386	1.7	0.1579	2.0	0.0246	1.2	0.59	156.5	1.8	148.9	2.8	30.0	39.5	156.5	1.8	NA
-062718CF-02 Spot 16	146	10826	3.2	21.0519	1.5	0.1610	1.9	0.0246	1.1	0.59	156.7	1.7	151.6	2.6	73.5	35.5	156.7	1.7	NA
-062718CF-02 Spot 103	465	93893	2.9	19.7622	1.7	0.1716	2.3	0.0246	1.5	0.66	156.7	2.4	160.8	3.4	221.7	40.5	156.7	2.4	NA
-062718CF-02 Spot 1	810	69885	1.8	20.0669	1.0	0.1690	1.8	0.0246	1.5	0.82	156.7	2.3	158.6	2.6	186.2	23.7	156.7	2.3	NA
-062718CF-02 Spot 83	499	2891535	5.2	19.7750	1.2	0.1715	1.7	0.0246	1.2	0.69	156.7	1.8	160.8	2.5	220.2	28.5	156.7	1.8	NA
-062718CF-02 Spot 233	447	19836	3.3	20.0007	1.3	0.1697	1.9	0.0246	1.4	0.73	156.8	2.1	159.1	2.7	193.9	29.6	156.8	2.1	NA
-062718CF-02 Spot 138	341	15914	2.1	20.4173	1.1	0.1663	1.4	0.0246	0.9	0.60	156.9	1.3	156.2	2.1	145.8	26.6	156.9	1.3	NA
-062718CF-02 Spot 161	115	8105	3.4	21.2835	1.7	0.1595	2.0	0.0246	1.0	0.51	156.9	1.6	150.3	2.8	47.4	41.3	156.9	1.6	NA
-062718CF-02 Spot 270	431	12512	3.5	20.5500	1.2	0.1653	1.8	0.0246	1.3	0.73	156.9	2.0	155.3	2.5	130.5	28.6	156.9	2.0	NA
-062718CF-02 Spot 118	324	5396523	4.2	20.7469	1.0	0.1639	1.6	0.0247	1.3	0.78	157.1	1.9	154.1	2.3	108.1	23.7	157.1	1.9	NA
-062718CF-02 Spot 104	328	90121	2.7	19.8738	1.6	0.1712	1.9	0.0247	1.1	0.57	157.2	1.7	160.5	2.9	208.7	37.0	157.2	1.7	NA
-062718CF-02 Spot 166	704	954955	3.5	19.8956	0.9	0.1711	1.5	0.0247	1.1	0.76	157.2	1.7	160.3	2.2	206.1	21.9	157.2	1.7	NA
-062718CF-02 Spot 269	274	37754	1.9	15.4453	1.9	0.2203	2.1	0.0247	0.8	0.40	157.2	1.3	202.2	3.8	765.1	40.4	157.2	1.3	NA
-062718CF-02 Spot 44	404	18574	2.6	20.5345	1.3	0.1657	1.7	0.0247	1.1	0.63	157.3	1.7	155.7	2.4	132.3	30.9	157.3	1.7	NA
-062718CF-02 Spot 272	351	12668	3.7	19.1883	2.0	0.1774	2.3	0.0247	1.0	0.45	157.3	1.6	165.9	3.5	289.5	46.1	157.3	1.6	NA
-062718CF-02 Spot 117	554	88310	3.2	20.3540	1.1	0.1673	1.7	0.0247	1.3	0.76	157.3	1.9	157.1	2.4	153.0	25.2	157.3	1.9	NA
-062718CF-02 Spot 265	134	6169	3.0	20.6454	1.6	0.1650	2.0	0.0247	1.2	0.59	157.4	1.9	155.1	2.9	119.6	38.8	157.4	1.9	NA
-062718CF-02 Spot 13	465	67761	4.3	20.3262	1.1	0.1676	1.8	0.0247	1.5	0.81	157.4	2.3	157.4	2.6	156.3	24.9	157.4	2.3	NA
-062718CF-02 Spot 184	119	16738	2.6	20.3334	2.0	0.1678	2.2	0.0248	0.9	0.43	157.7	1.5	157.5	3.2	155.4	46.5	157.7	1.5	NA
-062718CF-02 Spot 188	267	11339	2.6	20.8526	1.3	0.1637	1.6	0.0248	1.0	0.58	157.7	1.5	154.0	2.3	96.1	31.7	157.7	1.5	NA
-062718CF-02 Spot 310	281	5287	2.7	21.2285	1.3	0.1608	1.5	0.0248	0.7	0.49	157.8	1.1	151.4	2.1	53.6	31.1	157.8	1.1	NA
-062718CF-02 Spot 24	173	3581	3.6	22.3251	1.6	0.1530	1.9	0.0248	1.1	0.59	157.8	1.8	144.5	2.6	NA	NA	157.8	1.8	NA
-062718CF-02 Spot 126	189	40168	2.2	19.9821	1.4	0.1710	1.8	0.0248	1.1	0.63	157.9	1.7	160.3	2.6	196.1	31.6	157.9	1.7	NA
-062718CF-02 Spot 164	244	17604	2.3	20.4201	1.2	0.1674	1.6	0.0248	1.1	0.69	158.0	1.7	157.2	2.3	145.5	27.2	158.0	1.7	NA
-062718CF-02 Spot 304	201	10863	4.0	20.8368	1.4	0.1642	1.7	0.0248	1.0	0.59	158.1	1.6	154.3	2.5	97.9	33.2	158.1	1.6	NA
-062718CF-02 Spot 312	343	16866	2.7	20.6469	1.4	0.1657	1.7	0.0248	1.0	0.56	158.1	1.5	155.7	2.5	119.5	33.2	158.1	1.5	NA
-062718CF-02 Spot 18	225	7434	2.2	21.2890	2.6	0.1608	2.8	0.0248	1.1	0.39	158.2	1.7	151.4	3.9	46.8	61.6	158.2	1.7	NA
-062718CF-02 Spot 236	198	18633	3.1	20.5776	1.2	0.1666	1.6	0.0249	1.1	0.67	158.4	1.7	156.5	2.4	127.4	28.6	158.4	1.7	NA
-062718CF-02 Spot 230	326	23016	3.6	20.5862	1.3	0.1666	1.8	0.0249	1.2	0.67	158.4	1.9	156.4	2.6	126.4	31.6	158.4	1.9	NA
-062718CF-02 Spot 119	971	141926	2.7	20.0730	0.8	0.1709	1.3	0.0249	1.1	0.81	158.5	1.7	160.2	2.0	185.5	18.1	158.5	1.7	NA

-062718CF-02 Spot 123	200	12678	4.0	20.5991	1.7	0.1666	2.1	0.0249	1.1	0.55	158.6	1.8	156.5	3.0	124.9	40.5	158.6	1.8	NA
-062718CF-02 Spot 125	278	17332	2.3	20.1573	1.1	0.1704	1.7	0.0249	1.3	0.76	158.6	2.0	159.7	2.5	175.7	26.0	158.6	2.0	NA
-062718CF-02 Spot 45	268	26056	2.3	20.4359	1.1	0.1681	1.6	0.0249	1.1	0.69	158.7	1.7	157.8	2.3	143.6	26.6	158.7	1.7	NA
-062718CF-02 Spot 157	266	21136	3.5	20.0928	1.2	0.1710	1.8	0.0249	1.3	0.74	158.7	2.1	160.3	2.7	183.2	28.6	158.7	2.1	NA
-062718CF-02 Spot 57	119	7424	2.4	21.3503	2.0	0.1615	2.2	0.0250	1.0	0.44	159.3	1.5	152.1	3.1	39.9	46.9	159.3	1.5	NA
-062718CF-02 Spot 250	292	11261	2.9	20.6632	1.3	0.1670	1.6	0.0250	1.0	0.61	159.4	1.5	156.8	2.3	117.6	29.8	159.4	1.5	NA
-062718CF-02 Spot 190	227	6393	3.4	20.4251	2.0	0.1690	2.3	0.0250	1.1	0.48	159.5	1.7	158.6	3.3	144.8	46.4	159.5	1.7	NA
-062718CF-02 Spot 114	414	17123	1.7	20.3244	1.1	0.1698	1.5	0.0250	1.0	0.64	159.5	1.5	159.3	2.2	156.5	26.4	159.5	1.5	NA
-062718CF-02 Spot 89	390	24012	3.2	20.2971	1.0	0.1701	1.4	0.0251	1.0	0.68	159.5	1.5	159.5	2.1	159.6	24.3	159.5	1.5	NA
-062718CF-02 Spot 212	307	5701	4.1	21.1144	2.0	0.1635	2.1	0.0251	0.8	0.37	159.5	1.2	153.8	3.0	66.4	46.5	159.5	1.2	NA
-062718CF-02 Spot 109	464	32306	2.4	20.2108	1.0	0.1709	1.5	0.0251	1.2	0.77	159.6	1.9	160.2	2.3	169.5	22.7	159.6	1.9	NA
-062718CF-02 Spot 179	302	13408	3.0	20.3073	1.2	0.1702	1.5	0.0251	0.9	0.59	159.7	1.4	159.6	2.2	158.4	28.5	159.7	1.4	NA
-062718CF-02 Spot 280	288	21729	2.1	19.5514	1.9	0.1768	2.2	0.0251	1.2	0.53	159.7	1.8	165.3	3.4	246.5	43.7	159.7	1.8	NA
-062718CF-02 Spot 28	199	15127	4.3	16.5836	2.9	0.2084	3.1	0.0251	1.0	0.33	159.7	1.6	192.2	5.5	613.4	63.5	159.7	1.6	NA
-062718CF-02 Spot 49	264	28482	2.7	20.6239	1.4	0.1676	1.7	0.0251	1.0	0.58	159.7	1.6	157.4	2.5	122.1	32.8	159.7	1.6	NA
-062718CF-02 Spot 113	221	12206	3.5	20.8217	1.5	0.1661	1.8	0.0251	0.9	0.54	159.8	1.5	156.0	2.5	99.5	35.0	159.8	1.5	NA
-062718CF-02 Spot 60	368	33497	2.3	20.2618	1.1	0.1707	1.5	0.0251	1.0	0.67	159.8	1.6	160.1	2.3	163.6	26.4	159.8	1.6	NA
-062718CF-02 Spot 251	126	11408	2.8	20.2564	1.7	0.1710	2.0	0.0251	1.1	0.54	160.0	1.7	160.3	3.0	164.3	40.2	160.0	1.7	NA
-062718CF-02 Spot 301	1797	47587	4.6	20.2297	0.8	0.1713	1.3	0.0251	1.0	0.80	160.1	1.6	160.5	1.9	167.4	17.8	160.1	1.6	NA
-062718CF-02 Spot 279	134	19675	2.8	19.7823	1.9	0.1754	2.2	0.0252	1.2	0.53	160.3	1.8	164.1	3.3	219.4	42.9	160.3	1.8	NA
-062718CF-02 Spot 231	611	16618	4.7	20.6907	0.7	0.1677	1.5	0.0252	1.3	0.86	160.3	2.0	157.4	2.1	114.4	17.5	160.3	2.0	NA
-062718CF-02 Spot 202	275	60873	3.5	20.0257	1.4	0.1733	1.8	0.0252	1.1	0.62	160.3	1.8	162.3	2.7	191.0	32.8	160.3	1.8	NA
-062718CF-02 Spot 276	131	6035	1.3	18.5371	2.7	0.1872	3.0	0.0252	1.2	0.40	160.3	1.9	174.3	4.8	367.8	61.3	160.3	1.9	NA
-062718CF-02 Spot 70	95	14976	4.0	13.7949	3.1	0.2517	3.2	0.0252	0.8	0.26	160.4	1.3	228.0	6.5	998.9	62.3	160.4	1.3	NA
-062718CF-02 Spot 147	155	4780	2.2	21.3636	1.4	0.1626	1.7	0.0252	1.0	0.58	160.5	1.6	153.0	2.5	38.4	34.1	160.5	1.6	NA
-062718CF-02 Spot 286	527	99115	3.2	20.0383	0.8	0.1734	1.8	0.0252	1.6	0.89	160.5	2.5	162.4	2.7	189.5	19.1	160.5	2.5	NA
-062718CF-02 Spot 50	573	17899	2.4	20.2207	1.0	0.1719	1.5	0.0252	1.2	0.76	160.6	1.8	161.1	2.3	168.4	23.2	160.6	1.8	NA
-062718CF-02 Spot 131	64	3515	3.8	22.1236	3.6	0.1571	3.9	0.0252	1.3	0.34	160.6	2.1	148.2	5.3	NA	NA	160.6	2.1	NA
-062718CF-02 Spot 120	199	4771	2.6	15.8593	5.2	0.2193	5.3	0.0252	1.0	0.19	160.7	1.6	201.4	9.8	709.2	111.4	160.7	1.6	NA
-062718CF-02 Spot 94	235	36484	1.5	19.7738	1.5	0.1762	1.9	0.0253	1.2	0.61	161.0	1.9	164.8	3.0	220.4	35.5	161.0	1.9	NA
-062718CF-02 Spot 14	197	9951	3.3	20.1756	2.0	0.1727	2.2	0.0253	1.0	0.46	161.0	1.6	161.8	3.4	173.6	46.5	161.0	1.6	NA
-062718CF-02 Spot 294	290	40591	2.1	20.3276	1.2	0.1715	1.4	0.0253	0.8	0.57	161.0	1.3	160.7	2.1	156.1	27.4	161.0	1.3	NA
-062718CF-02 Spot 95	359	7956	2.9	21.0230	1.5	0.1658	1.8	0.0253	1.0	0.53	161.0	1.5	155.8	2.6	76.7	36.4	161.0	1.5	NA
-062718CF-02 Spot 0	142	2906	3.8	21.4809	1.6	0.1623	2.0	0.0253	1.2	0.60	161.1	1.9	152.7	2.9	25.3	38.8	161.1	1.9	NA
-062718CF-02 Spot 167	335	33725	2.7	20.3754	1.1	0.1712	1.6	0.0253	1.2	0.73	161.2	1.9	160.5	2.4	150.6	26.0	161.2	1.9	NA
-062718CF-02 Spot 165	767	26407	2.4	20.1993	1.1	0.1727	1.8	0.0253	1.4	0.78	161.2	2.2	161.8	2.7	170.9	26.1	161.2	2.2	NA
-062718CF-02 Spot 40	431	7172	3.2	20.7331	1.1	0.1684	1.6	0.0253	1.2	0.74	161.2	1.9	158.0	2.4	109.6	25.6	161.2	1.9	NA
-062718CF-02 Spot 288	288	30427	2.4	20.3717	1.2	0.1714	1.7	0.0253	1.2	0.70	161.3	1.8	160.6	2.5	151.0	27.7	161.3	1.8	NA
-062718CF-02 Spot 193	156	8452	2.9	20.8802	1.3	0.1675	1.5	0.0254	0.7	0.49	161.5	1.2	157.2	2.2	92.9	31.3	161.5	1.2	NA
-062718CF-02 Spot 27	357	19775	1.8	20.3164	1.1	0.1722	1.4	0.0254	0.9	0.64	161.6	1.5	161.3	2.1	157.4	25.9	161.6	1.5	NA
-062718CF-02 Spot 309	353	24477	2.2	20.4999	1.7	0.1707	2.2	0.0254	1.4	0.64	161.6	2.2	160.0	3.2	136.3	39.2	161.6	2.2	NA
-062718CF-02 Spot 130	441	85518	1.9	20.0212	1.1	0.1749	1.7	0.0254	1.3	0.79	161.7	2.1	163.6	2.6	191.5	24.5	161.7	2.1	NA
-062718CF-02 Spot 121	174	14092	1.7	20.4785	1.6	0.1710	2.0	0.0254	1.1	0.56	161.7	1.7	160.3	2.9	138.7	38.2	161.7	1.7	NA
-062718CF-02 Spot 74	100	43766	2.9	20.2032	1.9	0.1734	2.2	0.0254	1.0	0.48	161.8	1.7	162.3	3.3	170.4	44.5	161.8	1.7	NA
-062718CF-02 Spot 19	39	4236	3.4	10.0833	13.3	0.3474	13.3	0.0254	1.2	0.09	161.8	1.9	302.8	34.9	1607.8	248.5	161.8	1.9	NA
-062718CF-02 Spot 105	142	2720	1.7	21.5606	2.6	0.1625	2.8	0.0254	1.0	0.37	161.8	1.6	152.9	3.9	16.4	61.9	161.8	1.6	NA
-062718CF-02 Spot 149	1320	422446	1.9	20.1802	0.9	0.1737	1.4	0.0254	1.1	0.79	161.9	1.8	162.6	2.1	173.1	20.2	161.9	1.8	NA

-062718CF-02 Spot 232	340	31678	3.6	19.8919	1.0	0.1765	1.4	0.0255	1.0	0.70	162.1	1.6	165.0	2.2	206.6	23.9	162.1	1.6	NA
-062718CF-02 Spot 189	59	2953	2.6	22.8431	3.2	0.1538	3.4	0.0255	1.1	0.34	162.3	1.8	145.3	4.6	NA	NA	162.3	1.8	NA
-062718CF-02 Spot 21	571	5032	2.1	12.1829	8.4	0.2885	8.7	0.0255	2.2	0.25	162.3	3.5	257.4	19.7	1246.7	164.3	162.3	3.5	NA
-062718CF-02 Spot 141	75	3916	2.3	20.7403	2.1	0.1697	2.6	0.0255	1.4	0.55	162.6	2.3	159.2	3.8	108.8	50.4	162.6	2.3	NA
-062718CF-02 Spot 225	198	7491	1.6	20.9601	2.2	0.1680	2.4	0.0256	1.0	0.43	162.7	1.7	157.7	3.5	83.8	51.4	162.7	1.7	NA
-062718CF-02 Spot 43	617	37436	2.0	20.3532	0.8	0.1732	1.6	0.0256	1.3	0.85	162.8	2.1	162.2	2.3	153.1	19.3	162.8	2.1	NA
-062718CF-02 Spot 73	117	27830	3.6	20.0281	2.3	0.1761	2.5	0.0256	1.0	0.40	162.9	1.6	164.7	3.8	190.7	53.8	162.9	1.6	NA
-062718CF-02 Spot 36	201	47880	3.5	20.1173	1.3	0.1757	1.5	0.0256	0.9	0.58	163.2	1.4	164.3	2.3	180.3	29.2	163.2	1.4	NA
-062718CF-02 Spot 35	58	8106	4.4	19.8659	2.4	0.1780	2.7	0.0257	1.2	0.44	163.3	1.9	166.3	4.1	209.6	55.4	163.3	1.9	NA
-062718CF-02 Spot 38	305	12425	1.7	20.2540	1.6	0.1747	1.8	0.0257	0.9	0.47	163.4	1.4	163.5	2.8	164.5	37.5	163.4	1.4	NA
-062718CF-02 Spot 262	398	54309	2.6	20.0587	1.0	0.1769	1.3	0.0258	0.9	0.63	163.9	1.4	165.4	2.1	187.1	24.4	163.9	1.4	NA
-062718CF-02 Spot 31	463	3084	1.8	8.8096	13.1	0.4039	13.2	0.0258	1.7	0.13	164.3	2.7	344.5	38.5	1855.6	237.4	164.3	2.7	NA
-062718CF-02 Spot 133	340	270378	1.6	19.5917	1.1	0.1817	1.4	0.0258	0.9	0.60	164.4	1.4	169.5	2.2	241.7	26.1	164.4	1.4	NA
-062718CF-02 Spot 86	2744	133784	1.7	20.5283	0.6	0.1737	1.2	0.0259	1.0	0.84	164.6	1.7	162.6	1.8	133.0	15.3	164.6	1.7	NA
-062718CF-02 Spot 51	194	8931	1.6	20.3603	1.7	0.1751	2.1	0.0259	1.3	0.61	164.7	2.1	163.9	3.2	152.3	39.8	164.7	2.1	NA
-062718CF-02 Spot 206	361	203635	0.8	19.7642	1.0	0.1805	1.4	0.0259	1.0	0.71	164.8	1.6	168.5	2.1	221.5	22.4	164.8	1.6	NA
-062718CF-02 Spot 12	295	5726	1.2	20.9270	1.2	0.1707	1.6	0.0259	1.0	0.67	164.9	1.7	160.0	2.3	87.6	27.5	164.9	1.7	NA
-062718CF-02 Spot 210	58	6522	2.2	21.2599	2.9	0.1682	3.2	0.0259	1.3	0.41	165.1	2.2	157.8	4.7	50.1	70.3	165.1	2.2	NA
-062718CF-02 Spot 284	197	11684	3.1	20.4487	2.0	0.1752	2.2	0.0260	1.0	0.47	165.4	1.7	163.9	3.4	142.2	46.0	165.4	1.7	NA
-062718CF-02 Spot 248	430	37732	0.8	20.0982	1.1	0.1784	1.6	0.0260	1.2	0.76	165.6	2.0	166.7	2.5	182.6	24.8	165.6	2.0	NA
-062718CF-02 Spot 185	88	7463	2.4	20.1915	2.5	0.1779	2.7	0.0261	1.0	0.37	165.9	1.6	166.3	4.1	171.8	58.1	165.9	1.6	NA
-062718CF-02 Spot 209	884	42136	0.8	20.1599	0.8	0.1782	1.4	0.0261	1.2	0.82	165.9	1.9	166.5	2.2	175.4	18.8	165.9	1.9	NA
-062718CF-02 Spot 84	282	14219	8.1	20.0892	0.9	0.1792	1.5	0.0261	1.2	0.81	166.3	2.0	167.4	2.3	183.6	20.1	166.3	2.0	NA
-062718CF-02 Spot 46	503	49971	1.7	20.3870	0.8	0.1769	1.5	0.0262	1.2	0.84	166.5	2.0	165.4	2.3	149.2	18.8	166.5	2.0	NA
-062718CF-02 Spot 292	1180	113700	4.5	20.0445	0.8	0.1808	1.2	0.0263	1.0	0.79	167.3	1.6	168.7	1.9	188.8	17.7	167.3	1.6	NA
-062718CF-02 Spot 260	198	2208	2.4	8.9096	12.8	0.4074	13.0	0.0263	2.2	0.17	167.6	3.7	347.0	38.1	1835.2	232.2	167.6	3.7	NA
-062718CF-02 Spot 259	87	10362	2.8	20.1889	2.0	0.1808	2.3	0.0265	1.2	0.50	168.5	1.9	168.7	3.6	172.1	46.4	168.5	1.9	NA
-062718CF-02 Spot 267	91	5787	2.3	21.4248	1.8	0.1706	2.3	0.0265	1.4	0.60	168.8	2.3	160.0	3.4	31.6	43.4	168.8	2.3	NA
-062718CF-02 Spot 87	141	25125	2.0	20.8477	1.4	0.1755	1.7	0.0265	1.0	0.60	168.9	1.7	164.2	2.6	96.6	32.1	168.9	1.7	NA
-062718CF-02 Spot 237	327	165963	2.2	20.5002	1.0	0.1787	1.5	0.0266	1.1	0.76	169.1	1.9	166.9	2.3	136.2	22.7	169.1	1.9	NA
-062718CF-02 Spot 23	112	12459	1.9	12.3853	6.7	0.3059	7.0	0.0275	1.8	0.26	174.8	3.1	271.0	16.6	1214.3	132.4	174.8	3.1	NA
-062718CF-02 Spot 246	102	1358	2.2	6.8256	21.0	0.5923	21.1	0.0293	1.8	0.09	186.4	3.3	472.3	79.7	2304.8	364.9	186.4	3.3	NA
-062718CF-02 Spot 201	125	6287	6.5	20.7071	1.9	0.1993	2.7	0.0299	1.9	0.72	190.2	3.6	184.5	4.5	112.6	43.8	190.2	3.6	NA
-062718CF-02 Spot 136	282	632	1.7	3.2637	41.1	1.6538	41.3	0.0392	3.0	0.07	247.7	7.2	991.0	267.0	3502.2	670.8	247.7	7.2	NA
-062718CF-02 Spot 132	252	29473	3.0	19.1792	1.1	0.3245	1.6	0.0452	1.1	0.69	284.8	3.0	285.4	3.9	290.5	26.1	284.8	3.0	NA
-062718CF-02 Spot 26	477	24997	4.2	19.2114	0.9	0.3256	1.4	0.0454	1.0	0.76	286.1	2.9	286.2	3.4	286.7	20.2	286.1	2.9	NA
-062718CF-02 Spot 235	290	12185	2.4	19.6243	1.1	0.3264	1.4	0.0465	1.0	0.67	292.9	2.8	286.9	3.6	237.9	24.5	292.9	2.8	NA
-062718CF-02 Spot 85	389	35938	2.2	19.1731	0.9	0.3370	1.3	0.0469	0.9	0.69	295.3	2.6	294.9	3.3	291.3	21.4	295.3	2.6	NA
-062718CF-02 Spot 300	99	78154	1.1	5.5614	0.5	12.8368	1.0	0.5180	0.8	0.86	2690.7	18.6	2667.8	9.2	2650.4	8.2	2650.4	8.2	101.5

Nutzotin Mountains Sequence – LC1-COMP (FA2)

						Isotope ratios						Apparent ages (Ma)							
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
LC1-COMP (FA2)																			
-LC1 Spot 197	274	2808316	3.7	19.0549	1.5	0.1641	2.0	0.0227	1.3	0.65	144.6	1.8	154.3	2.8	305.4	33.9	144.6	1.8	NA
-LC1 Spot 133	96	9574572	3.8	20.0040	2.4	0.1565	2.7	0.0227	1.3	0.48	144.8	1.9	147.6	3.8	193.5	55.8	144.8	1.9	NA
-LC1 Spot 312	250	8443595	2.5	16.6478	1.7	0.1885	2.2	0.0228	1.4	0.65	145.2	2.0	175.4	3.5	605.1	36.0	145.2	2.0	NA
-LC1 Spot 175	499	18179268	1.5	19.6609	1.2	0.1599	1.8	0.0228	1.3	0.73	145.4	1.9	150.6	2.6	233.6	28.8	145.4	1.9	NA
-LC1 Spot 202	175	4106204	4.1	19.6086	1.6	0.1614	3.0	0.0230	2.5	0.85	146.4	3.6	151.9	4.2	239.7	36.0	146.4	3.6	NA
-LC1 Spot 308	122	3002624	2.2	20.4142	2.0	0.1551	2.3	0.0230	1.1	0.49	146.4	1.6	146.4	3.1	146.1	46.5	146.4	1.6	NA
-LC1 Spot 38	125	1879890	3.2	20.1701	2.1	0.1572	2.4	0.0230	1.2	0.51	146.6	1.8	148.3	3.3	174.2	48.3	146.6	1.8	NA
-LC1 Spot 285	157	15510645	2.2	19.7738	2.1	0.1606	2.6	0.0230	1.5	0.58	146.9	2.2	151.3	3.6	220.4	48.7	146.9	2.2	NA
-LC1 Spot 32	191	1415456	2.0	20.0677	1.6	0.1591	2.2	0.0232	1.4	0.65	147.6	2.0	149.9	3.0	186.1	38.0	147.6	2.0	NA
-LC1 Spot 108	186	9888564	2.5	19.5927	1.6	0.1630	2.6	0.0232	2.0	0.77	147.7	2.9	153.3	3.7	241.6	37.6	147.7	2.9	NA
-LC1 Spot 76	874	9177475	5.1	19.9919	1.0	0.1598	1.9	0.0232	1.7	0.86	147.7	2.4	150.5	2.7	194.9	23.2	147.7	2.4	NA
-LC1 Spot 40	122	17935186	2.9	17.8929	2.2	0.1791	2.5	0.0233	1.2	0.48	148.2	1.8	167.3	3.9	446.9	49.7	148.2	1.8	NA
-LC1 Spot 142	83	5083745	4.3	19.4076	2.0	0.1655	2.5	0.0233	1.4	0.58	148.5	2.1	155.5	3.5	263.4	46.2	148.5	2.1	NA
-LC1 Spot 296	148	2317888	3.8	21.0151	1.8	0.1536	2.2	0.0234	1.3	0.58	149.2	1.9	145.0	3.0	77.6	43.0	149.2	1.9	NA
-LC1 Spot 236	112	3216297	2.7	17.1242	3.8	0.1888	4.4	0.0235	2.2	0.50	149.5	3.2	175.6	7.1	543.7	83.7	149.5	3.2	NA
-LC1 Spot 124	113	2057947	2.2	18.8277	2.6	0.1717	2.9	0.0235	1.4	0.48	149.5	2.1	160.9	4.4	332.7	58.2	149.5	2.1	NA
-LC1 Spot 250	97	801755	2.9	19.4900	2.6	0.1660	2.9	0.0235	1.2	0.42	149.6	1.8	156.0	4.2	253.7	60.6	149.6	1.8	NA
-LC1 Spot 78	138	1887783	3.2	18.9758	2.1	0.1709	2.3	0.0235	1.0	0.41	149.9	1.4	160.2	3.5	314.9	48.3	149.9	1.4	NA
-LC1 Spot 68	64	2917383	6.0	19.3573	2.3	0.1677	2.9	0.0236	1.7	0.60	150.1	2.6	157.4	4.2	269.4	52.6	150.1	2.6	NA
-LC1 Spot 231	114	1525141	2.1	20.3636	2.3	0.1594	2.7	0.0236	1.4	0.52	150.1	2.0	150.2	3.7	151.9	53.7	150.1	2.0	NA
-LC1 Spot 303	355	3422515	1.9	19.5800	1.5	0.1658	1.8	0.0236	1.0	0.55	150.1	1.5	155.8	2.6	243.1	35.1	150.1	1.5	NA
-LC1 Spot 278	2064	37098772	3.5	19.8997	0.7	0.1632	1.3	0.0236	1.1	0.87	150.1	1.7	153.5	1.9	205.7	15.2	150.1	1.7	NA
-LC1 Spot 252	143	3433727	2.4	19.2477	1.8	0.1688	2.4	0.0236	1.5	0.64	150.2	2.3	158.4	3.5	282.4	42.0	150.2	2.3	NA
-LC1 Spot 43	66	5115843	4.1	19.1426	3.9	0.1698	4.2	0.0236	1.7	0.39	150.2	2.5	159.2	6.2	294.9	88.9	150.2	2.5	NA
-LC1 Spot 81	94	1818735	3.2	18.5942	2.9	0.1752	3.2	0.0236	1.5	0.46	150.6	2.2	163.9	4.9	360.9	64.5	150.6	2.2	NA
-LC1 Spot 110	68	22331075	4.8	17.7798	3.0	0.1833	3.2	0.0236	1.3	0.41	150.6	2.0	170.9	5.1	461.0	65.7	150.6	2.0	NA
-LC1 Spot 21	217	15585519	3.1	19.7052	1.6	0.1654	2.0	0.0236	1.2	0.61	150.6	1.8	155.4	2.9	228.4	37.1	150.6	1.8	NA
-LC1 Spot 94	132	5193586	3.9	16.5144	2.3	0.1974	2.6	0.0237	1.1	0.42	150.7	1.6	182.9	4.3	622.4	50.3	150.7	1.6	NA
-LC1 Spot 112	409	7004805	5.1	20.2216	1.6	0.1612	1.9	0.0237	1.1	0.56	150.7	1.6	151.8	2.7	168.3	37.5	150.7	1.6	NA
-LC1 Spot 71	181	1844861	4.7	18.2271	1.7	0.1789	2.1	0.0237	1.1	0.55	150.7	1.7	167.1	3.2	405.7	38.7	150.7	1.7	NA
-LC1 Spot 90	156	1513258	2.8	18.3888	1.7	0.1774	2.1	0.0237	1.3	0.59	150.8	1.9	165.9	3.3	385.9	39.0	150.8	1.9	NA
-LC1 Spot 188	90	15314136	3.2	18.9746	2.3	0.1720	2.7	0.0237	1.4	0.51	150.9	2.1	161.1	4.1	315.0	53.2	150.9	2.1	NA
-LC1 Spot 14	132	1978560	3.1	19.9047	1.8	0.1640	2.3	0.0237	1.4	0.62	150.9	2.1	154.2	3.3	205.1	41.4	150.9	2.1	NA
-LC1 Spot 12	473	10546440	4.2	19.9561	1.4	0.1636	2.0	0.0237	1.4	0.71	150.9	2.2	153.8	2.9	199.1	33.1	150.9	2.2	NA
-LC1 Spot 174	140	3204700	2.0	16.4202	3.2	0.1988	3.3	0.0237	1.0	0.31	150.9	1.5	184.2	5.6	634.8	68.0	150.9	1.5	NA
-LC1 Spot 168	260	6130632	4.6	19.4625	1.3	0.1680	1.5	0.0237	0.7	0.45	151.1	1.0	157.7	2.2	256.9	30.9	151.1	1.0	NA
-LC1 Spot 248	627	15666762	3.9	19.6233	1.0	0.1666	1.6	0.0237	1.3	0.78	151.2	1.9	156.5	2.4	238.0	23.7	151.2	1.9	NA
-LC1 Spot 111	214	5729272	4.8	19.8925	1.8	0.1645	2.3	0.0237	1.5	0.65	151.3	2.3	154.6	3.4	206.5	41.2	151.3	2.3	NA
-LC1 Spot 149	133	2989815	3.0	20.0934	2.1	0.1629	2.4	0.0238	1.2	0.51	151.3	1.8	153.3	3.4	183.1	48.0	151.3	1.8	NA
-LC1 Spot 227	158	2583513	5.6	19.5537	2.4	0.1678	2.7	0.0238	1.2	0.44	151.7	1.8	157.5	3.9	246.2	54.8	151.7	1.8	NA
-LC1 Spot 289	239	3571108	4.2	20.0063	1.6	0.1640	1.8	0.0238	0.9	0.49	151.7	1.3	154.2	2.6	193.3	37.2	151.7	1.3	NA

-LC1 Spot 123	242	2763460	3.0	18.5219	1.9	0.1772	2.3	0.0238	1.3	0.58	151.8	2.0	165.7	3.5	369.6	42.1	151.8	2.0	NA
-LC1 Spot 299	284	8895940	2.5	19.2836	1.3	0.1703	1.8	0.0238	1.2	0.67	151.8	1.8	159.7	2.7	278.2	30.6	151.8	1.8	NA
-LC1 Spot 136	115	8722636	2.7	19.3992	2.4	0.1693	2.9	0.0238	1.5	0.54	151.8	2.3	158.8	4.2	264.4	55.3	151.8	2.3	NA
-LC1 Spot 118	168	3208471	4.0	16.3956	2.5	0.2004	2.8	0.0238	1.4	0.48	151.8	2.0	185.4	4.8	638.0	53.7	151.8	2.0	NA
-LC1 Spot 67	151	2796718	2.3	18.0163	1.6	0.1824	2.0	0.0238	1.2	0.61	151.9	1.8	170.1	3.1	431.6	35.5	151.9	1.8	NA
-LC1 Spot 7	51	472034	2.7	16.9206	5.3	0.1942	5.6	0.0238	1.8	0.33	151.9	2.8	180.2	9.3	569.8	115.8	151.9	2.8	NA
-LC1 Spot 127	41	516031	4.8	18.8212	3.1	0.1746	3.4	0.0238	1.4	0.40	151.9	2.0	163.4	5.1	333.4	70.6	151.9	2.0	NA
-LC1 Spot 190	574	5136282	5.4	19.9227	1.1	0.1651	2.0	0.0239	1.7	0.84	152.0	2.6	155.1	2.9	203.0	26.0	152.0	2.6	NA
-LC1 Spot 4	191	3376974	3.1	18.0287	1.6	0.1824	2.1	0.0239	1.4	0.66	152.0	2.1	170.1	3.3	430.1	35.1	152.0	2.1	NA
-LC1 Spot 25	432	24432432	4.2	19.9433	1.2	0.1651	1.9	0.0239	1.4	0.76	152.2	2.1	155.1	2.7	200.6	28.3	152.2	2.1	NA
-LC1 Spot 262	207	4417561	3.0	17.9497	1.9	0.1835	2.4	0.0239	1.4	0.58	152.2	2.1	171.0	3.8	439.9	43.4	152.2	2.1	NA
-LC1 Spot 154	446	13926861	4.2	19.9603	1.5	0.1650	2.0	0.0239	1.4	0.67	152.2	2.1	155.0	2.9	198.6	35.4	152.2	2.1	NA
-LC1 Spot 19	179	2889079	5.5	19.4933	2.2	0.1689	2.5	0.0239	1.1	0.45	152.2	1.7	158.5	3.6	253.3	50.9	152.2	1.7	NA
-LC1 Spot 92	247	1136268	3.8	19.7660	1.5	0.1667	1.8	0.0239	0.9	0.51	152.3	1.4	156.5	2.5	221.3	34.9	152.3	1.4	NA
-LC1 Spot 35	82	7078101	3.1	19.2707	3.0	0.1712	3.5	0.0239	1.8	0.51	152.5	2.7	160.4	5.2	279.7	69.2	152.5	2.7	NA
-LC1 Spot 45	203	4473259	4.1	14.6183	2.9	0.2257	3.1	0.0239	1.1	0.37	152.5	1.7	206.6	5.8	880.0	59.2	152.5	1.7	NA
-LC1 Spot 161	140	1200474	2.7	12.6845	4.7	0.2601	4.9	0.0239	1.4	0.29	152.5	2.1	234.7	10.2	1167.2	92.3	152.5	2.1	NA
-LC1 Spot 162	182	8516760	5.5	19.3376	1.5	0.1706	1.8	0.0239	1.0	0.53	152.5	1.4	160.0	2.7	271.7	34.8	152.5	1.4	NA
-LC1 Spot 23	299	6529514	5.4	18.7434	1.7	0.1761	2.1	0.0239	1.2	0.56	152.6	1.7	164.7	3.1	342.8	38.5	152.6	1.7	NA
-LC1 Spot 1	137	1608966	3.6	18.3033	1.8	0.1803	2.3	0.0239	1.4	0.60	152.6	2.0	168.3	3.5	396.3	40.7	152.6	2.0	NA
-LC1 Spot 193	89	1664466	4.0	17.1031	3.0	0.1930	3.3	0.0240	1.3	0.41	152.6	2.0	179.2	5.3	546.4	64.7	152.6	2.0	NA
-LC1 Spot 18	533	39700234	5.0	19.9297	1.4	0.1657	2.2	0.0240	1.7	0.78	152.6	2.6	155.7	3.2	202.1	32.3	152.6	2.6	NA
-LC1 Spot 210	113	4144153	2.8	20.2652	2.1	0.1630	2.5	0.0240	1.4	0.57	152.6	2.2	153.3	3.6	163.2	48.3	152.6	2.2	NA
-LC1 Spot 55	110	2854768	2.4	17.8501	2.1	0.1852	2.3	0.0240	1.1	0.47	152.8	1.7	172.5	3.7	452.3	45.7	152.8	1.7	NA
-LC1 Spot 113	130	1992571	2.4	18.7735	2.3	0.1761	2.8	0.0240	1.6	0.57	152.8	2.4	164.7	4.2	339.2	51.3	152.8	2.4	NA
-LC1 Spot 198	105	4213969	4.3	19.5568	1.8	0.1690	2.3	0.0240	1.4	0.63	152.8	2.2	158.6	3.3	245.8	40.5	152.8	2.2	NA
-LC1 Spot 44	173	5580141	2.4	20.3409	2.0	0.1625	2.4	0.0240	1.4	0.58	152.8	2.1	152.9	3.4	154.6	46.2	152.8	2.1	NA
-LC1 Spot 72	41	251621492	4.7	20.0857	3.8	0.1648	4.1	0.0240	1.6	0.39	153.0	2.4	154.9	5.9	184.0	88.6	153.0	2.4	NA
-LC1 Spot 17	203	2326286	3.7	19.0343	1.4	0.1739	1.9	0.0240	1.2	0.66	153.0	1.9	162.8	2.8	307.8	32.1	153.0	1.9	NA
-LC1 Spot 201	181	3334211	2.9	19.1916	1.5	0.1725	2.0	0.0240	1.3	0.65	153.0	1.9	161.6	2.9	289.1	34.0	153.0	1.9	NA
-LC1 Spot 22	267	2685630	3.4	19.5302	1.5	0.1695	2.1	0.0240	1.5	0.71	153.0	2.3	159.0	3.1	249.0	34.7	153.0	2.3	NA
-LC1 Spot 251	585	19580469	5.4	20.1771	1.4	0.1641	1.9	0.0240	1.3	0.68	153.0	2.0	154.3	2.8	173.4	33.0	153.0	2.0	NA
-LC1 Spot 205	70	915099	5.5	19.1161	2.3	0.1733	2.6	0.0240	1.3	0.49	153.1	1.9	162.3	3.9	298.0	52.1	153.1	1.9	NA
-LC1 Spot 310	160	4404653	4.4	18.5352	2.4	0.1788	2.8	0.0240	1.4	0.49	153.2	2.1	167.0	4.3	368.0	54.3	153.2	2.1	NA
-LC1 Spot 305	138	1748179	3.6	19.7884	2.1	0.1676	2.5	0.0241	1.3	0.51	153.3	1.9	157.3	3.6	218.6	49.5	153.3	1.9	NA
-LC1 Spot 95	85	1373095	4.2	20.3034	2.5	0.1633	2.8	0.0241	1.4	0.49	153.3	2.1	153.6	4.0	158.9	57.7	153.3	2.1	NA
-LC1 Spot 29	86	19135235	3.7	18.8097	2.5	0.1763	2.8	0.0241	1.4	0.49	153.3	2.1	164.9	4.3	334.8	55.7	153.3	2.1	NA
-LC1 Spot 119	32	1931476	4.0	19.0871	4.2	0.1738	4.5	0.0241	1.8	0.40	153.4	2.7	162.7	6.8	301.5	94.9	153.4	2.7	NA
-LC1 Spot 302	97	1703771	3.2	18.3828	2.5	0.1805	3.0	0.0241	1.6	0.54	153.4	2.5	168.5	4.7	386.6	57.0	153.4	2.5	NA
-LC1 Spot 27	162	8540918	2.4	20.4685	2.0	0.1621	2.4	0.0241	1.3	0.54	153.4	1.9	152.6	3.4	139.9	47.1	153.4	1.9	NA
-LC1 Spot 313	113	10752081	3.8	19.3319	1.7	0.1717	2.2	0.0241	1.3	0.60	153.4	2.0	160.9	3.2	272.4	39.5	153.4	2.0	NA
-LC1 Spot 307	141	1614075	3.5	18.6237	2.0	0.1783	2.5	0.0241	1.5	0.60	153.4	2.3	166.6	3.9	357.3	45.6	153.4	2.3	NA
-LC1 Spot 204	323	5474876	4.4	17.9130	2.1	0.1854	2.5	0.0241	1.3	0.52	153.5	1.9	172.7	3.9	444.4	47.4	153.5	1.9	NA
-LC1 Spot 301	464	71181020	3.4	19.7165	1.4	0.1684	2.0	0.0241	1.4	0.71	153.5	2.1	158.1	2.9	227.1	32.1	153.5	2.1	NA
-LC1 Spot 272	83	5838303	3.4	19.3301	2.6	0.1719	3.0	0.0241	1.6	0.52	153.6	2.4	161.1	4.5	272.6	59.0	153.6	2.4	NA
-LC1 Spot 225	116	31018214	2.9	19.5454	1.9	0.1701	2.3	0.0241	1.2	0.52	153.7	1.8	159.5	3.3	247.2	44.4	153.7	1.8	NA
-LC1 Spot 199	322	13939427	3.0	19.9370	1.5	0.1668	1.7	0.0241	0.9	0.54	153.7	1.4	156.6	2.5	201.3	34.1	153.7	1.4	NA

-LC1 Spot 114	71	1456537	4.2	18.3593	2.3	0.1811	2.6	0.0241	1.2	0.46	153.7	1.8	169.0	4.0	389.5	51.3	153.7	1.8	NA
-LC1 Spot 219	153	5449753	2.7	19.8088	1.8	0.1679	2.1	0.0241	1.0	0.51	153.7	1.6	157.6	3.0	216.3	41.0	153.7	1.6	NA
-LC1 Spot 222	208	2525012	2.4	19.2276	1.9	0.1730	2.3	0.0241	1.4	0.59	153.8	2.1	162.0	3.5	284.8	42.6	153.8	2.1	NA
-LC1 Spot 187	35	987076	4.0	14.4143	4.2	0.2309	4.5	0.0241	1.5	0.33	153.8	2.3	210.9	8.5	909.0	87.3	153.8	2.3	NA
-LC1 Spot 82	167	3794728	3.3	18.8690	2.3	0.1764	2.7	0.0241	1.4	0.51	153.8	2.1	164.9	4.1	327.7	52.0	153.8	2.1	NA
-LC1 Spot 172	144	9938584	4.2	18.8425	2.4	0.1767	2.9	0.0242	1.7	0.58	153.8	2.5	165.2	4.4	330.9	53.5	153.8	2.5	NA
-LC1 Spot 258	114	35126297	3.0	15.4685	4.1	0.2152	4.3	0.0242	1.2	0.27	153.9	1.8	197.9	7.7	761.9	87.0	153.9	1.8	NA
-LC1 Spot 215	692	25515009	2.2	19.9508	1.1	0.1669	1.7	0.0242	1.3	0.78	153.9	2.0	156.7	2.4	199.7	24.6	153.9	2.0	NA
-LC1 Spot 160	36	294470	5.1	15.7656	5.0	0.2112	5.3	0.0242	1.8	0.33	153.9	2.7	194.5	9.4	721.7	106.2	153.9	2.7	NA
-LC1 Spot 46	34	557652	4.5	20.2009	3.7	0.1648	4.0	0.0242	1.5	0.38	153.9	2.3	154.9	5.7	170.7	86.1	153.9	2.3	NA
-LC1 Spot 242	373	24405931	4.5	19.8102	1.3	0.1682	1.9	0.0242	1.4	0.73	154.0	2.1	157.8	2.8	216.1	30.4	154.0	2.1	NA
-LC1 Spot 13	153	3505204	3.5	19.6685	1.9	0.1694	2.4	0.0242	1.6	0.64	154.0	2.4	158.9	3.6	232.7	43.4	154.0	2.4	NA
-LC1 Spot 50	23	349141	6.2	19.4819	4.0	0.1710	4.4	0.0242	1.9	0.43	154.0	2.9	160.3	6.5	254.7	91.5	154.0	2.9	NA
-LC1 Spot 226	109	2637847	3.2	18.7500	2.3	0.1777	2.5	0.0242	1.1	0.43	154.0	1.6	166.1	3.8	342.0	51.2	154.0	1.6	NA
-LC1 Spot 166	92	761330	2.7	17.1043	3.2	0.1949	3.4	0.0242	1.3	0.37	154.1	1.9	180.8	5.6	546.3	68.9	154.1	1.9	NA
-LC1 Spot 104	408	4068784	3.4	19.5804	1.3	0.1703	2.0	0.0242	1.5	0.75	154.1	2.3	159.7	3.0	243.1	30.7	154.1	2.3	NA
-LC1 Spot 189	142	13681568	2.6	19.1432	2.0	0.1742	2.4	0.0242	1.4	0.57	154.1	2.1	163.1	3.6	294.9	45.3	154.1	2.1	NA
-LC1 Spot 214	119	9809402	4.9	18.4426	1.6	0.1809	2.0	0.0242	1.1	0.57	154.2	1.7	168.8	3.0	379.3	36.1	154.2	1.7	NA
-LC1 Spot 115	261	2853285	4.2	20.1222	1.5	0.1659	1.8	0.0242	1.1	0.60	154.3	1.7	155.8	2.6	179.8	34.0	154.3	1.7	NA
-LC1 Spot 235	91	2869338	3.3	18.6126	2.6	0.1794	2.9	0.0242	1.2	0.42	154.3	1.8	167.5	4.4	358.6	58.6	154.3	1.8	NA
-LC1 Spot 283	69	12360359	5.0	20.6230	2.9	0.1619	3.3	0.0242	1.6	0.49	154.3	2.5	152.4	4.7	122.2	68.2	154.3	2.5	NA
-LC1 Spot 83	134	3904211	3.9	19.1363	1.8	0.1745	2.2	0.0242	1.3	0.58	154.4	2.0	163.3	3.4	295.7	41.6	154.4	2.0	NA
-LC1 Spot 34	73	12585303	2.9	19.2262	2.9	0.1737	3.4	0.0242	1.8	0.53	154.4	2.8	162.7	5.2	284.9	66.8	154.4	2.8	NA
-LC1 Spot 70	114	2308035	5.1	18.2674	1.9	0.1829	2.4	0.0242	1.5	0.62	154.4	2.3	170.6	3.8	400.7	42.5	154.4	2.3	NA
-LC1 Spot 84	264	2962665	3.5	20.4447	1.3	0.1636	2.0	0.0243	1.5	0.75	154.6	2.2	153.8	2.8	142.6	30.2	154.6	2.2	NA
-LC1 Spot 287	333	3522082	3.0	14.1051	3.9	0.2372	4.2	0.0243	1.5	0.36	154.6	2.3	216.1	8.1	953.5	79.3	154.6	2.3	NA
-LC1 Spot 132	147	9465666	2.5	16.8806	2.4	0.1982	2.7	0.0243	1.2	0.45	154.6	1.8	183.6	4.5	575.0	51.9	154.6	1.8	NA
-LC1 Spot 178	218	2698764	5.4	18.7462	1.6	0.1785	2.1	0.0243	1.3	0.61	154.7	1.9	166.8	3.2	342.5	37.3	154.7	1.9	NA
-LC1 Spot 51	346	2702594	3.9	18.6302	1.5	0.1797	1.8	0.0243	1.1	0.59	154.7	1.6	167.8	2.8	356.5	33.2	154.7	1.6	NA
-LC1 Spot 157	359	2162355	4.0	19.5111	1.7	0.1717	2.0	0.0243	1.1	0.56	154.8	1.7	160.9	3.0	251.2	38.5	154.8	1.7	NA
-LC1 Spot 33	117	1040023	2.9	19.9410	2.4	0.1680	2.8	0.0243	1.4	0.50	154.8	2.1	157.7	4.1	200.8	56.1	154.8	2.1	NA
-LC1 Spot 153	166	3256856	5.3	20.2473	1.7	0.1656	2.4	0.0243	1.7	0.70	155.0	2.6	155.6	3.4	165.3	39.7	155.0	2.6	NA
-LC1 Spot 163	197	5064953	4.1	19.5229	1.9	0.1718	2.4	0.0243	1.4	0.58	155.0	2.1	161.0	3.5	249.8	44.7	155.0	2.1	NA
-LC1 Spot 36	81	1057143	4.2	16.4600	3.1	0.2038	3.4	0.0243	1.5	0.43	155.0	2.2	188.3	5.9	629.6	66.4	155.0	2.2	NA
-LC1 Spot 238	40	388109	3.1	19.9593	2.9	0.1681	3.5	0.0243	1.9	0.55	155.1	2.9	157.8	5.1	198.7	67.2	155.1	2.9	NA
-LC1 Spot 311	315	3081777	2.3	18.5846	1.4	0.1806	1.6	0.0244	0.8	0.49	155.1	1.2	168.6	2.5	362.0	31.6	155.1	1.2	NA
-LC1 Spot 216	120	8311731	2.4	17.5128	1.8	0.1916	2.3	0.0244	1.4	0.61	155.1	2.1	178.0	3.7	494.5	40.0	155.1	2.1	NA
-LC1 Spot 195	170	2787153	3.3	14.4803	2.3	0.2318	2.7	0.0244	1.4	0.53	155.1	2.2	211.7	5.2	899.6	47.2	155.1	2.2	NA
-LC1 Spot 106	118	4303822	2.0	13.5888	3.5	0.2471	4.0	0.0244	2.1	0.51	155.1	3.2	224.2	8.1	1029.3	70.3	155.1	3.2	NA
-LC1 Spot 62	39	241252	3.6	15.6799	4.8	0.2142	5.0	0.0244	1.3	0.27	155.2	2.1	197.0	8.9	733.3	101.4	155.2	2.1	NA
-LC1 Spot 91	127	1662355	3.6	19.7927	1.9	0.1697	2.3	0.0244	1.2	0.53	155.2	1.8	159.2	3.3	218.2	44.4	155.2	1.8	NA
-LC1 Spot 57	182	2688325	3.8	19.8848	2.1	0.1690	2.3	0.0244	1.0	0.42	155.3	1.5	158.5	3.4	207.4	48.5	155.3	1.5	NA
-LC1 Spot 69	345	3203428	3.7	18.7187	1.5	0.1795	2.0	0.0244	1.4	0.69	155.3	2.1	167.7	3.1	345.8	32.9	155.3	2.1	NA
-LC1 Spot 240	420	5278715	1.4	18.1986	1.7	0.1847	1.9	0.0244	1.0	0.49	155.3	1.5	172.1	3.1	409.2	38.0	155.3	1.5	NA
-LC1 Spot 15	394	2434585	2.9	18.3694	1.5	0.1830	2.1	0.0244	1.4	0.68	155.4	2.2	170.7	3.3	388.2	34.6	155.4	2.2	NA
-LC1 Spot 292	125	1052329	2.4	12.0898	6.2	0.2781	6.3	0.0244	1.3	0.21	155.4	2.0	249.2	13.9	1261.7	120.7	155.4	2.0	NA
-LC1 Spot 28	628	37332745	3.3	19.0154	1.4	0.1769	2.0	0.0244	1.4	0.72	155.5	2.2	165.4	3.0	310.1	30.8	155.5	2.2	NA

-LC1 Spot 295	161	18295084	4.3	20.4275	1.6	0.1647	2.3	0.0244	1.6	0.70	155.5	2.5	154.8	3.3	144.6	38.1	155.5	2.5	NA
-LC1 Spot 5	156	1987075	4.3	16.5184	2.8	0.2037	3.1	0.0244	1.3	0.43	155.5	2.0	188.3	5.3	621.9	59.8	155.5	2.0	NA
-LC1 Spot 42	261	4132480	5.0	19.6337	1.9	0.1714	2.4	0.0244	1.5	0.60	155.5	2.2	160.6	3.6	236.8	44.5	155.5	2.2	NA
-LC1 Spot 135	309	10838127	4.3	19.5923	1.3	0.1718	2.0	0.0244	1.5	0.76	155.5	2.3	160.9	2.9	241.7	29.7	155.5	2.3	NA
-LC1 Spot 233	141	2318011	3.1	16.7510	3.4	0.2009	3.8	0.0244	1.5	0.40	155.5	2.3	185.9	6.4	591.7	74.8	155.5	2.3	NA
-LC1 Spot 141	572	5642818	4.7	19.6705	1.1	0.1712	1.7	0.0244	1.3	0.76	155.6	2.0	160.4	2.6	232.4	25.7	155.6	2.0	NA
-LC1 Spot 8	257	11262242	4.0	18.6327	1.5	0.1808	2.0	0.0244	1.4	0.68	155.6	2.1	168.7	3.1	356.2	33.6	155.6	2.1	NA
-LC1 Spot 75	164	3120041	3.9	17.6177	2.0	0.1912	2.2	0.0244	1.0	0.44	155.7	1.5	177.7	3.6	481.3	43.9	155.7	1.5	NA
-LC1 Spot 237	566	25942833	3.7	19.6085	1.2	0.1718	1.8	0.0244	1.2	0.70	155.7	1.9	161.0	2.6	239.7	28.8	155.7	1.9	NA
-LC1 Spot 16	93	1420941	3.5	19.1590	1.8	0.1759	2.4	0.0245	1.5	0.65	155.7	2.4	164.5	3.6	292.9	41.2	155.7	2.4	NA
-LC1 Spot 121	168	2165714	7.6	19.0076	1.6	0.1774	2.1	0.0245	1.4	0.65	155.8	2.1	165.8	3.3	311.0	37.4	155.8	2.1	NA
-LC1 Spot 274	161	4908928	2.9	17.0511	1.6	0.1977	2.1	0.0245	1.4	0.68	155.8	2.2	183.2	3.6	553.1	34.1	155.8	2.2	NA
-LC1 Spot 177	173	836166	5.0	19.6392	1.7	0.1717	2.3	0.0245	1.6	0.67	155.8	2.4	160.9	3.5	236.1	39.8	155.8	2.4	NA
-LC1 Spot 150	90	1666601	3.5	19.8524	2.2	0.1699	2.7	0.0245	1.6	0.58	155.8	2.4	159.3	4.0	211.2	50.7	155.8	2.4	NA
-LC1 Spot 20	32	19830951	4.9	15.1920	4.6	0.2220	4.8	0.0245	1.5	0.31	155.8	2.3	203.6	8.9	799.9	95.8	155.8	2.3	NA
-LC1 Spot 10	520	52865949	4.1	20.0287	1.2	0.1685	1.8	0.0245	1.3	0.72	156.0	2.0	158.1	2.6	190.7	29.0	156.0	2.0	NA
-LC1 Spot 105	224	1805343	3.6	13.5196	5.6	0.2498	5.9	0.0245	1.7	0.28	156.0	2.6	226.4	11.9	1039.7	113.7	156.0	2.6	NA
-LC1 Spot 256	124	13920494	2.5	19.8591	2.2	0.1701	2.6	0.0245	1.4	0.53	156.1	2.1	159.5	3.8	210.4	50.6	156.1	2.1	NA
-LC1 Spot 271	42	21900315	6.0	17.6325	3.1	0.1915	3.5	0.0245	1.6	0.46	156.1	2.5	177.9	5.7	479.4	69.3	156.1	2.5	NA
-LC1 Spot 24	239	35497690	3.5	20.5100	1.2	0.1647	2.3	0.0245	1.9	0.84	156.1	2.9	154.8	3.3	135.1	28.9	156.1	2.9	NA
-LC1 Spot 314	96	1163469	3.6	18.9559	2.4	0.1783	2.8	0.0245	1.5	0.52	156.2	2.3	166.6	4.4	317.2	55.1	156.2	2.3	NA
-LC1 Spot 306	193	3715186	7.4	20.0562	1.7	0.1685	2.2	0.0245	1.3	0.62	156.2	2.1	158.1	3.2	187.4	39.3	156.2	2.1	NA
-LC1 Spot 138	188	2175048	2.5	17.8823	2.5	0.1891	3.1	0.0245	1.7	0.56	156.2	2.7	175.8	5.0	448.3	56.4	156.2	2.7	NA
-LC1 Spot 265	275	4093728	4.6	16.3918	1.7	0.2066	2.1	0.0246	1.2	0.57	156.5	1.9	190.7	3.7	638.5	37.1	156.5	1.9	NA
-LC1 Spot 155	162	1389805	4.9	19.5676	1.9	0.1731	2.4	0.0246	1.4	0.60	156.5	2.2	162.1	3.6	244.6	43.9	156.5	2.2	NA
-LC1 Spot 182	57	404468	4.3	15.8763	3.2	0.2134	3.5	0.0246	1.4	0.40	156.6	2.2	196.4	6.3	706.9	69.0	156.6	2.2	NA
-LC1 Spot 284	164	3466536	4.6	20.0285	2.1	0.1692	2.5	0.0246	1.3	0.53	156.6	2.1	158.7	3.7	190.7	49.5	156.6	2.1	NA
-LC1 Spot 165	264	12220606	3.1	19.5485	1.8	0.1734	2.2	0.0246	1.3	0.58	156.6	2.0	162.3	3.3	246.8	40.7	156.6	2.0	NA
-LC1 Spot 48	98	86633196	4.0	18.4147	2.3	0.1841	2.7	0.0246	1.3	0.49	156.6	2.0	171.6	4.2	382.7	52.0	156.6	2.0	NA
-LC1 Spot 47	72	691136	3.4	13.3107	3.6	0.2547	3.8	0.0246	1.2	0.32	156.6	1.9	230.4	7.8	1071.1	72.0	156.6	1.9	NA
-LC1 Spot 59	95	1248907	2.8	18.5109	2.7	0.1832	2.9	0.0246	1.2	0.39	156.7	1.8	170.8	4.6	371.0	60.4	156.7	1.8	NA
-LC1 Spot 98	331	5336125	3.7	18.3030	1.5	0.1853	1.8	0.0246	1.0	0.58	156.7	1.6	172.6	2.9	396.4	33.1	156.7	1.6	NA
-LC1 Spot 221	437	3911251	2.4	16.3143	2.7	0.2079	3.0	0.0246	1.3	0.43	156.7	2.0	191.8	5.3	648.7	58.6	156.7	2.0	NA
-LC1 Spot 230	30	468101	6.2	18.5897	4.2	0.1825	4.8	0.0246	2.3	0.48	156.7	3.6	170.2	7.5	361.4	94.6	156.7	3.6	NA
-LC1 Spot 183	234	2026901	3.8	14.0138	4.6	0.2422	4.7	0.0246	1.3	0.27	156.8	1.9	220.2	9.4	966.8	93.1	156.8	1.9	NA
-LC1 Spot 49	41	956266	5.0	16.9004	3.3	0.2008	3.6	0.0246	1.4	0.39	156.8	2.2	185.8	6.1	572.4	72.3	156.8	2.2	NA
-LC1 Spot 173	235	10050357	2.9	20.0656	1.3	0.1692	1.8	0.0246	1.3	0.69	156.8	2.0	158.7	2.7	186.3	30.8	156.8	2.0	NA
-LC1 Spot 31	136	20765859	2.0	19.6690	2.5	0.1726	2.7	0.0246	1.2	0.45	156.9	1.9	161.7	4.1	232.6	56.6	156.9	1.9	NA
-LC1 Spot 100	40	575564	3.8	17.4704	3.1	0.1944	3.6	0.0246	1.8	0.50	156.9	2.8	180.4	5.9	499.8	68.7	156.9	2.8	NA
-LC1 Spot 207	335	20396981	2.2	18.4382	1.3	0.1842	1.5	0.0246	0.8	0.53	156.9	1.2	171.7	2.4	379.8	28.8	156.9	1.2	NA
-LC1 Spot 117	76	1639462	3.1	15.4766	2.6	0.2195	2.9	0.0247	1.3	0.44	157.0	2.0	201.5	5.4	760.8	55.6	157.0	2.0	NA
-LC1 Spot 143	191	8304287	2.9	20.7078	1.4	0.1641	1.9	0.0247	1.3	0.67	157.0	2.0	154.3	2.7	112.5	33.4	157.0	2.0	NA
-LC1 Spot 276	126	7085639	2.8	18.0429	2.0	0.1884	2.5	0.0247	1.4	0.57	157.1	2.2	175.2	4.0	428.4	45.1	157.1	2.2	NA
-LC1 Spot 279	306	8530118	2.8	16.0852	1.5	0.2114	1.8	0.0247	1.0	0.57	157.1	1.6	194.7	3.2	679.0	32.0	157.1	1.6	NA
-LC1 Spot 26	55	793184	3.8	13.5873	3.6	0.2503	3.9	0.0247	1.5	0.39	157.1	2.4	226.8	7.9	1029.6	72.6	157.1	2.4	NA
-LC1 Spot 167	216	1608826	4.3	18.5103	1.9	0.1838	2.2	0.0247	1.2	0.52	157.2	1.8	171.3	3.5	371.0	42.5	157.2	1.8	NA
-LC1 Spot 208	111	21145417	3.8	19.4785	2.4	0.1747	2.8	0.0247	1.4	0.50	157.2	2.2	163.5	4.2	255.0	55.4	157.2	2.2	NA

-LC1 Spot 171	69	2376379	2.6	20.2210	2.9	0.1683	3.2	0.0247	1.3	0.42	157.2	2.1	157.9	4.6	168.4	67.1	157.2	2.1	NA
-LC1 Spot 255	364	34768280	3.3	17.1531	2.4	0.1984	2.5	0.0247	0.9	0.36	157.2	1.4	183.8	4.3	540.0	51.6	157.2	1.4	NA
-LC1 Spot 298	1124	35772753	4.3	20.4755	1.0	0.1663	1.4	0.0247	1.1	0.74	157.3	1.7	156.2	2.1	139.1	22.4	157.3	1.7	NA
-LC1 Spot 249	62	1581675	3.0	13.7973	4.7	0.2470	4.9	0.0247	1.4	0.29	157.5	2.2	224.2	9.8	998.5	95.3	157.5	2.2	NA
-LC1 Spot 264	150	6751825	1.8	18.4235	2.2	0.1850	2.7	0.0247	1.5	0.58	157.5	2.4	172.4	4.2	381.6	49.0	157.5	2.4	NA
-LC1 Spot 206	89	1337479	3.0	21.2958	3.1	0.1601	3.4	0.0247	1.4	0.42	157.5	2.2	150.8	4.7	46.0	73.0	157.5	2.2	NA
-LC1 Spot 260	44	329019	4.1	17.7255	3.3	0.1923	3.7	0.0247	1.5	0.41	157.5	2.4	178.6	6.0	467.8	74.1	157.5	2.4	NA
-LC1 Spot 212	137	2550142	2.0	11.9379	3.1	0.2857	3.4	0.0248	1.4	0.42	157.6	2.2	255.2	7.8	1286.3	60.8	157.6	2.2	NA
-LC1 Spot 218	151	5913346	2.3	18.9207	2.3	0.1803	2.8	0.0248	1.6	0.57	157.6	2.4	168.3	4.3	321.5	51.7	157.6	2.4	NA
-LC1 Spot 39	437	4431268	1.9	15.0528	2.9	0.2268	3.2	0.0248	1.3	0.41	157.7	2.0	207.5	6.0	819.2	61.5	157.7	2.0	NA
-LC1 Spot 286	99	2231390	3.7	17.4938	2.1	0.1952	2.4	0.0248	1.3	0.53	157.8	2.0	181.0	4.1	496.9	45.8	157.8	2.0	NA
-LC1 Spot 246	96	1876733	3.6	19.1031	2.1	0.1789	2.5	0.0248	1.3	0.53	157.9	2.1	167.1	3.8	299.6	47.9	157.9	2.1	NA
-LC1 Spot 291	529	1674201	4.2	14.6401	5.2	0.2334	5.3	0.0248	1.1	0.20	157.9	1.7	213.0	10.2	877.0	107.4	157.9	1.7	NA
-LC1 Spot 74	322	7348311	1.4	19.2163	1.6	0.1779	1.9	0.0248	1.1	0.56	157.9	1.6	166.2	2.9	286.1	35.8	157.9	1.6	NA
-LC1 Spot 134	339	4669857	5.0	18.6128	1.7	0.1838	2.1	0.0248	1.2	0.57	158.1	1.9	171.3	3.4	358.6	39.3	158.1	1.9	NA
-LC1 Spot 191	143	1757963	3.5	13.8894	3.9	0.2466	4.0	0.0249	1.1	0.27	158.2	1.7	223.8	8.0	985.0	78.6	158.2	1.7	NA
-LC1 Spot 93	547	6277257	2.6	19.7598	1.1	0.1733	1.6	0.0249	1.2	0.75	158.2	1.9	162.3	2.4	222.0	25.1	158.2	1.9	NA
-LC1 Spot 79	158	6232907	2.2	17.5894	2.2	0.1949	2.4	0.0249	1.1	0.44	158.4	1.7	180.8	4.0	484.8	48.0	158.4	1.7	NA
-LC1 Spot 116	164	4639821	2.7	15.3640	3.0	0.2232	3.3	0.0249	1.3	0.38	158.5	2.0	204.6	6.1	776.2	64.0	158.5	2.0	NA
-LC1 Spot 192	62	1051758	3.3	16.1899	2.6	0.2120	3.0	0.0249	1.5	0.51	158.5	2.4	195.2	5.4	665.1	55.7	158.5	2.4	NA
-LC1 Spot 277	147	9251307	4.6	17.1419	2.2	0.2003	2.5	0.0249	1.1	0.44	158.6	1.7	185.4	4.2	541.5	48.8	158.6	1.7	NA
-LC1 Spot 280	28	516746	4.2	16.8327	5.0	0.2040	5.2	0.0249	1.5	0.28	158.7	2.3	188.5	9.0	581.1	109.2	158.7	2.3	NA
-LC1 Spot 131	58	668679	3.8	13.2207	5.8	0.2598	6.0	0.0249	1.7	0.28	158.7	2.7	234.5	12.6	1084.6	115.7	158.7	2.7	NA
-LC1 Spot 224	164	52323790	3.9	20.0220	2.0	0.1716	2.6	0.0249	1.6	0.62	158.8	2.5	160.8	3.8	191.4	47.3	158.8	2.5	NA
-LC1 Spot 73	63	11844054	3.0	13.2191	3.0	0.2601	3.3	0.0249	1.3	0.41	158.8	2.1	234.7	6.8	1084.9	59.7	158.8	2.1	NA
-LC1 Spot 88	159	6097090	3.4	19.5006	2.0	0.1764	2.2	0.0250	0.8	0.36	159.0	1.2	165.0	3.3	252.5	46.5	159.0	1.2	NA
-LC1 Spot 245	141	3064695	1.7	18.9664	1.7	0.1814	2.0	0.0250	1.1	0.57	159.0	1.8	169.3	3.1	316.0	37.6	159.0	1.8	NA
-LC1 Spot 66	361	65786967	4.4	18.0181	1.9	0.1911	2.1	0.0250	1.0	0.47	159.1	1.6	177.6	3.5	431.4	41.9	159.1	1.6	NA
-LC1 Spot 6	441	19135899	4.3	18.5984	1.5	0.1852	2.0	0.0250	1.4	0.68	159.1	2.1	172.5	3.2	360.3	32.9	159.1	2.1	NA
-LC1 Spot 228	208	3366649	2.1	12.2459	4.5	0.2816	4.7	0.0250	1.2	0.26	159.3	1.9	251.9	10.4	1236.5	88.6	159.3	1.9	NA
-LC1 Spot 185	111	2151928	4.0	15.2952	2.6	0.2255	3.0	0.0250	1.5	0.52	159.3	2.4	206.5	5.6	785.7	53.9	159.3	2.4	NA
-LC1 Spot 9	290	392398726	4.0	17.8540	1.4	0.1932	1.6	0.0250	0.8	0.50	159.4	1.3	179.4	2.7	451.8	31.8	159.4	1.3	NA
-LC1 Spot 96	170	4075275	3.8	16.2414	2.8	0.2124	3.1	0.0250	1.2	0.38	159.4	1.8	195.6	5.4	658.3	60.6	159.4	1.8	NA
-LC1 Spot 37	282	1456295	3.6	12.3776	4.6	0.2788	4.8	0.0250	1.2	0.24	159.4	1.8	249.7	10.6	1215.5	91.0	159.4	1.8	NA
-LC1 Spot 52	603	12627823	4.5	20.3543	1.0	0.1696	1.6	0.0250	1.2	0.77	159.5	1.9	159.1	2.3	153.0	23.3	159.5	1.9	NA
-LC1 Spot 60	78	2090065	2.4	11.4483	8.2	0.3016	8.4	0.0251	2.0	0.24	159.5	3.2	267.7	19.8	1367.4	157.4	159.5	3.2	NA
-LC1 Spot 293	215	11013315	1.3	18.4117	1.8	0.1876	2.2	0.0251	1.3	0.58	159.6	2.0	174.6	3.6	383.1	40.9	159.6	2.0	NA
-LC1 Spot 203	238	2263749	4.5	11.5238	6.9	0.2998	7.3	0.0251	2.3	0.31	159.6	3.6	266.3	17.1	1354.7	133.9	159.6	3.6	NA
-LC1 Spot 300	54	2558837	3.5	19.7288	3.7	0.1753	4.1	0.0251	1.7	0.41	159.8	2.7	164.0	6.2	225.6	85.9	159.8	2.7	NA
-LC1 Spot 53	408	6827676	3.7	18.1234	1.2	0.1908	1.6	0.0251	1.1	0.67	159.8	1.7	177.3	2.6	418.4	26.8	159.8	1.7	NA
-LC1 Spot 129	67	1911503	3.7	20.5994	2.2	0.1681	2.7	0.0251	1.5	0.56	160.0	2.4	157.8	3.9	124.9	52.4	160.0	2.4	NA
-LC1 Spot 97	47	1588671	4.1	12.0749	3.6	0.2870	4.1	0.0251	1.8	0.44	160.1	2.8	256.2	9.2	1264.1	71.2	160.1	2.8	NA
-LC1 Spot 61	365	39840702	4.9	19.3533	1.3	0.1791	1.8	0.0252	1.3	0.72	160.1	2.0	167.3	2.8	269.8	28.8	160.1	2.0	NA
-LC1 Spot 130	320	2956961	2.8	18.9484	1.4	0.1830	1.8	0.0252	1.1	0.62	160.2	1.8	170.6	2.9	318.1	32.3	160.2	1.8	NA
-LC1 Spot 275	108	2487552	2.7	18.5646	2.1	0.1868	2.4	0.0252	1.2	0.51	160.2	2.0	173.9	3.9	364.5	47.1	160.2	2.0	NA
-LC1 Spot 64	484	3262384	4.7	17.6137	1.6	0.1969	1.9	0.0252	1.1	0.58	160.2	1.8	182.5	3.2	481.8	34.9	160.2	1.8	NA
-LC1 Spot 54	115	10194360	2.8	10.3524	7.7	0.3350	7.8	0.0252	1.1	0.15	160.2	1.8	293.4	19.8	1558.6	144.1	160.2	1.8	NA

-LC1 Spot 213	194	4341663	3.9	20.3023	1.7	0.1711	2.3	0.0252	1.6	0.69	160.4	2.5	160.3	3.4	159.0	38.7	160.4	2.5	NA
-LC1 Spot 159	135	1709938002	3.0	17.0184	2.2	0.2041	2.6	0.0252	1.4	0.54	160.4	2.3	188.6	4.5	557.2	48.1	160.4	2.3	NA
-LC1 Spot 30	356	8786612	2.6	19.3296	1.4	0.1798	1.8	0.0252	1.1	0.64	160.5	1.8	167.8	2.8	272.7	31.5	160.5	1.8	NA
-LC1 Spot 145	85	3010676	4.2	18.5036	2.0	0.1878	2.6	0.0252	1.6	0.62	160.5	2.6	174.8	4.2	371.9	45.5	160.5	2.6	NA
-LC1 Spot 259	51	968108	3.0	11.3979	4.1	0.3050	4.3	0.0252	1.4	0.32	160.6	2.2	270.3	10.3	1375.8	79.1	160.6	2.2	NA
-LC1 Spot 309	171	1897161	3.9	20.0996	1.8	0.1730	2.3	0.0252	1.5	0.66	160.6	2.5	162.0	3.5	182.4	40.8	160.6	2.5	NA
-LC1 Spot 158	221	1716854	3.9	16.9204	1.5	0.2055	1.9	0.0252	1.1	0.60	160.6	1.8	189.8	3.3	569.8	33.2	160.6	1.8	NA
-LC1 Spot 211	102	1019851	3.1	17.7307	3.0	0.1962	3.3	0.0252	1.4	0.43	160.7	2.3	181.9	5.6	467.2	66.9	160.7	2.3	NA
-LC1 Spot 234	121	1597417	3.2	16.9230	2.2	0.2058	2.6	0.0253	1.3	0.49	160.9	2.0	190.0	4.4	569.5	48.8	160.9	2.0	NA
-LC1 Spot 103	299	4814298	3.9	19.7850	1.7	0.1764	2.2	0.0253	1.4	0.63	161.2	2.2	164.9	3.3	219.1	39.3	161.2	2.2	NA
-LC1 Spot 196	43	23227637	3.6	11.7147	4.4	0.2979	4.7	0.0253	1.7	0.37	161.2	2.8	264.8	11.0	1322.9	85.3	161.2	2.8	NA
-LC1 Spot 87	163	3609943	2.5	20.1698	1.9	0.1730	2.4	0.0253	1.4	0.59	161.2	2.2	162.0	3.6	174.3	44.6	161.2	2.2	NA
-LC1 Spot 266	225	3188172	2.7	14.0732	3.6	0.2481	3.8	0.0253	1.1	0.30	161.3	1.8	225.0	7.6	958.2	74.0	161.3	1.8	NA
-LC1 Spot 77	52	424399	4.9	11.1036	6.3	0.3150	6.4	0.0254	1.3	0.20	161.6	2.1	278.1	15.6	1426.0	120.2	161.6	2.1	NA
-LC1 Spot 170	113	4161555	4.2	14.5713	3.5	0.2403	3.7	0.0254	1.2	0.33	161.8	2.0	218.7	7.4	886.7	72.9	161.8	2.0	NA
-LC1 Spot 152	180	1340151	2.5	15.4319	2.7	0.2271	2.9	0.0254	1.0	0.35	161.9	1.6	207.8	5.4	766.9	56.9	161.9	1.6	NA
-LC1 Spot 194	209	4602130	5.1	19.4739	1.7	0.1800	2.5	0.0254	1.9	0.74	161.9	3.0	168.1	3.9	255.6	39.0	161.9	3.0	NA
-LC1 Spot 273	121	2675753	2.5	11.6450	3.1	0.3011	3.3	0.0254	1.2	0.37	161.9	2.0	267.2	7.8	1334.5	59.5	161.9	2.0	NA
-LC1 Spot 281	218	5560009	4.0	19.6467	2.1	0.1785	2.5	0.0254	1.4	0.54	162.0	2.2	166.8	3.9	235.3	49.1	162.0	2.2	NA
-LC1 Spot 179	582	28941735	3.7	20.0820	1.2	0.1747	1.6	0.0255	1.1	0.70	162.0	1.8	163.5	2.4	184.4	26.8	162.0	1.8	NA
-LC1 Spot 223	385	4097824	1.5	18.6219	1.3	0.1884	1.5	0.0255	0.9	0.57	162.1	1.4	175.3	2.5	357.5	28.3	162.1	1.4	NA
-LC1 Spot 107	180	3053751	3.5	16.6633	3.0	0.2112	3.3	0.0255	1.4	0.42	162.5	2.2	194.5	5.8	603.1	64.8	162.5	2.2	NA
-LC1 Spot 56	42	669691	3.6	13.9900	4.5	0.2516	4.7	0.0255	1.3	0.28	162.5	2.1	227.8	9.5	970.2	91.5	162.5	2.1	NA
-LC1 Spot 41	362	3309886	3.2	18.1158	2.5	0.1945	2.9	0.0256	1.3	0.47	162.7	2.2	180.4	4.7	419.4	56.6	162.7	2.2	NA
-LC1 Spot 239	124	12237967	3.3	16.7397	2.7	0.2107	3.0	0.0256	1.2	0.42	162.9	2.0	194.1	5.3	593.2	58.8	162.9	2.0	NA
-LC1 Spot 269	110	557822	3.2	18.0979	2.0	0.1951	2.5	0.0256	1.5	0.60	163.0	2.4	180.9	4.2	421.6	45.4	163.0	2.4	NA
-LC1 Spot 146	47	1987325	3.2	15.8487	3.0	0.2228	3.5	0.0256	1.7	0.50	163.1	2.8	204.2	6.5	710.5	64.4	163.1	2.8	NA
-LC1 Spot 180	693	7834221	4.8	20.5061	1.0	0.1724	1.7	0.0256	1.3	0.79	163.3	2.1	161.5	2.5	135.6	24.1	163.3	2.1	NA
-LC1 Spot 151	24	11738309	3.9	13.0132	5.2	0.2721	5.5	0.0257	1.7	0.32	163.5	2.8	244.4	12.0	1116.3	104.4	163.5	2.8	NA
-LC1 Spot 3	95	2106280	2.8	15.7844	2.3	0.2246	2.6	0.0257	1.3	0.48	163.8	2.0	205.8	4.9	719.2	48.5	163.8	2.0	NA
-LC1 Spot 261	52	7553118	5.4	10.8238	7.3	0.3277	7.5	0.0257	1.7	0.23	163.8	2.8	287.8	18.8	1474.6	138.6	163.8	2.8	NA
-LC1 Spot 176	27	639174	4.2	9.3488	6.4	0.3801	6.7	0.0258	1.9	0.29	164.1	3.1	327.1	18.8	1747.5	117.8	164.1	3.1	NA
-LC1 Spot 80	71	1669831	2.8	13.1775	5.8	0.2698	6.0	0.0258	1.5	0.25	164.2	2.5	242.5	12.8	1091.2	115.4	164.2	2.5	NA
-LC1 Spot 137	450	5411258	1.6	19.0582	1.2	0.1867	1.7	0.0258	1.2	0.69	164.3	1.9	173.8	2.7	305.0	27.9	164.3	1.9	NA
-LC1 Spot 125	23	292731	5.3	11.8036	5.7	0.3017	6.0	0.0258	1.9	0.31	164.4	3.0	267.7	14.1	1308.3	110.3	164.4	3.0	NA
-LC1 Spot 148	298	9513036	5.8	19.5103	1.3	0.1830	1.8	0.0259	1.2	0.68	164.8	2.0	170.6	2.8	251.3	29.6	164.8	2.0	NA
-LC1 Spot 241	74	860963	3.3	16.1086	3.3	0.2220	3.6	0.0259	1.4	0.39	165.1	2.3	203.6	6.7	675.9	71.2	165.1	2.3	NA
-LC1 Spot 0	219	2625909	3.6	16.7604	2.1	0.2137	2.6	0.0260	1.5	0.58	165.4	2.4	196.7	4.6	590.5	45.9	165.4	2.4	NA
-LC1 Spot 184	169	1797493	3.0	17.8037	1.9	0.2013	2.4	0.0260	1.5	0.61	165.5	2.4	186.2	4.1	458.0	41.9	165.5	2.4	NA
-LC1 Spot 268	178	12808332	3.0	18.5107	1.8	0.1936	2.2	0.0260	1.3	0.57	165.5	2.1	179.7	3.6	371.0	40.9	165.5	2.1	NA
-LC1 Spot 257	123	3928144	4.4	10.7805	3.8	0.3329	4.1	0.0260	1.4	0.33	165.7	2.2	291.8	10.3	1482.1	72.6	165.7	2.2	NA
-LC1 Spot 270	526	5420959	3.2	18.2865	1.7	0.1963	1.9	0.0260	1.0	0.52	165.8	1.6	182.0	3.2	398.4	37.2	165.8	1.6	NA
-LC1 Spot 200	358	4078130	3.5	18.7159	1.1	0.1921	1.9	0.0261	1.6	0.81	166.0	2.6	178.4	3.2	346.1	25.7	166.0	2.6	NA
-LC1 Spot 253	259	3534581	2.8	18.6048	1.5	0.1933	1.9	0.0261	1.1	0.57	166.1	1.7	179.4	3.1	359.6	34.9	166.1	1.7	NA
-LC1 Spot 147	89	919607	3.0	12.3517	4.1	0.2914	4.3	0.0261	1.4	0.32	166.2	2.3	259.7	10.0	1219.6	81.0	166.2	2.3	NA
-LC1 Spot 128	166	86334102	3.0	18.9556	1.6	0.1900	2.3	0.0261	1.7	0.73	166.3	2.8	176.7	3.7	317.3	36.1	166.3	2.8	NA
-LC1 Spot 89	136	6657444	5.8	14.6464	2.9	0.2461	3.2	0.0262	1.2	0.39	166.4	2.0	223.4	6.4	876.1	60.5	166.4	2.0	NA

-LC1 Spot 86	797	7632486	1.8	19.8750	0.9	0.1814	1.2	0.0262	0.8	0.68	166.5	1.4	169.2	1.9	208.6	21.1	166.5	1.4	NA
-LC1 Spot 290	351	7075036	3.1	16.9654	2.0	0.2125	2.4	0.0262	1.3	0.54	166.5	2.1	195.7	4.3	564.0	44.0	166.5	2.1	NA
-LC1 Spot 140	44	3497735	5.8	19.2303	3.4	0.1881	3.9	0.0262	1.9	0.48	167.0	3.1	175.0	6.2	284.5	78.2	167.0	3.1	NA
-LC1 Spot 263	215	5558125	1.5	15.3041	3.6	0.2373	3.8	0.0264	1.3	0.35	167.7	2.2	216.2	7.4	784.4	74.8	167.7	2.2	NA
-LC1 Spot 267	85	1827455	3.3	13.8300	3.7	0.2632	4.0	0.0264	1.4	0.36	168.0	2.4	237.2	8.4	993.7	75.6	168.0	2.4	NA
-LC1 Spot 11	332	883984	2.7	10.5978	3.3	0.3441	3.5	0.0265	1.2	0.35	168.4	2.1	300.3	9.1	1514.5	61.9	168.4	2.1	NA
-LC1 Spot 181	72	472358	3.9	9.0018	7.3	0.4059	7.5	0.0265	1.9	0.25	168.7	3.1	345.9	22.1	1816.5	132.8	168.7	3.1	NA
-LC1 Spot 217	276	32344448	3.0	15.5556	2.4	0.2351	2.7	0.0265	1.3	0.46	168.8	2.1	214.4	5.3	750.1	51.0	168.8	2.1	NA
-LC1 Spot 243	161	3501546	3.5	11.3170	4.8	0.3246	4.9	0.0267	1.3	0.27	169.6	2.2	285.4	12.3	1389.5	91.3	169.6	2.2	NA
-LC1 Spot 2	125	1520143	3.9	16.5263	3.4	0.2224	3.7	0.0267	1.5	0.39	169.7	2.4	203.9	6.9	620.9	73.9	169.7	2.4	NA
-LC1 Spot 186	24	415704	3.8	9.4117	6.2	0.3912	6.4	0.0267	1.7	0.26	169.9	2.8	335.2	18.4	1735.2	114.1	169.9	2.8	NA
-LC1 Spot 288	100	1198952	6.0	11.7865	6.7	0.3124	7.0	0.0267	2.0	0.29	170.0	3.4	276.0	17.0	1311.1	130.6	170.0	3.4	NA
-LC1 Spot 109	118	4229366	4.0	17.6748	2.3	0.2090	2.6	0.0268	1.2	0.45	170.5	2.0	192.7	4.5	474.1	50.5	170.5	2.0	NA
-LC1 Spot 294	105	1305342	2.9	9.0354	3.8	0.4096	3.9	0.0269	1.1	0.28	170.8	1.8	348.6	11.6	1809.7	68.7	170.8	1.8	NA
-LC1 Spot 297	79	437490	4.2	10.6652	5.4	0.3471	5.5	0.0269	1.3	0.24	170.8	2.2	302.5	14.5	1502.5	101.8	170.8	2.2	NA
-LC1 Spot 282	36	360435	4.9	11.0911	5.0	0.3352	5.4	0.0270	2.2	0.41	171.6	3.8	293.5	13.9	1428.1	94.8	171.6	3.8	NA
-LC1 Spot 169	110	53849772	2.9	12.6760	5.9	0.2935	6.0	0.0270	1.1	0.18	171.7	1.9	261.3	13.8	1168.5	116.7	171.7	1.9	NA
-LC1 Spot 144	42	325726	4.7	6.8607	5.2	0.5429	5.7	0.0270	2.5	0.43	171.9	4.2	440.3	20.5	2296.0	89.4	171.9	4.2	NA
-LC1 Spot 58	127	8733646	2.3	18.6471	1.5	0.2020	1.9	0.0273	1.0	0.56	173.8	1.8	186.8	3.2	354.5	34.8	173.8	1.8	NA
-LC1 Spot 232	37	486282	5.5	9.1429	9.4	0.4122	9.6	0.0273	1.8	0.19	173.9	3.1	350.4	28.4	1788.2	171.7	173.9	3.1	NA
-LC1 Spot 304	50	378280	4.6	9.7957	7.7	0.3850	7.9	0.0274	2.0	0.25	174.0	3.5	330.7	22.4	1661.6	142.4	174.0	3.5	NA
-LC1 Spot 209	126	1431299	2.6	18.2706	1.7	0.2077	2.2	0.0275	1.3	0.60	175.1	2.2	191.6	3.8	400.3	38.7	175.1	2.2	NA
-LC1 Spot 164	34	267435	4.4	7.4719	13.8	0.5112	14.1	0.0277	2.8	0.20	176.2	4.9	419.2	48.5	2148.1	242.5	176.2	4.9	NA
-LC1 Spot 139	173	589415	3.2	7.7331	9.3	0.4947	9.5	0.0278	2.0	0.21	176.5	3.5	408.1	32.0	2087.9	164.0	176.5	3.5	NA
-LC1 Spot 120	104	912015	3.0	9.0439	4.3	0.4236	4.5	0.0278	1.5	0.33	176.8	2.6	358.6	13.6	1808.0	77.4	176.8	2.6	NA
-LC1 Spot 244	131	3317903	2.0	16.3829	2.8	0.2359	3.1	0.0280	1.4	0.45	178.3	2.5	215.1	6.1	639.7	60.2	178.3	2.5	NA
-LC1 Spot 63	29	1992921	3.9	7.4708	3.7	0.5276	4.4	0.0286	2.3	0.54	181.8	4.2	430.2	15.4	2148.4	64.7	181.8	4.2	NA
-LC1 Spot 156	24	2263588	4.7	6.6183	6.5	0.6019	7.1	0.0289	2.9	0.41	183.7	5.2	478.4	27.1	2357.6	111.0	183.7	5.2	NA
-LC1 Spot 102	19	25180161	5.4	3.8707	16.7	1.0922	17.1	0.0307	3.5	0.21	194.8	6.7	749.6	90.7	3236.0	265.5	194.8	6.7	NA
-LC1 Spot 122	75	290110	3.4	4.5445	4.7	0.9680	5.3	0.0319	2.5	0.46	202.5	4.9	687.4	26.6	2980.3	75.9	202.5	4.9	NA
-LC1 Spot 85	80	30304920	2.2	17.1891	1.6	0.3716	1.8	0.0464	0.9	0.50	292.1	2.6	320.9	5.0	535.5	34.5	292.1	2.6	NA
-LC1 Spot 126	254	5313574	2.6	17.2777	1.4	0.3763	1.9	0.0472	1.2	0.63	297.2	3.4	324.3	5.2	524.2	31.6	297.2	3.4	NA
-LC1 Spot 254	237	16591555	2.3	18.6626	1.3	0.3537	1.7	0.0479	1.1	0.66	301.6	3.4	307.5	4.6	352.6	29.5	301.6	3.4	NA
-LC1 Spot 220	164	3806427	2.1	18.1383	1.3	0.3665	2.0	0.0482	1.4	0.73	303.7	4.2	317.1	5.3	416.6	29.9	303.7	4.2	NA
-LC1 Spot 247	95	93560580	2.8	13.1284	4.6	0.6473	5.6	0.0617	3.2	0.57	385.7	11.9	506.8	22.3	1098.7	92.3	385.7	11.9	NA
-LC1 Spot 229	92	2280903	3.4	17.3491	1.5	0.5551	1.9	0.0699	1.2	0.64	435.4	5.2	448.3	7.0	515.1	32.6	435.4	5.2	84.5

Wellesly Mountain Formation – WM1-COMP

						Isotope ratios						Apparent ages (Ma)							
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
WM1-COMP (Wellesly Mountain formation)																			
RIDGWAY_WM-1_14 <>	735	31222	1.4	20.7529	3.0	0.1307	3.2	0.0197	1.1	0.34	125.6	1.4	124.7	3.8	108.4	71.9	125.6	1.4	NA
WM1-COMP-9	234	11509	2.2	19.8184	19.7	0.1430	20.5	0.0205	5.8	0.28	131.1	7.5	135.7	26.1	216.1	459.9	131.1	7.5	NA
RIDGWAY_WM-1_46 <>	466	31884	3.4	21.2115	7.6	0.1342	7.7	0.0206	1.6	0.20	131.7	2.0	127.8	9.3	56.5	180.3	131.7	2.0	NA
WM1-COMP-42	171	12276	3.4	18.9121	20.4	0.1651	21.8	0.0226	7.6	0.35	144.3	10.8	155.1	31.4	323.5	468.7	144.3	10.8	NA
WM1-COMP-72	75	4490	1.3	-9.8085	508.7	-0.3191	508.8	0.0227	11.1	0.02	144.7	15.9	-390.2	#NUM!	0.0	883.4	144.7	15.9	NA
WM1-COMP-108	763	5166	1.3	20.2152	6.7	0.1562	6.9	0.0229	1.5	0.21	146.0	2.1	147.4	9.4	170.0	156.6	146.0	2.1	NA
WM1-COMP-82	317	11836	3.2	20.1054	16.1	0.1619	17.0	0.0236	5.3	0.31	150.4	7.9	152.3	24.0	182.7	377.9	150.4	7.9	NA
WM1-COMP-78	1532	68850	2.1	20.2614	2.6	0.1642	5.9	0.0241	5.3	0.90	153.7	8.1	154.4	8.5	164.7	60.6	153.7	8.1	NA
RIDGWAY_WM-1_41 <>	123	780	0.5	20.8208	21.5	0.1606	21.9	0.0243	4.1	0.19	154.5	6.2	151.3	30.8	100.7	514.4	154.5	6.2	NA
WM1-COMP-15	283	23931	1.4	21.5213	12.8	0.1568	15.3	0.0245	8.5	0.56	155.8	13.1	147.9	21.1	21.8	307.3	155.8	13.1	NA
WM1-COMP-103	206	8295	2.5	21.3712	18.2	0.1605	20.0	0.0249	8.4	0.42	158.4	13.1	151.1	28.1	38.6	437.9	158.4	13.1	NA
WM1-COMP-77	306	19695	2.7	20.5618	11.1	0.1678	14.5	0.0250	9.4	0.64	159.3	14.8	157.5	21.2	130.2	262.3	159.3	14.8	NA
WM1-COMP-81	56	2233	2.5	15.8565	57.0	0.2179	57.5	0.0251	8.2	0.14	159.5	12.9	200.2	104.9	710.4	1322.5	159.5	12.9	NA
WM1-COMP-62	372	10883	1.4	21.9216	9.3	0.1607	13.6	0.0255	9.9	0.73	162.6	15.9	151.3	19.1	-22.6	226.3	162.6	15.9	NA
WM1-COMP-51	116	3628	2.2	20.0653	32.4	0.1774	33.9	0.0258	10.0	0.30	164.3	16.3	165.8	52.0	187.4	772.6	164.3	16.3	NA
WM1-COMP-101	338	15808	1.8	19.6256	8.2	0.1818	11.6	0.0259	8.2	0.71	164.7	13.3	169.6	18.2	238.7	190.2	164.7	13.3	NA
WM1-COMP-40	361	10966	3.8	21.5674	10.4	0.1671	18.0	0.0261	14.6	0.82	166.3	24.0	156.9	26.1	16.7	250.3	166.3	24.0	NA
WM1-COMP-48	67	3273	4.2	18.1267	64.0	0.2000	65.6	0.0263	14.4	0.22	167.3	23.8	185.1	111.4	419.0	1601.0	167.3	23.8	NA
WM1-COMP-14	488	31919	3.4	19.7418	7.8	0.1842	8.1	0.0264	2.1	0.26	167.8	3.4	171.6	12.8	225.1	180.7	167.8	3.4	NA
WM1-COMP-90	966	64012	1.6	19.7734	4.2	0.1840	12.7	0.0264	12.0	0.94	167.9	19.8	171.5	20.0	221.4	97.8	167.9	19.8	NA
WM1-COMP-83	140	4506	2.6	22.1742	15.0	0.1650	18.4	0.0265	10.8	0.58	168.9	17.9	155.1	26.5	-50.4	365.6	168.9	17.9	NA
RIDGWAY_WM-1_45 <>	215	47053	5.3	18.6836	6.1	0.1961	6.5	0.0266	2.1	0.33	169.0	3.6	181.8	10.8	351.0	138.6	169.0	3.6	NA
WM1-COMP-30	355	15751	1.9	20.1739	10.4	0.1833	11.7	0.0268	5.4	0.46	170.6	9.1	170.9	18.4	174.8	243.0	170.6	9.1	NA
WM1-COMP-68	163	30701	3.7	21.3763	27.9	0.1733	30.0	0.0269	11.0	0.37	170.9	18.6	162.3	45.0	38.0	677.9	170.9	18.6	NA
RIDGWAY_WM-1_21 <>	812	56283	2.4	20.4206	2.7	0.1818	2.9	0.0269	1.0	0.35	171.3	1.7	169.6	4.5	146.4	63.5	171.3	1.7	NA
WM1-COMP-50	164	8044	5.0	19.5675	26.0	0.1897	27.6	0.0269	9.2	0.33	171.3	15.5	176.4	44.6	245.6	607.6	171.3	15.5	NA
RIDGWAY_WM-1_15 <>	109	5689	1.7	19.4894	24.3	0.1938	24.3	0.0274	1.5	0.06	174.2	2.6	179.9	40.1	254.8	565.6	174.2	2.6	NA
WM1-COMP-38	488	19626	2.1	21.9996	11.8	0.1720	15.8	0.0274	10.5	0.67	174.5	18.1	161.2	23.5	-31.2	285.7	174.5	18.1	NA
WM1-COMP-111	519	23644	4.1	16.2956	17.2	0.2332	20.6	0.0276	11.3	0.55	175.3	19.6	212.9	39.6	652.1	371.9	175.3	19.6	NA
WM1-COMP-19	390	37537	5.0	20.2526	9.0	0.1882	9.3	0.0276	2.2	0.24	175.8	3.9	175.1	14.9	165.7	210.7	175.8	3.9	NA
WM1-COMP-89	111	4253	3.3	24.8253	58.3	0.1539	58.8	0.0277	7.8	0.13	176.2	13.6	145.3	79.8	-332.9	1627.0	176.2	13.6	NA
WM1-COMP-67	197	17044	2.2	22.3639	24.9	0.1710	27.6	0.0277	11.8	0.43	176.3	20.5	160.3	40.9	-71.1	617.3	176.3	20.5	NA
WM1-COMP-5	287	31136	2.5	21.9516	15.9	0.1749	16.3	0.0279	3.3	0.20	177.1	5.8	163.7	24.6	-25.9	388.1	177.1	5.8	NA
WM1-COMP-59	135	3651	2.7	25.2295	55.8	0.1523	56.6	0.0279	9.6	0.17	177.1	16.7	143.9	76.1	-374.6	1558.2	177.1	16.7	NA
WM1-COMP-65	211	9725	2.3	19.8963	18.2	0.1969	24.0	0.0284	15.7	0.65	180.6	27.9	182.5	40.1	207.1	425.2	180.6	27.9	NA
WM1-COMP-13	298	23132	2.1	19.8528	7.5	0.1977	8.0	0.0285	2.5	0.32	181.0	4.5	183.2	13.4	212.1	175.1	181.0	4.5	NA
WM1-COMP-27	335	16235	2.1	21.3557	10.0	0.1841	10.2	0.0285	2.1	0.21	181.2	3.8	171.6	16.1	40.4	238.8	181.2	3.8	NA
RIDGWAY_WM-1_40 <>	602	48739	1.9	19.8405	3.4	0.1984	4.2	0.0286	2.5	0.59	181.5	4.4	183.8	7.0	213.6	77.7	181.5	4.4	NA
WM1-COMP-10	250	26439	1.4	19.1015	12.2	0.2068	12.6	0.0286	3.3	0.26	182.1	6.0	190.9	21.9	300.8	278.0	182.1	6.0	NA
WM1-COMP-74	535	34239	2.8	20.0693	8.1	0.1972	18.6	0.0287	16.8	0.90	182.5	30.2	182.8	31.1	186.9	188.6	182.5	30.2	NA
RIDGWAY_WM-1_31 <>	297	25456	1.8	21.2381	5.3	0.1872	7.2	0.0288	4.9	0.68	183.2	8.8	174.2	11.6	53.6	127.1	183.2	8.8	NA

WM1-COMP-86	166	6877	3.1	18.9697	17.2	0.2097	20.5	0.0288	11.1	0.54	183.3	20.1	193.3	36.0	316.6	392.5	183.3	20.1	NA
WM1-COMP-3	427	21937	2.1	20.1475	7.6	0.1977	8.4	0.0289	3.7	0.44	183.6	6.7	183.2	14.1	177.9	176.4	183.6	6.7	NA
RIDGWAY_WM-1_49 <>	425	33564	2.3	19.1880	5.7	0.2079	5.8	0.0289	1.4	0.23	183.9	2.5	191.8	10.2	290.5	129.8	183.9	2.5	NA
WM1-COMP-52	310	16300	2.4	20.4398	15.3	0.1952	20.0	0.0289	12.9	0.64	183.9	23.3	181.1	33.2	144.2	360.9	183.9	23.3	NA
WM1-COMP-116	197	7458	2.2	23.0666	14.9	0.1730	19.0	0.0289	11.7	0.62	183.9	21.3	162.0	28.4	-147.3	371.6	183.9	21.3	NA
RIDGWAY_WM-1_12 <>	430	20661	2.0	19.3356	2.8	0.2073	3.0	0.0291	1.1	0.36	184.7	2.0	191.3	5.2	272.9	63.1	184.7	2.0	NA
WM1-COMP-16	303	17482	1.8	20.6799	12.1	0.1945	12.6	0.0292	3.4	0.27	185.4	6.3	180.5	20.8	116.7	285.8	185.4	6.3	NA
WM1-COMP-71	210	5939	2.2	23.4390	20.1	0.1717	22.5	0.0292	10.2	0.45	185.4	18.7	160.9	33.5	-187.2	505.7	185.4	18.7	NA
WM1-COMP-96	445	23442	3.2	21.6479	8.1	0.1859	10.4	0.0292	6.6	0.63	185.5	12.0	173.1	16.6	7.7	194.7	185.5	12.0	NA
WM1-COMP-47	351	11734	2.7	19.7594	9.2	0.2040	14.8	0.0292	11.5	0.78	185.8	21.1	188.5	25.4	223.0	214.0	185.8	21.1	NA
WM1-COMP-49	193	9742	2.3	27.9219	28.2	0.1444	29.6	0.0292	9.0	0.30	185.8	16.4	137.0	37.9	-645.1	786.8	185.8	16.4	NA
WM1-COMP-35	399	38607	1.6	21.1725	8.4	0.1905	9.0	0.0293	3.2	0.35	185.9	5.8	177.0	14.6	60.9	200.6	185.9	5.8	NA
WM1-COMP-20	201	6759	3.9	20.9056	11.9	0.1930	18.6	0.0293	14.3	0.77	185.9	26.2	179.2	30.5	91.1	282.3	185.9	26.2	NA
RIDGWAY_WM-1_2 <>	418	26414	1.8	20.3656	5.5	0.1990	5.7	0.0294	1.2	0.22	186.7	2.2	184.3	9.6	152.7	129.9	186.7	2.2	NA
RIDGWAY_WM-1_35 <>	246	29949	2.5	18.8745	5.7	0.2148	6.0	0.0294	1.6	0.27	186.9	3.0	197.6	10.7	328.0	130.5	186.9	3.0	NA
RIDGWAY_WM-1_24 <>	745	46961	1.2	20.0680	2.1	0.2024	2.3	0.0295	0.8	0.35	187.2	1.5	187.2	3.9	187.1	49.7	187.2	1.5	NA
RIDGWAY_WM-1_16 <>	454	28682	1.7	19.5219	4.9	0.2083	5.2	0.0295	1.7	0.32	187.4	3.1	192.1	9.1	250.9	113.6	187.4	3.1	NA
RIDGWAY_WM-1_29 <>	206	20390	2.2	19.0472	7.3	0.2137	7.7	0.0295	2.4	0.31	187.6	4.5	196.7	13.7	307.3	165.8	187.6	4.5	NA
WM1-COMP-22	418	28474	1.4	20.0394	7.1	0.2032	7.9	0.0295	3.4	0.43	187.7	6.3	187.9	13.6	190.4	166.0	187.7	6.3	NA
WM1-COMP-100	248	10851	2.8	20.1077	13.2	0.2029	17.7	0.0296	11.8	0.67	187.9	21.8	187.5	30.3	182.5	307.8	187.9	21.8	NA
WM1-COMP-7	505	68860	2.4	20.1945	4.6	0.2020	5.6	0.0296	3.1	0.56	188.0	5.8	186.9	9.5	172.4	108.3	188.0	5.8	NA
RIDGWAY_WM-1_38 <>	414	58838	2.2	20.4593	4.9	0.1999	5.1	0.0297	1.7	0.32	188.5	3.1	185.1	8.7	142.0	114.2	188.5	3.1	NA
WM1-COMP-21	247	9637	2.6	21.2909	11.7	0.1924	12.5	0.0297	4.3	0.34	188.7	7.9	178.7	20.4	47.6	280.8	188.7	7.9	NA
WM1-COMP-88	339	24906	1.4	21.3605	10.8	0.1920	13.9	0.0297	8.8	0.63	188.9	16.4	178.3	22.8	39.8	258.4	188.9	16.4	NA
RIDGWAY_WM-1_11 <>	544	43480	2.0	19.4496	2.3	0.2108	2.5	0.0297	1.1	0.44	188.9	2.1	194.3	4.5	259.5	52.0	188.9	2.1	NA
RIDGWAY_WM-1_22 <>	289	27733	2.1	20.2165	9.1	0.2033	9.2	0.0298	1.2	0.13	189.4	2.2	187.9	15.8	169.9	213.7	189.4	2.2	NA
RIDGWAY_WM-1_9 <>	280	15261	2.3	20.8897	6.6	0.1970	7.1	0.0298	2.5	0.35	189.6	4.7	182.6	11.8	92.9	156.7	189.6	4.7	NA
WM1-COMP-54	264	11801	2.1	23.6398	26.8	0.1742	29.1	0.0299	11.3	0.39	189.7	21.1	163.1	43.8	-208.5	682.8	189.7	21.1	NA
WM1-COMP-95	265	10710	2.5	20.7651	26.0	0.1993	28.0	0.0300	10.2	0.37	190.7	19.2	184.5	47.2	107.0	623.7	190.7	19.2	NA
RIDGWAY_WM-1_34 <>	229	13833	1.5	19.5597	4.5	0.2124	4.8	0.0301	1.7	0.35	191.3	3.1	195.5	8.5	246.5	103.7	191.3	3.1	NA
RIDGWAY_WM-1_50 <>	334	44490	3.9	19.9692	7.7	0.2085	8.9	0.0302	4.4	0.49	191.7	8.3	192.3	15.5	198.6	179.2	191.7	8.3	NA
WM1-COMP-33	319	17069	1.7	19.9853	8.6	0.2087	9.2	0.0302	3.2	0.35	192.1	6.0	192.4	16.1	196.7	200.0	192.1	6.0	NA
WM1-COMP-26	276	21379	1.1	20.5581	10.2	0.2049	10.6	0.0306	3.0	0.28	194.0	5.7	189.3	18.3	130.7	240.2	194.0	5.7	NA
WM1-COMP-94	375	46549	2.0	20.2348	10.8	0.2102	15.5	0.0309	11.0	0.71	195.9	21.3	193.7	27.3	167.8	253.7	195.9	21.3	NA
WM1-COMP-18	167	11094	2.1	23.5251	22.5	0.1809	23.0	0.0309	4.7	0.20	196.0	9.0	168.8	35.7	-196.3	568.7	196.0	9.0	NA
WM1-COMP-4	481	56814	3.3	19.9171	8.4	0.2153	8.7	0.0311	2.3	0.27	197.4	4.5	198.0	15.7	204.7	195.2	197.4	4.5	NA
RIDGWAY_WM-1_18 <>	209	30020	3.1	22.2429	7.4	0.1940	7.5	0.0313	1.4	0.18	198.7	2.7	180.1	12.4	-57.9	180.0	198.7	2.7	NA
WM1-COMP-31	192	9199	1.6	23.0875	18.0	0.1870	18.4	0.0313	3.8	0.21	198.8	7.5	174.1	29.5	-149.5	449.6	198.8	7.5	NA
RIDGWAY_WM-1_39 <>	334	35943	2.1	19.0926	4.6	0.2261	5.1	0.0313	2.3	0.44	198.8	4.4	207.0	9.6	301.9	104.7	198.8	4.4	NA
RIDGWAY_WM-1_19 <>	565	53280	3.4	20.2526	4.7	0.2135	4.8	0.0314	0.9	0.18	199.1	1.7	196.5	8.6	165.7	110.3	199.1	1.7	NA
WM1-COMP-32	255	17768	3.1	24.7209	18.8	0.1761	19.2	0.0316	3.5	0.18	200.4	6.9	164.7	29.1	-322.0	487.1	200.4	6.9	NA
WM1-COMP-46	124	6804	3.0	22.3553	36.2	0.1949	37.4	0.0316	9.6	0.26	200.6	18.9	180.8	62.0	-70.2	909.2	200.6	18.9	NA
RIDGWAY_WM-1_48 <>	409	61199	2.3	20.2551	4.3	0.2154	4.5	0.0316	1.2	0.27	200.8	2.5	198.1	8.1	165.4	101.4	200.8	2.5	NA
RIDGWAY_WM-1_23 <>	399	58081	2.0	20.2679	3.3	0.2155	3.4	0.0317	0.8	0.22	201.1	1.5	198.2	6.1	164.0	77.3	201.1	1.5	NA
WM1-COMP-23	123	11365	3.7	18.0754	18.1	0.2422	19.0	0.0318	5.8	0.30	201.5	11.5	220.2	37.6	425.3	406.4	201.5	11.5	NA
RIDGWAY_WM-1_26 <>	270	40039	2.0	19.8134	6.5	0.2218	6.8	0.0319	2.0	0.30	202.2	4.0	203.4	12.6	216.7	151.5	202.2	4.0	NA
RIDGWAY_WM-1_4 <>	392	22761	2.2	19.8315	3.4	0.2218	4.0	0.0319	2.0	0.51	202.5	4.0	203.4	7.3	214.6	79.5	202.5	4.0	NA

WM1-COMP-2	78	6767	2.3	43.9248	109.5	0.1002	109.9	0.0319	9.7	0.09	202.5	19.3	97.0	102.0	-2103.8	0.0	202.5	19.3	NA
RIDGWAY_WM-1_10 <>	147	18797	2.7	18.3669	10.1	0.2398	10.3	0.0319	1.8	0.17	202.7	3.5	218.2	20.1	389.5	227.4	202.7	3.5	NA
RIDGWAY_WM-1_8 <>	89	14306	2.0	19.2169	19.6	0.2295	20.0	0.0320	4.3	0.21	203.0	8.6	209.8	38.0	287.0	451.5	203.0	8.6	NA
RIDGWAY_WM-1_20 <>	154	11975	3.0	21.4847	11.3	0.2061	12.9	0.0321	6.3	0.49	203.8	12.7	190.3	22.4	25.9	271.1	203.8	12.7	NA
WM1-COMP-58	196	11737	2.2	25.5706	26.0	0.1732	29.1	0.0321	13.0	0.45	203.8	26.2	162.2	43.6	-409.6	688.3	203.8	26.2	NA
WM1-COMP-1	157	49882	2.1	22.6648	28.6	0.1958	29.3	0.0322	6.1	0.21	204.2	12.2	181.5	48.7	-103.9	716.3	204.2	12.2	NA
WM1-COMP-12	85	4483	3.3	20.0198	15.3	0.2243	16.1	0.0326	5.0	0.31	206.6	10.2	205.5	29.9	192.7	356.6	206.6	10.2	NA
WM1-COMP-60	157	5256	3.7	19.6856	12.7	0.2316	21.7	0.0331	17.6	0.81	209.7	36.3	211.5	41.5	231.7	293.7	209.7	36.3	NA
WM1-COMP-114	106	7958	2.3	23.7864	45.8	0.1926	47.4	0.0332	12.0	0.25	210.8	25.0	178.9	77.8	-224.1	1209.1	210.8	25.0	NA
WM1-COMP-93	133	11803	2.6	22.6479	21.7	0.2038	22.8	0.0335	7.1	0.31	212.3	14.8	188.4	39.3	-102.1	539.0	212.3	14.8	NA
WM1-COMP-6	177	7378	2.8	18.8354	16.7	0.2476	17.1	0.0338	3.7	0.22	214.4	7.9	224.6	34.4	332.7	380.1	214.4	7.9	NA
WM1-COMP-120	99	5778	3.5	25.2721	35.4	0.1856	37.4	0.0340	11.9	0.32	215.6	25.2	172.8	59.5	-379.0	944.8	215.6	25.2	NA
RIDGWAY_WM-1_3 <>	535	74820	3.0	19.4138	2.9	0.2418	3.3	0.0340	1.5	0.45	215.8	3.2	219.9	6.5	263.7	67.7	215.8	3.2	NA
WM1-COMP-69	126	6152	3.9	18.5170	17.5	0.2535	24.3	0.0340	16.8	0.69	215.8	35.7	229.4	49.9	371.2	397.6	215.8	35.7	NA
WM1-COMP-24	99	8541	3.0	22.2381	32.8	0.2112	33.4	0.0341	6.2	0.19	215.9	13.2	194.6	59.1	-57.4	817.8	215.9	13.2	NA
WM1-COMP-64	81	5629	3.3	21.5577	41.0	0.2189	43.2	0.0342	13.3	0.31	216.9	28.5	201.0	78.8	17.8	1024.6	216.9	28.5	NA
WM1-COMP-56	437	22266	5.0	19.6255	6.7	0.2409	7.1	0.0343	2.4	0.34	217.3	5.1	219.1	13.9	238.7	153.5	217.3	5.1	NA
WM1-COMP-61	388	44331	3.9	18.4112	8.9	0.2573	11.6	0.0344	7.5	0.64	217.7	16.0	232.4	24.1	384.1	199.9	217.7	16.0	NA
WM1-COMP-57	595	42967	7.9	19.9155	4.4	0.2386	9.4	0.0345	8.3	0.89	218.4	17.9	217.3	18.4	204.9	101.4	218.4	17.9	NA
RIDGWAY_WM-1_33 <>	141	25439	3.4	22.9552	11.5	0.2074	11.5	0.0345	1.2	0.10	218.8	2.5	191.4	20.1	-135.3	284.6	218.8	2.5	NA
WM1-COMP-25	54	4306	1.9	21.6678	38.9	0.2200	39.9	0.0346	8.9	0.22	219.1	19.2	201.9	73.3	5.5	970.2	219.1	19.2	NA
WM1-COMP-107	293	14817	2.9	21.8692	11.3	0.2216	13.8	0.0351	8.0	0.58	222.7	17.4	203.2	25.4	-16.8	273.1	222.7	17.4	NA
RIDGWAY_WM-1_36 <>	141	16338	3.1	20.8359	11.4	0.2355	11.6	0.0356	1.8	0.16	225.4	4.0	214.7	22.4	99.0	270.8	225.4	4.0	NA
WM1-COMP-87	848	39545	2.8	19.4613	2.3	0.2607	12.1	0.0368	11.9	0.98	232.9	27.2	235.2	25.5	258.1	52.5	232.9	27.2	NA
WM1-COMP-43	217	7530	1.4	22.5529	18.4	0.2258	19.6	0.0369	6.5	0.33	233.8	14.9	206.7	36.6	-91.7	455.8	233.8	14.9	NA
WM1-COMP-29	323	27744	2.5	19.4235	11.0	0.2690	11.2	0.0379	2.1	0.19	239.8	5.0	241.9	24.1	262.6	253.4	239.8	5.0	NA
WM1-COMP-113	173	21362	1.4	20.2768	12.1	0.2733	16.0	0.0402	10.6	0.66	254.0	26.3	245.3	34.9	162.9	282.7	254.0	26.3	NA
WM1-COMP-105	190	18595	1.1	21.0431	19.2	0.2728	21.2	0.0416	8.9	0.42	262.9	22.8	244.9	46.1	75.5	460.9	262.9	22.8	NA
RIDGWAY_WM-1_47 <>	132	25529	2.6	20.0654	14.6	0.2880	14.8	0.0419	2.0	0.14	264.6	5.2	257.0	33.5	187.4	342.0	264.6	5.2	NA
RIDGWAY_WM-1_25 <>	87	11414	2.0	20.3378	15.0	0.2882	15.3	0.0425	3.1	0.20	268.4	8.2	257.1	34.8	155.9	352.7	268.4	8.2	NA
WM1-COMP-8	72	23866	2.0	19.4894	18.4	0.3665	18.8	0.0518	3.6	0.19	325.6	11.3	317.1	51.2	254.8	427.3	325.6	11.3	NA
WM1-COMP-112	377	41742	1.4	18.8274	5.2	0.4149	9.8	0.0567	8.3	0.85	355.3	28.7	352.4	29.1	333.7	117.0	355.3	28.7	NA
WM1-COMP-70	538	40976	5.7	18.6493	2.8	0.4273	7.4	0.0578	6.9	0.93	362.2	24.3	361.3	22.6	355.2	62.6	362.2	24.3	NA
RIDGWAY_WM-1_44 <>	823	152404	2.8	18.3895	0.6	0.4408	1.0	0.0588	0.8	0.79	368.3	2.9	370.8	3.2	386.8	14.0	368.3	2.9	NA
RIDGWAY_WM-1_28 <>	957	81250	29.7	15.9546	1.2	0.5271	3.0	0.0610	2.8	0.92	381.7	10.3	429.9	10.6	697.3	25.3	381.7	10.3	NA
WM1-COMP-85	80	8441	4.6	19.7970	18.4	0.4340	19.3	0.0623	5.9	0.31	389.7	22.4	366.0	59.4	218.7	428.4	389.7	22.4	NA
WM1-COMP-28	190	58533	0.7	18.2735	5.5	0.4915	5.7	0.0651	1.5	0.26	406.8	5.9	405.9	19.2	400.9	123.8	406.8	5.9	NA
RIDGWAY_WM-1_43 <>	1145	79196	1.2	18.0518	0.8	0.5063	1.3	0.0663	1.0	0.76	413.7	3.9	416.0	4.4	428.2	18.6	413.7	3.9	96.6
WM1-COMP-11	125	16554	2.6	18.9258	7.7	0.4909	8.7	0.0674	4.1	0.47	420.3	16.8	405.5	29.2	321.9	175.0	420.3	16.8	NA
WM1-COMP-109	170	12622	3.5	19.1769	6.7	0.4861	10.4	0.0676	8.0	0.77	421.7	32.7	402.2	34.7	291.8	153.0	421.7	32.7	NA
RIDGWAY_WM-1_32 <>	66	11853	4.2	18.7145	16.3	0.5090	16.6	0.0691	3.1	0.18	430.7	12.8	417.8	57.0	347.3	371.6	430.7	12.8	124.0
RIDGWAY_WM-1_42 <>	485	93973	2.5	17.9499	1.7	0.5421	2.0	0.0706	1.0	0.50	439.6	4.2	439.8	7.1	440.8	38.6	439.6	4.2	99.7
RIDGWAY_WM-1_13 <>	373	98741	1.5	17.5810	1.8	0.6305	2.1	0.0804	1.0	0.47	498.5	4.7	496.4	8.1	486.9	40.3	498.5	4.7	102.4
WM1-COMP-98	96	12266	2.4	16.8495	6.9	0.7188	11.8	0.0878	9.6	0.81	542.7	49.8	550.0	50.1	579.9	150.0	542.7	49.8	93.6
WM1-COMP-106	224	49775	1.4	13.5921	3.1	1.7154	4.8	0.1691	3.7	0.77	1007.2	34.2	1014.3	30.7	1029.7	62.3	1029.7	62.3	97.8
RIDGWAY_WM-1_30 <>	259	92993	1.9	13.5440	0.5	1.8338	1.0	0.1801	0.9	0.88	1067.7	8.9	1057.7	6.8	1036.9	10.1	1036.9	10.1	103.0
RIDGWAY_WM-1_27 <>	137	74997	2.6	13.3753	1.8	1.8756	2.0	0.1819	0.9	0.44	1077.6	8.8	1072.5	13.4	1062.2	36.6	1062.2	36.6	101.4

RIDGWAY_WM-1_1 <>	133	71932	1.3	12.8696	1.4	2.0323	1.6	0.1897	0.7	0.46	1119.7	7.5	1126.4	10.9	1139.3	28.2	1139.3	28.2	98.3
WM1-COMP-84	219	72013	2.4	12.4498	1.3	2.0516	8.8	0.1853	8.7	0.99	1095.6	87.7	1132.8	60.2	1204.9	26.5	1204.9	26.5	90.9
WM1-COMP-55	330	98809	3.8	12.3095	0.9	2.4168	2.0	0.2158	1.8	0.90	1259.4	20.6	1247.6	14.3	1227.2	16.9	1227.2	16.9	102.6
RIDGWAY_WM-1_6 <>	109	68218	3.1	11.6609	1.3	2.7430	2.9	0.2320	2.6	0.89	1344.9	31.7	1340.2	21.8	1332.7	25.8	1332.7	25.8	100.9
WM1-COMP-104	40	14264	1.4	11.2852	5.8	2.6478	9.4	0.2167	7.4	0.79	1264.5	85.2	1314.0	69.3	1395.8	110.4	1395.8	110.4	90.6
WM1-COMP-34	521	727043	2.2	11.1776	0.6	3.0468	2.7	0.2470	2.7	0.98	1423.0	34.2	1419.4	20.9	1414.1	11.1	1414.1	11.1	100.6
WM1-COMP-80	333	116887	3.8	10.8805	1.2	2.9081	11.2	0.2295	11.2	0.99	1331.8	134.5	1384.0	85.2	1465.5	23.2	1465.5	23.2	90.9
WM1-COMP-118	183	26001	1.7	10.7690	0.7	3.1792	4.8	0.2483	4.7	0.99	1429.7	60.4	1452.1	36.8	1485.0	13.6	1485.0	13.6	96.3
WM1-COMP-102	162	250527	2.9	9.9474	1.6	3.5811	4.2	0.2584	3.9	0.92	1481.4	51.5	1545.3	33.5	1633.9	30.3	1633.9	30.3	90.7
RIDGWAY_WM-1_5 <>	103	85676	1.3	9.8494	1.1	4.1003	1.3	0.2929	0.7	0.53	1656.0	9.7	1654.4	10.3	1652.3	20.0	1652.3	20.0	100.2
WM1-COMP-45	172	77362	0.8	9.8490	1.6	4.0829	5.1	0.2917	4.8	0.95	1649.8	70.1	1650.9	41.6	1652.3	30.5	1652.3	30.5	99.8
WM1-COMP-92	105	41072	3.0	9.3571	1.1	4.4859	10.2	0.3044	10.2	0.99	1713.3	153.1	1728.4	85.2	1746.7	20.8	1746.7	20.8	98.1
WM1-COMP-79	245	68035	3.8	8.9892	1.0	4.3019	14.0	0.2805	14.0	1.00	1593.7	197.6	1693.7	116.1	1819.8	17.9	1819.8	17.9	87.6
RIDGWAY_WM-1_7 <>	131	199488	2.8	8.8356	0.8	5.1325	1.0	0.3289	0.6	0.57	1833.1	9.4	1841.5	8.8	1851.1	15.3	1851.1	15.3	99.0
WM1-COMP-36	134	35907	2.4	8.8240	0.9	4.4385	5.6	0.2841	5.5	0.99	1611.8	78.8	1719.6	46.4	1853.4	16.2	1853.4	16.2	87.0

MacColl Ridge Formation – MAC-COMP

						Isotope ratios							Apparent ages (Ma)						
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
MAC-COMP (MacColl Ridge Formation)																			
MAC-COMP-19	729	30459	3.5	21.1078	4.7	0.0755	4.9	0.0116	1.2	0.25	74.1	0.9	73.9	3.5	68.2	112.5	74.1	0.9	NA
MAC-COMP-17	606	15048	4.1	21.5962	4.4	0.0743	4.8	0.0116	2.1	0.43	74.6	1.5	72.8	3.4	13.5	105.1	74.6	1.5	NA
MAC-COMP-63	225	7442	6.4	21.1333	19.8	0.0764	20.0	0.0117	2.2	0.11	75.1	1.6	74.8	14.4	65.3	476.4	75.1	1.6	NA
MAC-COMP-14	1102	9495	5.1	20.8926	2.9	0.0774	3.9	0.0117	2.6	0.67	75.1	2.0	75.7	2.9	92.5	69.1	75.1	2.0	NA
MAC-COMP-41	322	19223	2.7	22.6685	10.8	0.0715	11.2	0.0117	3.0	0.27	75.3	2.3	70.1	7.6	-104.3	265.0	75.3	2.3	NA
MAC-COMP-32	521	74676	4.4	21.6265	5.8	0.0750	8.0	0.0118	5.5	0.69	75.4	4.1	73.4	5.7	10.1	139.7	75.4	4.1	NA
MAC-COMP-16	907	33038	4.2	21.2448	3.8	0.0764	4.2	0.0118	1.9	0.45	75.4	1.4	74.7	3.1	52.8	90.3	75.4	1.4	NA
MAC-COMP-03	930	36774	6.2	21.1670	3.4	0.0766	3.7	0.0118	1.4	0.38	75.4	1.1	75.0	2.7	61.6	81.9	75.4	1.1	NA
MAC-COMP-02	837	15475	3.7	20.9095	4.9	0.0777	5.2	0.0118	1.7	0.33	75.5	1.3	76.0	3.8	90.6	115.5	75.5	1.3	NA
MAC-COMP-25	642	13521	5.2	20.6154	5.7	0.0790	6.1	0.0118	2.0	0.33	75.7	1.5	77.2	4.5	124.1	135.1	75.7	1.5	NA
MAC-COMP-71	427	38262	4.5	20.5775	8.0	0.0791	9.9	0.0118	5.8	0.59	75.7	4.4	77.3	7.4	128.4	187.8	75.7	4.4	NA
MAC-COMP-45	238	19226	6.4	20.9978	12.7	0.0777	13.3	0.0118	4.1	0.31	75.8	3.1	76.0	9.8	80.6	301.5	75.8	3.1	NA
MAC-COMP-83	637	16853	5.6	22.5509	7.8	0.0724	8.4	0.0118	3.0	0.36	75.9	2.3	70.9	5.7	-91.5	191.4	75.9	2.3	NA
MAC-COMP-40	418	15719	4.1	21.8829	8.2	0.0746	8.4	0.0118	1.9	0.22	75.9	1.4	73.1	5.9	-18.3	199.1	75.9	1.4	NA
MAC-COMP-18	617	24678	3.6	21.5103	5.4	0.0760	5.6	0.0118	1.6	0.29	75.9	1.2	74.3	4.0	23.1	129.4	75.9	1.2	NA
MAC-COMP-27	985	33328	2.9	20.9114	3.8	0.0781	4.1	0.0119	1.5	0.36	76.0	1.1	76.4	3.0	90.4	90.2	76.0	1.1	NA
MAC-COMP-12	635	17344	4.6	20.9464	3.5	0.0782	4.0	0.0119	1.9	0.47	76.1	1.4	76.5	2.9	86.5	82.8	76.1	1.4	NA
MAC-COMP-94	422	19983	2.8	22.9835	14.3	0.0713	14.6	0.0119	2.8	0.19	76.2	2.1	69.9	9.8	-138.3	355.5	76.2	2.1	NA
MAC-COMP-49	657	23820	4.7	21.2594	4.5	0.0771	5.1	0.0119	2.4	0.47	76.2	1.8	75.4	3.7	51.2	107.7	76.2	1.8	NA
MAC-COMP-91	469	25126	2.9	21.5515	7.7	0.0761	8.2	0.0119	3.1	0.37	76.2	2.3	74.4	5.9	18.5	184.2	76.2	2.3	NA
MAC-COMP-99	797	22052	5.4	21.2066	4.9	0.0774	5.6	0.0119	2.6	0.46	76.3	1.9	75.7	4.0	57.1	117.6	76.3	1.9	NA
MAC-COMP-67	321	9095	3.4	23.5752	9.2	0.0697	9.6	0.0119	2.8	0.29	76.4	2.1	68.4	6.3	-201.7	230.0	76.4	2.1	NA
MAC-COMP-87	605	33288	5.8	21.0554	4.5	0.0781	4.8	0.0119	1.7	0.36	76.4	1.3	76.3	3.5	74.1	106.1	76.4	1.3	NA
MAC-COMP-10	855	31283	3.6	20.4484	4.8	0.0805	5.6	0.0119	2.9	0.52	76.5	2.2	78.6	4.2	143.2	112.2	76.5	2.2	NA
MAC-COMP-33	760	10977	4.2	21.4679	5.8	0.0768	6.3	0.0120	2.5	0.39	76.6	1.9	75.1	4.6	27.8	139.3	76.6	1.9	NA
MAC-COMP-44	364	23254	5.6	21.1046	6.6	0.0783	7.6	0.0120	3.8	0.50	76.8	2.9	76.6	5.6	68.6	156.2	76.8	2.9	NA
MAC-COMP-61	438	29240	3.3	19.6140	9.5	0.0844	9.8	0.0120	2.0	0.21	77.0	1.6	82.3	7.7	240.1	220.4	77.0	1.6	NA
MAC-COMP-23	622	46635	3.9	21.1658	3.0	0.0783	4.0	0.0120	2.6	0.66	77.0	2.0	76.5	3.0	61.7	72.2	77.0	2.0	NA
MAC-COMP-59	387	12639	2.8	21.7932	10.9	0.0761	11.3	0.0120	2.9	0.26	77.1	2.2	74.5	8.1	-8.4	264.4	77.1	2.2	NA
MAC-COMP-66	703	46806	4.1	21.8430	4.1	0.0760	4.7	0.0120	2.3	0.49	77.1	1.8	74.3	3.4	-13.9	98.6	77.1	1.8	NA
MAC-COMP-43	335	9995	3.6	22.4506	14.5	0.0739	14.8	0.0120	2.6	0.18	77.2	2.0	72.4	10.3	-80.6	357.4	77.2	2.0	NA
MAC-COMP-88	648	16710	5.0	20.1825	4.6	0.0823	5.6	0.0120	3.2	0.57	77.2	2.5	80.3	4.4	173.8	108.0	77.2	2.5	NA
MAC-COMP-56	892	9213	2.4	20.8272	4.9	0.0801	5.5	0.0121	2.4	0.44	77.5	1.8	78.3	4.1	100.0	116.0	77.5	1.8	NA
MAC-COMP-60	364	15131	2.5	22.4423	7.2	0.0744	7.7	0.0121	2.6	0.34	77.6	2.0	72.9	5.4	-79.7	177.5	77.6	2.0	NA
MAC-COMP-24	1612	69626	2.8	20.9548	1.1	0.0798	1.6	0.0121	1.1	0.72	77.7	0.9	78.0	1.2	85.5	25.9	77.7	0.9	NA
MAC-COMP-37	662	24191	3.6	21.2194	4.1	0.0788	4.3	0.0121	1.3	0.30	77.7	1.0	77.1	3.2	55.7	97.5	77.7	1.0	NA
MAC-COMP-78	451	12754	7.7	21.7044	9.0	0.0771	9.9	0.0121	4.2	0.43	77.8	3.3	75.4	7.2	1.5	216.0	77.8	3.3	NA
MAC-COMP-54	696	50428	4.5	21.0735	3.0	0.0795	5.2	0.0121	4.2	0.81	77.8	3.2	77.7	3.9	72.1	71.2	77.8	3.2	NA
MAC-COMP-05	669	30515	1.6	21.3673	4.6	0.0788	5.0	0.0122	2.0	0.39	78.2	1.5	77.0	3.7	39.1	110.4	78.2	1.5	NA
MAC-COMP-68	452	2728	3.9	18.5940	11.0	0.0908	11.3	0.0122	2.3	0.20	78.4	1.8	88.2	9.5	361.9	249.7	78.4	1.8	NA
MAC-COMP-29	277	11087	2.6	21.9121	10.6	0.0771	10.9	0.0122	2.8	0.26	78.5	2.2	75.4	7.9	-21.5	256.0	78.5	2.2	NA

MAC-COMP-77	757	28669	2.3	20.7201	3.7	0.0815	5.0	0.0122	3.3	0.66	78.5	2.6	79.6	3.8	112.2	87.9	78.5	2.6	NA
MAC-COMP-80	373	13456	3.3	21.7871	7.9	0.0776	8.3	0.0123	2.7	0.32	78.5	2.1	75.9	6.1	-7.7	189.8	78.5	2.1	NA
MAC-COMP-57	298	10919	2.9	22.2611	8.8	0.0760	9.3	0.0123	2.9	0.31	78.6	2.3	74.4	6.7	-59.9	215.2	78.6	2.3	NA
MAC-COMP-95	1208	66831	4.9	21.2687	2.4	0.0796	3.5	0.0123	2.6	0.73	78.7	2.0	77.8	2.7	50.1	57.7	78.7	2.0	NA
MAC-COMP-15	298	10895	3.4	20.8475	10.5	0.0816	11.3	0.0123	4.1	0.36	79.1	3.2	79.7	8.7	97.7	249.8	79.1	3.2	NA
MAC-COMP-28	812	55329	3.4	20.5953	4.2	0.0827	4.6	0.0123	1.8	0.38	79.1	1.4	80.7	3.5	126.4	99.6	79.1	1.4	NA
MAC-COMP-100	111	3893	3.6	40.4383	80.6	0.0422	80.7	0.0124	4.8	0.06	79.2	3.8	41.9	33.2	NA	NA	79.2	3.8	NA
MAC-COMP-75	323	14287	1.6	24.3993	19.3	0.0699	19.5	0.0124	2.8	0.14	79.3	2.2	68.6	12.9	-288.5	496.1	79.3	2.2	NA
MAC-COMP-48	425	12771	2.1	21.3173	5.0	0.0803	5.6	0.0124	2.5	0.44	79.5	2.0	78.4	4.2	44.6	120.7	79.5	2.0	NA
MAC-COMP-38	1018	10515	4.8	20.4033	6.3	0.0844	7.1	0.0125	3.3	0.46	80.0	2.6	82.3	5.6	148.4	147.9	80.0	2.6	NA
MAC-COMP-72	433	7270	3.5	20.5496	9.6	0.0840	10.1	0.0125	3.1	0.31	80.2	2.5	81.9	8.0	131.6	226.8	80.2	2.5	NA
MAC-COMP-58	83	3203	3.1	17.7345	24.1	0.0993	24.5	0.0128	4.5	0.18	81.8	3.6	96.1	22.5	467.7	541.4	81.8	3.6	NA
MAC-COMP-51	48	2773	4.1	20.8358	41.5	0.0855	42.1	0.0129	7.0	0.17	82.8	5.8	83.3	33.7	99.0	1021.4	82.8	5.8	NA
MAC-COMP-20	292	18619	2.3	22.0298	12.5	0.0823	12.7	0.0131	2.6	0.21	84.2	2.2	80.3	9.8	-34.5	303.2	84.2	2.2	NA
MAC-COMP-95	795	45075	8.4	20.6882	3.4	0.0885	3.9	0.0133	1.8	0.46	85.0	1.5	86.1	3.2	115.8	80.8	85.0	1.5	NA
MAC-COMP-21	145	7306	2.4	23.9609	34.2	0.0767	34.6	0.0133	5.5	0.16	85.4	4.7	75.1	25.1	-242.5	886.0	85.4	4.7	NA
MAC-COMP-34	163	13085	2.7	24.7956	33.4	0.0744	33.5	0.0134	2.5	0.08	85.6	2.2	72.8	23.5	-329.8	878.2	85.6	2.2	NA
MAC-COMP-35	103	4480	3.0	19.8574	19.3	0.0929	19.7	0.0134	3.8	0.19	85.7	3.2	90.2	17.0	211.6	451.1	85.7	3.2	NA
MAC-COMP-98	193	13748	2.7	22.1399	23.1	0.0840	23.2	0.0135	2.9	0.13	86.4	2.5	81.9	18.3	-46.6	567.1	86.4	2.5	NA
MAC-COMP-65	303	15314	2.0	20.8313	9.4	0.0895	9.6	0.0135	2.2	0.23	86.6	1.9	87.0	8.0	99.5	222.1	86.6	1.9	NA
MAC-COMP-55	232	13834	4.1	22.4398	12.0	0.0864	12.3	0.0141	2.9	0.23	90.0	2.6	84.2	10.0	-79.4	294.3	90.0	2.6	NA
MAC-COMP-13	463	13653	1.9	21.1249	9.0	0.0922	9.6	0.0141	3.3	0.34	90.4	3.0	89.5	8.2	66.3	215.1	90.4	3.0	NA
MAC-COMP-70	81	3800	3.0	48.5605	91.9	0.0404	92.3	0.0142	9.1	0.10	91.1	8.2	40.2	36.4	NA	NA	91.1	8.2	NA
MAC-COMP-64	88	3805	2.7	22.3517	40.0	0.0892	40.6	0.0145	7.0	0.17	92.6	6.5	86.8	33.8	-69.8	1013.4	92.6	6.5	NA
MAC-COMP-69	642	32880	4.4	21.5026	3.0	0.0928	5.3	0.0145	4.4	0.82	92.6	4.0	90.1	4.6	23.9	73.1	92.6	4.0	NA
MAC-COMP-82	445	37869	3.1	20.6923	5.7	0.0975	6.1	0.0146	2.3	0.38	93.7	2.1	94.5	5.5	115.3	134.3	93.7	2.1	NA
MAC-COMP-30	144	4547	2.9	21.1428	19.3	0.0959	19.6	0.0147	3.4	0.17	94.1	3.2	93.0	17.4	64.3	463.4	94.1	3.2	NA
MAC-COMP-90	784	31681	1.8	20.9827	3.9	0.1070	4.4	0.0163	2.0	0.46	104.2	2.1	103.3	4.3	82.3	92.0	104.2	2.1	NA
MAC-COMP-74	125	7228	2.3	24.1657	52.3	0.1014	52.5	0.0178	4.4	0.08	113.6	5.0	98.1	49.1	-264.1	1413.9	113.6	5.0	NA
MAC-COMP-84	165	8462	2.8	22.9224	18.9	0.1092	19.2	0.0182	2.9	0.15	116.0	3.4	105.2	19.2	-131.8	471.5	116.0	3.4	NA
MAC-COMP-52	243	12465	2.6	21.1390	12.5	0.1187	13.1	0.0182	4.1	0.31	116.3	4.7	113.9	14.1	64.7	297.7	116.3	4.7	NA
MAC-COMP-31	398	21032	2.5	21.0053	8.4	0.1195	9.3	0.0182	4.1	0.44	116.3	4.7	114.7	10.1	79.8	200.0	116.3	4.7	NA
MAC-COMP-01	347	42600	2.3	19.9759	4.9	0.1300	5.1	0.0188	1.3	0.25	120.3	1.5	124.1	5.9	197.8	114.0	120.3	1.5	NA
MAC-COMP-36	205	6442	2.7	18.2428	8.3	0.1537	8.7	0.0203	2.4	0.28	129.8	3.1	145.2	11.7	404.7	186.4	129.8	3.1	NA
MAC-COMP-04	247	14383	1.7	22.8712	8.2	0.1303	8.7	0.0216	3.0	0.34	137.9	4.1	124.4	10.2	-126.2	202.7	137.9	4.1	NA
MAC-COMP-89	775	62436	10.3	19.8675	3.4	0.1541	3.6	0.0222	0.9	0.24	141.6	1.2	145.5	4.8	210.4	79.9	141.6	1.2	NA
MAC-COMP-39	902	81380	2.5	20.3718	2.7	0.1535	4.3	0.0227	3.3	0.78	144.6	4.8	145.0	5.8	152.0	63.4	144.6	4.8	NA
MAC-COMP-93	438	83169	13.4	19.3545	4.3	0.1625	4.7	0.0228	1.8	0.39	145.4	2.6	152.9	6.7	270.7	99.4	145.4	2.6	NA
MAC-COMP-11	541	18989	2.6	20.9683	3.2	0.1505	3.6	0.0229	1.5	0.41	145.9	2.1	142.4	4.7	83.9	77.1	145.9	2.1	NA
MAC-COMP-42	159	16433	2.4	21.1292	11.4	0.1498	11.7	0.0230	2.7	0.23	146.3	3.8	141.7	15.4	65.8	271.5	146.3	3.8	NA
MAC-COMP-07	305	33478	1.8	20.1171	5.8	0.1575	6.2	0.0230	2.3	0.36	146.4	3.3	148.5	8.6	181.4	135.0	146.4	3.3	NA
MAC-COMP-73	1027	137565	2.0	20.4053	3.3	0.1626	3.6	0.0241	1.4	0.39	153.3	2.1	153.0	5.1	148.2	76.8	153.3	2.1	NA
MAC-COMP-97	287	18744	3.4	20.4635	7.8	0.1638	8.2	0.0243	2.4	0.30	154.9	3.7	154.0	11.7	141.5	183.8	154.9	3.7	NA
MAC-COMP-81	446	76778	2.3	20.7775	4.4	0.1644	4.6	0.0248	1.2	0.25	157.8	1.8	154.6	6.5	105.6	104.1	157.8	1.8	NA
MAC-COMP-86	278	18679	3.1	20.3495	6.1	0.1693	9.3	0.0250	7.0	0.75	159.1	11.0	158.8	13.6	154.6	142.9	159.1	11.0	NA
MAC-COMP-96	236	15163	3.0	20.4991	5.5	0.1779	5.7	0.0265	1.2	0.22	168.3	2.1	166.3	8.7	137.4	130.4	168.3	2.1	NA
MAC-COMP-50	397	29681	2.3	20.2154	4.2	0.1959	4.9	0.0287	2.6	0.53	182.6	4.7	181.7	8.2	170.0	97.4	182.6	4.7	NA

MAC-COMP-62	237	15340	2.3	19.9428	4.4	0.2109	5.1	0.0305	2.6	0.52	193.7	5.0	194.3	9.0	201.7	101.6	193.7	5.0	NA
MAC-COMP-06	186	31837	1.4	19.5676	6.4	0.2195	6.9	0.0311	2.3	0.34	197.7	4.5	201.5	12.5	245.5	148.6	197.7	4.5	NA
MAC-COMP-22	310	40979	3.3	18.9081	5.3	0.2274	6.2	0.0312	3.3	0.54	197.9	6.5	208.0	11.7	324.0	119.4	197.9	6.5	NA
MAC-COMP-26	175	4248	1.6	14.7534	31.4	0.3009	32.3	0.0322	7.3	0.23	204.3	14.6	267.1	76.0	861.8	668.5	204.3	14.6	NA
MAC-COMP-92	601	89093	2.6	19.2917	1.8	0.3261	1.9	0.0456	0.6	0.33	287.6	1.8	286.6	4.7	278.2	40.5	287.6	1.8	NA
MAC-COMP-85	87	21217	2.3	19.4527	6.4	0.3872	6.5	0.0546	1.4	0.21	342.9	4.7	332.3	18.6	259.1	147.1	342.9	4.7	NA
MAC-COMP-08	231	59354	1.3	18.5348	2.0	0.4281	2.2	0.0575	1.0	0.46	360.7	3.6	361.8	6.8	369.0	44.9	360.7	3.6	NA
MAC-COMP-46	598	116006	1.2	18.5371	1.0	0.4550	1.2	0.0612	0.6	0.49	382.8	2.2	380.8	3.8	368.8	23.2	382.8	2.2	NA
MAC-COMP-79	41	16049	4.5	18.0665	11.4	0.5668	11.9	0.0743	3.6	0.30	461.8	15.9	456.0	43.8	426.4	254.4	461.8	15.9	108.3
MAC-COMP-53	184	71071	1.3	15.7123	1.7	1.0588	3.3	0.1207	2.8	0.86	734.3	19.7	733.2	17.3	729.9	36.4	734.3	19.7	100.6
MAC-COMP-09	134	65473	3.0	10.7754	5.9	1.1495	10.3	0.0898	8.5	0.82	554.6	45.0	777.0	56.2	1483.9	112.5	1483.9	112.5	37.4
MAC-COMP-76	127	205598	1.2	6.6167	0.3	9.2900	1.5	0.4458	1.4	0.98	2376.6	28.6	2367.0	13.4	2358.8	5.0	2358.8	5.0	100.8

Moonshine Creek Formation – CG-DZ-1/2/3

Sample no.			Isotopic Ratios							Isotopic Ages							
Analysis ID	U (ppm)	U/Th	207Pb/235U	2σ (abs)	206Pb/238U	2σ (abs)	ρ	$^{207}Pb/^{206}Pb$	2σ (abs)	$^{207}Pb/^{235}U$	2σ (Ma)	$^{206}Pb/^{238}U$	2σ (Ma)	$^{207}Pb/^{206}Pb$	2σ (Ma)	Best Age (Ma)	2σ (Ma)
CG_DZ_1_1	1155	2.8	0.3430	0.016	0.0472	0.0006	0.22134	0.0527	0.0024	299.0	12.0	297.3	3.4	290	100	297.3	3.4
CG_DZ_1_2	709	2.0	0.3380	0.016	0.0467	0.0008	0.05972	0.0526	0.0026	295.0	12.0	294.5	5.1	280	110	294.5	5.1
CG_DZ_1_3	323.9	4.9	0.1570	0.020	0.0214	0.0005	0.07289	0.0531	0.0067	147.0	17.0	136.3	3.3	220	240	136.3	3.3
CG_DZ_1_4	387	1.7	0.2630	0.021	0.0355	0.0009	0.13626	0.0540	0.0043	236.0	17.0	224.7	5.3	310	180	224.7	5.3
CG_DZ_1_5	287.3	2.6	0.3640	0.027	0.0475	0.0009	0.06857	0.0557	0.0043	313.0	20.0	299.2	5.5	380	160	299.2	5.5
CG_DZ_1_6	521	2.8	0.3550	0.020	0.0471	0.0008	0.16243	0.0548	0.0033	307.0	15.0	296.4	4.9	360	130	296.4	4.9
CG_DZ_1_7	464.6	1.8	0.3240	0.016	0.0474	0.0009	0.14061	0.0496	0.0025	284.0	12.0	298.3	5.3	160	110	298.3	5.3
CG_DZ_1_8	395.2	3.0	0.3260	0.022	0.0469	0.0008	0.53415	0.0507	0.0038	285.0	17.0	295.3	5.1	190	160	295.3	5.1
CG_DZ_1_9	406	3.3	0.3430	0.020	0.0473	0.0012	0.00227	0.0520	0.0038	299.0	15.0	298.1	7.5	280	140	298.1	7.5
CG_DZ_1_10	683	2.8	0.3400	0.018	0.0479	0.0008	0.15309	0.0515	0.0029	296.0	14.0	301.8	5.0	270	130	301.8	5.0
CG_DZ_1_11	837	2.6	0.3460	0.013	0.0471	0.0007	0.42058	0.0539	0.0025	301.2	9.4	296.9	4.2	340	100	296.9	4.2
CG_DZ_1_12	184.9	1.3	0.1120	0.015	0.0163	0.0006	0.07541	0.0528	0.0079	111.0	15.0	104.3	3.8	180	290	104.3	3.8
CG_DZ_1_13	641.5	2.3	0.3520	0.020	0.0475	0.0007	0.18115	0.0536	0.0030	305.0	15.0	299.3	4.4	320	120	299.3	4.4
CG_DZ_1_14	718.1	1.5	0.3350	0.017	0.0471	0.0006	0.12365	0.0516	0.0026	292.0	13.0	296.5	3.9	240	110	296.5	3.9
CG_DZ_1_15	891	3.1	0.3580	0.038	0.0470	0.0011	0.10269	0.0548	0.0058	310.0	28.0	296.0	6.9	350	220	296.0	6.9
CG_DZ_1_16	130.5	2.7	0.3230	0.033	0.0433	0.0016	0.11513	0.0530	0.0051	281.0	25.0	273.1	9.6	290	200	273.1	9.6
CG_DZ_1_17	361.2	4.5	0.3580	0.023	0.0491	0.0009	0.05942	0.0529	0.0036	309.0	18.0	309.0	5.8	280	150	309.0	5.8
CG_DZ_1_18	1072	3.0	0.3430	0.010	0.0476	0.0008	0.30533	0.0518	0.0018	299.1	7.9	299.5	5.1	265	80	299.5	5.1
CG_DZ_1_19	729	1.6	0.3570	0.032	0.0464	0.0014	0.28404	0.0564	0.0051	309.0	24.0	292.2	8.7	440	210	292.2	8.7
CG_DZ_1_20	238.5	3.3	0.1600	0.017	0.0231	0.0007	0.02958	0.0506	0.0054	150.0	14.0	147.3	4.3	150	210	147.3	4.3
CG_DZ_1_21	306.7	2.4	0.3660	0.021	0.0471	0.0009	0.10031	0.0566	0.0035	315.0	16.0	296.8	5.6	430	140	296.8	5.6
CG_DZ_1_22	168.1	2.4	0.1520	0.026	0.0241	0.0006	0.03906	0.0457	0.0079	141.0	23.0	154.4	3.9	-100	310	154.4	3.9
CG_DZ_1_23	414	1.7	0.3530	0.024	0.0477	0.0014	0.00219	0.0533	0.0038	306.0	18.0	300.3	8.4	310	160	300.3	8.4
CG_DZ_1_24	365.4	3.5	0.3290	0.027	0.0469	0.0009	0.17016	0.0511	0.0045	287.0	20.0	295.5	5.2	190	170	295.5	5.2
CG_DZ_1_25	341	4.3	0.3470	0.027	0.0488	0.0008	0.05731	0.0515	0.0039	300.0	20.0	307.3	5.1	260	170	307.3	5.1
CG_DZ_1_26	299.7	3.7	0.3490	0.031	0.0464	0.0009	0.04404	0.0530	0.0044	301.0	23.0	292.6	5.5	310	190	292.6	5.5
CG_DZ_1_27	262.2	2.8	0.3370	0.022	0.0476	0.0008	0.30230	0.0504	0.0028	294.0	17.0	300.0	4.9	220	130	300.0	4.9
CG_DZ_1_28	465	2.2	0.1640	0.014	0.0237	0.0007	0.17770	0.0504	0.0044	153.0	13.0	150.8	4.5	160	180	150.8	4.5
CG_DZ_1_29	975	2.4	0.3680	0.016	0.0488	0.0007	0.16064	0.0548	0.0023	318.0	12.0	307.3	4.1	379	94	307.3	4.1
CG_DZ_1_30	140.1	1.8	0.3190	0.031	0.0455	0.0012	0.04974	0.0512	0.0052	278.0	24.0	286.7	7.3	180	200	286.7	7.3
CG_DZ_1_31	561.1	3.1	0.3420	0.018	0.0486	0.0008	0.02925	0.0511	0.0028	298.0	14.0	306.0	4.8	220	120	306.0	4.8
CG_DZ_1_32	422	2.8	0.3430	0.026	0.0450	0.0009	0.16068	0.0551	0.0040	297.0	19.0	283.7	5.5	360	150	283.7	5.5
CG_DZ_1_33	182.4	2.2	0.1470	0.039	0.0237	0.0017	0.17706	0.0460	0.0120	137.0	36.0	151.0	11.0	-40	500	151.0	11.0
CG_DZ_1_34	91.9	1.4	0.1260	0.024	0.0164	0.0009	0.24615	0.0580	0.0120	118.0	21.0	105.0	5.6	230	400	105.0	5.6
CG_DZ_1_35	107.1	2.6	0.1310	0.031	0.0160	0.0008	0.10692	0.0590	0.0140	122.0	27.0	102.4	5.0	180	430	102.4	5.0
CG_DZ_1_36	577	0.9	0.2450	0.016	0.0353	0.0006	0.04729	0.0503	0.0033	222.0	13.0	223.7	3.6	180	140	223.7	3.6
CG_DZ_1_37	470.8	3.7	0.3620	0.020	0.0492	0.0008	0.17865	0.0536	0.0031	313.0	15.0	309.3	4.8	320	130	309.3	4.8
CG_DZ_1_38	448	1.9	0.1070	0.013	0.0171	0.0005	0.06169	0.0454	0.0055	102.0	12.0	109.2	3.1	-60	230	109.2	3.1
CG_DZ_1_39	1027	2.3	0.3280	0.024	0.0437	0.0011	0.26413	0.0555	0.0042	288.0	18.0	275.7	7.0	400	160	275.7	7.0
CG_DZ_1_40	184.4	3.0	0.3520	0.026	0.0475	0.0012	0.01208	0.0542	0.0043	305.0	20.0	299.0	7.6	320	170	299.0	7.6
CG_DZ_1_41	304	2.2	0.3440	0.026	0.0488	0.0012	0.13446	0.0513	0.0039	298.0	20.0	307.2	7.4	250	170	307.2	7.4
CG_DZ_1_42	771	3.1	0.3540	0.015	0.0477	0.0008	0.01139	0.0540	0.0025	307.0	11.0	300.2	4.8	350	100	300.2	4.8
CG_DZ_1_43	669	2.9	0.3760	0.028	0.0483	0.0013	0.19753	0.0561	0.0045	323.0	20.0	303.9	8.1	420	180	303.9	8.1
CG_DZ_1_44	205	3.3	0.3810	0.068	0.0497	0.0023	0.22749	0.0576	0.0083	324.0	48.0	313.0	14.0	430	310	313.0	14.0
CG_DZ_1_45	397.4	2.7	0.1530	0.015	0.0229	0.0006	0.03223	0.0503	0.0055	147.0	14.0	145.7	3.8	130	210	145.7	3.8
CG_DZ_1_46	299.9	1.2	0.3350	0.026	0.0434	0.0011	0.17636	0.0561	0.0043	291.0	20.0	273.6	6.9	390	160	273.6	6.9

CG_DZ_1_47	324.5	3.2	0.3540	0.027	0.0488	0.0009	0.14732	0.0528	0.0038	306.0	20.0	307.1	5.3	270	160	307.1	5.3
CG_DZ_1_48	651	3.0	0.2740	0.022	0.0406	0.0012	0.13433	0.0498	0.0040	246.0	17.0	256.6	7.4	170	170	256.6	7.4
CG_DZ_1_49	859	2.1	0.3550	0.021	0.0489	0.0008	0.27930	0.0526	0.0030	308.0	16.0	308.0	4.7	280	120	308.0	4.7
CG_DZ_1_50	595	1.7	0.3680	0.023	0.0459	0.0009	0.17326	0.0584	0.0037	317.0	17.0	289.0	5.3	500	130	289.0	5.3
CG_DZ_1_51	331.8	4.5	0.3440	0.022	0.0469	0.0012	0.06278	0.0541	0.0036	299.0	17.0	295.5	7.3	320	140	295.5	7.3
CG_DZ_1_52	283.3	3.0	0.3380	0.028	0.0490	0.0009	0.12890	0.0502	0.0042	294.0	21.0	308.1	5.6	150	170	308.1	5.6
CG_DZ_1_53	552	3.6	0.3440	0.018	0.0481	0.0008	0.00457	0.0520	0.0029	299.0	14.0	302.7	5.0	250	120	302.7	5.0
CG_DZ_1_54	279.7	5.0	0.3380	0.031	0.0504	0.0012	0.28782	0.0489	0.0049	294.0	23.0	317.1	7.4	100	190	317.1	7.4
CG_DZ_1_55	243.7	3.7	0.1490	0.022	0.0234	0.0007	0.14224	0.0462	0.0067	139.0	19.0	149.1	4.2	-50	270	149.1	4.2
CG_DZ_1_56	267.7	4.1	0.3470	0.029	0.0463	0.0009	0.17264	0.0547	0.0049	300.0	22.0	291.5	5.4	320	190	291.5	5.4
CG_DZ_1_57	741	1.6	0.3500	0.014	0.0469	0.0006	0.06853	0.0543	0.0022	304.0	11.0	295.6	3.6	380	100	295.6	3.6
CG_DZ_1_58	403	2.0	0.3340	0.031	0.0478	0.0012	0.19090	0.0554	0.0049	291.0	23.0	301.1	7.4	380	190	301.1	7.4
CG_DZ_1_59	281	1.9	0.0960	0.015	0.0150	0.0004	0.02277	0.0463	0.0074	92.0	14.0	96.0	2.4	-50	300	96.0	2.4
CG_DZ_1_60	658	2.3	0.3500	0.015	0.0482	0.0006	0.05034	0.0527	0.0023	304.0	11.0	303.4	4.0	292	97	303.4	4.0
CG_DZ_1_61	389	2.5	0.1230	0.015	0.0171	0.0008	0.31202	0.0527	0.0064	117.0	13.0	109.3	5.2	220	250	109.3	5.2
CG_DZ_1_62	1067	2.8	0.3460	0.021	0.0468	0.0017	0.69402	0.0566	0.0039	301.0	16.0	295.0	11.0	450	150	295.0	11.0
CG_DZ_1_63	170.4	3.1	0.3270	0.032	0.0450	0.0011	0.10440	0.0527	0.0054	284.0	25.0	283.8	7.0	240	210	283.8	7.0
CG_DZ_1_64	518	2.5	0.1550	0.014	0.0222	0.0004	0.15405	0.0508	0.0045	146.0	12.0	141.3	2.5	170	180	141.3	2.5
CG_DZ_1_65	266.7	3.3	0.3740	0.035	0.0463	0.0008	0.20417	0.0586	0.0051	320.0	25.0	291.5	5.1	470	190	291.5	5.1
CG_DZ_1_66	398	7.2	0.1780	0.019	0.0240	0.0006	0.13520	0.0537	0.0059	165.0	16.0	152.7	3.8	260	220	152.7	3.8
CG_DZ_1_67	436	2.6	0.3620	0.024	0.0492	0.0010	0.08066	0.0535	0.0035	312.0	18.0	309.3	6.4	310	140	309.3	6.4
CG_DZ_1_68	268.7	2.6	0.3610	0.033	0.0474	0.0010	0.21267	0.0541	0.0048	310.0	24.0	298.4	5.9	350	190	298.4	5.9
CG_DZ_1_69	451	2.2	0.3540	0.025	0.0468	0.0010	0.08939	0.0550	0.0038	306.0	19.0	294.9	6.3	360	150	294.9	6.3
CG_DZ_1_70	753	2.3	0.3580	0.015	0.0482	0.0006	0.18090	0.0539	0.0024	310.0	11.0	303.2	4.0	344	96	303.2	4.0
CG_DZ_1_71	373.2	4.7	0.3560	0.022	0.0486	0.0009	0.12540	0.0544	0.0040	312.0	19.0	305.6	5.8	330	160	305.6	5.8
CG_DZ_1_72	551	1.4	0.3490	0.017	0.0450	0.0010	0.11043	0.0574	0.0035	303.0	13.0	283.7	6.1	460	130	283.7	6.1
CG_DZ_1_73	373	2.2	0.3440	0.023	0.0470	0.0009	0.02900	0.0532	0.0038	298.0	17.0	295.9	5.6	290	150	295.9	5.6
CG_DZ_1_74	209	3.6	0.1690	0.026	0.0242	0.0008	0.11217	0.0508	0.0076	156.0	22.0	154.2	5.1	110	290	154.2	5.1
CG_DZ_1_75	589	2.2	0.3310	0.019	0.0475	0.0008	0.30183	0.0505	0.0027	289.0	14.0	298.8	5.0	220	120	298.8	5.0
CG_DZ_1_76	480.6	2.4	0.3350	0.020	0.0478	0.0006	0.24142	0.0509	0.0032	293.0	15.0	300.8	3.4	200	130	300.8	3.4
CG_DZ_1_77	40.49	3.3	0.0900	0.033	0.0173	0.0017	0.04626	0.0360	0.0140	84.0	30.0	110.0	11.0	-460	570	110.0	11.0
CG_DZ_1_78	388	2.1	0.1030	0.014	0.0152	0.0005	0.02011	0.0497	0.0071	99.0	13.0	97.3	3.3	90	290	97.3	3.3
CG_DZ_1_79	346	2.4	0.1640	0.014	0.0239	0.0006	0.26466	0.0513	0.0048	154.0	12.0	152.2	3.8	190	190	152.2	3.8
CG_DZ_1_80	501	3.0	0.3630	0.015	0.0483	0.0015	0.40009	0.0558	0.0024	314.0	11.0	304.3	9.0	432	99	304.3	9.0
CG_DZ_2_1	191.3	2.4	0.3270	0.029	0.0470	0.0012	0.09948	0.0497	0.0044	285.0	22.0	296.3	7.6	170	190	296.3	7.6
CG_DZ_2_2	466.3	1.6	0.1550	0.012	0.0244	0.0005	0.04415	0.0461	0.0036	146.0	10.0	155.6	3.2	0	160	155.6	3.2
CG_DZ_2_3	199.6	1.9	0.1340	0.016	0.0223	0.0007	0.16172	0.0435	0.0052	127.0	15.0	142.1	4.6	-140	220	142.1	4.6
CG_DZ_2_4	415.6	7.4	0.1680	0.017	0.0235	0.0005	0.12243	0.0521	0.0051	157.0	15.0	149.6	3.2	220	200	149.6	3.2
CG_DZ_2_5	1245	2.4	0.1670	0.011	0.0238	0.0005	0.45820	0.0507	0.0030	156.4	9.3	151.8	3.2	200	130	151.8	3.2
CG_DZ_2_6	727	2.9	0.1590	0.012	0.0241	0.0004	0.24030	0.0471	0.0034	150.0	11.0	153.6	2.5	80	160	153.6	2.5
CG_DZ_2_7	508	2.7	0.1580	0.015	0.0237	0.0005	0.12652	0.0478	0.0047	148.0	13.0	151.2	3.4	50	190	151.2	3.4
CG_DZ_2_8	244.1	3.0	0.1570	0.019	0.0234	0.0007	0.06681	0.0493	0.0061	147.0	16.0	149.3	4.4	140	250	149.3	4.4
CG_DZ_2_9	65.3	1.9	0.1250	0.036	0.0157	0.0013	0.18095	0.0580	0.0180	116.0	33.0	100.3	8.2	170	600	100.3	8.2
CG_DZ_2_10	364	3.1	0.1580	0.016	0.0243	0.0005	0.17898	0.0470	0.0046	148.0	14.0	154.6	3.3	20	190	154.6	3.3
CG_DZ_2_11	430.9	1.9	0.3270	0.023	0.0472	0.0010	0.07654	0.0505	0.0038	286.0	18.0	297.3	6.2	180	150	297.3	6.2
CG_DZ_2_12	154	2.7	0.1470	0.026	0.0233	0.0010	0.09107	0.0456	0.0078	143.0	25.0	148.4	6.0	-30	320	148.4	6.0
CG_DZ_2_13	145.6	2.2	0.1550	0.025	0.0236	0.0009	0.28255	0.0470	0.0075	144.0	22.0	150.1	5.6	-40	290	150.1	5.6

CG_DZ_2_14	664	2.2	0.1614	0.010	0.0240	0.0004	0.07453	0.0490	0.0031	151.5	8.6	152.7	2.6	130	130	152.7	2.6
CG_DZ_2_15	1099	1.8	0.1594	0.010	0.0233	0.0005	0.20762	0.0488	0.0026	149.8	8.5	148.5	3.1	150	120	148.5	3.1
CG_DZ_2_16	316	3.2	0.1440	0.019	0.0228	0.0005	0.10443	0.0460	0.0063	135.0	17.0	145.5	3.3	-50	260	145.5	3.3
CG_DZ_2_17	219	3.5	0.1350	0.020	0.0220	0.0007	0.24975	0.0453	0.0070	127.0	18.0	140.5	4.4	-40	290	140.5	4.4
CG_DZ_2_18	226	1.7	0.1710	0.020	0.0233	0.0008	0.14012	0.0535	0.0061	159.0	17.0	148.2	5.1	320	220	148.2	5.1
CG_DZ_2_19	1031	1.0	0.3420	0.015	0.0482	0.0007	0.18853	0.0516	0.0026	301.0	10.0	303.3	4.5	240	110	303.3	4.5
CG_DZ_2_20	752	1.2	0.1680	0.012	0.0239	0.0005	0.14465	0.0512	0.0039	157.0	10.0	152.3	2.9	200	150	152.3	2.9
CG_DZ_2_21	288.6	1.4	0.3490	0.028	0.0486	0.0011	0.24681	0.0524	0.0046	302.0	21.0	305.6	6.7	240	180	305.6	6.7
CG_DZ_2_22	508	2.5	0.1710	0.014	0.0240	0.0005	0.10540	0.0522	0.0044	160.0	12.0	152.6	3.4	240	190	152.6	3.4
CG_DZ_2_23	597	2.3	0.1650	0.013	0.0237	0.0005	0.03450	0.0506	0.0040	154.0	11.0	151.0	2.9	170	160	151.0	2.9
CG_DZ_2_24	201.3	3.0	0.1680	0.035	0.0254	0.0013	0.27571	0.0510	0.0110	156.0	30.0	161.5	8.0	130	420	161.5	8.0
CG_DZ_2_25	779	2.1	0.1620	0.011	0.0238	0.0004	0.11899	0.0493	0.0035	152.0	10.0	151.5	2.6	130	150	151.5	2.6
CG_DZ_2_26	243.6	3.7	0.1360	0.019	0.0180	0.0007	0.11783	0.0549	0.0078	128.0	17.0	115.1	4.1	260	280	115.1	4.1
CG_DZ_2_27	296	1.9	0.3670	0.027	0.0479	0.0012	0.07756	0.0554	0.0042	316.0	20.0	303.7	7.9	370	160	303.7	7.9
CG_DZ_2_28	745	2.4	0.1440	0.013	0.0219	0.0004	0.20945	0.0479	0.0043	136.0	11.0	139.4	2.8	60	180	139.4	2.8
CG_DZ_2_29	181	2.6	0.1120	0.020	0.0180	0.0007	0.13201	0.0459	0.0080	106.0	18.0	115.1	4.6	-100	310	115.1	4.6
CG_DZ_2_30	553	2.8	0.1660	0.013	0.0234	0.0005	0.06604	0.0515	0.0040	155.0	11.0	149.3	2.9	220	160	149.3	2.9
CG_DZ_2_31	340	2.5	0.3310	0.025	0.0478	0.0010	0.16463	0.0502	0.0037	289.0	19.0	301.2	6.3	170	150	301.2	6.3
CG_DZ_2_32	836	2.7	0.1600	0.022	0.0250	0.0014	0.27058	0.0491	0.0072	150.0	19.0	159.3	9.1	120	300	159.3	9.1
CG_DZ_2_33	514	1.5	0.1540	0.016	0.0234	0.0005	0.35361	0.0475	0.0046	144.0	14.0	149.1	3.4	40	190	149.1	3.4
CG_DZ_2_34	841	2.0	0.1627	0.009	0.0239	0.0005	0.29096	0.0494	0.0027	152.8	8.1	152.2	3.0	150	120	152.2	3.0
CG_DZ_2_35	236	1.8	0.1590	0.019	0.0230	0.0005	0.08655	0.0504	0.0063	148.0	17.0	146.5	3.4	120	230	146.5	3.4
CG_DZ_2_36	491.9	2.7	0.1760	0.016	0.0241	0.0004	0.36134	0.0529	0.0045	164.0	14.0	153.3	2.7	270	180	153.3	2.7
CG_DZ_2_37	1011	2.4	0.1530	0.010	0.0236	0.0004	0.17465	0.0471	0.0031	144.2	9.1	150.1	2.7	40	140	150.1	2.7
CG_DZ_2_38	387.1	2.6	0.1720	0.019	0.0234	0.0005	0.01304	0.0535	0.0058	160.0	16.0	148.9	3.1	250	220	148.9	3.1
CG_DZ_2_39	111	1.6	4.3100	0.210	0.2945	0.0059	0.10300	0.1072	0.0055	1691.0	39.0	1664.0	29.0	1735	94	1664.0	29.0
CG_DZ_2_40	570	2.0	0.3420	0.029	0.0483	0.0010	0.04405	0.0504	0.0043	298.0	22.0	303.9	6.0	180	180	303.9	6.0
CG_DZ_2_41	548	2.9	0.1650	0.014	0.0235	0.0005	0.16452	0.0510	0.0042	155.0	12.0	149.9	3.3	190	170	149.9	3.3
CG_DZ_2_42	118.6	1.2	0.1730	0.036	0.0224	0.0009	0.32773	0.0560	0.0110	157.0	30.0	142.5	5.7	200	380	142.5	5.7
CG_DZ_2_43	170.8	3.1	0.1550	0.024	0.0236	0.0008	0.34250	0.0476	0.0072	144.0	21.0	150.0	4.9	0	290	150.0	4.9
CG_DZ_2_44	193.3	3.1	0.3610	0.032	0.0483	0.0013	0.03686	0.0545	0.0051	310.0	24.0	304.1	7.8	310	190	304.1	7.8
CG_DZ_2_45	810.5	2.6	0.1540	0.011	0.0235	0.0004	0.12857	0.0474	0.0033	144.9	9.8	149.7	2.7	50	140	149.7	2.7
CG_DZ_2_46	388	2.7	0.1560	0.017	0.0225	0.0006	0.10726	0.0504	0.0055	146.0	15.0	143.4	3.6	140	220	143.4	3.6
CG_DZ_2_47	950	1.5	0.1598	0.009	0.0224	0.0005	0.06800	0.0519	0.0030	150.3	7.8	142.7	3.2	250	120	142.7	3.2
CG_DZ_2_48	654	3.9	0.1530	0.013	0.0227	0.0004	0.13686	0.0491	0.0043	144.0	11.0	144.4	2.7	110	170	144.4	2.7
CG_DZ_2_49	599.1	2.7	0.3570	0.020	0.0469	0.0008	0.16676	0.0553	0.0032	309.0	15.0	295.4	4.8	390	130	295.4	4.8
CG_DZ_2_50	436	2.1	0.1500	0.013	0.0224	0.0007	0.00367	0.0489	0.0045	142.0	12.0	142.9	4.1	100	190	142.9	4.1
CG_DZ_2_51	711	1.7	0.1650	0.013	0.0244	0.0005	0.02192	0.0491	0.0038	155.0	11.0	155.5	3.1	120	160	155.5	3.1
CG_DZ_2_52	616	2.6	0.3430	0.018	0.0472	0.0006	0.08183	0.0528	0.0030	299.0	14.0	297.4	3.4	290	120	297.4	3.4
CG_DZ_2_53	332	1.6	0.1710	0.019	0.0235	0.0006	0.03143	0.0531	0.0059	159.0	16.0	149.6	3.9	240	230	149.6	3.9
CG_DZ_2_54	100.7	2.7	0.1610	0.029	0.0244	0.0011	0.26907	0.0472	0.0079	150.0	25.0	155.3	7.1	10	320	155.3	7.1
CG_DZ_2_55	747	2.7	0.3590	0.018	0.0497	0.0008	0.16720	0.0525	0.0027	311.0	13.0	312.5	4.7	280	120	312.5	4.7
CG_DZ_2_56	216.8	3.0	0.3570	0.031	0.0495	0.0013	0.18209	0.0521	0.0044	308.0	23.0	311.4	7.8	230	180	311.4	7.8
CG_DZ_2_57	587.4	2.0	0.1720	0.014	0.0239	0.0005	0.28351	0.0521	0.0041	160.0	12.0	152.2	2.8	240	160	152.2	2.8
CG_DZ_2_58	623	2.7	0.1360	0.012	0.0181	0.0005	0.10350	0.0540	0.0049	129.0	11.0	115.6	3.0	320	190	115.6	3.0
CG_DZ_2_59	224	2.7	0.1720	0.028	0.0249	0.0008	0.11483	0.0504	0.0082	159.0	24.0	158.2	5.1	80	310	158.2	5.1
CG_DZ_2_60	144.6	2.2	0.1620	0.024	0.0226	0.0008	0.41965	0.0515	0.0072	150.0	20.0	144.3	5.0	140	270	144.3	5.0

CG_DZ_2_61	161.6	4.1	0.1490	0.025	0.0233	0.0008	0.44813	0.0455	0.0071	139.0	22.0	148.3	4.9	-100	270	148.3	4.9
CG_DZ_2_62	330.4	3.0	0.1100	0.015	0.0176	0.0005	0.00949	0.0455	0.0064	105.0	14.0	112.7	3.0	-80	250	112.7	3.0
CG_DZ_2_63	739	2.8	0.3470	0.014	0.0478	0.0006	0.00108	0.0528	0.0023	302.0	10.0	301.0	4.0	296	97	301.0	4.0
CG_DZ_2_64	584	2.0	0.1410	0.014	0.0217	0.0004	0.04003	0.0470	0.0047	133.0	12.0	138.6	2.4	20	190	138.6	2.4
CG_DZ_2_65	580.4	3.0	0.3430	0.019	0.0472	0.0010	0.12615	0.0529	0.0033	298.0	14.0	297.3	6.1	320	150	297.3	6.1
CG_DZ_2_66	458.4	3.1	0.1470	0.013	0.0226	0.0006	0.01109	0.0475	0.0042	139.0	11.0	143.8	3.7	40	170	143.8	3.7
CG_DZ_2_67	346.1	2.5	0.1770	0.018	0.0240	0.0005	0.13876	0.0540	0.0056	165.0	15.0	152.6	3.4	280	210	152.6	3.4
CG_DZ_2_68	158.1	2.5	0.1140	0.023	0.0185	0.0007	0.08798	0.0445	0.0090	107.0	21.0	117.9	4.2	-190	350	117.9	4.2
CG_DZ_2_69	928	2.1	0.1670	0.010	0.0237	0.0004	0.08464	0.0511	0.0034	156.2	9.2	151.2	2.5	210	140	151.2	2.5
CG_DZ_2_70	220.2	1.9	0.1540	0.019	0.0212	0.0008	0.04614	0.0527	0.0068	144.0	17.0	135.5	5.3	240	280	135.5	5.3
CG_DZ_2_71	237.5	1.4	0.5240	0.038	0.0708	0.0011	0.27187	0.0539	0.0043	425.0	26.0	440.9	6.6	310	170	440.9	6.6
CG_DZ_2_72	899	1.8	0.1479	0.010	0.0232	0.0003	0.06397	0.0462	0.0031	139.7	8.6	148.0	1.9	0	130	148.0	1.9
CG_DZ_2_73	356	2.1	0.1110	0.012	0.0159	0.0005	0.02824	0.0486	0.0048	106.0	11.0	101.8	3.0	190	240	101.8	3.0
CG_DZ_2_74	283	1.7	0.1640	0.013	0.0226	0.0007	0.05556	0.0532	0.0045	154.0	11.0	144.1	4.7	270	180	144.1	4.7
CG_DZ_2_75	1670	2.6	0.2570	0.013	0.0349	0.0011	0.15622	0.0551	0.0031	232.0	10.0	220.8	6.7	390	130	220.8	6.7
CG_DZ_2_76	315.6	2.5	0.3540	0.025	0.0489	0.0010	0.16980	0.0525	0.0038	306.0	19.0	307.9	6.0	260	150	307.9	6.0
CG_DZ_2_77	311.2	4.4	0.1230	0.015	0.0189	0.0006	0.07313	0.0475	0.0058	117.0	13.0	120.4	3.8	20	230	120.4	3.8
CG_DZ_2_78	44	4.2	0.1560	0.062	0.0170	0.0014	0.04309	0.0680	0.0280	141.0	53.0	108.8	8.6	330	770	108.8	8.6
CG_DZ_2_79	640.8	2.7	0.3580	0.017	0.0503	0.0007	0.04003	0.0516	0.0025	310.0	13.0	316.5	4.3	240	110	316.5	4.3
CG_DZ_2_80	294.3	2.6	0.1060	0.014	0.0159	0.0005	0.18807	0.0491	0.0068	101.0	13.0	101.5	3.1	50	260	101.5	3.1
CG_DZ_3_1	87.6	2.0	0.1020	0.023	0.0178	0.0010	0.08892	0.0393	0.0087	96.0	21.0	113.9	6.3	-290	370	113.9	6.3
CG_DZ_3_2	175.1	3.1	0.1390	0.021	0.0180	0.0007	0.20059	0.0573	0.0096	130.0	19.0	115.2	4.7	280	320	115.2	4.7
CG_DZ_3_3	70.5	3.3	0.0940	0.029	0.0192	0.0016	0.14793	0.0360	0.0110	89.0	26.0	123.0	10.0	-510	440	123.0	10.0
CG_DZ_3_4	230.4	2.4	0.1160	0.014	0.0175	0.0007	0.13771	0.0488	0.0065	111.0	13.0	112.0	4.4	50	250	112.0	4.4
CG_DZ_3_5	271.6	2.8	0.5930	0.036	0.0764	0.0016	0.03277	0.0563	0.0035	470.0	23.0	474.4	9.6	420	140	474.4	9.6
CG_DZ_3_6	391	1.8	0.1720	0.017	0.0245	0.0006	0.16563	0.0509	0.0052	160.0	15.0	156.1	3.7	170	200	156.1	3.7
CG_DZ_3_7	69.2	3.0	0.0990	0.029	0.0163	0.0011	0.03108	0.0420	0.0130	93.0	26.0	104.2	6.9	-290	470	104.2	6.9
CG_DZ_3_8	1320	1.5	0.1588	0.007	0.0234	0.0003	0.50855	0.0497	0.0021	149.5	5.8	149.1	1.9	165	90	149.1	1.9
CG_DZ_3_9	237.1	2.1	0.1630	0.019	0.0234	0.0007	0.03635	0.0509	0.0063	152.0	16.0	149.1	4.2	140	230	149.1	4.2
CG_DZ_3_10	190.9	2.4	0.1190	0.020	0.0181	0.0007	0.00590	0.0483	0.0081	112.0	18.0	115.6	4.5	0	310	115.6	4.5
CG_DZ_3_11	396	4.0	0.1430	0.015	0.0203	0.0006	0.11652	0.0511	0.0054	135.0	14.0	129.6	3.6	170	210	129.6	3.6
CG_DZ_3_12	108.2	2.6	0.1300	0.027	0.0187	0.0009	0.18533	0.0510	0.0110	121.0	24.0	119.2	5.8	10	370	119.2	5.8
CG_DZ_3_13	80.9	2.8	0.1220	0.032	0.0184	0.0010	0.21206	0.0520	0.0140	113.0	28.0	117.5	6.5	-60	430	117.5	6.5
CG_DZ_3_14	273	1.4	0.1210	0.017	0.0174	0.0006	0.22630	0.0517	0.0081	115.0	16.0	110.9	3.8	130	300	110.9	3.8
CG_DZ_3_15	222.9	2.9	0.1160	0.018	0.0185	0.0006	0.09262	0.0456	0.0073	110.0	16.0	118.0	4.0	-80	290	118.0	4.0
CG_DZ_3_16	418.1	1.5	0.5380	0.021	0.0702	0.0010	0.26113	0.0552	0.0021	436.0	14.0	437.6	6.1	398	86	437.6	6.1
CG_DZ_3_17	561	2.7	0.1710	0.015	0.0246	0.0004	0.12279	0.0501	0.0044	159.0	13.0	156.7	2.7	150	180	156.7	2.7
CG_DZ_3_18	220	3.0	0.1260	0.017	0.0186	0.0007	0.18161	0.0492	0.0065	120.0	15.0	119.0	4.2	70	250	119.0	4.2
CG_DZ_3_19	404	2.9	0.1760	0.017	0.0244	0.0005	0.28831	0.0529	0.0057	163.0	15.0	155.1	3.4	230	220	155.1	3.4
CG_DZ_3_20	556	2.5	0.1110	0.011	0.0161	0.0004	0.08480	0.0489	0.0047	107.0	10.0	103.2	2.8	140	210	103.2	2.8
CG_DZ_3_21	334.6	2.5	0.1180	0.012	0.0178	0.0005	0.08292	0.0486	0.0053	113.0	11.0	113.5	3.4	80	220	113.5	3.4
CG_DZ_3_22	307	2.5	0.1200	0.016	0.0195	0.0006	0.16965	0.0449	0.0062	114.0	15.0	124.2	3.6	-90	250	124.2	3.6
CG_DZ_3_23	340.1	3.0	0.2140	0.035	0.0246	0.0008	0.05552	0.0640	0.0100	194.0	29.0	156.4	5.3	580	330	156.4	5.3
CG_DZ_3_24	586	2.8	0.5450	0.019	0.0727	0.0011	0.28545	0.0542	0.0018	441.0	12.0	452.3	6.9	366	72	452.3	6.9
CG_DZ_3_25	464	3.0	0.1040	0.013	0.0159	0.0004	0.01668	0.0479	0.0059	100.0	11.0	101.4	2.2	30	230	101.4	2.2
CG_DZ_3_26	174	1.8	0.1350	0.024	0.0182	0.0007	0.14253	0.0550	0.0100	127.0	21.0	116.0	4.3	170	330	116.0	4.3
CG_DZ_3_27	822	1.9	0.1036	0.008	0.0164	0.0003	0.09446	0.0490	0.0041	99.8	7.8	105.1	2.2	150	180	105.1	2.2

CG_DZ_3_28	294	2.5	0.1580	0.017	0.0213	0.0006	0.06628	0.0543	0.0062	148.0	15.0	135.7	3.6	270	230	135.7	3.6
CG_DZ_3_29	210	2.6	0.1510	0.021	0.0233	0.0007	0.10562	0.0473	0.0071	141.0	19.0	148.6	4.2	-30	270	148.6	4.2
CG_DZ_3_30	1053	1.8	0.1313	0.008	0.0204	0.0003	0.19958	0.0465	0.0026	125.1	7.0	130.2	2.1	20	110	130.2	2.1
CG_DZ_3_31	667.4	2.4	0.5880	0.024	0.0746	0.0010	0.09662	0.0570	0.0024	468.0	16.0	463.9	6.2	470	94	463.9	6.2
CG_DZ_3_32	302	1.5	0.1050	0.020	0.0167	0.0006	0.09556	0.0490	0.0092	100.0	18.0	106.8	4.0	0	340	106.8	4.0
CG_DZ_3_33	126.6	2.5	2.5090	0.094	0.2110	0.0032	0.10653	0.0863	0.0036	1271.0	28.0	1234.0	17.0	1322	86	1234.0	17.0
CG_DZ_3_34	522	2.6	0.1720	0.014	0.0240	0.0005	0.02986	0.0523	0.0044	161.0	12.0	152.6	3.3	240	170	152.6	3.3
CG_DZ_3_35	160	1.9	0.1310	0.025	0.0185	0.0007	0.05793	0.0530	0.0110	123.0	22.0	118.2	4.4	160	380	118.2	4.4
CG_DZ_3_36	251	1.9	0.1640	0.018	0.0234	0.0008	0.10391	0.0514	0.0063	153.0	16.0	149.0	5.2	170	240	149.0	5.2
CG_DZ_3_37	542	2.7	0.1570	0.012	0.0248	0.0005	0.09484	0.0460	0.0035	148.0	11.0	157.8	3.4	-10	150	157.8	3.4
CG_DZ_3_38	164.9	3.0	0.5430	0.044	0.0700	0.0020	0.15042	0.0564	0.0045	436.0	29.0	436.0	12.0	400	170	436.0	12.0
CG_DZ_3_39	730	1.4	0.1390	0.012	0.0208	0.0006	0.13567	0.0522	0.0045	131.0	11.0	132.4	3.9	230	180	132.4	3.9
CG_DZ_3_40	292	2.4	0.1250	0.016	0.0180	0.0005	0.21015	0.0510	0.0069	118.0	14.0	114.7	3.2	130	260	114.7	3.2
CG_DZ_3_41	614.7	1.7	0.1550	0.013	0.0228	0.0005	0.44727	0.0490	0.0038	145.0	11.0	145.3	3.3	110	160	145.3	3.3
CG_DZ_3_42	254	1.4	0.1290	0.022	0.0189	0.0008	0.06797	0.0515	0.0085	123.0	20.0	120.4	4.9	210	350	120.4	4.9
CG_DZ_3_43	190	2.4	0.1790	0.027	0.0260	0.0007	0.35239	0.0493	0.0070	165.0	23.0	165.7	4.4	60	270	165.7	4.4
CG_DZ_3_44	603	1.7	0.1650	0.013	0.0236	0.0005	0.33818	0.0513	0.0047	155.0	11.0	150.2	3.4	180	180	150.2	3.4
CG_DZ_3_45	582	1.2	0.1200	0.012	0.0188	0.0005	0.05208	0.0466	0.0049	115.0	11.0	119.9	3.3	0	200	119.9	3.3
CG_DZ_3_46	286	3.0	0.1000	0.013	0.0155	0.0005	0.07417	0.0470	0.0063	96.0	12.0	99.2	3.3	-10	260	99.2	3.3
CG_DZ_3_47	175.6	2.8	0.4830	0.033	0.0686	0.0015	0.20380	0.0515	0.0040	398.0	23.0	427.4	9.3	220	160	427.4	9.3
CG_DZ_3_48	61.3	2.5	0.0990	0.029	0.0183	0.0011	0.05674	0.0400	0.0120	93.0	27.0	117.1	7.1	-360	470	117.1	7.1
CG_DZ_3_49	619	2.1	0.1550	0.012	0.0234	0.0005	0.33514	0.0489	0.0039	146.0	10.0	149.3	3.0	110	160	149.3	3.0
CG_DZ_3_50	160	2.1	0.1360	0.018	0.0181	0.0007	0.15224	0.0529	0.0066	128.0	16.0	115.5	4.6	290	270	115.5	4.6
CG_DZ_3_51	644	2.6	0.1410	0.014	0.0218	0.0008	0.37803	0.0474	0.0045	134.0	13.0	138.7	4.8	60	200	138.7	4.8
CG_DZ_3_52	286.9	3.8	0.1270	0.016	0.0196	0.0006	0.08505	0.0469	0.0057	120.0	14.0	125.4	3.9	-10	220	125.4	3.9
CG_DZ_3_53	141.4	1.8	0.1130	0.022	0.0182	0.0007	0.03639	0.0463	0.0096	107.0	20.0	116.2	4.2	-110	350	116.2	4.2
CG_DZ_3_54	305.6	3.2	0.1210	0.019	0.0182	0.0006	0.01042	0.0487	0.0075	115.0	17.0	116.1	3.7	30	290	116.1	3.7
CG_DZ_3_55	542	2.2	0.1540	0.014	0.0235	0.0005	0.15941	0.0475	0.0045	144.0	13.0	149.8	3.0	40	190	149.8	3.0
CG_DZ_3_56	225.4	3.6	0.1220	0.017	0.0189	0.0005	0.10864	0.0485	0.0077	116.0	15.0	120.6	3.3	10	280	120.6	3.3
CG_DZ_3_57	608.8	2.0	0.1590	0.012	0.0235	0.0005	0.20592	0.0486	0.0036	149.0	11.0	149.7	2.8	100	150	149.7	2.8
CG_DZ_3_58	429	2.4	0.1690	0.017	0.0237	0.0007	0.04816	0.0520	0.0055	157.0	15.0	150.6	4.1	210	220	150.6	4.1
CG_DZ_3_59	280	2.4	0.1720	0.024	0.0234	0.0006	0.26865	0.0529	0.0072	159.0	20.0	148.9	3.4	190	270	148.9	3.4
CG_DZ_3_60	555	2.8	0.1220	0.012	0.0179	0.0004	0.18315	0.0499	0.0050	117.0	11.0	114.3	2.6	120	200	114.3	2.6
CG_DZ_3_61	323.6	2.9	0.4420	0.033	0.0574	0.0011	0.08250	0.0562	0.0042	370.0	23.0	360.1	6.8	410	160	360.1	6.8
CG_DZ_3_62	385	1.4	0.1420	0.018	0.0220	0.0006	0.03058	0.0469	0.0062	134.0	16.0	140.0	3.5	0	240	140.0	3.5
CG_DZ_3_63	566	2.2	0.1490	0.014	0.0235	0.0005	0.01773	0.0461	0.0043	140.0	12.0	149.4	3.1	30	190	149.4	3.1
CG_DZ_3_64	142.2	1.5	0.1920	0.036	0.0266	0.0008	0.30069	0.0521	0.0096	174.0	30.0	169.0	4.9	100	340	169.0	4.9
CG_DZ_3_65	991	1.8	0.1530	0.010	0.0227	0.0003	0.01229	0.0487	0.0031	144.0	8.7	144.9	1.7	110	130	144.9	1.7
CG_DZ_3_66	76.8	1.9	0.1320	0.028	0.0191	0.0010	0.02028	0.0510	0.0120	123.0	25.0	122.0	6.3	90	420	122.0	6.3
CG_DZ_3_67	146.9	2.2	0.1070	0.025	0.0191	0.0010	0.55574	0.0430	0.0110	102.0	22.0	122.1	6.4	-250	410	122.1	6.4
CG_DZ_3_68	3090	0.8	0.0889	0.005	0.0129	0.0004	0.02753	0.0511	0.0032	86.4	5.0	82.3	2.5	220	140	82.3	2.5
CG_DZ_3_69	279.8	3.5	0.1250	0.016	0.0186	0.0006	0.29716	0.0495	0.0069	118.0	15.0	118.6	3.7	80	280	118.6	3.7
CG_DZ_3_70	217	2.2	0.1090	0.017	0.0187	0.0007	0.30709	0.0451	0.0066	104.0	15.0	119.7	4.2	-100	260	119.7	4.2
CG_DZ_3_71	98.5	2.6	0.1060	0.027	0.0172	0.0007	0.00709	0.0450	0.0120	99.0	24.0	109.9	4.5	-240	410	109.9	4.5
CG_DZ_3_72	568	2.3	0.1480	0.010	0.0231	0.0005	0.29320	0.0465	0.0030	139.8	8.7	147.1	2.8	20	130	147.1	2.8
CG_DZ_3_73	282	2.1	0.1640	0.018	0.0243	0.0008	0.21305	0.0498	0.0061	153.0	16.0	154.6	4.7	100	240	154.6	4.7
CG_DZ_3_74	165.4	2.8	0.1180	0.025	0.0187	0.0008	0.36919	0.0448	0.0091	111.0	22.0	119.4	4.8	-170	350	119.4	4.8
CG_DZ_3_75	359	4.6	0.1080	0.014	0.0158	0.0005	0.00761	0.0499	0.0064	103.0	12.0	101.0	3.3	110	250	101.0	3.3
CG_DZ_3_76	191.6	2.7	0.1340	0.025	0.0169	0.0006	0.04973	0.0580	0.0110	126.0	22.0	107.7	3.5	350	380	107.7	3.5
CG_DZ_3_77	87.7	1.0	0.1120	0.026	0.0174	0.0009	0.00757	0.0440	0.0100	105.0	23.0	111.3	6.0	-140	400	111.3	6.0
CG_DZ_3_78	1579	2.4	0.1569	0.009	0.0231	0.0006	0.19056	0.0493	0.0026	147.7	7.6	147.1	3.7	170	130	147.1	3.7
CG_DZ_3_79	345	2.7	0.1820	0.015	0.0245	0.0006	0.06244	0.0541	0.0047	169.0	13.0	155.9	3.7	310	180	155.9	3.7

Kennicott Formation – KUS1-COMP

						Isotope ratios							Apparent ages (Ma)						
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
KUS1-COMP (Kennicott Formation)																			
KUS1-COMP-16	187	9739	1.7	20.1775	12.9	0.1522	13.8	0.0223	4.9	0.35	142.0	6.8	143.8	18.5	174.4	301.8	142.0	6.8	NA
KUS1-COMP-53	268	18536	3.1	21.1951	9.7	0.1470	10.0	0.0226	2.4	0.24	144.0	3.4	139.3	13.0	58.4	230.9	144.0	3.4	NA
KUS1-COMP-89	252	18978	1.7	19.7009	7.0	0.1590	7.6	0.0227	2.8	0.38	144.8	4.1	149.8	10.5	229.9	162.1	144.8	4.1	NA
KUS1-COMP-29	271	12760	1.5	20.6822	5.9	0.1516	6.4	0.0227	2.4	0.37	144.9	3.4	143.3	8.5	116.5	139.7	144.9	3.4	NA
KUS1-COMP-12	179	12177	1.8	19.5756	11.2	0.1618	11.9	0.0230	4.0	0.33	146.4	5.7	152.3	16.8	244.6	259.0	146.4	5.7	NA
KUS1-COMP-40	179	10362	1.6	20.7718	5.7	0.1533	6.5	0.0231	3.1	0.47	147.2	4.5	144.8	8.8	106.2	135.6	147.2	4.5	NA
KUS1-COMP-101	248	39325	1.3	20.5202	9.1	0.1559	9.6	0.0232	3.1	0.32	147.9	4.5	147.1	13.1	135.0	213.8	147.9	4.5	NA
KUS1-COMP-28	324	18441	1.8	20.9771	6.8	0.1525	7.1	0.0232	2.1	0.29	147.9	3.1	144.1	9.6	82.9	161.6	147.9	3.1	NA
KUS1-COMP-17	135	12086	2.2	21.3218	21.4	0.1508	21.5	0.0233	1.4	0.07	148.6	2.1	142.6	28.6	44.1	516.9	148.6	2.1	NA
KUS1-COMP-33	149	17241	2.3	20.4773	15.7	0.1570	16.2	0.0233	3.6	0.22	148.6	5.3	148.1	22.3	139.9	371.8	148.6	5.3	NA
KUS1-COMP-65	909	86535	1.7	20.7364	3.3	0.1553	3.5	0.0234	0.9	0.27	148.9	1.4	146.6	4.7	110.3	78.6	148.9	1.4	NA
KUS1-COMP-2	229	11888	1.5	20.6350	10.8	0.1563	11.0	0.0234	2.0	0.18	149.1	3.0	147.5	15.0	121.9	254.2	149.1	3.0	NA
KUS1-COMP-59	150	12125	4.7	20.6193	8.5	0.1565	8.8	0.0234	2.5	0.28	149.1	3.7	147.6	12.1	123.6	200.0	149.1	3.7	NA
KUS1-COMP-22	191	33821	1.8	20.6398	13.3	0.1566	13.5	0.0234	2.3	0.17	149.4	3.4	147.8	18.6	121.3	314.6	149.4	3.4	NA
KUS1-COMP-38	973	61157	1.9	20.7283	2.1	0.1562	2.4	0.0235	1.1	0.47	149.6	1.7	147.4	3.3	111.2	49.8	149.6	1.7	NA
KUS1-COMP-75	469	23853	2.3	20.7369	3.2	0.1565	3.5	0.0235	1.4	0.39	150.0	2.0	147.6	4.8	110.2	75.2	150.0	2.0	NA
KUS1-COMP-85	75	11396	1.9	22.9265	36.3	0.1416	36.8	0.0236	5.9	0.16	150.1	8.7	134.5	46.3	-132.2	923.7	150.1	8.7	NA
KUS1-COMP-51	125	12421	1.3	21.2049	15.4	0.1532	15.8	0.0236	3.3	0.21	150.1	4.9	144.8	21.3	57.3	369.6	150.1	4.9	NA
KUS1-COMP-58	221	27086	1.8	20.2939	5.2	0.1602	6.3	0.0236	3.5	0.56	150.2	5.3	150.9	8.8	161.0	122.0	150.2	5.3	NA
KUS1-COMP-44	716	65921	2.1	20.1431	3.1	0.1614	3.3	0.0236	1.1	0.34	150.3	1.7	152.0	4.7	178.4	73.4	150.3	1.7	NA
KUS1-COMP-97	89	7571	1.6	21.7593	26.4	0.1497	27.2	0.0236	6.7	0.25	150.5	9.9	141.7	36.0	-4.6	645.4	150.5	9.9	NA
KUS1-COMP-79	343	26227	1.5	20.1714	6.8	0.1619	7.2	0.0237	2.4	0.33	150.9	3.6	152.3	10.2	175.1	158.7	150.9	3.6	NA
KUS1-COMP-63	117	8514	1.8	20.2115	16.5	0.1619	16.9	0.0237	3.7	0.22	151.2	5.5	152.3	23.9	170.5	387.4	151.2	5.5	NA
KUS1-COMP-67	120	8638	2.6	20.3965	8.7	0.1607	9.3	0.0238	3.3	0.36	151.4	5.0	151.3	13.1	149.2	203.6	151.4	5.0	NA
KUS1-COMP-69	367	38694	1.6	21.0530	7.3	0.1561	7.5	0.0238	1.5	0.21	151.8	2.3	147.2	10.3	74.4	174.9	151.8	2.3	NA
KUS1-COMP-52	553	29493	2.2	20.2060	4.1	0.1630	4.5	0.0239	1.7	0.38	152.1	2.5	153.3	6.4	171.1	96.8	152.1	2.5	NA
KUS1-COMP-66	200	30258	1.8	21.0998	7.2	0.1562	8.3	0.0239	4.0	0.49	152.3	6.0	147.4	11.3	69.1	172.1	152.3	6.0	NA
KUS1-COMP-88	249	22671	2.3	19.8733	11.1	0.1659	11.3	0.0239	2.2	0.19	152.4	3.3	155.9	16.4	209.8	258.3	152.4	3.3	NA
KUS1-COMP-64	853	45769	0.9	19.8645	2.2	0.1660	3.0	0.0239	2.0	0.67	152.4	3.0	156.0	4.3	210.8	50.6	152.4	3.0	NA
KUS1-COMP-90	244	23073	1.6	20.9730	8.8	0.1573	9.0	0.0239	1.5	0.17	152.5	2.3	148.4	12.4	83.4	210.0	152.5	2.3	NA
KUS1-COMP-95	213	13766	1.6	20.0620	14.3	0.1648	14.5	0.0240	2.7	0.18	152.8	4.0	154.9	20.9	187.8	334.2	152.8	4.0	NA
KUS1-COMP-82	354	20147	1.6	20.1867	6.5	0.1638	6.8	0.0240	2.3	0.33	152.8	3.4	154.0	9.8	173.3	151.1	152.8	3.4	NA
KUS1-COMP-39	494	41229	2.1	20.2448	3.2	0.1635	3.7	0.0240	1.7	0.48	152.9	2.6	153.7	5.2	166.6	75.3	152.9	2.6	NA
KUS1-COMP-104	897	66839	1.7	20.4677	2.9	0.1619	3.1	0.0240	1.1	0.36	153.1	1.7	152.3	4.4	141.0	68.8	153.1	1.7	NA
KUS1-COMP-27	130	11492	2.6	20.2727	14.3	0.1635	14.7	0.0240	3.4	0.23	153.2	5.1	153.8	20.9	163.4	335.2	153.2	5.1	NA
KUS1-COMP-43	785	7192	1.7	19.5158	2.7	0.1700	2.9	0.0241	0.9	0.32	153.3	1.4	159.4	4.2	251.7	62.3	153.3	1.4	NA
KUS1-COMP-96	200	15026	4.0	19.8828	11.3	0.1670	11.6	0.0241	2.8	0.24	153.4	4.2	156.8	16.8	208.6	261.6	153.4	4.2	NA
KUS1-COMP-9	87	4369	1.9	20.8747	15.7	0.1594	16.6	0.0241	5.3	0.32	153.7	8.1	150.2	23.2	94.6	374.5	153.7	8.1	NA
KUS1-COMP-60	493	26561	1.9	19.6596	4.5	0.1693	4.6	0.0241	1.2	0.27	153.8	1.9	158.8	6.8	234.8	103.1	153.8	1.9	NA
KUS1-COMP-25	671	44132	2.3	19.8581	2.4	0.1677	3.1	0.0242	2.0	0.63	153.9	3.0	157.5	4.6	211.5	56.1	153.9	3.0	NA
KUS1-COMP-87	147	12595	1.8	21.0313	23.6	0.1588	23.8	0.0242	2.9	0.12	154.3	4.4	149.6	33.1	76.8	568.2	154.3	4.4	NA

KUS1-COMP-46	271	15483	2.4	19.9636	7.2	0.1673	7.7	0.0242	2.9	0.37	154.3	4.4	157.0	11.2	199.2	166.8	154.3	4.4	NA
KUS1-COMP-1	114	8130	1.8	22.8874	14.5	0.1460	15.7	0.0242	6.1	0.39	154.3	9.2	138.4	20.3	-128.0	360.0	154.3	9.2	NA
KUS1-COMP-78	167	17940	1.8	20.9079	7.7	0.1603	8.0	0.0243	2.1	0.27	154.8	3.3	150.9	11.3	90.8	183.5	154.8	3.3	NA
KUS1-COMP-55	355	29033	5.4	21.2857	6.0	0.1575	6.2	0.0243	1.6	0.26	154.9	2.5	148.6	8.6	48.2	143.9	154.9	2.5	NA
KUS1-COMP-42	388	52650	1.7	20.0847	7.2	0.1670	7.4	0.0243	1.7	0.22	155.0	2.5	156.8	10.7	185.1	167.4	155.0	2.5	NA
KUS1-COMP-6	159	13020	1.3	20.1737	8.9	0.1664	9.4	0.0244	3.0	0.32	155.1	4.6	156.3	13.6	174.8	208.4	155.1	4.6	NA
KUS1-COMP-21	762	103572	2.1	19.8479	2.7	0.1696	3.6	0.0244	2.4	0.67	155.5	3.8	159.1	5.4	212.7	62.8	155.5	3.8	NA
KUS1-COMP-36	185	9097	1.8	21.5690	6.9	0.1562	7.7	0.0244	3.5	0.46	155.6	5.5	147.4	10.6	16.5	165.1	155.6	5.5	NA
KUS1-COMP-86	120	14988	2.6	18.6455	7.1	0.1811	7.5	0.0245	2.6	0.34	156.0	4.0	169.0	11.7	355.6	160.2	156.0	4.0	NA
KUS1-COMP-26	186	11947	2.1	20.2888	9.6	0.1668	10.1	0.0245	3.0	0.30	156.3	4.7	156.7	14.7	161.6	225.7	156.3	4.7	NA
KUS1-COMP-3	78	6036	2.4	21.1910	21.6	0.1598	22.4	0.0246	5.7	0.25	156.4	8.8	150.5	31.3	58.9	520.5	156.4	8.8	NA
KUS1-COMP-19	693	40011	1.8	20.5156	1.9	0.1656	2.6	0.0246	1.7	0.68	156.9	2.7	155.6	3.7	135.5	43.9	156.9	2.7	NA
KUS1-COMP-54	221	8382	1.8	20.4601	11.2	0.1663	11.9	0.0247	4.3	0.36	157.1	6.6	156.2	17.3	141.9	262.6	157.1	6.6	NA
KUS1-COMP-103	85	6221	2.9	24.8944	47.4	0.1367	47.5	0.0247	3.6	0.08	157.1	5.5	130.1	58.0	-340.0	1283.3	157.1	5.5	NA
KUS1-COMP-102	306	32941	2.5	20.2390	3.9	0.1686	4.4	0.0247	2.0	0.46	157.6	3.1	158.2	6.4	167.3	91.5	157.6	3.1	NA
KUS1-COMP-14	519	74135	1.8	20.7874	4.7	0.1643	4.9	0.0248	1.5	0.31	157.7	2.4	154.5	7.0	104.5	110.3	157.7	2.4	NA
KUS1-COMP-71	806	52053	2.3	20.4608	2.7	0.1683	3.5	0.0250	2.3	0.64	159.0	3.6	157.9	5.2	141.8	63.7	159.0	3.6	NA
KUS1-COMP-47	199	33791	2.3	21.6984	8.8	0.1593	9.2	0.0251	2.7	0.29	159.6	4.2	150.1	12.8	2.1	211.7	159.6	4.2	NA
KUS1-COMP-45	154	11165	2.7	19.7775	11.7	0.1748	12.4	0.0251	4.0	0.32	159.7	6.3	163.6	18.7	220.9	271.3	159.7	6.3	NA
KUS1-COMP-80	146	11823	1.4	20.9837	11.5	0.1648	11.9	0.0251	3.2	0.27	159.7	5.0	154.9	17.2	82.2	273.8	159.7	5.0	NA
KUS1-COMP-98	529	69610	2.0	20.3310	3.2	0.1702	4.4	0.0251	3.0	0.69	159.8	4.8	159.6	6.5	156.7	74.2	159.8	4.8	NA
KUS1-COMP-99	402	43171	2.0	19.7111	3.2	0.1760	3.8	0.0252	2.0	0.52	160.2	3.1	164.6	5.7	228.7	74.4	160.2	3.1	NA
KUS1-COMP-11	192	18969	1.8	20.1947	8.6	0.1718	9.3	0.0252	3.7	0.40	160.2	5.9	161.0	13.9	172.4	200.3	160.2	5.9	NA
KUS1-COMP-105	309	35812	3.2	20.2707	5.9	0.1713	6.2	0.0252	2.1	0.34	160.3	3.3	160.6	9.3	163.6	137.3	160.3	3.3	NA
KUS1-COMP-34	99	57529	2.3	20.9736	27.1	0.1661	27.2	0.0253	2.7	0.10	160.8	4.3	156.0	39.4	83.4	653.8	160.8	4.3	NA
KUS1-COMP-31	458	4594	2.2	18.9165	9.4	0.1845	10.0	0.0253	3.7	0.36	161.1	5.8	171.9	15.9	323.0	212.9	161.1	5.8	NA
KUS1-COMP-70	354	34608	1.6	20.4013	4.9	0.1730	5.9	0.0256	3.3	0.56	162.9	5.3	162.0	8.9	148.6	114.9	162.9	5.3	NA
KUS1-COMP-76	174	35356	1.3	19.5854	9.1	0.1840	9.3	0.0261	1.6	0.17	166.3	2.6	171.5	14.6	243.5	210.8	166.3	2.6	NA
KUS1-COMP-10	154	13184	1.9	19.6080	10.8	0.1843	11.2	0.0262	2.9	0.26	166.8	4.9	171.7	17.7	240.8	250.4	166.8	4.9	NA
KUS1-COMP-74	193	12464	3.2	20.2552	9.8	0.2075	10.7	0.0305	4.2	0.39	193.6	8.0	191.4	18.6	165.4	229.4	193.6	8.0	NA
KUS1-COMP-35	316	36460	1.4	19.3055	2.8	0.3273	3.7	0.0458	2.4	0.65	288.8	6.7	287.5	9.2	276.6	64.2	288.8	6.7	NA
KUS1-COMP-32	440	74108	3.1	18.7224	1.7	0.3441	2.0	0.0467	1.0	0.50	294.4	2.9	300.3	5.2	346.4	38.8	294.4	2.9	NA
KUS1-COMP-49	982	147994	1.6	18.8228	1.1	0.3449	2.5	0.0471	2.3	0.90	296.6	6.6	300.9	6.6	334.2	25.1	296.6	6.6	NA
KUS1-COMP-18	225	22202	2.6	18.5589	4.2	0.3498	4.4	0.0471	1.6	0.35	296.6	4.5	304.6	11.7	366.1	93.6	296.6	4.5	NA
KUS1-COMP-94	1174	171373	1.9	19.1057	0.5	0.3412	0.9	0.0473	0.7	0.78	297.8	2.0	298.1	2.3	300.3	12.5	297.8	2.0	NA
KUS1-COMP-5	106	34553	1.6	19.8703	9.8	0.3290	10.3	0.0474	3.1	0.30	298.7	8.9	288.8	25.8	210.1	227.5	298.7	8.9	NA
KUS1-COMP-48	205	13114	3.4	19.7153	4.1	0.3324	4.2	0.0475	0.9	0.23	299.3	2.8	291.4	10.6	228.2	94.0	299.3	2.8	NA
KUS1-COMP-50	558	91871	4.7	19.0328	1.8	0.3445	2.5	0.0476	1.7	0.70	299.5	5.0	300.6	6.4	309.0	40.3	299.5	5.0	NA
KUS1-COMP-73	312	48625	1.4	18.6369	3.6	0.3521	4.1	0.0476	2.0	0.49	299.7	5.8	306.3	10.8	356.7	80.4	299.7	5.8	NA
KUS1-COMP-41	265	16247	1.3	18.4882	4.4	0.3553	5.3	0.0476	2.9	0.55	300.0	8.5	308.7	14.1	374.7	99.8	300.0	8.5	NA
KUS1-COMP-30	173	23258	2.0	18.7228	5.0	0.3519	5.1	0.0478	1.1	0.21	300.9	3.2	306.2	13.4	346.3	112.5	300.9	3.2	NA
KUS1-COMP-23	318	55761	2.3	19.0545	3.6	0.3467	4.4	0.0479	2.5	0.57	301.7	7.4	302.2	11.5	306.4	82.2	301.7	7.4	NA
KUS1-COMP-15	246	36539	3.5	18.5617	5.7	0.3562	6.0	0.0480	1.8	0.30	301.9	5.3	309.4	16.0	365.8	129.5	301.9	5.3	NA
KUS1-COMP-72	266	39384	1.5	19.2022	4.5	0.3452	6.0	0.0481	4.0	0.66	302.7	11.8	301.1	15.6	288.8	102.4	302.7	11.8	NA
KUS1-COMP-81	172	31525	3.2	18.6491	3.3	0.3562	3.9	0.0482	2.2	0.56	303.4	6.5	309.4	10.5	355.2	73.7	303.4	6.5	NA
KUS1-COMP-37	742	129799	3.4	18.9310	1.5	0.3520	2.1	0.0483	1.5	0.69	304.2	4.4	306.2	5.6	321.2	35.0	304.2	4.4	NA
KUS1-COMP-7	324	42677	1.5	19.4884	1.8	0.3430	4.2	0.0485	3.8	0.90	305.2	11.2	299.4	10.8	254.9	42.2	305.2	11.2	NA

KUS1-COMP-100	446	100928	1.8	19.2351	2.5	0.3483	2.8	0.0486	1.3	0.45	305.8	3.8	303.4	7.4	284.9	57.2	305.8	3.8	NA
KUS1-COMP-4	232	36880	3.0	19.3819	4.0	0.3464	4.3	0.0487	1.6	0.37	306.5	4.8	302.0	11.3	267.5	92.1	306.5	4.8	NA
KUS1-COMP-106	207	48934	2.6	19.4244	4.0	0.3459	4.5	0.0487	2.0	0.45	306.7	6.1	301.6	11.8	262.4	92.8	306.7	6.1	NA
KUS1-COMP-84	297	43501	4.6	18.7909	1.9	0.3580	2.7	0.0488	1.9	0.71	307.1	5.7	310.7	7.2	338.0	42.8	307.1	5.7	NA
KUS1-COMP-20	544	81318	2.0	18.8102	1.4	0.3586	1.6	0.0489	0.8	0.49	307.9	2.4	311.2	4.4	335.7	32.2	307.9	2.4	NA
KUS1-COMP-77	281	48428	3.4	19.3880	2.4	0.3488	3.3	0.0490	2.2	0.67	308.6	6.6	303.8	8.6	266.7	55.5	308.6	6.6	NA
KUS1-COMP-62	178	44347	1.6	19.2370	4.0	0.3518	4.8	0.0491	2.8	0.57	308.9	8.3	306.1	12.8	284.7	90.7	308.9	8.3	NA
KUS1-COMP-83	985	168831	1.7	19.0002	0.8	0.3567	1.5	0.0491	1.3	0.85	309.3	3.8	309.7	3.9	312.9	17.6	309.3	3.8	NA
KUS1-COMP-56	468	72007	3.5	18.7825	3.3	0.3609	3.8	0.0492	1.9	0.51	309.4	5.9	312.9	10.3	339.1	74.2	309.4	5.9	NA
KUS1-COMP-8	1097	223888	2.8	18.8394	1.0	0.3605	2.4	0.0493	2.2	0.91	309.9	6.6	312.6	6.5	332.2	22.9	309.9	6.6	NA
KUS1-COMP-92	301	46080	3.4	19.0950	3.6	0.3557	4.5	0.0493	2.7	0.60	310.0	8.2	309.0	11.9	301.6	81.0	310.0	8.2	NA
KUS1-COMP-57	384	66882	2.3	18.7523	2.7	0.3675	3.3	0.0500	1.8	0.56	314.4	5.6	317.8	8.9	342.7	60.8	314.4	5.6	NA
KUS1-COMP-13	744	146369	2.5	17.9488	0.6	0.5414	1.2	0.0705	1.0	0.86	439.0	4.3	439.3	4.2	441.0	13.1	439.0	4.3	99.6
KUS1-COMP-91	410	85088	1.4	17.9075	1.2	0.5545	2.4	0.0720	2.1	0.88	448.3	9.2	447.9	8.7	446.1	25.7	448.3	9.2	100.5
KUS1-COMP-61	285	55164	2.6	17.7058	2.2	0.6067	2.7	0.0779	1.5	0.57	483.6	7.2	481.5	10.4	471.2	49.2	483.6	7.2	102.6
KUS1-COMP-71	548	225395	4.7	17.0111	0.5	0.7528	1.2	0.0929	1.1	0.91	572.5	6.1	569.8	5.4	559.2	11.3	572.5	6.1	102.4
KUS1-COMP-24	74	26924	1.5	15.0055	5.0	1.2643	5.2	0.1376	1.2	0.24	831.0	9.7	829.8	29.4	826.6	105.0	831.0	9.7	100.5
KUS1-COMP-93	184	175954	1.8	8.9209	0.3	5.1478	2.9	0.3331	2.9	0.99	1853.2	46.1	1844.0	24.5	1833.7	5.9	1833.7	5.9	101.1
KUS1-COMP-68	171	205588	4.5	8.5722	0.4	5.5688	1.5	0.3462	1.5	0.97	1916.5	24.6	1911.3	13.1	1905.6	6.3	1905.6	6.3	100.6

Kotsina Conglomerate – KOT-COMP

						Isotope ratios							Apparent ages (Ma)						
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
KOT-COMP (Kotsina Conglomerate)																			
KOT-COMP-1	157	14691	2.2	24.8244	36.6	0.1399	36.8	0.0252	3.2	0.09	160.3	5.0	132.9	45.8	-332.8	969.6	160.3	5.0	NA
KOT-COMP-2	156	12695	2.1	23.1094	25.7	0.1402	27.3	0.0235	9.1	0.33	149.7	13.5	133.2	34.1	-151.9	646.9	149.7	13.5	NA
KOT-COMP-3	210	8975	2.8	22.8859	39.5	0.1442	39.7	0.0239	4.7	0.12	152.5	7.1	136.8	50.9	-127.8	1008.9	152.5	7.1	NA
KOT-COMP-4	272	8024	2.4	23.7374	26.5	0.1419	27.1	0.0244	5.4	0.20	155.6	8.2	134.8	34.2	-218.9	677.5	155.6	8.2	NA
KOT-COMP-5	288	19574	1.8	21.7331	20.9	0.1643	21.3	0.0259	4.0	0.19	164.9	6.5	154.5	30.5	-1.7	508.2	164.9	6.5	NA
KOT-COMP-6	294	11553	5.7	20.0587	11.0	0.1808	11.8	0.0263	4.2	0.36	167.3	7.0	168.7	18.4	188.1	257.8	167.3	7.0	NA
KOT-COMP-7	371	20581	6.2	20.3589	14.7	0.1713	15.1	0.0253	3.4	0.22	161.1	5.3	160.6	22.4	153.5	346.5	161.1	5.3	NA
KOT-COMP-8	290	9980	2.8	22.1254	12.6	0.1542	12.8	0.0247	2.5	0.19	157.6	3.8	145.6	17.4	-45.0	307.3	157.6	3.8	NA
KOT-COMP-9	179	10150	2.3	21.1223	25.7	0.1679	27.6	0.0257	10.1	0.37	163.7	16.4	157.6	40.3	66.6	620.7	163.7	16.4	NA
KOT-COMP-11	207	12720	2.0	22.7185	12.6	0.1482	13.9	0.0244	5.9	0.42	155.6	9.0	140.4	18.2	-109.7	310.5	155.6	9.0	NA
KOT-COMP-12	59	5942	2.6	6.6291	243.6	0.5062	243.7	0.0243	8.0	0.03	155.0	12.3	415.9	1171.6	2355.6	57.9	2355.6	57.9	6.6
KOT-COMP-13	304	26156	1.2	20.0744	11.9	0.1714	12.4	0.0249	3.3	0.27	158.9	5.2	160.6	18.4	186.3	278.0	158.9	5.2	NA
KOT-COMP-14	277	12231	3.8	19.6202	12.6	0.1979	13.6	0.0282	5.2	0.38	179.0	9.2	183.3	22.9	239.4	291.3	179.0	9.2	NA
KOT-COMP-15	499	23699	3.2	21.4817	7.2	0.1720	7.7	0.0268	2.8	0.36	170.5	4.7	161.2	11.5	26.2	173.1	170.5	4.7	NA
KOT-COMP-16	930	65246	2.2	20.1745	4.3	0.1754	4.9	0.0257	2.3	0.47	163.4	3.7	164.1	7.5	174.7	101.4	163.4	3.7	NA
KOT-COMP-17	459	27919	3.8	21.7434	5.7	0.1720	6.6	0.0271	3.3	0.50	172.5	5.6	161.1	9.8	-2.8	137.3	172.5	5.6	NA
KOT-COMP-18	247	12681	2.4	23.5959	24.9	0.1473	25.0	0.0252	2.4	0.10	160.5	3.8	139.6	32.6	-203.9	631.6	160.5	3.8	NA
KOT-COMP-19	368	24032	4.5	20.1275	7.9	0.1809	9.5	0.0264	5.2	0.55	168.0	8.7	168.9	14.7	180.2	183.9	168.0	8.7	NA
KOT-COMP-20	281	15103	2.5	25.5671	35.1	0.1357	35.2	0.0252	2.8	0.08	160.2	4.4	129.2	42.7	-409.2	941.5	160.2	4.4	NA
KOT-COMP-21	340	11807	2.0	22.6485	12.7	0.1522	13.6	0.0250	4.9	0.36	159.2	7.6	143.9	18.3	-102.1	313.4	159.2	7.6	NA
KOT-COMP-22	187	11146	2.3	22.3721	16.0	0.1592	17.0	0.0258	5.7	0.33	164.4	9.2	150.0	23.7	-72.0	392.8	164.4	9.2	NA
KOT-COMP-23	415	32550	2.5	19.3636	6.7	0.1694	7.4	0.0238	3.3	0.44	151.6	4.9	158.9	10.9	269.6	153.2	151.6	4.9	NA
KOT-COMP-24	288	19347	1.8	18.5321	10.9	0.1896	11.7	0.0255	4.1	0.35	162.3	6.6	176.3	18.9	369.4	246.8	162.3	6.6	NA
KOT-COMP-25	291	42271	3.3	20.9695	17.7	0.1563	17.9	0.0238	2.6	0.14	151.5	3.9	147.5	24.6	83.8	422.8	151.5	3.9	NA
KOT-COMP-26	653	26810	1.1	20.1628	10.5	0.1650	10.8	0.0241	2.6	0.24	153.7	4.0	155.1	15.5	176.1	244.6	153.7	4.0	NA
KOT-COMP-27	148	5527	2.2	35.4605	70.6	0.0924	71.1	0.0238	8.2	0.11	151.4	12.2	89.7	61.2	-1353.2	774.6	151.4	12.2	NA
KOT-COMP-28	110	7873	2.1	25.3216	39.1	0.1291	39.6	0.0237	6.6	0.17	151.0	9.9	123.3	46.0	-384.1	1049.1	151.0	9.9	NA
KOT-COMP-29	225	20375	1.9	22.0222	27.1	0.1589	28.6	0.0254	9.4	0.33	161.6	14.9	149.8	39.9	-33.6	666.8	161.6	14.9	NA
KOT-COMP-30	232	9253	2.0	22.3212	18.1	0.1577	18.4	0.0255	3.4	0.18	162.5	5.4	148.7	25.5	-66.5	444.7	162.5	5.4	NA
KOT-COMP-32	98	7954	3.1	18.5961	21.8	0.3808	22.6	0.0514	5.7	0.25	322.9	18.1	327.7	63.3	361.6	497.4	322.9	18.1	NA
KOT-COMP-33	486	22357	3.0	19.2362	7.7	0.1904	8.7	0.0266	4.1	0.47	169.0	6.8	177.0	14.2	284.7	176.6	169.0	6.8	NA
KOT-COMP-34	112	5213	2.7	30.6435	68.7	0.1103	69.1	0.0245	6.8	0.10	156.1	10.4	106.3	69.8	-907.6	2244.9	156.1	10.4	NA
KOT-COMP-35	282	9607	2.4	24.3001	17.8	0.1385	18.0	0.0244	2.8	0.15	155.4	4.2	131.7	22.2	-278.1	454.7	155.4	4.2	NA
KOT-COMP-36	441	18281	2.4	22.1909	9.0	0.1540	10.5	0.0248	5.4	0.52	157.9	8.4	145.5	14.2	-52.2	219.5	157.9	8.4	NA
KOT-COMP-37	363	9605	1.9	20.0184	18.1	0.1698	18.2	0.0247	2.1	0.11	157.0	3.2	159.2	26.8	192.9	423.1	157.0	3.2	NA
KOT-COMP-38	555	26008	3.1	20.4586	5.3	0.1658	5.8	0.0246	2.4	0.41	156.6	3.7	155.7	8.4	142.1	125.4	156.6	3.7	NA
KOT-COMP-39	77	2523	1.9	33.2999	72.8	0.1119	73.4	0.0270	8.9	0.12	171.9	15.1	107.7	75.1	-1155.8	904.0	171.9	15.1	NA
KOT-COMP-40	406	24541	2.3	20.5728	11.0	0.1663	11.9	0.0248	4.6	0.39	158.0	7.2	156.2	17.2	129.0	259.0	158.0	7.2	NA
KOT-COMP-41	110	7682	1.7	34.2391	75.0	0.0941	76.1	0.0234	12.4	0.16	148.9	18.3	91.3	66.5	-1242.0	955.6	148.9	18.3	NA
KOT-COMP-42	181	9735	2.0	20.3408	25.5	0.1706	28.0	0.0252	11.7	0.42	160.2	18.5	159.9	41.5	155.6	605.7	160.2	18.5	NA
KOT-COMP-43	190	13250	1.7	18.1866	10.0	0.1925	11.0	0.0254	4.4	0.40	161.6	7.0	178.7	18.0	411.6	225.0	161.6	7.0	NA

KOT-COMP-44	112	9726	2.0	22.6822	61.7	0.1557	62.3	0.0256	8.7	0.14	163.1	13.9	146.9	85.4	-105.8	1670.9	163.1	13.9	NA
KOT-COMP-45	368	14458	1.9	20.7361	11.3	0.1691	11.7	0.0254	3.1	0.26	161.9	4.9	158.6	17.1	110.3	266.4	161.9	4.9	NA
KOT-COMP-46	263	13459	2.3	22.1267	21.2	0.1510	21.6	0.0242	4.0	0.18	154.4	6.0	142.8	28.8	-45.1	521.4	154.4	6.0	NA
KOT-COMP-47	357	21848	2.0	20.1356	13.0	0.1564	13.3	0.0228	2.7	0.20	145.6	3.9	147.5	18.2	179.2	303.8	145.6	3.9	NA
KOT-COMP-48	252	9376	3.0	19.6493	19.8	0.1810	20.2	0.0258	4.1	0.20	164.1	6.6	168.9	31.4	235.9	460.5	164.1	6.6	NA
KOT-COMP-49	229	16741	2.8	19.6296	17.5	0.1733	18.2	0.0247	4.8	0.26	157.1	7.4	162.3	27.2	238.3	406.7	157.1	7.4	NA
KOT-COMP-50	113	4457	2.1	20.7793	35.5	0.1564	36.0	0.0236	6.1	0.17	150.2	9.1	147.5	49.5	105.4	862.9	150.2	9.1	NA
KOT-COMP-51	47	2679	2.5	5.8051	260.6	0.5712	261.2	0.0240	17.3	0.07	153.2	26.2	458.8	1853.8	2579.7	44.0	2579.7	44.0	5.9
KOT-COMP-52	224	14882	2.7	21.6906	28.2	0.1623	28.4	0.0255	3.2	0.11	162.5	5.2	152.7	40.3	3.0	691.9	162.5	5.2	NA
KOT-COMP-53	106	7980	1.3	21.8712	39.1	0.1642	39.6	0.0260	6.4	0.16	165.7	10.4	154.4	56.8	-17.0	978.8	165.7	10.4	NA
KOT-COMP-54	590	29053	3.2	19.6989	2.5	0.1963	5.1	0.0280	4.5	0.87	178.3	7.9	182.0	8.6	230.1	58.1	178.3	7.9	NA
KOT-COMP-55	436	24233	5.2	19.2353	7.5	0.1963	8.1	0.0274	3.0	0.38	174.1	5.2	182.0	13.5	284.9	171.2	174.1	5.2	NA
KOT-COMP-56	581	50726	3.4	19.9828	3.7	0.1840	4.4	0.0267	2.4	0.55	169.6	4.0	171.5	7.0	197.0	85.9	169.6	4.0	NA
KOT-COMP-57	312	12498	1.9	22.2223	21.2	0.1640	21.6	0.0264	4.1	0.19	168.2	6.8	154.2	30.9	-55.6	520.8	168.2	6.8	NA
KOT-COMP-58	851	37753	3.7	20.3032	5.7	0.1810	6.2	0.0267	2.4	0.39	169.6	4.1	168.9	9.7	159.9	134.4	169.6	4.1	NA
KOT-COMP-59	364	49928	2.2	23.0394	10.0	0.1529	10.4	0.0256	2.7	0.26	162.6	4.3	144.5	14.0	-144.4	249.3	162.6	4.3	NA
KOT-COMP-60	83	11833	4.5	26.7635	51.7	0.1673	52.5	0.0325	9.5	0.18	206.0	19.3	157.1	76.6	-530.2	1470.4	206.0	19.3	NA
KOT-COMP-62	601	20232	4.4	19.6072	6.1	0.1781	7.5	0.0253	4.4	0.58	161.2	6.9	166.4	11.5	240.9	139.9	161.2	6.9	NA
KOT-COMP-63	117	5488	1.2	26.2733	41.7	0.1330	43.0	0.0253	10.7	0.25	161.3	17.0	126.8	51.3	-480.9	1147.8	161.3	17.0	NA
KOT-COMP-64	226	13227	1.6	22.3381	13.5	0.1481	14.0	0.0240	3.6	0.26	152.9	5.4	140.3	18.3	-68.3	331.6	152.9	5.4	NA
KOT-COMP-65	201	9104	2.9	21.6486	25.2	0.1554	25.4	0.0244	3.2	0.13	155.4	5.0	146.7	34.7	7.7	615.3	155.4	5.0	NA
KOT-COMP-66	1202	68626	3.3	20.8333	2.4	0.1705	3.1	0.0258	2.0	0.63	164.0	3.2	159.9	4.6	99.3	57.1	164.0	3.2	NA
KOT-COMP-67	147	10567	4.8	21.9889	22.4	0.1777	22.7	0.0283	3.6	0.16	180.1	6.5	166.1	34.7	-30.0	548.1	180.1	6.5	NA
KOT-COMP-68	492	55620	1.4	20.2315	11.4	0.1755	14.7	0.0258	9.3	0.63	163.9	15.0	164.2	22.3	168.1	266.7	163.9	15.0	NA
KOT-COMP-69	119	4730	2.0	20.4241	35.8	0.1526	37.2	0.0226	9.8	0.26	144.1	14.0	144.2	50.0	146.0	865.4	144.1	14.0	NA
KOT-COMP-70	90	5761	1.6	26.1606	50.6	0.1191	51.1	0.0226	7.6	0.15	144.1	10.8	114.3	55.3	-469.5	1417.0	144.1	10.8	NA
KOT-COMP-71	214	7063	2.7	21.7496	30.8	0.1497	31.0	0.0236	3.7	0.12	150.5	5.5	141.7	41.1	-3.5	758.6	150.5	5.5	NA
KOT-COMP-72	541	4142	1.0	18.9178	16.4	0.1905	17.9	0.0261	7.3	0.41	166.3	12.0	177.0	29.1	322.8	374.0	166.3	12.0	NA
KOT-COMP-73	145	6980	2.2	20.5098	19.8	0.1616	21.0	0.0240	7.2	0.34	153.1	10.9	152.1	29.7	136.2	468.0	153.1	10.9	NA
KOT-COMP-74	680	28967	2.1	19.7270	4.7	0.1622	5.2	0.0232	2.2	0.41	147.9	3.2	152.6	7.4	226.9	109.6	147.9	3.2	NA
KOT-COMP-75	311	13784	2.4	19.1159	15.5	0.1742	16.4	0.0241	5.3	0.33	153.8	8.1	163.0	24.6	299.1	354.5	153.8	8.1	NA
KOT-COMP-76	205	10896	1.8	23.5911	18.6	0.1485	19.1	0.0254	4.4	0.23	161.7	7.0	140.6	25.1	-203.4	469.6	161.7	7.0	NA
KOT-COMP-77	155	5386	1.8	29.9192	53.1	0.1162	53.3	0.0252	5.0	0.09	160.6	7.9	111.6	56.5	-838.6	1617.1	160.6	7.9	NA
KOT-COMP-78	388	7758	3.2	20.8915	14.9	0.1697	15.5	0.0257	4.2	0.27	163.6	6.8	159.1	22.9	92.7	355.4	163.6	6.8	NA
KOT-COMP-79	343	20442	3.6	20.1741	9.6	0.1755	10.7	0.0257	4.8	0.45	163.5	7.7	164.2	16.2	174.8	223.3	163.5	7.7	NA
KOT-COMP-81	181	9969	1.7	18.5752	13.1	0.1826	14.4	0.0246	6.0	0.42	156.7	9.3	170.3	22.6	364.1	295.7	156.7	9.3	NA
KOT-COMP-82	163	9126	1.8	17.9607	24.7	0.1863	24.9	0.0243	3.3	0.13	154.5	5.0	173.4	39.8	439.5	558.0	154.5	5.0	NA
KOT-COMP-83	160	5535	1.9	20.2891	27.0	0.1645	27.2	0.0242	3.8	0.14	154.2	5.8	154.6	39.1	161.5	641.1	154.2	5.8	NA

Root Glacier Formation – ROOT1-COMP

						Isotope ratios							Apparent ages (Ma)						
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
ROOT1-COMP (Root Glacier Formation)																			
ROOT1-CAMP-62	91	49003	2.2	25.5036	35.9	0.1218	37.2	0.0225	9.7	0.26	143.6	13.8	116.7	41.0	-402.7	962.7	143.6	13.8	NA
ROOT1-CAMP-66	145	111902	1.8	20.4107	13.7	0.1542	15.2	0.0228	6.6	0.43	145.5	9.5	145.6	20.6	147.5	322.6	145.5	9.5	NA
ROOT1-CAMP-23	128	90352	2.7	21.6004	19.6	0.1472	20.2	0.0231	5.0	0.25	147.0	7.2	139.4	26.3	13.1	474.8	147.0	7.2	NA
ROOT1-CAMP-49	134	51839	2.4	20.0119	14.4	0.1590	15.0	0.0231	4.3	0.28	147.0	6.2	149.8	20.9	193.6	336.4	147.0	6.2	NA
ROOT1-CAMP-75	63	36807	2.7	25.6103	55.8	0.1242	56.4	0.0231	8.4	0.15	147.1	12.2	118.9	63.4	-413.6	1570.2	147.1	12.2	NA
ROOT1-CAMP-34	364	189411	1.9	20.4706	4.8	0.1556	5.0	0.0231	1.4	0.28	147.2	2.0	146.8	6.9	140.6	113.9	147.2	2.0	NA
ROOT1-CAMP-95	366	206047	1.1	21.6254	5.5	0.1475	6.3	0.0231	3.0	0.48	147.4	4.4	139.7	8.2	10.3	133.0	147.4	4.4	NA
ROOT1-CAMP-1	91	78451	3.0	25.2036	38.5	0.1271	38.7	0.0232	4.2	0.11	148.0	6.1	121.5	44.3	-371.9	1030.3	148.0	6.1	NA
ROOT1-CAMP-44	303	113995	2.3	19.6273	6.4	0.1636	7.2	0.0233	3.2	0.45	148.4	4.8	153.8	10.3	238.6	147.8	148.4	4.8	NA
ROOT1-CAMP-7	131	46884	2.4	19.0532	25.1	0.1687	25.4	0.0233	4.1	0.16	148.5	6.0	158.3	37.3	306.6	579.4	148.5	6.0	NA
ROOT1-CAMP-15	233	100626	2.4	21.0483	13.3	0.1529	13.5	0.0233	2.0	0.15	148.7	2.9	144.4	18.1	74.9	317.7	148.7	2.9	NA
ROOT1-CAMP-48	191	93482	2.5	21.8398	15.4	0.1474	15.6	0.0233	2.6	0.17	148.7	3.9	139.6	20.3	-13.5	372.9	148.7	3.9	NA
ROOT1-CAMP-4	238	258066	2.1	20.6623	11.7	0.1559	12.0	0.0234	2.8	0.23	148.9	4.1	147.1	16.4	118.7	275.8	148.9	4.1	NA
ROOT1-CAMP-35	214	88302	2.1	21.0476	15.1	0.1532	15.4	0.0234	2.6	0.17	149.0	3.9	144.7	20.7	75.0	361.2	149.0	3.9	NA
ROOT1-CAMP-67	114	66815	2.7	24.9292	70.7	0.1293	70.9	0.0234	5.4	0.08	149.0	8.0	123.5	82.6	-343.6	2086.3	149.0	8.0	NA
ROOT1-CAMP-90	94	50682	2.4	18.9937	20.8	0.1698	21.1	0.0234	3.3	0.16	149.0	4.9	159.2	31.1	313.7	478.8	149.0	4.9	NA
ROOT1-CAMP-21	456	304647	1.3	21.1327	8.3	0.1530	8.4	0.0234	1.3	0.15	149.4	1.9	144.5	11.3	65.4	198.1	149.4	1.9	NA
ROOT1-CAMP-55	79	47790	2.9	26.1274	25.8	0.1237	26.3	0.0234	5.3	0.20	149.4	7.8	118.4	29.4	-466.2	690.3	149.4	7.8	NA
ROOT1-CAMP-77	58	30769	2.4	17.4105	51.7	0.1859	52.1	0.0235	6.1	0.12	149.6	9.1	173.1	83.0	508.4	1217.5	149.6	9.1	NA
ROOT1-CAMP-52	137	115395	1.6	17.4099	7.3	0.1861	8.6	0.0235	4.5	0.52	149.7	6.6	173.3	13.6	508.4	160.8	149.7	6.6	NA
ROOT1-CAMP-19	241	172041	2.2	21.8196	10.9	0.1487	11.3	0.0235	2.7	0.24	149.9	4.1	140.7	14.8	-11.3	264.8	149.9	4.1	NA
ROOT1-CAMP-86	254	118487	1.4	21.2460	4.2	0.1527	5.0	0.0235	2.7	0.53	149.9	4.0	144.3	6.7	52.7	101.4	149.9	4.0	NA
ROOT1-CAMP-2	193	123422	2.8	17.8460	16.0	0.1819	16.2	0.0235	2.7	0.17	150.0	4.0	169.7	25.4	453.8	357.0	150.0	4.0	NA
ROOT1-CAMP-46	250	93117	2.4	16.0156	20.0	0.2028	20.5	0.0236	4.4	0.21	150.1	6.5	187.5	35.0	689.2	430.3	150.1	6.5	NA
ROOT1-CAMP-18	113	9630	2.4	10.4446	46.2	0.3111	46.9	0.0236	7.9	0.17	150.2	11.8	275.0	113.5	1542.7	922.9	150.2	11.8	NA
ROOT1-CAMP-30	150	200001	2.1	20.3593	17.7	0.1597	18.3	0.0236	4.7	0.26	150.2	7.0	150.4	25.7	153.5	418.2	150.2	7.0	NA
ROOT1-CAMP-100	233	234441	1.5	21.7298	10.1	0.1497	10.8	0.0236	3.9	0.36	150.3	5.8	141.6	14.3	-1.3	244.2	150.3	5.8	NA
ROOT1-CAMP-36	154	138195	2.5	20.2837	9.6	0.1604	10.4	0.0236	4.1	0.40	150.4	6.1	151.1	14.7	162.2	224.5	150.4	6.1	NA
ROOT1-CAMP-45	151	63937	2.2	20.4231	11.7	0.1594	12.6	0.0236	4.7	0.37	150.5	6.9	150.2	17.6	146.1	276.1	150.5	6.9	NA
ROOT1-CAMP-64	60	33372	1.7	19.3735	29.3	0.1681	29.8	0.0236	5.7	0.19	150.5	8.4	157.8	43.6	268.5	684.7	150.5	8.4	NA
ROOT1-CAMP-26	387	224358	1.4	20.3918	8.0	0.1597	10.0	0.0236	6.1	0.61	150.5	9.0	150.5	14.0	149.7	187.2	150.5	9.0	NA
ROOT1-CAMP-13	185	98345	2.5	20.6913	9.7	0.1574	10.6	0.0236	4.3	0.41	150.5	6.4	148.5	14.7	115.5	229.8	150.5	6.4	NA
ROOT1-CAMP-60	50	29902	2.7	12.9006	22.1	0.2527	23.8	0.0236	8.9	0.37	150.6	13.3	228.7	48.9	1134.5	445.5	150.6	13.3	NA
ROOT1-CAMP-70	160	385924	4.4	19.3456	15.3	0.1686	17.1	0.0237	7.6	0.44	150.7	11.3	158.2	25.1	271.8	353.7	150.7	11.3	NA
ROOT1-CAMP-38	231	117941	2.4	19.9161	5.2	0.1638	5.6	0.0237	2.0	0.36	150.8	2.9	154.1	7.9	204.8	120.5	150.8	2.9	NA
ROOT1-CAMP-28	209	104012	2.2	19.9012	16.0	0.1642	16.1	0.0237	1.4	0.09	151.0	2.1	154.3	23.1	206.5	374.2	151.0	2.1	NA
ROOT1-CAMP-25	173	104616	2.1	22.6266	21.2	0.1445	21.6	0.0237	4.1	0.19	151.1	6.2	137.0	27.7	-99.8	525.2	151.1	6.2	NA
ROOT1-CAMP-22	70	47820	2.9	23.4332	35.5	0.1396	36.1	0.0237	6.5	0.18	151.2	9.7	132.7	45.0	-186.5	912.9	151.2	9.7	NA
ROOT1-CAMP-32	201	135061	2.8	20.9707	12.3	0.1561	12.7	0.0237	3.1	0.24	151.2	4.6	147.3	17.3	83.7	292.3	151.2	4.6	NA
ROOT1-CAMP-50	151	84098	2.0	19.2193	16.5	0.1703	17.0	0.0237	4.2	0.25	151.3	6.3	159.7	25.2	286.8	379.7	151.3	6.3	NA
ROOT1-CAMP-47	300	38903	2.1	18.5213	8.1	0.1769	8.5	0.0238	2.5	0.30	151.4	3.8	165.4	13.0	370.7	183.4	151.4	3.8	NA

ROOT1-CAMP-85	134	81385	1.5	20.6324	16.0	0.1588	17.1	0.0238	6.1	0.36	151.4	9.2	149.7	23.8	122.2	378.7	151.4	9.2	NA
ROOT1-CAMP-79	109	73047	1.5	23.4272	18.7	0.1399	19.2	0.0238	4.5	0.23	151.4	6.7	132.9	24.0	-185.9	470.7	151.4	6.7	NA
ROOT1-CAMP-17	84	40305	2.9	18.2298	19.4	0.1798	19.9	0.0238	4.5	0.23	151.4	6.8	167.9	30.9	406.3	438.5	151.4	6.8	NA
ROOT1-CAMP-39	349	345192	2.2	19.4123	7.1	0.1689	7.5	0.0238	2.2	0.30	151.5	3.4	158.4	11.0	263.9	164.3	151.5	3.4	NA
ROOT1-CAMP-41	183	56879	3.0	20.8533	13.9	0.1572	14.0	0.0238	1.9	0.14	151.5	2.9	148.2	19.3	97.0	329.6	151.5	2.9	NA
ROOT1-CAMP-31	106	71260	2.7	17.2607	14.7	0.1900	16.2	0.0238	6.8	0.42	151.6	10.2	176.7	26.3	527.3	324.8	151.6	10.2	NA
ROOT1-CAMP-65	84	44263	1.2	30.4136	91.0	0.1079	91.2	0.0238	5.3	0.06	151.7	8.0	104.1	90.4	-885.8	1888.8	151.7	8.0	NA
ROOT1-CAMP-69	62	27851	2.6	18.5729	31.5	0.1770	32.6	0.0238	8.1	0.25	151.9	12.2	165.5	49.8	364.4	727.5	151.9	12.2	NA
ROOT1-CAMP-89	56	45396	2.6	20.2990	73.1	0.1622	73.5	0.0239	7.7	0.11	152.1	11.6	152.6	104.5	160.4	2003.2	152.1	11.6	NA
ROOT1-CAMP-12	148	87287	2.8	20.7780	14.7	0.1584	15.4	0.0239	4.6	0.30	152.1	7.0	149.3	21.4	105.5	348.9	152.1	7.0	NA
ROOT1-CAMP-76	79	30123	2.5	30.0523	33.2	0.1095	33.8	0.0239	6.1	0.18	152.1	9.1	105.5	33.9	-851.4	975.4	152.1	9.1	NA
ROOT1-CAMP-84	344	212413	1.5	20.5452	6.6	0.1604	7.1	0.0239	2.7	0.38	152.2	4.0	151.0	10.0	132.1	155.4	152.2	4.0	NA
ROOT1-CAMP-27	350	225913	1.9	21.9033	11.2	0.1505	11.5	0.0239	2.6	0.22	152.3	3.9	142.4	15.3	-20.5	272.4	152.3	3.9	NA
ROOT1-CAMP-42	267	342629	2.6	21.0015	9.3	0.1572	9.8	0.0240	2.9	0.30	152.6	4.4	148.3	13.5	80.2	221.5	152.6	4.4	NA
ROOT1-CAMP-82	238	105885	1.3	20.1302	12.1	0.1641	13.0	0.0240	4.8	0.37	152.6	7.3	154.3	18.7	179.9	283.0	152.6	7.3	NA
ROOT1-CAMP-3	291	155640	2.5	21.0043	10.2	0.1573	10.4	0.0240	2.1	0.20	152.6	3.1	148.3	14.4	79.9	243.0	152.6	3.1	NA
ROOT1-CAMP-14	102	81247	3.2	19.3124	25.2	0.1712	26.3	0.0240	7.4	0.28	152.8	11.1	160.5	39.0	275.7	586.5	152.8	11.1	NA
ROOT1-CAMP-88	48	25749	2.9	19.9007	130.4	0.1662	130.5	0.0240	5.6	0.04	152.8	8.5	156.1	191.1	206.6	1136.0	152.8	8.5	NA
ROOT1-CAMP-94	59	29305	1.9	26.0631	54.1	0.1269	54.3	0.0240	4.4	0.08	152.9	6.7	121.4	62.2	-459.7	1529.2	152.9	6.7	NA
ROOT1-CAMP-10	237	162485	2.0	20.7461	7.2	0.1596	7.7	0.0240	2.9	0.37	153.0	4.3	150.4	10.8	109.2	170.2	153.0	4.3	NA
ROOT1-CAMP-24	352	178919	2.2	20.2722	10.5	0.1634	11.2	0.0240	3.8	0.34	153.0	5.7	153.7	15.9	163.5	246.1	153.0	5.7	NA
ROOT1-CAMP-71	86	46961	1.8	24.1263	36.7	0.1373	37.9	0.0240	9.5	0.25	153.1	14.4	130.7	46.5	-259.9	958.0	153.1	14.4	NA
ROOT1-CAMP-33	249	114592	2.2	20.8476	9.6	0.1592	9.9	0.0241	2.3	0.24	153.3	3.5	150.0	13.7	97.7	227.0	153.3	3.5	NA
ROOT1-CAMP-68	170	120354	2.3	22.4444	26.2	0.1482	26.4	0.0241	3.1	0.12	153.6	4.7	140.3	34.5	-79.9	650.0	153.6	4.7	NA
ROOT1-CAMP-81	135	129836	1.9	21.3268	21.0	0.1562	21.8	0.0242	5.7	0.26	153.9	8.6	147.4	29.9	43.6	506.9	153.9	8.6	NA
ROOT1-CAMP-8	74	58562	2.9	23.1038	36.7	0.1442	37.7	0.0242	8.3	0.22	153.9	12.6	136.8	48.2	-151.3	939.2	153.9	12.6	NA
ROOT1-CAMP-56	85	46057	2.2	20.4721	28.0	0.1628	28.3	0.0242	3.6	0.13	154.0	5.5	153.2	40.2	140.5	669.5	154.0	5.5	NA
ROOT1-CAMP-29	389	305516	1.6	20.4192	8.1	0.1634	8.3	0.0242	1.8	0.22	154.1	2.8	153.7	11.8	146.6	189.1	154.1	2.8	NA
ROOT1-CAMP-91	266	81408	2.5	20.2585	9.6	0.1649	9.9	0.0242	2.3	0.23	154.4	3.5	155.0	14.2	165.0	225.5	154.4	3.5	NA
ROOT1-CAMP-78	178	204774	3.6	21.3470	8.2	0.1569	8.6	0.0243	2.6	0.31	154.7	4.0	148.0	11.8	41.4	195.7	154.7	4.0	NA
ROOT1-CAMP-103	141	59390	1.9	21.8729	27.4	0.1532	27.9	0.0243	5.3	0.19	154.8	8.1	144.7	37.7	-17.2	674.3	154.8	8.1	NA
ROOT1-CAMP-72	97	39943	1.5	23.6430	28.4	0.1417	28.9	0.0243	5.4	0.19	154.8	8.3	134.6	36.4	-208.9	725.0	154.8	8.3	NA
ROOT1-CAMP-74	53	24283	2.3	15.0795	30.6	0.2223	30.7	0.0243	2.9	0.10	154.9	4.5	203.8	56.8	816.4	653.5	154.9	4.5	NA
ROOT1-CAMP-9	102	52293	2.7	23.4125	33.8	0.1435	33.9	0.0244	2.6	0.08	155.1	3.9	136.1	43.2	-184.3	865.4	155.1	3.9	NA
ROOT1-CAMP-53	163	134441	2.7	20.7840	18.5	0.1625	18.6	0.0245	2.1	0.11	156.0	3.3	152.9	26.4	104.9	439.6	156.0	3.3	NA
ROOT1-CAMP-63	135	97693	1.1	22.2319	24.6	0.1521	24.7	0.0245	1.4	0.06	156.2	2.2	143.7	33.1	-56.7	608.4	156.2	2.2	NA
ROOT1-CAMP-61	74	53173	2.0	21.7924	29.2	0.1553	29.7	0.0246	5.2	0.18	156.4	8.1	146.6	40.5	-8.3	718.4	156.4	8.1	NA
ROOT1-CAMP-6	106	59171	2.9	20.6474	23.7	0.1640	24.2	0.0246	5.0	0.21	156.4	7.7	154.2	34.7	120.4	565.6	156.4	7.7	NA
ROOT1-CAMP-102	239	106092	1.4	20.1882	7.1	0.1677	7.9	0.0246	3.5	0.44	156.4	5.3	157.5	11.5	173.2	165.5	156.4	5.3	NA
ROOT1-CAMP-37	135	89774	2.3	18.4816	15.6	0.1840	15.8	0.0247	2.4	0.15	157.0	3.7	171.5	24.9	375.5	352.3	157.0	3.7	NA
ROOT1-CAMP-58	521	338771	1.3	20.3259	4.4	0.1676	4.5	0.0247	1.2	0.26	157.4	1.8	157.4	6.6	157.3	102.5	157.4	1.8	NA
ROOT1-CAMP-16	163	67436	2.6	20.6097	20.7	0.1658	21.1	0.0248	4.1	0.20	157.9	6.4	155.8	30.5	124.7	491.6	157.9	6.4	NA
ROOT1-CAMP-11	106	71803	2.6	19.9009	24.3	0.1720	24.9	0.0248	5.5	0.22	158.1	8.6	161.2	37.1	206.6	570.8	158.1	8.6	NA
ROOT1-CAMP-101	397	265269	7.8	20.3058	7.0	0.1692	7.4	0.0249	2.4	0.33	158.6	3.8	158.7	10.9	159.6	163.9	158.6	3.8	NA
ROOT1-CAMP-98	179	108369	2.3	19.5924	7.8	0.1761	10.0	0.0250	6.1	0.62	159.3	9.7	164.7	15.1	242.6	180.7	159.3	9.7	NA
ROOT1-CAMP-40	379	179054	2.1	20.4261	6.1	0.1695	7.5	0.0251	4.4	0.58	159.9	6.9	159.0	11.1	145.8	144.4	159.9	6.9	NA
ROOT1-CAMP-87	130	51841	1.9	22.2539	34.7	0.1562	35.1	0.0252	5.3	0.15	160.5	8.4	147.4	48.2	-59.1	868.6	160.5	8.4	NA

ROOT1-CAMP-57	120	142705	1.9	22.7467	25.9	0.1534	26.2	0.0253	4.5	0.17	161.1	7.1	144.9	35.4	-112.8	646.1	161.1	7.1	NA
ROOT1-CAMP-51	122	109363	1.2	20.3127	8.8	0.1720	9.8	0.0253	4.2	0.43	161.3	6.8	161.2	14.6	158.8	207.1	161.3	6.8	NA
ROOT1-CAMP-59	93	49586	3.2	18.5344	25.3	0.1890	25.5	0.0254	3.2	0.13	161.7	5.1	175.7	41.1	369.1	577.5	161.7	5.1	NA
ROOT1-CAMP-80	73	58892	1.7	28.8457	80.6	0.1246	80.8	0.0261	5.6	0.07	165.9	9.2	119.2	91.2	-735.3	2732.2	165.9	9.2	NA
ROOT1-CAMP-20	100	9624	3.3	12.6092	23.9	0.2851	25.1	0.0261	7.7	0.31	165.9	12.7	254.7	56.6	1179.8	479.1	165.9	12.7	NA
ROOT1-CAMP-92	257	108467	1.9	19.9900	11.6	0.1799	11.8	0.0261	2.3	0.20	166.0	3.8	168.0	18.3	196.2	270.7	166.0	3.8	NA
ROOT1-CAMP-93	601	369830	1.5	19.8837	3.5	0.1825	3.7	0.0263	1.4	0.37	167.4	2.3	170.2	5.8	208.6	80.1	167.4	2.3	NA
ROOT1-CAMP-104	40	42137	1.6	18.4675	18.6	0.5707	18.7	0.0764	2.0	0.11	474.9	9.4	458.5	69.0	377.2	420.8	474.9	9.4	125.9
ROOT1-CAMP-43	47	279402	2.4	11.2109	2.7	3.0815	3.3	0.2505	1.8	0.56	1441.3	23.9	1428.1	25.2	1408.4	52.1	1408.4	52.1	102.3

APPENDIX C. HF ISOTOPE COMPOSITIONS OF DETRITAL ZIRCONS FOR JURASSIC-CRETACEOUS SEDIMENTARY BASINS IN SOUTH-CENTRAL ALASKA

The data tables that follow include all raw measured isotopic ratios for all detrital zircon samples of Jurassic-Cretaceous sedimentary basins in south-central Alaska analyzed for Hf isotopic compositions that are presented in Chapter 2 of this thesis. All Hf analyses were conducted at the University of Arizona LaserChron Center.

Nutzotin Mountains Sequence – 062718CF-02 (FA2)

062718CF-02 (FA2)										
Sample	(^{176}Yb + ^{176}Lu) / ^{176}Hf (%)	Volts Hf	^{176}Hf/^{177}Hf	± (1σ)	^{176}Lu/^{177}Hf	^{176}Hf/^{177}Hf (T)	E-Hf (0)	E-Hf (0) ± (1σ)	E-Hf (T)	Age (Ma)
062718CF-02 SPOT 213	9.7	4.2	0.282892	0.000021	0.000766	0.282890	3.8	0.8	7.0	149
062718CF-02 SPOT 223	18.1	4.1	0.282857	0.000025	0.001254	0.282854	2.6	0.9	5.8	150
062718CF-02 SPOT 148	13.8	4.4	0.282808	0.000031	0.000882	0.282805	0.8	1.1	4.1	151
062718CF-02 SPOT 92	16.5	4.2	0.282792	0.000029	0.001350	0.282789	0.3	1.0	3.5	152
062718CF-02 SPOT 2	13.4	4.0	0.282853	0.000030	0.000891	0.282850	2.4	1.1	5.7	153
062718CF-02 SPOT 10	10.6	5.0	0.282809	0.000024	0.000639	0.282807	0.8	0.8	4.2	154
062718CF-02 SPOT 25	9.7	5.2	0.282831	0.000026	0.000644	0.282829	1.6	0.9	5.0	155
062718CF-02 SPOT 97	14.7	4.2	0.282804	0.000030	0.000917	0.282802	0.7	1.0	4.1	156
062718CF-02 SPOT 118	18.1	3.6	0.282805	0.000023	0.001349	0.282801	0.7	0.8	4.0	157
062718CF-02 SPOT 312	22.3	4.7	0.282828	0.000021	0.001595	0.282824	1.5	0.7	4.9	158
062718CF-02 SPOT 57	10.5	4.4	0.282819	0.000023	0.000674	0.282817	1.2	0.8	4.7	159
062718CF-02 SPOT 251	10.9	4.0	0.282867	0.000030	0.000731	0.282865	2.9	1.0	6.4	160
062718CF-02 SPOT 294	23.3	4.1	0.282884	0.000019	0.001628	0.282880	3.5	0.7	6.9	161
062718CF-02 SPOT 232	6.9	5.0	0.282927	0.000022	0.000482	0.282926	5.0	0.8	8.6	162
062718CF-02 SPOT 36	6.9	3.6	0.282768	0.000020	0.000578	0.282767	-0.6	0.7	3.0	163
062718CF-02 SPOT 31	24.3	4.2	0.282838	0.000024	0.001653	0.282833	1.9	0.8	5.4	164
062718CF-02 SPOT 84	17.3	2.9	0.283107	0.000035	0.001529	0.283102	11.4	1.2	14.9	166
062718CF-02 SPOT 87	14.2	4.1	0.282882	0.000024	0.001104	0.282879	3.4	0.8	7.1	169

Nutzotin Mountains Sequence – BON-COMP (FA5)

BON-COMP (FA5)										
Sample	(^{176}Yb + ^{176}Lu) / ^{176}Hf (%)	Volts Hf	^{176}Hf/^{177}Hf	± (1σ)	^{176}Lu/^{177}Hf	^{176}Hf/^{177}Hf (T)	E-Hf (0)	E-Hf (0) ± (1σ)	E-Hf (T)	Age (Ma)
FASULO BON COMPOSITE-285	25.6	4.1	0.283041	0.000022	0.002215	0.283035	9.0	0.8	11.7	127
FASULO BON COMPOSITE-310	15.2	5.1	0.283000	0.000016	0.001339	0.282997	7.6	0.6	10.3	128
FASULO BON COMPOSITE-207	14.0	4.5	0.282981	0.000022	0.001240	0.282978	6.9	0.8	9.7	129
FASULO BON COMPOSITE-175	14.1	4.6	0.283011	0.000015	0.001167	0.283008	8.0	0.5	10.8	130
FASULO BON COMPOSITE-158	13.2	5.3	0.283049	0.000021	0.000908	0.283046	9.3	0.7	12.2	131
FASULO BON COMPOSITE-2	18.8	4.5	0.282896	0.000019	0.001351	0.282893	3.9	0.7	6.8	132
FASULO BON COMPOSITE-246	13.0	4.6	0.283131	0.000021	0.001106	0.283129	12.3	0.7	15.1	133
FASULO BON COMPOSITE-70	15.7	4.6	0.283070	0.000021	0.001446	0.283067	10.1	0.7	12.9	134
FASULO BON COMPOSITE-62	32.2	3.7	0.282972	0.000018	0.002621	0.282965	6.6	0.6	9.4	135
FASULO BON COMPOSITE-24	8.8	4.2	0.282978	0.000027	0.000706	0.282976	6.8	1.0	9.8	136
FASULO BON COMPOSITE-96	9.6	4.5	0.282970	0.000023	0.000768	0.282968	6.5	0.8	9.5	137
FASULO BON COMPOSITE-171	8.0	4.1	0.283049	0.000026	0.000683	0.283048	9.4	0.9	12.4	138
FASULO BON COMPOSITE-118	10.5	3.7	0.283012	0.000021	0.000760	0.283010	8.0	0.8	11.1	139
FASULO BON COMPOSITE-223	6.0	4.5	0.282978	0.000021	0.000467	0.282976	6.8	0.7	9.9	140
FASULO BON COMPOSITE-294	4.6	4.6	0.282988	0.000027	0.000387	0.282987	7.2	1.0	10.3	141
FASULO BON COMPOSITE-303	6.7	4.8	0.282986	0.000028	0.000495	0.282985	7.1	1.0	10.2	142
FASULO BON COMPOSITE-287	10.9	3.9	0.282995	0.000028	0.000724	0.282993	7.4	1.0	10.5	143
FASULO BON COMPOSITE-115	46.8	3.5	0.283021	0.000019	0.003067	0.283013	8.4	0.7	11.3	144
FASULO BON COMPOSITE-184	27.8	3.2	0.282953	0.000019	0.002082	0.282948	6.0	0.7	9.0	145
FASULO BON COMPOSITE-228	13.6	4.3	0.282994	0.000021	0.000957	0.282991	7.4	0.7	10.5	146
FASULO BON COMPOSITE-262	18.0	4.6	0.282991	0.000024	0.001213	0.282988	7.3	0.8	10.5	147
FASULO BON COMPOSITE-174	56.6	2.4	0.283061	0.000030	0.003975	0.283050	9.8	1.0	12.7	148
FASULO BON COMPOSITE-308	10.3	4.6	0.283057	0.000026	0.000777	0.283055	9.6	0.9	12.9	149
FASULO BON COMPOSITE-282	6.6	4.3	0.283061	0.000020	0.000510	0.283060	9.8	0.7	13.1	152

Nutzotin Mountains Sequence – MM1-COMP (FA1)

MM1-COMP (FA1)										
Sample	(^{176}Yb + ^{176}Lu) / ^{176}Hf (%)	Volts Hf	^{176}Hf/^{177}Hf	± (1σ)	^{176}Lu/^{177}Hf	^{176}Hf/^{177}Hf (T)	E-Hf (0)	E-Hf (0) ± (1σ)	E-Hf (T)	Age (Ma)
FASULO MMI-COMP-160	9.0	3.7	0.283007	0.000018	0.000702	0.283005	7.8	0.6	10.8	138
FASULO MMI-COMP-80	12.6	3.7	0.283036	0.000024	0.000843	0.283034	8.9	0.9	11.9	139
FASULO MMI-COMP-62	6.7	3.4	0.283059	0.000020	0.000404	0.283058	9.7	0.7	12.8	140
FASULO MMI-COMP-66	15.2	3.4	0.283040	0.000025	0.001036	0.283037	9.0	0.9	12.0	141
FASULO MMI-COMP-177	23.9	3.0	0.283053	0.000022	0.001913	0.283048	9.5	0.8	12.5	142
FASULO MMI-COMP-61	15.9	2.8	0.283030	0.000027	0.001293	0.283027	8.7	1.0	11.7	143
FASULO MMI-COMP-97	9.7	2.7	0.283001	0.000027	0.000790	0.282999	7.6	1.0	10.8	144
FASULO MMI-COMP-234	18.4	3.6	0.282960	0.000031	0.001545	0.282956	6.2	1.1	9.3	145
FASULO MMI-COMP-167	11.7	2.7	0.283101	0.000033	0.001302	0.283097	11.2	1.2	14.3	146
FASULO MMI-COMP-93	25.3	2.9	0.282976	0.000018	0.002150	0.282970	6.7	0.6	9.8	147
FASULO MMI-COMP-125	38.9	3.3	0.282902	0.000027	0.002984	0.282893	4.1	0.9	7.1	148
FASULO MMI-COMP-123	11.4	3.0	0.282945	0.000023	0.000728	0.282943	5.7	0.8	8.9	149
FASULO MMI-COMP-33	16.7	3.6	0.283030	0.000031	0.001139	0.283027	8.7	1.1	11.9	150
FASULO MMI-COMP-84	10.9	3.0	0.282854	0.000037	0.000889	0.282851	2.4	1.3	5.7	151
FASULO MMI-COMP-72	7.0	3.2	0.282881	0.000025	0.000458	0.282880	3.4	0.9	6.8	154
FASULO MMI-COMP-3	26.8	2.6	0.282756	0.000030	0.001628	0.282747	-1.0	1.0	5.3	297
FASULO MMI-COMP-191	35.6	2.3	0.282785	0.000035	0.002196	0.282773	0.0	1.2	6.2	299
FASULO MMI-COMP-181	38.4	2.1	0.282593	0.000038	0.002268	0.282580	-6.8	1.3	-0.6	300
FASULO MMI-COMP-115	37.7	2.5	0.282727	0.000034	0.002468	0.282713	-2.0	1.2	4.2	302
FASULO MMI-COMP-175	11.5	4.0	0.282749	0.000030	0.000745	0.282745	-1.3	1.1	5.3	303
FASULO MMI-COMP-225	16.7	2.8	0.282692	0.000026	0.001040	0.282686	-3.3	0.9	3.3	304
FASULO MMI-COMP-209	9.5	3.8	0.282726	0.000022	0.000643	0.282722	-2.1	0.8	4.6	305
FASULO MMI-COMP-92	35.3	2.8	0.282680	0.000034	0.002267	0.282667	-3.7	1.2	2.6	306

Nutzotin Mountains Sequence – 071718KR-01 (FA2)

071718KR-01 (FA2)										
Sample	(^{176}Yb + ^{176}Lu) / ^{176}Hf (%)	Volts Hf	^{176}Hf/^{177}Hf	± (1σ)	^{176}Lu/^{177}Hf	^{176}Hf/^{177}Hf (T)	E-Hf (0)	E-Hf (0) ± (1σ)	E-Hf (T)	Age (Ma)
FASULO 071718KR-01-290	11.0	4.9	0.282951	0.000023	0.000852	0.282949	5.9	0.8	9.0	145
FASULO 071718KR-01-02	10.6	4.6	0.282864	0.000034	0.000934	0.282862	2.8	1.2	6.0	147
FASULO 071718KR-01-161	9.4	5.0	0.282913	0.000030	0.000759	0.282911	4.5	1.1	7.7	148
FASULO 071718KR-01-68	12.1	4.5	0.282908	0.000028	0.000928	0.282905	4.3	1.0	7.6	149
FASULO 071718KR-01-144	10.6	5.1	0.282919	0.000031	0.000812	0.282917	4.8	1.1	8.0	150
FASULO 071718KR-01-106	8.9	4.8	0.282915	0.000031	0.000771	0.282913	4.6	1.1	7.9	151
FASULO 071718KR-01-92	16.0	4.0	0.282886	0.000024	0.001195	0.282882	3.6	0.8	6.8	152
FASULO 071718KR-01-201	14.5	4.6	0.282930	0.000034	0.000961	0.282928	5.1	1.2	8.4	153
FASULO 071718KR-01-212	9.3	4.6	0.282967	0.000026	0.000782	0.282965	6.4	0.9	9.8	154
FASULO 071718KR-01-168	11.7	4.7	0.282993	0.000029	0.000927	0.282991	7.4	1.0	10.7	155
FASULO 071718KR-01-108	13.9	5.0	0.282802	0.000021	0.001103	0.282799	0.6	0.8	4.0	156
FASULO 071718KR-01-207	14.8	4.5	0.282902	0.000030	0.001095	0.282899	4.2	1.1	7.5	157
FASULO 071718KR-01-243	7.8	4.7	0.282928	0.000029	0.000573	0.282926	5.1	1.0	8.5	158
FASULO 071718KR-01-244	10.6	5.2	0.282881	0.000024	0.000793	0.282878	3.4	0.8	6.8	159
FASULO 071718KR-01-70	11.9	4.1	0.283029	0.000028	0.000908	0.283026	8.6	1.0	11.9	150

Nutzotin Mountains Sequence – BR1-COMP (FA3)

BR1-COMP (FA3)										
Sample	(^{176}Yb + ^{176}Lu) / ^{176}Hf (%)	Volts Hf	^{176}Hf/^{177}Hf	± (1σ)	^{176}Lu/^{177}Hf	^{176}Hf/^{177}Hf (T)	E-Hf (0)	E-Hf (0) ± (1σ)	E-Hf (T)	Age (Ma)
RIDGWAY NUT-BR1-COMP-2	13.1	2.9	0.282830	0.000018	0.000763	0.282827	1.6	0.6	5.1	164
RIDGWAY NUT-BR1-COMP-3	29.6	2.6	0.282747	0.000022	0.001869	0.282741	-1.3	0.8	2.0	160
RIDGWAY NUT-BR1-COMP-6	15.2	2.8	0.282872	0.000027	0.001225	0.282868	3.1	1.0	6.8	171
RIDGWAY NUT-BR1-COMP-65	22.8	2.5	0.282826	0.000024	0.001400	0.282822	1.5	0.9	4.7	153
RIDGWAY NUT-BR1-COMP-89	28.5	2.8	0.282747	0.000019	0.001635	0.282742	-1.3	0.7	1.9	154
RIDGWAY NUT-BR1-COMP-91	39.4	2.4	0.282801	0.000025	0.002309	0.282794	0.6	0.9	3.8	154
RIDGWAY NUT-BR1-COMP-94	15.9	2.4	0.282715	0.000022	0.001010	0.282711	-2.5	0.8	1.0	163
RIDGWAY NUT-BR1-COMP-106	21.4	2.4	0.282768	0.000027	0.001210	0.282765	-0.6	0.9	2.8	159
RIDGWAY NUT-BR1-COMP-81	12.0	2.8	0.282824	0.000025	0.000674	0.282822	1.4	0.9	4.8	156
RIDGWAY NUT-BR1-COMP-43	10.6	2.6	0.282728	0.000021	0.000716	0.282726	-2.0	0.7	1.2	148
RIDGWAY NUT-BR1-COMP-29	29.0	2.9	0.282858	0.000021	0.001710	0.282854	2.6	0.7	5.8	150
RIDGWAY NUT-BR1-COMP-54	60.9	2.4	0.282809	0.000027	0.003437	0.282799	0.9	1.0	3.9	151
RIDGWAY NUT-BR1-COMP-33	14.6	2.4	0.282792	0.000025	0.000969	0.282790	0.3	0.9	3.6	153
RIDGWAY NUT-BR1-COMP-35	9.8	2.4	0.283001	0.000021	0.000783	0.282998	7.6	0.7	11.0	155
RIDGWAY NUT-BR1-COMP-49	20.7	2.4	0.282676	0.000027	0.001280	0.282672	-3.9	1.0	-0.5	157
RIDGWAY NUT-BR1-COMP-13	25.3	2.8	0.282805	0.000021	0.001447	0.282801	0.7	0.8	4.3	167
RIDGWAY NUT-BR1-COMP-102	22.1	2.5	0.282803	0.000018	0.001546	0.282798	0.6	0.6	3.9	155
RIDGWAY NUT-BR1-COMP-86	10.6	2.3	0.282829	0.000023	0.000592	0.282828	1.6	0.8	5.0	157

Wellesly Mountain Formation – WM1-COMP

WM1-COMP (Wellesly Mtn. Fm.)										
Sample	(^{176}Yb + ^{176}Lu) / ^{176}Hf (%)	Volts Hf	^{176}Hf/^{177}Hf	± (1σ)	^{176}Lu/^{177}Hf	^{176}Hf/^{177}Hf (T)	E-Hf (0)	E-Hf (0) ± (1σ)	E-Hf (T)	Age (Ma)
RIDGWAY WM1-COMP-47	16.8	2.8	0.282523	0.000027	0.001022	0.282519	-9.3	1.0	-5.3	186
RIDGWAY WM1-COMP-48	9.3	2.8	0.282870	0.000023	0.000701	0.282868	3.0	0.8	6.7	167
RIDGWAY WM1-COMP-71	15.5	2.4	0.282434	0.000028	0.000982	0.282431	-12.4	1.0	-8.4	185
RIDGWAY WM1-COMP-81	7.6	2.4	0.282836	0.000022	0.000565	0.282834	1.8	0.8	5.3	160
RIDGWAY WM1-COMP-38	13.2	2.9	0.282691	0.000024	0.000881	0.282688	-3.3	0.8	0.5	175
RIDGWAY WM1-COMP-26	25.9	2.4	0.282465	0.000017	0.001409	0.282460	-11.3	0.6	-7.2	194
RIDGWAY WM1-COMP-21	11.0	2.9	0.282698	0.000017	0.000760	0.282695	-3.1	0.6	1.0	189
RIDGWAY WM1-COMP-54	32.2	2.7	0.282859	0.000022	0.001989	0.282852	2.6	0.8	6.6	190
RIDGWAY WM1-COMP-86	6.8	2.9	0.282642	0.000016	0.000446	0.282640	-5.1	0.6	-1.0	183
RIDGWAY WM1-COMP-103	12.5	2.5	0.282533	0.000023	0.000888	0.282531	-8.9	0.8	-5.5	158
RIDGWAY WM1-COMP-89	13.1	2.7	0.282841	0.000020	0.000872	0.282838	2.0	0.7	5.8	176
RIDGWAY WM1-COMP-95	10.9	2.8	0.282508	0.000020	0.000728	0.282505	-9.8	0.7	-5.7	191
RIDGWAY WM1-COMP-59	18.2	2.4	0.282821	0.000025	0.001273	0.282816	1.3	0.9	5.0	177
RIDGWAY WM1-COMP-10	16.6	2.5	0.282269	0.000024	0.001187	0.282265	-18.2	0.9	-14.4	182
RIDGWAY WM1-COMP-79	18.4	1.9	0.281730	0.000029	0.001066	0.281693	-37.3	1.0	2.4	1820
RIDGWAY WM1-COMP-85	15.6	2.8	0.282543	0.000020	0.001151	0.282534	-8.6	0.7	-0.2	390
RIDGWAY WM1-COMP-36	11.6	2.5	0.281570	0.000023	0.000656	0.281547	-43.0	0.8	-2.0	1853
RIDGWAY WM1-COMP-8	18.7	2.3	0.282631	0.000025	0.001206	0.282624	-5.4	0.9	1.5	326
RIDGWAY WM1-COMP-112	36.4	2.2	0.282398	0.000031	0.002153	0.282384	-13.7	1.1	-6.3	355
RIDGWAY WM1-COMP-4	18.3	2.9	0.282592	0.000022	0.001370	0.282587	-6.8	0.8	-2.6	197
RIDGWAY WM1-COMP-7	12.4	3.2	0.283906	0.000025	0.001019	0.283902	39.6	0.9	43.7	188
RIDGWAY WM1-COMP-52	19.5	2.9	0.282946	0.000022	0.001247	0.282942	5.7	0.8	9.6	184
RIDGWAY WM1-COMP-33	12.1	2.8	0.282754	0.000019	0.000927	0.282751	-1.1	0.7	3.1	192
RIDGWAY WM1-COMP-49	20.4	2.4	0.282726	0.000031	0.001453	0.282721	-2.1	1.1	1.9	186

APPENDIX D. U-PB DETRITAL ZIRCON ANALYSES FOR MODERN RIVERS IN SOUTH-CENTRAL ALASKA

The data tables that follow include all raw measured isotopic ratios and calculated ages for all detrital zircon samples of modern river sediment in south-central Alaska that are presented in Chapter 3 of this thesis. All U-Pb analyses were conducted at the University of Arizona LaserChron Center.

Upper Delta River – 072709KR-01

						Isotope ratios							Apparent ages (Ma)						
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
Upper Delta River																			
072709KR-01-1	266	262626	3.4	19.2004	3.7	0.3513	4.4	0.0489	2.4	0.54	307.9	7.2	305.7	11.6	289.0	84.4	307.9	7.2	NA
072709KR-01-2	101	31890	2.9	23.4634	24.7	0.1088	25.8	0.0185	7.5	0.29	118.3	8.8	104.9	25.7	-189.8	625.1	118.3	8.8	NA
072709KR-01-3	275	184451	5.4	18.7829	2.2	0.3641	3.6	0.0496	2.9	0.80	312.1	8.9	315.3	9.9	339.0	49.1	312.1	8.9	NA
072709KR-01-4	132	41887	5.6	23.9816	29.1	0.1133	29.7	0.0197	5.8	0.19	125.8	7.2	109.0	30.7	-244.7	749.8	125.8	7.2	NA
072709KR-01-5	219	65479	4.8	22.8078	19.2	0.1142	19.8	0.0189	4.8	0.24	120.6	5.7	109.8	20.6	-119.4	477.3	120.6	5.7	NA
072709KR-01-7	132	24748	2.6	19.9407	20.0	0.1260	21.5	0.0182	7.9	0.37	116.4	9.1	120.5	24.4	201.9	467.4	116.4	9.1	NA
072709KR-01-8	169	99738	4.3	19.8638	7.5	0.3439	7.9	0.0495	2.6	0.33	311.7	8.0	300.1	20.6	210.9	173.3	311.7	8.0	NA
072709KR-01-6	342	156153	3.1	19.3905	3.0	0.3718	3.9	0.0523	2.5	0.64	328.6	8.0	321.0	10.7	266.5	68.6	328.6	8.0	NA
072709KR-01-9	297	139874	3.5	18.6378	3.3	0.3731	4.1	0.0504	2.3	0.57	317.2	7.2	322.0	11.2	356.6	75.2	317.2	7.2	NA
072709KR-01-10	203	97742	3.7	19.6348	3.8	0.3548	4.7	0.0505	2.7	0.58	317.8	8.4	308.4	12.5	237.7	88.2	317.8	8.4	NA
072709KR-01-11	435	236414	2.3	18.5115	2.2	0.3630	2.6	0.0487	1.3	0.51	306.8	4.0	314.5	7.0	371.9	50.4	306.8	4.0	NA
072709KR-01-12	171	57354	4.7	22.7732	21.8	0.1142	21.9	0.0189	2.1	0.10	120.5	2.5	109.8	22.8	-115.6	541.6	120.5	2.5	NA
072709KR-01-13	205	58215	4.5	19.1626	11.0	0.1385	11.9	0.0192	4.5	0.37	122.9	5.4	131.7	14.7	293.5	252.9	122.9	5.4	NA
072709KR-01-14	184	159929	4.1	19.1309	8.8	0.3621	9.1	0.0502	2.5	0.28	316.0	7.8	313.8	24.6	297.3	200.0	316.0	7.8	NA
072709KR-01-15	82	26472	2.8	24.8229	42.8	0.1045	43.4	0.0188	7.2	0.17	120.1	8.6	100.9	41.7	-332.6	1145.9	120.1	8.6	NA
072709KR-01-16	169	29644	3.2	23.4753	23.3	0.1103	24.3	0.0188	6.9	0.29	119.9	8.2	106.2	24.5	-191.0	589.4	119.9	8.2	NA
072709KR-01-17	171	42230	3.1	17.7702	20.5	0.1521	21.5	0.0196	6.3	0.29	125.2	7.8	143.8	28.8	463.2	459.2	125.2	7.8	NA
072709KR-01-18	219	96011	4.7	18.2606	6.5	0.3748	7.0	0.0496	2.5	0.36	312.3	7.5	323.2	19.3	402.5	145.7	312.3	7.5	NA
072709KR-01-19	798	431988	2.6	18.8711	1.2	0.3711	6.7	0.0508	6.6	0.98	319.4	20.6	320.4	18.5	328.4	27.0	319.4	20.6	NA
072709KR-01-20	389	205578	2.6	18.4847	1.2	0.3740	2.3	0.0501	2.0	0.86	315.3	6.2	322.6	6.5	375.1	27.2	315.3	6.2	NA
072709KR-01-22	87	34629	3.5	22.1198	35.1	0.1135	36.1	0.0182	8.5	0.23	116.3	9.8	109.1	37.4	-44.4	877.4	116.3	9.8	NA
072709KR-01-23	282	223902	3.8	18.7648	6.4	0.3654	7.8	0.0497	4.4	0.56	312.8	13.3	316.2	21.2	341.2	146.1	312.8	13.3	NA
072709KR-01-25	300	198057	2.8	19.7893	3.9	0.3332	4.1	0.0478	1.3	0.33	301.2	3.9	292.0	10.3	219.5	89.2	301.2	3.9	NA
072709KR-01-26	149	102125	4.1	19.0600	9.2	0.3571	9.5	0.0494	2.3	0.25	310.6	7.1	310.0	25.3	305.8	209.4	310.6	7.1	NA
072709KR-01-27	475	253429	2.8	19.3465	1.4	0.3594	2.1	0.0504	1.5	0.73	317.1	4.7	311.8	5.6	271.7	32.5	317.1	4.7	NA
072709KR-01-28	198	38194	3.3	25.1252	33.3	0.1025	34.0	0.0187	6.8	0.20	119.3	8.1	99.1	32.1	-363.9	881.9	119.3	8.1	NA
072709KR-01-29	290	165606	3.5	18.8676	5.4	0.3626	6.0	0.0496	2.7	0.46	312.2	8.3	314.2	16.3	328.8	121.6	312.2	8.3	NA
072709KR-01-30	94	54052	4.2	18.5427	11.0	0.3727	12.8	0.0501	6.6	0.51	315.3	20.2	321.7	35.4	368.1	248.9	315.3	20.2	NA
072709KR-01-31	93	27599	3.1	18.4835	23.4	0.1391	23.9	0.0187	5.1	0.21	119.1	6.1	132.3	29.7	375.3	532.6	119.1	6.1	NA
072709KR-01-32	255	180850	4.4	18.9152	3.4	0.3355	3.7	0.0460	1.4	0.38	290.1	3.9	293.7	9.4	323.1	77.6	290.1	3.9	NA
072709KR-01-33	280	238348	5.8	18.6186	2.6	0.3604	3.9	0.0487	2.9	0.75	306.3	8.7	312.5	10.4	358.9	57.9	306.3	8.7	NA
072709KR-01-34	336	275864	3.6	18.6911	3.6	0.3656	3.9	0.0496	1.5	0.38	311.8	4.6	316.4	10.7	350.1	82.0	311.8	4.6	NA
072709KR-01-35	118	33441	3.9	23.7890	44.2	0.1102	44.5	0.0190	5.1	0.12	121.4	6.2	106.2	44.9	-224.3	1162.3	121.4	6.2	NA
072709KR-01-36	320	208324	3.0	19.1606	3.6	0.3865	4.1	0.0537	2.0	0.48	337.3	6.6	331.8	11.7	293.8	82.7	337.3	6.6	NA
072709KR-01-37	2307	723736	2.3	20.4491	1.3	0.1326	1.7	0.0197	1.0	0.60	125.6	1.3	126.5	2.0	143.1	31.2	125.6	1.3	NA
072709KR-01-38	142	107587	3.6	20.0834	8.7	0.3383	8.8	0.0493	1.2	0.14	310.1	3.7	295.9	22.6	185.3	202.9	310.1	3.7	NA
072709KR-01-39	223	130901	5.0	19.2675	7.2	0.3601	7.4	0.0503	1.4	0.19	316.5	4.4	312.3	19.8	281.1	165.7	316.5	4.4	NA
072709KR-01-40	298	157409	2.9	18.8610	4.4	0.3782	4.8	0.0517	2.0	0.42	325.2	6.5	325.7	13.5	329.7	99.7	325.2	6.5	NA
072709KR-01-41	344	110185	2.0	19.2062	10.4	0.1319	10.6	0.0184	2.0	0.19	117.4	2.3	125.8	12.5	288.3	237.8	117.4	2.3	NA
072709KR-01-42	426	397505	3.7	18.8511	3.7	0.3631	3.9	0.0496	1.4	0.36	312.3	4.3	314.5	10.6	330.8	83.1	312.3	4.3	NA
072709KR-01-43	518	60197	4.8	23.4756	11.2	0.0448	11.4	0.0076	2.3	0.20	48.9	1.1	44.5	5.0	-191.1	280.5	48.9	1.1	NA

072709KR-01-44	147	44009	2.0	20.1241	17.9	0.1288	18.8	0.0188	6.0	0.32	120.1	7.1	123.1	21.8	180.6	419.3	120.1	7.1	NA
072709KR-01-45	302	246443	4.6	19.1950	5.3	0.3551	5.9	0.0494	2.6	0.43	311.1	7.8	308.6	15.8	289.7	122.1	311.1	7.8	NA
072709KR-01-46	320	275665	2.7	18.8521	3.2	0.3646	3.8	0.0499	2.1	0.54	313.6	6.3	315.7	10.4	330.7	73.6	313.6	6.3	NA
072709KR-01-47	217	184019	5.0	18.6267	4.0	0.3650	4.3	0.0493	1.6	0.37	310.3	4.9	315.9	11.8	357.9	90.8	310.3	4.9	NA
072709KR-01-48	155	125564	4.4	19.0556	10.5	0.3650	11.4	0.0504	4.2	0.37	317.3	13.0	315.9	30.8	306.3	240.9	317.3	13.0	NA
072709KR-01-49	376	298279	4.0	18.7132	2.5	0.3638	2.7	0.0494	1.0	0.38	310.7	3.1	315.1	7.4	347.4	57.2	310.7	3.1	NA
072709KR-01-50	280	216105	3.7	18.7894	4.5	0.3753	5.6	0.0511	3.4	0.60	321.5	10.6	323.6	15.5	338.2	101.0	321.5	10.6	NA
072709KR-01-51	209	140461	4.2	19.9127	7.1	0.3363	7.5	0.0486	2.2	0.29	305.7	6.5	294.4	19.1	205.2	166.1	305.7	6.5	NA
072709KR-01-52	120	30141	3.3	24.7521	41.2	0.1032	42.0	0.0185	8.3	0.20	118.3	9.7	99.7	39.9	-325.3	1098.4	118.3	9.7	NA
072709KR-01-53	891	611645	5.5	18.8547	2.7	0.3759	3.0	0.0514	1.4	0.46	323.1	4.3	324.0	8.3	330.4	60.2	323.1	4.3	NA
072709KR-01-54	180	49488	3.3	20.9308	30.2	0.1289	31.3	0.0196	8.1	0.26	125.0	10.0	123.1	36.3	88.2	730.5	125.0	10.0	NA
072709KR-01-55	190	105115	3.8	18.4839	5.0	0.3713	5.4	0.0498	2.0	0.37	313.1	6.1	320.6	14.9	375.2	113.3	313.1	6.1	NA
072709KR-01-56	228	139304	3.5	18.9206	5.6	0.3577	6.1	0.0491	2.3	0.38	308.9	7.0	310.5	16.3	322.5	127.9	308.9	7.0	NA
072709KR-01-57	135	26665	3.4	17.8916	26.0	0.1423	27.3	0.0185	8.4	0.31	117.9	9.8	135.1	34.6	448.1	587.1	117.9	9.8	NA
072709KR-01-58	142	64708	3.5	20.0326	7.9	0.3400	8.1	0.0494	1.7	0.21	310.8	5.2	297.2	20.9	191.2	185.1	310.8	5.2	NA
072709KR-01-59	265	133922	3.5	18.8385	5.6	0.3967	5.8	0.0542	1.5	0.27	340.3	5.1	339.3	16.7	332.3	126.7	340.3	5.1	NA
072709KR-01-60	305	176587	2.5	18.4081	3.6	0.3744	4.4	0.0500	2.5	0.57	314.4	7.7	322.9	12.2	384.5	81.1	314.4	7.7	NA
072709KR-01-61	106	22229	3.3	20.1822	25.1	0.1251	25.8	0.0183	6.0	0.23	117.0	7.0	119.7	29.1	173.9	592.8	117.0	7.0	NA
072709KR-01-62	125	23363	4.4	21.6026	33.9	0.1179	34.7	0.0185	7.4	0.21	118.0	8.7	113.2	37.2	12.8	836.1	118.0	8.7	NA
072709KR-01-63	473	102842	2.6	20.7758	9.2	0.1250	9.5	0.0188	2.3	0.24	120.3	2.7	119.6	10.7	105.8	218.2	120.3	2.7	NA
072709KR-01-64	275	197637	2.7	18.7927	5.0	0.3677	5.1	0.0501	1.0	0.20	315.2	3.1	317.9	13.8	337.8	112.3	315.2	3.1	NA
072709KR-01-65	148	38523	2.8	20.9928	17.6	0.1237	18.0	0.0188	3.3	0.19	120.3	4.0	118.4	20.1	81.2	421.6	120.3	4.0	NA
072709KR-01-66	284	161026	3.2	19.5595	3.1	0.3495	3.5	0.0496	1.5	0.44	311.9	4.6	304.3	9.2	246.5	72.5	311.9	4.6	NA
072709KR-01-67	196	113253	3.8	18.8117	6.9	0.3604	7.2	0.0492	1.8	0.25	309.5	5.3	312.5	19.3	335.6	157.6	309.5	5.3	NA
072709KR-01-68	278	164006	3.2	19.1932	2.9	0.3867	4.8	0.0538	3.8	0.80	338.0	12.7	331.9	13.6	289.9	65.7	338.0	12.7	NA
072709KR-01-69	555	279882	2.3	18.9192	2.0	0.3713	2.5	0.0510	1.5	0.59	320.4	4.6	320.6	6.9	322.7	45.8	320.4	4.6	NA
072709KR-01-70	290	182872	4.2	18.6698	6.5	0.3626	6.7	0.0491	1.7	0.25	308.9	5.0	314.1	18.0	352.7	146.3	308.9	5.0	NA
072709KR-01-71	107	36715	3.1	21.9367	26.5	0.1200	27.0	0.0191	5.5	0.20	121.9	6.6	115.1	29.4	-24.2	650.7	121.9	6.6	NA
072709KR-01-72	470	52455	3.6	23.3415	20.0	0.0452	20.4	0.0077	4.4	0.22	49.2	2.2	44.9	9.0	-176.8	502.1	49.2	2.2	NA
072709KR-01-73	397	241287	3.3	19.5540	4.2	0.3517	4.4	0.0499	1.4	0.31	313.8	4.2	306.0	11.6	247.2	95.7	313.8	4.2	NA
072709KR-01-74	234	121353	4.0	18.9598	4.1	0.3788	5.4	0.0521	3.5	0.66	327.3	11.3	326.2	15.0	317.7	92.4	327.3	11.3	NA
072709KR-01-75	216	103115	4.0	18.3793	4.5	0.3888	5.5	0.0518	3.1	0.57	325.7	10.0	333.5	15.5	388.0	100.5	325.7	10.0	NA
072709KR-01-76	223	87409	4.2	19.3646	6.9	0.3607	7.2	0.0507	1.9	0.26	318.6	5.8	312.7	19.3	269.5	159.3	318.6	5.8	NA
072709KR-01-77	304	166638	2.8	18.4397	3.3	0.3926	4.4	0.0525	2.9	0.66	329.9	9.3	336.3	12.5	380.6	73.5	329.9	9.3	NA
072709KR-01-78	178	90433	3.8	19.0715	4.9	0.3670	5.7	0.0508	3.0	0.53	319.2	9.4	317.4	15.6	304.4	110.6	319.2	9.4	NA
072709KR-01-79	376	145776	2.8	18.6985	3.4	0.3787	3.8	0.0514	1.7	0.43	322.9	5.2	326.1	10.7	349.2	77.9	322.9	5.2	NA
072709KR-01-80	1148	500459	3.8	19.1096	1.7	0.3807	2.8	0.0528	2.2	0.79	331.5	7.2	327.5	7.9	299.8	39.4	331.5	7.2	NA
072709KR-01-82	914	254019	5.2	20.0460	4.9	0.1331	5.2	0.0194	1.8	0.35	123.6	2.2	126.9	6.2	189.6	113.8	123.6	2.2	NA
072709KR-01-83	361	326917	2.4	19.3298	4.3	0.3550	4.6	0.0498	1.7	0.36	313.1	5.1	308.5	12.2	273.6	97.6	313.1	5.1	NA
072709KR-01-84	151	93825	4.9	18.4114	5.5	0.3749	5.8	0.0501	1.9	0.33	314.9	5.9	323.3	16.1	384.1	123.1	314.9	5.9	NA
072709KR-01-85	147	36283	1.7	26.7617	39.3	0.1040	39.4	0.0202	2.6	0.07	128.9	3.3	100.5	37.7	-530.0	1088.4	128.9	3.3	NA
072709KR-01-86	298	137438	2.7	19.1027	3.9	0.3581	4.5	0.0496	2.1	0.48	312.1	6.5	310.8	12.0	300.7	89.5	312.1	6.5	NA
072709KR-01-87	197	72824	4.8	18.5189	10.9	0.3823	11.1	0.0514	2.4	0.21	322.8	7.5	328.7	31.2	371.0	245.1	322.8	7.5	NA
072709KR-01-88	436	182411	2.0	19.3284	3.2	0.3537	3.5	0.0496	1.4	0.39	312.0	4.1	307.5	9.3	273.8	74.4	312.0	4.1	NA
072709KR-01-89	193	106236	4.0	19.1528	7.0	0.3654	7.5	0.0508	2.5	0.33	319.1	7.8	316.2	20.3	294.7	160.7	319.1	7.8	NA
072709KR-01-90	204	94543	4.3	18.4759	5.6	0.3764	6.3	0.0504	2.9	0.45	317.2	8.8	324.4	17.6	376.2	127.2	317.2	8.8	NA
072709KR-01-91	257	79630	2.1	22.7562	13.1	0.1150	13.4	0.0190	2.8	0.21	121.2	3.3	110.5	14.1	-113.8	325.0	121.2	3.3	NA

072709KR-01-93	718	542173	2.5	18.9232	2.0	0.3717	2.4	0.0510	1.5	0.60	320.8	4.6	320.9	6.7	322.2	44.4	320.8	4.6	NA
072709KR-01-94	152	36625	2.7	22.8589	20.9	0.1074	22.5	0.0178	8.3	0.37	113.8	9.3	103.6	22.2	-124.9	521.2	113.8	9.3	NA
072709KR-01-95	316	195034	3.9	18.2467	4.6	0.3723	5.3	0.0493	2.6	0.49	310.1	7.9	321.4	14.6	404.2	103.5	310.1	7.9	NA
072709KR-01-96	246	102736	2.6	19.5695	6.3	0.3612	6.8	0.0513	2.5	0.37	322.2	7.9	313.1	18.3	245.3	145.2	322.2	7.9	NA
072709KR-01-97	183	29218	2.5	18.5572	8.0	0.1436	8.4	0.0193	2.6	0.31	123.4	3.1	136.2	10.7	366.3	180.2	123.4	3.1	NA
072709KR-01-98	284	48219	4.3	22.0319	2.9	0.1292	6.2	0.0206	5.4	0.88	131.8	7.1	123.4	7.2	-34.7	71.1	131.8	7.1	NA
072709KR-01-99	315	148269	4.0	19.4607	3.7	0.3754	5.2	0.0530	3.6	0.69	332.8	11.6	323.6	14.3	258.2	85.5	332.8	11.6	NA
072709KR-01-100	385	170943	2.2	18.6463	2.2	0.3696	3.6	0.0500	2.8	0.78	314.4	8.6	319.3	9.8	355.5	50.8	314.4	8.6	NA
072709KR-01-102	112	19542	2.1	25.2832	32.4	0.1054	32.8	0.0193	4.7	0.14	123.3	5.8	101.7	31.7	-380.1	861.6	123.3	5.8	NA
072709KR-01-103	668	268308	2.2	19.0388	2.7	0.3844	3.7	0.0531	2.5	0.68	333.4	8.2	330.3	10.5	308.3	62.0	333.4	8.2	NA
072709KR-01-104	348	156803	4.0	18.4476	5.0	0.3753	5.2	0.0502	1.7	0.33	315.8	5.3	323.6	14.5	379.7	111.6	315.8	5.3	NA
072709KR-01-105	252	104201	4.0	18.6810	4.2	0.3847	4.8	0.0521	2.3	0.48	327.6	7.3	330.5	13.4	351.3	94.2	327.6	7.3	NA

Lower Delta River – 072709KR-04

						Isotope ratios							Apparent ages (Ma)						
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
Lower Delta River																			
072709KR-04-1	511	4757	7.5	22.2110	22.6	0.0355	26.8	0.0057	14.4	0.54	36.8	5.3	35.4	9.3	-54.4	555.7	36.8	5.3	NA
072709KR-04-5	457	2760	2.1	21.8442	18.3	0.0352	22.1	0.0056	12.3	0.56	35.8	4.4	35.1	7.6	-14.0	446.5	35.8	4.4	NA
072709KR-04-7	142	99625	1.9	8.1736	1.0	5.9807	1.7	0.3545	1.3	0.81	1956.2	22.8	1973.0	14.4	1990.7	17.1	1990.7	17.1	98.3
072709KR-04-8	102	16149	0.5	15.7953	4.5	1.0311	5.3	0.1181	2.9	0.54	719.7	19.6	719.5	27.5	718.6	95.5	719.7	19.6	100.2
072709KR-04-9	749	126716	1.3	15.8430	0.5	1.0516	2.6	0.1208	2.5	0.98	735.3	17.6	729.7	13.5	712.3	11.1	735.3	17.6	103.2
072709KR-04-11	1057	125131	2.5	18.6325	1.0	0.4285	1.8	0.0579	1.5	0.83	362.9	5.3	362.1	5.5	357.2	22.5	362.9	5.3	NA
072709KR-04-12	207	112565	1.4	8.9692	0.6	4.3478	2.1	0.2828	2.0	0.96	1605.6	28.2	1702.5	17.0	1823.9	10.1	1823.9	10.1	88.0
072709KR-04-13	608	63331	1.4	8.8418	0.3	4.5829	2.7	0.2939	2.7	0.99	1660.9	39.1	1746.2	22.4	1849.8	6.2	1849.8	6.2	89.8
072709KR-04-14	204	103534	1.7	9.0089	1.0	4.4675	6.1	0.2919	6.0	0.99	1651.0	87.2	1725.0	50.5	1815.9	18.6	1815.9	18.6	90.9
072709KR-04-15	66	45243	0.4	8.1788	1.3	5.9412	2.1	0.3524	1.6	0.77	1946.2	27.6	1967.3	18.5	1989.6	24.0	1989.6	24.0	97.8
072709KR-04-16	279	11977	1.7	18.3944	17.6	0.1304	18.4	0.0174	5.3	0.29	111.2	5.9	124.4	21.5	386.2	397.2	111.2	5.9	NA
072709KR-04-19	312	65941	1.8	8.7918	0.5	5.2446	2.4	0.3344	2.4	0.98	1859.8	38.7	1859.9	20.9	1860.0	9.2	1860.0	9.2	100.0
072709KR-04-20	1489	4634	6.4	20.4183	12.4	0.0386	12.9	0.0057	3.6	0.28	36.8	1.3	38.5	4.9	146.7	291.4	36.8	1.3	NA
072709KR-04-21	344	44354	1.8	7.7513	0.5	6.4808	3.3	0.3643	3.3	0.99	2002.7	56.5	2043.3	29.3	2084.5	9.5	2084.5	9.5	96.1
072709KR-04-22	116	62503	0.8	7.9780	0.7	6.3147	2.4	0.3654	2.3	0.96	2007.6	40.2	2020.5	21.3	2033.7	12.3	2033.7	12.3	98.7
072709KR-04-23	1891	40847	2.2	21.2103	3.0	0.1011	4.1	0.0156	2.8	0.69	99.5	2.8	97.8	3.8	56.7	70.7	99.5	2.8	NA
072709KR-04-24	121	141525	2.0	5.3534	0.6	13.5457	3.1	0.5259	3.0	0.98	2724.3	67.5	2718.5	29.2	2714.1	9.1	2714.1	9.1	100.4
072709KR-04-25	563	5684	3.5	21.1328	22.5	0.0382	23.1	0.0059	5.1	0.22	37.6	1.9	38.0	8.6	65.4	541.7	37.6	1.9	NA
072709KR-04-26	240	66792	0.8	12.8185	1.3	2.1147	2.4	0.1966	2.1	0.85	1157.0	21.9	1153.6	16.8	1147.2	25.5	1147.2	25.5	100.9
072709KR-04-27	819	10867	3.1	20.4056	22.9	0.0393	23.8	0.0058	6.2	0.26	37.3	2.3	39.1	9.1	148.1	543.5	37.3	2.3	NA
072709KR-04-28	209	83294	3.0	9.2299	0.8	4.8332	2.0	0.3235	1.8	0.91	1807.0	28.6	1790.7	16.8	1771.7	15.1	1771.7	15.1	102.0
072709KR-04-29	329	59961	1.9	18.9643	3.7	0.4313	3.8	0.0593	1.0	0.26	371.5	3.6	364.1	11.7	317.2	83.8	371.5	3.6	NA
072709KR-04-30	470	98959	6.2	9.1323	0.5	4.3804	4.2	0.2901	4.2	0.99	1642.2	60.4	1708.6	34.7	1791.1	9.1	1791.1	9.1	91.7
072709KR-04-31	160	29868	1.3	8.6979	1.6	3.8600	12.9	0.2435	12.8	0.99	1404.9	161.8	1605.4	104.5	1879.4	28.4	1879.4	28.4	74.8
072709KR-04-32	244	34603	0.6	6.4631	0.5	7.6036	2.7	0.3564	2.6	0.98	1965.2	44.5	2185.3	23.9	2398.8	7.9	2398.8	7.9	81.9
072709KR-04-33	196	155149	1.2	6.8038	0.4	8.4226	1.3	0.4156	1.3	0.95	2240.6	24.2	2277.6	12.2	2311.0	7.1	2311.0	7.1	97.0
072709KR-04-34	122	3194	3.5	24.6158	38.4	0.1031	41.9	0.0184	16.7	0.40	117.6	19.5	99.7	39.8	-311.1	1016.7	117.6	19.5	NA
072709KR-04-34	131	153109	0.7	8.6125	0.6	5.2812	1.4	0.3299	1.2	0.90	1837.8	19.5	1865.8	11.6	1897.2	10.7	1897.2	10.7	96.9
072709KR-04-36	111	70902	5.1	8.7216	1.1	5.1336	4.1	0.3247	3.9	0.97	1812.8	61.8	1841.7	34.5	1874.5	19.1	1874.5	19.1	96.7
072709KR-04-37	101	75211	2.8	8.7109	1.6	5.5512	3.5	0.3507	3.1	0.88	1938.0	52.1	1908.6	30.3	1876.7	29.6	1876.7	29.6	103.3
072709KR-04-38	498	16299	2.1	20.8657	16.2	0.0953	16.5	0.0144	3.1	0.19	92.3	2.8	92.5	14.6	95.6	386.1	92.3	2.8	NA
072709KR-04-41	425	456936	2.6	8.8289	0.4	5.3415	2.7	0.3420	2.6	0.99	1896.4	43.5	1875.5	22.9	1852.4	7.8	1852.4	7.8	102.4
072709KR-04-42	1232	150131	2.0	18.4074	0.9	0.4353	3.6	0.0581	3.5	0.97	364.1	12.3	366.9	11.0	384.6	21.0	364.1	12.3	NA
072709KR-04-43	3299	49321	1.8	21.0379	3.3	0.0583	6.3	0.0089	5.3	0.85	57.1	3.0	57.5	3.5	76.1	79.1	57.1	3.0	NA
072709KR-04-44	534	5043	2.4	19.4055	12.4	0.0377	18.0	0.0053	13.1	0.72	34.1	4.4	37.6	6.6	264.7	285.9	34.1	4.4	NA
072709KR-04-45	1290	35163	2.4	20.9483	4.3	0.1064	4.8	0.0162	2.1	0.44	103.4	2.2	102.7	4.7	86.3	102.2	103.4	2.2	NA
072709KR-04-46	484	1447	4.2	13.7231	41.1	0.0549	43.0	0.0055	12.5	0.29	35.1	4.4	54.3	22.7	1010.3	871.4	35.1	4.4	3.5
072709KR-04-47	2124	13994	1.8	19.6155	4.3	0.1166	5.5	0.0166	3.5	0.63	106.0	3.7	112.0	5.8	239.9	98.8	106.0	3.7	NA
072709KR-04-48	94	3791	2.3	16.7927	28.3	0.2752	28.9	0.0335	5.6	0.20	212.5	11.8	246.8	63.3	587.3	625.9	212.5	11.8	NA
072709KR-04-49	85	87425	0.7	5.3537	0.7	13.2393	1.2	0.5141	1.0	0.83	2673.9	22.4	2696.9	11.7	2714.1	11.4	2714.1	11.4	98.5
072709KR-04-50	366	28394	2.2	18.2454	3.0	0.4363	4.1	0.0577	2.7	0.66	361.8	9.5	367.6	12.5	404.4	68.0	361.8	9.5	NA

072709KR-04-51	280	6700	2.3	22.2891	23.1	0.0725	24.7	0.0117	8.8	0.36	75.1	6.6	71.0	16.9	-63.0	568.9	75.1	6.6	NA
072709KR-04-54	252	90713	1.7	9.1607	0.5	4.6533	2.5	0.3092	2.5	0.98	1736.6	37.5	1758.9	21.0	1785.5	8.5	1785.5	8.5	97.3
072709KR-04-55	202	19939	2.0	18.3895	12.8	0.4077	13.2	0.0544	3.4	0.26	341.3	11.3	347.2	39.0	386.7	288.5	341.3	11.3	NA
072709KR-04-56	411	417797	1.8	6.7303	0.4	8.7017	1.4	0.4248	1.3	0.96	2282.0	25.9	2307.3	12.7	2329.7	6.6	2329.7	6.6	98.0
072709KR-04-57	349	36512	1.3	7.8195	1.1	5.3557	9.7	0.3037	9.6	0.99	1709.8	144.9	1877.8	83.2	2069.1	18.6	2069.1	18.6	82.6
072709KR-04-57	131	57700	1.6	9.8354	1.2	3.8629	3.8	0.2756	3.6	0.95	1568.9	49.5	1606.0	30.3	1654.9	22.2	1654.9	22.2	94.8
072709KR-04-58	355	8295	2.4	21.5045	10.9	0.0931	11.4	0.0145	3.2	0.28	92.9	3.0	90.4	9.9	23.7	263.2	92.9	3.0	NA
072709KR-04-59	169	88206	2.5	8.9168	1.1	4.9589	2.0	0.3207	1.7	0.85	1793.1	26.9	1812.3	17.2	1834.5	19.6	1834.5	19.6	97.7
072709KR-04-60	905	158410	1.3	18.1805	1.0	0.4512	1.9	0.0595	1.6	0.83	372.6	5.7	378.1	5.9	412.4	23.4	372.6	5.7	NA
072709KR-04-61	103	37296	3.2	11.4201	1.4	2.8748	3.5	0.2381	3.2	0.92	1376.9	40.3	1375.3	26.7	1372.9	27.2	1372.9	27.2	100.3
072709KR-04-62	208	386919	1.7	5.0879	0.2	14.7085	1.3	0.5428	1.3	0.98	2795.0	28.9	2796.6	12.3	2797.7	3.8	2797.7	3.8	99.9
072709KR-04-63	156	50472	3.3	11.7702	1.8	2.4737	4.2	0.2112	3.7	0.90	1235.0	42.0	1264.4	30.1	1314.6	35.7	1314.6	35.7	93.9
072709KR-04-64	154	64123	1.4	8.9382	1.3	4.7280	2.0	0.3065	1.5	0.77	1723.4	23.2	1772.2	16.6	1830.2	22.7	1830.2	22.7	94.2
072709KR-04-66	146	76722	6.3	8.8809	0.6	5.1793	2.5	0.3336	2.4	0.97	1855.8	38.7	1849.2	21.1	1841.8	11.1	1841.8	11.1	100.8
072709KR-04-67	243	180447	45.3	8.7715	0.5	5.1426	1.7	0.3272	1.6	0.96	1824.6	25.9	1843.2	14.5	1864.2	8.6	1864.2	8.6	97.9
072709KR-04-68	764	6745	3.0	20.3154	14.4	0.0413	15.4	0.0061	5.6	0.37	39.1	2.2	41.1	6.2	158.5	337.3	39.1	2.2	NA
072709KR-04-71	978	5553	1.7	19.2802	11.8	0.1141	12.1	0.0160	2.8	0.23	102.0	2.8	109.7	12.6	279.6	270.2	102.0	2.8	NA
072709KR-04-72	84	40867	1.5	8.8833	1.5	5.1197	2.2	0.3298	1.6	0.73	1837.6	25.2	1839.4	18.4	1841.3	26.8	1841.3	26.8	99.8
072709KR-04-73	184	62376	1.6	8.9055	0.4	5.1343	1.5	0.3316	1.5	0.96	1846.2	23.5	1841.8	13.0	1836.8	7.8	1836.8	7.8	100.5
072709KR-04-74	164	196367	1.9	8.1407	0.8	6.1823	1.5	0.3650	1.2	0.82	2005.9	21.1	2002.0	13.0	1997.8	15.0	1997.8	15.0	100.4
072709KR-04-75	122	23327	1.2	15.6344	3.0	1.1292	3.5	0.1280	1.9	0.54	776.7	14.0	767.4	19.1	740.3	63.1	776.7	14.0	104.9
072709KR-04-76	881	17915	1.9	21.2709	4.1	0.0952	4.2	0.0147	1.2	0.29	94.0	1.1	92.4	3.7	49.9	96.8	94.0	1.1	NA
072709KR-04-78	569	12099	2.5	20.9006	10.4	0.0705	11.5	0.0107	4.9	0.42	68.5	3.3	69.2	7.7	91.7	248.0	68.5	3.3	NA
072709KR-04-79	39	32977	3.3	8.1560	2.0	6.2632	3.3	0.3705	2.6	0.80	2031.7	46.0	2013.3	28.9	1994.5	35.2	1994.5	35.2	101.9
072709KR-04-80	310	148687	2.7	8.7180	0.5	5.2494	2.6	0.3319	2.5	0.98	1847.7	40.3	1860.7	21.9	1875.2	9.6	1875.2	9.6	98.5
072709KR-04-81	815	115771	2.7	13.1774	0.7	1.7619	2.2	0.1684	2.1	0.95	1003.2	19.4	1031.5	14.3	1092.1	14.2	1092.1	14.2	91.9
072709KR-04-82	353	48943	0.7	6.0904	0.8	7.3934	18.2	0.3266	18.2	1.00	1821.8	289.1	2160.2	164.4	2499.3	13.3	2499.3	13.3	72.9
072709KR-04-83	90	4624	1.5	12.6863	2.9	2.0200	3.6	0.1859	2.1	0.59	1098.9	21.7	1122.3	24.7	1167.7	58.2	1167.7	58.2	94.1
072709KR-04-84	640	8310	1.6	25.4320	30.6	0.0305	31.3	0.0056	6.5	0.21	36.2	2.4	30.5	9.4	-395.4	813.6	36.2	2.4	NA
072709KR-04-85	1080	18468	3.1	20.7388	4.9	0.1005	5.6	0.0151	2.7	0.48	96.8	2.6	97.3	5.2	110.0	115.2	96.8	2.6	NA
072709KR-04-86	884	20287	2.7	20.6354	4.8	0.1142	5.7	0.0171	3.2	0.55	109.2	3.4	109.8	6.0	121.8	112.7	109.2	3.4	NA
072709KR-04-87	271	22823	3.1	18.3743	3.2	0.3633	3.7	0.0484	1.8	0.49	304.8	5.3	314.7	9.9	388.6	71.7	304.8	5.3	NA
072709KR-04-88	429	40389	2.3	18.4381	3.7	0.4511	5.5	0.0603	4.0	0.74	377.6	14.8	378.1	17.2	380.8	82.5	377.6	14.8	NA
072709KR-04-89	240	143353	1.1	9.7792	0.9	4.0538	1.6	0.2875	1.2	0.79	1629.1	17.8	1645.1	12.7	1665.5	17.5	1665.5	17.5	97.8
072709KR-04-92	1227	35084	2.2	15.7235	0.7	0.9641	2.2	0.1099	2.1	0.95	672.4	13.4	685.4	11.0	728.3	14.8	672.4	13.4	92.3
072709KR-04-94	170	64157	2.6	11.6854	1.3	2.6549	2.4	0.2250	2.0	0.84	1308.2	24.0	1316.0	17.9	1328.6	25.6	1328.6	25.6	98.5
072709KR-04-96	326	108190	1.3	17.8481	3.7	0.4438	4.3	0.0574	2.2	0.51	360.1	7.6	372.9	13.4	453.5	82.2	360.1	7.6	NA
072709KR-04-98	914	14212	3.0	20.6471	9.6	0.0586	9.8	0.0088	2.1	0.22	56.3	1.2	57.8	5.5	120.5	225.6	56.3	1.2	NA
072709KR-04-100	624	6385	2.7	26.2957	9.4	0.0473	10.0	0.0090	3.3	0.33	57.9	1.9	46.9	4.6	-483.2	251.1	57.9	1.9	NA
072709KR-04-101	129	32360	6.0	5.3385	1.1	12.7403	13.0	0.4933	12.9	1.00	2584.9	274.9	2660.6	122.5	2718.8	18.9	2718.8	18.9	95.1
072709KR-04-104	262	5786	1.8	17.9362	4.7	0.4535	5.2	0.0590	2.1	0.40	369.5	7.5	379.7	16.3	442.5	104.8	369.5	7.5	NA
072709KR-04-105	228	50142	1.0	13.2329	3.1	1.9059	4.6	0.1829	3.4	0.74	1082.9	34.1	1083.2	30.8	1083.7	62.5	1083.7	62.5	99.9

Eastern Tanana River – 072709KR-05

						Isotope ratios							Apparent ages (Ma)						
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
Eastern Tanana River																			
072709KR-05-1	101	41618	2.3	8.8188	0.8	5.3187	2.6	0.3402	2.5	0.95	1887.6	40.4	1871.9	22.1	1854.5	13.9	1854.5	13.9	101.8
072709KR-05-2	441	69049	2.3	6.7447	0.3	8.5347	1.1	0.4175	1.0	0.95	2249.1	19.9	2289.6	10.0	2326.0	5.9	2326.0	5.9	96.7
072709KR-05-3	56	22837	2.5	8.9299	1.4	5.0681	2.0	0.3282	1.4	0.71	1829.9	22.1	1830.8	16.6	1831.8	25.2	1831.8	25.2	99.9
072709KR-05-4	426	69757	2.1	15.6118	1.6	0.9710	2.6	0.1099	2.1	0.80	672.4	13.6	689.0	13.3	743.4	33.3	672.4	13.6	90.4
072709KR-05-5	117	39735	3.4	8.7604	0.8	5.2642	1.8	0.3345	1.6	0.90	1860.0	26.4	1863.1	15.5	1866.5	14.4	1866.5	14.4	99.7
072709KR-05-6	143	53672	1.0	9.7572	0.9	4.2242	1.8	0.2989	1.5	0.86	1686.0	22.7	1678.7	14.5	1669.7	16.4	1669.7	16.4	101.0
072709KR-05-7	60	27680	0.9	8.9045	1.8	5.1274	2.3	0.3311	1.5	0.66	1843.9	24.7	1840.7	19.8	1837.0	31.8	1837.0	31.8	100.4
072709KR-05-8	189	72755	1.4	5.9779	1.0	9.0627	6.3	0.3929	6.2	0.99	2136.3	112.3	2344.3	57.4	2530.6	17.6	2530.6	17.6	84.4
072709KR-05-9	34	10682	1.0	8.2216	1.7	5.7159	4.0	0.3408	3.6	0.90	1890.7	59.3	1933.8	34.6	1980.3	30.4	1980.3	30.4	95.5
072709KR-05-10	276	12476	3.9	19.2317	5.2	0.3484	5.5	0.0486	1.8	0.32	305.9	5.3	303.5	14.5	285.3	119.3	305.9	5.3	NA
072709KR-05-12	77	41274	3.6	8.8659	1.6	5.2103	2.2	0.3350	1.5	0.70	1862.7	25.0	1854.3	18.8	1844.9	28.6	1844.9	28.6	101.0
072709KR-05-13	274	13700	1.6	19.3324	7.8	0.1299	8.1	0.0182	2.4	0.29	116.4	2.8	124.0	9.5	273.3	178.7	116.4	2.8	NA
072709KR-05-14	179	48325	1.1	12.7597	1.1	1.6854	7.9	0.1560	7.9	0.99	934.3	68.4	1003.0	50.6	1156.3	21.3	1156.3	21.3	80.8
072709KR-05-15	127	50240	2.5	8.9041	0.9	4.1949	4.9	0.2709	4.8	0.98	1545.4	65.5	1673.0	39.8	1837.1	16.9	1837.1	16.9	84.1
072709KR-05-16	336	203636	1.3	9.9674	0.3	4.0254	1.5	0.2910	1.4	0.98	1646.5	21.0	1639.4	12.0	1630.1	5.3	1630.1	5.3	101.0
072709KR-05-17	1052	26696	1.8	20.8071	3.6	0.1112	4.0	0.0168	1.8	0.45	107.3	1.9	107.1	4.1	102.2	84.0	107.3	1.9	NA
072709KR-05-18	336	187474	4.8	9.2777	0.5	4.5707	1.4	0.3076	1.3	0.92	1728.7	19.1	1743.9	11.3	1762.3	9.6	1762.3	9.6	98.1
072709KR-05-19	117	32165	1.7	8.9166	0.8	5.1236	1.5	0.3313	1.3	0.85	1844.9	21.1	1840.0	13.2	1834.5	14.8	1834.5	14.8	100.6
072709KR-05-20	233	148064	1.8	6.0230	0.6	10.5217	2.5	0.4596	2.4	0.97	2437.9	49.2	2481.8	23.1	2518.0	9.8	2518.0	9.8	96.8
072709KR-05-21	107	65335	1.1	8.0782	0.9	6.1471	1.5	0.3601	1.2	0.79	1982.9	21.0	1997.0	13.5	2011.6	16.7	2011.6	16.7	98.6
072709KR-05-22	140	254239	1.2	5.7665	0.5	12.3455	3.3	0.5163	3.2	0.99	2683.6	70.9	2631.0	30.7	2590.9	8.0	2590.9	8.0	103.6
072709KR-05-23	147	422695	1.1	5.4457	0.4	11.5673	2.4	0.4569	2.3	0.99	2425.7	47.2	2570.0	22.2	2685.9	6.7	2685.9	6.7	90.3
072709KR-05-24	96	99434	3.2	8.8222	1.4	5.2377	2.0	0.3351	1.5	0.73	1863.2	23.7	1858.8	17.1	1853.8	24.8	1853.8	24.8	100.5
072709KR-05-25	260	80905	1.4	6.1636	0.2	9.4961	1.8	0.4245	1.8	0.99	2280.9	34.5	2387.2	16.6	2479.1	3.4	2479.1	3.4	92.0
072709KR-05-26	290	213160	3.7	9.2237	0.7	4.9138	2.0	0.3287	1.9	0.94	1832.2	30.1	1804.6	17.0	1773.0	12.6	1773.0	12.6	103.3
072709KR-05-27	120	3636	2.4	19.5970	33.1	0.1204	34.2	0.0171	8.5	0.25	109.4	9.3	115.5	37.3	242.1	782.0	109.4	9.3	NA
072709KR-05-28	79	40422	0.6	8.8953	1.6	5.0006	2.3	0.3226	1.6	0.71	1802.5	25.1	1819.4	19.1	1838.9	28.9	1838.9	28.9	98.0
072709KR-05-29	97	77614	1.4	8.1617	0.8	5.5512	1.8	0.3286	1.6	0.89	1831.6	25.7	1908.6	15.6	1993.3	14.9	1993.3	14.9	91.9
072709KR-05-30	357	128608	4.9	9.1902	0.9	4.3831	2.0	0.2921	1.8	0.89	1652.3	25.8	1709.2	16.5	1779.6	16.7	1779.6	16.7	92.8
072709KR-05-31	321	29863	2.9	9.1215	0.8	4.3873	9.3	0.2902	9.3	1.00	1642.8	134.6	1710.0	77.1	1793.3	13.7	1793.3	13.7	91.6
072709KR-05-33	83	3556	2.0	41.5109	71.5	0.0750	71.9	0.0226	7.6	0.11	144.0	10.8	73.5	51.0	-1892.0	651.8	144.0	10.8	NA
072709KR-05-34	31	24013	1.2	5.5230	1.2	12.9697	2.2	0.5195	1.8	0.83	2697.2	40.0	2677.5	20.6	2662.6	20.0	2662.6	20.0	101.3
072709KR-05-35	338	31711	0.9	18.3232	3.2	0.4457	3.7	0.0592	1.8	0.50	370.9	6.6	374.2	11.6	394.9	72.0	370.9	6.6	NA
072709KR-05-36	139	48864	2.2	12.8632	2.0	2.1141	2.5	0.1972	1.5	0.61	1160.4	16.2	1153.4	17.3	1140.3	39.7	1140.3	39.7	101.8
072709KR-05-37	169	5331	2.3	20.4924	18.0	0.1231	18.4	0.0183	3.4	0.19	116.8	4.0	117.8	20.4	138.1	426.5	116.8	4.0	NA
072709KR-05-38	163	126313	1.9	8.7679	0.6	4.9242	1.2	0.3131	1.0	0.86	1756.1	16.0	1806.4	10.2	1864.9	11.0	1864.9	11.0	94.2
072709KR-05-39	94	52437	1.6	5.8551	0.4	11.5974	1.7	0.4925	1.7	0.98	2581.4	35.7	2572.5	16.1	2565.4	6.1	2565.4	6.1	100.6
072709KR-05-40	68	45339	0.6	5.3960	0.7	13.3742	1.9	0.5234	1.8	0.93	2713.6	40.2	2706.4	18.4	2701.1	11.8	2701.1	11.8	100.5
072709KR-05-41	149	129974	1.8	8.1699	0.8	6.1488	2.4	0.3643	2.3	0.95	2002.7	39.7	1997.2	21.2	1991.5	13.5	1991.5	13.5	100.6
072709KR-05-42	238	37668	1.7	13.1882	1.4	1.8580	2.0	0.1777	1.4	0.72	1054.5	14.0	1066.3	13.1	1090.4	27.4	1090.4	27.4	96.7
072709KR-05-44	45	34221	0.8	8.5473	1.6	5.5240	2.8	0.3424	2.3	0.81	1898.4	37.6	1904.3	24.1	1910.8	29.2	1910.8	29.2	99.3

072709KR-05-45	452	204866	2.2	8.1268	0.6	6.2185	3.8	0.3665	3.7	0.99	2013.0	64.6	2007.1	33.1	2000.9	10.5	2000.9	10.5	100.6
072709KR-05-47	154	3568	2.7	26.5362	34.2	0.0871	34.6	0.0168	4.6	0.13	107.2	4.9	84.8	28.1	-507.4	935.8	107.2	4.9	NA
072709KR-05-48	86	55507	1.9	10.2802	1.4	3.5062	2.0	0.2614	1.5	0.72	1497.1	19.5	1528.6	16.0	1572.5	26.4	1572.5	26.4	95.2
072709KR-05-49	103	3139	2.3	22.3191	24.8	0.1169	26.4	0.0189	8.9	0.34	120.8	10.7	112.2	28.0	-66.2	613.3	120.8	10.7	NA
072709KR-05-50	2025	44763	3.5	20.9319	3.4	0.1017	3.7	0.0154	1.4	0.38	98.8	1.4	98.3	3.4	88.1	80.6	98.8	1.4	NA
072709KR-05-51	18	5388	1.9	8.8670	4.5	5.2720	5.2	0.3390	2.7	0.52	1882.1	44.8	1864.3	44.7	1844.6	80.6	1844.6	80.6	102.0
072709KR-05-52	764	7491	4.2	20.7163	6.6	0.0698	6.8	0.0105	1.6	0.23	67.2	1.1	68.5	4.5	112.6	155.8	67.2	1.1	NA
072709KR-05-53	82	78790	1.4	5.7875	0.3	12.0897	1.9	0.5075	1.9	0.99	2645.8	40.2	2611.4	17.6	2584.8	4.9	2584.8	4.9	102.4
072709KR-05-54	177	92141	1.4	8.9733	0.8	4.2896	1.5	0.2792	1.3	0.84	1587.2	17.7	1691.4	12.3	1823.0	14.6	1823.0	14.6	87.1
072709KR-05-55	240	95259	0.8	5.4720	0.3	10.3941	5.0	0.4125	5.0	1.00	2226.4	94.6	2470.5	46.7	2678.0	4.9	2678.0	4.9	83.1
072709KR-05-57	543	34396	1.7	18.6194	1.4	0.4409	1.5	0.0595	0.7	0.46	372.8	2.6	370.9	4.8	358.8	30.6	372.8	2.6	NA
072709KR-05-58	539	35869	2.5	18.6203	3.2	0.4429	3.7	0.0598	1.9	0.51	374.5	6.8	372.3	11.6	358.7	72.1	374.5	6.8	NA
072709KR-05-59	338	49424	2.4	12.5799	0.5	2.1104	1.6	0.1926	1.5	0.94	1135.2	15.1	1152.2	10.7	1184.4	10.8	1184.4	10.8	95.8
072709KR-05-60	146	76493	2.7	8.1015	0.5	6.1783	0.9	0.3630	0.8	0.88	1996.5	14.3	2001.4	8.3	2006.4	8.1	2006.4	8.1	99.5
072709KR-05-61	316	305202	1.6	5.7083	0.2	11.3386	0.9	0.4694	0.8	0.97	2481.0	17.4	2551.4	8.1	2607.8	3.4	2607.8	3.4	95.1
072709KR-05-62	52	15461	1.2	8.9960	1.9	4.9836	2.9	0.3252	2.2	0.75	1814.9	35.0	1816.5	24.8	1818.5	34.9	1818.5	34.9	99.8
072709KR-05-63	201	24930	1.7	5.4859	0.4	12.0464	3.7	0.4793	3.6	0.99	2524.2	75.9	2608.0	34.3	2673.8	6.5	2673.8	6.5	94.4
072709KR-05-64	216	3711	2.0	21.1444	17.4	0.1156	19.3	0.0177	8.4	0.43	113.3	9.4	111.1	20.3	64.1	416.7	113.3	9.4	NA
072709KR-05-67	615	68235	2.2	8.4934	0.5	4.9129	2.1	0.3026	2.1	0.97	1704.4	30.8	1804.5	17.9	1922.2	9.8	1922.2	9.8	88.7
072709KR-05-69	75	35572	1.6	8.5351	1.3	5.5669	1.8	0.3446	1.3	0.69	1908.8	20.9	1911.0	15.9	1913.4	24.1	1913.4	24.1	99.8
072709KR-05-70	155	91081	2.6	9.7180	0.7	4.2785	1.5	0.3016	1.4	0.90	1699.0	20.7	1689.2	12.6	1677.1	12.2	1677.1	12.2	101.3
072709KR-05-71	161	53159	3.7	8.7327	0.5	5.2948	1.9	0.3353	1.8	0.96	1864.2	29.4	1868.0	16.2	1872.2	9.7	1872.2	9.7	99.6
072709KR-05-72	237	58615	1.5	13.2302	0.9	1.9685	3.0	0.1889	2.9	0.95	1115.3	29.4	1104.8	20.3	1084.1	18.5	1084.1	18.5	102.9
072709KR-05-73	568	64230	1.1	18.4005	2.5	0.4750	7.5	0.0634	7.0	0.94	396.2	27.0	394.6	24.4	385.4	56.6	396.2	27.0	NA
072709KR-05-74	183	7137	1.4	21.5411	21.8	0.1503	22.6	0.0235	5.8	0.26	149.7	8.6	142.2	29.9	19.6	528.4	149.7	8.6	NA
072709KR-05-75	56	18365	1.5	8.7945	2.0	5.2901	2.4	0.3374	1.3	0.55	1874.3	21.8	1867.3	20.8	1859.5	36.7	1859.5	36.7	100.8
072709KR-05-76	72	37017	1.3	5.4593	0.7	13.2651	1.9	0.5252	1.7	0.93	2721.3	38.6	2698.7	17.6	2681.8	11.3	2681.8	11.3	101.5
072709KR-05-78	123	19034	1.1	6.4825	1.4	9.4704	2.3	0.4453	1.9	0.82	2374.1	37.9	2384.7	21.5	2393.7	23.1	2393.7	23.1	99.2
072709KR-05-79	107	141262	1.8	5.2845	0.2	13.6139	1.3	0.5218	1.3	0.99	2706.7	28.5	2723.2	12.3	2735.5	3.1	2735.5	3.1	98.9
072709KR-05-80	316	240032	3.0	5.7905	0.4	11.5598	1.0	0.4855	0.9	0.93	2551.0	20.0	2569.4	9.5	2583.9	6.1	2583.9	6.1	98.7
072709KR-05-81	180	59826	1.5	7.9505	1.0	6.3131	2.3	0.3640	2.1	0.90	2001.2	35.6	2020.3	20.0	2039.8	17.3	2039.8	17.3	98.1
072709KR-05-82	403	7657	1.2	21.3668	15.6	0.0679	16.1	0.0105	4.1	0.25	67.4	2.7	66.7	10.4	39.1	374.1	67.4	2.7	NA
072709KR-05-84	265	194470	2.4	5.8529	0.6	8.8102	4.0	0.3740	3.9	0.99	2048.1	69.3	2318.5	36.4	2566.0	9.4	2566.0	9.4	79.8
072709KR-05-85	342	150844	2.7	7.9056	0.4	6.6345	2.7	0.3804	2.7	0.99	2078.2	47.2	2064.0	23.7	2049.8	6.6	2049.8	6.6	101.4
072709KR-05-87	92	61423	1.4	8.6139	0.9	5.6861	1.8	0.3552	1.6	0.88	1959.5	27.5	1929.3	16.0	1896.9	15.9	1896.9	15.9	103.3
072709KR-05-88	228	115582	2.6	9.0760	0.6	4.8890	2.5	0.3218	2.4	0.97	1798.6	38.4	1800.4	21.2	1802.4	10.6	1802.4	10.6	99.8
072709KR-05-90	91	102552	1.4	4.9315	0.5	15.4231	1.9	0.5516	1.8	0.96	2831.9	40.9	2841.7	17.7	2848.7	8.3	2848.7	8.3	99.4
072709KR-05-91	210	83471	1.3	8.1103	0.6	6.0890	2.0	0.3582	1.9	0.95	1973.5	31.9	1988.7	17.3	2004.5	11.3	2004.5	11.3	98.5
072709KR-05-92	415	35130	1.6	18.7158	1.7	0.4249	1.9	0.0577	1.0	0.50	361.5	3.4	359.5	5.8	347.1	37.8	361.5	3.4	NA
072709KR-05-94	881	66886	1.7	18.7965	2.1	0.3522	3.7	0.0480	3.1	0.83	302.3	9.1	306.4	9.8	337.4	47.0	302.3	9.1	NA
072709KR-05-95	317	144068	1.8	11.6071	0.9	2.7219	1.8	0.2291	1.5	0.87	1330.0	18.5	1334.5	13.1	1341.6	16.9	1341.6	16.9	99.1
072709KR-05-96	284	46009	0.9	5.9458	1.6	9.8960	8.0	0.4267	7.9	0.98	2291.0	151.5	2425.1	74.0	2539.6	26.7	2539.6	26.7	90.2
072709KR-05-98	156	69986	2.3	8.1409	0.6	6.2053	1.7	0.3664	1.6	0.93	2012.4	26.9	2005.2	14.7	1997.8	11.3	1997.8	11.3	100.7
072709KR-05-99	123	82348	1.0	8.0825	0.7	6.3509	1.6	0.3723	1.4	0.91	2040.2	24.8	2025.5	13.7	2010.6	11.7	2010.6	11.7	101.5
072709KR-05-100	71	33312	2.1	9.1830	1.2	4.7160	4.3	0.3141	4.1	0.96	1760.8	63.7	1770.1	36.1	1781.0	22.3	1781.0	22.3	98.9
072709KR-05-101	242	200303	2.1	8.4610	0.7	5.5721	4.5	0.3419	4.5	0.99	1896.0	73.6	1911.8	39.1	1929.0	12.3	1929.0	12.3	98.3
072709KR-05-102	592	16330	1.9	21.5660	19.3	0.0693	20.8	0.0108	7.7	0.37	69.5	5.4	68.0	13.7	16.8	467.6	69.5	5.4	NA
072709KR-05-104	230	72250	1.1	8.1018	0.8	6.1622	5.3	0.3621	5.2	0.99	1992.1	89.8	1999.1	46.4	2006.4	14.4	2006.4	14.4	99.3
072709KR-05-105	204	107225	2.1	9.1667	0.5	4.8408	2.5	0.3218	2.5	0.98	1798.7	39.0	1792.0	21.3	1784.3	8.8	1784.3	8.8	100.8

Western Tanana River – 072709KR-06

						Isotope ratios							Apparent ages (Ma)						
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
Western Tanana River																			
072709KR-06-1	352	110525	2.3	6.0401	0.9	8.3904	4.7	0.3676	4.6	0.98	2017.9	79.2	2274.1	42.3	2513.2	15.4	2513.2	15.4	80.3
072709KR-06-2	556	14064	2.0	21.6187	7.7	0.0977	8.1	0.0153	2.4	0.30	98.0	2.3	94.7	7.3	11.0	186.3	98.0	2.3	NA
072709KR-06-3	122	196148	2.7	5.7180	0.4	11.6701	1.7	0.4840	1.6	0.97	2544.5	34.3	2578.3	15.8	2604.9	6.9	2604.9	6.9	97.7
072709KR-06-4	289	70238	3.0	13.4213	0.7	1.8048	4.2	0.1757	4.1	0.99	1043.3	39.8	1047.2	27.4	1055.3	14.4	1055.3	14.4	98.9
072709KR-06-5	619	11162	1.5	21.5305	10.2	0.0938	10.6	0.0147	2.9	0.27	93.8	2.7	91.1	9.2	20.8	245.1	93.8	2.7	NA
072709KR-06-6	33	8399	1.0	13.5693	2.4	1.8099	3.6	0.1781	2.7	0.75	1056.7	26.1	1049.0	23.3	1033.1	47.7	1033.1	47.7	102.3
072709KR-06-8	177	224316	2.7	5.9113	1.2	11.3210	3.7	0.4854	3.5	0.95	2550.6	73.1	2549.9	34.3	2549.4	20.1	2549.4	20.1	100.0
072709KR-06-10	146	75856	1.4	8.5333	0.6	5.4112	2.9	0.3349	2.9	0.98	1862.1	46.7	1886.6	25.2	1913.8	10.6	1913.8	10.6	97.3
072709KR-06-11	94	3057	2.4	32.7166	32.1	0.0751	32.8	0.0178	6.7	0.20	113.9	7.6	73.5	23.3	-1101.9	994.8	113.9	7.6	NA
072709KR-06-12	105	56367	0.8	5.3780	0.3	13.3443	2.4	0.5205	2.4	0.99	2701.3	52.1	2704.3	22.5	2706.6	5.2	2706.6	5.2	99.8
072709KR-06-13	380	44616	2.3	19.9486	5.5	0.1986	5.9	0.0287	2.3	0.39	182.6	4.2	184.0	10.0	201.0	126.8	182.6	4.2	NA
072709KR-06-15	424	39712	0.9	5.8921	0.8	8.0921	7.5	0.3458	7.5	0.99	1914.5	124.3	2241.4	68.2	2554.9	12.8	2554.9	12.8	74.9
072709KR-06-16	335	32745	4.8	18.5651	3.5	0.4165	4.2	0.0561	2.3	0.56	351.7	8.0	353.5	12.4	365.4	78.0	351.7	8.0	NA
072709KR-06-18	137	60683	2.0	8.1420	0.8	4.8589	7.1	0.2869	7.1	0.99	1626.1	101.9	1795.2	60.2	1997.6	14.4	1997.6	14.4	81.4
072709KR-06-19	24	24731	1.0	8.8788	5.6	5.0571	6.4	0.3257	3.1	0.49	1817.3	49.5	1828.9	54.3	1842.2	101.2	1842.2	101.2	98.6
072709KR-06-20	764	2474	3.8	20.5537	15.3	0.0595	15.8	0.0089	4.2	0.26	56.9	2.4	58.7	9.0	131.1	361.4	56.9	2.4	NA
072709KR-06-21	500	275635	8.6	8.9084	0.6	4.0615	6.5	0.2624	6.4	1.00	1502.2	86.4	1646.6	52.8	1836.2	11.4	1836.2	11.4	81.8
072709KR-06-21	58	29066	1.9	5.3231	1.6	12.9481	2.9	0.4999	2.5	0.85	2613.3	53.5	2675.9	27.8	2723.5	25.9	2723.5	25.9	96.0
072709KR-06-22	1133	202708	28.1	14.2621	0.6	1.2239	2.6	0.1266	2.5	0.97	768.4	18.2	811.5	14.4	931.8	12.5	768.4	18.2	82.5
072709KR-06-24	39	26938	2.2	5.1573	1.1	14.1692	2.3	0.5300	2.1	0.88	2741.4	46.0	2761.1	22.3	2775.5	18.5	2775.5	18.5	98.8
072709KR-06-25	73	77359	0.8	5.5638	0.8	12.2724	1.6	0.4952	1.4	0.86	2593.2	28.9	2625.5	14.7	2650.4	13.1	2650.4	13.1	97.8
072709KR-06-26	106	11558	3.4	19.5772	11.6	0.4033	12.1	0.0573	3.3	0.28	359.0	11.7	344.0	35.4	244.4	268.9	359.0	11.7	NA
072709KR-06-27	441	52796	6.3	11.9440	1.5	2.2517	4.3	0.1951	4.0	0.94	1148.7	42.5	1197.3	30.3	1286.1	29.1	1286.1	29.1	89.3
072709KR-06-28	161	2604	6.1	21.0082	38.6	0.0423	46.9	0.0065	26.6	0.57	41.4	11.0	42.1	19.3	79.4	946.9	41.4	11.0	NA
072709KR-06-29	105	41640	2.2	11.4286	1.2	2.7683	3.6	0.2295	3.4	0.94	1331.7	40.6	1347.0	26.8	1371.5	23.7	1371.5	23.7	97.1
072709KR-06-30	307	6580	3.2	25.1683	8.0	0.0807	8.8	0.0147	3.8	0.44	94.3	3.6	78.8	6.7	-368.3	206.4	94.3	3.6	NA
072709KR-06-31	154	11696	3.8	21.7997	11.7	0.1913	12.6	0.0302	4.5	0.36	192.1	8.6	177.7	20.5	-9.1	284.3	192.1	8.6	NA
072709KR-06-32	453	5316	3.6	24.7325	23.7	0.0491	24.0	0.0088	3.4	0.14	56.6	1.9	48.7	11.4	-323.2	616.7	56.6	1.9	NA
072709KR-06-33	649	10817	2.5	20.9312	12.1	0.0920	12.5	0.0140	3.1	0.25	89.4	2.8	89.4	10.7	88.2	287.8	89.4	2.8	NA
072709KR-06-34	146	12771	2.2	18.4151	8.2	0.4103	8.5	0.0548	2.4	0.28	343.9	8.0	349.1	25.2	383.6	184.2	343.9	8.0	NA
072709KR-06-35	43	37153	4.4	8.9586	1.6	5.1780	2.7	0.3364	2.1	0.80	1869.5	34.8	1849.0	22.8	1826.0	29.2	1826.0	29.2	102.4
072709KR-06-36	188	20864	4.6	19.4858	5.2	0.3482	5.6	0.0492	2.1	0.38	309.7	6.4	303.4	14.6	255.2	118.7	309.7	6.4	NA
072709KR-06-37	238	161040	1.4	8.9143	0.6	4.7660	1.2	0.3081	1.0	0.85	1731.5	15.1	1778.9	9.9	1835.0	11.2	1835.0	11.2	94.4
072709KR-06-38	394	249311	3.2	9.1029	0.4	4.7631	1.8	0.3145	1.8	0.97	1762.6	27.5	1778.4	15.4	1797.0	8.0	1797.0	8.0	98.1
072709KR-06-40	606	10525	3.5	24.0264	11.7	0.0518	12.0	0.0090	2.6	0.22	57.9	1.5	51.3	6.0	-249.4	297.4	57.9	1.5	NA
072709KR-06-41	363	180562	2.8	9.1725	0.4	4.4236	1.1	0.2943	1.0	0.95	1662.9	15.3	1716.8	9.1	1783.1	6.4	1783.1	6.4	93.3
072709KR-06-42	161	134275	2.1	8.0762	0.5	6.2377	2.5	0.3654	2.4	0.98	2007.6	41.5	2009.8	21.6	2012.0	9.4	2012.0	9.4	99.8
072709KR-06-43	273	198849	2.0	8.1033	0.4	6.2467	2.7	0.3671	2.6	0.99	2015.9	45.7	2011.0	23.5	2006.0	7.9	2006.0	7.9	100.5
072709KR-06-44	179	201830	1.7	5.9763	0.2	11.5034	2.3	0.4986	2.3	1.00	2607.8	48.5	2564.9	21.2	2531.1	3.8	2531.1	3.8	103.0
072709KR-06-45	95	97666	1.7	8.4204	0.6	5.7406	2.2	0.3506	2.1	0.97	1937.4	35.4	1937.5	18.9	1937.6	10.1	1937.6	10.1	100.0
072709KR-06-46	217	97788	1.7	8.8320	0.5	5.2027	3.9	0.3333	3.9	0.99	1854.2	62.9	1853.1	33.5	1851.8	9.2	1851.8	9.2	100.1

072709KR-06-47	657	27164	4.3	21.5600	7.5	0.1018	13.5	0.0159	11.2	0.83	101.8	11.3	98.4	12.7	17.5	180.3	101.8	11.3	NA
072709KR-06-48	141	141638	1.5	6.7027	0.4	9.0132	2.9	0.4382	2.9	0.99	2342.4	56.9	2339.3	26.7	2336.7	7.0	2336.7	7.0	100.2
072709KR-06-50	213	176687	4.4	8.7882	0.6	5.3137	1.6	0.3387	1.5	0.94	1880.3	24.2	1871.1	13.5	1860.8	9.9	1860.8	9.9	101.1
072709KR-06-R1	396	40197	2.4	18.2102	2.3	0.5061	2.6	0.0668	1.3	0.47	417.1	5.1	415.9	9.0	408.7	52.0	417.1	5.1	NA
072709KR-06-51	123	4895	3.6	16.7252	14.5	0.1481	20.4	0.0180	14.4	0.70	114.8	16.3	140.2	26.7	596.0	316.1	114.8	16.3	NA
072709KR-06-52	560	4523	4.0	18.5082	13.2	0.0424	13.5	0.0057	3.0	0.22	36.6	1.1	42.2	5.6	372.3	297.6	36.6	1.1	NA
072709KR-06-53	320	101797	1.2	5.4454	0.2	11.6685	1.1	0.4608	1.1	0.98	2443.2	22.6	2578.2	10.6	2686.0	4.0	2686.0	4.0	91.0
072709KR-06-54	161	8284	2.0	18.4730	6.9	0.4097	7.7	0.0549	3.2	0.42	344.5	10.8	348.6	22.6	376.6	156.4	344.5	10.8	NA
072709KR-06-55	195	379459	1.1	8.8996	0.6	5.1712	1.4	0.3338	1.3	0.90	1856.7	20.2	1847.9	11.9	1838.0	11.2	1838.0	11.2	101.0
072709KR-06-57	53	37653	1.8	8.7949	2.1	5.2282	2.5	0.3335	1.3	0.52	1855.3	21.2	1857.2	21.5	1859.4	38.8	1859.4	38.8	99.8
072709KR-06-58	372	13548	4.8	20.9979	7.8	0.0964	8.3	0.0147	2.9	0.35	93.9	2.7	93.4	7.4	80.6	185.1	93.9	2.7	NA
072709KR-06-59	392	7518	3.4	27.8394	39.0	0.0439	40.0	0.0089	8.9	0.22	56.9	5.0	43.6	17.1	-637.0	1102.7	56.9	5.0	NA
072709KR-06-60	81	2822	2.5	26.9223	23.5	0.1358	23.9	0.0265	4.4	0.18	168.7	7.3	129.3	29.0	-546.1	638.1	168.7	7.3	NA
072709KR-06-61	372	256780	17.8	5.9106	0.4	10.9468	1.3	0.4693	1.3	0.94	2480.3	26.0	2518.6	12.5	2549.6	7.4	2549.6	7.4	97.3
072709KR-06-62	78	37588	1.4	8.9962	1.1	4.9889	1.8	0.3255	1.5	0.81	1816.6	23.6	1817.4	15.6	1818.4	19.7	1818.4	19.7	99.9
072709KR-06-63	59	21913	0.8	12.8429	2.9	2.1564	7.0	0.2009	6.4	0.91	1180.0	69.1	1167.1	48.9	1143.4	58.2	1143.4	58.2	103.2
072709KR-06-64	129	5171	4.1	20.7877	18.5	0.1193	19.3	0.0180	5.5	0.28	114.9	6.2	114.4	20.8	104.4	439.5	114.9	6.2	NA
072709KR-06-65	177	80551	2.1	8.3165	0.7	4.7208	3.1	0.2847	3.1	0.97	1615.2	43.7	1770.9	26.4	1959.8	13.3	1959.8	13.3	82.4
072709KR-06-66	177	232166	4.1	5.6429	0.4	12.1477	1.0	0.4972	0.9	0.93	2601.6	19.1	2615.9	9.0	2626.9	6.0	2626.9	6.0	99.0
072709KR-06-67	214	178826	2.6	8.5143	0.5	5.6331	1.2	0.3479	1.1	0.91	1924.3	17.9	1921.2	10.2	1917.8	9.0	1917.8	9.0	100.3
072709KR-06-68	35	58441	0.8	5.4747	1.0	12.8368	1.2	0.5097	0.7	0.56	2655.3	15.2	2667.7	11.7	2677.1	17.0	2677.1	17.0	99.2
072709KR-06-69	1119	118786	3.4	20.9686	2.4	0.0994	3.5	0.0151	2.5	0.72	96.7	2.4	96.2	3.2	83.9	57.6	96.7	2.4	NA
072709KR-06-70	92	64131	2.2	5.7584	0.4	11.8505	1.0	0.4949	0.8	0.88	2591.9	18.1	2592.7	9.0	2593.2	7.5	2593.2	7.5	100.0
072709KR-06-72	1284	17579	0.7	20.7123	11.3	0.0444	11.4	0.0067	1.9	0.17	42.8	0.8	44.1	4.9	113.1	266.9	42.8	0.8	NA
072709KR-06-73	47	21856	1.7	8.3990	1.4	5.8354	2.1	0.3555	1.5	0.74	1960.6	26.1	1951.7	18.1	1942.2	25.2	1942.2	25.2	101.0
072709KR-06-74	46	50083	0.7	5.7125	0.7	11.9383	1.9	0.4946	1.8	0.93	2590.6	37.6	2599.6	17.8	2606.5	11.8	2606.5	11.8	99.4
072709KR-06-76	45	52579	2.5	6.2299	1.9	10.4747	6.4	0.4733	6.1	0.95	2497.9	125.5	2477.7	59.0	2461.1	32.6	2461.1	32.6	101.5
072709KR-06-77	1828	29593	8.6	21.6754	6.6	0.0407	7.6	0.0064	3.7	0.50	41.1	1.5	40.5	3.0	4.7	158.5	41.1	1.5	NA
072709KR-06-78	1885	55160	2.8	20.8462	3.0	0.0987	3.3	0.0149	1.4	0.43	95.5	1.4	95.6	3.0	97.8	71.1	95.5	1.4	NA
072709KR-06-79	857	51175	6.5	20.8946	3.0	0.1728	4.0	0.0262	2.7	0.68	166.6	4.5	161.8	6.0	92.3	70.2	166.6	4.5	NA
072709KR-06-80	455	3565	3.1	20.8191	19.8	0.0386	20.0	0.0058	3.2	0.16	37.5	1.2	38.5	7.6	100.9	471.6	37.5	1.2	NA
072709KR-06-81	170	107842	2.3	12.2777	1.7	2.4077	2.1	0.2144	1.3	0.61	1252.2	14.9	1244.9	15.3	1232.3	33.2	1232.3	33.2	101.6
072709KR-06-82	194	45072	4.7	10.1081	3.4	2.1095	11.8	0.1547	11.3	0.96	927.0	97.8	1151.9	81.6	1604.0	62.8	1604.0	62.8	57.8
072709KR-06-83	102	65611	2.0	11.6805	2.2	2.6615	3.7	0.2255	3.1	0.82	1310.7	36.3	1317.8	27.7	1329.4	41.9	1329.4	41.9	98.6
072709KR-06-84	883	20577	3.0	21.5244	4.2	0.0985	4.6	0.0154	2.0	0.44	98.4	2.0	95.4	4.2	21.5	100.2	98.4	2.0	NA
072709KR-06-85	955	48763	1.6	8.3838	0.6	3.5772	2.1	0.2175	2.0	0.95	1268.7	22.6	1544.5	16.4	1945.4	11.2	1945.4	11.2	65.2
072709KR-06-86	139	15115	2.6	19.1030	7.4	0.4171	7.8	0.0578	2.4	0.31	362.2	8.5	354.0	23.3	300.7	169.2	362.2	8.5	NA
072709KR-06-87	178	63484	1.6	13.2707	1.1	1.8881	1.4	0.1817	0.9	0.62	1076.4	8.8	1076.9	9.5	1078.0	22.4	1078.0	22.4	99.9
072709KR-06-88	368	255144	5.6	9.1613	0.4	5.0202	1.9	0.3336	1.9	0.98	1855.6	30.7	1822.7	16.4	1785.3	6.5	1785.3	6.5	103.9
072709KR-06-89	554	7105	2.8	22.4308	12.8	0.0526	12.9	0.0086	2.0	0.15	54.9	1.1	52.0	6.6	-78.4	314.1	54.9	1.1	NA
072709KR-06-90	1172	15317	4.2	21.9750	6.7	0.0373	7.7	0.0059	3.8	0.49	38.2	1.4	37.2	2.8	-28.4	161.9	38.2	1.4	NA
072709KR-06-91	113	28101	0.6	8.5538	1.1	5.3361	3.4	0.3310	3.2	0.95	1843.4	52.1	1874.7	29.3	1909.4	19.4	1909.4	19.4	96.5
072709KR-06-93	122	95351	1.3	8.1525	0.6	6.2371	2.0	0.3688	1.9	0.95	2023.7	33.2	2009.7	17.6	1995.3	11.2	1995.3	11.2	101.4
072709KR-06-94	108	194263	1.8	3.6407	0.5	25.9718	2.9	0.6858	2.8	0.99	3366.5	73.7	3345.5	27.9	3332.9	7.4	3332.9	7.4	101.0
072709KR-06-95	212	91349	2.4	8.8029	0.4	5.3154	1.8	0.3394	1.8	0.98	1883.6	29.4	1871.3	15.7	1857.8	6.9	1857.8	6.9	101.4
072709KR-06-96	199	78511	1.5	7.6281	0.4	7.0894	1.3	0.3922	1.2	0.94	2133.1	22.7	2122.7	11.8	2112.7	7.8	2112.7	7.8	101.0
072709KR-06-97	412	13804	2.5	20.8264	6.1	0.1023	6.3	0.0154	1.4	0.22	98.8	1.3	98.9	5.9	100.1	145.2	98.8	1.3	NA
072709KR-06-98	116	81156	1.6	8.1497	0.9	6.0836	3.2	0.3596	3.0	0.96	1980.2	51.9	1987.9	27.6	1995.9	15.5	1995.9	15.5	99.2
072709KR-06-99	1065	18341	2.2	22.6952	8.5	0.0380	8.7	0.0062	2.1	0.24	40.2	0.8	37.8	3.2	-107.2	209.3	40.2	0.8	NA
072709KR-06-100	189	8090	3.6	21.2218	10.3	0.2177	11.0	0.0335	3.7	0.33	212.5	7.7	200.0	19.9	55.4	246.9	212.5	7.7	NA
072709KR-06-101	251	170518	5.5	8.5632	0.4	5.5221	2.3	0.3430	2.2	0.98	1900.9	37.0	1904.0	19.7	1907.5	7.7	1907.5	7.7	99.7
072709KR-06-103	132	195137	3.6	5.5935	0.4	12.4793	1.7	0.5063	1.6	0.97	2640.7	35.3	2641.2	15.8	2641.6	7.1	2641.6	7.1	100.0
072709KR-06-104	46	55041	3.0	5.2080	0.5	14.5125	1.6	0.5482	1.6	0.95	2817.5	35.7	2783.8	15.6	2759.5	8.1	2759.5	8.1	102.1
072709KR-06-105	42	24467	0.6	8.4743	2.3	5.7754	3.0	0.3550	2.0	0.65	1958.2	33.3	1942.7	26.1	1926.2	41.0	1926.2	41.0	101.7

Lower Nenana River – 072709KR-07

						Isotope ratios							Apparent ages (Ma)						
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
Lower Nenana River																			
072709KR-07-1	2362	25433	3.8	21.7125	6.6	0.0371	7.5	0.0058	3.7	0.49	37.6	1.4	37.0	2.7	0.6	158.9	37.6	1.4	NA
072709KR-07-2	1019	140061	2.8	18.3832	1.4	0.4246	1.8	0.0566	1.3	0.68	355.0	4.3	359.3	5.6	387.5	30.3	355.0	4.3	NA
072709KR-07-3	610	3171	4.3	20.0480	15.8	0.0416	16.4	0.0060	4.5	0.27	38.9	1.7	41.4	6.7	189.4	369.1	38.9	1.7	NA
072709KR-07-4	261	6771	5.9	21.8909	31.4	0.0601	31.7	0.0095	4.7	0.15	61.2	2.8	59.3	18.3	-19.2	775.7	61.2	2.8	NA
072709KR-07-4	45	31449	1.1	5.5073	0.7	12.5807	2.3	0.5025	2.2	0.95	2624.6	47.4	2648.8	21.7	2667.3	11.6	2667.3	11.6	98.4
072709KR-07-5	1238	17583	2.5	20.1103	10.3	0.0971	10.5	0.0142	2.2	0.21	90.6	2.0	94.1	9.5	182.2	240.3	90.6	2.0	NA
072709KR-07-6	232	1693	2.5	19.1326	12.8	0.2082	16.0	0.0289	9.6	0.60	183.6	17.4	192.0	28.0	297.1	293.0	183.6	17.4	NA
072709KR-07-7	237	13892	2.6	18.8393	9.8	0.2308	11.3	0.0315	5.7	0.50	200.1	11.2	210.9	21.6	332.2	222.4	200.1	11.2	NA
072709KR-07-8	101	26636	3.0	12.0276	2.2	2.4568	2.5	0.2143	1.2	0.49	1251.8	14.1	1259.4	18.2	1272.5	42.9	1272.5	42.9	98.4
072709KR-07-9	392	4883	3.7	22.5213	11.3	0.0903	11.7	0.0148	3.2	0.27	94.4	3.0	87.8	9.9	-88.3	276.8	94.4	3.0	NA
072709KR-07-10	1187	21718	2.7	20.1041	2.2	0.0956	2.9	0.0139	2.0	0.67	89.3	1.7	92.7	2.6	182.9	51.0	89.3	1.7	NA
072709KR-07-11	686	85486	4.5	9.1853	0.5	2.2279	4.1	0.1484	4.1	0.99	892.1	34.1	1189.9	28.9	1780.6	10.0	1780.6	10.0	50.1
072709KR-07-12	898	29026	5.6	21.0179	5.2	0.0989	5.5	0.0151	1.7	0.31	96.5	1.7	95.8	5.0	78.3	124.0	96.5	1.7	NA
072709KR-07-13	1545	31645	4.5	20.7533	2.8	0.0944	2.9	0.0142	1.0	0.34	91.0	0.9	91.6	2.6	108.4	65.5	91.0	0.9	NA
072709KR-07-14	617	24171	3.9	20.4088	7.2	0.1003	7.9	0.0149	3.3	0.41	95.0	3.1	97.1	7.3	147.8	169.0	95.0	3.1	NA
072709KR-07-15	865	22976	4.1	20.3997	5.8	0.1019	6.0	0.0151	1.6	0.26	96.5	1.5	98.6	5.6	148.8	135.3	96.5	1.5	NA
072709KR-07-16	790	12435	3.7	21.1840	6.4	0.0928	6.8	0.0143	2.2	0.32	91.3	2.0	90.1	5.9	59.7	153.4	91.3	2.0	NA
072709KR-07-17	797	74936	2.1	18.3378	1.6	0.4523	2.8	0.0602	2.3	0.82	376.6	8.5	378.9	9.0	393.1	36.1	376.6	8.5	NA
072709KR-07-18	208	5231	6.1	20.5561	14.8	0.1025	15.6	0.0153	5.0	0.32	97.8	4.9	99.1	14.8	130.8	350.1	97.8	4.9	NA
072709KR-07-19	3680	31984	3.5	21.0001	4.1	0.0395	4.1	0.0060	0.6	0.14	38.7	0.2	39.3	1.6	80.4	96.5	38.7	0.2	NA
072709KR-07-20	270	87194	1.6	8.0218	0.6	5.7386	1.8	0.3339	1.7	0.95	1857.1	27.8	1937.2	15.7	2024.0	9.8	2024.0	9.8	91.8
072709KR-07-21	480	25866	7.0	22.2164	19.2	0.0922	19.5	0.0149	3.0	0.15	95.0	2.8	89.5	16.7	-55.0	472.0	95.0	2.8	NA
072709KR-07-23	230	171599	2.1	8.4384	0.4	5.6166	1.7	0.3437	1.6	0.97	1904.6	26.5	1918.6	14.2	1933.8	6.6	1933.8	6.6	98.5
072709KR-07-24	283	146746	3.7	13.0370	0.8	1.8555	2.5	0.1754	2.4	0.95	1042.0	23.1	1065.4	16.7	1113.5	16.1	1113.5	16.1	93.6
072709KR-07-25	2359	26181	2.6	20.8609	6.9	0.0402	7.4	0.0061	2.7	0.36	39.1	1.0	40.0	2.9	96.2	164.2	39.1	1.0	NA
072709KR-07-26	29	10166	1.0	7.7590	2.9	6.8798	3.8	0.3872	2.5	0.65	2109.6	44.4	2096.1	33.6	2082.8	50.5	2082.8	50.5	101.3
072709KR-07-27	298	5436	4.5	21.8890	17.3	0.0940	17.4	0.0149	2.3	0.13	95.5	2.1	91.2	15.2	-19.0	420.5	95.5	2.1	NA
072709KR-07-28	167	52993	2.0	8.8267	0.7	5.2797	1.7	0.3380	1.5	0.91	1877.0	25.2	1865.6	14.6	1852.9	13.1	1852.9	13.1	101.3
072709KR-07-29	578	4817	2.1	19.6585	12.7	0.0410	13.6	0.0058	4.8	0.35	37.6	1.8	40.8	5.4	234.9	294.7	37.6	1.8	NA
072709KR-07-30	453	170329	2.6	12.1675	0.5	2.3296	1.4	0.2056	1.3	0.93	1205.2	14.2	1221.4	9.9	1250.0	10.2	1250.0	10.2	96.4
072709KR-07-31	315	4297	5.1	22.7226	12.9	0.0919	13.0	0.0151	2.0	0.15	96.9	1.9	89.3	11.1	-110.2	317.5	96.9	1.9	NA
072709KR-07-33	492	13705	5.4	21.0975	8.0	0.0982	8.4	0.0150	2.5	0.30	96.1	2.4	95.1	7.6	69.4	191.4	96.1	2.4	NA
072709KR-07-34	1310	17125	4.5	23.0241	10.8	0.0363	11.9	0.0061	5.0	0.42	39.0	1.9	36.2	4.2	-142.7	267.7	39.0	1.9	NA
072709KR-07-35	395	36001	4.6	21.9981	13.0	0.0952	13.2	0.0152	2.2	0.17	97.1	2.2	92.3	11.6	-31.0	316.7	97.1	2.2	NA
072709KR-07-36	336	8051	3.1	20.7135	8.5	0.1007	9.6	0.0151	4.5	0.46	96.7	4.3	97.4	8.9	112.9	201.6	96.7	4.3	NA
072709KR-07-37	318	5872	5.0	22.4543	12.3	0.0914	13.1	0.0149	4.7	0.36	95.3	4.4	88.8	11.2	-81.0	301.3	95.3	4.4	NA
072709KR-07-38	79	77914	1.3	5.3409	1.0	13.4540	1.6	0.5212	1.3	0.78	2704.1	27.8	2712.1	15.2	2718.0	16.4	2718.0	16.4	99.5
072709KR-07-39	1107	32981	2.5	20.7134	3.7	0.0978	3.8	0.0147	1.0	0.27	94.0	1.0	94.7	3.5	112.9	86.9	94.0	1.0	NA
072709KR-07-40	154	29780	1.1	13.1108	1.1	1.9100	1.8	0.1816	1.3	0.76	1075.8	13.1	1084.6	11.7	1102.3	23.0	1102.3	23.0	97.6
072709KR-07-41	757	8948	9.1	21.0953	6.4	0.0991	7.0	0.0152	2.9	0.41	97.0	2.8	95.9	6.4	69.6	151.3	97.0	2.8	NA
072709KR-07-42	263	4344	5.3	22.3429	25.3	0.0949	25.6	0.0154	4.4	0.17	98.4	4.3	92.1	22.6	-68.8	625.2	98.4	4.3	NA
072709KR-07-43	200	60209	2.7	11.1121	1.3	3.0550	2.5	0.2462	2.2	0.85	1418.9	27.5	1421.5	19.4	1425.3	25.5	1425.3	25.5	99.5
072709KR-07-45	3384	66346	1.5	21.9239	4.0	0.0368	4.2	0.0059	1.3	0.30	37.6	0.5	36.7	1.5	-22.8	97.6	37.6	0.5	NA
072709KR-07-47	365	12147	4.2	19.5603	9.1	0.1120	9.5	0.0159	2.6	0.27	101.7	2.6	107.8	9.7	246.4	211.1	101.7	2.6	NA
072709KR-07-48	2444	50145	3.7	20.8686	4.6	0.0402	5.6	0.0061	3.1	0.56	39.1	1.2	40.1	2.2	95.2	109.3	39.1	1.2	NA

072709KR-07-49	1010	20179	5.9	20.8201	3.1	0.0999	3.7	0.0151	2.1	0.56	96.5	2.0	96.7	3.4	100.8	73.1	96.5	2.0	NA
072709KR-07-50	447	666234	2.0	5.7062	0.3	12.1349	1.9	0.5022	1.9	0.98	2623.3	39.9	2614.9	17.6	2608.4	5.5	2608.4	5.5	100.6
072709KR-07-64	142	14245	1.9	8.0396	3.5	5.5280	7.5	0.3223	6.6	0.88	1801.1	103.8	1905.0	64.3	2020.0	61.9	2020.0	61.9	89.2
072709KR-07-65	276	114611	3.0	13.2126	0.7	1.8031	1.6	0.1728	1.4	0.89	1027.4	13.8	1046.6	10.6	1086.8	14.8	1086.8	14.8	94.5
072709KR-07-R1	217	18110	3.0	17.9949	3.3	0.5234	3.7	0.0683	1.8	0.49	425.9	7.6	427.4	13.0	435.3	72.5	425.9	7.6	NA
072709KR-07-66	807	232338	3.6	6.2641	0.7	8.8816	1.4	0.4035	1.2	0.86	2185.2	22.2	2325.9	12.7	2451.8	11.8	2451.8	11.8	89.1
072709KR-07-51	354	11904	4.0	22.1775	18.0	0.0927	18.3	0.0149	2.9	0.16	95.4	2.8	90.1	15.7	-50.7	441.6	95.4	2.8	NA
072709KR-07-67	47	25914	3.0	5.3770	0.6	13.6736	2.3	0.5332	2.2	0.96	2755.1	49.1	2727.4	21.5	2706.9	10.0	2706.9	10.0	101.8
072709KR-07-52	536	11612	4.5	22.0698	8.1	0.0950	9.2	0.0152	4.3	0.47	97.3	4.2	92.2	8.1	-38.9	197.5	97.3	4.2	NA
072709KR-07-68	482	8337	5.8	22.2772	9.8	0.0931	10.1	0.0150	2.2	0.22	96.2	2.1	90.3	8.7	-61.7	239.8	96.2	2.1	NA
072709KR-07-53	695	4950	3.2	24.5729	19.5	0.0328	19.7	0.0059	2.9	0.15	37.6	1.1	32.8	6.3	-306.6	501.7	37.6	1.1	NA
072709KR-07-69	330	3835	4.2	24.1982	14.1	0.0885	16.1	0.0155	7.8	0.49	99.4	7.7	86.1	13.3	-267.5	359.5	99.4	7.7	NA
072709KR-07-54	656	27058	4.3	20.9494	4.8	0.1004	5.4	0.0153	2.5	0.46	97.6	2.4	97.2	5.0	86.1	114.5	97.6	2.4	NA
072709KR-07-70	400	12011	4.3	21.5393	11.0	0.0954	11.6	0.0149	3.6	0.32	95.4	3.5	92.5	10.2	19.8	264.1	95.4	3.5	NA
072709KR-07-71	349	9475	3.1	19.1239	16.3	0.1159	17.4	0.0161	6.0	0.35	102.8	6.1	111.3	18.4	298.2	375.0	102.8	6.1	NA
072709KR-07-56	554	9782	3.4	22.0883	10.1	0.0923	10.5	0.0148	2.7	0.26	94.6	2.6	89.6	9.0	-40.9	246.3	94.6	2.6	NA
072709KR-07-72	576	89159	2.1	16.0972	1.1	0.9335	2.6	0.1090	2.4	0.91	666.9	15.0	669.5	12.8	678.3	23.5	666.9	15.0	98.3
072709KR-07-57	227	3299	2.0	22.1116	30.2	0.0755	30.9	0.0121	6.9	0.22	77.6	5.3	73.9	22.1	-43.5	747.7	77.6	5.3	NA
072709KR-07-73	451	11580	4.7	20.8841	9.9	0.1001	10.2	0.0152	2.4	0.23	97.0	2.3	96.9	9.4	93.5	235.1	97.0	2.3	NA
072709KR-07-59	387	9611	4.1	22.7425	11.8	0.0913	12.1	0.0151	2.3	0.19	96.4	2.2	88.7	10.3	-112.3	292.7	96.4	2.2	NA
072709KR-07-75	212	9603	2.2	20.9456	17.1	0.2040	17.2	0.0310	2.0	0.12	196.7	3.9	188.5	29.6	86.6	407.5	196.7	3.9	NA
072709KR-07-60	345	128547	2.9	10.9138	0.4	3.1404	1.7	0.2486	1.7	0.97	1431.1	21.7	1442.6	13.5	1459.7	8.3	1459.7	8.3	98.0
072709KR-07-76	557	11825	3.8	20.6752	11.0	0.0989	11.2	0.0148	2.4	0.21	94.9	2.2	95.7	10.3	117.2	259.3	94.9	2.2	NA
072709KR-07-61	59	52622	1.0	7.5096	1.8	7.0139	2.8	0.3820	2.1	0.76	2085.7	37.5	2113.2	24.6	2140.1	31.5	2140.1	31.5	97.5
072709KR-07-77	846	20853	4.9	21.0229	6.1	0.0981	6.4	0.0150	1.8	0.29	95.7	1.7	95.1	5.8	77.8	145.2	95.7	1.7	NA
072709KR-07-62	260	216859	1.7	7.7340	0.3	6.3320	2.7	0.3552	2.7	0.99	1959.3	46.2	2022.9	24.1	2088.4	5.1	2088.4	5.1	93.8
072709KR-07-78	185	66215	2.8	11.5371	1.1	2.7557	2.9	0.2306	2.7	0.93	1337.6	32.5	1343.6	21.6	1353.3	20.8	1353.3	20.8	98.8
072709KR-07-63	1468	5793	2.5	19.9287	7.9	0.0414	9.4	0.0060	5.2	0.55	38.5	2.0	41.2	3.8	203.3	182.8	38.5	2.0	NA
072709KR-07-79	522	8575	4.0	20.3434	7.0	0.0996	7.9	0.0147	3.6	0.46	94.0	3.4	96.4	7.2	155.3	163.9	94.0	3.4	NA
072709KR-07-81	334	4565	4.8	23.0716	10.2	0.0887	10.4	0.0148	2.3	0.22	94.9	2.2	86.3	8.6	-147.8	253.3	94.9	2.2	NA
072709KR-07-82	206	208781	1.0	8.7473	0.5	5.4058	2.5	0.3430	2.4	0.98	1900.9	40.3	1885.8	21.4	1869.2	9.2	1869.2	9.2	101.7
072709KR-07-83	47	22355	1.2	7.7681	1.4	6.9962	2.5	0.3942	2.1	0.83	2142.1	38.5	2110.9	22.5	2080.7	24.6	2080.7	24.6	103.0
072709KR-07-84	408	17672	4.8	20.7827	13.3	0.0978	13.8	0.0147	3.8	0.28	94.3	3.6	94.7	12.5	105.0	314.6	94.3	3.6	NA
072709KR-07-85	529	14179	3.7	20.1116	5.9	0.1038	6.8	0.0151	3.3	0.48	96.8	3.1	100.3	6.5	182.0	138.1	96.8	3.1	NA
072709KR-07-86	122	39810	3.5	9.8560	0.9	4.0858	2.2	0.2921	2.0	0.92	1651.8	29.0	1651.5	17.7	1651.0	15.8	1651.0	15.8	100.1
072709KR-07-87	812	568850	3.6	8.6665	0.3	5.5503	3.5	0.3489	3.5	1.00	1929.2	58.6	1908.4	30.4	1885.9	5.5	1885.9	5.5	102.3
072709KR-07-88	1002	7509	3.8	19.1583	8.6	0.0419	9.3	0.0058	3.5	0.37	37.4	1.3	41.7	3.8	294.0	196.9	37.4	1.3	NA
072709KR-07-89	65	44484	2.7	5.2566	0.7	13.8942	3.5	0.5297	3.4	0.98	2740.2	75.6	2742.5	32.9	2744.2	12.1	2744.2	12.1	99.9
072709KR-07-90	556	10731	3.4	20.8599	8.4	0.0974	9.4	0.0147	4.2	0.45	94.3	3.9	94.3	8.5	96.2	199.5	94.3	3.9	NA
072709KR-07-91	308	1888124	1.1	3.8010	0.3	24.0795	1.2	0.6638	1.2	0.97	3281.9	30.6	3271.6	11.9	3265.3	4.3	3265.3	4.3	100.5
072709KR-07-92	441	6371	2.2	22.3056	10.1	0.0984	11.9	0.0159	6.3	0.53	101.9	6.4	95.3	10.8	-64.8	245.8	101.9	6.4	NA
072709KR-07-93	383	9291	4.1	20.8054	7.9	0.1027	8.4	0.0155	3.1	0.36	99.1	3.0	99.3	8.0	102.5	186.4	99.1	3.0	NA
072709KR-07-94	22	15083	1.8	8.9748	3.2	5.0457	3.5	0.3284	1.5	0.42	1830.8	23.6	1827.0	29.6	1822.7	57.5	1822.7	57.5	100.4
072709KR-07-95	393	17302	4.7	19.2263	7.4	0.1056	7.8	0.0147	2.6	0.33	94.3	2.4	102.0	7.6	285.9	169.1	94.3	2.4	NA
072709KR-07-96	155	14579	3.0	17.5155	5.3	0.5858	5.6	0.0744	1.8	0.32	462.7	7.9	468.2	20.9	495.1	116.3	462.7	7.9	NA
072709KR-07-97	488	10158	3.6	20.4968	12.8	0.0963	14.9	0.0143	7.7	0.51	91.6	7.0	93.3	13.3	137.7	300.9	91.6	7.0	NA
072709KR-07-98	28	37975	0.9	8.3921	1.5	5.7042	5.5	0.3472	5.3	0.96	1921.1	88.2	1932.0	47.7	1943.6	27.1	1943.6	27.1	98.8
072709KR-07-99	171	606084	1.4	8.6471	0.3	5.5374	1.1	0.3473	1.0	0.96	1921.6	17.2	1906.4	9.3	1889.9	5.3	1889.9	5.3	101.7
072709KR-07-100	42	54373	0.6	6.5996	1.0	9.2698	3.0	0.4437	2.8	0.95	2367.2	56.2	2365.0	27.4	2363.2	16.3	2363.2	16.3	100.2
072709KR-07-101	233	15144	1.5	18.2915	4.6	0.5142	4.8	0.0682	1.2	0.25	425.4	5.0	421.3	16.5	398.7	104.1	425.4	5.0	NA
072709KR-07-101	129	135357	1.5	5.7977	0.4	11.6156	3.3	0.4884	3.3	0.99	2563.8	69.5	2573.9	30.9	2581.9	6.5	2581.9	6.5	99.3
072709KR-07-102	720	7267	2.3	22.9929	22.1	0.0360	22.8	0.0060	5.4	0.24	38.6	2.1	35.9	8.0	-139.4	553.1	38.6	2.1	NA
072709KR-07-103	324	8273	4.3	19.7548	10.1	0.1036	10.6	0.0149	3.1	0.30	95.0	3.0	100.1	10.1	223.6	233.9	95.0	3.0	NA
072709KR-07-104	183	3895	3.7	14.5059	18.5	0.1153	18.9	0.0121	3.9	0.21	77.7	3.0	110.8	19.9	896.9	385.0	77.7	3.0	NA
072709KR-07-105	656	19436	4.2	20.3716	7.1	0.1024	7.3	0.0151	1.6	0.22	96.8	1.5	99.0	6.8	152.0	166.1	96.8	1.5	NA

Upper Nenana River – 072809KR-02

						Isotope ratios							Apparent ages (Ma)						
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
Upper Nenana River																			
072809KR-02-1	785	10839	3.5	23.2907	25.3	0.0327	25.7	0.0055	4.7	0.18	35.5	1.6	32.6	8.3	-171.3	639.4	35.5	1.6	NA
072809KR-02-2	358	11206	3.6	25.4048	16.0	0.0776	16.4	0.0143	3.5	0.21	91.5	3.2	75.9	12.0	-392.6	419.3	91.5	3.2	NA
072809KR-02-3	522	22883	5.6	20.0240	4.1	0.1010	5.6	0.0147	3.8	0.67	93.8	3.5	97.7	5.2	192.2	95.6	93.8	3.5	NA
072809KR-02-4	415	12395	4.7	20.6590	14.6	0.0956	15.0	0.0143	3.4	0.22	91.7	3.1	92.7	13.3	119.1	345.4	91.7	3.1	NA
072809KR-02-7	815	28001	3.4	20.2809	6.4	0.0981	7.4	0.0144	3.8	0.51	92.4	3.5	95.1	6.8	162.5	149.8	92.4	3.5	NA
072809KR-02-8	496	14966	11.9	21.8289	24.0	0.0580	24.3	0.0092	3.6	0.15	58.9	2.1	57.2	13.5	-12.3	587.4	58.9	2.1	NA
072809KR-02-9	69	44614	2.4	13.7973	8.6	1.7582	8.8	0.1759	1.5	0.17	1044.7	14.3	1030.2	56.7	999.4	175.6	999.4	175.6	104.5
072809KR-02-10	292	24121	4.4	21.7289	28.7	0.0909	29.0	0.0143	4.0	0.14	91.7	3.6	88.4	24.5	-1.2	704.4	91.7	3.6	NA
072809KR-02-11	472	4501	4.1	19.1485	10.5	0.0687	11.0	0.0095	3.4	0.30	61.3	2.0	67.5	7.2	295.2	240.8	61.3	2.0	NA
072809KR-02-12	304	10656	4.7	22.1558	17.6	0.0910	17.7	0.0146	1.9	0.11	93.6	1.8	88.4	15.0	-48.3	430.6	93.6	1.8	NA
072809KR-02-13	931	224364	3.4	18.1639	1.3	0.4292	2.6	0.0565	2.3	0.87	354.5	7.9	362.6	8.0	414.4	28.6	354.5	7.9	NA
072809KR-02-14	367	13317	4.0	20.2971	9.9	0.0993	10.4	0.0146	2.9	0.28	93.6	2.7	96.1	9.5	160.6	233.1	93.6	2.7	NA
072809KR-02-15	507	7839	3.2	18.7636	16.8	0.0423	18.1	0.0058	6.6	0.37	37.0	2.4	42.0	7.4	341.3	382.7	37.0	2.4	NA
072809KR-02-16	511	20787	3.7	21.8500	20.6	0.0554	21.1	0.0088	4.5	0.21	56.3	2.5	54.7	11.2	-14.6	503.4	56.3	2.5	NA
072809KR-02-17	170	9061	5.5	19.2126	20.7	0.1067	21.8	0.0149	7.0	0.32	95.2	6.6	103.0	21.4	287.6	476.9	95.2	6.6	NA
072809KR-02-18	4691	87620	5.3	21.3796	2.9	0.0381	3.7	0.0059	2.2	0.60	37.9	0.8	37.9	1.4	37.7	70.4	37.9	0.8	NA
072809KR-02-19	239	14442	3.9	19.8760	11.1	0.1069	12.7	0.0154	6.2	0.49	98.6	6.1	103.2	12.4	209.4	257.2	98.6	6.1	NA
072809KR-02-20	1534	44049	7.5	20.9073	9.4	0.0400	10.1	0.0061	3.8	0.37	39.0	1.5	39.8	4.0	90.9	223.0	39.0	1.5	NA
072809KR-02-21	456	15857	4.1	21.3378	7.3	0.0966	8.0	0.0149	3.1	0.39	95.7	2.9	93.6	7.1	42.4	175.8	95.7	2.9	NA
072809KR-02-22	304	13847	4.6	21.7708	19.3	0.0939	19.6	0.0148	3.6	0.18	94.8	3.4	91.1	17.1	-5.9	469.6	94.8	3.4	NA
072809KR-02-23	1843	159404	5.7	20.3269	2.4	0.1087	2.6	0.0160	1.1	0.41	102.4	1.1	104.7	2.6	157.2	56.3	102.4	1.1	NA
072809KR-02-24	608	87471	3.9	20.5277	8.2	0.1094	8.4	0.0163	1.9	0.22	104.1	1.9	105.4	8.4	134.1	193.1	104.1	1.9	NA
072809KR-02-25	325	16564	2.0	22.0156	21.9	0.0657	23.1	0.0105	7.4	0.32	67.2	5.0	64.6	14.4	-32.9	535.8	67.2	5.0	NA
072809KR-02-26	226	9180	5.4	27.1908	63.2	0.0513	63.6	0.0101	7.3	0.11	64.9	4.7	50.8	31.5	-572.8	1881.5	64.9	4.7	NA
072809KR-02-28	613	41175	5.1	20.9178	8.7	0.0980	9.8	0.0149	4.5	0.46	95.1	4.2	94.9	8.8	89.7	205.9	95.1	4.2	NA
072809KR-02-29	927	19874	3.2	23.0888	6.6	0.0538	6.7	0.0090	1.5	0.23	57.8	0.9	53.2	3.5	-149.7	162.9	57.8	0.9	NA
072809KR-02-30	346	17694	3.5	19.5556	14.5	0.1034	14.8	0.0147	2.9	0.20	93.8	2.7	99.9	14.1	247.0	335.3	93.8	2.7	NA
072809KR-02-31	132	4486	2.7	13.0684	39.3	0.0927	40.7	0.0088	10.5	0.26	56.4	5.9	90.0	35.1	1108.7	817.5	56.4	5.9	5.1
072809KR-02-32	1816	53722	3.1	21.1546	5.8	0.0388	6.4	0.0060	2.6	0.41	38.3	1.0	38.7	2.4	62.9	138.7	38.3	1.0	NA
072809KR-02-33	385	11937	4.3	22.5693	14.6	0.0924	14.9	0.0151	3.2	0.21	96.8	3.1	89.8	12.8	-93.5	358.8	96.8	3.1	NA
072809KR-02-34	1445	16828	4.1	20.6309	10.9	0.0397	11.1	0.0059	2.1	0.19	38.2	0.8	39.5	4.3	122.3	257.2	38.2	0.8	NA
072809KR-02-35	1125	35485	3.7	20.8206	9.3	0.0694	10.2	0.0105	4.2	0.41	67.2	2.8	68.1	6.7	100.7	220.3	67.2	2.8	NA
072809KR-02-37	164	8611	5.6	24.6028	44.7	0.0808	45.2	0.0144	6.9	0.15	92.2	6.3	78.9	34.3	-309.8	1195.7	92.2	6.3	NA
072809KR-02-38	379	23618	4.3	20.8250	15.6	0.0978	16.0	0.0148	3.5	0.22	94.6	3.3	94.8	14.5	100.2	370.7	94.6	3.3	NA
072809KR-02-39	982	48930	3.5	22.6774	5.9	0.0631	6.2	0.0104	1.8	0.29	66.5	1.2	62.1	3.7	-105.3	145.9	66.5	1.2	NA
072809KR-02-40	1044	21632	4.3	22.0423	12.1	0.0567	12.3	0.0091	2.3	0.19	58.1	1.3	56.0	6.7	-35.9	295.2	58.1	1.3	NA
072809KR-02-41	407	5092	4.8	19.4131	15.5	0.1041	15.6	0.0147	2.2	0.14	93.8	2.0	100.6	15.0	263.8	356.9	93.8	2.0	NA
072809KR-02-42	231	3580	4.5	10.4394	220.1	0.1099	220.3	0.0083	9.8	0.04	53.4	5.2	105.9	225.2	1543.7	583.2	53.4	5.2	3.5
072809KR-02-43	1065	12959	2.7	24.1642	8.5	0.0346	9.1	0.0061	3.4	0.37	39.0	1.3	34.6	3.1	-263.9	215.4	39.0	1.3	NA
072809KR-02-44	209	3198	1.4	20.3614	21.6	0.0982	21.7	0.0145	2.0	0.09	92.8	1.9	95.1	19.7	153.2	511.5	92.8	1.9	NA
072809KR-02-45	861	14642	3.0	24.5016	16.7	0.0356	17.3	0.0063	4.5	0.26	40.6	1.8	35.5	6.0	-299.2	428.5	40.6	1.8	NA
072809KR-02-46	143	5346	4.6	20.1248	25.4	0.1033	26.1	0.0151	5.6	0.22	96.5	5.4	99.8	24.8	180.5	601.5	96.5	5.4	NA
072809KR-02-48	347	13475	5.2	21.0586	16.0	0.0962	16.3	0.0147	3.3	0.20	94.0	3.1	93.2	14.5	73.8	381.3	94.0	3.1	NA
072809KR-02-49	802	26354	6.2	21.0836	5.4	0.0961	5.7	0.0147	1.6	0.29	94.0	1.5	93.1	5.0	70.9	129.0	94.0	1.5	NA
072809KR-02-50	267	18656	5.5	18.6605	20.1	0.1106	20.6	0.0150	4.2	0.21	95.8	4.0	106.5	20.8	353.8	458.7	95.8	4.0	NA

072809KR-02-51	591	22688	4.9	23.3943	7.7	0.0868	8.1	0.0147	2.6	0.32	94.2	2.5	84.5	6.6	-182.4	192.8	94.2	2.5	NA
072809KR-02-52	1183	26017	3.6	22.3686	13.2	0.0367	13.4	0.0059	2.5	0.19	38.2	1.0	36.6	4.8	-71.7	323.6	38.2	1.0	NA
072809KR-02-53	1753	28796	3.6	21.2527	5.8	0.0384	8.0	0.0059	5.5	0.69	38.1	2.1	38.3	3.0	51.9	138.0	38.1	2.1	NA
072809KR-02-54	392	8363	3.0	19.0735	13.8	0.0650	14.7	0.0090	4.8	0.33	57.7	2.8	63.9	9.1	304.2	316.9	57.7	2.8	NA
072809KR-02-55	158	6060	4.3	29.1017	54.0	0.0706	54.2	0.0149	4.6	0.09	95.4	4.4	69.3	36.3	-760.1	1619.8	95.4	4.4	NA
072809KR-02-56	273	10899	4.0	19.4289	38.1	0.0692	38.9	0.0097	8.0	0.20	62.5	5.0	67.9	25.6	261.9	905.2	62.5	5.0	NA
072809KR-02-57	431	16853	2.2	20.8312	11.7	0.1025	13.0	0.0155	5.7	0.44	99.1	5.6	99.1	12.3	99.5	277.5	99.1	5.6	NA
072809KR-02-59	405	16420	4.9	19.4274	10.3	0.1097	12.2	0.0155	6.5	0.53	98.9	6.4	105.7	12.3	262.1	238.1	98.9	6.4	NA
072809KR-02-61	166	11206	4.7	19.5035	27.4	0.1045	28.0	0.0148	5.5	0.20	94.6	5.2	100.9	26.9	253.1	640.8	94.6	5.2	NA
072809KR-02-62	418	17383	4.6	20.7357	9.1	0.0994	9.8	0.0149	3.6	0.37	95.6	3.5	96.2	9.0	110.4	214.8	95.6	3.5	NA
072809KR-02-65	635	49017	1.8	20.2483	6.2	0.1972	6.5	0.0290	1.9	0.30	184.0	3.5	182.7	10.8	166.2	144.1	184.0	3.5	NA
072809KR-02-66	735	12549	2.8	23.8719	11.2	0.0506	11.6	0.0088	2.9	0.25	56.2	1.6	50.1	5.7	-233.1	284.0	56.2	1.6	NA
072809KR-02-67	291	26703	3.8	21.2479	11.4	0.0955	12.8	0.0147	5.8	0.46	94.2	5.4	92.6	11.3	52.5	271.8	94.2	5.4	NA
072809KR-02-68	275	10407	4.0	20.2130	21.5	0.1034	21.7	0.0152	3.2	0.15	97.0	3.1	99.9	20.7	170.3	506.6	97.0	3.1	NA
072809KR-02-69	342	13582	4.6	18.7964	10.3	0.1070	11.0	0.0146	3.6	0.33	93.4	3.3	103.2	10.8	337.4	234.9	93.4	3.3	NA
072809KR-02-70	796	51556	6.8	20.5851	6.4	0.1046	6.8	0.0156	2.3	0.33	99.9	2.2	101.0	6.5	127.6	151.3	99.9	2.2	NA
072809KR-02-71	451	22795	3.8	21.5254	23.5	0.0559	23.9	0.0087	4.1	0.17	56.1	2.3	55.3	12.9	21.4	571.8	56.1	2.3	NA
072809KR-02-72	467	20348	5.1	21.7552	15.1	0.0939	15.3	0.0148	2.8	0.18	94.8	2.7	91.1	13.4	-4.1	365.2	94.8	2.7	NA
072809KR-02-73	226	6533	4.1	30.8651	31.6	0.0679	32.1	0.0152	5.3	0.16	97.3	5.1	66.7	20.7	-928.6	941.3	97.3	5.1	NA
072809KR-02-74	367	9859	5.0	23.4293	12.7	0.0900	13.9	0.0153	5.8	0.42	97.8	5.7	87.5	11.7	-186.1	317.4	97.8	5.7	NA
072809KR-02-75	444	23789	3.7	21.4314	7.5	0.0987	8.9	0.0153	4.8	0.54	98.2	4.7	95.6	8.1	31.9	180.1	98.2	4.7	NA
072809KR-02-76	1189	33491	3.2	20.5755	8.5	0.0397	9.0	0.0059	3.1	0.35	38.1	1.2	39.5	3.5	128.7	199.8	38.1	1.2	NA
072809KR-02-77	1220	72245	24.7	22.0324	5.1	0.0686	5.8	0.0110	2.7	0.47	70.3	1.9	67.4	3.7	-34.8	123.0	70.3	1.9	NA
072809KR-02-78	507	29775	3.8	23.9499	13.3	0.0842	14.0	0.0146	4.3	0.31	93.6	4.0	82.1	11.0	-241.3	338.0	93.6	4.0	NA
072809KR-02-79	384	16713	4.4	21.3300	15.3	0.0936	16.0	0.0145	4.6	0.29	92.7	4.2	90.9	13.9	43.2	367.6	92.7	4.2	NA
072809KR-02-80	331	17347	3.8	23.3353	27.4	0.0873	27.6	0.0148	3.0	0.11	94.5	2.8	85.0	22.5	-176.1	695.0	94.5	2.8	NA
072809KR-02-81	2161	46344	4.6	21.6965	5.0	0.0372	5.9	0.0059	3.1	0.52	37.6	1.1	37.1	2.1	2.3	120.7	37.6	1.1	NA
072809KR-02-82	503	10951	2.3	23.6618	17.0	0.0525	17.6	0.0090	4.7	0.27	57.8	2.7	52.0	8.9	-210.9	429.2	57.8	2.7	NA
072809KR-02-83	192	4928	1.7	27.9792	52.5	0.0494	53.1	0.0100	8.4	0.16	64.3	5.4	49.0	25.4	-650.7	1533.1	64.3	5.4	NA
072809KR-02-84	349	17882	2.8	21.2216	18.2	0.0955	18.9	0.0147	5.3	0.28	94.1	4.9	92.6	16.8	55.4	436.9	94.1	4.9	NA
072809KR-02-85	577	20161	4.0	22.7096	7.9	0.0949	8.4	0.0156	2.8	0.33	100.0	2.8	92.0	7.4	-108.8	195.4	100.0	2.8	NA
072809KR-02-86	602	11257	3.3	21.3468	22.3	0.0380	22.7	0.0059	4.3	0.19	37.8	1.6	37.9	8.4	41.4	538.0	37.8	1.6	NA
072809KR-02-88	624	14834	3.0	21.9916	22.6	0.0537	22.7	0.0086	2.3	0.10	55.0	1.3	53.1	11.7	-30.3	553.0	55.0	1.3	NA
072809KR-02-90	65	412	1.4	8.6869	22.7	0.2795	27.1	0.0176	14.7	0.54	112.5	16.4	250.2	60.2	1881.7	415.5	112.5	16.4	NA
072809KR-02-91	400	31958	4.8	22.5052	12.9	0.0910	13.0	0.0149	1.8	0.14	95.0	1.7	88.4	11.0	-86.6	317.2	95.0	1.7	NA
072809KR-02-92	433	16275	5.0	20.5959	13.8	0.0976	14.1	0.0146	2.9	0.20	93.3	2.6	94.5	12.7	126.3	325.9	93.3	2.6	NA
072809KR-02-93	429	18414	4.0	19.6036	11.1	0.1028	11.5	0.0146	3.1	0.27	93.5	2.9	99.3	10.9	241.3	255.5	93.5	2.9	NA
072809KR-02-94	475	7922	3.7	19.4523	10.9	0.1057	11.1	0.0149	2.1	0.19	95.4	2.0	102.0	10.7	259.2	250.5	95.4	2.0	NA
072809KR-02-95	287	12160	4.3	22.0047	14.9	0.0991	15.5	0.0158	4.3	0.28	101.1	4.3	95.9	14.2	-31.7	363.6	101.1	4.3	NA
072809KR-02-96	460	21025	3.0	18.2376	13.9	0.1131	14.4	0.0150	3.6	0.25	95.7	3.4	108.8	14.8	405.3	312.9	95.7	3.4	NA
072809KR-02-98	343	13415	4.2	25.1715	24.2	0.0841	24.7	0.0153	5.0	0.20	98.2	4.9	82.0	19.5	-368.6	635.6	98.2	4.9	NA
072809KR-02-99	221	25876	1.7	18.5725	3.3	0.4002	3.6	0.0539	1.4	0.40	338.5	4.7	341.8	10.3	364.5	73.7	338.5	4.7	NA
072809KR-02-100	276	23581	4.4	23.7387	17.9	0.0896	18.6	0.0154	4.9	0.26	98.6	4.8	87.1	15.5	-219.0	454.0	98.6	4.8	NA
072809KR-02-101	286	5967	1.6	21.5867	31.1	0.0661	33.4	0.0104	12.0	0.36	66.4	7.9	65.0	21.0	14.6	764.7	66.4	7.9	NA
072809KR-02-102	889	17562	2.9	21.5402	11.6	0.0562	12.0	0.0088	3.0	0.25	56.3	1.7	55.5	6.5	19.7	279.2	56.3	1.7	NA
072809KR-02-103	673	54532	3.7	20.8975	6.9	0.0977	7.4	0.0148	2.9	0.39	94.8	2.7	94.7	6.7	92.0	162.8	94.8	2.7	NA
072809KR-02-104	344	8187	3.0	25.4900	19.8	0.0410	23.3	0.0076	12.3	0.53	48.6	6.0	40.8	9.3	-401.3	519.5	48.6	6.0	NA
072809KR-02-105	447	507515	2.3	11.2514	0.6	2.9835	3.1	0.2435	3.0	0.98	1404.7	38.0	1403.4	23.3	1401.5	10.8	1401.5	10.8	100.2

Johnson River – 071511KR-01

						Isotope ratios							Apparent ages (Ma)						
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
Johnson River																			
071511KR-01-40	338	7292	1.9	17.6312	24.8	0.0854	25.6	0.0109	6.3	0.25	70.0	4.4	83.2	20.4	480.5	555.3	70.0	4.4	NA
071511KR-01-79	192	10126	1.5	19.0130	9.9	0.2728	10.6	0.0376	3.7	0.35	238.1	8.8	244.9	23.1	311.4	226.0	238.1	8.8	NA
071511KR-01-53	1643	18439	1.2	18.6822	1.2	0.3729	8.9	0.0505	8.8	0.99	317.7	27.2	321.8	24.4	351.2	27.9	317.7	27.2	NA
071511KR-01-06	844	52554	1.1	18.3124	1.6	0.3948	6.5	0.0524	6.2	0.97	329.5	20.0	337.9	18.6	396.2	36.9	329.5	20.0	NA
071511KR-01-44	452	21584	1.3	18.5364	3.7	0.4245	7.8	0.0571	6.8	0.88	357.8	23.7	359.3	23.5	368.9	84.0	357.8	23.7	NA
071511KR-01-92	484	43223	1.3	18.6169	3.2	0.4324	5.2	0.0584	4.1	0.79	365.8	14.7	364.9	16.0	359.1	72.7	365.8	14.7	NA
071511KR-01-22	194	26114	1.7	19.2461	5.4	0.4198	5.8	0.0586	2.1	0.37	367.1	7.6	355.9	17.5	283.6	124.4	367.1	7.6	NA
071511KR-01-75	606	62113	1.9	18.5715	2.3	0.4365	3.0	0.0588	1.9	0.64	368.3	6.8	367.8	9.2	364.6	51.2	368.3	6.8	NA
071511KR-01-03	270	46099	1.5	18.7720	4.1	0.4376	4.6	0.0596	2.1	0.45	373.1	7.5	368.6	14.3	340.4	93.6	373.1	7.5	NA
071511KR-01-66	194	14329	3.4	18.0885	8.9	0.4603	9.3	0.0604	2.7	0.29	378.0	9.7	384.5	29.8	423.7	199.1	378.0	9.7	NA
071511KR-01-77	428	43688	1.8	18.1554	3.1	0.4591	4.2	0.0605	2.8	0.67	378.4	10.4	383.6	13.5	415.4	70.1	378.4	10.4	NA
071511KR-01-24	518	56052	1.3	18.6583	2.6	0.4727	4.9	0.0640	4.1	0.85	399.7	16.0	393.1	15.9	354.1	58.3	399.7	16.0	NA
071511KR-01-74	378	33718	2.1	18.1750	2.5	0.4871	8.2	0.0642	7.8	0.95	401.1	30.3	402.9	27.2	413.0	55.9	401.1	30.3	97.1
071511KR-01-60	943	64342	1.8	18.1933	4.7	0.5094	9.3	0.0672	8.0	0.86	419.3	32.6	418.0	31.8	410.8	104.3	419.3	32.6	102.1
071511KR-01-80	368	37121	1.9	16.2986	2.0	0.8909	2.4	0.1053	1.4	0.58	645.4	8.6	646.8	11.6	651.7	42.6	645.4	8.6	99.0
071511KR-01-23	705	181226	4.1	13.8460	0.7	1.5788	6.0	0.1585	6.0	0.99	948.7	52.6	961.9	37.4	992.2	14.5	992.2	14.5	95.6
071511KR-01-84	73	17629	1.3	13.3982	6.6	1.9063	7.3	0.1852	3.0	0.42	1095.5	30.4	1083.3	48.3	1058.8	132.9	1058.8	132.9	103.5
071511KR-01-01	75	26874	1.5	13.3215	4.4	1.8593	4.7	0.1796	1.8	0.38	1065.0	17.5	1066.7	31.2	1070.3	88.0	1070.3	88.0	99.5
071511KR-01-78	33	7456	1.5	12.7557	6.3	1.8668	6.8	0.1727	2.7	0.40	1027.0	25.6	1069.4	45.2	1156.9	124.5	1156.9	124.5	88.8
071511KR-01-63	363	156728	20.6	12.5803	0.7	2.1677	1.4	0.1978	1.2	0.85	1163.4	12.5	1170.7	9.7	1184.4	14.6	1184.4	14.6	98.2
071511KR-01-50	142	50475	3.2	12.5535	2.3	2.1784	2.6	0.1983	1.2	0.48	1166.3	13.2	1174.2	18.0	1188.6	44.8	1188.6	44.8	98.1
071511KR-01-49	77	29122	2.0	12.5111	4.2	2.1951	5.7	0.1992	3.8	0.67	1170.9	40.7	1179.5	39.5	1195.2	82.5	1195.2	82.5	98.0
071511KR-01-32	408	205702	2.9	12.1786	0.4	2.5477	4.3	0.2250	4.3	0.99	1308.4	50.9	1285.8	31.5	1248.2	8.6	1248.2	8.6	104.8
071511KR-01-51	114	36324	2.4	11.0412	2.0	3.1046	2.8	0.2486	1.9	0.69	1431.3	24.5	1433.8	21.2	1437.6	38.1	1437.6	38.1	99.6
071511KR-01-29	301	79412	1.6	10.9995	1.4	2.7822	4.0	0.2220	3.8	0.94	1292.2	44.5	1350.8	30.2	1444.8	25.9	1444.8	25.9	89.4
071511KR-01-19	226	96552	2.1	10.7860	0.8	3.2372	1.6	0.2532	1.4	0.88	1455.2	18.7	1466.1	12.6	1482.0	14.4	1482.0	14.4	98.2
071511KR-01-04	201	49241	1.6	10.1386	3.4	3.6320	9.1	0.2671	8.5	0.93	1525.9	115.2	1556.6	72.8	1598.4	63.1	1598.4	63.1	95.5
071511KR-01-55	328	20915	0.8	10.0598	0.9	3.1192	4.9	0.2276	4.9	0.98	1321.8	58.1	1437.4	38.1	1613.0	17.0	1613.0	17.0	81.9
071511KR-01-39	130	91759	0.8	9.2645	1.2	4.6750	2.1	0.3141	1.7	0.82	1761.0	26.8	1762.8	17.7	1764.9	22.0	1764.9	22.0	99.8
071511KR-01-56	28	29949	1.4	9.0541	3.0	5.1516	4.0	0.3383	2.6	0.65	1878.4	42.1	1844.7	33.6	1806.8	54.4	1806.8	54.4	104.0
071511KR-01-100	233	58776	1.9	9.0237	0.8	4.7220	3.6	0.3090	3.6	0.97	1736.0	54.1	1771.1	30.5	1812.9	14.7	1812.9	14.7	95.8
071511KR-01-41	146	72785	2.4	8.9877	0.7	5.0582	1.0	0.3297	0.6	0.65	1837.0	10.2	1829.1	8.3	1820.1	13.4	1820.1	13.4	100.9
071511KR-01-48	46	21599	1.1	8.9803	2.1	4.5686	7.3	0.2976	7.0	0.96	1679.2	102.8	1743.6	60.6	1821.6	37.9	1821.6	37.9	92.2

071511KR-01-27	151	85816	1.3	8.9594	1.1	4.9231	9.0	0.3199	9.0	0.99	1789.2	139.9	1806.2	76.2	1825.9	19.4	1825.9	19.4	98.0
071511KR-01-95	68	71611	1.8	8.8072	1.6	5.1806	2.3	0.3309	1.7	0.73	1842.8	26.6	1849.4	19.4	1856.9	28.1	1856.9	28.1	99.2
071511KR-01-35	412	100417	1.6	8.7958	0.4	5.0641	3.8	0.3231	3.8	0.99	1804.6	60.2	1830.1	32.6	1859.2	7.5	1859.2	7.5	97.1
071511KR-01-08	74	48954	2.9	8.7911	1.9	5.1632	2.6	0.3292	1.8	0.69	1834.5	28.3	1846.6	21.9	1860.2	33.8	1860.2	33.8	98.6
071511KR-01-81	122	89487	2.3	8.7182	0.9	5.1942	5.2	0.3284	5.1	0.98	1830.8	81.5	1851.7	44.3	1875.2	16.3	1875.2	16.3	97.6
071511KR-01-31	272	12829	2.3	8.5211	0.8	4.7672	5.2	0.2946	5.1	0.99	1664.6	75.3	1779.1	43.6	1916.3	14.2	1916.3	14.2	86.9
071511KR-01-34	160	149259	1.2	8.5029	1.1	5.6018	1.8	0.3455	1.4	0.80	1912.9	23.1	1916.4	15.1	1920.2	19.0	1920.2	19.0	99.6
071511KR-01-05	144	46355	1.3	8.3420	0.8	5.9289	1.4	0.3587	1.1	0.80	1976.1	19.0	1965.5	12.1	1954.4	14.9	1954.4	14.9	101.1
071511KR-01-64	124	78649	1.1	8.2340	0.7	5.2333	2.8	0.3125	2.8	0.97	1753.1	42.3	1858.1	24.3	1977.6	13.0	1977.6	13.0	88.7
071511KR-01-36	227	273545	2.2	8.1945	0.7	6.1734	1.4	0.3669	1.2	0.85	2014.8	20.3	2000.7	12.1	1986.2	13.1	1986.2	13.1	101.4
071511KR-01-20	274	58389	2.2	8.1343	0.4	5.2024	2.2	0.3069	2.1	0.98	1725.5	32.5	1853.0	18.6	1999.3	7.5	1999.3	7.5	86.3
071511KR-01-91	198	108763	2.2	7.7830	0.6	6.9233	4.9	0.3908	4.8	0.99	2126.6	87.7	2101.6	43.3	2077.3	11.2	2077.3	11.2	102.4
071511KR-01-37	252	189811	3.5	7.7719	0.4	6.7343	3.1	0.3796	3.1	0.99	2074.4	54.3	2077.1	27.3	2079.8	7.8	2079.8	7.8	99.7
071511KR-01-07	162	99994	1.4	6.9866	0.9	7.6758	2.9	0.3889	2.8	0.96	2118.0	49.8	2193.8	26.0	2265.4	14.7	2265.4	14.7	93.5
071511KR-01-28	25	24569	1.4	6.9431	2.3	8.4779	4.5	0.4269	3.8	0.86	2291.8	74.1	2283.6	40.6	2276.2	39.2	2276.2	39.2	100.7
071511KR-01-16	116	69930	1.5	6.1283	0.5	10.3117	1.8	0.4583	1.8	0.97	2432.1	36.1	2463.2	17.1	2488.8	8.1	2488.8	8.1	97.7
071511KR-01-42	196	50044	1.1	5.8396	0.5	10.9385	6.4	0.4633	6.3	1.00	2454.0	129.4	2517.9	59.2	2569.8	8.3	2569.8	8.3	95.5
071511KR-01-38	140	92751	1.0	5.4425	0.3	12.8154	1.6	0.5059	1.5	0.98	2638.9	33.5	2666.2	14.9	2686.9	5.8	2686.9	5.8	98.2
071511KR-01-30	198	123248	1.8	5.4281	0.2	13.2209	1.5	0.5205	1.5	0.99	2701.2	32.6	2695.5	14.1	2691.3	4.0	2691.3	4.0	100.4
071511KR-01-47	80	74213	0.9	4.9448	0.4	15.2647	0.7	0.5474	0.6	0.82	2814.5	13.6	2831.9	6.9	2844.3	6.8	2844.3	6.8	99.0

Gerstle River – 071511KR-02

						Isotope ratios							Apparent ages (Ma)						
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
Gerstle River																			
071511KR-02-86	1378	43231	2.7	20.3411	7.0	0.0594	7.2	0.0088	1.7	0.23	56.3	0.9	58.6	4.1	155.6	165.2	56.3	0.9	NA
071511KR-02-15	102	23015	1.4	17.4747	3.5	0.7135	3.7	0.0904	1.5	0.39	558.1	7.8	546.8	15.8	500.3	76.1	558.1	7.8	111.6
071511KR-02-41	67	14708	1.6	16.8292	8.1	0.7586	8.7	0.0926	3.1	0.35	570.8	16.7	573.2	38.1	582.6	177.2	570.8	16.7	98.0
071511KR-02-98	303	170657	2.2	13.9884	0.4	1.6057	1.1	0.1629	1.0	0.94	972.9	8.9	972.4	6.6	971.4	7.3	971.4	7.3	100.1
071511KR-02-59	101	45976	1.4	13.5907	2.8	1.6682	4.3	0.1644	3.3	0.77	981.3	30.3	996.5	27.5	1029.9	56.1	1029.9	56.1	95.3
071511KR-02-60	57	23669	1.9	13.4807	3.4	1.8177	4.0	0.1777	2.2	0.54	1054.5	21.2	1051.9	26.5	1046.4	68.8	1046.4	68.8	100.8
071511KR-02-28	368	232398	1.8	13.3883	0.4	1.8064	3.1	0.1754	3.1	0.99	1041.8	30.0	1047.8	20.6	1060.2	8.6	1060.2	8.6	98.3
071511KR-02-66	158	93906	1.1	13.2835	1.1	1.8372	2.2	0.1770	1.9	0.87	1050.5	18.7	1058.9	14.6	1076.0	22.2	1076.0	22.2	97.6
071511KR-02-31	28	15950	1.5	13.2449	6.9	1.6369	8.2	0.1572	4.4	0.54	941.4	38.8	984.5	52.0	1081.9	139.4	1081.9	139.4	87.0
071511KR-02-104	293	155581	2.0	13.2186	0.7	1.9334	1.3	0.1854	1.1	0.86	1096.2	11.3	1092.7	8.7	1085.8	13.0	1085.8	13.0	101.0
071511KR-02-20	167	45576	2.3	13.1829	1.0	1.6838	3.9	0.1610	3.8	0.97	962.3	33.6	1002.4	24.7	1091.3	19.1	1091.3	19.1	88.2
071511KR-02-84	73	39890	1.4	12.9820	2.6	1.9024	4.1	0.1791	3.1	0.78	1062.2	30.8	1081.9	27.0	1122.0	50.9	1122.0	50.9	94.7
071511KR-02-45	98	35245	2.0	12.8939	1.7	2.0353	2.3	0.1903	1.6	0.69	1123.2	16.3	1127.4	15.6	1135.5	32.9	1135.5	32.9	98.9
071511KR-02-43	57	24137	2.3	12.8249	2.0	2.0244	3.5	0.1883	2.8	0.81	1112.2	28.6	1123.8	23.6	1146.2	40.6	1146.2	40.6	97.0
071511KR-02-74	162	160184	2.4	12.7958	1.1	2.0847	2.7	0.1935	2.4	0.91	1140.2	25.3	1143.8	18.3	1150.7	21.9	1150.7	21.9	99.1
071511KR-02-100	154	101132	1.9	12.7733	0.7	2.1272	1.9	0.1971	1.8	0.93	1159.5	19.0	1157.7	13.3	1154.2	14.2	1154.2	14.2	100.5
071511KR-02-80	330	271073	3.9	12.7495	0.3	2.1221	2.3	0.1962	2.3	0.99	1155.0	24.5	1156.0	16.1	1157.9	5.5	1157.9	5.5	99.8
071511KR-02-01	69	48519	3.0	12.6913	2.3	2.0769	3.3	0.1912	2.4	0.72	1127.7	24.9	1141.2	22.9	1167.0	45.8	1167.0	45.8	96.6
071511KR-02-33	68	32813	1.9	12.6201	3.0	2.0858	6.2	0.1909	5.4	0.88	1126.3	56.3	1144.1	42.8	1178.1	59.5	1178.1	59.5	95.6
071511KR-02-36	242	224459	1.6	12.5846	0.7	2.1507	4.3	0.1963	4.2	0.99	1155.4	44.5	1165.3	29.5	1183.7	13.0	1183.7	13.0	97.6
071511KR-02-12	68	46471	2.2	12.4776	1.9	2.2080	2.9	0.1998	2.1	0.74	1174.3	22.8	1183.6	20.0	1200.5	37.9	1200.5	37.9	97.8
071511KR-02-07	92	51276	2.5	12.2650	1.8	2.2854	2.7	0.2033	2.0	0.75	1193.0	22.3	1207.8	19.2	1234.3	35.1	1234.3	35.1	96.7
071511KR-02-26	88	46936	1.8	12.2631	1.8	2.3114	3.8	0.2056	3.4	0.88	1205.2	37.4	1215.8	27.2	1234.6	35.2	1234.6	35.2	97.6
071511KR-02-57	210	88293	1.2	12.2107	0.5	2.3270	2.0	0.2061	1.9	0.97	1207.9	21.0	1220.6	14.0	1243.0	9.2	1243.0	9.2	97.2
071511KR-02-65	328	158763	2.3	12.2094	0.3	2.2892	2.1	0.2027	2.0	0.99	1189.9	22.1	1209.0	14.5	1243.2	5.7	1243.2	5.7	95.7
071511KR-02-93	49	25706	2.5	11.8665	2.3	2.5035	3.7	0.2155	2.9	0.79	1257.9	33.4	1273.1	26.9	1298.8	44.3	1298.8	44.3	96.8
071511KR-02-56	28	39561	2.6	11.8265	4.4	2.2834	6.6	0.1959	4.9	0.74	1153.0	51.4	1207.2	46.5	1305.4	85.9	1305.4	85.9	88.3
071511KR-02-54	99	56336	1.3	11.7367	1.4	2.5350	3.5	0.2158	3.2	0.92	1259.6	36.9	1282.1	25.5	1320.1	26.3	1320.1	26.3	95.4
071511KR-02-62	114	122956	2.1	11.5983	0.9	2.7190	3.3	0.2287	3.2	0.96	1327.8	37.9	1333.7	24.3	1343.1	16.8	1343.1	16.8	98.9
071511KR-02-13	53	43195	3.1	11.5183	2.5	2.7473	3.2	0.2295	1.9	0.60	1331.9	22.8	1341.4	23.6	1356.5	48.9	1356.5	48.9	98.2
071511KR-02-08	178	123632	1.1	11.1145	0.6	2.9319	2.8	0.2363	2.8	0.98	1367.6	34.1	1390.2	21.3	1424.9	10.7	1424.9	10.7	96.0
071511KR-02-63	66	54460	1.9	11.0017	0.9	3.1143	3.3	0.2485	3.2	0.97	1430.7	41.1	1436.2	25.5	1444.4	16.5	1444.4	16.5	99.1
071511KR-02-69	80	79326	3.4	9.1418	1.1	4.4861	3.6	0.2974	3.5	0.96	1678.6	51.3	1728.4	30.1	1789.2	19.3	1789.2	19.3	93.8
071511KR-02-23	102	17248	2.3	9.1264	0.9	4.5166	3.6	0.2990	3.4	0.97	1686.1	50.9	1734.0	29.5	1792.3	16.8	1792.3	16.8	94.1
071511KR-02-18	265	266113	2.2	9.0197	0.2	4.8137	3.1	0.3149	3.1	1.00	1764.8	47.7	1787.3	26.1	1813.7	4.3	1813.7	4.3	97.3
071511KR-02-27	72	53613	4.2	8.9880	0.7	4.9836	3.5	0.3249	3.4	0.98	1813.5	54.5	1816.5	29.8	1820.1	13.6	1820.1	13.6	99.6
071511KR-02-35	117	137262	0.6	8.9807	0.9	4.8830	3.5	0.3180	3.4	0.97	1780.2	53.0	1799.3	29.6	1821.6	15.6	1821.6	15.6	97.7
071511KR-02-95	107	84288	1.4	8.9758	0.5	4.5722	2.7	0.2976	2.6	0.98	1679.6	38.6	1744.2	22.2	1822.5	9.7	1822.5	9.7	92.2
071511KR-02-89	312	34741	1.1	8.9671	0.9	3.4098	9.2	0.2218	9.2	1.00	1291.2	107.3	1506.7	72.4	1824.3	15.7	1824.3	15.7	70.8
071511KR-02-25	111	139168	1.8	8.9213	0.5	4.9982	3.3	0.3234	3.3	0.99	1806.3	51.7	1819.0	28.0	1833.6	8.3	1833.6	8.3	98.5
071511KR-02-30	177	106433	1.6	8.9179	0.3	4.6858	2.3	0.3031	2.3	0.99	1706.5	34.3	1764.7	19.3	1834.3	5.4	1834.3	5.4	93.0
071511KR-02-02	405	24352	2.6	8.9126	0.2	3.6685	3.2	0.2371	3.2	1.00	1371.8	40.0	1564.5	25.9	1835.3	4.2	1835.3	4.2	74.7
071511KR-02-67	67	42122	1.5	8.8991	0.9	4.8794	1.9	0.3149	1.7	0.89	1764.9	26.4	1798.7	16.1	1838.1	15.7	1838.1	15.7	96.0
071511KR-02-24	121	100893	1.4	8.8991	0.3	5.0153	1.3	0.3237	1.3	0.98	1807.8	20.6	1821.9	11.3	1838.1	4.8	1838.1	4.8	98.3
071511KR-02-17	139	353989	2.0	8.8800	0.2	5.1181	4.5	0.3296	4.5	1.00	1836.6	71.1	1839.1	37.9	1842.0	4.5	1842.0	4.5	99.7

071511KR-02-85	84	64726	1.1	8.8778	1.1	4.7105	6.4	0.3033	6.3	0.98	1707.7	94.2	1769.1	53.5	1842.4	20.4	1842.4	20.4	92.7
071511KR-02-94	71	48844	1.0	8.8697	0.8	5.0161	2.4	0.3227	2.2	0.94	1802.8	35.2	1822.0	20.2	1844.1	14.6	1844.1	14.6	97.8
071511KR-02-73	125	200342	2.1	8.8679	0.6	4.9442	3.4	0.3180	3.3	0.98	1779.9	51.8	1809.8	28.6	1844.5	10.8	1844.5	10.8	96.5
071511KR-02-14	249	120035	3.8	8.8593	0.3	5.0867	3.9	0.3268	3.8	1.00	1823.0	61.1	1833.9	32.8	1846.2	5.9	1846.2	5.9	98.7
071511KR-02-19	223	291557	1.8	8.8275	0.3	5.1815	3.5	0.3317	3.5	1.00	1846.8	55.9	1849.6	29.7	1852.7	4.9	1852.7	4.9	99.7
071511KR-02-22	241	424568	2.1	8.8265	0.3	5.1271	2.6	0.3282	2.5	0.99	1829.7	40.5	1840.6	21.7	1852.9	4.9	1852.9	4.9	98.7
071511KR-02-10	114	178745	2.8	8.8126	0.7	5.0024	4.1	0.3197	4.0	0.98	1788.4	62.4	1819.7	34.4	1855.8	13.5	1855.8	13.5	96.4
071511KR-02-49	59	42959	1.1	8.8125	1.3	5.1577	2.4	0.3296	2.0	0.85	1836.7	32.2	1845.7	20.3	1855.8	23.0	1855.8	23.0	99.0
071511KR-02-58	108	105793	3.0	8.8067	1.0	5.0808	3.9	0.3245	3.8	0.96	1811.8	59.6	1832.9	33.2	1857.0	18.9	1857.0	18.9	97.6
071511KR-02-88	61	61183	3.6	8.7658	0.9	5.1683	2.7	0.3286	2.6	0.95	1831.5	41.3	1847.4	23.3	1865.4	15.7	1865.4	15.7	98.2
071511KR-02-70	100	69124	4.7	8.7341	1.6	5.3236	7.5	0.3372	7.3	0.98	1873.3	119.1	1872.7	64.1	1871.9	28.3	1871.9	28.3	100.1
071511KR-02-90	53	45020	4.2	8.6389	1.1	5.4625	3.3	0.3423	3.0	0.94	1897.5	50.1	1894.7	27.9	1891.6	20.4	1891.6	20.4	100.3
071511KR-02-64	26	30456	3.5	8.6267	1.9	5.3149	3.0	0.3325	2.3	0.77	1850.7	37.5	1871.3	25.8	1894.2	34.4	1894.2	34.4	97.7
071511KR-02-76	76	50281	1.0	8.5450	0.8	3.7445	3.3	0.2321	3.2	0.97	1345.3	39.2	1580.9	26.6	1911.3	13.6	1911.3	13.6	70.4
071511KR-02-37	137	132598	1.1	8.4651	0.5	5.5555	2.9	0.3411	2.9	0.99	1891.9	47.0	1909.2	25.0	1928.2	8.5	1928.2	8.5	98.1
071511KR-02-77	190	124412	1.5	8.4108	0.3	5.5766	3.2	0.3402	3.1	1.00	1887.5	51.3	1912.5	27.1	1939.7	5.4	1939.7	5.4	97.3
071511KR-02-68	231	241033	1.0	8.4014	0.4	5.4459	1.9	0.3318	1.9	0.98	1847.3	30.6	1892.1	16.7	1941.7	6.5	1941.7	6.5	95.1
071511KR-02-96	231	518382	0.8	8.3710	0.6	5.8533	1.9	0.3554	1.8	0.95	1960.2	30.5	1954.3	16.5	1948.2	10.6	1948.2	10.6	100.6
071511KR-02-47	124	42500	1.6	8.2574	0.4	4.8124	3.9	0.2882	3.9	0.99	1632.5	56.1	1787.1	32.9	1972.5	7.5	1972.5	7.5	82.8
071511KR-02-81	220	48185	1.3	8.2226	0.5	4.8526	2.4	0.2894	2.4	0.98	1638.5	34.4	1794.1	20.4	1980.1	8.4	1980.1	8.4	82.7
071511KR-02-105	157	96605	0.7	8.1613	2.2	5.4608	7.2	0.3232	6.9	0.95	1805.5	108.2	1894.5	62.1	1993.4	39.7	1993.4	39.7	90.6
071511KR-02-71	155	261646	2.2	8.1549	0.3	5.8183	2.9	0.3441	2.8	1.00	1906.5	46.9	1949.1	24.7	1994.8	4.7	1994.8	4.7	95.6
071511KR-02-61	397	29599	2.2	8.1043	0.4	5.9636	1.9	0.3505	1.9	0.98	1937.1	31.1	1970.5	16.5	2005.8	7.3	2005.8	7.3	96.6
071511KR-02-06	29	44679	1.2	7.9975	2.4	6.2467	3.1	0.3623	2.0	0.64	1993.2	33.8	2011.0	26.9	2029.3	41.8	2029.3	41.8	98.2
071511KR-02-48	178	4810	1.7	7.9016	1.1	4.7156	5.3	0.2702	5.2	0.98	1542.0	71.3	1770.0	44.5	2050.7	18.7	2050.7	18.7	75.2
071511KR-02-55	150	170895	1.9	7.7638	0.3	6.2557	2.3	0.3522	2.2	0.99	1945.3	37.5	2012.3	19.8	2081.7	6.0	2081.7	6.0	93.4
071511KR-02-50	58	70037	1.4	7.5990	1.0	6.7893	3.7	0.3742	3.6	0.96	2049.0	62.3	2084.3	32.7	2119.4	17.9	2119.4	17.9	96.7
071511KR-02-83	93	129629	1.1	6.8049	0.4	8.4561	2.2	0.4173	2.2	0.98	2248.4	41.2	2281.2	20.1	2310.7	7.0	2310.7	7.0	97.3
071511KR-02-05	62	4394	1.1	6.1474	1.4	7.8786	4.6	0.3513	4.3	0.95	1940.7	72.4	2217.2	41.1	2483.6	24.4	2483.6	24.4	78.1
071511KR-02-03	113	151842	3.0	5.9531	0.2	10.7673	2.1	0.4649	2.1	1.00	2461.1	42.6	2503.2	19.4	2537.6	2.9	2537.6	2.9	97.0
071511KR-02-29	37	23560	1.6	5.8380	1.3	10.9473	4.3	0.4635	4.2	0.96	2455.1	84.9	2518.7	40.5	2570.3	21.3	2570.3	21.3	95.5
071511KR-02-32	150	284282	1.3	5.8131	0.2	11.3039	2.2	0.4766	2.2	1.00	2512.4	46.6	2548.5	21.0	2577.4	3.7	2577.4	3.7	97.5
071511KR-02-78	167	261725	3.3	5.7959	0.1	11.6951	2.9	0.4916	2.9	1.00	2577.6	62.4	2580.3	27.5	2582.4	1.9	2582.4	1.9	99.8
071511KR-02-99	66	67637	1.5	5.7716	0.4	11.9633	1.5	0.5008	1.4	0.96	2617.2	31.0	2601.5	14.1	2589.4	7.2	2589.4	7.2	101.1
071511KR-02-101	245	268290	2.0	5.7346	0.2	11.6805	0.9	0.4858	0.9	0.97	2552.5	18.0	2579.1	8.2	2600.1	3.5	2600.1	3.5	98.2
071511KR-02-42	90	108831	3.3	5.7324	0.5	11.6309	2.6	0.4836	2.6	0.98	2542.7	53.7	2575.2	24.3	2600.7	7.8	2600.7	7.8	97.8
071511KR-02-91	300	382466	1.9	5.7233	0.2	12.0277	3.0	0.4993	3.0	1.00	2610.6	63.7	2606.6	27.9	2603.4	2.6	2603.4	2.6	100.3
071511KR-02-21	85	228915	1.9	5.6310	0.4	10.3862	4.1	0.4242	4.1	1.00	2279.4	78.8	2469.8	38.2	2630.5	6.5	2630.5	6.5	86.7
071511KR-02-44	258	50117	1.8	5.6142	0.2	9.1341	4.1	0.3719	4.1	1.00	2038.4	71.6	2351.5	37.6	2635.4	4.1	2635.4	4.1	77.3
071511KR-02-34	194	43111	1.2	5.5701	0.2	9.4716	7.6	0.3826	7.6	1.00	2088.6	136.1	2384.8	70.2	2648.5	4.0	2648.5	4.0	78.9
071511KR-02-39	56	93742	3.1	5.5667	0.3	12.4636	3.2	0.5032	3.2	1.00	2627.5	68.4	2640.0	29.9	2649.5	4.6	2649.5	4.6	99.2
071511KR-02-92	25	59294	1.1	5.5287	0.9	12.6572	2.5	0.5075	2.3	0.93	2646.1	50.8	2654.5	23.6	2660.9	14.9	2660.9	14.9	99.4
071511KR-02-38	107	90566	0.3	5.5076	0.7	11.2016	4.7	0.4474	4.7	0.99	2383.9	93.2	2540.1	44.1	2667.2	12.2	2667.2	12.2	89.4
071511KR-02-75	89	47236	0.6	5.4178	0.3	13.0215	2.5	0.5117	2.5	0.99	2663.7	54.0	2681.2	23.5	2694.4	5.3	2694.4	5.3	98.9
071511KR-02-97	62	76474	2.1	5.4174	0.6	13.3562	1.6	0.5248	1.5	0.93	2719.4	33.3	2705.2	15.3	2694.5	9.9	2694.5	9.9	100.9
071511KR-02-79	140	101627	1.0	5.3530	0.6	13.3058	2.1	0.5166	2.0	0.96	2684.7	43.8	2701.6	19.7	2714.3	10.0	2714.3	10.0	98.9
071511KR-02-11	30	46461	0.4	5.3458	0.7	12.9120	2.1	0.5006	2.0	0.94	2616.4	42.6	2673.2	19.8	2716.5	11.6	2716.5	11.6	96.3
071511KR-02-103	49	78690	2.2	5.3209	0.5	11.9442	1.7	0.4609	1.6	0.96	2443.7	33.4	2600.0	16.1	2724.2	8.3	2724.2	8.3	89.7
071511KR-02-09	51	79607	10.5	5.3126	0.5	13.0444	3.2	0.5026	3.1	0.99	2625.0	67.6	2682.9	29.9	2726.8	8.1	2726.8	8.1	96.3
071511KR-02-87	120	145025	1.1	5.3074	0.2	13.3885	1.9	0.5154	1.8	0.99	2679.5	40.5	2707.4	17.5	2728.4	3.1	2728.4	3.1	98.2
071511KR-02-72	168	425374	1.9	5.1191	1.0	14.5147	3.2	0.5389	3.1	0.95	2778.8	69.6	2784.0	30.7	2787.7	15.8	2787.7	15.8	99.7
071511KR-02-46	136	336668	1.3	5.0679	0.3	12.3267	6.1	0.4531	6.1	1.00	2408.9	122.9	2629.6	57.6	2804.1	5.0	2804.1	5.0	85.9
071511KR-02-82	39	131654	1.1	4.6463	0.4	16.9203	2.9	0.5702	2.9	0.99	2908.6	67.4	2930.3	27.9	2945.3	6.8	2945.3	6.8	98.8
071511KR-02-102	88	180234	1.2	3.7307	0.3	23.5274	1.1	0.6366	1.1	0.97	3175.6	27.0	3249.0	10.9	3294.6	4.4	3294.6	4.4	96.4

Chulitna River – 072809KR-04

						Isotope ratios							Apparent ages (Ma)						
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
Chulitna River																			
072809KR-04-1	134	2921	4.8	20.5222	52.8	0.0581	53.5	0.0087	8.8	0.16	55.5	4.9	57.4	29.9	134.7	1329.0	55.5	4.9	NA
072809KR-04-2	298	4991	3.2	22.9708	15.1	0.0535	16.1	0.0089	5.6	0.35	57.2	3.2	53.0	8.3	-137.0	374.4	57.2	3.2	NA
072809KR-04-3	93	82873	2.0	6.0649	0.5	10.6529	1.3	0.4686	1.2	0.94	2477.4	25.3	2493.3	12.2	2506.3	7.9	2506.3	7.9	98.8
072809KR-04-4	155	4140	3.5	17.3507	75.0	0.0663	76.1	0.0083	12.7	0.17	53.6	6.8	65.2	48.1	515.9	1968.0	53.6	6.8	NA
072809KR-04-5	1115	47370	2.4	20.7206	2.5	0.0999	2.8	0.0150	1.2	0.45	96.0	1.2	96.7	2.5	112.1	58.1	96.0	1.2	NA
072809KR-04-6	829	11615	13.5	19.5618	7.3	0.0632	9.6	0.0090	6.2	0.64	57.6	3.5	62.3	5.8	246.2	168.7	57.6	3.5	NA
072809KR-04-7	4647	96363	7.3	20.8068	1.0	0.0503	19.6	0.0076	19.6	1.00	48.8	9.5	49.8	9.6	102.3	24.4	48.8	9.5	NA
072809KR-04-9	552	7985	2.7	22.4872	22.4	0.0510	22.8	0.0083	4.7	0.21	53.4	2.5	50.5	11.3	-84.6	553.4	53.4	2.5	NA
072809KR-04-10	178	4626	2.7	19.0578	38.8	0.0649	39.5	0.0090	7.1	0.18	57.6	4.1	63.9	24.4	306.0	916.8	57.6	4.1	NA
072809KR-04-11	868	11915	5.5	22.1851	6.5	0.0549	7.3	0.0088	3.3	0.45	56.7	1.9	54.3	3.9	-51.6	159.2	56.7	1.9	NA
072809KR-04-12	539	11203	2.4	22.3195	17.8	0.0544	18.0	0.0088	2.7	0.15	56.5	1.5	53.8	9.4	-66.3	438.1	56.5	1.5	NA
072809KR-04-13	978	9685	6.3	21.6267	6.6	0.0661	7.6	0.0104	3.7	0.49	66.4	2.5	64.9	4.8	10.1	158.4	66.4	2.5	NA
072809KR-04-14	609	21962	5.1	22.2323	5.2	0.0550	6.0	0.0089	2.9	0.49	56.9	1.7	54.3	3.2	-56.7	127.0	56.9	1.7	NA
072809KR-04-15	254	3482	4.6	21.8393	24.4	0.0578	25.1	0.0092	6.1	0.24	58.8	3.6	57.1	13.9	-13.5	596.5	58.8	3.6	NA
072809KR-04-16	305	3072	8.8	20.0231	20.1	0.0673	21.6	0.0098	7.9	0.37	62.7	4.9	66.2	13.9	192.3	472.2	62.7	4.9	NA
072809KR-04-17	686	13164	2.9	20.7315	10.5	0.0605	11.5	0.0091	4.5	0.39	58.3	2.6	59.6	6.6	110.8	249.1	58.3	2.6	NA
072809KR-04-18	592	12081	12.3	23.0775	10.2	0.0546	10.5	0.0091	2.3	0.22	58.6	1.4	53.9	5.5	-148.5	253.8	58.6	1.4	NA
072809KR-04-19	1163	18891	14.3	20.9362	6.0	0.0674	8.0	0.0102	5.4	0.67	65.6	3.5	66.2	5.2	87.6	141.5	65.6	3.5	NA
072809KR-04-20	201	6483	3.1	20.6730	35.2	0.0549	38.8	0.0082	16.3	0.42	52.8	8.5	54.2	20.5	117.5	853.3	52.8	8.5	NA
072809KR-04-21	118	1587	3.9	16.2838	121.1	0.0765	121.7	0.0090	12.4	0.10	58.0	7.2	74.8	88.0	653.7	700.9	58.0	7.2	NA
072809KR-04-22	310	5541	3.3	22.0519	19.2	0.0573	19.6	0.0092	4.0	0.21	58.8	2.4	56.6	10.8	-36.9	469.5	58.8	2.4	NA
072809KR-04-23	193	143729	2.4	8.3639	0.5	5.6308	1.4	0.3416	1.3	0.93	1894.2	20.8	1920.8	11.8	1949.7	9.1	1949.7	9.1	97.2
072809KR-04-24	1337	66011	3.0	21.3114	2.6	0.0969	2.7	0.0150	0.5	0.19	95.8	0.5	93.9	2.4	45.3	62.5	95.8	0.5	NA
072809KR-04-25	254	272751	1.7	8.7414	0.5	5.1825	1.2	0.3286	1.1	0.92	1831.4	17.2	1849.7	10.0	1870.4	8.4	1870.4	8.4	97.9
072809KR-04-26	337	4834	6.5	21.2524	23.3	0.0687	24.8	0.0106	8.4	0.34	67.9	5.6	67.5	16.2	51.9	563.2	67.9	5.6	NA
072809KR-04-27	104	26225	1.1	18.4607	12.7	0.4445	13.8	0.0595	5.4	0.39	372.7	19.7	373.4	43.1	378.1	285.8	372.7	19.7	NA
072809KR-04-28	88	37146	88.1	16.5552	4.6	0.8180	5.1	0.0982	2.1	0.42	603.9	12.1	606.9	23.2	618.1	99.7	603.9	12.1	97.7
072809KR-04-29	786	5114	1.9	19.3968	9.0	0.0623	9.3	0.0088	2.5	0.27	56.3	1.4	61.4	5.5	265.7	205.9	56.3	1.4	NA
072809KR-04-30	1673	18360	20.9	21.5132	5.5	0.0582	5.7	0.0091	1.6	0.28	58.3	0.9	57.5	3.2	22.7	132.4	58.3	0.9	NA
072809KR-04-31	528	10406	6.3	23.1109	8.6	0.0527	9.0	0.0088	2.8	0.31	56.7	1.6	52.2	4.6	-152.0	213.4	56.7	1.6	NA
072809KR-04-32	518	20827	1.9	22.6520	8.1	0.1005	8.4	0.0165	2.2	0.26	105.6	2.3	97.3	7.8	-102.5	200.0	105.6	2.3	NA
072809KR-04-33	515	8874	5.5	22.7462	10.9	0.0563	11.8	0.0093	4.6	0.39	59.6	2.7	55.6	6.4	-112.7	268.3	59.6	2.7	NA
072809KR-04-34	167	1066	3.0	17.0572	28.9	0.0713	30.6	0.0088	9.9	0.32	56.6	5.6	69.9	20.6	553.3	643.5	56.6	5.6	NA
072809KR-04-36	688	32045	4.0	21.2081	10.0	0.0597	10.2	0.0092	2.1	0.20	58.9	1.2	58.9	5.8	56.9	238.5	58.9	1.2	NA
072809KR-04-37	268	286529	2.5	6.0308	0.7	8.8679	6.0	0.3879	5.9	0.99	2113.0	106.4	2324.5	54.4	2515.8	12.3	2515.8	12.3	84.0
072809KR-04-38	498	36188	2.2	20.6562	9.4	0.0975	10.3	0.0146	4.3	0.41	93.5	3.9	94.5	9.3	119.5	221.9	93.5	3.9	NA
072809KR-04-39	2290	52674	4.7	21.0221	1.7	0.0998	2.3	0.0152	1.6	0.69	97.3	1.5	96.6	2.1	77.9	39.4	97.3	1.5	NA
072809KR-04-40	274	5122	3.1	21.5288	18.7	0.0565	21.9	0.0088	11.4	0.52	56.7	6.4	55.9	11.9	21.0	451.8	56.7	6.4	NA
072809KR-04-41	355	13279	2.1	20.9232	9.8	0.1093	9.9	0.0166	1.7	0.17	106.1	1.8	105.3	9.9	89.1	231.6	106.1	1.8	NA
072809KR-04-43	2122	25520	4.4	21.1778	2.4	0.0670	3.8	0.0103	2.9	0.77	66.0	1.9	65.8	2.4	60.4	57.6	66.0	1.9	NA
072809KR-04-44	538	10817	7.3	20.2556	13.8	0.0607	14.0	0.0089	2.3	0.16	57.2	1.3	59.8	8.1	165.4	324.5	57.2	1.3	NA
072809KR-04-45	231	63114	2.1	14.2787	1.2	1.4996	3.8	0.1553	3.6	0.95	930.6	31.6	930.2	23.4	929.4	24.1	929.4	24.1	100.1

072809KR-04-46	906	204325	1.9	16.4044	0.8	0.6983	3.2	0.0831	3.1	0.97	514.5	15.4	537.8	13.4	637.8	16.9	514.5	15.4	80.7
072809KR-04-47	472	9013	7.6	23.2907	17.1	0.0517	18.0	0.0087	5.7	0.32	56.0	3.2	51.1	9.0	-171.3	427.6	56.0	3.2	NA
072809KR-04-49	1580	21158	4.7	20.8621	6.4	0.0669	6.8	0.0101	2.2	0.33	64.9	1.4	65.7	4.3	96.0	152.2	64.9	1.4	NA
072809KR-04-50	278	937	2.4	20.3488	20.9	0.0604	21.7	0.0089	5.8	0.27	57.2	3.3	59.6	12.5	154.7	493.5	57.2	3.3	NA
072809KR-04-R1	151	26732	1.3	17.9953	3.7	0.4979	4.6	0.0650	2.7	0.59	405.8	10.8	410.2	15.6	435.2	83.2	405.8	10.8	NA
072809KR-04-51	1387	18500	3.9	20.5382	5.2	0.0595	5.5	0.0089	1.8	0.33	56.9	1.0	58.7	3.1	132.9	122.6	56.9	1.0	NA
072809KR-04-52	519	42196	8.1	16.4227	2.0	0.4948	4.2	0.0589	3.7	0.88	369.1	13.1	408.2	14.0	635.4	42.6	369.1	13.1	58.1
072809KR-04-53	753	16359	8.6	20.5666	4.7	0.0603	5.3	0.0090	2.5	0.47	57.7	1.4	59.4	3.1	129.7	110.3	57.7	1.4	NA
072809KR-04-54	810	8409	4.0	21.3765	8.4	0.0661	9.0	0.0102	3.1	0.35	65.7	2.0	65.0	5.7	38.0	202.2	65.7	2.0	NA
072809KR-04-55	532	5037	4.3	19.1456	19.2	0.0640	19.6	0.0089	4.1	0.21	57.0	2.3	63.0	12.0	295.5	441.2	57.0	2.3	NA
072809KR-04-56	134	3518	2.7	22.9143	34.7	0.0569	36.6	0.0095	11.6	0.32	60.7	7.0	56.2	20.0	-130.9	881.7	60.7	7.0	NA
072809KR-04-57	436	7522	3.6	20.5526	15.7	0.0577	16.1	0.0086	3.5	0.21	55.2	1.9	56.9	8.9	131.3	371.0	55.2	1.9	NA
072809KR-04-58	659	15963	8.4	22.0716	7.4	0.0565	8.7	0.0090	4.7	0.54	58.0	2.7	55.8	4.7	-39.1	178.8	58.0	2.7	NA
072809KR-04-59	1496	10965	3.6	19.6788	6.3	0.0692	8.6	0.0099	5.9	0.68	63.4	3.7	68.0	5.7	232.5	146.0	63.4	3.7	NA
072809KR-04-60	480	36683	2.0	19.7791	3.3	0.2220	4.0	0.0319	2.3	0.58	202.1	4.7	203.6	7.5	220.7	76.3	202.1	4.7	NA
072809KR-04-61	831	7105	6.5	22.6517	7.4	0.0560	8.4	0.0092	4.1	0.49	59.0	2.4	55.3	4.5	-102.5	181.3	59.0	2.4	NA
072809KR-04-62	363	5836	5.0	19.6212	23.5	0.0708	23.9	0.0101	4.5	0.19	64.7	2.9	69.5	16.0	239.3	547.4	64.7	2.9	NA
072809KR-04-63	327	3043	4.0	23.3014	24.8	0.0563	25.3	0.0095	4.9	0.19	61.0	3.0	55.6	13.7	-172.5	625.4	61.0	3.0	NA
072809KR-04-64	2880	73580	4.1	20.8535	1.9	0.1037	3.1	0.0157	2.5	0.80	100.3	2.4	100.2	2.9	97.0	44.4	100.3	2.4	NA
072809KR-04-66	186	1341	5.8	20.1652	40.0	0.0572	41.9	0.0084	12.5	0.30	53.7	6.7	56.5	23.1	175.8	968.6	53.7	6.7	NA
072809KR-04-67	204	5949	3.5	15.9816	24.6	0.0792	28.0	0.0092	13.5	0.48	58.9	7.9	77.4	20.9	693.7	531.7	58.9	7.9	NA
072809KR-04-68	2779	76322	22.4	20.8399	1.5	0.0627	3.0	0.0095	2.6	0.86	60.8	1.6	61.8	1.8	98.5	35.4	60.8	1.6	NA
072809KR-04-69	922	12656	4.6	22.2267	7.3	0.0571	8.1	0.0092	3.7	0.45	59.1	2.2	56.4	4.5	-56.1	176.9	59.1	2.2	NA
072809KR-04-70	511	7682	3.2	21.1234	7.6	0.1076	8.2	0.0165	3.2	0.39	105.4	3.3	103.8	8.1	66.4	180.7	105.4	3.3	NA
072809KR-04-72	538	6174	2.6	21.9250	14.8	0.0567	15.2	0.0090	3.7	0.24	57.8	2.1	56.0	8.3	-22.9	359.4	57.8	2.1	NA
072809KR-04-73	412	9826	4.9	21.9950	15.1	0.0564	15.3	0.0090	2.4	0.16	57.7	1.4	55.7	8.3	-30.6	366.8	57.7	1.4	NA
072809KR-04-74	590	4820	2.8	21.3391	9.7	0.0562	10.1	0.0087	2.6	0.25	55.8	1.4	55.5	5.4	42.2	233.2	55.8	1.4	NA
072809KR-04-75	1088	59712	3.2	20.0765	4.0	0.0625	5.1	0.0091	3.2	0.62	58.4	1.9	61.6	3.1	186.1	93.4	58.4	1.9	NA
072809KR-04-76	358	6480	8.1	20.2476	12.2	0.0617	13.3	0.0091	5.4	0.40	58.1	3.1	60.8	7.9	166.3	285.9	58.1	3.1	NA
072809KR-04-77	979	12857	2.6	21.5197	5.3	0.0545	5.7	0.0085	1.9	0.34	54.6	1.1	53.9	3.0	22.0	128.4	54.6	1.1	NA
072809KR-04-79	534	12603	3.3	19.5946	10.4	0.0624	10.5	0.0089	1.4	0.13	56.9	0.8	61.5	6.3	242.4	240.5	56.9	0.8	NA
072809KR-04-80	146	2241	4.2	31.6815	54.6	0.0385	56.8	0.0088	15.9	0.28	56.7	9.0	38.3	21.4	-1005.4	1728.6	56.7	9.0	NA
072809KR-04-82	1659	60357	4.3	20.4517	2.6	0.1024	3.5	0.0152	2.4	0.68	97.2	2.3	99.0	3.3	142.8	60.3	97.2	2.3	NA
072809KR-04-83	897	28231	9.7	20.2855	5.7	0.0556	9.7	0.0082	7.8	0.81	52.5	4.1	54.9	5.2	161.9	132.8	52.5	4.1	NA
072809KR-04-84	1200	16506	3.5	21.0373	2.9	0.0559	4.0	0.0085	2.7	0.68	54.8	1.5	55.3	2.1	76.2	69.0	54.8	1.5	NA
072809KR-04-85	218	6416	3.4	23.8548	27.5	0.0515	32.9	0.0089	18.1	0.55	57.2	10.3	51.0	16.4	-231.3	704.2	57.2	10.3	NA
072809KR-04-86	1548	46083	15.8	21.4271	4.3	0.0614	7.7	0.0095	6.4	0.83	61.2	3.9	60.5	4.5	32.4	102.0	61.2	3.9	NA
072809KR-04-87	356	5175	3.6	29.4484	28.1	0.0411	28.8	0.0088	6.2	0.21	56.4	3.5	40.9	11.6	-793.5	809.4	56.4	3.5	NA
072809KR-04-88	234	9878	4.6	19.5133	15.1	0.0649	15.5	0.0092	3.8	0.24	58.9	2.2	63.8	9.6	252.0	348.2	58.9	2.2	NA
072809KR-04-89	575	18228	7.5	23.6682	11.2	0.0525	11.5	0.0090	2.8	0.24	57.8	1.6	52.0	5.8	-211.5	281.6	57.8	1.6	NA
072809KR-04-90	431	12420	3.9	21.2095	11.9	0.0570	12.6	0.0088	4.1	0.32	56.3	2.3	56.3	6.9	56.7	285.8	56.3	2.3	NA
072809KR-04-91	192	4085	4.2	18.0798	19.9	0.0661	20.8	0.0087	6.2	0.30	55.6	3.4	65.0	13.1	424.8	446.9	55.6	3.4	NA
072809KR-04-92	135	947	3.8	28.2418	56.0	0.0443	57.2	0.0091	11.6	0.20	58.3	6.7	44.0	24.6	-676.4	1661.0	58.3	6.7	NA
072809KR-04-93	1125	28444	12.5	21.6066	8.5	0.0560	9.3	0.0088	4.0	0.42	56.3	2.2	55.3	5.0	12.3	203.8	56.3	2.2	NA
072809KR-04-94	175	3057	2.4	22.7028	27.0	0.0519	27.7	0.0085	6.1	0.22	54.9	3.3	51.4	13.9	-108.0	674.6	54.9	3.3	NA
072809KR-04-95	484	10769	6.9	20.9713	12.3	0.0915	13.6	0.0139	5.9	0.43	89.1	5.2	88.9	11.6	83.6	292.2	89.1	5.2	NA
072809KR-04-96	355	9485	5.6	26.2886	20.8	0.0507	21.3	0.0097	4.5	0.21	62.1	2.8	50.3	10.4	-482.5	556.2	62.1	2.8	NA

Susitna River – 072809KR-05

						Isotope ratios							Apparent ages (Ma)						
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
Susitna River																			
072809KR-05-1	232	42624	2.9	17.6038	2.2	0.5811	4.8	0.0742	4.2	0.88	461.4	18.7	465.2	17.7	484.0	49.0	461.4	18.7	NA
072809KR-05-2	289	37873	6.2	8.8721	1.8	1.0443	5.4	0.0672	5.1	0.94	419.3	20.5	726.1	27.8	1843.6	32.2	419.3	20.5	NA
072809KR-05-3	940	23177	15.2	20.3314	9.8	0.0619	10.6	0.0091	4.0	0.38	58.5	2.3	60.9	6.3	156.7	229.9	58.5	2.3	NA
072809KR-05-4	623	47925	2.5	20.4441	4.3	0.1081	4.5	0.0160	1.4	0.32	102.5	1.5	104.2	4.5	143.7	101.0	102.5	1.5	NA
072809KR-05-5	105	9003	2.6	18.2989	9.9	0.3680	10.1	0.0488	2.1	0.21	307.4	6.5	318.2	27.6	397.8	221.3	307.4	6.5	NA
072809KR-05-6	400	13599	2.7	23.1846	14.1	0.0519	14.4	0.0087	3.0	0.21	56.0	1.7	51.3	7.2	-160.0	351.2	56.0	1.7	NA
072809KR-05-7	481	10633	5.4	18.5975	14.1	0.0645	14.6	0.0087	3.9	0.27	55.8	2.2	63.5	9.0	361.4	319.0	55.8	2.2	NA
072809KR-05-8	365	8918	8.8	21.1893	12.6	0.0944	13.0	0.0145	3.3	0.26	92.9	3.1	91.6	11.4	59.1	301.4	92.9	3.1	NA
072809KR-05-9	347	21424	4.5	20.7734	9.4	0.0977	9.6	0.0147	2.1	0.21	94.2	1.9	94.7	8.7	106.1	222.5	94.2	1.9	NA
072809KR-05-10	175	238036	3.7	6.3735	0.8	9.2577	1.5	0.4279	1.2	0.84	2296.4	24.1	2363.8	13.7	2422.5	13.8	2422.5	13.8	94.8
072809KR-05-11	478	32581	2.4	20.1568	4.9	0.1020	5.5	0.0149	2.5	0.45	95.4	2.4	98.6	5.2	176.8	114.8	95.4	2.4	NA
072809KR-05-12	45	46732	1.6	8.5730	2.0	5.5504	2.4	0.3451	1.2	0.50	1911.2	19.6	1908.4	20.3	1905.4	36.6	1905.4	36.6	100.3
072809KR-05-13	651	20930	2.2	21.0907	10.7	0.0619	11.0	0.0095	2.4	0.21	60.8	1.4	61.0	6.5	70.1	255.9	60.8	1.4	NA
072809KR-05-14	464	16859	4.2	22.5411	5.6	0.0552	7.2	0.0090	4.4	0.62	57.9	2.6	54.6	3.8	-90.5	137.8	57.9	2.6	NA
072809KR-05-15	614	22671	5.2	20.2189	12.3	0.0585	12.5	0.0086	2.1	0.17	55.1	1.1	57.8	7.0	169.6	289.0	55.1	1.1	NA
072809KR-05-16	711	28583	4.1	19.8326	5.6	0.0991	5.9	0.0143	1.6	0.27	91.3	1.4	96.0	5.4	214.5	130.8	91.3	1.4	NA
072809KR-05-17	293	33917	2.4	19.6471	7.1	0.2065	7.2	0.0294	1.2	0.17	186.9	2.2	190.6	12.5	236.2	164.1	186.9	2.2	NA
072809KR-05-19	1213	258937	6.3	16.6085	0.6	0.8117	2.5	0.0978	2.4	0.97	601.4	13.9	603.4	11.4	611.1	13.7	601.4	13.9	98.4
072809KR-05-20	95	121	0.4	8.3527	14.7	0.1504	18.5	0.0091	11.2	0.61	58.5	6.5	142.3	24.5	1952.1	263.5	58.5	6.5	NA
072809KR-05-21	3378	79292	20.5	21.1560	1.3	0.0648	3.5	0.0099	3.2	0.93	63.7	2.0	63.7	2.1	62.8	30.6	63.7	2.0	NA
072809KR-05-22	355	140127	1.9	12.4286	1.0	2.2875	4.4	0.2062	4.2	0.97	1208.5	46.8	1208.4	30.8	1208.3	19.6	1208.3	19.6	100.0
072809KR-05-23	282	6557	4.7	29.4946	30.6	0.0411	30.8	0.0088	3.8	0.12	56.4	2.1	40.9	12.4	-797.9	884.2	56.4	2.1	NA
072809KR-05-24	628	22173	7.1	21.1503	11.0	0.0621	12.5	0.0095	5.9	0.47	61.1	3.6	61.2	7.4	63.5	262.6	61.1	3.6	NA
072809KR-05-25	516	25920	4.6	21.5516	12.9	0.0545	13.2	0.0085	2.6	0.20	54.7	1.4	53.9	6.9	18.5	311.2	54.7	1.4	NA
072809KR-05-26	1044	51233	4.8	21.1774	7.4	0.0565	9.0	0.0087	5.2	0.58	55.7	2.9	55.8	4.9	60.4	175.7	55.7	2.9	NA
072809KR-05-28	565	17447	3.3	20.7768	8.1	0.0999	8.6	0.0151	2.9	0.34	96.3	2.8	96.7	8.0	105.7	192.2	96.3	2.8	NA
072809KR-05-30	426	11169	5.4	23.1431	9.1	0.0882	9.7	0.0148	3.3	0.34	94.7	3.1	85.8	8.0	-155.5	227.6	94.7	3.1	NA
072809KR-05-31	397	10056	2.2	17.2701	22.4	0.1238	25.5	0.0155	12.0	0.47	99.2	11.9	118.5	28.5	526.1	497.7	99.2	11.9	NA
072809KR-05-32	510	12718	11.6	22.1330	15.0	0.0575	15.8	0.0092	5.1	0.32	59.2	3.0	56.8	8.7	-45.8	365.7	59.2	3.0	NA
072809KR-05-33	155	2467	4.8	23.0176	52.8	0.0515	53.8	0.0086	10.4	0.19	55.2	5.7	51.0	26.8	-142.0	1396.9	55.2	5.7	NA
072809KR-05-34	809	32158	2.2	20.7517	6.0	0.0579	6.5	0.0087	2.3	0.36	56.0	1.3	57.2	3.6	108.6	142.4	56.0	1.3	NA
072809KR-05-35	64	252768	1.0	5.1525	0.5	14.5968	3.6	0.5455	3.6	0.99	2806.3	81.8	2789.3	34.6	2777.1	9.0	2777.1	9.0	101.1
072809KR-05-36	610	26607	2.8	18.5765	9.8	0.0674	10.7	0.0091	4.3	0.40	58.3	2.5	66.2	6.8	364.0	220.6	58.3	2.5	NA
072809KR-05-37	282	14821	1.9	20.5632	4.8	0.2049	5.2	0.0306	2.0	0.38	194.1	3.8	189.3	9.0	130.1	113.2	194.1	3.8	NA
072809KR-05-39	233	46992	0.7	19.1770	6.3	0.3419	6.7	0.0475	2.3	0.34	299.4	6.8	298.6	17.3	291.8	143.8	299.4	6.8	NA
072809KR-05-40	1132	47577	2.8	21.7372	2.7	0.0951	3.0	0.0150	1.2	0.41	96.0	1.2	92.3	2.6	-2.1	65.9	96.0	1.2	NA
072809KR-05-41	2236	55485	8.6	21.0688	2.3	0.0579	3.3	0.0088	2.4	0.71	56.7	1.3	57.1	1.9	72.6	55.6	56.7	1.3	NA
072809KR-05-42	920	13759	2.0	21.7841	8.1	0.0565	8.2	0.0089	1.3	0.16	57.3	0.8	55.8	4.5	-7.3	195.6	57.3	0.8	NA
072809KR-05-43	442	9448	5.1	22.6137	13.1	0.0548	13.7	0.0090	4.1	0.30	57.7	2.4	54.2	7.2	-98.4	323.0	57.7	2.4	NA
072809KR-05-45	627	56976	6.8	17.3547	4.2	0.2018	12.4	0.0254	11.6	0.94	161.7	18.6	186.7	21.1	515.4	92.1	161.7	18.6	NA
072809KR-05-46	294	12573	4.5	22.4149	18.0	0.0947	18.1	0.0154	1.5	0.08	98.5	1.4	91.9	15.9	-76.7	443.5	98.5	1.4	NA
072809KR-05-49	278	9812	2.1	21.5298	15.1	0.0977	16.1	0.0153	5.4	0.33	97.6	5.2	94.7	14.5	20.9	365.3	97.6	5.2	NA
072809KR-05-50	376	4256	3.1	22.0796	14.3	0.0518	15.2	0.0083	5.3	0.35	53.2	2.8	51.3	7.6	-40.0	347.8	53.2	2.8	NA
072809KR-05-51	1231	29437	2.2	20.6114	4.0	0.0581	4.6	0.0087	2.3	0.50	55.8	1.3	57.4	2.6	124.5	93.7	55.8	1.3	NA

072809KR-05-52	673	33338	2.7	20.4672	7.5	0.0994	7.8	0.0148	2.1	0.27	94.5	2.0	96.3	7.2	141.1	177.2	94.5	2.0	NA
072809KR-05-53	268	1396	4.2	11.0459	59.9	0.1222	60.3	0.0098	7.1	0.12	62.8	4.4	117.1	66.8	1436.7	1272.4	62.8	4.4	4.4
072809KR-05-54	325	9172	3.2	22.8920	15.3	0.0885	15.5	0.0147	2.6	0.17	94.1	2.4	86.1	12.8	-128.5	379.4	94.1	2.4	NA
072809KR-05-55	244	4304	4.0	22.0682	32.5	0.0543	32.8	0.0087	4.5	0.14	55.8	2.5	53.7	17.1	-38.7	806.5	55.8	2.5	NA
072809KR-05-57	164	8269	3.1	20.7216	19.8	0.1257	20.0	0.0189	3.1	0.16	120.7	3.7	120.2	22.7	112.0	470.1	120.7	3.7	NA
072809KR-05-58	173	2602	3.1	19.2312	25.0	0.0683	25.3	0.0095	4.4	0.17	61.1	2.7	67.1	16.4	285.3	578.5	61.1	2.7	NA
072809KR-05-59	668	18818	2.2	18.8863	9.2	0.1204	10.7	0.0165	5.6	0.52	105.4	5.8	115.4	11.7	326.6	208.8	105.4	5.8	NA
072809KR-05-60	1099	28419	3.1	21.0360	8.8	0.0531	13.3	0.0081	10.0	0.75	52.0	5.2	52.5	6.8	76.3	209.0	52.0	5.2	NA
072809KR-05-61	356	7380	5.2	21.8848	11.1	0.0936	11.5	0.0149	2.9	0.25	95.1	2.8	90.8	10.0	-18.5	269.5	95.1	2.8	NA
072809KR-05-62	182	5531	3.4	30.7354	49.6	0.0368	50.9	0.0082	11.6	0.23	52.7	6.1	36.7	18.4	-916.3	1521.2	52.7	6.1	NA
072809KR-05-63	3381	82520	7.6	20.8775	1.8	0.0619	4.9	0.0094	4.5	0.93	60.1	2.7	61.0	2.9	94.3	43.7	60.1	2.7	NA
072809KR-05-64	884	336889	15.2	16.8113	1.8	0.4277	9.5	0.0521	9.4	0.98	327.7	30.0	361.5	29.1	584.9	38.1	327.7	30.0	NA
072809KR-05-65	207	5896	3.2	30.0582	61.9	0.0399	62.2	0.0087	6.8	0.11	55.8	3.8	39.7	24.2	-851.9	1941.1	55.8	3.8	NA
072809KR-05-66	540	14292	4.8	21.7464	5.3	0.0934	6.3	0.0147	3.5	0.55	94.3	3.2	90.7	5.5	-3.2	128.1	94.3	3.2	NA
072809KR-05-67	483	10359	2.1	20.5888	7.0	0.0637	8.5	0.0095	4.9	0.57	61.0	3.0	62.7	5.2	127.2	165.5	61.0	3.0	NA
072809KR-05-68	543	27280	3.7	20.7201	8.8	0.0983	11.1	0.0148	6.7	0.60	94.5	6.3	95.2	10.1	112.2	208.8	94.5	6.3	NA
072809KR-05-69	412	13419	4.9	24.1025	26.9	0.0484	28.1	0.0085	8.0	0.29	54.3	4.4	48.0	13.2	-257.4	691.7	54.3	4.4	NA
072809KR-05-71	681	10696	3.4	21.0543	11.0	0.0579	11.8	0.0088	4.2	0.36	56.8	2.4	57.2	6.6	74.2	263.3	56.8	2.4	NA
072809KR-05-72	190	2353	4.8	54.5615	47.0	0.0208	48.5	0.0082	11.8	0.24	52.9	6.2	20.9	10.0	-3038.8	370.1	52.9	6.2	NA
072809KR-05-73	418	9109	3.2	23.9749	14.3	0.0490	14.5	0.0085	2.6	0.18	54.7	1.4	48.6	6.9	-244.0	362.4	54.7	1.4	NA
072809KR-05-74	813	21578	2.7	21.3964	8.9	0.0541	9.4	0.0084	3.1	0.33	53.9	1.7	53.5	4.9	35.8	212.2	53.9	1.7	NA
072809KR-05-75	643	49489	3.4	22.9395	4.5	0.0866	6.6	0.0144	4.8	0.72	92.2	4.4	84.3	5.3	-133.6	112.3	92.2	4.4	NA
072809KR-05-76	931	37552	10.3	21.6700	5.9	0.0643	6.6	0.0101	3.0	0.45	64.9	1.9	63.3	4.0	5.3	141.6	64.9	1.9	NA
072809KR-05-77	159	5752	4.4	26.0863	69.2	0.0760	70.4	0.0144	12.9	0.18	92.1	11.8	74.4	50.6	-462.0	2072.9	92.1	11.8	NA
072809KR-05-79	443	25724	5.4	21.6768	10.1	0.0960	10.3	0.0151	1.7	0.16	96.6	1.6	93.1	9.1	4.5	244.3	96.6	1.6	NA
072809KR-05-81	1215	50036	2.5	20.9593	6.6	0.0530	7.3	0.0081	3.0	0.41	51.7	1.5	52.4	3.7	85.0	157.6	51.7	1.5	NA
072809KR-05-82	196	4654	3.8	22.6606	34.3	0.0510	34.7	0.0084	5.0	0.15	53.9	2.7	50.6	17.1	-103.4	865.6	53.9	2.7	NA
072809KR-05-83	344	10688	3.0	22.5738	7.8	0.0904	8.2	0.0148	2.4	0.30	94.7	2.3	87.8	6.9	-94.0	191.6	94.7	2.3	NA
072809KR-05-84	2354	116897	3.3	21.0803	2.6	0.0681	5.5	0.0104	4.9	0.88	66.8	3.2	66.9	3.6	71.3	62.0	66.8	3.2	NA
072809KR-05-85	406	24978	4.2	13.6533	2.9	0.2090	4.5	0.0207	3.4	0.77	132.1	4.5	192.7	7.9	1020.6	57.9	132.1	4.5	12.9
072809KR-05-86	380	6746	5.6	25.2609	40.1	0.0488	40.8	0.0089	8.0	0.20	57.4	4.6	48.4	19.3	-377.8	1076.9	57.4	4.6	NA
072809KR-05-87	536	9553	4.9	24.4039	14.4	0.0559	15.5	0.0099	5.6	0.36	63.5	3.5	55.2	8.3	-289.0	369.5	63.5	3.5	NA
072809KR-05-88	157	4885	3.6	51.9917	78.7	0.0235	79.5	0.0088	11.1	0.14	56.8	6.3	23.6	18.5	-2810.9	718.0	56.8	6.3	NA
072809KR-05-89	109	8945	2.4	21.9075	20.1	0.1951	20.3	0.0310	3.3	0.16	196.8	6.5	181.0	33.7	-21.0	489.7	196.8	6.5	NA
072809KR-05-90	1132	18098	5.8	22.7173	6.0	0.0539	7.5	0.0089	4.5	0.59	57.0	2.5	53.3	3.9	-109.6	149.0	57.0	2.5	NA
072809KR-05-91	265	322927	1.5	8.9436	0.7	4.8504	4.2	0.3146	4.1	0.98	1763.4	63.6	1793.7	35.3	1829.0	13.3	1829.0	13.3	96.4
072809KR-05-92	92	22448	1.4	16.8886	5.7	0.6856	5.9	0.0840	1.7	0.29	519.8	8.5	530.2	24.5	574.9	123.9	519.8	8.5	90.4
072809KR-05-93	253	4794	2.8	23.7451	15.1	0.0651	15.7	0.0112	4.3	0.28	71.9	3.1	64.0	9.7	-219.7	380.6	71.9	3.1	NA
072809KR-05-94	559	31770	6.2	21.5208	16.0	0.0553	16.2	0.0086	2.0	0.12	55.4	1.1	54.7	8.6	21.9	387.1	55.4	1.1	NA
072809KR-05-96	351	9945	5.4	20.3473	13.8	0.0593	14.4	0.0087	4.0	0.28	56.1	2.3	58.5	8.2	154.9	325.1	56.1	2.3	NA
072809KR-05-97	395	16147	3.6	22.0013	17.3	0.0920	17.4	0.0147	2.2	0.13	94.0	2.0	89.4	14.9	-31.3	421.3	94.0	2.0	NA
072809KR-05-98	457	11438	8.7	23.3347	16.6	0.0514	17.2	0.0087	4.5	0.26	55.8	2.5	50.9	8.5	-176.0	416.6	55.8	2.5	NA
072809KR-05-99	676	86381	6.6	20.4439	3.9	0.0580	5.4	0.0086	3.7	0.69	55.2	2.1	57.3	3.0	143.7	90.6	55.2	2.1	NA
072809KR-05-101	1148	11395	14.1	19.7999	13.9	0.0645	14.0	0.0093	1.5	0.10	59.4	0.9	63.4	8.6	218.3	324.0	59.4	0.9	NA
072809KR-05-102	183	439	3.4	8.8684	50.2	0.1769	52.0	0.0114	13.8	0.26	72.9	10.0	165.4	79.6	1844.3	977.8	72.9	10.0	NA
072809KR-05-103	137	108159	2.2	12.9137	1.8	2.1375	2.2	0.2002	1.2	0.54	1176.4	12.6	1161.0	15.1	1132.5	36.7	1132.5	36.7	103.9
072809KR-05-104	614	32108	4.3	21.0862	4.9	0.1012	5.9	0.0155	3.3	0.55	99.0	3.2	97.9	5.5	70.6	117.2	99.0	3.2	NA
072809KR-05-105	480	17148	4.1	21.6641	7.0	0.0916	7.0	0.0144	0.9	0.13	92.1	0.8	88.9	6.0	5.9	167.5	92.1	0.8	NA

Matanuska River – 073009KR-01

						Isotope ratios							Apparent ages (Ma)						
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
Matanuska River																			
073009KR-01-1	364	30386	4.4	22.9789	13.2	0.0679	13.5	0.0113	2.7	0.20	72.6	2.0	66.7	8.7	-137.9	329.0	72.6	2.0	NA
073009KR-01-2	2688	286084	2.7	20.6778	1.7	0.0717	1.9	0.0107	0.9	0.45	68.9	0.6	70.3	1.3	117.0	39.7	68.9	0.6	NA
073009KR-01-3	296	25343	2.8	20.7801	14.9	0.0668	15.8	0.0101	5.0	0.32	64.6	3.2	65.7	10.0	105.3	354.6	64.6	3.2	NA
073009KR-01-4	238	22465	3.8	20.8674	22.9	0.0763	24.1	0.0115	7.5	0.31	74.0	5.5	74.6	17.4	95.4	549.5	74.0	5.5	NA
073009KR-01-5	148	15180	1.7	24.6455	26.1	0.0762	27.1	0.0136	7.4	0.27	87.3	6.4	74.6	19.5	-314.2	679.1	87.3	6.4	NA
073009KR-01-6	134	24895	2.4	22.7662	8.9	0.1646	9.8	0.0272	4.1	0.42	172.9	7.1	154.7	14.1	-114.9	219.9	172.9	7.1	NA
073009KR-01-7	508	40647	3.9	19.8401	9.1	0.0766	10.2	0.0110	4.6	0.45	70.6	3.2	74.9	7.3	213.6	210.8	70.6	3.2	NA
073009KR-01-8	99	42009	2.4	22.1112	21.9	0.1473	24.0	0.0236	9.9	0.41	150.5	14.7	139.5	31.3	-43.4	538.2	150.5	14.7	NA
073009KR-01-9	65	27493	3.6	17.1374	20.5	0.2229	22.5	0.0277	9.3	0.41	176.2	16.2	204.4	41.7	543.0	452.5	176.2	16.2	NA
073009KR-01-10	160	20394	2.7	19.5480	27.5	0.1025	28.0	0.0145	5.0	0.18	93.0	4.6	99.1	26.4	247.9	644.0	93.0	4.6	NA
073009KR-01-11	226	14116	2.6	29.1546	37.4	0.0481	38.3	0.0102	8.5	0.22	65.3	5.5	47.7	17.9	-765.2	1083.1	65.3	5.5	NA
073009KR-01-12	529	36428	2.4	21.2961	9.7	0.0916	9.9	0.0142	2.2	0.22	90.6	2.0	89.0	8.5	47.0	232.0	90.6	2.0	NA
073009KR-01-13	58	11430	3.2	19.1257	13.7	0.3747	15.3	0.0520	6.7	0.44	326.6	21.5	323.1	42.3	297.9	314.4	326.6	21.5	NA
073009KR-01-15	343	17406	4.2	23.9453	10.7	0.0569	10.9	0.0099	2.3	0.21	63.4	1.4	56.2	6.0	-240.9	270.3	63.4	1.4	NA
073009KR-01-16	259	18537	1.9	22.8315	22.0	0.0695	22.8	0.0115	5.7	0.25	73.8	4.2	68.3	15.0	-122.0	549.1	73.8	4.2	NA
073009KR-01-17	318	27232	1.5	20.6287	12.2	0.1149	12.9	0.0172	4.0	0.31	109.9	4.4	110.5	13.5	122.6	289.0	109.9	4.4	NA
073009KR-01-18	70	9425	3.3	23.2733	39.5	0.1419	40.1	0.0239	7.0	0.17	152.5	10.5	134.7	50.6	-169.5	1018.1	152.5	10.5	NA
073009KR-01-19	128	16990	4.1	21.9110	17.9	0.1504	19.2	0.0239	7.0	0.36	152.3	10.5	142.3	25.6	-21.4	436.8	152.3	10.5	NA
073009KR-01-20	253	16737	6.2	20.3047	14.9	0.0740	15.3	0.0109	3.3	0.22	69.9	2.3	72.5	10.7	159.7	350.8	69.9	2.3	NA
073009KR-01-21	122	37043	2.2	22.5453	34.7	0.1429	34.8	0.0234	2.9	0.08	148.9	4.2	135.7	44.2	-90.9	873.7	148.9	4.2	NA
073009KR-01-22	141	46338	3.5	20.9976	22.0	0.1612	22.1	0.0245	2.3	0.10	156.3	3.5	151.7	31.2	80.6	528.1	156.3	3.5	NA
073009KR-01-23	432	105340	3.2	18.8051	9.1	0.0717	9.8	0.0098	3.5	0.35	62.7	2.2	70.3	6.6	336.4	207.1	62.7	2.2	NA
073009KR-01-24	178	41760	2.2	20.3424	30.4	0.0895	30.6	0.0132	3.6	0.12	84.6	3.1	87.1	25.6	155.4	727.0	84.6	3.1	NA
073009KR-01-26	199	22451	2.5	22.0044	26.8	0.0749	27.5	0.0120	6.3	0.23	76.6	4.8	73.3	19.5	-31.7	660.2	76.6	4.8	NA
073009KR-01-27	1057	123764	6.5	19.4355	7.5	0.0700	10.6	0.0099	7.5	0.71	63.3	4.7	68.7	7.0	261.1	172.0	63.3	4.7	NA
073009KR-01-28	255	36514	2.8	22.6962	21.5	0.0761	21.6	0.0125	2.1	0.10	80.2	1.7	74.4	15.5	-107.3	535.4	80.2	1.7	NA
073009KR-01-29	2313	231344	4.1	20.8764	1.5	0.0744	2.6	0.0113	2.1	0.82	72.2	1.5	72.8	1.8	94.4	35.3	72.2	1.5	NA
073009KR-01-30	161	13655	2.6	22.1253	19.0	0.0668	19.4	0.0107	3.8	0.20	68.8	2.6	65.7	12.3	-45.0	466.0	68.8	2.6	NA
073009KR-01-32	138	60183	2.3	18.5457	13.8	0.1956	14.5	0.0263	4.3	0.30	167.4	7.2	181.4	24.1	367.7	312.6	167.4	7.2	NA
073009KR-01-33	116	24164	3.3	16.8370	24.7	0.1352	25.3	0.0165	5.5	0.22	105.5	5.7	128.7	30.6	581.5	543.8	105.5	5.7	NA
073009KR-01-34	588	81918	3.4	19.7565	7.0	0.0712	7.6	0.0102	3.1	0.40	65.4	2.0	69.9	5.1	223.4	161.2	65.4	2.0	NA
073009KR-01-35	876	140135	3.8	21.0191	6.8	0.0693	7.6	0.0106	3.5	0.46	67.7	2.4	68.0	5.0	78.2	160.9	67.7	2.4	NA
073009KR-01-36	820	65205	3.5	21.7137	5.9	0.0702	6.3	0.0111	2.2	0.35	70.9	1.5	68.9	4.2	0.5	141.5	70.9	1.5	NA
073009KR-01-37	900	36010	3.5	20.7966	6.9	0.0624	7.1	0.0094	1.6	0.23	60.4	1.0	61.5	4.3	103.5	164.3	60.4	1.0	NA
073009KR-01-38	117	8715	2.1	22.8529	27.6	0.1266	29.2	0.0210	9.7	0.33	133.9	12.8	121.0	33.3	-124.3	691.7	133.9	12.8	NA
073009KR-01-40	83	95792	3.0	9.8776	1.7	3.9966	2.5	0.2863	1.8	0.72	1623.1	25.7	1633.5	20.2	1646.9	31.9	1646.9	31.9	98.6
073009KR-01-41	216	13969	4.6	21.1808	19.1	0.0709	19.5	0.0109	3.6	0.18	69.8	2.5	69.6	13.1	60.0	459.4	69.8	2.5	NA
073009KR-01-43	106	10292	2.9	19.9680	25.5	0.0870	26.7	0.0126	7.9	0.30	80.7	6.3	84.7	21.7	198.7	600.8	80.7	6.3	NA
073009KR-01-44	320	28648	8.9	24.8848	14.5	0.0590	15.2	0.0106	4.5	0.30	68.3	3.1	58.2	8.6	-339.0	375.7	68.3	3.1	NA
073009KR-01-45	223	20059	1.7	36.1262	67.4	0.0367	67.5	0.0096	3.1	0.05	61.7	1.9	36.6	24.3	-1413.3	656.8	61.7	1.9	NA
073009KR-01-46	209	18074	2.9	22.4013	25.2	0.0584	26.3	0.0095	7.4	0.28	60.9	4.5	57.6	14.7	-75.2	625.8	60.9	4.5	NA
073009KR-01-47	273	16033	4.7	22.2031	18.9	0.0632	19.3	0.0102	3.6	0.19	65.3	2.4	62.3	11.6	-53.5	464.0	65.3	2.4	NA
073009KR-01-48	71	10993	2.9	22.4031	30.4	0.1596	31.4	0.0259	7.8	0.25	165.0	12.7	150.4	43.9	-75.4	758.3	165.0	12.7	NA
073009KR-01-50	656	45288	4.4	19.9783	6.6	0.0774	7.8	0.0112	4.1	0.53	71.9	2.9	75.7	5.7	197.5	154.6	71.9	2.9	NA

073009KR-01-51	295	100613	3.0	20.1937	10.6	0.1808	11.1	0.0265	3.3	0.30	168.4	5.5	168.7	17.3	172.5	248.6	168.4	5.5	NA
073009KR-01-52	323	97650	3.2	20.0955	8.1	0.1950	8.5	0.0284	2.4	0.28	180.6	4.3	180.8	14.0	183.9	189.5	180.6	4.3	NA
073009KR-01-53	537	141747	5.1	20.8341	8.7	0.0875	9.3	0.0132	3.3	0.35	84.6	2.8	85.1	7.6	99.2	206.5	84.6	2.8	NA
073009KR-01-54	78	33758	4.0	18.7032	24.7	0.1977	25.4	0.0268	5.8	0.23	170.6	9.8	183.2	42.6	348.7	566.2	170.6	9.8	NA
073009KR-01-55	80	32475	4.3	17.3296	14.3	0.1866	15.1	0.0235	4.9	0.33	149.5	7.3	173.7	24.1	518.6	314.8	149.5	7.3	NA
073009KR-01-56	144	319396	3.3	9.0472	0.5	4.7790	1.7	0.3136	1.6	0.95	1758.3	25.0	1781.2	14.3	1808.2	9.3	1808.2	9.3	97.2
073009KR-01-57	935	115884	3.1	20.7547	2.9	0.1114	4.4	0.0168	3.3	0.76	107.2	3.5	107.2	4.5	108.2	67.8	107.2	3.5	NA
073009KR-01-58	495	42340	1.9	22.2478	14.5	0.0620	15.8	0.0100	6.5	0.41	64.1	4.1	61.0	9.4	-58.4	353.8	64.1	4.1	NA
073009KR-01-59	2521	263637	7.7	20.8785	2.0	0.0866	2.9	0.0131	2.1	0.72	84.0	1.8	84.3	2.4	94.1	47.4	84.0	1.8	NA
073009KR-01-61	1635	256795	2.8	20.7511	1.4	0.1101	3.6	0.0166	3.3	0.92	105.9	3.5	106.0	3.7	108.6	34.2	105.9	3.5	NA
073009KR-01-62	909	104971	7.8	21.2699	4.4	0.0726	5.4	0.0112	3.1	0.58	71.8	2.2	71.2	3.7	50.0	105.3	71.8	2.2	NA
073009KR-01-63	75	24784	2.7	23.4340	19.2	0.1551	21.4	0.0264	9.4	0.44	167.7	15.6	146.4	29.1	-186.6	482.6	167.7	15.6	NA
073009KR-01-64	232	40718	6.2	19.7350	12.5	0.1147	12.7	0.0164	2.5	0.19	105.0	2.6	110.3	13.3	225.9	289.0	105.0	2.6	NA
073009KR-01-66	561	27363	2.6	19.7988	10.9	0.0738	11.9	0.0106	4.7	0.39	67.9	3.2	72.3	8.3	218.5	253.5	67.9	3.2	NA
073009KR-01-67	1129	70465	3.9	20.3833	4.3	0.0654	4.7	0.0097	1.8	0.39	62.1	1.1	64.4	2.9	150.7	101.5	62.1	1.1	NA
073009KR-01-68	460	114398	2.2	19.0448	10.2	0.1377	10.7	0.0190	3.4	0.32	121.4	4.1	131.0	13.2	307.6	232.6	121.4	4.1	NA
073009KR-01-69	822	83442	3.9	21.5541	6.9	0.0742	7.1	0.0116	1.7	0.24	74.3	1.3	72.7	5.0	18.2	165.6	74.3	1.3	NA
073009KR-01-70	560	1257111	2.0	8.9772	0.3	4.6871	3.0	0.3052	3.0	1.00	1716.9	44.6	1764.9	24.9	1822.3	5.3	1822.3	5.3	94.2
073009KR-01-72	302	72968	5.1	19.8569	5.4	0.1923	6.1	0.0277	2.7	0.44	176.1	4.7	178.6	9.9	211.6	125.9	176.1	4.7	NA
073009KR-01-73	204	20057	3.3	19.7947	28.4	0.0824	29.9	0.0118	9.3	0.31	75.8	7.0	80.4	23.1	218.9	668.2	75.8	7.0	NA
073009KR-01-76	520	32337	3.9	21.0858	8.2	0.0668	8.5	0.0102	2.4	0.28	65.6	1.5	65.7	5.4	70.7	194.8	65.6	1.5	NA
073009KR-01-77	153	12614	4.9	18.2022	25.5	0.0831	26.7	0.0110	7.8	0.29	70.4	5.5	81.1	20.8	409.7	578.7	70.4	5.5	NA
073009KR-01-79	279	15280	3.5	23.1299	23.1	0.0556	23.4	0.0093	3.4	0.15	59.8	2.0	54.9	12.5	-154.1	581.0	59.8	2.0	NA
073009KR-01-80	498	35902	5.1	20.8635	12.5	0.0706	13.1	0.0107	3.7	0.29	68.5	2.5	69.2	8.8	95.8	298.0	68.5	2.5	NA
073009KR-01-81	138	22142	3.2	20.5015	41.6	0.0783	42.2	0.0116	7.3	0.17	74.6	5.4	76.6	31.2	137.2	1017.8	74.6	5.4	NA
073009KR-01-82	2125	464528	3.6	20.4332	2.2	0.0780	2.6	0.0116	1.4	0.53	74.1	1.0	76.3	1.9	144.9	51.5	74.1	1.0	NA
073009KR-01-83	199	25136	1.3	19.8937	20.5	0.0747	20.9	0.0108	3.8	0.18	69.1	2.6	73.1	14.7	207.4	480.1	69.1	2.6	NA
073009KR-01-84	249	98883	1.6	18.9821	6.1	0.2106	6.6	0.0290	2.5	0.38	184.2	4.6	194.1	11.6	315.1	138.5	184.2	4.6	NA
073009KR-01-85	88	14468	1.6	13.2534	33.8	0.1281	34.2	0.0123	5.1	0.15	78.9	4.0	122.4	39.4	1080.6	698.0	78.9	4.0	7.3
073009KR-01-86	273	51984	7.3	20.4430	7.5	0.1519	7.9	0.0225	2.2	0.28	143.6	3.1	143.6	10.5	143.8	177.3	143.6	3.1	NA
073009KR-01-87	98	18904	3.3	23.5029	27.9	0.1532	28.8	0.0261	7.1	0.25	166.2	11.6	144.7	38.9	-194.0	710.9	166.2	11.6	NA
073009KR-01-89	1368	115872	6.1	21.2061	4.1	0.0793	4.1	0.0122	0.7	0.16	78.2	0.5	77.5	3.1	57.1	97.4	78.2	0.5	NA
073009KR-01-90	1203	76235	6.3	20.5351	3.4	0.0762	5.3	0.0113	4.1	0.77	72.7	2.9	74.5	3.8	133.3	79.6	72.7	2.9	NA
073009KR-01-91	82	27051	3.3	23.4229	37.5	0.1371	38.0	0.0233	6.0	0.16	148.5	8.8	130.5	46.6	-185.4	966.9	148.5	8.8	NA
073009KR-01-92	1041	240472	18.9	20.9579	6.3	0.0732	8.7	0.0111	6.0	0.68	71.3	4.2	71.7	6.0	85.2	150.3	71.3	4.2	NA
073009KR-01-93	510	221105	1.5	19.9047	2.9	0.1961	4.1	0.0283	2.9	0.71	179.9	5.1	181.8	6.8	206.1	66.2	179.9	5.1	NA
073009KR-01-94	147	65864	2.6	20.1311	19.4	0.1535	20.8	0.0224	7.6	0.36	142.9	10.7	145.0	28.2	179.8	456.1	142.9	10.7	NA
073009KR-01-95	119	257175	1.1	16.5431	4.6	0.8795	4.8	0.1055	1.4	0.29	646.7	8.6	640.7	23.0	619.6	100.1	646.7	8.6	104.4
073009KR-01-96	477	47214	2.3	18.1956	18.7	0.0753	20.5	0.0099	8.4	0.41	63.7	5.3	73.7	14.6	410.5	421.3	63.7	5.3	NA
073009KR-01-99	990	205645	2.1	20.2519	1.8	0.1959	3.3	0.0288	2.8	0.85	182.9	5.1	181.7	5.5	165.8	41.3	182.9	5.1	NA
073009KR-01-100	124	41035	1.8	19.5419	7.0	0.3688	7.4	0.0523	2.4	0.33	328.4	7.8	318.7	20.3	248.6	161.8	328.4	7.8	NA
073009KR-01-101	150	88532	2.3	20.6171	9.0	0.2204	11.1	0.0330	6.5	0.58	209.0	13.4	202.2	20.4	123.9	213.0	209.0	13.4	NA
073009KR-01-102	584	99473	2.5	20.1778	11.6	0.0690	12.0	0.0101	2.9	0.24	64.8	1.9	67.8	7.8	174.4	271.9	64.8	1.9	NA
073009KR-01-103	197	30272	3.9	16.8965	18.6	0.0912	19.6	0.0112	5.9	0.30	71.7	4.2	88.6	16.6	573.9	408.4	71.7	4.2	NA
073009KR-01-104	642	85245	2.5	20.8628	11.4	0.0666	12.1	0.0101	4.3	0.35	64.7	2.7	65.5	7.7	95.9	269.4	64.7	2.7	NA
073009KR-01-105	240	38062	6.0	22.3886	21.2	0.0684	23.1	0.0111	9.1	0.40	71.2	6.5	67.2	15.0	-73.8	522.6	71.2	6.5	NA

Chickaloon River – 073009KR-02

						Isotope ratios							Apparent ages (Ma)						
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
Chickaloon River																			
073009KR-02-1	80	3675	2.4	18.9654	34.3	0.1641	37.0	0.0226	13.7	0.37	143.9	19.5	154.3	53.0	317.1	802.2	143.9	19.5	NA
073009KR-02-2	109	7546	2.4	21.8418	16.8	0.1729	17.6	0.0274	5.2	0.29	174.2	8.9	161.9	26.4	-13.7	409.3	174.2	8.9	NA
073009KR-02-3	127	6776	3.3	21.0292	21.2	0.1807	23.1	0.0276	9.2	0.40	175.2	15.8	168.6	35.8	77.1	507.5	175.2	15.8	NA
073009KR-02-4	69	4571	2.8	22.8780	40.9	0.1436	42.1	0.0238	9.9	0.24	151.8	14.9	136.2	53.7	-127.0	1048.2	151.8	14.9	NA
073009KR-02-7	57	3917	3.8	26.5583	28.8	0.1226	30.0	0.0236	8.5	0.28	150.4	12.6	117.4	33.3	-509.6	780.4	150.4	12.6	NA
073009KR-02-8	126	9322	3.3	28.5369	47.6	0.1160	47.8	0.0240	5.1	0.11	153.0	7.7	111.5	50.6	-705.3	1389.0	153.0	7.7	NA
073009KR-02-9	49	2038	4.9	26.5444	81.5	0.1229	82.6	0.0237	13.5	0.16	150.8	20.2	117.7	92.1	-508.2	2666.9	150.8	20.2	NA
073009KR-02-10	67	5228	6.1	8.0218	311.9	0.4036	312.0	0.0235	6.9	0.02	149.6	10.2	344.2	1479.4	2024.0	566.0	149.6	10.2	NA
073009KR-02-11	107	7384	3.2	22.2317	18.5	0.1433	19.4	0.0231	5.8	0.30	147.2	8.5	135.9	24.7	-56.7	455.0	147.2	8.5	NA
073009KR-02-12	31	2463	2.6	21.7090	212.1	0.1432	212.8	0.0225	17.4	0.08	143.7	24.8	135.9	277.4	1.0	0.0	143.7	24.8	NA
073009KR-02-13	106	7933	3.3	17.9206	14.0	0.2020	14.9	0.0263	5.1	0.34	167.0	8.3	186.8	25.4	444.5	312.1	167.0	8.3	NA
073009KR-02-14	96	11689	2.6	18.0710	13.6	0.2087	17.5	0.0274	11.0	0.63	174.0	19.0	192.5	30.7	425.9	304.6	174.0	19.0	NA
073009KR-02-15	99	8963	5.2	18.0336	22.2	0.2025	22.9	0.0265	5.8	0.25	168.5	9.7	187.2	39.2	430.5	500.1	168.5	9.7	NA
073009KR-02-16	103	11718	2.4	19.9694	27.2	0.1922	27.7	0.0278	5.5	0.20	177.0	9.6	178.5	45.4	198.5	642.0	177.0	9.6	NA
073009KR-02-18	95	7107	3.2	20.6956	24.7	0.1579	25.2	0.0237	4.7	0.19	151.0	7.0	148.9	34.9	114.9	591.6	151.0	7.0	NA
073009KR-02-19	62	4713	3.4	21.5555	34.5	0.1751	34.9	0.0274	4.9	0.14	174.1	8.5	163.8	52.8	18.0	852.1	174.1	8.5	NA
073009KR-02-20	385	24083	8.2	20.8824	5.8	0.1534	5.9	0.0232	1.2	0.20	148.1	1.7	144.9	8.0	93.7	137.8	148.1	1.7	NA
073009KR-02-21	159	5098	5.0	25.3302	86.6	0.0482	87.5	0.0088	12.3	0.14	56.8	7.0	47.8	40.8	-384.9	2918.6	56.8	7.0	NA
073009KR-02-22	47	5251	4.2	42.6851	169.0	0.0744	169.4	0.0230	11.9	0.07	146.9	17.3	72.9	119.7	-1995.2	0.0	146.9	17.3	NA
073009KR-02-23	68	6353	2.4	19.8348	40.7	0.1602	41.3	0.0230	6.9	0.17	146.8	10.0	150.9	58.0	214.3	980.7	146.8	10.0	NA
073009KR-02-24	108	2164	3.0	30.9438	111.1	0.0294	111.5	0.0066	10.1	0.09	42.5	4.3	29.5	32.4	-936.0	0.0	42.5	4.3	NA
073009KR-02-25	60	3266	3.4	32.8446	98.7	0.1133	99.1	0.0270	8.3	0.08	171.7	14.0	109.0	102.7	-1113.7	#VALUE!	171.7	14.0	NA
073009KR-02-27	70	5477	3.7	24.7089	62.3	0.1333	62.5	0.0239	5.4	0.09	152.1	8.1	127.0	74.8	-320.8	1761.9	152.1	8.1	NA
073009KR-02-28	49	2684	4.8	27.6228	68.3	0.1140	69.3	0.0228	11.2	0.16	145.5	16.2	109.6	72.1	-615.6	2099.4	145.5	16.2	NA
073009KR-02-29	256	16475	1.3	20.3872	15.3	0.0892	15.6	0.0132	3.2	0.20	84.5	2.7	86.8	13.0	150.3	360.0	84.5	2.7	NA
073009KR-02-30	86	12664	3.6	19.4422	25.3	0.1661	26.3	0.0234	7.2	0.27	149.2	10.6	156.0	38.1	260.4	590.6	149.2	10.6	NA
073009KR-02-31	23	2018	2.6	11.3907	75.8	0.3694	77.1	0.0305	14.0	0.18	193.8	26.6	319.2	214.4	1377.9	1786.5	193.8	26.6	14.1
073009KR-02-32	44	4601	3.4	27.4859	57.7	0.1359	58.6	0.0271	9.9	0.17	172.3	16.8	129.4	71.3	-602.1	1696.6	172.3	16.8	NA
073009KR-02-33	93	17150	2.5	21.0174	24.2	0.1598	25.0	0.0244	6.1	0.24	155.2	9.3	150.6	34.9	78.4	582.4	155.2	9.3	NA
073009KR-02-34	59	4089	2.4	28.3032	96.3	0.1274	97.8	0.0262	17.3	0.18	166.5	28.5	121.8	112.8	-682.5	1563.9	166.5	28.5	NA
073009KR-02-35	51	4755	2.4	37.9606	50.0	0.0896	51.6	0.0247	12.6	0.24	157.1	19.5	87.1	43.1	-1577.8	1785.2	157.1	19.5	NA
073009KR-02-36	34	1701	4.3	44.7059	50.0	0.0747	52.1	0.0242	14.6	0.28	154.2	22.3	73.1	36.8	-2172.1	34.0	154.2	22.3	NA
073009KR-02-37	92	6677	4.0	20.9251	23.1	0.1747	24.2	0.0265	7.1	0.29	168.6	11.8	163.5	36.6	88.9	555.1	168.6	11.8	NA
073009KR-02-38	46	4479	2.8	15.2563	118.6	0.2271	119.3	0.0251	13.2	0.11	160.0	20.8	207.8	227.9	791.9	580.0	160.0	20.8	NA
073009KR-02-40	46	2976	4.0	14.6121	106.8	0.2126	107.9	0.0225	14.9	0.14	143.6	21.1	195.7	194.4	881.8	433.8	143.6	21.1	16.3
073009KR-02-41	76	6302	5.5	22.2619	24.1	0.1615	25.9	0.0261	9.7	0.37	165.9	15.9	152.0	36.6	-60.0	593.7	165.9	15.9	NA
073009KR-02-42	432	9115	5.3	22.4385	15.7	0.0561	16.5	0.0091	5.0	0.31	58.6	2.9	55.5	8.9	-79.3	385.5	58.6	2.9	NA
073009KR-02-44	318	27259	2.2	20.4412	8.3	0.1942	8.8	0.0288	3.1	0.35	183.0	5.6	180.2	14.6	144.0	194.2	183.0	5.6	NA
073009KR-02-46	100	11953	2.5	19.6709	20.4	0.1857	20.8	0.0265	4.0	0.19	168.5	6.7	172.9	33.1	233.4	475.4	168.5	6.7	NA
073009KR-02-47	98	9453	3.5	19.8268	23.0	0.1649	24.0	0.0237	6.9	0.29	151.1	10.3	155.0	34.5	215.2	539.0	151.1	10.3	NA
073009KR-02-48	93	8777	2.5	27.5052	28.0	0.1375	28.2	0.0274	3.8	0.14	174.4	6.6	130.8	34.7	-604.0	773.7	174.4	6.6	NA
073009KR-02-49	71	8836	4.0	24.7644	32.7	0.1295	33.8	0.0233	8.4	0.25	148.2	12.3	123.6	39.4	-326.5	860.7	148.2	12.3	NA
073009KR-02-50	64	5683	2.7	19.8599	39.6	0.1612	40.0	0.0232	6.0	0.15	148.0	8.8	151.8	56.5	211.3	951.1	148.0	8.8	NA

073009KR-02-51	33	4757	3.0	29.3148	76.8	0.1082	78.4	0.0230	15.5	0.20	146.6	22.5	104.3	77.8	-780.6	2555.9	146.6	22.5	NA
073009KR-02-52	215	5816	3.3	17.4185	12.7	0.1406	13.3	0.0178	4.0	0.30	113.5	4.5	133.6	16.6	507.3	279.6	113.5	4.5	NA
073009KR-02-53	46	7322	3.4	22.7167	31.2	0.1494	31.5	0.0246	4.5	0.14	156.8	6.9	141.4	41.6	-109.5	784.7	156.8	6.9	NA
073009KR-02-54	203	5163	4.7	18.5514	24.1	0.0535	25.4	0.0072	8.1	0.32	46.2	3.7	52.9	13.1	367.0	550.8	46.2	3.7	NA
073009KR-02-55	119	16172	2.3	21.8890	24.1	0.1622	24.3	0.0257	2.9	0.12	163.9	4.7	152.6	34.4	-19.0	590.5	163.9	4.7	NA
073009KR-02-56	155	6655	2.7	22.3811	13.1	0.1690	15.2	0.0274	7.7	0.51	174.5	13.2	158.6	22.3	-73.0	321.5	174.5	13.2	NA
073009KR-02-57	66	2443	3.4	32.1802	64.7	0.1068	65.1	0.0249	7.5	0.12	158.7	11.8	103.0	63.9	-1052.0	2140.5	158.7	11.8	NA
073009KR-02-58	64	4666	3.0	20.8165	60.3	0.1579	62.9	0.0238	18.0	0.29	151.9	27.1	148.9	87.3	101.2	1565.5	151.9	27.1	NA
073009KR-02-59	73	6672	3.0	20.9535	29.8	0.1795	31.1	0.0273	8.8	0.28	173.5	15.1	167.6	48.1	85.7	721.2	173.5	15.1	NA
073009KR-02-60	122	9657	2.0	19.6871	21.8	0.1944	21.9	0.0278	2.4	0.11	176.5	4.1	180.4	36.3	231.5	508.5	176.5	4.1	NA
073009KR-02-61	53	4701	4.2	24.2269	73.9	0.1403	74.7	0.0247	10.9	0.15	157.0	16.9	133.3	93.6	-270.5	2192.1	157.0	16.9	NA
073009KR-02-62	103	6203	2.9	23.5586	22.6	0.1518	25.2	0.0259	11.1	0.44	165.1	18.1	143.5	33.7	-199.9	572.8	165.1	18.1	NA
073009KR-02-63	104	12005	2.4	29.3902	47.6	0.1107	47.9	0.0236	5.4	0.11	150.4	8.0	106.6	48.5	-787.9	1413.6	150.4	8.0	NA
073009KR-02-64	86	6836	5.5	23.4541	21.9	0.1467	22.8	0.0249	6.6	0.29	158.8	10.4	139.0	29.7	-188.8	552.0	158.8	10.4	NA
073009KR-02-65	72	4687	3.2	26.2435	39.7	0.1374	40.6	0.0262	8.5	0.21	166.4	13.9	130.7	49.8	-477.9	1087.6	166.4	13.9	NA
073009KR-02-66	98	4218	2.9	20.6284	26.3	0.1517	27.0	0.0227	6.0	0.22	144.7	8.7	143.4	36.2	122.6	629.7	144.7	8.7	NA
073009KR-02-68	50	3289	3.6	28.0589	93.0	0.1118	93.9	0.0228	12.8	0.14	145.0	18.3	107.6	96.1	-658.5	3633.0	145.0	18.3	NA
073009KR-02-69	101	7374	2.8	22.6226	28.0	0.1696	28.4	0.0278	4.9	0.17	177.0	8.6	159.1	41.9	-99.3	700.0	177.0	8.6	NA
073009KR-02-70	1356	79569	1.4	20.2744	2.2	0.1948	3.1	0.0286	2.1	0.70	182.0	3.8	180.7	5.1	163.2	51.4	182.0	3.8	NA
073009KR-02-71	51	22819	3.6	15.6713	34.2	0.2030	35.5	0.0231	9.7	0.27	147.0	14.1	187.7	61.0	735.4	745.0	147.0	14.1	NA
073009KR-02-72	470	48512	3.2	20.2888	5.5	0.1821	5.7	0.0268	1.3	0.23	170.5	2.2	169.9	8.9	161.6	128.8	170.5	2.2	NA
073009KR-02-73	81	6017	2.7	20.7908	41.7	0.1593	42.3	0.0240	7.4	0.18	153.1	11.3	150.1	59.1	104.1	1025.3	153.1	11.3	NA
073009KR-02-74	167	12691	3.7	21.8862	12.8	0.1737	13.4	0.0276	3.9	0.29	175.3	6.7	162.6	20.1	-18.6	311.0	175.3	6.7	NA
073009KR-02-75	162	24431	4.6	20.2483	15.2	0.1793	16.0	0.0263	4.8	0.30	167.5	7.9	167.4	24.7	166.2	358.0	167.5	7.9	NA
073009KR-02-76	43	4368	4.2	23.9440	57.4	0.1523	58.5	0.0265	11.4	0.19	168.3	18.9	144.0	78.7	-240.7	1570.4	168.3	18.9	NA
073009KR-02-77	107	7950	2.5	24.8869	56.8	0.1277	57.4	0.0230	8.4	0.15	146.9	12.3	122.0	66.1	-339.2	1579.1	146.9	12.3	NA
073009KR-02-78	180	13047	3.2	20.9889	11.0	0.1739	11.2	0.0265	2.1	0.19	168.4	3.5	162.8	16.8	81.6	261.0	168.4	3.5	NA
073009KR-02-79	25	1326	4.5	16.6047	154.6	0.2080	155.3	0.0250	14.2	0.09	159.5	22.4	191.9	278.2	611.6	979.6	159.5	22.4	NA
073009KR-02-81	56	3565	2.6	15.2236	20.7	0.2339	26.0	0.0258	15.6	0.60	164.3	25.4	213.4	50.0	796.4	438.9	164.3	25.4	NA
073009KR-02-82	202	9992	3.3	19.6488	5.7	0.1636	7.5	0.0233	4.9	0.65	148.5	7.2	153.8	10.8	236.0	132.5	148.5	7.2	NA
073009KR-02-83	92	6033	3.9	23.3820	26.8	0.1597	28.2	0.0271	8.8	0.31	172.3	15.0	150.4	39.4	-181.1	678.3	172.3	15.0	NA
073009KR-02-84	232	15868	2.9	26.3472	38.6	0.0588	39.4	0.0112	8.1	0.21	72.0	5.8	58.0	22.2	-488.4	1056.9	72.0	5.8	NA
073009KR-02-85	51	4706	3.7	15.5863	47.3	0.2073	48.7	0.0234	11.4	0.23	149.3	16.8	191.3	85.1	746.8	1059.5	149.3	16.8	NA
073009KR-02-86	80	3957	2.3	25.7232	32.5	0.1249	33.6	0.0233	8.8	0.26	148.5	12.9	119.5	37.9	-425.1	870.5	148.5	12.9	NA
073009KR-02-87	55	3571	3.0	19.3715	32.1	0.1741	36.3	0.0245	16.9	0.47	155.8	26.1	163.0	54.7	268.7	752.9	155.8	26.1	NA
073009KR-02-88	56	4652	3.8	18.1885	49.9	0.1827	50.2	0.0241	6.0	0.12	153.5	9.1	170.3	79.0	411.4	1187.2	153.5	9.1	NA
073009KR-02-89	100	4672	2.0	21.6696	16.4	0.1675	17.2	0.0263	5.0	0.29	167.5	8.3	157.3	25.1	5.3	398.3	167.5	8.3	NA
073009KR-02-90	69	4280	3.2	30.2511	50.9	0.1238	52.3	0.0272	12.1	0.23	172.8	20.7	118.5	58.6	-870.3	1550.8	172.8	20.7	NA
073009KR-02-91	47	4406	4.1	7.3257	324.6	0.4512	324.8	0.0240	11.0	0.03	152.7	16.6	378.1	#NUM!	2183.3	475.6	152.7	16.6	7.0
073009KR-02-92	56	4560	4.1	14.6109	24.1	0.2222	29.9	0.0235	17.6	0.59	150.0	26.2	203.8	55.2	882.0	505.6	150.0	26.2	17.0
073009KR-02-93	105	6015	2.7	21.4445	25.8	0.1561	26.1	0.0243	3.6	0.14	154.6	5.5	147.3	35.8	30.4	628.5	154.6	5.5	NA
073009KR-02-94	131	8561	3.0	22.0733	17.1	0.1541	18.5	0.0247	7.1	0.38	157.1	11.0	145.6	25.0	-39.3	416.6	157.1	11.0	NA
073009KR-02-95	85	7845	2.6	17.9030	25.1	0.2243	26.0	0.0291	6.9	0.27	185.0	12.7	205.5	48.4	446.6	565.4	185.0	12.7	NA
073009KR-02-96	122	6411	3.6	21.0679	21.7	0.1511	22.5	0.0231	5.9	0.26	147.1	8.6	142.9	29.9	72.7	520.4	147.1	8.6	NA
073009KR-02-97	63	3743	3.3	24.3616	41.3	0.1520	41.9	0.0269	7.2	0.17	170.8	12.1	143.7	56.2	-284.6	1091.9	170.8	12.1	NA
073009KR-02-98	70	9523	5.0	22.7579	39.8	0.1556	40.2	0.0257	5.4	0.13	163.4	8.7	146.8	55.0	-114.0	1015.8	163.4	8.7	NA
073009KR-02-99	373	14951	2.2	21.4687	9.7	0.0704	10.1	0.0110	3.1	0.30	70.3	2.1	69.1	6.8	27.7	232.3	70.3	2.1	NA
073009KR-02-100	47	3419	2.8	16.2560	58.4	0.2037	59.7	0.0240	12.6	0.21	153.0	19.0	188.2	102.9	657.3	1373.3	153.0	19.0	NA
073009KR-02-101	87	6770	2.9	20.3385	27.3	0.1679	31.2	0.0248	15.2	0.49	157.7	23.6	157.6	45.6	155.8	649.3	157.7	23.6	NA
073009KR-02-103	117	8015	3.9	21.4103	24.9	0.1773	27.0	0.0275	10.4	0.39	175.1	18.0	165.8	41.4	34.2	605.5	175.1	18.0	NA
073009KR-02-104	59	3250	3.5	21.3681	49.3	0.1526	49.7	0.0237	6.1	0.12	150.7	9.1	144.2	66.9	38.9	1249.8	150.7	9.1	NA
073009KR-02-105	161	15489	2.0	21.4291	13.0	0.1707	13.8	0.0265	4.6	0.34	168.8	7.7	160.0	20.5	32.1	313.5	168.8	7.7	NA

Tonsina River – 072609KR-01

						Isotope ratios							Apparent ages (Ma)						
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
Tonsina River																			
072609KR-01-1	164	90131	2.0	9.1502	0.6	4.9425	1.0	0.3280	0.9	0.82	1828.7	13.6	1809.5	8.8	1787.5	10.9	1787.5	10.9	102.3
072609KR-01-2	143	5528	2.4	23.7509	17.1	0.1473	17.3	0.0254	2.8	0.16	161.5	4.4	139.5	22.6	-220.3	432.4	161.5	4.4	NA
072609KR-01-3	568	23077	1.3	21.5198	13.2	0.1000	13.4	0.0156	2.5	0.18	99.8	2.4	96.7	12.4	22.0	317.0	99.8	2.4	NA
072609KR-01-4	1517	34881	1.0	21.4839	2.1	0.1008	3.5	0.0157	2.8	0.80	100.5	2.7	97.5	3.2	26.0	49.9	100.5	2.7	NA
072609KR-01-5	216	28744	2.0	18.9119	13.3	0.2278	13.5	0.0312	1.9	0.14	198.3	3.6	208.4	25.4	323.5	304.0	198.3	3.6	NA
072609KR-01-6	515	13332	1.5	21.1449	8.5	0.0876	9.7	0.0134	4.7	0.49	86.0	4.1	85.2	7.9	64.0	201.6	86.0	4.1	NA
072609KR-01-7	323	32813	1.3	18.0196	2.8	0.5486	9.5	0.0717	9.1	0.96	446.4	39.3	444.1	34.3	432.2	61.3	446.4	39.3	NA
072609KR-01-8	1658	74525	0.8	21.4750	2.7	0.0754	3.6	0.0117	2.4	0.65	75.3	1.8	73.8	2.6	27.0	65.2	75.3	1.8	NA
072609KR-01-9	983	16890	2.9	21.0853	4.4	0.0815	4.9	0.0125	2.1	0.43	79.9	1.7	79.6	3.7	70.8	105.2	79.9	1.7	NA
072609KR-01-10	1377	25301	1.9	21.2418	3.7	0.0812	6.1	0.0125	4.8	0.79	80.2	3.8	79.3	4.6	53.1	87.9	80.2	3.8	NA
072609KR-01-11	154	9323	1.9	21.3794	21.6	0.1767	22.0	0.0274	4.3	0.20	174.3	7.4	165.2	33.5	37.7	521.0	174.3	7.4	NA
072609KR-01-12	55	112805	1.3	5.3775	0.5	13.0166	3.7	0.5077	3.7	0.99	2646.7	79.6	2680.9	34.9	2706.7	8.5	2706.7	8.5	97.8
072609KR-01-13	122	107448	1.7	8.7723	1.1	5.2959	2.0	0.3369	1.7	0.84	1871.9	27.7	1868.2	17.4	1864.0	20.0	1864.0	20.0	100.4
072609KR-01-14	329	13162	3.0	23.8764	26.7	0.0669	27.0	0.0116	4.0	0.15	74.3	3.0	65.8	17.2	-233.6	682.6	74.3	3.0	NA
072609KR-01-15	473	27777	3.8	21.0077	14.2	0.0819	15.1	0.0125	5.2	0.34	79.9	4.1	79.9	11.6	79.5	338.6	79.9	4.1	NA
072609KR-01-16	888	25491	2.1	21.1604	6.9	0.0763	7.8	0.0117	3.6	0.46	75.1	2.7	74.7	5.6	62.3	165.4	75.1	2.7	NA
072609KR-01-17	319	19094	2.6	20.8930	6.8	0.1919	7.4	0.0291	2.8	0.39	184.8	5.2	178.3	12.0	92.5	160.9	184.8	5.2	NA
072609KR-01-18	294	38274	3.1	16.5889	1.8	0.8807	8.1	0.1060	7.8	0.97	649.3	48.4	641.4	38.3	613.7	39.5	649.3	48.4	105.8
072609KR-01-20	206	3866	2.4	20.7476	24.0	0.0825	25.0	0.0124	6.8	0.27	79.6	5.4	80.5	19.3	109.0	574.9	79.6	5.4	NA
072609KR-01-22	1105	95938	7.9	16.8615	0.7	0.7515	2.1	0.0919	2.0	0.95	566.8	10.7	569.1	9.1	578.4	14.3	566.8	10.7	98.0
072609KR-01-23	563	13902	3.2	23.2657	9.1	0.0710	9.4	0.0120	2.4	0.26	76.8	1.8	69.7	6.3	-168.6	226.8	76.8	1.8	NA
072609KR-01-24	823	28849	5.4	19.4476	4.0	0.0864	5.3	0.0122	3.4	0.65	78.1	2.6	84.1	4.3	259.7	92.1	78.1	2.6	NA
072609KR-01-26	564	16845	4.9	24.1195	13.9	0.0672	14.4	0.0118	3.8	0.26	75.3	2.8	66.0	9.2	-259.2	353.7	75.3	2.8	NA
072609KR-01-27	1443	69358	1.4	18.6964	0.9	0.3759	6.7	0.0510	6.7	0.99	320.5	20.8	324.0	18.6	349.5	20.5	320.5	20.8	NA
072609KR-01-28	331	20791	3.1	21.8581	6.3	0.1611	6.6	0.0255	1.9	0.29	162.6	3.1	151.7	9.3	-15.5	152.4	162.6	3.1	NA
072609KR-01-29	240	5597	2.5	26.7521	26.6	0.0659	27.1	0.0128	5.0	0.19	81.9	4.1	64.8	17.0	-529.0	723.2	81.9	4.1	NA
072609KR-01-30	650	8230	3.4	21.3729	15.1	0.0727	15.5	0.0113	3.4	0.22	72.3	2.4	71.3	10.7	38.4	364.2	72.3	2.4	NA
072609KR-01-31	82	59122	1.0	5.5907	0.5	12.2845	2.7	0.4981	2.6	0.99	2605.6	56.5	2626.4	25.1	2642.4	7.5	2642.4	7.5	98.6
072609KR-01-32	198	38564	2.1	13.3298	3.0	1.6247	4.4	0.1571	3.2	0.72	940.5	27.7	979.8	27.5	1069.1	60.8	1069.1	60.8	88.0
072609KR-01-33	91	1946	4.0	20.9921	23.9	0.1140	25.4	0.0174	8.8	0.35	111.0	9.7	109.7	26.5	81.3	573.8	111.0	9.7	NA
072609KR-01-34	693	18578	2.3	21.6445	8.4	0.0872	8.8	0.0137	2.6	0.29	87.6	2.2	84.9	7.2	8.1	202.9	87.6	2.2	NA
072609KR-01-35	155	10546	2.8	20.3743	12.3	0.2272	12.7	0.0336	3.2	0.25	212.9	6.7	207.9	23.9	151.7	289.6	212.9	6.7	NA
072609KR-01-36	283	9280	3.7	22.6155	25.0	0.0739	25.4	0.0121	4.6	0.18	77.7	3.6	72.4	17.8	-98.5	622.9	77.7	3.6	NA
072609KR-01-37	376	6411	4.4	22.7949	15.8	0.0661	15.9	0.0109	1.7	0.11	70.0	1.2	65.0	10.0	-118.0	392.0	70.0	1.2	NA
072609KR-01-38	255	3697	2.4	21.2187	25.6	0.0774	25.8	0.0119	3.2	0.12	76.3	2.4	75.7	18.8	55.7	618.8	76.3	2.4	NA
072609KR-01-40	709	44469	2.7	20.1551	2.3	0.2104	3.0	0.0308	1.9	0.64	195.3	3.7	193.9	5.3	177.0	53.5	195.3	3.7	NA
072609KR-01-41	68	1656	1.5	30.3072	74.3	0.0602	74.9	0.0132	9.4	0.13	84.7	7.9	59.3	43.2	-875.7	2482.4	84.7	7.9	NA
072609KR-01-42	1069	127578	1.4	18.4022	1.4	0.4245	1.9	0.0567	1.3	0.68	355.3	4.6	359.3	5.8	385.2	31.6	355.3	4.6	NA
072609KR-01-43	765	101205	3.6	19.1724	1.3	0.3313	3.4	0.0461	3.1	0.93	290.4	8.8	290.6	8.5	292.4	29.1	290.4	8.8	NA
072609KR-01-44	400	17703	1.5	20.1406	7.2	0.1705	7.5	0.0249	2.1	0.28	158.6	3.3	159.9	11.0	178.7	167.0	158.6	3.3	NA
072609KR-01-45	97	5751	2.2	26.6875	17.6	0.1570	20.2	0.0304	9.9	0.49	192.9	18.8	148.0	27.9	-522.6	474.4	192.9	18.8	NA
072609KR-01-46	246	9896	1.4	20.4292	10.5	0.1879	10.8	0.0278	2.3	0.22	177.0	4.1	174.8	17.3	145.4	246.9	177.0	4.1	NA
072609KR-01-47	172	4127	2.2	20.1401	20.4	0.1664	21.0	0.0243	4.9	0.23	154.8	7.5	156.3	30.4	178.7	480.3	154.8	7.5	NA
072609KR-01-48	493	8861	4.2	19.3205	8.4	0.0774	10.0	0.0108	5.3	0.53	69.5	3.7	75.7	7.3	274.7	193.5	69.5	3.7	NA
072609KR-01-49	610	13041	3.2	21.5613	15.3	0.0768	15.5	0.0120	3.0	0.19	77.0	2.3	75.1	11.3	17.4	368.3	77.0	2.3	NA

072609KR-01-50	213	193820	1.5	5.4173	0.4	12.8933	4.6	0.5066	4.6	1.00	2642.0	98.9	2671.9	43.2	2694.6	5.8	2694.6	5.8	98.0
072609KR-01-R1	183	58591	1.2	18.4739	4.9	0.4986	5.3	0.0668	2.0	0.38	416.9	8.0	410.7	17.7	376.5	109.4	416.9	8.0	NA
072609KR-01-51	758	63096	1.6	20.2710	4.2	0.0994	5.2	0.0146	3.0	0.58	93.5	2.8	96.2	4.8	163.6	99.2	93.5	2.8	NA
072609KR-01-52	47	51911	1.4	8.8674	3.7	5.0882	4.1	0.3272	1.8	0.44	1825.0	28.3	1834.1	34.5	1844.5	66.2	1844.5	66.2	98.9
072609KR-01-53	116	77097	1.3	9.1076	1.0	4.8202	1.5	0.3184	1.1	0.74	1781.9	17.1	1788.4	12.4	1796.0	18.0	1796.0	18.0	99.2
072609KR-01-54	667	15313	2.9	20.0554	9.2	0.0790	9.4	0.0115	1.8	0.19	73.7	1.3	77.2	7.0	188.5	214.2	73.7	1.3	NA
072609KR-01-55	54	35354	2.0	6.2189	2.4	10.0643	7.3	0.4539	6.9	0.94	2412.7	138.7	2440.7	67.5	2464.1	40.6	2464.1	40.6	97.9
072609KR-01-56	94	77439	2.5	9.1859	1.6	4.8294	2.8	0.3217	2.3	0.82	1798.3	36.2	1790.0	23.7	1780.4	29.6	1780.4	29.6	101.0
072609KR-01-56	203	12250	1.9	20.3059	36.2	0.0776	37.0	0.0114	7.8	0.21	73.3	5.7	75.9	27.1	159.6	873.0	73.3	5.7	NA
072609KR-01-57	462	13796	2.9	19.4924	8.7	0.0795	9.0	0.0112	2.2	0.25	72.1	1.6	77.7	6.7	254.4	200.3	72.1	1.6	NA
072609KR-01-58	384	13063	3.1	20.7026	13.6	0.0775	14.2	0.0116	4.0	0.28	74.6	3.0	75.8	10.4	114.1	322.0	74.6	3.0	NA
072609KR-01-59	437	7903	4.1	23.8108	16.9	0.0621	17.1	0.0107	3.1	0.18	68.8	2.1	61.2	10.2	-226.6	427.2	68.8	2.1	NA
072609KR-01-60	211	13439	1.9	20.1122	10.2	0.1690	10.6	0.0246	2.8	0.26	157.0	4.3	158.5	15.5	182.0	238.1	157.0	4.3	NA
072609KR-01-61	385	22560	3.5	19.6930	5.5	0.2180	6.0	0.0311	2.4	0.41	197.7	4.7	200.2	10.9	230.8	126.4	197.7	4.7	NA
072609KR-01-62	488	12822	5.8	21.8811	8.9	0.0966	9.4	0.0153	3.0	0.32	98.1	2.9	93.6	8.4	-18.1	214.9	98.1	2.9	NA
072609KR-01-63	572	200991	69.0	7.8063	0.5	6.3137	5.3	0.3575	5.3	1.00	1970.1	89.3	2020.4	46.3	2072.1	8.4	2072.1	8.4	95.1
072609KR-01-64	358	70910	1.9	19.7304	8.1	0.2189	8.2	0.0313	1.5	0.19	198.9	3.0	201.0	15.0	226.5	186.7	198.9	3.0	NA
072609KR-01-65	470	49658	8.2	18.7428	3.1	0.4352	3.6	0.0592	1.9	0.51	370.5	6.7	366.8	11.2	343.9	71.1	370.5	6.7	NA
072609KR-01-66	1885	342049	0.9	19.0542	0.7	0.3623	3.4	0.0501	3.4	0.98	315.0	10.3	313.9	9.3	306.5	16.9	315.0	10.3	NA
072609KR-01-67	469	129914	1.9	17.6366	1.9	0.5590	4.3	0.0715	3.8	0.89	445.2	16.4	450.9	15.5	479.9	42.4	445.2	16.4	NA
072609KR-01-68	241	18084	2.3	19.5474	7.3	0.2104	7.7	0.0298	2.5	0.32	189.5	4.6	193.9	13.6	248.0	168.2	189.5	4.6	NA
072609KR-01-69	226	15739	3.6	19.4123	11.4	0.1796	11.8	0.0253	3.0	0.25	161.0	4.8	167.7	18.2	263.9	262.1	161.0	4.8	NA
072609KR-01-70	233	4917	2.6	24.7845	25.5	0.0681	26.5	0.0122	7.3	0.28	78.4	5.7	66.9	17.2	-328.6	664.8	78.4	5.7	NA
072609KR-01-71	80	1623	0.3	17.8991	15.2	0.3899	16.8	0.0506	7.0	0.42	318.3	21.9	334.3	47.8	447.1	339.6	318.3	21.9	NA
072609KR-01-74	146	149774	2.0	8.7723	0.9	5.0989	1.8	0.3244	1.6	0.86	1811.2	24.8	1835.9	15.5	1864.0	16.9	1864.0	16.9	97.2
072609KR-01-75	1599	8658	5.7	19.3506	7.1	0.0856	7.4	0.0120	1.7	0.23	77.0	1.3	83.4	5.9	271.2	164.0	77.0	1.3	NA
072609KR-01-76	80	19628	1.7	15.9426	5.3	0.9758	6.4	0.1128	3.5	0.56	689.2	23.2	691.5	32.0	698.9	112.8	689.2	23.2	98.6
072609KR-01-77	411	22947	2.3	20.4893	6.4	0.1659	8.0	0.0247	4.9	0.61	157.0	7.6	155.9	11.6	138.5	150.5	157.0	7.6	NA
072609KR-01-78	1005	11532	3.5	22.2783	7.2	0.0708	7.4	0.0114	1.6	0.22	73.3	1.2	69.4	4.9	-61.8	175.6	73.3	1.2	NA
072609KR-01-79	72	2743	3.4	14.7313	29.0	0.1343	29.7	0.0143	6.0	0.20	91.8	5.5	128.0	35.7	865.0	614.8	91.8	5.5	NA
072609KR-01-81	908	110278	1.6	18.6469	1.3	0.4292	2.0	0.0580	1.6	0.76	363.7	5.5	362.6	6.2	355.5	29.6	363.7	5.5	NA
072609KR-01-83	459	53427	1.3	21.1033	4.2	0.1649	5.7	0.0252	3.9	0.68	160.7	6.2	155.0	8.2	68.7	99.8	160.7	6.2	NA
072609KR-01-84	152	30676	0.8	16.6695	4.7	0.8406	7.5	0.1016	5.9	0.78	623.9	34.9	619.5	34.8	603.2	101.2	623.9	34.9	103.4
072609KR-01-85	302	17918	1.9	18.7957	4.1	0.4199	4.3	0.0572	1.1	0.26	358.8	3.9	356.0	12.9	337.5	93.7	358.8	3.9	NA
072609KR-01-86	392	5787	6.2	22.5699	16.5	0.0681	17.4	0.0111	5.7	0.33	71.5	4.0	66.9	11.3	-93.6	406.0	71.5	4.0	NA
072609KR-01-88	188	218023	1.6	5.3648	0.3	13.6282	1.7	0.5303	1.7	0.98	2742.5	37.6	2724.2	16.2	2710.7	5.7	2710.7	5.7	101.2
072609KR-01-89	170	16191	2.4	20.3085	8.8	0.2488	9.1	0.0366	2.4	0.26	232.0	5.4	225.6	18.4	159.3	205.1	232.0	5.4	NA
072609KR-01-90	208	5971	3.1	18.5790	21.2	0.0955	21.2	0.0129	1.7	0.08	82.4	1.4	92.6	18.8	363.7	482.3	82.4	1.4	NA
072609KR-01-91	396	13679	3.8	19.9081	9.5	0.0843	10.2	0.0122	3.5	0.34	78.0	2.7	82.1	8.0	205.7	221.7	78.0	2.7	NA
072609KR-01-92	347	5793	3.7	23.4492	34.1	0.0625	34.7	0.0106	6.7	0.19	68.1	4.5	61.5	20.8	-188.3	874.0	68.1	4.5	NA
072609KR-01-93	280	6997	1.4	20.6089	15.8	0.0785	17.1	0.0117	6.3	0.37	75.2	4.7	76.8	12.6	124.8	375.1	75.2	4.7	NA
072609KR-01-94	733	26384	3.1	21.9199	9.3	0.0722	9.6	0.0115	2.7	0.27	73.6	1.9	70.8	6.6	-22.4	224.8	73.6	1.9	NA
072609KR-01-95	295	36881	2.1	19.2375	6.1	0.2468	6.6	0.0344	2.6	0.39	218.3	5.6	224.0	13.4	284.6	139.9	218.3	5.6	NA
072609KR-01-96	799	26518	2.4	21.1329	8.6	0.0781	9.0	0.0120	2.7	0.30	76.7	2.0	76.4	6.6	65.4	203.9	76.7	2.0	NA
072609KR-01-97	412	18197	1.8	21.0982	6.4	0.1289	7.1	0.0197	3.1	0.44	125.9	3.8	123.1	8.2	69.3	151.4	125.9	3.8	NA
072609KR-01-97	642	11973	2.3	19.3041	4.9	0.0879	6.2	0.0123	3.9	0.62	78.8	3.0	85.5	5.1	276.7	111.9	78.8	3.0	NA
072609KR-01-98	144	105163	2.3	8.7649	1.0	5.3570	3.4	0.3405	3.3	0.96	1889.3	54.1	1878.0	29.5	1865.6	17.8	1865.6	17.8	101.3
072609KR-01-99	593	31575	1.6	21.1960	9.7	0.0994	9.9	0.0153	1.6	0.16	97.8	1.6	96.2	9.1	58.3	232.7	97.8	1.6	NA
072609KR-01-100	401	9454	4.5	21.3421	8.8	0.0766	9.5	0.0119	3.6	0.38	76.0	2.7	75.0	6.9	41.9	210.8	76.0	2.7	NA
072609KR-01-101	302	5563	5.5	22.6436	16.1	0.0691	16.6	0.0113	4.2	0.25	72.7	3.0	67.8	10.9	-101.6	396.8	72.7	3.0	NA
072609KR-01-102	102	2911	1.7	19.7565	19.4	0.1757	21.4	0.0252	9.0	0.42	160.3	14.3	164.4	32.5	223.4	453.1	160.3	14.3	NA
072609KR-01-103	487	11040	4.1	21.2040	11.7	0.0774	12.0	0.0119	2.9	0.24	76.3	2.2	75.7	8.8	57.4	279.6	76.3	2.2	NA
072609KR-01-105	207	12478	3.3	22.8991	18.9	0.0715	19.5	0.0119	4.8	0.24	76.1	3.6	70.1	13.2	-129.2	470.0	76.1	3.6	NA

Lower Copper River – 072609KR-02

						Isotope ratios							Apparent ages (Ma)						
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
Lower Copper River																			
072609KR-02-1	944	19350	1.7	20.9516	5.8	0.1012	6.0	0.0154	1.7	0.28	98.4	1.6	97.9	5.6	85.9	136.6	98.4	1.6	NA
072609KR-02-2	73	59256	1.7	8.9137	1.7	5.0016	3.7	0.3233	3.3	0.89	1806.1	52.6	1819.6	31.7	1835.1	30.8	1835.1	30.8	98.4
072609KR-02-3	294	29129	2.1	19.1726	3.6	0.3526	4.4	0.0490	2.5	0.56	308.6	7.4	306.7	11.6	292.3	83.1	308.6	7.4	NA
072609KR-02-4	261	22294	2.6	19.2500	9.9	0.1645	11.5	0.0230	5.9	0.51	146.4	8.5	154.6	16.5	283.1	226.5	146.4	8.5	NA
072609KR-02-5	92	3092	2.6	24.3170	28.7	0.0959	30.0	0.0169	8.7	0.29	108.2	9.4	93.0	26.7	-279.9	744.4	108.2	9.4	NA
072609KR-02-6	113	917	1.1	18.1274	9.0	0.3298	9.6	0.0434	3.4	0.35	273.6	9.1	289.4	24.2	418.9	200.7	273.6	9.1	NA
072609KR-02-7	83	3053	3.0	21.8665	47.4	0.1155	53.6	0.0183	25.0	0.47	117.1	29.0	111.0	56.4	-16.5	1206.7	117.1	29.0	NA
072609KR-02-8	741	27758	7.1	23.6843	7.5	0.0969	7.8	0.0166	2.0	0.25	106.4	2.1	93.9	7.0	-213.2	188.7	106.4	2.1	NA
072609KR-02-9	2911	55263	1.7	20.8074	2.2	0.0580	2.5	0.0088	1.2	0.47	56.2	0.7	57.3	1.4	102.2	51.6	56.2	0.7	NA
072609KR-02-10	82	44515	6.4	8.8754	1.7	5.3046	2.0	0.3415	1.1	0.53	1893.7	17.2	1869.6	16.8	1842.9	30.1	1842.9	30.1	102.8
072609KR-02-11	204	8469	3.6	22.1484	14.6	0.1143	15.3	0.0184	4.7	0.30	117.3	5.4	109.9	16.0	-47.5	356.7	117.3	5.4	NA
072609KR-02-13	174	7827	1.7	19.4849	12.1	0.1756	12.2	0.0248	1.9	0.16	158.0	3.0	164.3	18.6	255.3	278.6	158.0	3.0	NA
072609KR-02-15	444	4651	3.6	24.7029	19.1	0.0612	19.2	0.0110	2.5	0.13	70.3	1.8	60.4	11.3	-320.2	492.8	70.3	1.8	NA
072609KR-02-16	4744	127286	2.0	20.6675	1.4	0.1024	2.3	0.0153	1.8	0.79	98.2	1.8	99.0	2.2	118.1	32.9	98.2	1.8	NA
072609KR-02-17	401	25825	2.2	18.4815	2.6	0.4404	3.8	0.0590	2.8	0.72	369.7	9.9	370.5	11.8	375.5	59.2	369.7	9.9	NA
072609KR-02-18	148	2477	3.4	30.3901	54.5	0.0539	54.8	0.0119	6.1	0.11	76.1	4.6	53.3	28.5	-883.5	1680.3	76.1	4.6	NA
072609KR-02-19	426	14655	2.7	22.3349	12.8	0.1184	13.2	0.0192	3.2	0.24	122.5	3.9	113.7	14.2	-68.0	314.3	122.5	3.9	NA
072609KR-02-20	96	1975	2.8	29.4998	81.2	0.0823	82.1	0.0176	12.4	0.15	112.5	13.8	80.3	63.4	-798.4	2796.0	112.5	13.8	NA
072609KR-02-21	76	3046	1.8	37.3876	35.6	0.0818	38.7	0.0222	15.2	0.39	141.4	21.3	79.8	29.7	-1526.6	1221.4	141.4	21.3	NA
072609KR-02-22	189	13461	2.0	19.8893	4.6	0.3348	5.3	0.0483	2.5	0.47	304.1	7.4	293.2	13.4	207.9	107.8	304.1	7.4	NA
072609KR-02-24	82	1312	5.8	1.0621	1272.9	1.1832	1273.0	0.0091	18.2	0.01	58.5	10.6	792.8	#NUM!	0.0	443.1	58.5	10.6	NA
072609KR-02-26	211	43882	1.7	8.1271	0.6	5.9970	1.9	0.3535	1.8	0.94	1951.2	29.8	1975.4	16.4	2000.8	11.4	2000.8	11.4	97.5
072609KR-02-27	297	11738	3.5	21.9235	9.8	0.1173	10.3	0.0187	3.0	0.29	119.1	3.5	112.6	10.9	-22.8	238.2	119.1	3.5	NA
072609KR-02-28	637	8676	3.4	21.0265	8.8	0.0760	10.0	0.0116	4.8	0.48	74.3	3.5	74.4	7.2	77.4	209.2	74.3	3.5	NA
072609KR-02-29	308	6630	1.6	24.6208	17.5	0.1035	17.6	0.0185	2.4	0.13	118.0	2.8	100.0	16.8	-311.6	450.7	118.0	2.8	NA
072609KR-02-30	86	2715	3.1	27.0022	58.2	0.0946	59.2	0.0185	10.4	0.18	118.4	12.2	91.8	52.0	-554.0	1697.9	118.4	12.2	NA
072609KR-02-31	93	6881	2.3	25.9571	38.7	0.1097	39.3	0.0206	7.1	0.18	131.7	9.2	105.7	39.5	-448.9	1052.2	131.7	9.2	NA
072609KR-02-32	46	19940	2.9	8.6779	2.4	5.2941	3.0	0.3332	1.9	0.61	1853.9	29.9	1867.9	25.9	1883.5	43.3	1883.5	43.3	98.4
072609KR-02-33	152	55418	3.7	11.4528	1.0	2.8770	3.7	0.2390	3.5	0.96	1381.4	44.0	1375.9	27.8	1367.4	19.8	1367.4	19.8	101.0
072609KR-02-34	153	52593	0.6	8.5157	0.4	5.4657	2.4	0.3376	2.4	0.99	1875.0	38.9	1895.2	20.8	1917.5	6.7	1917.5	6.7	97.8
072609KR-02-35	390	56382	2.7	18.7738	3.0	0.3582	3.5	0.0488	1.8	0.51	307.0	5.3	310.9	9.3	340.2	67.9	307.0	5.3	NA
072609KR-02-38	135	13277	3.1	19.5305	5.3	0.3512	6.1	0.0497	3.1	0.51	312.9	9.5	305.6	16.1	249.9	121.3	312.9	9.5	NA
072609KR-02-39	198	6099	2.9	19.9271	18.8	0.1302	19.2	0.0188	4.1	0.21	120.1	4.8	124.2	22.5	203.5	439.4	120.1	4.8	NA
072609KR-02-40	1281	27874	1.4	21.2563	5.6	0.0964	6.0	0.0149	2.3	0.39	95.1	2.2	93.4	5.4	51.5	132.6	95.1	2.2	NA
072609KR-02-41	24	938	3.9	10.3121	98.1	0.3397	98.5	0.0254	9.7	0.10	161.7	15.5	297.0	259.2	1566.7	#VALUE!	161.7	15.5	10.3
072609KR-02-42	191	17418	2.7	18.2924	5.3	0.3838	5.5	0.0509	1.7	0.30	320.2	5.2	329.8	15.5	398.6	117.9	320.2	5.2	NA
072609KR-02-43	70	2810	3.9	29.6211	36.5	0.1019	37.5	0.0219	9.0	0.24	139.7	12.4	98.6	35.3	-810.1	1064.9	139.7	12.4	NA
072609KR-02-46	629	40129	2.9	19.5750	2.0	0.3320	2.8	0.0471	2.0	0.70	296.9	5.7	291.1	7.2	244.7	46.4	296.9	5.7	NA
072609KR-02-48	85	3494	3.7	21.3553	36.1	0.1073	41.3	0.0166	20.0	0.48	106.3	21.0	103.5	40.6	40.4	890.1	106.3	21.0	NA
072609KR-02-49	566	15322	2.9	21.5241	3.6	0.1219	4.2	0.0190	2.3	0.53	121.5	2.7	116.8	4.7	21.6	86.0	121.5	2.7	NA
072609KR-02-50	133	2592	2.8	21.8267	25.1	0.1516	25.6	0.0240	5.2	0.20	152.9	7.9	143.4	34.3	-12.1	614.1	152.9	7.9	NA
072609KR-02-51	133	3464	2.4	18.2632	18.7	0.1689	19.2	0.0224	4.4	0.23	142.6	6.2	158.5	28.2	402.2	421.5	142.6	6.2	NA
072609KR-02-52	309	5889	2.5	25.5607	13.0	0.0607	13.6	0.0112	3.8	0.28	72.1	2.7	59.8	7.9	-408.5	341.7	72.1	2.7	NA
072609KR-02-53	128	5568	2.2	23.8057	33.3	0.1280	33.7	0.0221	5.0	0.15	140.9	6.9	122.3	38.8	-226.1	858.6	140.9	6.9	NA
072609KR-02-58	92	2392	3.8	27.1609	31.1	0.1033	33.3	0.0203	11.8	0.35	129.8	15.1	99.8	31.6	-569.8	857.8	129.8	15.1	NA

072609KR-02-59	410	39300	3.3	18.4183	3.0	0.4358	3.8	0.0582	2.3	0.62	364.8	8.3	367.3	11.8	383.2	67.6	364.8	8.3	NA
072609KR-02-60	89	2234	5.0	24.0088	31.2	0.1037	33.2	0.0181	11.3	0.34	115.4	12.9	100.2	31.7	-247.6	805.7	115.4	12.9	NA
072609KR-02-61	40	13399	1.1	8.8426	1.3	5.1603	2.5	0.3309	2.2	0.87	1842.9	35.3	1846.1	21.6	1849.6	22.9	1849.6	22.9	99.6
072609KR-02-62	280	11276	1.6	21.3661	11.7	0.1246	12.5	0.0193	4.2	0.34	123.3	5.2	119.2	14.0	39.2	281.9	123.3	5.2	NA
072609KR-02-63	63	1736	2.4	23.7632	42.8	0.1345	43.3	0.0232	6.8	0.16	147.7	9.9	128.1	52.2	-221.6	1121.0	147.7	9.9	NA
072609KR-02-64	466	19164	3.7	21.9144	13.1	0.0923	13.3	0.0147	2.5	0.18	93.9	2.3	89.7	11.4	-21.8	317.9	93.9	2.3	NA
072609KR-02-65	216	7847	1.6	20.1263	9.5	0.1561	10.0	0.0228	3.1	0.31	145.2	4.5	147.3	13.7	180.3	221.1	145.2	4.5	NA
072609KR-02-66	213	3270	4.7	21.5156	38.7	0.0625	40.5	0.0097	11.7	0.29	62.5	7.3	61.5	24.2	22.5	961.8	62.5	7.3	NA
072609KR-02-67	134	5289	1.8	20.5771	12.7	0.1578	14.7	0.0235	7.4	0.50	150.1	11.0	148.8	20.3	128.5	299.3	150.1	11.0	NA
072609KR-02-68	102	8666	2.8	22.0862	33.2	0.1132	34.2	0.0181	8.5	0.25	115.9	9.8	108.9	35.4	-40.7	825.3	115.9	9.8	NA
072609KR-02-68	979	52041	2.0	19.2459	2.2	0.3426	2.8	0.0478	1.7	0.62	301.2	5.0	299.2	7.2	283.6	50.1	301.2	5.0	NA
072609KR-02-69	4337	85133	2.5	20.6758	0.9	0.1013	2.2	0.0152	2.0	0.92	97.2	2.0	97.9	2.1	117.2	21.0	97.2	2.0	NA
072609KR-02-73	249	6041	1.5	24.1231	12.7	0.1402	12.9	0.0245	2.2	0.17	156.2	3.3	133.2	16.1	-259.6	323.0	156.2	3.3	NA
072609KR-02-74	357	13773	1.6	20.8800	6.3	0.1780	6.5	0.0270	1.7	0.27	171.5	3.0	166.4	10.0	94.0	149.5	171.5	3.0	NA
072609KR-02-75	100	2128	2.9	19.9087	14.8	0.1356	15.0	0.0196	2.5	0.17	125.0	3.1	129.1	18.2	205.6	344.5	125.0	3.1	NA
072609KR-02-75	173	6779	1.7	22.6652	23.2	0.1228	23.4	0.0202	3.0	0.13	128.8	3.9	117.6	26.0	-103.9	577.8	128.8	3.9	NA
072609KR-02-76	92	4370	2.5	21.9133	27.2	0.1524	28.0	0.0242	6.8	0.24	154.3	10.4	144.1	37.6	-21.6	667.8	154.3	10.4	NA
072609KR-02-77	942	12638	4.4	21.4410	8.1	0.0634	8.4	0.0099	2.3	0.27	63.3	1.4	62.4	5.1	30.8	194.4	63.3	1.4	NA
072609KR-02-78	406	35214	3.1	20.4376	7.8	0.1353	8.0	0.0201	2.0	0.25	128.0	2.5	128.8	9.7	144.4	182.6	128.0	2.5	NA
072609KR-02-79	240	13616	2.8	19.9923	10.9	0.1768	12.3	0.0256	5.8	0.47	163.1	9.4	165.3	18.8	195.9	253.2	163.1	9.4	NA
072609KR-02-80	405	44737	1.7	19.6412	6.4	0.3391	7.0	0.0483	3.0	0.43	304.1	8.9	296.5	18.1	236.9	147.2	304.1	8.9	NA
072609KR-02-81	332	5976	4.8	22.0551	13.9	0.0907	14.2	0.0145	3.0	0.21	92.9	2.7	88.2	12.0	-37.3	339.0	92.9	2.7	NA
072609KR-02-82	40	20483	1.0	8.1316	1.8	6.0297	2.8	0.3556	2.1	0.75	1961.3	35.1	1980.1	24.1	1999.9	32.5	1999.9	32.5	98.1
072609KR-02-83	68	3266	3.5	17.5859	25.3	0.1774	26.1	0.0226	6.4	0.25	144.2	9.2	165.8	40.0	486.3	567.2	144.2	9.2	NA
072609KR-02-84	988	82471	3.2	19.0527	1.5	0.3485	4.4	0.0482	4.2	0.94	303.2	12.3	303.6	11.6	306.7	34.8	303.2	12.3	NA
072609KR-02-86	801	56840	2.0	20.5341	4.9	0.1514	5.5	0.0226	2.4	0.44	143.8	3.4	143.2	7.3	133.4	116.3	143.8	3.4	NA
072609KR-02-87	121	8807	2.1	18.8385	21.9	0.1741	22.2	0.0238	3.7	0.16	151.5	5.5	163.0	33.5	332.3	502.3	151.5	5.5	NA
072609KR-02-91	95	2697	2.0	29.3750	31.3	0.0951	32.3	0.0203	8.0	0.25	129.3	10.2	92.3	28.5	-786.4	904.2	129.3	10.2	NA
072609KR-02-92	129	6115	2.9	26.2111	41.9	0.0976	42.3	0.0185	6.2	0.15	118.5	7.2	94.5	38.2	-474.6	1151.4	118.5	7.2	NA
072609KR-02-93	61	3230	2.1	23.7517	35.5	0.1326	36.3	0.0229	7.5	0.21	145.6	10.8	126.5	43.2	-220.4	918.5	145.6	10.8	NA
072609KR-02-94	111	3365	3.3	19.2960	21.1	0.1323	27.0	0.0185	16.9	0.63	118.2	19.7	126.1	32.0	277.7	486.7	118.2	19.7	NA
072609KR-02-96	523	7125	5.6	22.2273	27.3	0.0459	27.7	0.0074	4.8	0.17	47.5	2.3	45.5	12.3	-56.2	675.1	47.5	2.3	NA
072609KR-02-97	281	9075	4.6	20.8056	8.2	0.2199	9.4	0.0332	4.6	0.49	210.4	9.6	201.8	17.2	102.4	193.3	210.4	9.6	NA
072609KR-02-98	255	170128	1.6	5.8831	0.3	10.5347	5.5	0.4495	5.5	1.00	2393.0	109.2	2483.0	50.8	2557.4	5.1	2557.4	5.1	93.6
072609KR-02-100	173	7047	2.7	23.0481	19.7	0.1415	20.1	0.0237	3.8	0.19	150.7	5.6	134.4	25.3	-145.3	492.3	150.7	5.6	NA
072609KR-02-101	235	5416	2.4	21.9433	11.7	0.1846	12.0	0.0294	3.0	0.25	186.6	5.4	172.0	19.0	-24.9	283.1	186.6	5.4	NA
072609KR-02-102	379	34890	3.8	19.4240	3.9	0.3582	4.3	0.0505	1.7	0.40	317.4	5.3	310.9	11.4	262.5	89.9	317.4	5.3	NA
072609KR-02-104	1905	167741	1.9	19.4990	0.9	0.2473	2.6	0.0350	2.5	0.94	221.6	5.4	224.4	5.3	253.7	21.2	221.6	5.4	NA

Christochina River – 072609KR-05

						Isotope ratios							Apparent ages (Ma)						
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
Christochina River																			
072609KR-05-1	1189	33502	1.6	20.7609	4.1	0.0999	5.2	0.0150	3.2	0.61	96.3	3.1	96.7	4.8	107.5	97.4	96.3	3.1	NA
072609KR-05-2	2464	53993	1.0	20.9608	1.6	0.1035	2.6	0.0157	2.0	0.78	100.6	2.0	100.0	2.5	84.8	38.2	100.6	2.0	NA
072609KR-05-3	166	5442	3.2	21.5257	40.4	0.1105	40.9	0.0172	6.9	0.17	110.2	7.5	106.4	41.4	21.4	1005.2	110.2	7.5	NA
072609KR-05-4	225	164577	1.5	8.1132	0.6	6.4957	2.6	0.3822	2.6	0.98	2086.7	45.8	2045.3	23.2	2003.9	9.9	2003.9	9.9	104.1
072609KR-05-5	134	68060	1.1	9.8920	0.7	4.2022	1.9	0.3015	1.8	0.94	1698.6	26.3	1674.4	15.5	1644.2	12.3	1644.2	12.3	103.3
072609KR-05-6	163	6723	4.0	23.6213	16.2	0.1595	16.5	0.0273	3.4	0.21	173.8	5.9	150.3	23.1	-206.6	408.2	173.8	5.9	NA
072609KR-05-7	112	57980	1.4	8.8985	1.0	5.1873	1.8	0.3348	1.5	0.82	1861.5	23.6	1850.5	15.2	1838.2	18.5	1838.2	18.5	101.3
072609KR-05-8	107	2154	4.3	35.6958	59.2	0.0688	59.4	0.0178	4.4	0.07	113.8	4.9	67.5	38.8	-1374.5	2066.8	113.8	4.9	NA
072609KR-05-9	62	42796	1.3	5.1950	0.6	14.3536	1.9	0.5408	1.8	0.94	2786.8	41.4	2773.4	18.4	2763.6	10.5	2763.6	10.5	100.8
072609KR-05-10	507	14816	2.8	21.4213	11.2	0.1208	12.1	0.0188	4.7	0.39	119.9	5.6	115.8	13.3	33.0	269.1	119.9	5.6	NA
072609KR-05-11	365	130219	1.7	8.7601	0.5	4.9069	5.9	0.3118	5.9	1.00	1749.3	89.9	1803.4	49.7	1866.6	8.9	1866.6	8.9	93.7
072609KR-05-12	114	101255	1.6	7.7861	0.6	6.9411	2.3	0.3920	2.2	0.97	2131.9	40.3	2103.9	20.4	2076.6	10.3	2076.6	10.3	102.7
072609KR-05-13	74	48953	1.4	8.8419	1.1	5.4059	2.0	0.3467	1.7	0.83	1918.7	28.2	1885.8	17.4	1849.8	20.3	1849.8	20.3	103.7
072609KR-05-14	243	6167	2.5	26.5428	26.0	0.0877	27.2	0.0169	7.9	0.29	107.9	8.4	85.3	22.3	-508.1	704.1	107.9	8.4	NA
072609KR-05-15	3260	292730	2.3	20.6680	1.0	0.1012	1.8	0.0152	1.5	0.82	97.1	1.4	97.9	1.7	118.1	24.1	97.1	1.4	NA
072609KR-05-16	404	53707	1.4	18.7261	2.7	0.4470	3.0	0.0607	1.4	0.47	379.9	5.3	375.2	9.5	345.9	60.3	379.9	5.3	NA
072609KR-05-17	584	38946	21.5	18.5963	2.4	0.4334	3.7	0.0585	2.7	0.74	366.2	9.7	365.6	11.2	361.6	55.2	366.2	9.7	NA
072609KR-05-18	270	10162	2.0	20.1820	13.0	0.1320	13.4	0.0193	3.4	0.25	123.4	4.2	125.9	15.9	173.9	303.8	123.4	4.2	NA
072609KR-05-19	111	131349	0.9	5.3612	0.7	13.3794	1.3	0.5202	1.0	0.81	2700.2	22.4	2706.8	11.9	2711.7	12.2	2711.7	12.2	99.6
072609KR-05-20	686	29815	2.7	20.3067	7.9	0.1285	8.3	0.0189	2.7	0.33	120.8	3.3	122.7	9.6	159.5	184.5	120.8	3.3	NA
072609KR-05-21	383	11362	2.7	21.0127	5.8	0.1302	6.6	0.0198	3.0	0.46	126.6	3.8	124.3	7.7	78.9	138.5	126.6	3.8	NA
072609KR-05-22	162	4713	2.1	23.2532	24.7	0.1028	25.3	0.0173	5.4	0.21	110.8	6.0	99.3	23.9	-167.3	622.9	110.8	6.0	NA
072609KR-05-23	3012	78509	3.2	21.0128	2.0	0.1003	2.2	0.0153	1.0	0.43	97.8	0.9	97.0	2.1	78.9	48.2	97.8	0.9	NA
072609KR-05-24	146	130416	7.6	8.9750	0.7	5.0523	3.0	0.3289	2.9	0.97	1832.9	45.9	1828.1	25.1	1822.7	12.5	1822.7	12.5	100.6
072609KR-05-25	155	18072	1.8	22.3079	30.3	0.1211	31.0	0.0196	6.3	0.20	125.1	7.8	116.1	34.0	-65.0	754.8	125.1	7.8	NA
072609KR-05-26	217	99504	3.5	12.8007	0.9	2.0524	1.5	0.1905	1.1	0.78	1124.3	11.8	1133.1	10.0	1150.0	18.2	1150.0	18.2	97.8
072609KR-05-27	687	16561	1.5	21.1997	7.6	0.0942	8.8	0.0145	4.5	0.51	92.7	4.1	91.4	7.7	57.8	181.9	92.7	4.1	NA
072609KR-05-28	52	30936	1.3	9.1078	1.7	4.7504	3.8	0.3138	3.4	0.89	1759.4	52.0	1776.2	31.7	1796.0	31.0	1796.0	31.0	98.0
072609KR-05-29	275	204787	1.1	9.7824	0.6	4.1463	1.4	0.2942	1.3	0.92	1662.4	18.8	1663.5	11.4	1664.9	10.2	1664.9	10.2	99.8
072609KR-05-30	320	8412	2.1	23.4538	12.9	0.0940	13.8	0.0160	5.1	0.37	102.3	5.1	91.2	12.1	-188.7	322.5	102.3	5.1	NA
072609KR-05-31	1085	39861	3.9	22.5619	5.0	0.0613	5.4	0.0100	2.0	0.37	64.3	1.3	60.4	3.1	-92.7	122.0	64.3	1.3	NA
072609KR-05-32	203	20312	2.1	22.3799	10.3	0.1780	11.8	0.0289	5.8	0.49	183.7	10.6	166.4	18.2	-72.9	252.7	183.7	10.6	NA
072609KR-05-33	1340	28089	1.3	21.2733	3.6	0.0971	4.1	0.0150	1.9	0.47	95.9	1.8	94.1	3.7	49.6	86.0	95.9	1.8	NA
072609KR-05-34	166	7890	2.9	23.6728	16.1	0.1001	17.7	0.0172	7.4	0.42	109.8	8.1	96.8	16.3	-212.0	405.4	109.8	8.1	NA
072609KR-05-35	1019	30650	1.1	20.1959	3.4	0.1004	4.0	0.0147	2.0	0.51	94.1	1.9	97.1	3.7	172.3	80.3	94.1	1.9	NA
072609KR-05-37	256	23943	1.3	18.3067	2.7	0.4804	3.0	0.0638	1.3	0.44	398.6	5.1	398.3	9.8	396.9	59.9	398.6	5.1	NA
072609KR-05-38	93	65515	3.4	8.9056	1.6	5.1230	3.2	0.3309	2.7	0.86	1842.7	43.6	1839.9	26.8	1836.8	29.1	1836.8	29.1	100.3
072609KR-05-39	532	23385	1.8	20.9530	5.1	0.0984	5.5	0.0149	1.9	0.35	95.7	1.8	95.3	5.0	85.7	121.7	95.7	1.8	NA
072609KR-05-40	318	182911	2.0	10.6597	0.8	3.2912	1.8	0.2544	1.7	0.91	1461.4	22.0	1479.0	14.4	1504.3	14.4	1504.3	14.4	97.1
072609KR-05-41	85	45468	1.0	8.4620	1.3	5.6555	2.6	0.3471	2.3	0.86	1920.7	37.7	1924.6	22.7	1928.8	24.1	1928.8	24.1	99.6
072609KR-05-42	594	22864	1.4	21.2197	10.5	0.0926	10.8	0.0143	2.5	0.23	91.2	2.2	89.9	9.3	55.6	250.7	91.2	2.2	NA
072609KR-05-43	559	44676	1.9	20.5553	6.6	0.0978	8.0	0.0146	4.4	0.56	93.3	4.1	94.7	7.2	130.9	156.2	93.3	4.1	NA

072609KR-05-44	122	151606	0.9	5.3836	0.5	13.5099	2.2	0.5275	2.1	0.98	2730.9	47.7	2716.0	20.7	2704.9	7.7	2704.9	7.7	101.0
072609KR-05-45	140	48513	1.5	8.8823	0.8	5.1309	2.2	0.3305	2.0	0.94	1841.0	32.6	1841.2	18.5	1841.5	13.9	1841.5	13.9	100.0
072609KR-05-46	277	2937	3.8	25.1193	16.9	0.0604	17.6	0.0110	5.0	0.29	70.5	3.5	59.5	10.2	-363.2	439.1	70.5	3.5	NA
072609KR-05-47	167	168093	2.6	6.5554	0.4	9.3486	1.3	0.4445	1.3	0.96	2370.6	25.2	2372.8	12.2	2374.7	6.7	2374.7	6.7	99.8
072609KR-05-48	809	25211	1.9	21.5913	5.2	0.0946	5.6	0.0148	1.9	0.35	94.8	1.8	91.8	4.9	14.0	125.0	94.8	1.8	NA
072609KR-05-49	208	51541	2.4	13.4722	1.8	1.7869	6.0	0.1746	5.8	0.95	1037.4	55.1	1040.7	39.3	1047.7	37.0	1047.7	37.0	99.0
072609KR-05-50	83	1247	4.3	35.4608	59.4	0.0678	59.7	0.0174	5.9	0.10	111.4	6.5	66.6	38.5	-1353.2	2063.4	111.4	6.5	NA
072609KR-05-51	319	12299	1.9	19.5328	12.0	0.1211	12.3	0.0172	2.8	0.23	109.6	3.1	116.1	13.5	249.6	276.6	109.6	3.1	NA
072609KR-05-53	253	34906	1.5	15.5135	2.5	1.0814	4.7	0.1217	4.0	0.84	740.2	27.7	744.3	24.8	756.7	53.2	740.2	27.7	97.8
072609KR-05-54	793	10997	1.3	20.8958	4.7	0.0956	6.0	0.0145	3.7	0.62	92.8	3.4	92.7	5.3	92.2	111.6	92.8	3.4	NA
072609KR-05-55	374	6198	1.7	18.4050	3.6	0.4451	5.1	0.0594	3.5	0.70	372.0	12.8	373.8	15.9	384.9	82.0	372.0	12.8	NA
072609KR-05-56	89	87321	1.7	9.2234	1.4	4.6453	2.2	0.3107	1.7	0.79	1744.4	26.5	1757.4	18.4	1773.0	24.9	1773.0	24.9	98.4
072609KR-05-57	292	7925	2.9	22.7003	8.5	0.1130	8.7	0.0186	1.4	0.16	118.8	1.6	108.7	8.9	-107.7	210.5	118.8	1.6	NA
072609KR-05-58	196	92276	2.4	11.5035	1.1	2.6131	1.9	0.2180	1.5	0.80	1271.4	17.5	1304.3	14.0	1358.9	22.1	1358.9	22.1	93.6
072609KR-05-59	139	4776	2.4	22.0572	27.6	0.1063	28.1	0.0170	5.0	0.18	108.7	5.4	102.6	27.4	-37.5	682.4	108.7	5.4	NA
072609KR-05-60	153	3711	1.4	20.3193	40.7	0.0899	41.3	0.0133	6.6	0.16	84.9	5.6	87.4	34.6	158.1	990.2	84.9	5.6	NA
072609KR-05-61	102	6107	3.6	19.2262	22.6	0.1880	23.0	0.0262	4.1	0.18	166.8	6.7	174.9	36.9	285.9	522.5	166.8	6.7	NA
072609KR-05-62	269	300424	4.0	6.8196	0.5	7.0846	3.5	0.3504	3.4	0.99	1936.5	57.0	2122.1	30.7	2307.1	9.3	2307.1	9.3	83.9
072609KR-05-63	429	12491	3.6	22.1436	10.4	0.0708	10.6	0.0114	2.0	0.19	72.9	1.5	69.5	7.1	-47.0	252.5	72.9	1.5	NA
072609KR-05-64	481	25800	3.3	21.1760	6.7	0.1182	8.1	0.0182	4.6	0.57	116.0	5.3	113.4	8.7	60.5	159.6	116.0	5.3	NA
072609KR-05-65	188	10776	3.3	21.9730	14.3	0.1735	14.8	0.0277	3.5	0.24	175.9	6.2	162.5	22.2	-28.2	349.1	175.9	6.2	NA
072609KR-05-66	1004	11903	4.0	22.4369	9.2	0.0450	9.7	0.0073	3.2	0.33	47.1	1.5	44.7	4.2	-79.1	224.5	47.1	1.5	NA
072609KR-05-67	1603	25828	1.6	21.0887	2.3	0.0991	2.8	0.0152	1.6	0.58	97.0	1.6	96.0	2.6	70.4	54.2	97.0	1.6	NA
072609KR-05-68	73	35591	2.4	9.9565	1.3	3.9537	2.4	0.2855	2.1	0.85	1619.0	29.4	1624.8	19.6	1632.2	23.7	1632.2	23.7	99.2
072609KR-05-69	2004	60211	3.0	20.5611	2.2	0.1019	4.1	0.0152	3.4	0.84	97.2	3.3	98.5	3.8	130.3	51.2	97.2	3.3	NA
072609KR-05-70	94	3646	2.4	89.0948	99.8	0.0266	100.3	0.0172	9.9	0.10	110.0	10.7	26.7	26.4	0.0	#VALUE!	110.0	10.7	NA
072609KR-05-71	217	4732	2.7	24.7004	30.8	0.0454	33.6	0.0081	13.6	0.40	52.2	7.1	45.0	14.8	-319.9	805.1	52.2	7.1	NA
072609KR-05-72	241	25193	2.5	20.2604	8.5	0.2106	9.7	0.0309	4.8	0.49	196.4	9.3	194.0	17.2	164.8	198.1	196.4	9.3	NA
072609KR-05-73	468	24298	2.5	20.8743	6.8	0.0941	7.1	0.0143	2.0	0.29	91.2	1.8	91.3	6.2	94.6	160.7	91.2	1.8	NA
072609KR-05-74	206	9329	2.4	25.3050	21.7	0.1014	22.3	0.0186	4.9	0.22	118.9	5.7	98.1	20.8	-382.3	569.7	118.9	5.7	NA
072609KR-05-75	971	29172	1.2	21.2406	3.1	0.1021	5.5	0.0157	4.5	0.83	100.6	4.5	98.7	5.1	53.2	72.8	100.6	4.5	NA
072609KR-05-76	175	6648	3.1	26.7030	41.0	0.0986	41.1	0.0191	1.7	0.04	122.0	2.0	95.5	37.4	-524.1	1137.7	122.0	2.0	NA
072609KR-05-77	345	11415	1.8	22.9287	9.2	0.1129	9.9	0.0188	3.7	0.37	119.9	4.3	108.6	10.2	-132.4	226.8	119.9	4.3	NA
072609KR-05-78	416	8469	1.9	22.1433	9.9	0.0907	10.1	0.0146	1.9	0.19	93.2	1.8	88.1	8.5	-47.0	240.6	93.2	1.8	NA
072609KR-05-79	312	3353	5.3	22.8872	30.0	0.0497	30.5	0.0083	5.4	0.18	53.0	2.9	49.3	14.7	-128.0	756.7	53.0	2.9	NA
072609KR-05-80	1290	20937	3.4	20.9741	3.6	0.0516	4.0	0.0079	1.7	0.42	50.4	0.8	51.1	2.0	83.3	85.7	50.4	0.8	NA
072609KR-05-81	389	191476	1.9	9.4017	0.3	4.5962	2.5	0.3134	2.4	0.99	1757.4	37.7	1748.6	20.6	1738.0	5.7	1738.0	5.7	101.1
072609KR-05-82	903	20856	2.2	20.6114	3.2	0.1278	3.6	0.0191	1.7	0.46	122.0	2.0	122.1	4.2	124.5	76.3	122.0	2.0	NA
072609KR-05-83	159	157932	1.1	7.3924	0.7	7.3869	2.5	0.3960	2.4	0.96	2150.8	44.1	2159.4	22.4	2167.5	11.8	2167.5	11.8	99.2
072609KR-05-84	256	26029	2.5	18.9114	4.0	0.3577	4.3	0.0491	1.6	0.37	308.7	4.8	310.5	11.6	323.6	91.5	308.7	4.8	NA
072609KR-05-85	172	1814	2.5	15.3127	96.3	0.0646	96.7	0.0072	8.4	0.09	46.1	3.9	63.6	59.6	784.2	#VALUE!	46.1	3.9	NA
072609KR-05-86	294	10254	2.3	22.5552	12.8	0.0911	13.2	0.0149	3.4	0.26	95.4	3.2	88.6	11.2	-92.0	314.9	95.4	3.2	NA
072609KR-05-87	98	161594	1.4	5.8513	0.8	11.4461	2.6	0.4857	2.5	0.95	2552.2	51.8	2560.2	24.2	2566.5	13.6	2566.5	13.6	99.4
072609KR-05-88	139	67305	1.1	12.8596	2.1	2.0406	2.6	0.1903	1.5	0.57	1123.1	15.0	1129.2	17.5	1140.8	42.2	1140.8	42.2	98.4
072609KR-05-89	3501	72757	1.7	20.7690	1.0	0.1033	2.8	0.0156	2.6	0.93	99.5	2.6	99.8	2.7	106.6	24.5	99.5	2.6	NA

072609KR-05-90	740	12887	1.8	20.9337	8.0	0.0614	9.3	0.0093	4.7	0.51	59.8	2.8	60.5	5.4	87.9	189.6	59.8	2.8	NA
072609KR-05-91	711	13487	1.7	21.6051	4.5	0.0927	5.0	0.0145	2.2	0.44	92.9	2.1	90.0	4.3	12.5	108.2	92.9	2.1	NA
072609KR-05-92	2847	64700	1.2	20.8268	2.3	0.0988	2.5	0.0149	1.0	0.41	95.5	1.0	95.7	2.3	100.0	53.7	95.5	1.0	NA
072609KR-05-93	242	19533	0.5	5.3543	0.4	13.2814	2.4	0.5158	2.3	0.99	2681.2	51.2	2699.9	22.3	2713.9	6.4	2713.9	6.4	98.8
072609KR-05-94	297	36530	2.0	18.2565	3.7	0.4587	4.0	0.0607	1.6	0.40	380.1	5.9	383.4	12.9	403.0	83.2	380.1	5.9	NA
072609KR-05-95	97	651685	0.8	5.3260	0.4	13.8369	2.2	0.5345	2.2	0.98	2760.3	48.7	2738.6	20.9	2722.6	7.0	2722.6	7.0	101.4
072609KR-05-96	273	4473	3.1	23.7404	28.4	0.0486	29.2	0.0084	6.6	0.22	53.7	3.5	48.2	13.7	-219.2	727.7	53.7	3.5	NA
072609KR-05-97	340	15678	2.0	20.6270	10.6	0.1634	11.4	0.0244	4.1	0.36	155.6	6.2	153.6	16.2	122.7	250.3	155.6	6.2	NA
072609KR-05-98	390	9136	1.6	22.6470	14.6	0.0911	15.0	0.0150	3.6	0.24	95.8	3.4	88.6	12.7	-102.0	359.7	95.8	3.4	NA
072609KR-05-99	66	1819	3.6	18.1990	88.3	0.1240	88.8	0.0164	8.9	0.10	104.6	9.3	118.7	99.8	410.1	2699.0	104.6	9.3	NA
072609KR-05-100	1137	121172	1.7	19.1424	1.5	0.3507	2.0	0.0487	1.3	0.66	306.5	3.9	305.3	5.2	295.9	34.0	306.5	3.9	NA
072609KR-05-101	47	41970	0.7	5.4996	0.7	12.7257	2.3	0.5076	2.2	0.96	2646.3	48.6	2659.6	22.0	2669.6	11.1	2669.6	11.1	99.1
072609KR-05-102	140	45889	1.2	16.9440	4.1	0.7388	4.5	0.0908	1.9	0.42	560.2	10.2	561.7	19.4	567.8	88.5	560.2	10.2	98.7
072609KR-05-103	210	26942	2.1	24.1220	19.8	0.1138	19.9	0.0199	2.4	0.12	127.1	3.1	109.4	20.7	-259.5	505.0	127.1	3.1	NA
072609KR-05-104	1152	84193	1.3	20.2111	1.8	0.1035	3.1	0.0152	2.4	0.80	97.1	2.4	100.0	2.9	170.5	42.9	97.1	2.4	NA
072609KR-05-105	267	6361	2.4	23.4246	9.0	0.1322	9.8	0.0225	3.9	0.40	143.2	5.6	126.1	11.6	-185.6	224.1	143.2	5.6	NA

Upper Copper River – 072609KR-06

						Isotope ratios							Apparent ages (Ma)						
Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
Upper Copper River																			
072609KR-06-1	1129	36278	3.3	20.9579	4.5	0.0983	5.2	0.0149	2.5	0.48	95.6	2.4	95.2	4.7	85.2	107.8	95.6	2.4	NA
072609KR-06-2	574	18572	2.8	21.3132	6.4	0.0953	7.3	0.0147	3.4	0.47	94.3	3.2	92.5	6.5	45.1	154.0	94.3	3.2	NA
072609KR-06-5	99	76697	1.3	5.4625	0.4	13.0152	1.8	0.5156	1.7	0.98	2680.6	38.1	2680.8	16.8	2680.8	6.3	2680.8	6.3	100.0
072609KR-06-6	894	104558	1.8	19.2478	1.2	0.3337	2.5	0.0466	2.2	0.88	293.5	6.3	292.4	6.3	283.4	26.6	293.5	6.3	NA
072609KR-06-7	870	25443	2.2	21.5464	4.6	0.0899	5.1	0.0140	2.1	0.42	89.9	1.9	87.4	4.3	19.1	110.9	89.9	1.9	NA
072609KR-06-9	644	129975	2.4	18.9524	1.6	0.3570	2.0	0.0491	1.1	0.57	308.8	3.4	309.9	5.3	318.6	37.2	308.8	3.4	NA
072609KR-06-10	155	2323	3.8	24.1370	23.7	0.0974	24.2	0.0171	4.7	0.19	109.0	5.1	94.4	21.8	-261.0	609.1	109.0	5.1	NA
072609KR-06-11	679	53028	2.2	19.3694	1.4	0.3405	2.4	0.0478	2.0	0.81	301.2	5.8	297.6	6.3	268.9	32.6	301.2	5.8	NA
072609KR-06-13	256	23630	2.4	21.6786	10.1	0.0937	11.3	0.0147	5.1	0.45	94.2	4.8	90.9	9.8	4.3	243.6	94.2	4.8	NA
072609KR-06-14	120	3637	2.4	25.8920	45.8	0.0885	46.0	0.0166	4.4	0.10	106.2	4.6	86.1	38.0	-442.3	1262.2	106.2	4.6	NA
072609KR-06-15	854	22152	3.3	20.5722	6.8	0.1044	7.1	0.0156	2.3	0.32	99.6	2.2	100.8	6.8	129.1	159.3	99.6	2.2	NA
072609KR-06-16	108	43737	1.8	11.7054	1.3	2.7348	1.8	0.2322	1.3	0.72	1345.9	16.2	1338.0	13.7	1325.3	24.6	1325.3	24.6	101.6
072609KR-06-17	334	129304	1.8	11.0133	0.7	3.1890	6.3	0.2547	6.3	0.99	1462.8	82.4	1454.5	49.0	1442.4	13.9	1442.4	13.9	101.4
072609KR-06-18	234	5282	2.3	23.7119	9.5	0.1032	9.8	0.0177	2.7	0.27	113.4	3.0	99.7	9.4	-216.2	238.6	113.4	3.0	NA
072609KR-06-19	225	205179	3.0	8.1031	0.4	6.2953	2.2	0.3700	2.2	0.99	2029.3	38.2	2017.8	19.5	2006.1	6.4	2006.1	6.4	101.2
072609KR-06-20	146	143181	2.9	8.7684	0.7	5.3842	2.4	0.3424	2.3	0.96	1898.2	37.7	1882.3	20.5	1864.8	12.2	1864.8	12.2	101.8
072609KR-06-21	399	16685	3.3	23.5307	9.0	0.0870	9.9	0.0148	4.2	0.42	95.0	3.9	84.7	8.0	-196.9	224.5	95.0	3.9	NA
072609KR-06-22	846	22285	5.7	21.4081	4.5	0.0965	4.9	0.0150	2.0	0.40	95.8	1.9	93.5	4.4	34.5	108.0	95.8	1.9	NA
072609KR-06-23	151	91042	2.9	8.7995	0.6	5.1995	1.8	0.3318	1.7	0.94	1847.3	26.7	1852.5	15.0	1858.4	10.7	1858.4	10.7	99.4
072609KR-06-24	260	18068	2.6	19.2061	4.1	0.3462	4.3	0.0482	1.3	0.30	303.6	3.8	301.9	11.1	288.3	92.9	303.6	3.8	NA
072609KR-06-25	82	60188	2.5	5.4231	0.5	13.1177	1.3	0.5159	1.2	0.93	2682.0	25.7	2688.2	11.8	2692.8	7.5	2692.8	7.5	99.6
072609KR-06-26	1091	92352	2.7	19.1593	1.3	0.3528	2.1	0.0490	1.7	0.79	308.5	5.0	306.8	5.6	293.9	29.4	308.5	5.0	NA
072609KR-06-27	883	70529	2.7	19.1307	1.0	0.3487	2.9	0.0484	2.7	0.94	304.6	8.2	303.8	7.7	297.3	22.8	304.6	8.2	NA
072609KR-06-28	135	32075	1.6	16.8806	3.9	0.7212	5.0	0.0883	3.1	0.63	545.5	16.3	551.4	21.1	575.9	84.1	545.5	16.3	94.7
072609KR-06-29	857	13844	14.9	19.7829	4.7	0.0611	5.9	0.0088	3.6	0.60	56.3	2.0	60.2	3.5	220.3	109.7	56.3	2.0	NA
072609KR-06-30	194	30380	6.8	18.4268	3.0	0.3869	4.3	0.0517	3.1	0.72	325.0	9.8	332.1	12.2	382.2	67.0	325.0	9.8	NA
072609KR-06-31	720	85157	1.6	19.0923	2.1	0.3344	2.5	0.0463	1.3	0.51	291.8	3.6	292.9	6.3	301.9	48.2	291.8	3.6	NA
072609KR-06-32	176	11747	1.7	20.3638	9.9	0.2017	10.2	0.0298	2.5	0.24	189.3	4.6	186.6	17.4	152.9	232.6	189.3	4.6	NA
072609KR-06-33	220	18116	3.9	19.0564	4.7	0.3508	4.9	0.0485	1.4	0.29	305.2	4.2	305.3	12.9	306.2	106.9	305.2	4.2	NA
072609KR-06-34	383	138669	1.9	17.8363	2.5	0.5146	3.1	0.0666	1.8	0.58	415.4	7.3	421.5	10.8	454.9	56.6	415.4	7.3	NA
072609KR-06-35	346	44123	3.6	19.2044	2.6	0.3684	2.9	0.0513	1.2	0.43	322.5	3.8	318.4	7.8	288.5	59.2	322.5	3.8	NA
072609KR-06-36	774	48195	1.8	18.9862	1.3	0.3474	2.1	0.0478	1.7	0.81	301.2	5.0	302.8	5.6	314.6	28.6	301.2	5.0	NA
072609KR-06-37	393	9250	2.5	21.4511	9.0	0.0954	9.5	0.0148	3.1	0.32	95.0	2.9	92.5	8.4	29.7	216.7	95.0	2.9	NA
072609KR-06-38	149	80807	1.8	8.0034	0.8	6.1023	4.1	0.3542	4.0	0.98	1954.7	67.5	1990.6	35.6	2028.0	13.9	2028.0	13.9	96.4
072609KR-06-39	91	26632	2.6	12.8350	2.8	2.0274	6.0	0.1887	5.4	0.89	1114.5	54.9	1124.8	41.1	1144.6	55.4	1144.6	55.4	97.4
072609KR-06-40	266	3927	1.7	17.6893	8.5	0.4929	9.8	0.0632	4.9	0.50	395.3	18.6	406.9	32.7	473.3	187.5	395.3	18.6	NA
072609KR-06-41	1497	151200	1.9	19.0187	0.8	0.3386	1.4	0.0467	1.2	0.84	294.2	3.5	296.1	3.7	310.7	17.7	294.2	3.5	NA
072609KR-06-42	105	65998	2.2	8.8701	0.7	5.0989	2.4	0.3280	2.3	0.96	1828.8	37.2	1835.9	20.6	1844.0	12.1	1844.0	12.1	99.2
072609KR-06-43	75	29779	1.2	10.1567	1.8	3.6067	3.7	0.2657	3.2	0.87	1518.8	43.1	1551.0	29.2	1595.1	33.9	1595.1	33.9	95.2
072609KR-06-44	477	55444	2.1	19.0397	2.2	0.3381	2.7	0.0467	1.7	0.61	294.1	4.8	295.7	7.0	308.2	49.4	294.1	4.8	NA
072609KR-06-45	481	72794	2.0	19.4168	2.1	0.3371	3.1	0.0475	2.3	0.73	299.0	6.6	294.9	7.9	263.3	48.3	299.0	6.6	NA
072609KR-06-46	1530	25528	2.7	20.9653	2.8	0.1002	5.9	0.0152	5.1	0.87	97.5	5.0	97.0	5.4	84.3	67.5	97.5	5.0	NA
072609KR-06-47	262	142099	0.6	8.8972	0.5	5.0599	1.8	0.3265	1.8	0.96	1821.4	28.0	1829.4	15.7	1838.5	9.7	1838.5	9.7	99.1
072609KR-06-48	384	38207	1.6	18.2088	2.5	0.4441	3.5	0.0586	2.4	0.70	367.4	8.6	373.1	10.8	408.9	55.2	367.4	8.6	NA
072609KR-06-49	93	30671	3.5	11.7435	1.4	2.6521	2.4	0.2259	2.0	0.81	1312.9	23.3	1315.2	17.8	1319.0	27.1	1319.0	27.1	99.5

072609KR-06-50	981	125048	2.5	18.9367	1.5	0.3593	3.2	0.0493	2.8	0.88	310.5	8.5	311.7	8.6	320.6	34.8	310.5	8.5	NA
072609KR-06-51	702	18579	1.7	20.9695	5.6	0.1033	6.2	0.0157	2.8	0.44	100.5	2.8	99.8	5.9	83.8	132.2	100.5	2.8	NA
072609KR-06-52	809	74482	2.2	20.7025	4.1	0.1286	5.0	0.0193	2.7	0.55	123.3	3.3	122.9	5.7	114.2	97.6	123.3	3.3	NA
072609KR-06-54	79	4808	4.0	17.0687	30.6	0.1442	31.0	0.0179	4.6	0.15	114.1	5.2	136.8	39.6	551.8	683.0	114.1	5.2	NA
072609KR-06-55	922	38449	3.6	21.0385	7.6	0.0986	7.7	0.0150	1.5	0.19	96.3	1.4	95.5	7.1	76.0	180.8	96.3	1.4	NA
072609KR-06-56	310	155675	1.9	12.9212	0.7	2.0003	1.3	0.1875	1.1	0.86	1107.6	11.7	1115.6	9.1	1131.3	13.7	1131.3	13.7	97.9
072609KR-06-57	118	114705	1.7	4.8007	0.4	15.8825	1.5	0.5530	1.4	0.96	2837.6	32.8	2869.8	14.2	2892.4	6.9	2892.4	6.9	98.1
072609KR-06-58	216	175412	1.2	8.8603	1.0	5.0398	1.3	0.3239	0.9	0.65	1808.6	13.5	1826.0	11.2	1846.0	18.2	1846.0	18.2	98.0
072609KR-06-59	1055	17238	5.6	20.5423	8.7	0.0535	10.1	0.0080	5.2	0.51	51.1	2.6	52.9	5.2	132.5	204.8	51.1	2.6	NA
072609KR-06-60	193	133431	3.3	8.6931	0.6	5.3772	2.2	0.3390	2.2	0.97	1882.0	35.2	1881.2	19.1	1880.4	10.0	1880.4	10.0	100.1
072609KR-06-61	154	4559	3.4	21.5556	20.6	0.1057	23.1	0.0165	10.6	0.46	105.7	11.1	102.0	22.4	18.0	498.3	105.7	11.1	NA
072609KR-06-62	685	47711	1.9	19.3533	1.8	0.3430	3.2	0.0482	2.6	0.82	303.2	7.8	299.5	8.3	270.8	42.3	303.2	7.8	NA
072609KR-06-63	134	65140	4.5	12.9315	1.3	2.1306	2.4	0.1998	2.0	0.83	1174.4	21.3	1158.8	16.5	1129.7	26.6	1129.7	26.6	104.0
072609KR-06-64	2711	81901	2.3	20.7260	1.3	0.0984	1.7	0.0148	1.1	0.65	94.6	1.1	95.3	1.6	111.5	31.2	94.6	1.1	NA
072609KR-06-65	482	73389	1.6	19.1423	3.1	0.3476	4.0	0.0483	2.5	0.63	303.8	7.3	302.9	10.4	295.9	70.5	303.8	7.3	NA
072609KR-06-66	3175	132395	0.9	20.8554	1.0	0.1033	3.6	0.0156	3.5	0.96	99.9	3.4	99.8	3.4	96.7	24.8	99.9	3.4	NA
072609KR-06-67	316	6084	3.3	28.7343	41.5	0.0511	41.9	0.0107	5.5	0.13	68.3	3.8	50.6	20.7	-724.5	1200.5	68.3	3.8	NA
072609KR-06-68	745	70674	1.6	19.1074	1.6	0.3440	2.5	0.0477	1.9	0.77	300.2	5.6	300.2	6.4	300.1	35.7	300.2	5.6	NA
072609KR-06-69	53	9888	2.0	18.9573	13.1	0.5196	14.5	0.0714	6.1	0.42	444.9	26.1	424.9	50.3	318.0	299.6	444.9	26.1	NA
072609KR-06-70	477	34143	1.9	19.2204	2.4	0.3434	2.6	0.0479	1.0	0.38	301.4	2.9	299.8	6.7	286.6	54.6	301.4	2.9	NA
072609KR-06-72	976	98553	2.5	19.1541	1.1	0.3351	4.1	0.0465	4.0	0.96	293.3	11.4	293.4	10.6	294.5	26.1	293.3	11.4	NA
072609KR-06-73	113	74056	1.4	8.1596	0.7	6.1238	3.1	0.3624	3.0	0.97	1993.6	51.3	1993.6	26.9	1993.7	13.1	1993.7	13.1	100.0
072609KR-06-74	1090	25368	0.8	20.9198	4.3	0.0998	5.4	0.0151	3.3	0.61	96.9	3.2	96.6	5.0	89.5	101.7	96.9	3.2	NA
072609KR-06-75	1354	38312	3.6	22.4397	4.6	0.0578	4.9	0.0094	1.5	0.30	60.3	0.9	57.0	2.7	-79.4	113.5	60.3	0.9	NA
072609KR-06-76	120	53154	2.6	11.3086	1.0	2.8524	1.7	0.2339	1.3	0.79	1355.2	16.0	1369.4	12.4	1391.8	19.4	1391.8	19.4	97.4
072609KR-06-77	152	100555	2.2	7.7571	0.6	6.7755	2.4	0.3812	2.3	0.97	2081.8	41.0	2082.5	21.0	2083.2	10.0	2083.2	10.0	99.9
072609KR-06-78	625	17382	2.9	20.2609	5.7	0.1000	6.2	0.0147	2.5	0.40	94.1	2.3	96.8	5.7	164.8	132.8	94.1	2.3	NA
072609KR-06-79	95	99558	1.3	5.3142	0.7	13.2135	1.3	0.5093	1.1	0.86	2653.5	24.3	2695.0	12.2	2726.3	10.9	2726.3	10.9	97.3
072609KR-06-80	218	50254	1.7	14.5250	1.1	1.4020	2.3	0.1477	2.0	0.87	888.0	16.6	889.8	13.6	894.1	22.9	888.0	16.6	99.3
072609KR-06-82	864	33209	3.2	21.1383	5.5	0.1009	7.7	0.0155	5.5	0.71	99.0	5.4	97.6	7.2	64.8	130.1	99.0	5.4	NA
072609KR-06-83	825	9233	7.3	21.3071	9.2	0.0464	9.5	0.0072	2.3	0.24	46.0	1.1	46.0	4.3	45.8	221.0	46.0	1.1	NA
072609KR-06-84	678	38007	1.8	19.0808	3.1	0.3393	4.2	0.0470	2.7	0.66	295.8	7.9	296.6	10.7	303.3	71.7	295.8	7.9	NA
072609KR-06-85	770	12611	3.2	19.8247	8.2	0.1029	8.9	0.0148	3.7	0.41	94.7	3.4	99.4	8.5	215.4	189.1	94.7	3.4	NA
072609KR-06-86	379	468461	2.3	5.1488	0.6	13.0046	6.2	0.4856	6.2	1.00	2551.7	129.9	2680.0	58.4	2778.2	9.3	2778.2	9.3	91.8
072609KR-06-87	2510	209430	4.8	19.0342	0.5	0.3536	1.1	0.0488	1.0	0.89	307.2	3.0	307.4	3.0	308.9	12.0	307.2	3.0	NA
072609KR-06-88	876	62939	1.9	18.8465	2.0	0.3461	3.7	0.0473	3.1	0.85	298.0	9.1	301.8	9.6	331.4	44.2	298.0	9.1	NA
072609KR-06-89	52	39336	1.0	8.9583	1.4	4.9952	1.9	0.3245	1.3	0.67	1811.9	20.5	1818.5	16.4	1826.1	26.0	1826.1	26.0	99.2
072609KR-06-90	109	4031	1.8	34.5378	39.5	0.0882	39.8	0.0221	4.4	0.11	140.8	6.1	85.8	32.7	-1269.3	1284.3	140.8	6.1	NA
072609KR-06-91	1371	37431	1.3	20.9188	3.4	0.0975	3.9	0.0148	2.0	0.51	94.7	1.9	94.5	3.5	89.6	80.1	94.7	1.9	NA
072609KR-06-92	667	14203	2.0	21.2871	8.8	0.0950	9.3	0.0147	3.0	0.33	93.8	2.8	92.1	8.2	48.0	210.1	93.8	2.8	NA
072609KR-06-93	133	74251	2.2	13.5855	2.6	1.7577	3.6	0.1732	2.6	0.71	1029.6	24.6	1030.0	23.6	1030.7	52.0	1030.7	52.0	99.9
072609KR-06-94	710	23681	1.6	22.2205	7.0	0.0939	7.8	0.0151	3.5	0.45	96.8	3.4	91.2	6.8	-55.4	169.8	96.8	3.4	NA
072609KR-06-95	685	50809	1.5	19.0817	1.1	0.3355	2.0	0.0464	1.7	0.85	292.6	4.8	293.8	5.0	303.2	24.0	292.6	4.8	NA
072609KR-06-96	485	39494	2.2	19.3770	4.2	0.3316	4.3	0.0466	0.9	0.21	293.6	2.7	290.8	10.9	268.0	96.9	293.6	2.7	NA
072609KR-06-97	197	131267	2.9	10.9752	0.8	3.1014	2.3	0.2469	2.2	0.94	1422.3	28.1	1433.0	18.0	1449.0	15.2	1449.0	15.2	98.2
072609KR-06-98	649	99743	1.9	19.2137	2.4	0.3458	2.7	0.0482	1.2	0.44	303.4	3.5	301.6	7.0	287.5	55.0	303.4	3.5	NA
072609KR-06-100	252	21994	2.3	18.5234	2.9	0.4467	3.4	0.0600	1.8	0.53	375.7	6.6	375.0	10.6	370.4	64.6	375.7	6.6	NA
072609KR-06-101	94	147505	0.9	5.7060	0.3	12.0395	1.3	0.4982	1.3	0.98	2606.2	27.5	2607.5	12.3	2608.4	4.8	2608.4	4.8	99.9
072609KR-06-102	90	53491	1.4	12.1310	1.9	2.4163	2.6	0.2126	1.8	0.69	1242.6	20.5	1247.4	18.8	1255.8	37.0	1255.8	37.0	98.9
072609KR-06-103	223	120688	1.5	8.9413	0.4	5.0825	1.9	0.3296	1.9	0.97	1836.4	30.3	1833.2	16.5	1829.5	8.0	1829.5	8.0	100.4
072609KR-06-104	1033	142301	2.3	19.2719	1.0	0.3359	1.8	0.0470	1.4	0.81	295.8	4.1	294.1	4.5	280.5	23.6	295.8	4.1	NA
072609KR-06-105	401	56927	3.6	19.3736	2.7	0.3423	4.2	0.0481	3.2	0.76	302.9	9.3	298.9	10.8	268.4	62.6	302.9	9.3	NA