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PROPERTIES OF PLEISTOCENE SEDIMENT IN TWO WELLS IN THE WEST-
CENTRAL PORTION OF THE BIG LOST TROUGH, EASTERN SNAKE RIVER
PLAIN, IDAHO NATIONAL LABORATORY, IDAHO

by

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FIGURES

FIGURE 1: MAP OF SOUTHERN IDAHO, WITH LOCATION OF IDAHO NATIONAL LABORATORY, AND THE IDAHO NATIONAL LABORATORY	2
FIGURE 2: AGE AND DISTRIBUTION OF BASALT AND SEDIMENT FOUND BETWEEN CORE HOLES NRF 15 AND USGS 142.....	4
FIGURE 3: EXTENT OF THE BIG LOST TROUGH, IDAHO NATIONAL LABORATORY, CORE HOLES USGS 142 AND NRF 15	7
FIGURE 4: GRAPH USED TO DETERMINE HYDRAULIC CONDUCTIVITY	16
FIGURE 5: SEDIMENT CHARACTERISTICS AS DEFINED BY MARK AND THACKRAY, 2002.....	17
FIGURE 6: PREVIOUS FENCE DIAGRAMS SHOWING THE STRATIGRAPHY WITHIN AND ON THE EDGES OF THE BIG LOST TROUGH (FROM BLAIR, 2001).....	18
FIGURE 7: CORRELATION ZONES BETWEEN USGS 142 AND NRF 15.....	22
FIGURE 8: USGS 142 INTERVAL 7 STRATIGRAPHIC AND GRAPHICAL REPRESENTATION	24
FIGURE 9: USGS 142 INTERVAL 6 STRATIGRAPHIC AND GRAPHICAL REPRESENTATION	26
FIGURE 10: USGS 142 BOTTOM OF 5 STRATIGRAPHIC AND GRAPHICAL REPRESENTATION	28
FIGURE 11: USGS 142 MIDDLE OF 5 STRATIGRAPHIC AND GRAPHICAL REPRESENTATION	30
FIGURE 12: USGS 142 INTERVAL TOP OF 5 STRATIGRAPHIC AND GRAPHICAL REPRESENTATION....	32
FIGURE 13: NRF 15 INTERVAL 8 STRATIGRAPHIC AND GRAPHICAL REPRESENTATION.....	34
FIGURE 14: NRF 15 INTERVAL 6 STRATIGRAPHIC AND GRAPHICAL REPRESENTATION.....	36
FIGURE 15: NRF 15 INTERVAL 5 STRATIGRAPHIC AND GRAPHICAL REPRESENTATION.....	38
FIGURE 16: NRF 15 INTERVAL 11 STRATIGRAPHIC AND GRAPHICAL REPRESENTATION.....	40
FIGURE 17: NRF 15 INTERVAL 10 STRATIGRAPHIC AND GRAPHICAL REPRESENTATION.....	42
FIGURE 18: NRF 15 INTERVAL 9 STRATIGRAPHIC AND GRAPHICAL REPRESENTATION.....	44
FIGURE 19: NRF 15 INTERVAL 2 STRATIGRAPHIC AND GRAPHICAL REPRESENTATION.....	46
FIGURE 20: NRF 15 UNNAMED CORRELATED WITH USGS 142 BOTTOM OF 5	47
FIGURE 21: NRF 15 INTERVAL 2 CORRELATED WITH USGS 142 INTERVAL 6	48
FIGURE 22: CUMULATIVE FREQUENCY NRF 15 INTERVAL 2 CORRELATED WITH USGS 142 INTERVAL 6	49

FIGURE 23: NRF 15 INTERVAL 11 CORRELATED WITH USGS 142 INTERVAL 7	50
FIGURE 24: CUMULATIVE FREQUENCY NRF 15 INTERVAL 11 CORRELATED WITH USGS 142 INTERVAL 7	51
FIGURE 25: MEAN GRAIN SIZE VS. SORTING	52
FIGURE 26: MEAN GRAIN SIZE VS. SKEWNESS	53
FIGURE 27: CUMULATIVE FREQUENCY CURVES FOR USGS 142.....	54
FIGURE 28: CUMULATIVE FREQUENCY CURVES FOR NRF 15	55
FIGURE 29: GENERAL GRAIN SIZE, SORTING AND SKEWNESS FOR IDENTIFIED FACIES	56
FIGURE 30: TERNARY DIAGRAM QFL (POINT COUNTS).....	57
FIGURE 31: TERNARY DIAGRAM QtLvLs (POINT COUNTS).....	59
FIGURE 32: DETRITAL ZIRCON AGE DISTRIBUTIONS.....	60
FIGURE 33: HYDRAULIC CONDUCTIVITY VS. MEAN GRAIN SIZE	62
FIGURE 34A: SEDIMENTARY AND BASALTIC EFFUSIVE EVOLUTION OF THE BLT.....	67
FIGURE 34B: SEDIMENTARY AND BASALTIC EFFUSIVE EVOLUTION OF THE BLT	68
FIGURE 35: MARINE ISOTOPE STAGES (FROM LISIECKI AND RAYMO, 2005).....	70
FIGURE 36: EVOLUTION OF CYCLIC FACIES ACROSS THE BIG LOST TROUGH.....	71

TABLES

TABLE 1: HYDRAULIC CONDUCTIVITY OF SEDIMENT INTERVALS IN USGS 142	63
TABLE 2: HYDRAULIC CONDUCTIVITY OF SEDIMENT INTERVALS IN NRF 15	64

TABLE OF CONTENTS

LIST OF FIGURES	V
LIST OF TABLES.....	VI
ABSTRACT	X
CHAPTER 1	
1.1 INTRODUCTION.....	1
1.1.1 <i>FLOW GROUP LABELS</i>	1
1.1.2 <i>HISTORY</i>	5
1.2 GEOLOGIC SETTING.....	8
1.2.1 <i>EASTERN SNAKE RIVER PLAIN</i>	8
1.2.2 <i>HOTSPOT VOLCANISM</i>	8
1.2.3 <i>BIG LOST TROUGH</i>	9
1.2.4 <i>MODERN SEDIMENTATION</i>	9
1.2.5 <i>CORRELATION OF FLOWS</i>	10
CHAPTER 2	
2.1 METHODS.....	11
2.1.1 <i>SMEAR SLIDES</i>	11
2.1.2 <i>HYDRAULIC CONDUCTIVITY</i>	12
2.1.3 <i>LOOSE SEDIMENT SLIDES POINT COUNTS</i>	12
2.1.4 <i>GRAIN SIZE ANALYSIS</i>	13
2.1.5 <i>DETRITAL ZIRCON GEOCHRONOLOGY AND PROVENANCE</i>	14
2.1.6 <i>STRATIGRAPHIC DESCRIPTION</i>	15
2.2 PREVIOUS ENVIRONMENTAL INTERPRETATIONS.....	17
CHAPTER 3	
3.1 STRATIGRAPHIC AND SEDIMENTOLOGICAL PROPERTIES OF SEDIMENT INTERVALS FOUND IN CORES USGS 142 AND NRF 15.....	19
3.1.1 <i>STRATIGRAPHY</i>	19
3.1.2 <i>STRATIGRAPHIC COLUMN</i>	22

3.2 SEDIMENT INTERVALS USGS 142	23
3.2.1 <i>Stratigraphic and cumulative frequency curves interval 7 USGS 142</i>	23
3.2.2 <i>Stratigraphic and cumulative frequency curves interval 6 USGS 142</i>	25
3.2.3 <i>Stratigraphic and cumulative frequency curves interval bottom of 5 USGS 142</i>	27
3.2.4 <i>Stratigraphic and cumulative frequency curves interval middle of 5 USGS 142</i>	29
3.2.5 <i>Stratigraphic and cumulative frequency curves interval top of 5 USGS 142</i>	31
3.3 SEDIMENT INTERVALS NRF 15.....	33
3.3.1 <i>Stratigraphic and cumulative frequency curves interval 8 NRF 15</i>	33
3.3.2 <i>Stratigraphic and cumulative frequency curves interval 6 NRF 15</i>	35
3.3.3 <i>Stratigraphic and cumulative frequency curves interval 5 NRF 15</i>	37
3.3.4 <i>Stratigraphic and cumulative frequency curves interval 11 NRF 15</i>	39
3.3.5 <i>Stratigraphic and cumulative frequency curves interval 10 NRF 15</i>	41
3.3.6 <i>Stratigraphic and cumulative frequency curves interval 9 NRF 15</i>	43
3.3.7 <i>Stratigraphic and cumulative frequency curves interval 2 NRF 15</i>	45
3.4 CORRELATIVE SECTIONS	47
3.4.1 <i>Interval unnamed NRF 15 correlated with interval bottom of 5 USGS 142</i>	47
3.4.2 <i>Interval 2 NRF 15 correlated with interval 6 USGS 142</i>	48
3.4.3 <i>Interval 11 NRF 15 correlated with interval 7 USGS 142</i>	50
3.5 SEDIMENT CHARACTERISTICS (SYNTHESIS)	52
3.5.1 <i>Sorting</i>	52
3.5.2 <i>Skewness</i>	53
3.5.3 <i>Cumulative frequency curves</i>	54
3.6 POINT COUNTS GRAPHIC REPRESENTATION	57
3.7 DETRITAL ZIRCONS	60
3.8 HYDRAULIC CONDUCTIVITY	61
CHAPTER 4	
4.1 INTERPRETATIONS.....	65
4.1.1 <i>SEDIMENTARY ENVIRONMENTS</i>	65

4.1.2 CYCLICITY.....	66
4.1.3 INFERRED RELATIONSHIPS WITH CLIMATIC CYCLICITY.....	69
4.1.4 RECURRENCE INTERVALS	69
4.1.5 PROVENANCE	71
4.1.6 HYDRAULIC CONDUCTIVITY.....	72
CHAPTER 5	
5.1 DISCUSSION AND IMPLICATIONS	73
REFERENCES CITED.....	75
APPENDICES.....	84
APPENDIX A: SMEAR SLIDE RAW DATA.....	84
APPENDIX B: SKEWNESS, SORTING AND HYDRAULIC CONDUCTIVITY	86
APPENDIX C: POINT COUNT DATA WITH RECALCULATED FELDSPAR	87
APPENDIX D: GRAIN SIZE INFORMATION	89
APPENDIX E: DETRITAL ZIRCON DATA	112

Abstract

Sediment in cores from drillholes Naval Reactor Facility (NRF) 15 and United States Geologic Survey (USGS) 142 from the northern part of the Big Lost Trough (BLT) at the Idaho National Laboratory (INL) document an evolution of facies during Early Pleistocene time. Although more than 95% of the upper portions of these cores is basalt, sedimentary intervals, from 520 ft to 595 ft below land surface (BLS) in NRF 15 and from 732 ft to 837 ft BLS in USGS 142 were analyzed for grain size and petrologic analysis. The large difference in depth BLS between USGS 142 and NRF 15 is accounted for by variable subsidence across the BLT. Estimated ages, based on paleomagnetic signatures of the basalt, suggest that the intervals are 884 ka-988 ka. Each interval consists of clay that grades upward to coarse silt and sand. Through grain size analysis and visual inspection of the core each interval is interpreted to represent a lake that shallows upward into shoreline sands and loess.

Three depositional environments can be interpreted from the grain size data in each of these upward coarsening intervals. The lower part of each interval is clay dominated and coarse-skewed with average grain-size of 6 to 8 phi. This interval is interpreted as a shallow lake deposit. The intervals then coarsen upward to a fine-skewed silty sand, interpreted as shoreline or eolian sediment. Parts of the upper portions of sedimentary intervals in NRF 15 display bimodal grain size distributions with peaks at 2 and 8 phi; this sediment is interpreted as loess.

Point counting reveals that sands in the shoreline facies are volcanic lithic arenites (58% lithics, and of those 63% are volcanic lithics with 54% of the volcanic lithics being felsitic volcanic grains). These sands are interpreted to reflect transport via the paleo-Big Lost River, and are most likely sourced from the Challis volcanics, which are primarily dacitic and rhyodacitic in composition. The detrital zircons in the sandy intervals at 840 and 780 feet in USGS 142 resemble samples previously described from the Big Lost River. The zircon age spectra have an age peak at 45 Ma that correlates most closely with a Challis volcanic source, and a

Neoproterozoic age peak at 675 Ma that correlates with granitic rocks intruded into the Pioneer Mountains core complex.

Chapter 1

1.1 Introduction

Extensive Pleistocene lakes have formed repeatedly on the Eastern Snake River Plain (ESRP); resulting from the interplay of regional and local subsidence, volcanic activity, and climatic fluctuations (Anderson, 1991; Anderson and Bowers, 1995; Bestland et al., 2002; Geslin et al., 2002). Researchers have studied the timing and extent of sediment deposits on the ESRP and inferred the presence of lakes, playas, and fluvial deposits (Anderson, 1991; Anderson and Bowers, 1995; Gianniny et al., 1997; Blair, 2002; Bestland et al., 2002; Geslin et al., 2002; Mark and Thackray, 2002). This study focuses on identifying three depositional environments in two cores that have been drilled in the Big Lost Trough (BLT) within the Idaho National Laboratory (INL) (Fig. 1). The two cores, USGS 142 and NRF 15, are the focus of the investigation, chosen because they have not yet been significantly studied and have proximity and correlative potential to each other. The investigation of these cores seeks to clarify subsurface locations of lacustrine, loess, and shoreline sedimentary deposits across the west-central part of the INL, and to extend knowledge of the subsurface stratigraphic architecture of the Big Lost Trough (BLT) (Fig. 1).

1.1.1 Flow Group Labeling

Paleomagnetic inclination and polarity studies provide age constraints and correlation for basalt intervals within the INL (Champion et al., 2011; Champion et al., 2013; and Champion, D. E., USGS, 2015 unpublished data). Basaltic flow groups are named based on the source vent, so the material in flow group North Late Matuyama all came from the same vent, and was emplaced in the same effusive eruption. The term “North Late Matuyama” refers to “north” or “south” based on vent location on the INL, and “Late Matuyama” refers to the upper part of the Matuyama interval, below the Bruhnes interval (Hodges et al., 2012). An eruption can last days to decades. Each flow group also has similar paleomagnetic inclination values; this allows for basalt

in core holes to be correlated, when a definite location of the vent is unknown (Champion et al., 2011).

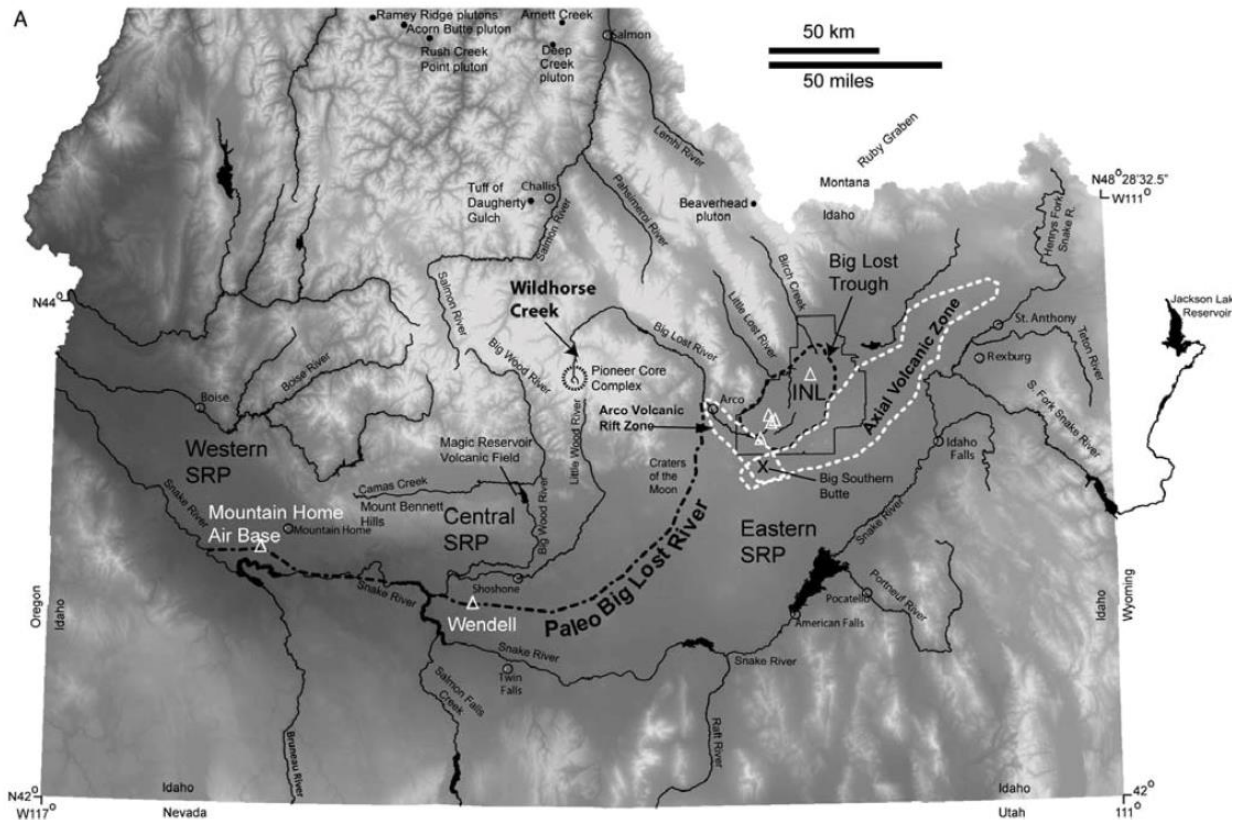


Figure 1: Map of southern Idaho, note the location of the Eastern Snake River Plain, Idaho National Laboratory, the Axial Volcanic Zone, Pioneer core complex, and the paleo Big Lost River (the location of the Big Lost River 3 to 5 Ma). Basin and Range structures are located just north of the Big Lost Trough (BLT), the location of USGS 142 and NRF 15 is in the western portion of the INL and BLT (from Hodges et al., 2009).

This paper provides information about the timing of sedimentary deposits, through the use of paleomagnetic studies. The work done by Duane Champion is used to assign ages to sediment intervals in USGS 142 and NRF 15, and is a basis for the correlation of selected intervals across the west central part of the INL. Age dating studies (Champion and Lanphere, 1997; Hodges et al., 2015) and correlative paleomagnetic studies by Champion et al. (2013) indicate the timing of the sedimentary deposits studied in this thesis to be about 884 ka-988 ka

(North late Matuyama to Jaramillo) Fig. 2; these ages correlate to sediment deposited during Marine Isotope Stage (MIS) 22-25, spanning at least one glacial-interglacial cycle during Early Pleistocene time (Lisiecki and Raymo, 2005).

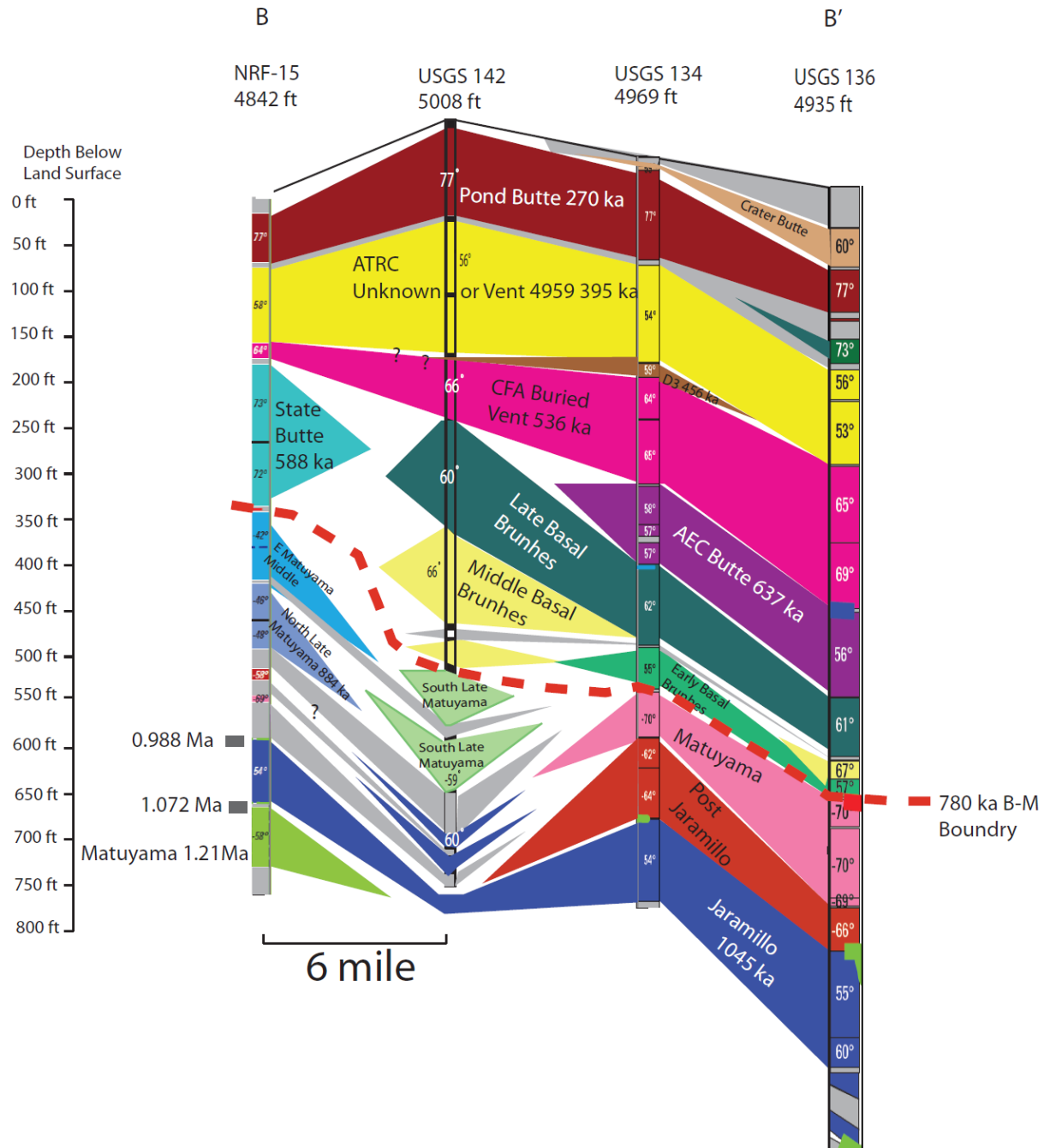


Figure 2: Fence diagram showing the age and distribution of basalt and sediment deposits found between core holes, NRF 15, USGS 142, USGS 132, and USGS 136. The question marks are unknown basaltic ages. The units in grey are the sediment intervals. The red dotted line represents the Brunhes Matuyama boundary (780 ka). The numbers in each hole represent average inclination values for that flow group (Redrawn from Champion et al. 2013 data and Mary Hodges written communication 7/20/2016). Correlations were made by interpretations by Mary Hodges and Duane Champion.

This thesis will characterize the deposition of sediment deposits in these two core holes lying in the west-central part of the INL. Subsidence in the BLT is 124 meters (656 feet) from 350-247 thousand years ago (Wetmore, 1998). Subsidence along with lake base level change, induced by volcanic damming, can create accommodation space for the deposition of surficial sediment in the BLT. Climate change and base level change are the cause for small scale cycles seen in the BLT, and account for the cycles identified in correlated intervals in this thesis.

Several techniques are used in this thesis to determine environmental change. Grainsize distributions, skewness, and sorting are used to determine sediment properties. Detrital zircon geochronology and point counting are used to determine the provenance of coarser grained sediment. Hydraulic conductivity values, derived from grain-size analyses, help understand aquifer properties in the upper part of the eastern Snake River Plain aquifer. The combination of all of these properties allows for a more complete hydrologic model of the subsurface in the west central portion of the BLT.

1.1.2 History

The US Atomic Energy Commission, which later became the Department of Energy, established the National Reactor Testing Station (NRTS) in 1949 for the use of atomic energy projects. The site went through several name and mission changes before being named the Idaho National Laboratory (INL) in 2005. The Idaho National Laboratory (INL), operated by the U.S. Department of Energy (DOE), encompasses about 890 mi² of the eastern Snake River Plain in southeastern Idaho (Figure 3). The INL was established in 1949 to develop atomic energy, nuclear safety research, defense programs, environmental research, and advanced energy concepts. More recent work has focused on spent nuclear fuel management; hazardous and mixed waste management and minimization; national security; cultural resources preservation; and environmental engineering, protection, and remediation (Bartholomay et al., 2002).

The (USGS) has been involved with the site since 1949, conducting groundwater quality studies and water level measurements; which are meant to track contaminant plumes, resultant from management of radioactive waste (Bartholomay et al., 2002). Continual work by the USGS includes improving upon the stratigraphic understanding of basalt and sediment that comprise the ESRP aquifer to assist with understanding groundwater flow (Roy Bartholomay, USGS, written commun. 7/13/2015). This thesis was funded by the USGS by a grant to further the stratigraphic understanding of the Big Lost Trough.

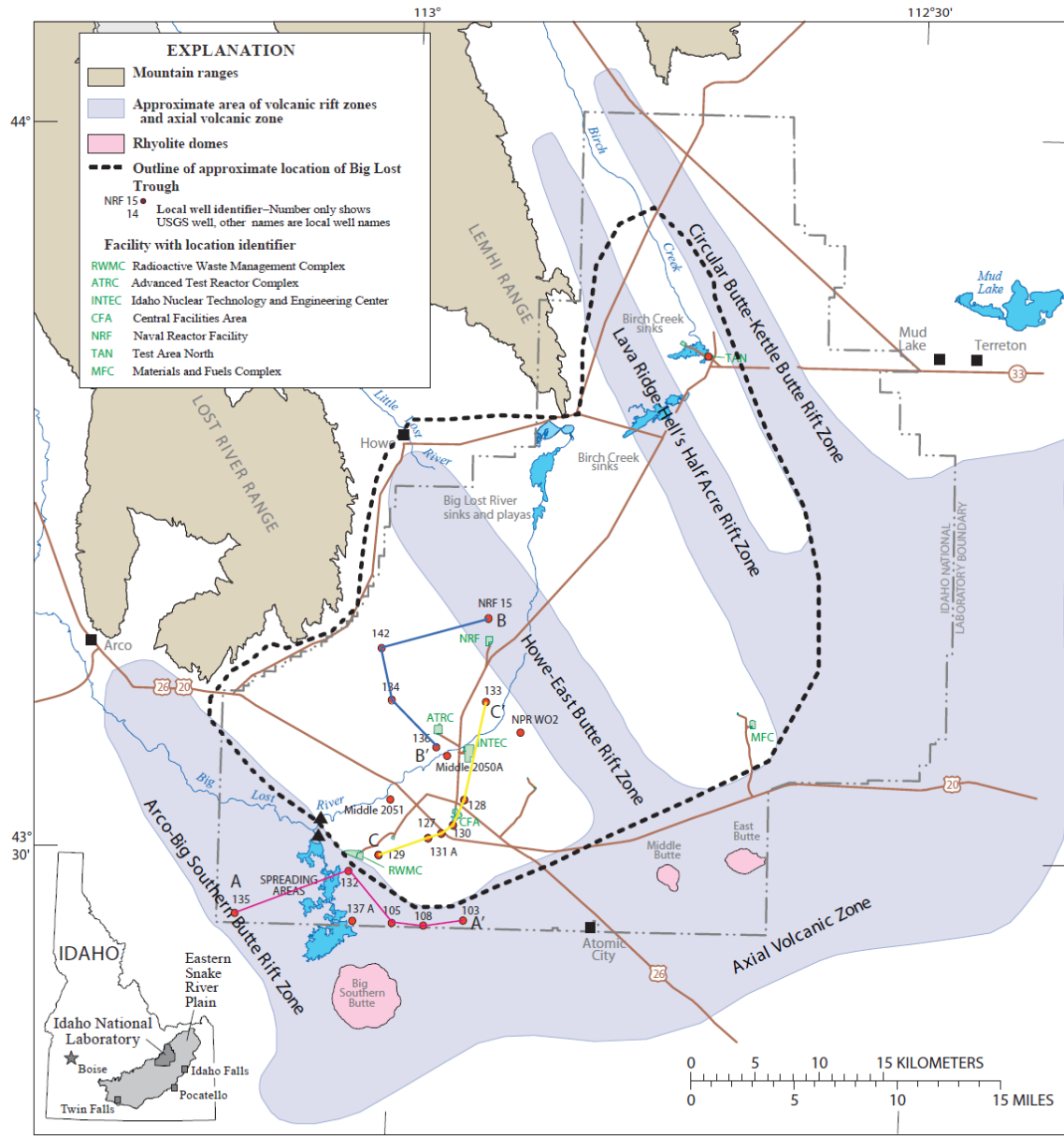


Figure 3: Map of the Idaho National Laboratory (INL). The Big Lost Trough is outlined in black dashes; the holes of interest USGS 142 and NRF 15, and the location of cross section B and B' are shown (from Twining et al., 2012).

1.2 Geologic Setting

1.2.1 Eastern Snake River Plain

The ESRP is a northeast-trending basin about 200 mi long and 50 to 70 miles wide, and is a seismically quiescent, low relief region located across south central Idaho (Anderson and Bowers, 1995; Pierce and Morgan, 1992; Geslin et al., 2002). The plain is dominated by basaltic lava flows, rhyolitic domes, fluvial deposits, seasonal playas and discontinuous loess. Modern Basin and Range extension occurs north and south of the Snake River Plain. Shortening prior to Basin and Range deformation is represented by Cretaceous to Paleocene Sevier deformation (Geslin et al., 2002; Weil and Yonkee, 2012).

The ESRP has existed for some 10 million years (Morgan, 1972; Armstrong et al., 1975). This is represented by the movement of the North American Plate over a stationary mantle plume (Yellowstone Hotspot). The ESRP contains older rhyolite calderas overlain by basaltic material. Chemical analysis of basalts show a sub-lithosphere mantle plume origin, similar to Hawaiian Island basalts (Morgan, 1972; Armstrong et al., 1975; Geist et al., 2002; Shervais and Hanan, 2008). Explosive, caldera-type silicic volcanism occurred on the ESRP from approximately 10 to 4 Ma and moved to the northeast as North America moved to the southwest (Pierce and Morgan, 1992). The mantle plume is now located under the Yellowstone plateau (Yuan and Dueker, 2005; Waite et al., 2006; Pierce and Morgan, 2009).

1.2.2 Hotspot volcanism

The Yellowstone “hotspot” hypothesis revolves around work done by Morgan (1972); Armstrong et al. (1975); Pierce and Morgan (1992); Smith and Braile (1993); Camp (1995); Camp and Hanan (2008); Shervais and Hanan (2008). They argue that a stationary plume originating 16 Ma, in the location where Oregon, Nevada and Idaho meet, formed the Owyhee-Humboldt Volcanic Field, and is the source of magmatism across the Snake River plain.

Continued movement of the North American plate to the south-west allowed for multiple successive eruptive centers in the last 16 m.y. These eruptions are large and siliceous, with the most recent eruption approximately 600 ka under the Yellowstone Plateau in Wyoming. This magmatism created the Heise Volcanic field, 6 to 4 Ma, and products of this magmatism underlie the current sediment and basaltic material found across the INL.

1.2.3 Big Lost Trough

The study area is located within the Eastern Snake River Plain (ESRP) (Fig. 1, Fig. 3), and completely within the Big Lost Trough (BLT) (Fig. 3) an underfilled, volcanically silled basin. The BLT is found directly north of the Axial Volcanic Zone and south of Basin and Range structures. Volcanic features bounding the BLT are Lava Ridge-Hell's Half Acre and the Circular Butte- Kettle Butte volcanic rift zones to the north-east and the Arco-Big Southern Butte volcanic rift zone to the southwest. Surficial deposits within the BLT are fluvial, eolian and playa sediment. The area has become variously lacustrine dominated and eolian dominated multiple times during the Holocene, seen as Lake Terreton highstands and lowstands (Kimmel, 1982; Gianniny et al., 1997; Geslin et al., 1999; Blair, 2002; Mark and Thackray, 2002). Surficial ages of sediment and basalt within the BLT range from 940 ka to the north to 15-200 ka to the south (Geslin et al., 1999).

1.2.4 Modern Sedimentation

Lakes have formed repeatedly throughout the Pleistocene within the Big Lost Trough (BLT). The BLT sub-basin is defined by the terminus and sedimentation from the Big Lost River, Little Lost River and Birch Creek, and is found completely within the INL boundaries (Fig. 3). Olduvai Lake, Diamictic Lake, and Lake Terreton represent fine grained facies deposited in the BLT during the Pleistocene (Bestland et al., 2002; Geslin et al., 1997).

Modern sedimentation results in the development of ephemeral lake beds with dunes and lunettes, bounded by volcanic rift zones, which are areas defined by basaltic vent material, and

are parallel to Basin and Range structures (Geslin et al., 1997). The basalt from various rift zones fill in the topographic lows, directing the location of future sedimentation across the BLT. Surficial deposits represent active sedimentation into the INL (Geslin et al., 2002; Mark and Thackray, 2002), but because of late Holocene drying, perennial playas and sinks now form the terminus of the Big Lost River, Little Lost River and Birch Creek, and all other bodies of water that flow into the BLT.

1.2.5 Correlation of Flow Groups

Samples were collected from both surface sites and from core, and analyzed by Duane Champion. Inclination and polarity was calculated and then averaged for each flow group. These averaged values were then assigned a name based on similar polarity values. Flow groups can contain more than a dozen individual flows from the same eruptive event Fig. 2. The correlation of material between holes is based on of the mean inclination values and location of the flow group in the hole. Correlation of material over long distances is difficult because flows pinch out and have low relief (Champion et al., 2011).

Paleomagnetic correlations were reconstructed using data produced by Mary Hodges and Duane Champion (written communication 7/20/2016). The results of these reconstructions can be found in Fig. 2, and allow for the dating of sediments intervals found in USGS 142 and NRF 15. Basaltic flow units are named by which vent the basalt is sourced from, an example of this is Pond Butte. All the basalt sourced from Pond Butte has similar paleo magnetic values and stratigraphic location in the subsurface, and is assigned an age of 270 ka based on dating techniques.

Chapter 2

2.1 Methods

Stratigraphic and sedimentological properties were used to better understand sediment found at depth in two cores found in the BLT, NRF 15 and USGS 142. A combination of detrital zircon ages and point counting were used to determine the source and provenance of sediment. Hydraulic conductivity was estimated to quantify aquifer properties.

In this thesis, English units are used because that is how depths are measured on the drill cores at the INL. In some places both US customary measurement system and metric units are reported. This was done so the data are more acceptable to a wider audience.

2.1.1 Smear Slides (*Appendix A*)

Smear slides provide a relatively low cost and efficient means of observing the general sediment composition in sedimentary intervals sampled. Slides were made by wetting and disaggregating sediment samples so they could be easily placed on glass slides using an eye dropper. One to two drops of sediment, for each sample, are placed onto the slide before it is heated. Once heated a slide cover is overlain. Each heated slide and cover pair were injected with ultra-violet (UV) reactive glue and placed under a UV light to permanently affix the slide cover. Using a binocular microscope general descriptions of grain size, overall composition, and rounding were made. Information obtained through this method is used to evaluate what further preparation methods were needed. Samples taken from cores USGS 142 and NRF 15 displayed concentrations of secondary calcium carbonate requiring acid washing as detailed above. To identify minerals and composition of material found in the smear slides, the Tool for Microscopic Identification on the LacCore web site at the University of Minnesota (<https://tmi.laccore.umn.edu/>, Mark Shapley verbal communication 10/12/2015) was used. Smear slides here were only used to assign preparation methods.

2.1.2 Hydraulic Conductivity Method (Appendix B)

Sediment hydraulic conductivity was estimated using mean grain size and textural maturity (Shepherd, 1989; Fetter, 2001). Microscope examination combined with sorting values provides a means of assigning samples a textural maturity within the consolidated sediment characteristic curve (Fig. 4) (Shepherd, 1989). Hydraulic conductivity is then calculated using the following equation (Brian Twining, USGS, written communication Apr 12, 2016):

$$K = c(D_{50})^j$$

K = Hydraulic conductivity

c = The shape factor-dimensionless, determined from textural maturity, in this case a value of 100 is used because of poorly sorted, angular sediment, found through microscope work

j = is an exponent again based on sedimentary properties (poorly sorted and angular grains) here it is 1.5

D_{50} = The mean grain size of the sediment sampled

2.1.3 Loose sediment slides (Point Counting Appendix C)

Sediment samples for point counting analysis were sent to Wagner Petrographic. While at Wagner Petrographic slides were mounted and polished allowing for identification of sediment grains using a Nikon Optiphot polarizing microscope fitted with a Hacker Instruments Automatic Point Counter Model F. The following groups of grains were used for point counting: mono-crystalline quartz, poly-crystalline quartz, feldspar, biotite, chert, Quartz-mica-feldspar (Qmf) aggregates, felsitic textured volcanic lithics, lathwork volcanic lithics, microlitic-textured volcanic lithics, siltstone sedimentary lithics, and carbonate sedimentary lithics.

Point count results were plotted in a Standard QFL (quartz-feldspar-lithic) diagram (Dickinson, 1985), and the QtLsLv (quartz total, sedimentary lithic, and volcanic lithic) diagram (Weltje, 2006). QtFL was used in preference over the QmFL, a plot that characterizes poly-crystalline quartz as a lithic, because there were not enough poly-crystalline quartz grains to change the results of the overall plot. Point counts were also compared with grain size distributions. This determined if the mineralogical maturity of samples created change in the sorting of sediment.

2.1.4 Grain Size Analysis (Appendix D)

Samples were collected from two cores on the INL, USGS 142 (732-837 ft BLS) and NRF 15 (520-595 ft BLS), location of these cores can be found in Fig. 2.

At the geochemical preparation lab, Idaho State University, samples were acid washed with 1 molar HCl as treatment for calcium carbonate. Samples were then neutralized through repetitive centrifuge/decanting stages using high purity deionized water. Prior to and after the acid wash steps the weight of each sample was measured. Acid washing is conducted to eliminate secondary calcite that would affect grain size results. A small amount of high purity deionized water was left in each sample, this allowed for a paste to be formed just prior to analysis, giving an even mix and a proper representation of sediment distribution for each sample. Loose sediment, previously treated for calcium carbonate, was dried prior to grain size analysis.

Grain size analysis were completed at the stable isotope laboratory at Utah State University, on a Malvern instrument Mastersizer 2000 Laser Particle Size Analyzer. The purpose of this analysis was to better understand grain size distributions in the selected sedimentary intervals. The Malvern uses obscuration of a detecting surface to determine grain size, then represents grain sizes in bins of a certain grain size interval. The final data is presented in an Excel file as percentages of each grain size interval detected.

Grain size data were used for determining sorting and skewness (appendix B) calculations from the formulas (Folk and Ward, 1957):

$$\text{Sorting- } \sigma\Phi = \frac{(\Phi_{84} - \Phi_{16})}{4} + \frac{(\Phi_{95} - \Phi_5)}{6.6}$$

$$\text{Skewness - SK} = \frac{\Phi_{16} + \Phi_{84} - 2\Phi_{50}}{2(\Phi_{84} - \Phi_{16})} + \frac{\Phi_5 + \Phi_{95} - 2\Phi_{50}}{2(\Phi_{95} - \Phi_5)}$$

2.1.5 Detrital Zircon Geochronology and Provenance (Appendix E)

Two samples were collected from USGS 142 for detrital zircon analysis, to determine the depositional source area for what is identified as fluvial reworked sediment. USGS 142 core site is located 6 miles west of the Naval Reactors Facility, NRF site on the INL, and is part of the BLT (Fig. 2) Two kilograms (4.4 pounds) for each detrital zircon sample were taken for analysis, DZ2 at a depth of 780 ft in core hole USGS 142, and DZ1 at a depth of 832 ft in core hole USGS 142.

Samples were processed by Multiple Collector Laser Ablation Inductively Coupled Plasma Mass Spectrometry (MC-LA-ICP-MS) on a Thermo Element2 single-collector ICPMS, at the Arizona Laserchron Center, University of Arizona. Processes completed at the Laserchron center include sample preparation, and mineral separation, along with mass spectrometry analysis. Uranium-Thorium- Lead (U-Th-Pb) decay rates, were used to age date the formation of selected zircon grains; a technique known as geochronology. Geochronology, through the use of U-Th-Pb decay acts like a barcode on commercial products (Link et al., 2005), and gives a good understanding of where sediments were originally sourced. Ages of zircon grains were found from the weighted mean of $^{206}\text{Pb}/^{238}\text{U}$, $^{207}\text{Pb}/^{235}\text{U}$, and $^{208}\text{Pb}/^{232}\text{Th}$ -corrected ages, using the NUagecalc Excel macros and the Isoplot plugin (Ludwig, 2003) for Excel. Statistical similarity of the samples provenance was determined using a two sample Kolmogorov-Smirnov test, using an Excel macro obtained from the University of Arizona Laserchron Lab (Guynn and Gehrels,

2010). The use of MC-LA-ICP-MS allows for the dating of individual grains. In the case of this study we are identifying the source of fluvial sands and silts deposited in the BLT.

2.1.6 Stratigraphic description

Core descriptions were made using USGS Corelogger program (Davis et al., 1997) as described at <http://id.water.usgs.gov/INL/Facility/C-S-L/index.html> (accessed on May 9, 2016). These descriptions identify aspects of the sediment not captured by other methods (e.g. observations of bioturbation, plant remains/traces, etc.).

The methods introduced in this section will be used to interpret the sedimentary environments that previously existed on the Snake River Plain. Mark and Thackray (2002) used a similar approach of using grain size analyses, skewness, sorting and mean grain sizes along with hydraulic conductivity to assign properties to surficial samples of known sediment facies at the INL.

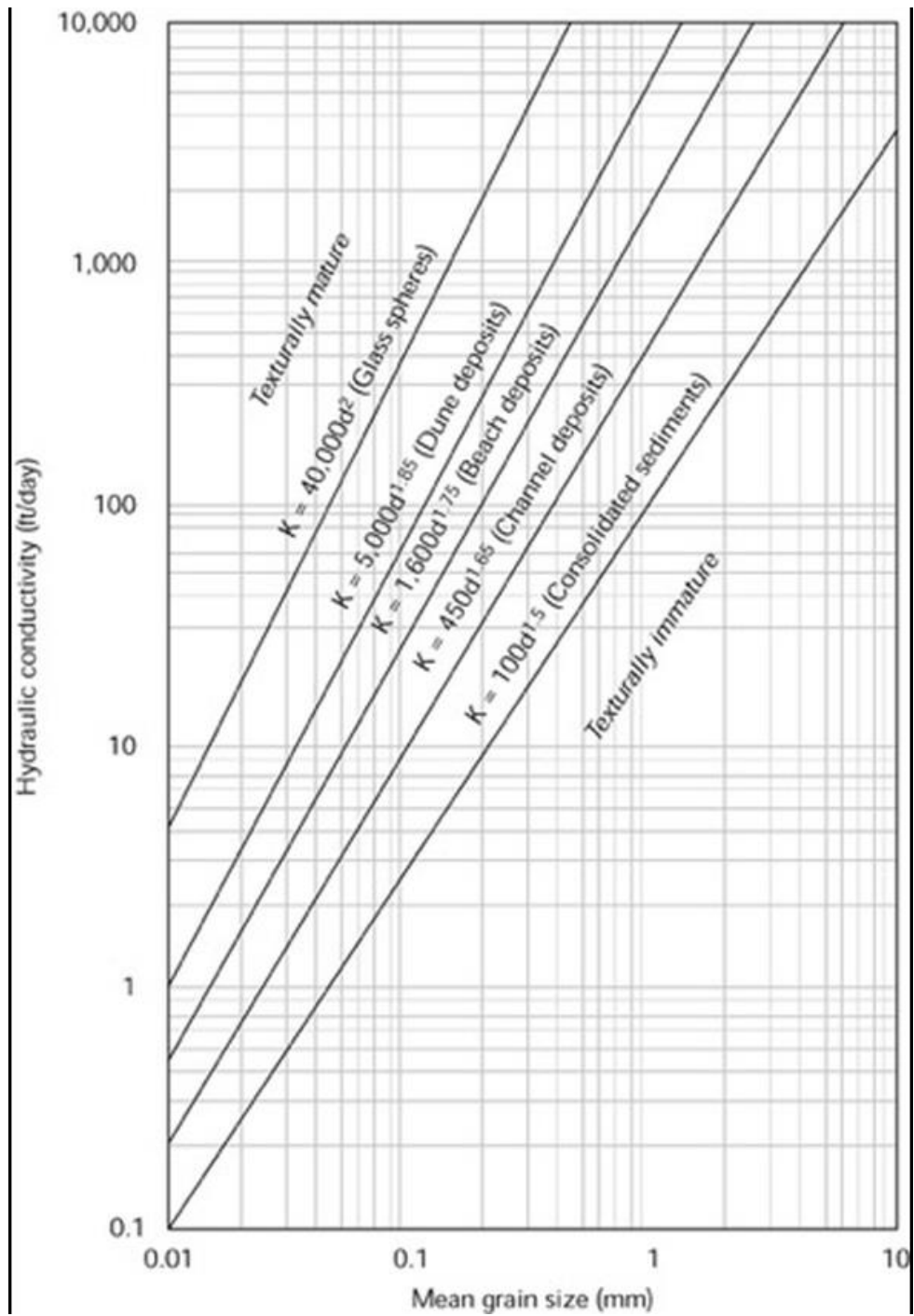


Figure 4: Graph used to determine Hydraulic conductivity from Fetter (2001).

2.2 Previous Environmental Interpretation

Previous environmental interpretation of sedimentary deposits at the INL were done by Anderson (1991); Anderson and Bowers (1995); Anderson and Liszewski (1997); Geslin et al. (1997); Gianniny et al. (1997); Mark and Thackray (2002) (Fig. 5); and Bestland et al. (2002). Based on the previous work, sedimentary environments were split into three facies: lake, shoreline (interfluvial/shoreline described by Mark and Thackray, 2002), and loess. The properties of facies used in this thesis are found in Figure 29, and are modified based on Fig. 5 (Mark and Thackray, 2002), and include example grain size distribution and cumulative frequency curves for lacustrine, shoreline, and loess facies.

Facies	Mean grain size	Clay content	Sorting	Skewness
Lake floor	Finer than 6.1 phi (fine silt) to finer than 7.8 phi (very fine silt); averages finer than 7.1 phi (very fine silt)	24%–60%	Poorly sorted*	Nearly symmetrical to strongly coarse skewed†
Playa bottom	4.6 phi (coarse silt) to finer than 7.3 phi (very fine silt); averages finer than 6.2 phi (fine silt)	18%–60%	Poorly sorted to very poorly sorted*	Strongly fine skewed to strongly coarse skewed†
Dune	2.7 phi (fine sand) to finer than 5.9 phi (medium silt); averages finer than 4.1 phi (coarse silt)	Usually 7%–19%	Poorly sorted to very poorly sorted	Typically strongly fine skewed to nearly symmetrical†
Loess	4.9 phi (coarse silt) to finer than 6.0 phi (medium silt); averages finer than 5.5 phi (medium silt)	15%–40%	Poorly sorted to very poorly sorted*	Typically strongly fine skewed to nearly symmetrical†
Channel	–2.4 phi (pebble) to 1.7 phi (medium sand); averages 0.2 phi (coarse sand)	less than 3% combined clay and silt	Ranges from moderately sorted to very poorly sorted	Strongly fine skewed to strongly coarse skewed
Interfluvial	4.5 phi (coarse silt) to finer than 7.0 phi (fine silt); averages finer than 5.7 phi (medium silt)	9%–34%	Poorly sorted to very poorly sorted*	Strongly fine skewed to strongly coarse skewed†

Note: Data from Mark (1999). Sorting and skewness were calculated according to Folk and Ward (1957).
* These are maximum estimates of sorting due to a lack of grain-size data in the finer than ~8.2 phi range. The sediment may be more poorly sorted than indicated.
† These are maximum estimates of skewness due to a lack of grain-size data in the finer than ~8.2 phi range. The sediment may be less skewed than indicated.

Figure 5: Sediment characteristics and facies (table 1 of Mark and Thackray, 2002). In this thesis we use shoreline instead of interfluvial.

Work done by Blair (2002), shown in Fig. 6, correlates sediment and basalt in three cores across the BLT. Blair (2002) notes that there are discontinuous sediment layers in the upper and lower portions of coreholes drilled across the BLT.

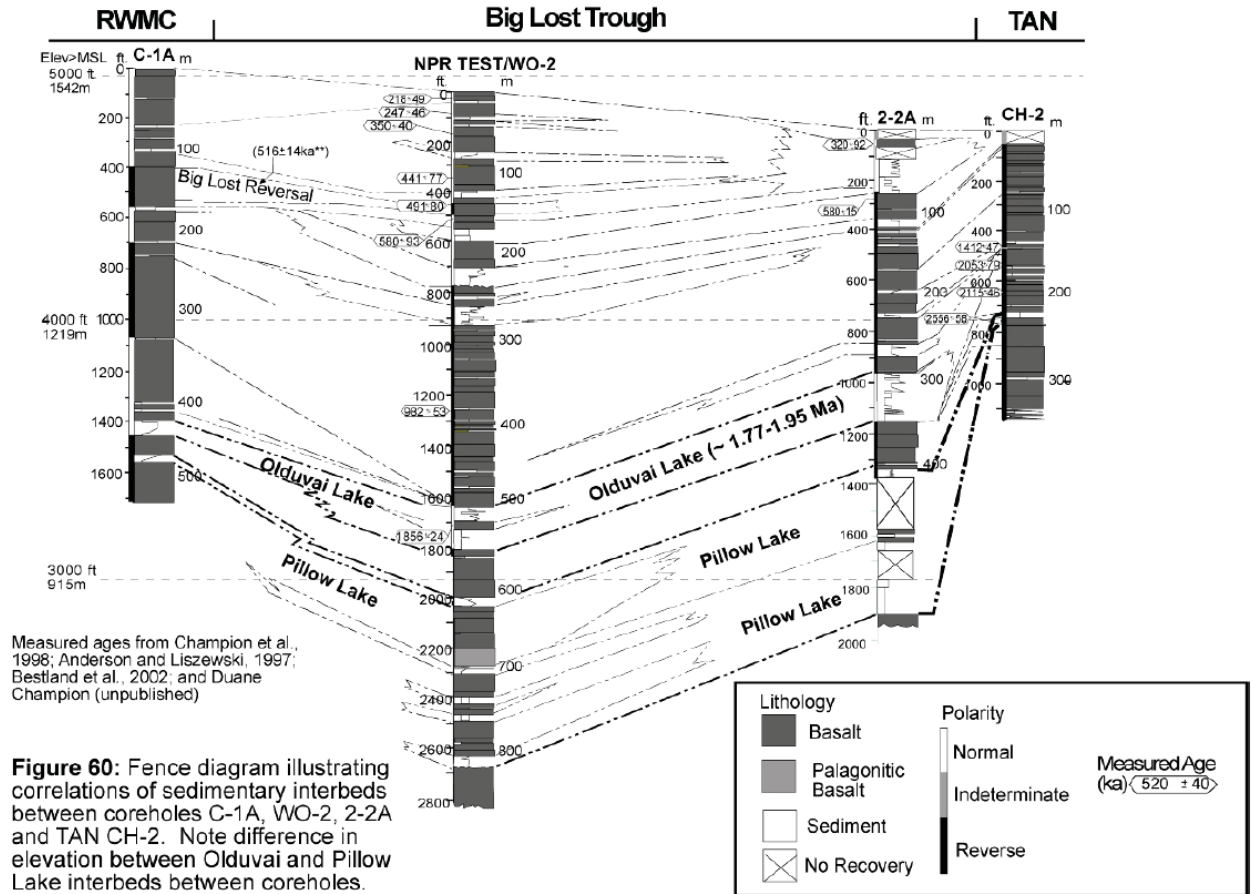


Figure 6: Fence diagrams showing the stratigraphy within and on the edges of the Big Lost Trough (From Blair, 2001, Fig. 60). Figure 7 is a representation of sediment and basaltic units found at depth in four core holes drilled around the BLT (descriptions can be found in Blair, 2001), showing that there are deep persistent lakes (Olduvai Lake), older than 1.77 Ma. The correlated sediment between USGS 142 and NRF 15 may be representative of sediment found at a depth of 800 to 900 feet in corehole WO-2.

Chapter 3

3.1 Stratigraphic and Sedimentological Properties of Sediment intervals found in cores USGS 142 and NRF 15

The following section presents sedimentary properties and correlated intervals, separated into stratigraphic information, sorting, skewness, grain size, hydraulic conductivity, point counting, and detrital zircon information. The raw data can be found in the appendices.

Sediment was divided into separate intervals found in NRF 15 and USGS 142, with three intervals found in each USGS 142 (732-837 ft BLS) and NRF 15 (520-595 ft BLS). Intervals were divided into sediment found between basalt.

3.1.1 Stratigraphy

Using paleomagnetic inclination from Champion et al. (2013) along with unpublished paleomagnetic data from Duane Champion, USGS, written communication 2016, in conjunction with core logs for USGS 142 and NRF 15 a general stratigraphic column and correlated sediment (determined to be 884 ka to 988 ka) figure was created (Fig. 7). USGS 142 is 87.7% basalt and 12.2% sediment, with a bottom depth of roughly 836 feet below land surface (BLS) and a surface elevation of 5008 feet. Sediments that are found in USGS 142 are sand, silt, and clay and some combination of the three. NRF 15 is made up of 78.9% basalt and 21.1% sediment, with a bottom depth of 780 feet BLS, and has a surface elevation of 4842 feet. NRF 15 sediments are sand, silt, and clay or some combination of the three. Rhyolitic ash in USGS 142 was found at a depth of 115 feet. Sediment found outside of the correlation zone, seen in Fig. 9, was sparse and thin in both USGS 142 and NRF 15. NRF 15 has an abundance of non-recovery zones while USGS 142 has more complete sediment recovery.

In both core holes the basalt directly above the sediment of interest is related to the Matuyama Chron flow groups and is estimated to be 884 ka. The Bruhnes/Matuyama boundary (780 ka) is found at a depth of roughly 350 ft in NRF 15 and 500 ft in USGS 142. This depth

difference likely reflects variable subsidence, between the two core holes. Variable subsidence is also confirmed by the depth of the Jaramillo subchron flow found at the bottom of the two core holes.

The correlation of sediment intervals between NRF 15 and USGS 142 is determined in two ways. First is through paleomagnetic work done by Duane Champion, USGS (written communication 2016), which correlates basaltic flow groups through paleo-magnetic properties and assigns ages to identified flow groups. This shows that the thick sediment found near the bottom of each hole are between 884-988 ka (North late Matuyama to Jaramillo). Secondly correlative sediment intervals are very similar in their geometry, containing silt and clay that coarsens up into sand. This shows similar depositional environments in each core.

The core log description shown in the following section and general stratigraphy found in Fig. 7, identified 33 basaltic lava flows in USGS 142, erupted over a time period of roughly 988 ka. Detrital zircon samples (Fig. 7), represented as DZ1 and DZ2, were taken at a depth of 832 feet and 780 feet in USGS 142. Point counts, in 12 sections in USGS 142 and two sections in NRF 15, were taken for petrographic analysis and provenance interpretations. Grain size analysis samples were taken from several locations in NRF 15 and USGS 142, and were used for the calculation of skewness, sorting, hydraulic conductivity and ultimately facies identification of sediment intervals.

The age range of correlated sediment intervals, (Fig. 7) between USGS 142 and NRF 15 is thought to be 884 ka to 988 ka (North late Matuyama for NRF 15 and South late Matuyama for USGS 142 to Jaramillo) at depths ranging from 732 feet to 836 feet in USGS 142 and depths ranging from 527 to 595 feet in NRF 15. Flows from the South late Matuyama vent pinch out between USGS 142 and NRF 15. A complete interpretation of correlated basalt can be found in Fig. 2.

Areas of non-recovery are thought to be loose sediment that is blown into the formation when the drill bit passes through uncemented sediment intervals. The number on the right of each column (Fig. 7) is where sediment was taken for grain size analysis.

3.1.2

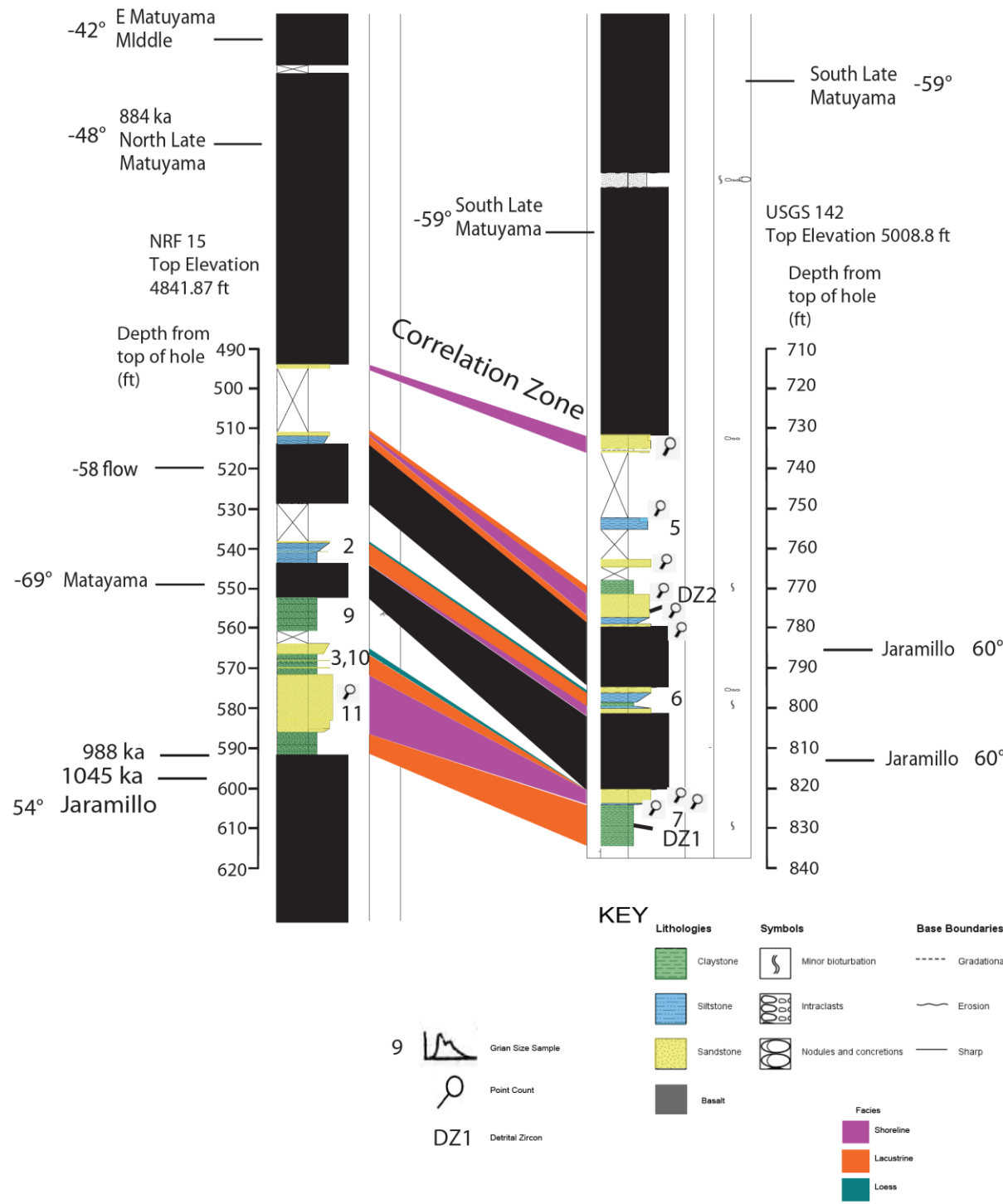


Figure 7: Correlation figure between USGS 142 and NRF 15, with inferred facies identification. I defined sediment intervals (numbers to the right of each column) based partially on intervals separated by basalt (degree number to the

side of each flow name is a different flow group) in USGS 142 and a separation of larger intervals for NRF 15. Intervals are as follows 5, 6, and 7 for USGS 142 and 2, 3, 9, 10, and 11 for NRF 15.

3.2 Sediment interbeds USGS 142

Sediment intervals are defined by units that are separated by basalt. The larger intervals are separated into smaller intervals, as follows: top, middle and bottom part of interval 5 in USGS 142 and interval 9, 10 and 11 in NRF 15. The data for all of the discussed properties of sediment (sorting, skewness, point counts, and hydraulic conductivity) can be found later in the report, and also in the appendix.

3.2.1 Interval USGS 142 7. Interval 7 is from 819.2-836.6 feet, Fig. 8. Although this is the bottom of the core used for this thesis, later drilling found several thick sedimentary units between about 846 ft and 1370 ft before bottoming out in a thick rhyolite deposit at 1396 ft BLS (USGS geophysical log accessed from the internet at http://ga2.er.usgs.gov/geologs/projects/inl/INL_Logarchive.htm). A sample for detrital zircon analysis was collected (sample DZI) at 832 feet BLS. Three point counts were taken at 823.5, 825.1 and 826.4 feet. Point counts were dominated by quartz and lithics (51% are felsitic volcanic lithics). There is bioturbation associated with rhizoliths at roughly 833.3 feet. In the cumulative frequency curve (Fig. 10) there are two distinct populations. There is a coarse sand population in the top of the interval. There is claystone in the middle and bottom of the interval. One coarse sandy lens was found in the middle of the fine grained section, USGS 142 7F. Smear slides show angular poorly sorted deposits in this section. Hydraulic conductivity ranged from 0.085 feet per day in sample USGS 142 7E to 10.6 feet per day in sample USGS 142 7B. Skewness values range from 0.674 for USGS 142 7A to 0.115 for 7E, 0.157 for 7G, and -0.068 for 7H to -0.093 for 7I.

USGS 142 interval 7

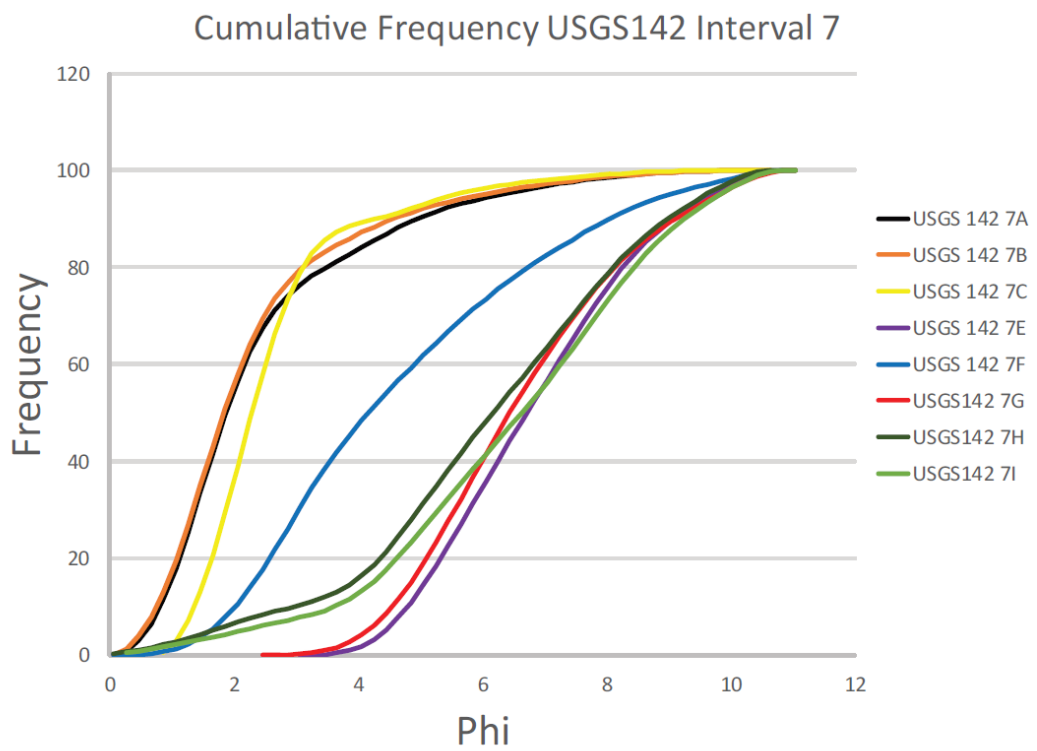
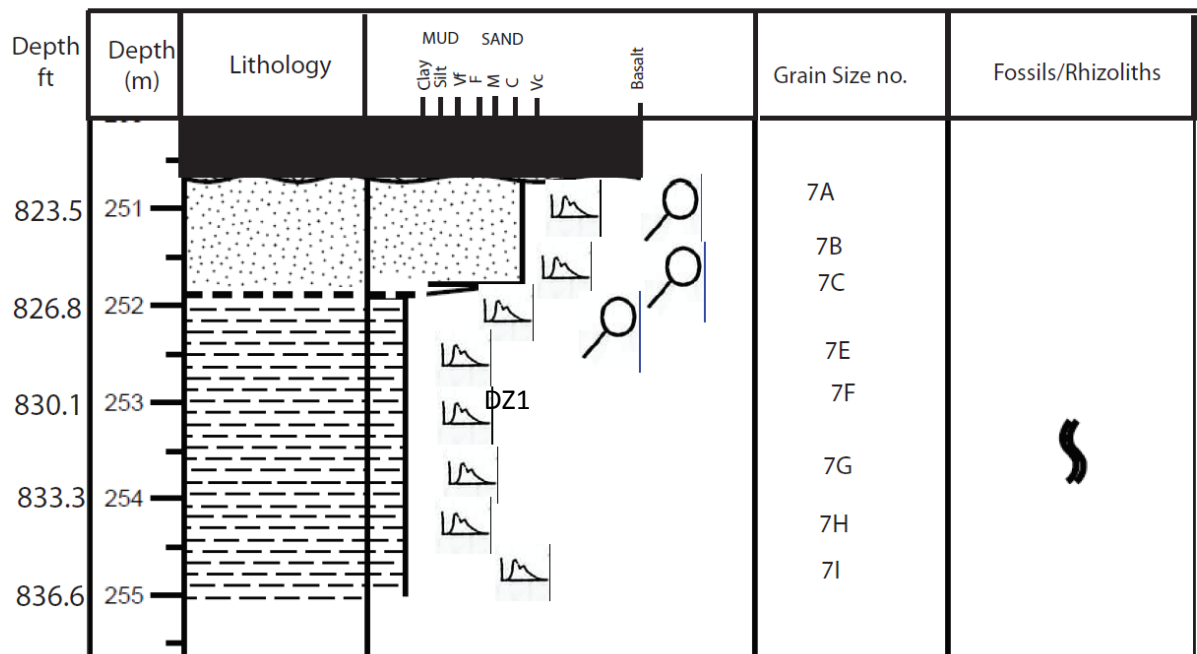


Figure 8: Stratigraphic and graphical representation of sediment USGS 142 interval 7. See figure 8 key for symbols.

3.2.2 Interval USGS 142 6. Interval 6 is from 796.3-803.1 feet. Five sediment samples were collected for grain size analyses (Fig. 9). Intraclasts were found at 797.2 feet and rhizoliths were noted at 800.5 feet. The cumulative frequency curve shows that there is little variation in grainsize between samples. The majority of sediment is in the fine sand to silt range. It grades from mostly fine sand and coarse silt to coarse sand. Smear slides show poorly sorted angular sediment deposits. Hydraulic conductivity ranges from 0.294 feet per day in USGS 142 6B to 1.97 feet per day in USGS 142 6E. Skewness values range from 0.261 for 6D to 0.436 for 6E.

USGS 142 interval 6

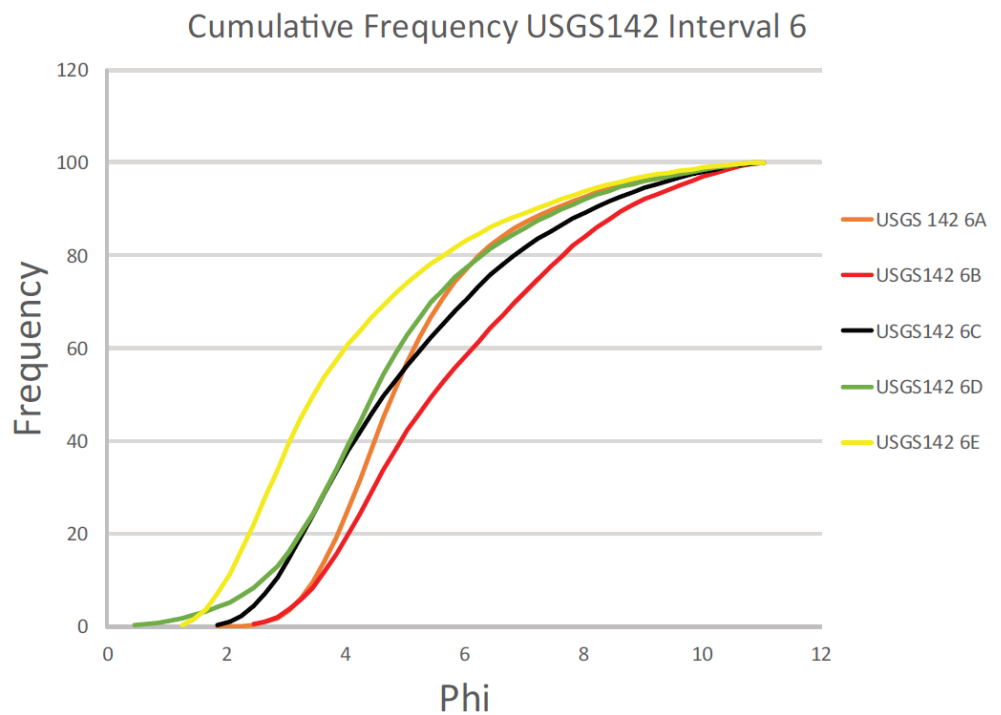
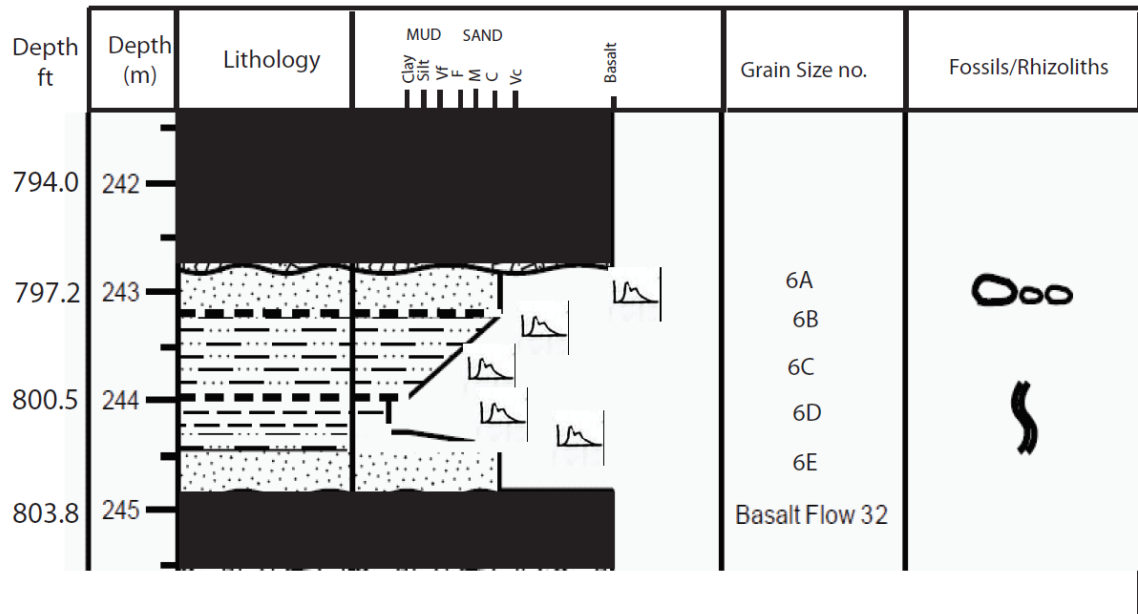


Figure 9: Stratigraphic and graphical representation of sediment USGS 142 interval 6. See figure 8 key for symbols.

3.2.3 Interval USGS 142 bottom of part 5. Interval bottom of 5 is from 774.3-780.8 feet. Seven grain size samples were taken in the section, Fig. 10. USGS 142 5O is slightly bi-modal, while USGS 142 5S is mostly fine grained. The rest of the cumulative frequency curves here are similar and show coarse grained material. Detrital zircon analysis (sample DZ2) was collected at a depth of 780 feet. Two point counts were taken at 776.6 and 780.8 feet. Point counts are dominated by quartz and lithics, with 61% of lithics being volcanic (76% are felsitic). Smear slides show angular poorly sorted sediment. Hydraulic conductivity ranges from 0.863 feet per day in sample USGS 142 5S, to 5.18 feet per day in sample USGS 142 5P. Skewness values range from 0.098 for 5O to 0.522 for 5N.

USGS 142 interval bottom of 5

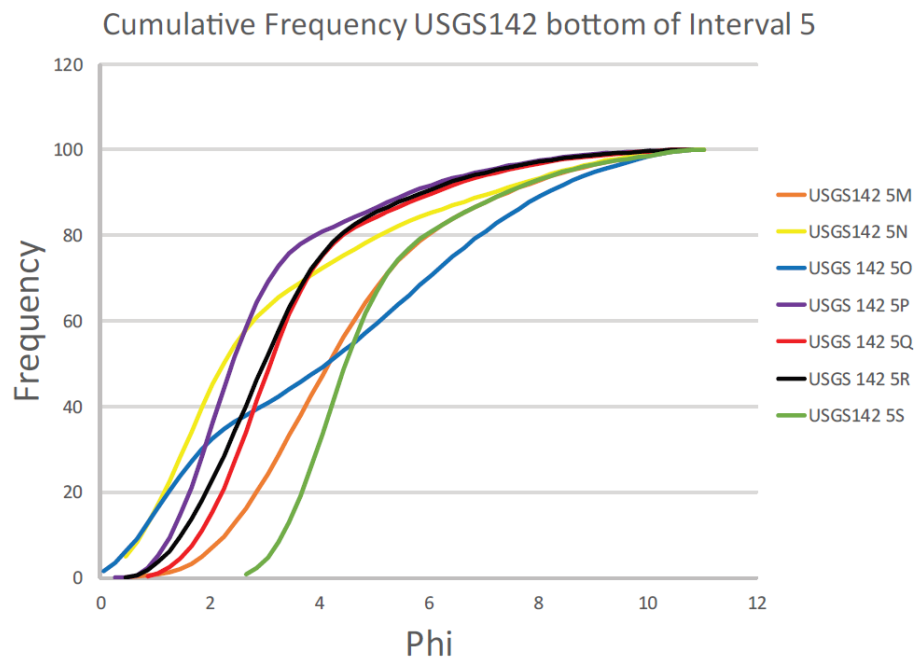
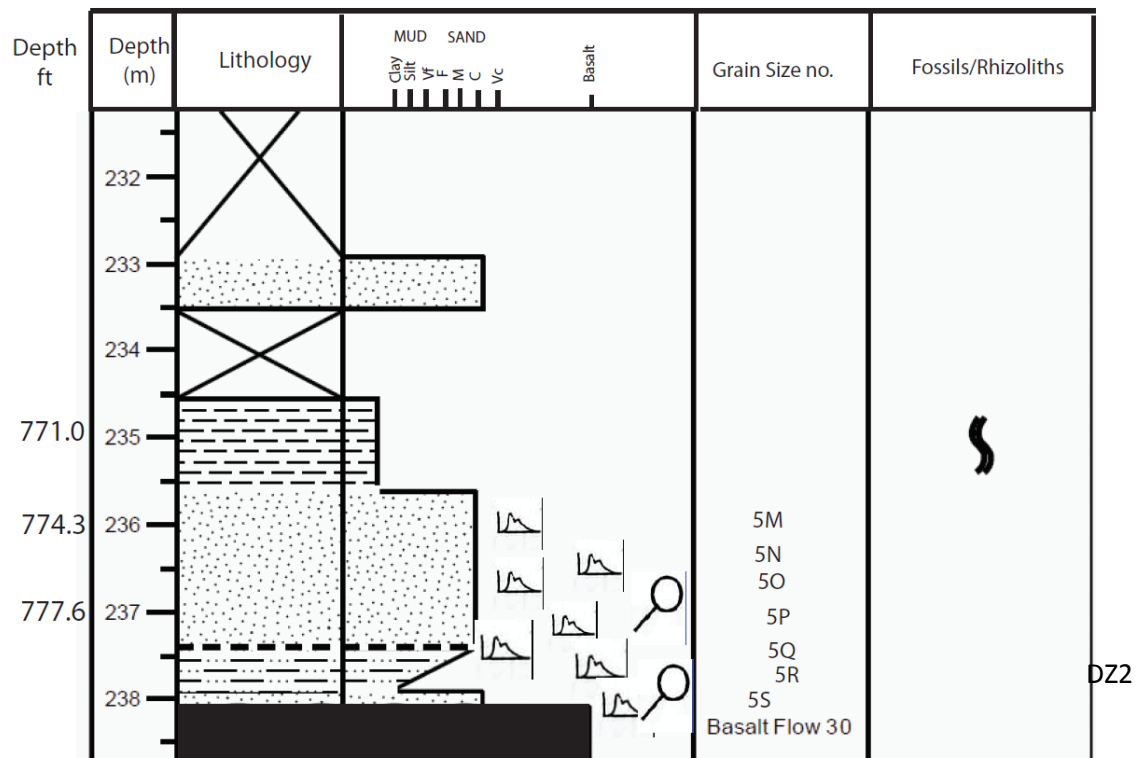
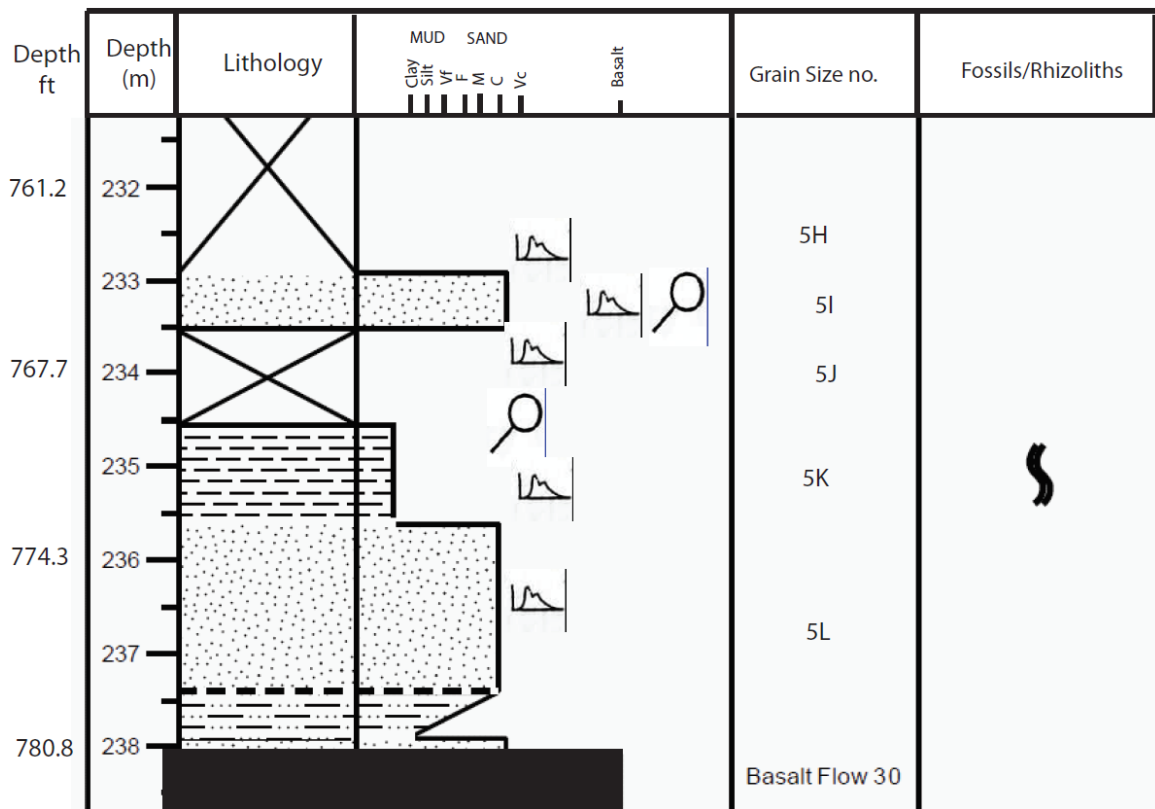


Figure 10: Stratigraphic and graphical representation of sediment USGS 142 interval bottom of 5. See figure 8 key for symbols.

3.2.4 Interval USGS 142 middle part of 5. Interval middle of 5 is from 764.4-774.3 feet in depth, Fig. 11. Thirty percent of this section was not recovered. Sediments are primarily coarse sand with a silty section at 769.4 feet. Point counts were taken in two sections, 764.4 feet and 769.4 feet. Point counts are dominated by quartz and lithics, with 62% volcanic lithics and (75% are felsitic). Bioturbation associated with rhizoliths was found at 771.7 feet. Cumulative frequency curves show general coarse sand with silt at USGS 142 5K. Smear slides show angular poorly sorted sediment. Hydraulic conductivity ranges from 0.464 feet per day in USGS 142 5K to 6.4 feet per day in USGS 142 5J. Skewness values range from 0.232 in 5K, to 0.403 in 5L.

USGS 142 interval middle of 5



Cumulative Frequency USGS142 middle of Interval 5

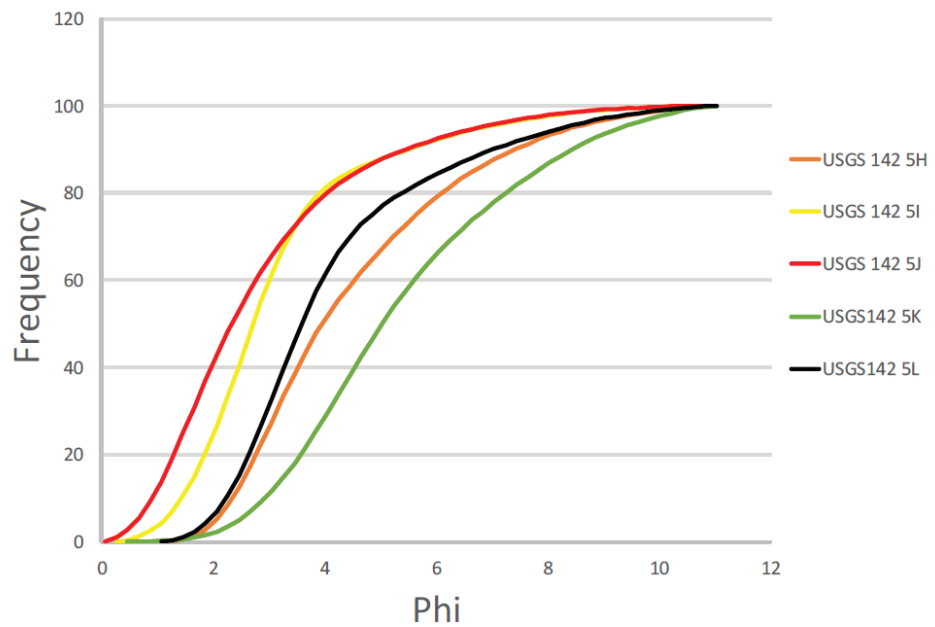


Figure 11: Stratigraphic and graphical representation of sediment USGS 142 interval middle of 5. See figure 8 key for symbols.

3.2.5 Interval USGS 142 top part of 5. Interval top of 5 is from 732.9-756.7 feet in depth. There is sand and silt in the top part of this section demonstrated by samples USGS 142 5D and 5E, Fig. 12. The section moves to silt and clay in samples USGS 142 5F and 5G (Fig. 12). There is a large area of non-recovery in the middle of this section, which accounts for 71.4% of the interval. Point counts were taken from the upper less consolidated coarser grained unit in 5D and 5E, and show a dominance of lithics and quartz. Of the total lithics in point counts, 70% are volcanic, and of that 73% are felsitic volcanic grains. Hydraulic conductivity, as estimated from grain size, ranged from 0.708 feet per day in sample USGS 142 5G to 4.05 feet per day in sample USGS 142 5E. Smear slides indicate angular poorly sorted sediment. Skewness values range from 0.000 in 5F to 0.396 in 5E.

USGS 142 interval top of 5

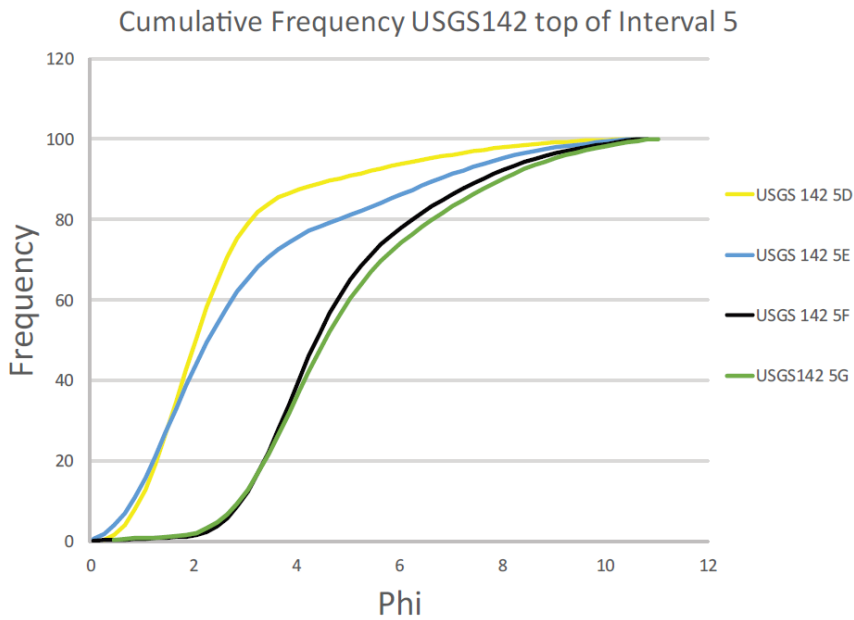
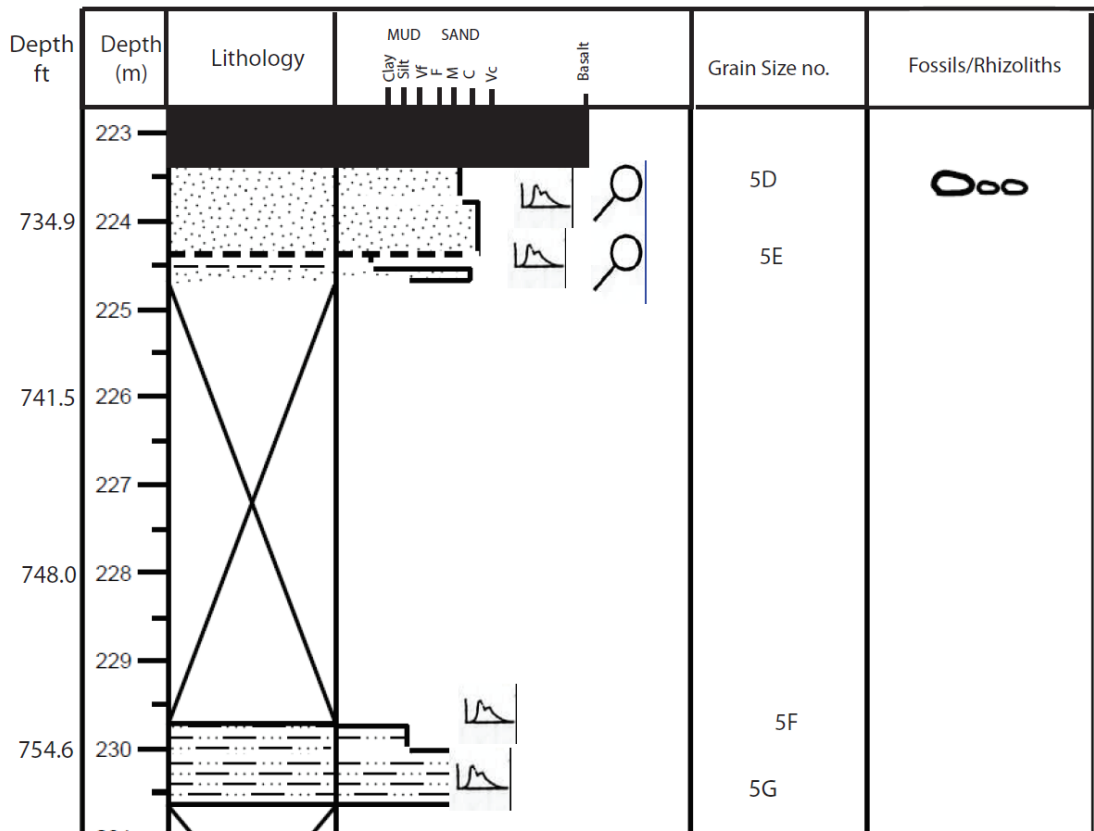
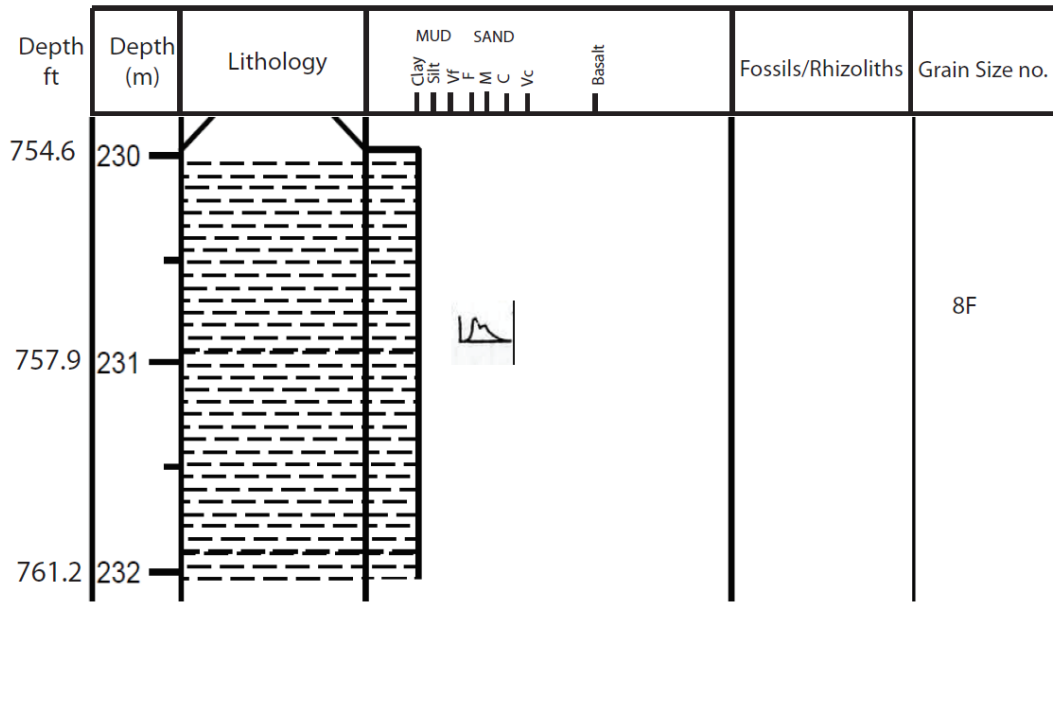


Figure 12: Stratigraphic and graphical representation of sediment USGS 142 interval top of 5. See figure 8 key for symbols.

3.3 Sediment interbeds NRF 15

3.3.1 Interval NRF 15 8. Interval 8 is found at a depth of 754.6 to 761.2 ft (Fig. 13). This is a massive clay to silt deposit with only one data point that confirms the fine grained nature of the unit. Smear slides show angular grains in poorly sorted sediment. Hydraulic conductivity is 0.0785 feet per day. Skewness is 0.014, or nearly symmetrical.

NRF 15 interval 8



Cumulative Frequency NRF 15 interval 8

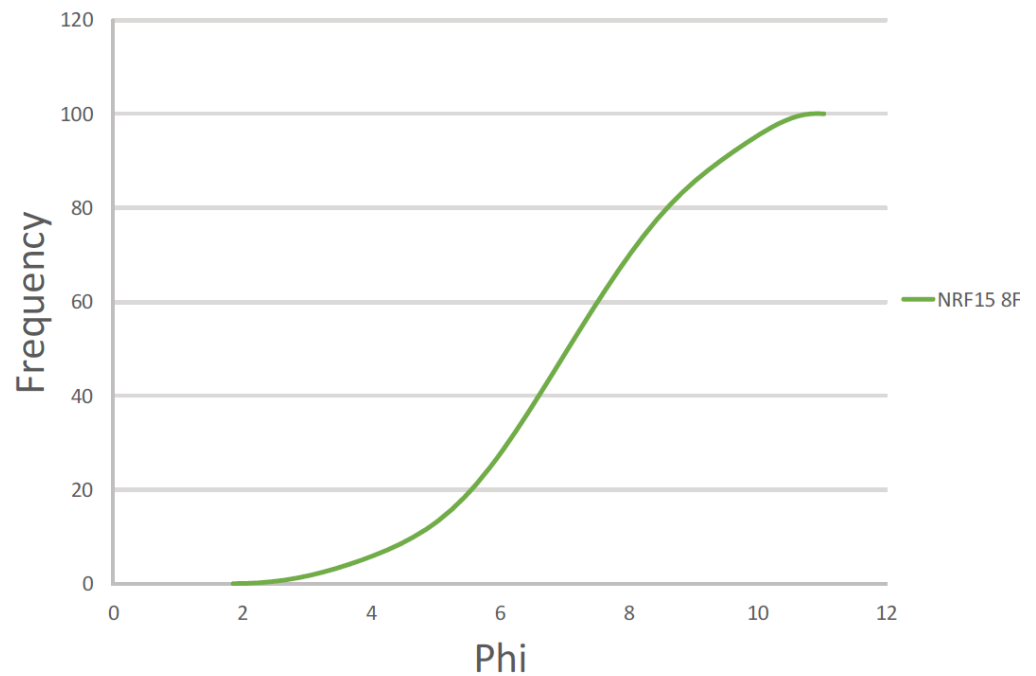


Figure 13: Stratigraphic and graphical representation of sediment NRF 15 interval 8. See figure 8 key for symbols.

3.3.2 Interval NRF 15 6. Interval is found at a depth of 739.8-745.7 ft, Fig. 14. Another massive silt and clay deposit with rhizoliths at 742.5 ft. The cumulative frequency curve shows NRF 15 6D and 6E are slightly coarser grained than samples NRF 15 6A, 6B and 6C. This coarser material shows up as lens in the massive unit. Smear slides show angular grains in poorly to very poorly sorted sediment. Hydraulic conductivity ranges from 0.095 feet per day in sample NRF 15 6D to 0.107 feet per day in sample NRF 15 6E. Skewness values range from 0.254 for NRF 15 6B to -0.308 for NRF 15 6D.

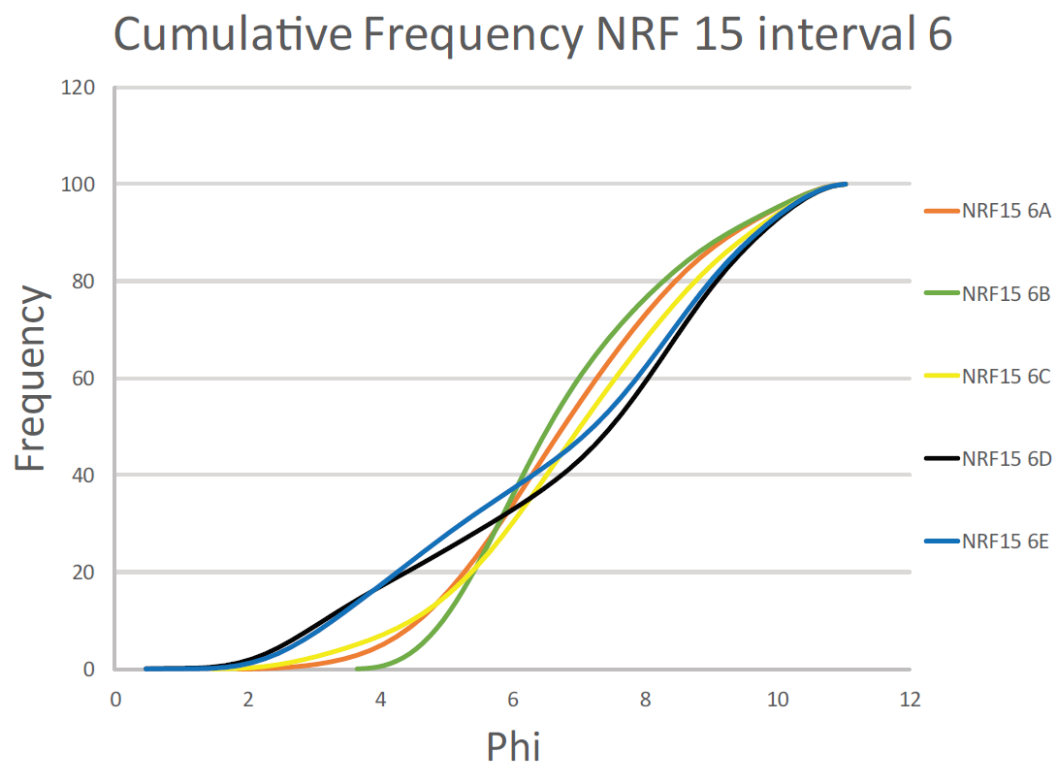
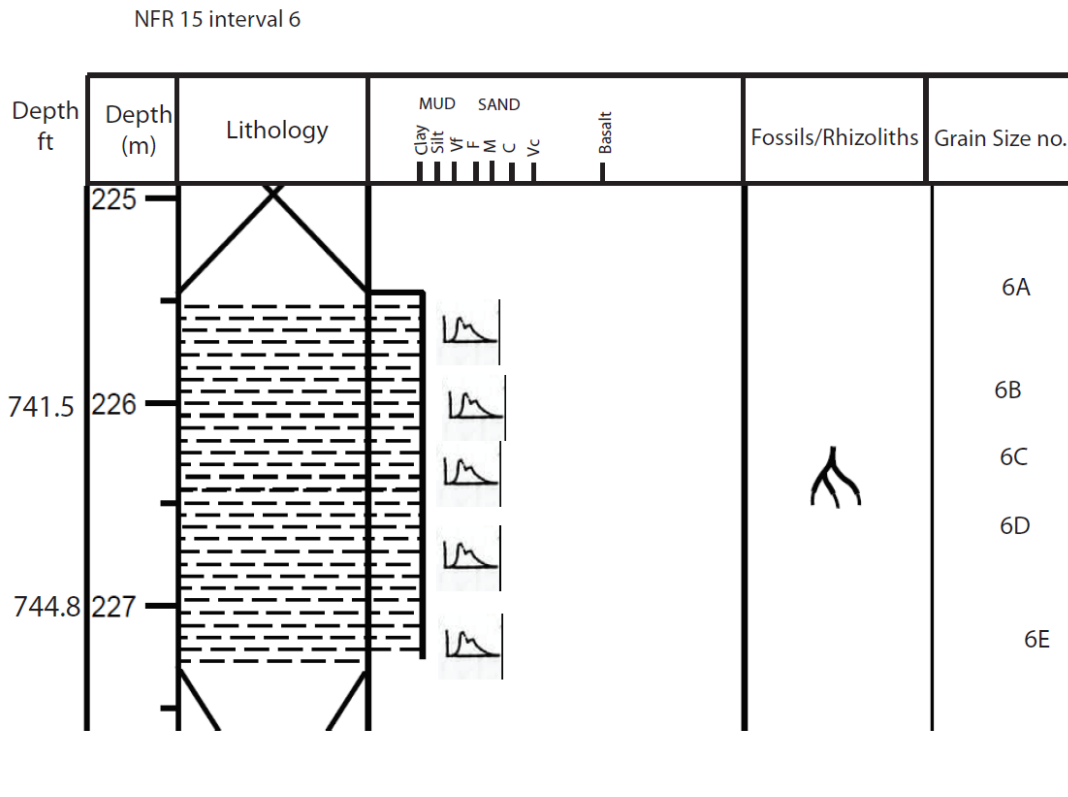
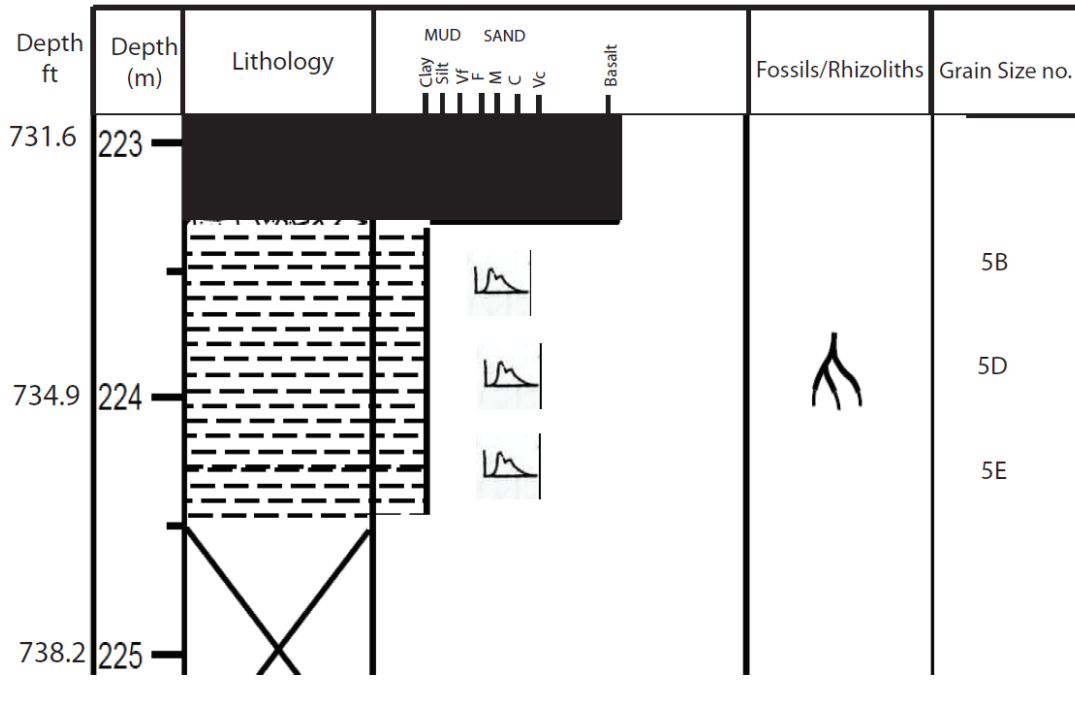


Figure 14: Stratigraphic and graphical representation of sediment NRF 15 interval 6. See figure 8 key for symbols.

3.3.3 Interval NRF 15 5. Interval is found at a depth of 732.6-739.8 ft (Fig. 15). This is a massive clay and silt unit. Rhizoliths show up at 734.3 ft. Cumulative frequency curves display same/similar grain sizes, silt to clay, throughout the interval. Smear slides show angular grains in poorly to very poorly sorted sediment. Hydraulic conductivity is fairly uniform ranging from 0.055 feet per day in sample NRF 15 5D to 0.0788 feet per day in sample NRF 15 5E. Skewness values range from 0.060 for NRF 15 5D, to 0.100 for NRF 15 5E.

NRF 15 interval 5



Cumulative Frequency NRF 15 interval 5

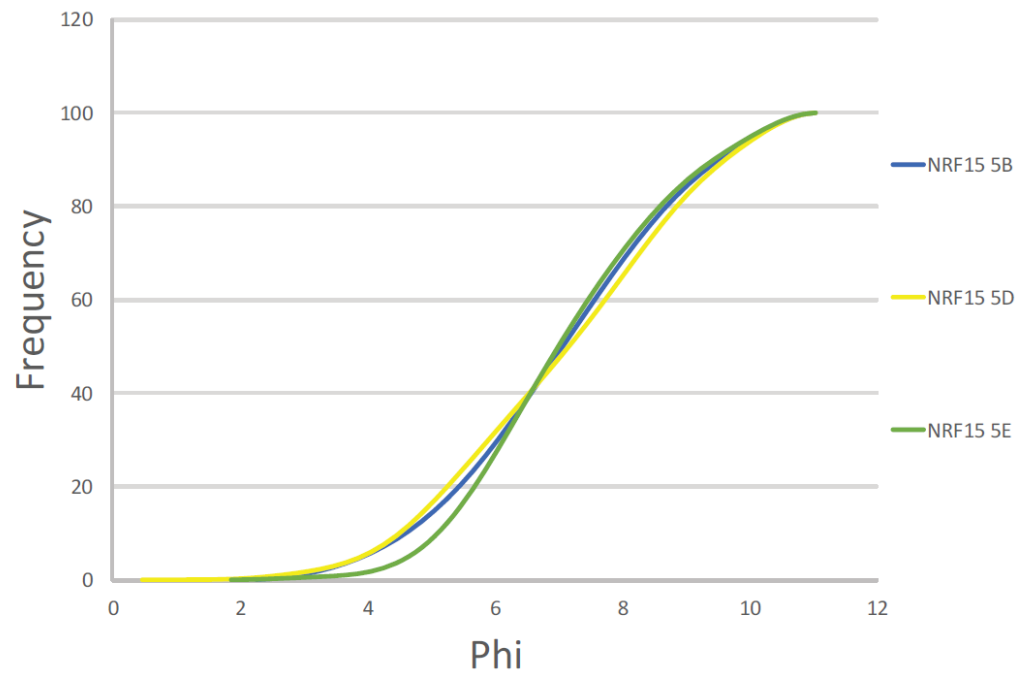
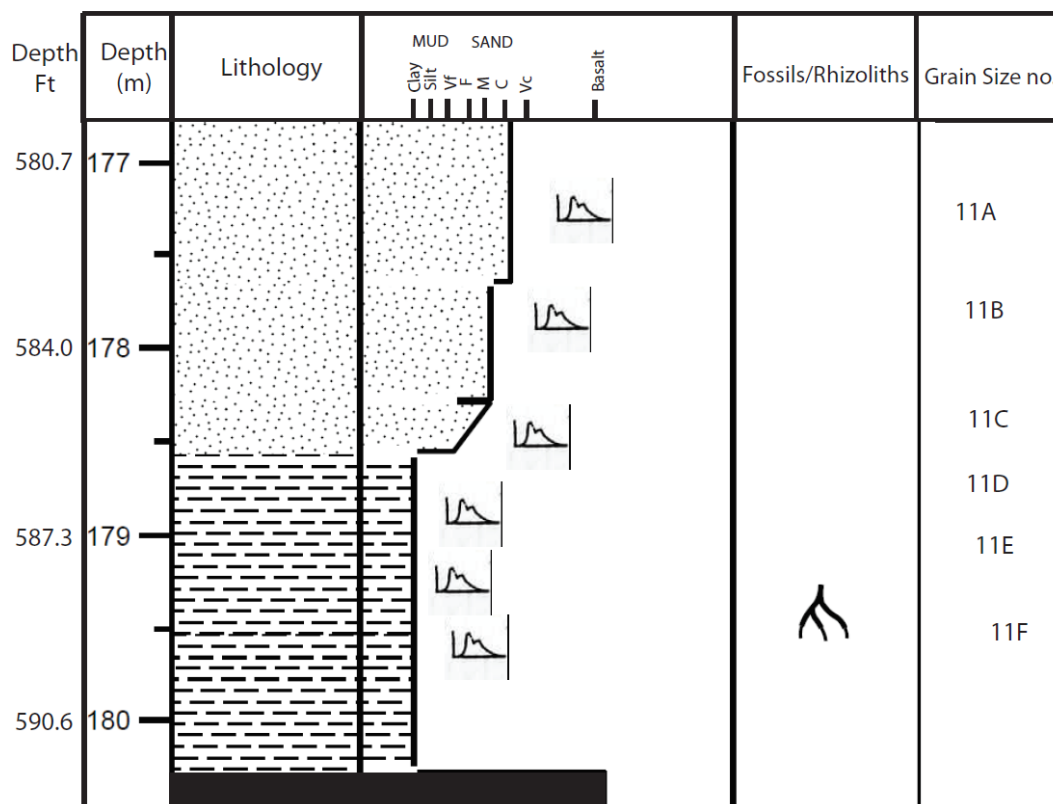


Figure 15: Stratigraphic and graphical representation of sediment NRF 15 interval 5. See figure 8 key for symbols.

3.3.4 Interval NRF 15 11. Interval 11 is found at a depth of 580.1-591.5 ft (Fig. 16). This represents a coarsening up interval that changes from fine silt and clay to medium sand. In the cumulative frequency curve NRF 15 11A is the coarsest sample, while NRF 15 11B and 11C are slightly finer grained. NRF 15 11D and 11E are fine grained silt and clay while NRF 15 11F is a sandy lens found in a fine grained unit. Rhizolith bioturbations show up at 588.9 ft. Point counts taken from loose sediment in NRF 15 11B were predominantly quartz and lithics, with 67% of lithics being volcanic (62% of those be felsitic). Smear slide show angular grains with poorly to very poorly sorted sediment. Hydraulic conductivity ranged from 0.058 feet per day in sample NRF 15 11E to 5.16 feet per day in sample NRF 15 11B. Skewness values range from 0.021 for NRF 15 11D to 0.622 for NRF 15 11C.

NRF 15 interval 11



Cumulative Frequency NRF 15 interval 11

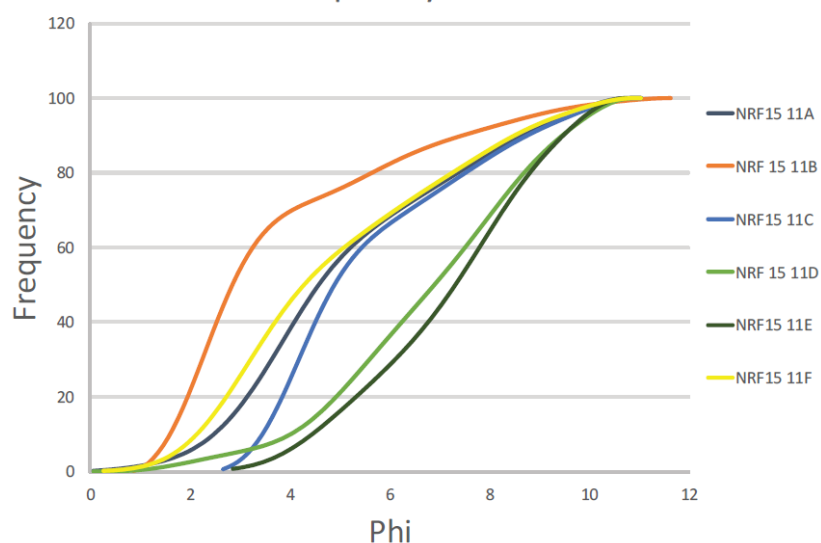
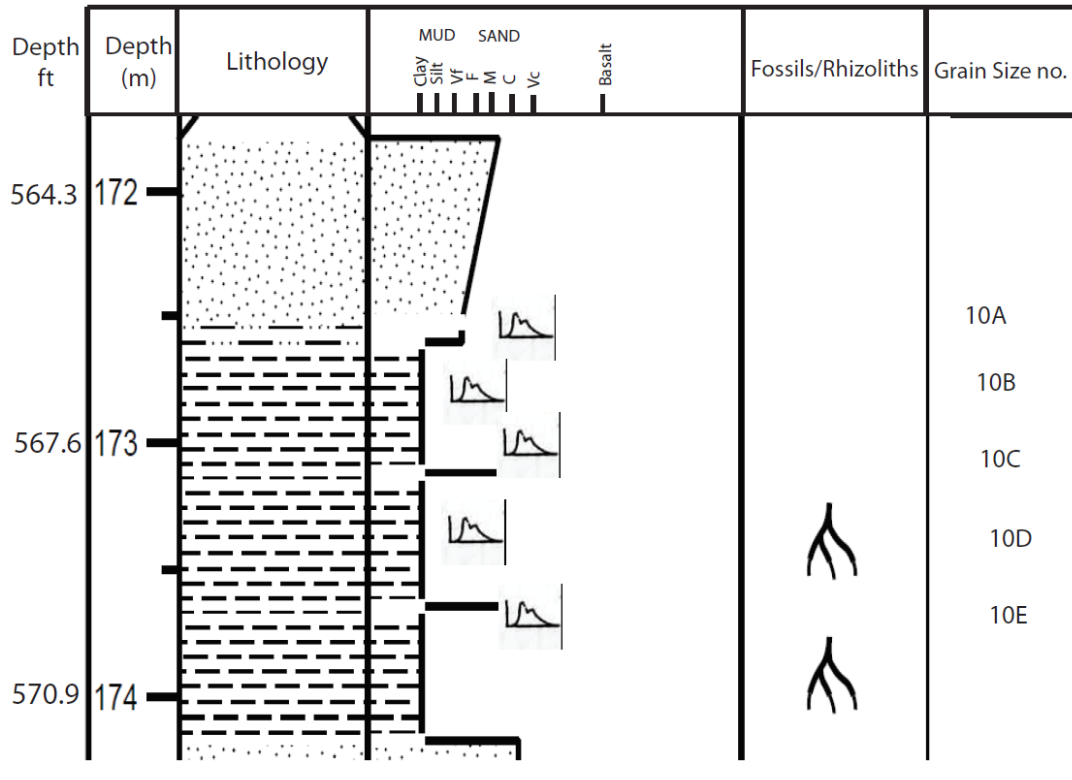


Figure 16: Stratigraphic and graphical representation of sediment NRF 15 interval 11. See figure 8 key for symbols.

3.3.5 Interval NRF 15 10. Interval 10 is found at a depth of 563.6-571.5 ft (Fig. 17). The base of this unit is silt and clay with fine grained sandy lenses at regular intervals. The section is topped with a coarsening up sandy unit. Rhizoliths are found at both 568.9 and 569.9 ft. The cumulative frequency curves are very similar except for NRF 15 10E which has a coarse grained distribution. NRF 15 10E is a lens of coarse grained material in a silt and clay unit. Other lenses were found while creating the stratigraphic column but only NRF 15 10E was a direct sample of a coarse grained lens. Smear slides show angular grains that are poorly to very poorly sorted. Hydraulic conductivity ranges from 0.039 feet per day in sample NRF 15 10C to 0.140 feet per day in sample NRF 15 10E. Skewness values range from -0.072 for NRF 15 10A, to -0.379 for NRF 15 10E.

NRF 15 interval 10



Cumulative Frequency NRF 15 interval 10

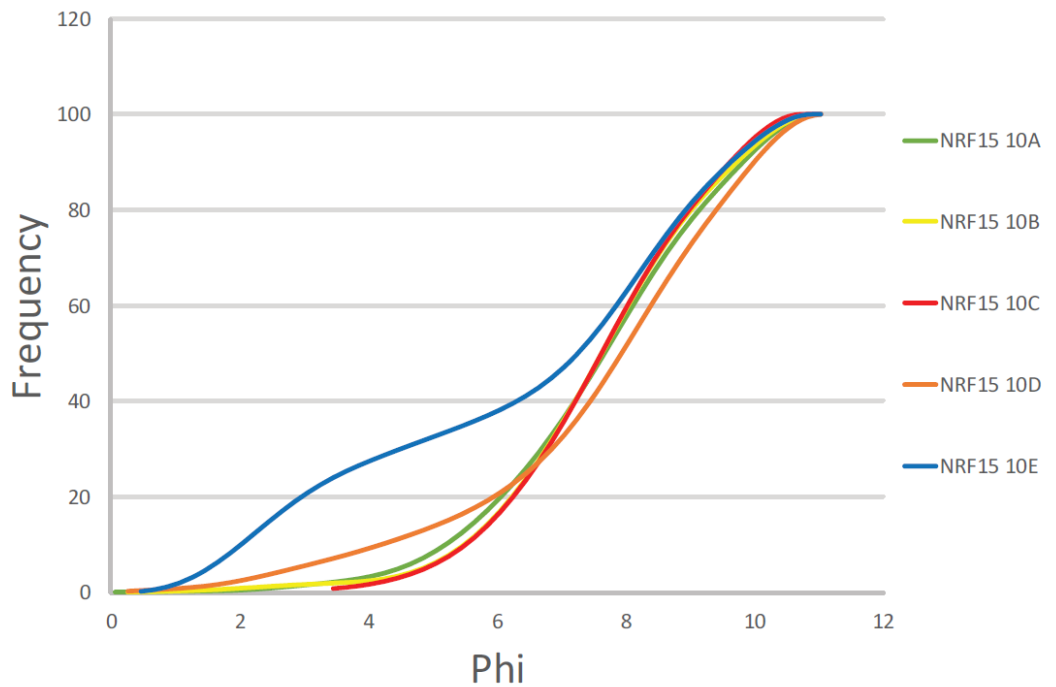


Figure 17: Stratigraphic and graphical representation of sediment NRF 15 interval 10. See figure 8 key for symbols.

3.3.6 Interval NRF 15 9. Interval 9 is found at a depth of 552.2-560.0 ft, Fig. 18. It is massive silt and clay. A single fine sand grained sample was collected from the very top of the interval in sample NRF-15 9A. Rhizoliths are found at 556.1 ft. Smear slides show angular grains that are poorly to very poorly sorted. Hydraulic conductivity ranges from 0.051 feet per day for sample NRF 15 9F to 0.568 feet per day in sample NRF 15 9A. Skewness values ranged from 0.068 for NRF 15 9B, to 0.327 for NRF 15 9A.

NRF 15 Interval 9

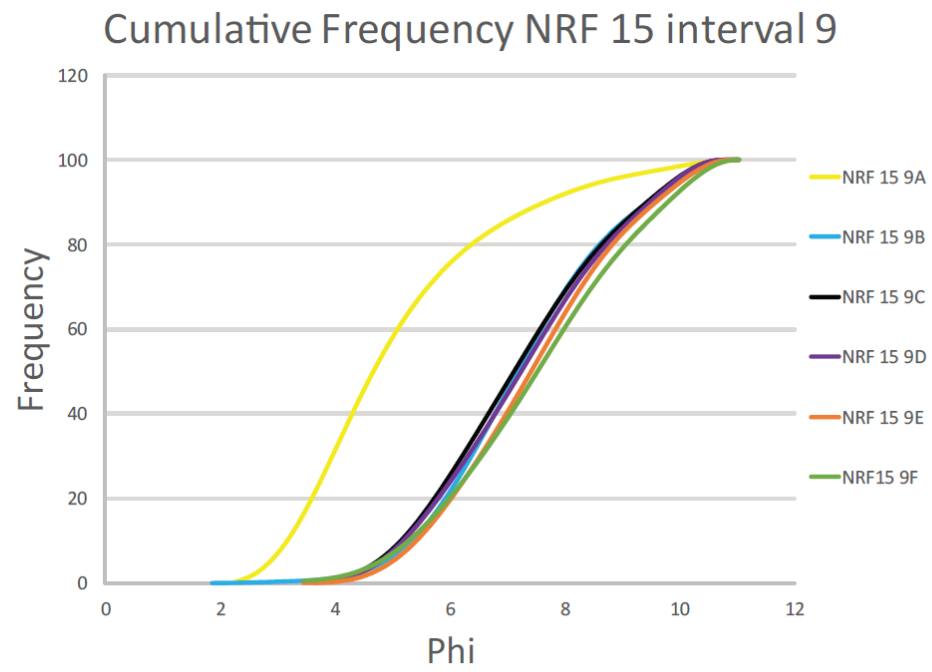
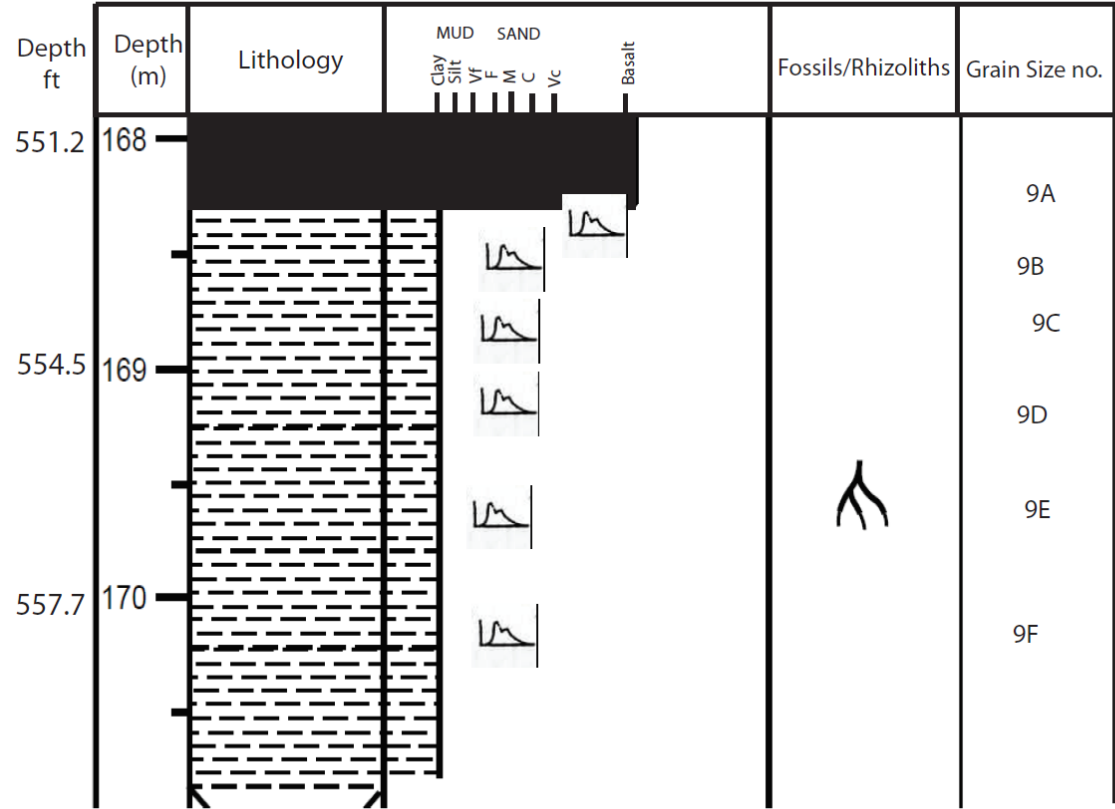
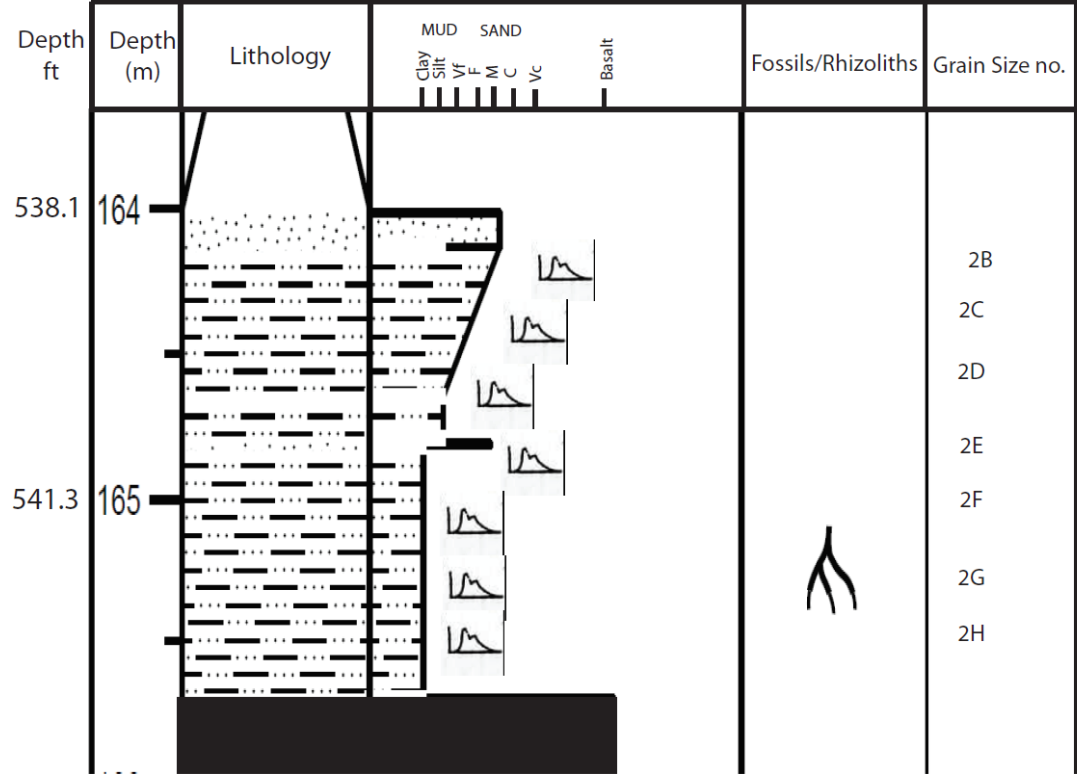


Figure 18: Stratigraphic and graphical representation of sediment NRF 15 interval 9. See figure 8 key for symbols.

3.3.7 Interval NRF 15 2. Interval 2 is found at depths from 538.1-543.6 ft, Fig. 19. The cumulative frequency curves show bi-modal grain size distribution toward the top of the section. This is a coarsening up interval, with fine grained silt and clay at the bottom and coarser material at the top of the interval. Rhizoliths show up at a depth of 542.3 ft. Smear slides show angular grains that are poorly to very poorly sorted. Hydraulic conductivity range from 0.099 feet per day in sample NRF 15 2C to 0.173 feet per day in sample NRF 15 2B. Skewness values ranged from -0.397 for NRF 15 2D to 0.149 for NRF 15 2F.

NRF 15 interval 2



Cumulative Frequency NRF 15 interval 2

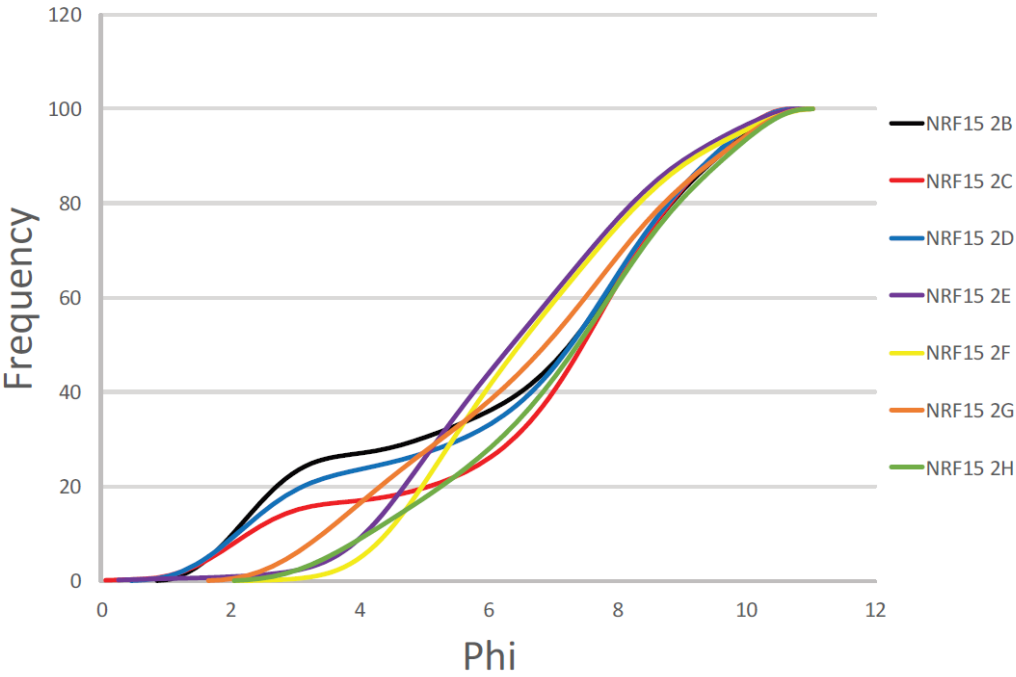


Figure 19: Stratigraphic and graphical representation of sediment NRF 15 interval 2. See figure 8 key for symbols.

3.4 Sedimentary intervals correlated between USGS 142 and NRF 15

3.4.1 The sediment intervals at 511-514 feet BLS in NRF 15 (unnamed) and at 773-781 BLS in USGS 142 (interval 5), Fig. 20, are seen as similar geometry of sediment between cores. This geometry is interpreted as a coarsening up or shallowing up sequence, which is bounded by basalt on the top and the bottom. The correlated unit between NRF 15 unknown and USGS 142 bottom of interval 5 is fine grained silt and sand that coarsens into fine to medium sand. The upper portions of USGS 142 interval 5 is extensive and thick showing two other units, within interval 5, that grade from silt and clay into fine to medium sand. This upper portion of USGS 142 5 has fine grained silt and clay and fine sand, but could not be correlated to the upper portion of NRF 15 unnamed.

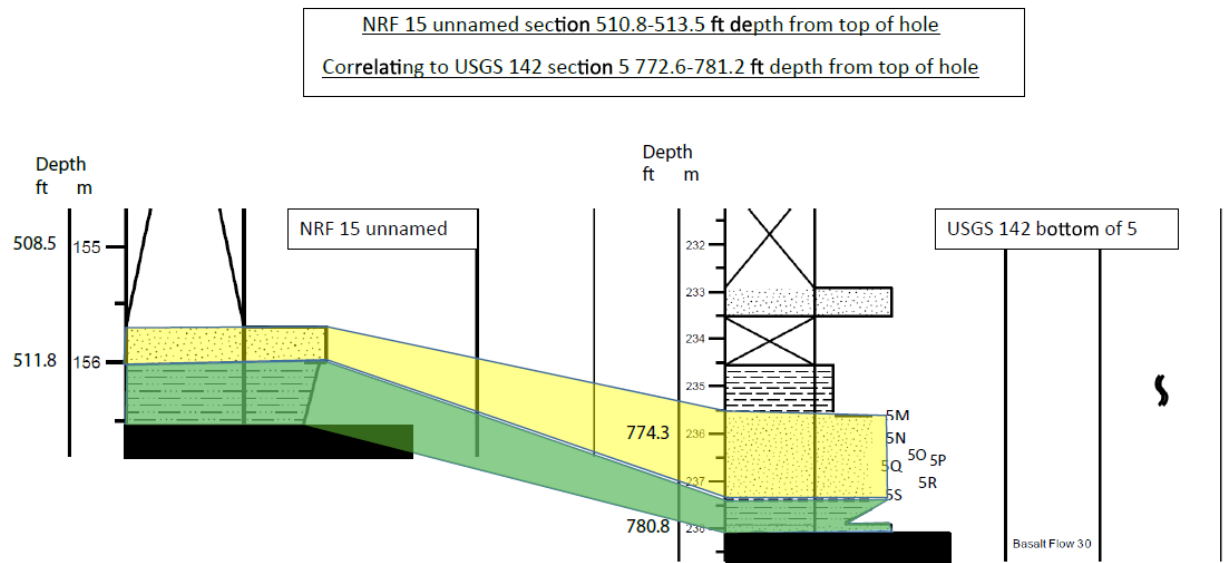


Figure 20: NRF 15 unnamed correlated with USGS 142 bottom of 5. See figure 8 key for symbols.

3.4.2 The sediment interval at 538-543 feet BLS in NRF 15 (interval 2) and at 797-800 feet BLS in USGS 142 (interval 6), (Fig. 21) correlate based on each interval having a similar coarsening up grainsize bounded by basalt on the top and the bottom. The correlative unit between NRF 15 interval 2 and USGS interval 6 shows silt and clay sediment that coarsens up to sand and a bi-modal distribution. This bi-modal unit is the only interval that is found in both USGS 142 and NRF 15 that fits the definition a bi-modal grain size distribution. Bioturbation and rhizoliths help to confirm a shallow lake facies in both intervals. In the bottom USGS 142 interval 6, there is a thick lens of fine to medium sand that could be associated with loess deposition.

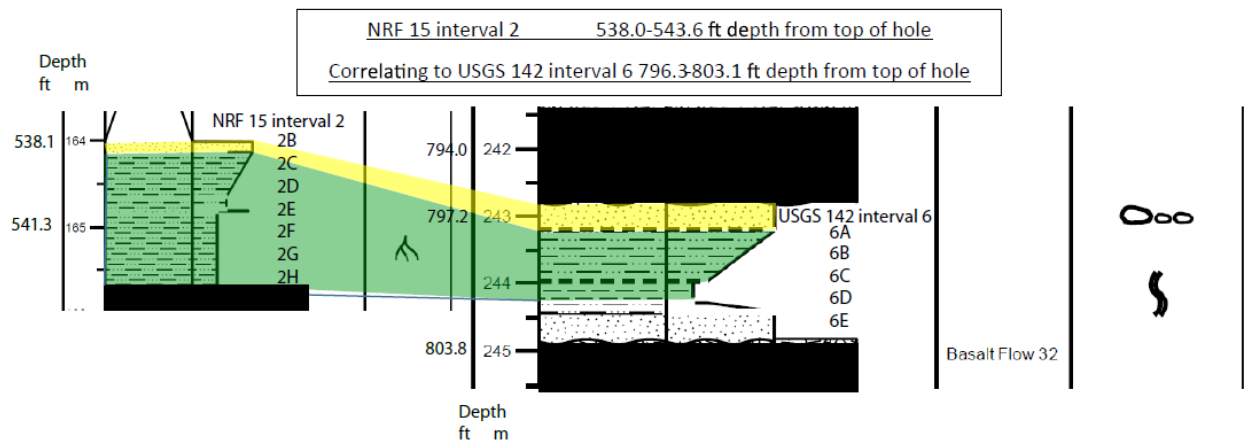


Figure 21: NRF 15 interval 2 correlated with USGS 142 interval 6. See figure 8 key for symbols.

The cumulative frequency curve for these correlated intervals is seen in Fig. 22. This graph shows us that NRF 15 sediment in interval 2 (dashed line) is dominated by bi-modal sediment and silt to clay. USGS 142 interval 6 on the other hand contains coarse sand. This represents a deepening of lake facies toward NRF 15.

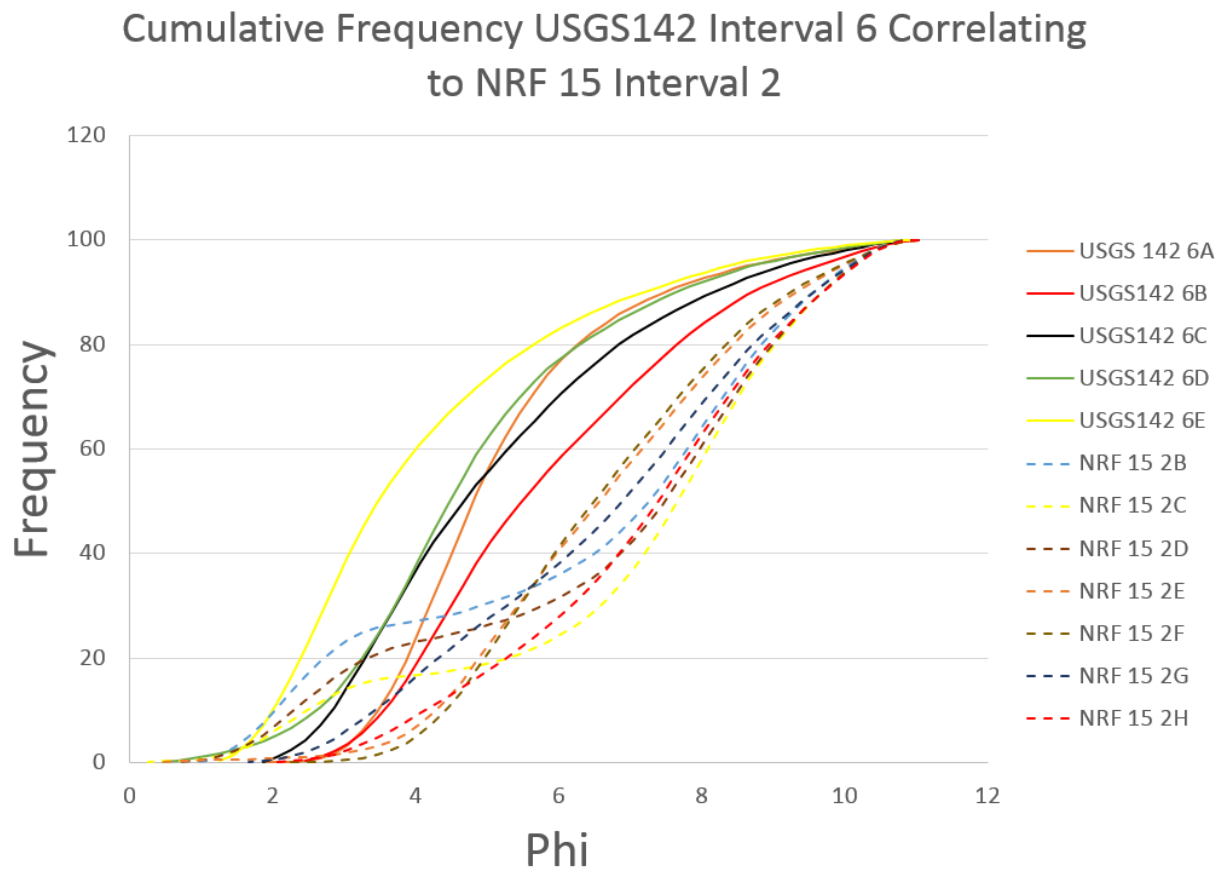


Figure 22: Cumulative Frequency curves for USGS 142 (solid lines) interval 6 and NRF 15 (dashed line) interval 2
Correlation between USGS 142 and NRF 15.

3.4.3 The sediment interval at 580-591 feet BLS in NRF 15 (interval 11) and at 823-836 feet BLS in USGS 142 (interval 7), fig 23, is a coarsening up sequence that is bounded by basalt on the top and the bottom. Correlation of NRF 15 interval 11 and USGS 142 interval 7 shows two massive clay and silt units that grade into fine to medium sand. Rhizoliths and bioturbation are found within the clay portions of both cores indicating a shallow lake. These are the thickest continuous deposits found in all the sedimentary intervals between both NRF 15 and USGS 142.

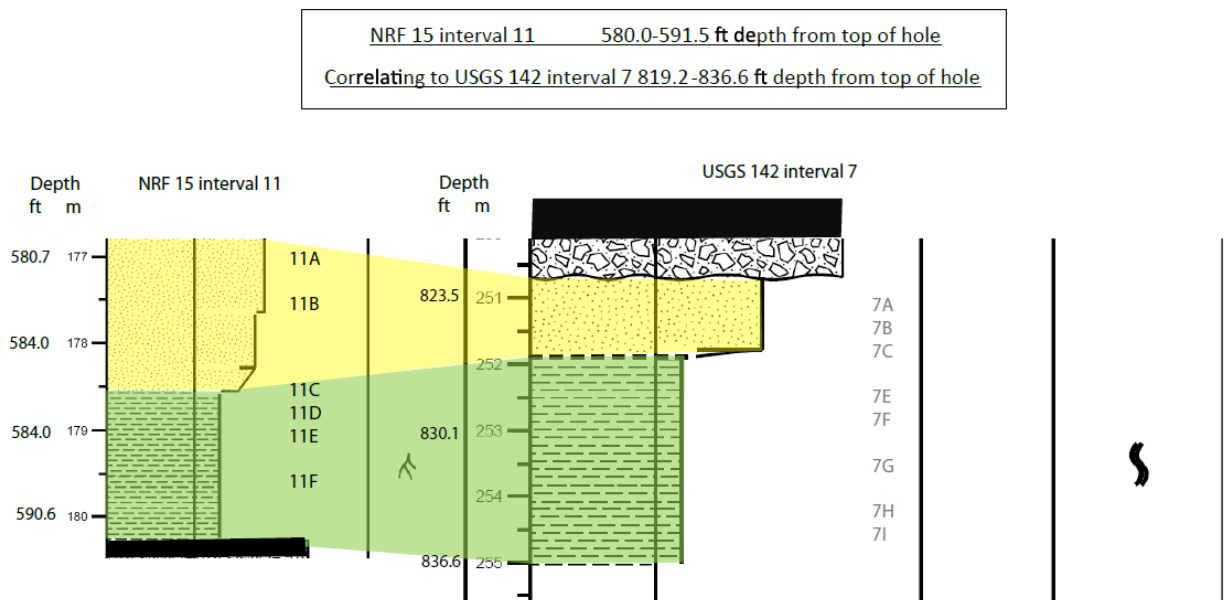


Figure 23: NRF 15 interval 11 correlated with USGS 142 interval 7. See figure 8 key for symbols.

The cumulative frequency curve comparing these intervals is found in Fig. 24. There are very similar grain size frequency curves between the two cores with silt and clay that coarsens up into sand. Also there are sandy lenses within the fine grained clay and silt found in each interval. This is interpreted to represent similar depositional environments between cores.

Cumulative Frequency USGS142 Interval 7 Correlating to NRF 15 interval 11

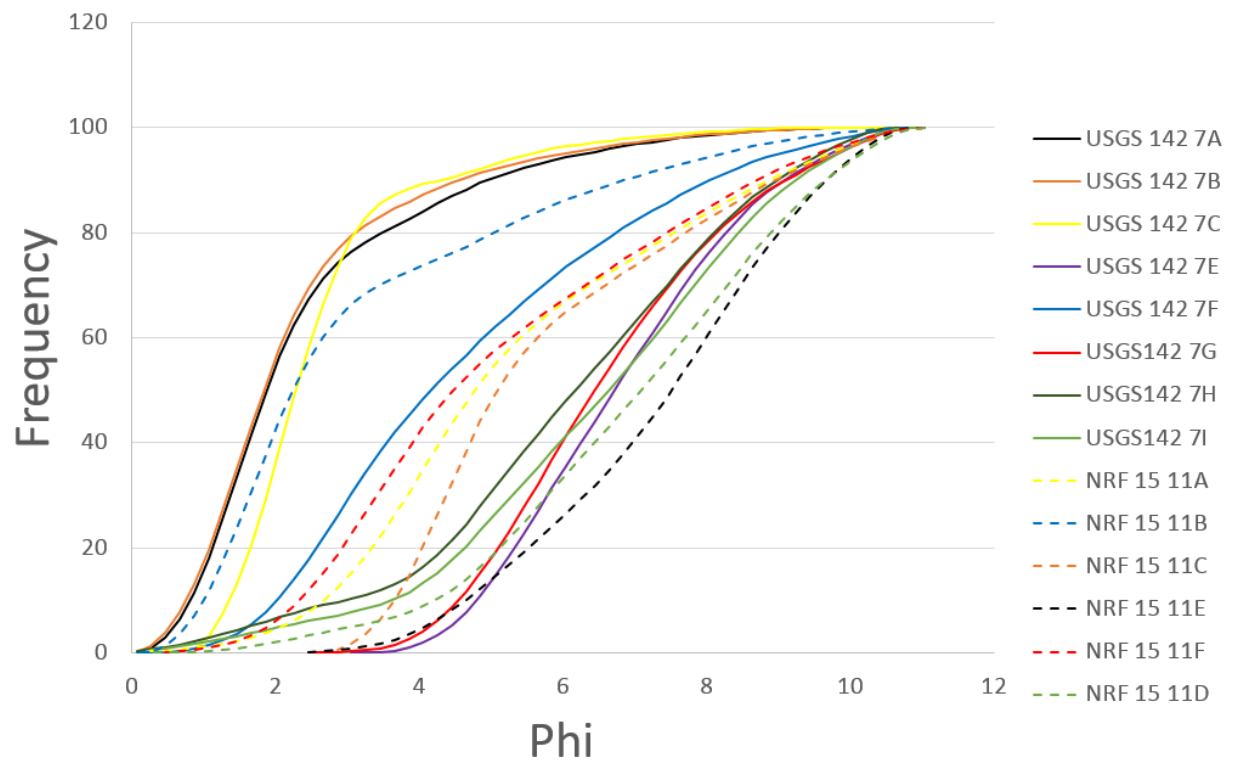


Figure 24: Cumulative frequency curves comparing USGS 142 interval 7 (solid lines) which is correlated to NRF 15 (dashed lines) interval 11. The two correlated intervals and representative curves match up well.

3.5 Synthesis

Sediment characteristics: Sorting and Skewness

3.5.1 Sorting

Equation used (Tucker, 2001) $\sigma\Phi = \frac{(\Phi_{84} - \Phi_{16})}{4} + \frac{(\Phi_{95} - \Phi_5)}{6.6}$

Figure 25 shows sorting compared with mean grain size for all samples analyzed from USGS 142 and NRF 15. All values are in the poorly sorted to very poorly sorted range as indicated by values greater than 1.00 on the horizontal axis. The graphical representation shows no real correlation for sorting values, though it should be noted that coarser grained samples are generally better sorted. Better sorted coarse grained samples are represented by values between 1 and 2.5 on the horizontal axis and coarse grained sediment seen as values between 2 and 3.5 phi on the vertical axis. Good sorting is representative of winnowing and reworking of shoreline and loess deposits (fine and medium sand samples).

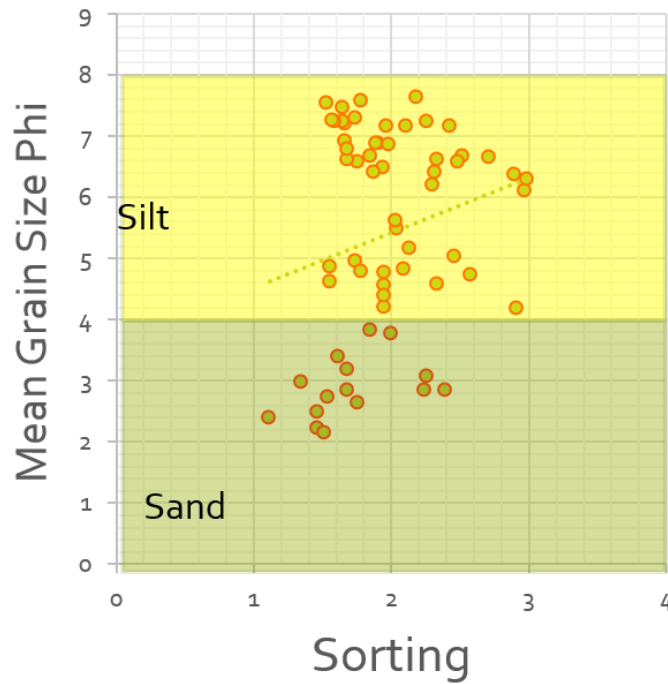


Figure 25. Sorting compared with mean grain size for NRF 15 and USGS 142. The higher the sorting value the more poorly sorted the deposit. The dashed line is a best fit line (R2 value of 0.0485) and shows very little correlation across all sorting values.

3.5.2 Skewness

$$\text{Equation used (Tucker, 2001)} \quad SK = \frac{\Phi_{16} + \Phi_{84} - 2\Phi_{50}}{2(\Phi_{84} - \Phi_{16})} + \frac{\Phi_5 + \Phi_{95} - 2\Phi_{50}}{2(\Phi_{95} - \Phi_5)}$$

Two distinct populations are evident when comparing mean grain size against skewness (Fig. 26). The first population is fine to medium sand (shoreline facies) and is skewed to the fine/positive direction. The next is lake facies and has skewness values close to zero. These two populations show that fines are incorporated more into fine to medium sand samples, and that there is a distinct lack of coarse grained material in sediment interpreted to be deposited in lakes.



Figure 26. Mean grain size compared to skewness. Positive values are fine skewed while negative values are coarse skewed

3.5.3 Cumulative Frequency Curves

Figure 27 shows the cumulative grain size frequency for all samples collected from USGS 142. Loess deposits, blue, are easily identified as a result of a bi-modal grain size distribution. Green curves represent lake deposits, which are primarily fine grained silt and clay deposits. Yellow represents shoreline deposits, which are dominantly medium to fine sand. USGS 142 has better recovery thus a better representation of the three interpreted facies.

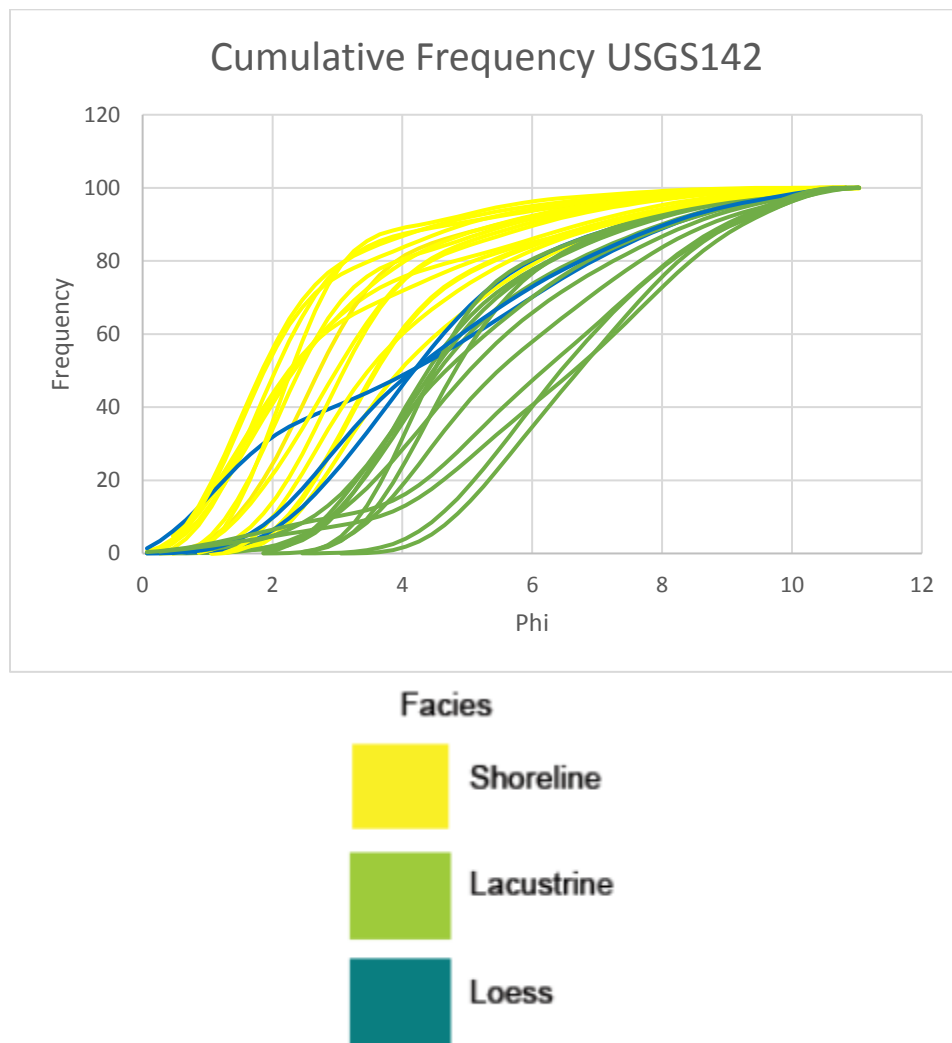


Figure 27: Cumulative frequency of all samples in USGS 142. Note that green is lacustrine, blue is loess and yellow is shoreline.

Figure 28 shows the cumulative grain size frequency for all the samples collected from NRF 15. The green curves shows lake facies, while the yellow represents shoreline, and the blue represents loess. This graph shows a dominance of fine grained material (lake deposits), and small populations of bi-modal and coarse grained material (loess and shoreline). Core recovery is higher in lake facies as deposits are often better cemented compared with coarse grained material, which are lost due to coring techniques.

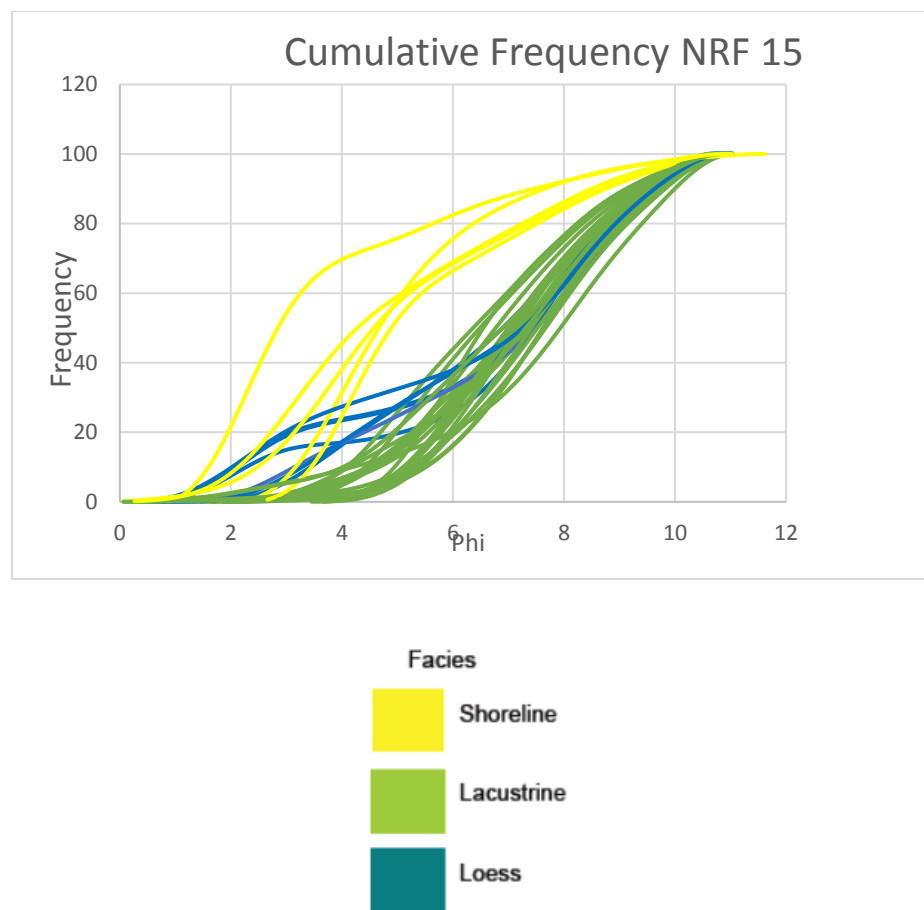


Figure 28: Cumulative frequency of all samples in NRF 15 note that green is lacustrine, blue is loess and yellow is shoreline facies

Properties of Facies Identified in Cores USGS 142 and NRF 15

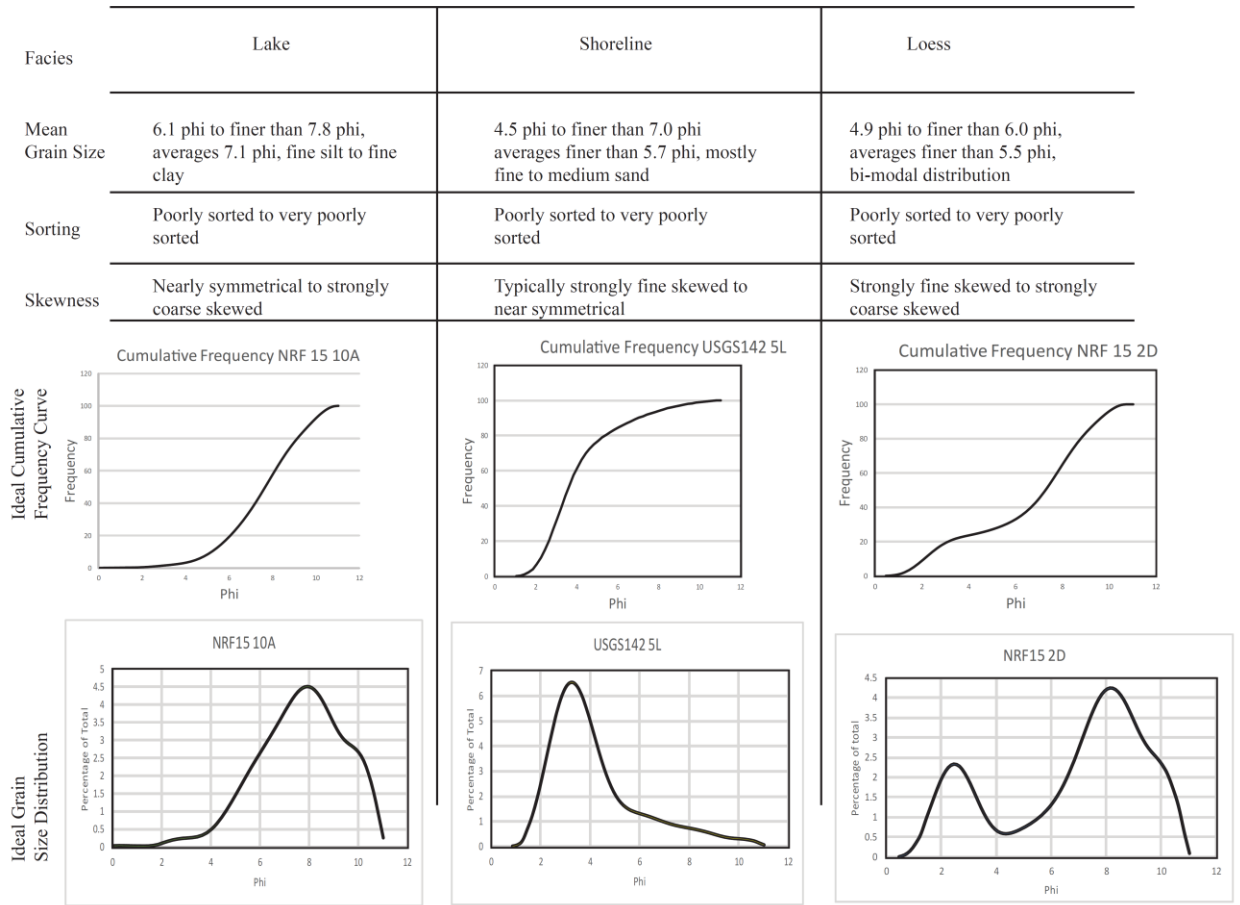


Figure 29. General grain size, sorting, and skewness, along with idealized distribution and cumulative frequency curves, for shoreline, loess and lacustrine deposits.

3.6 Point Counts

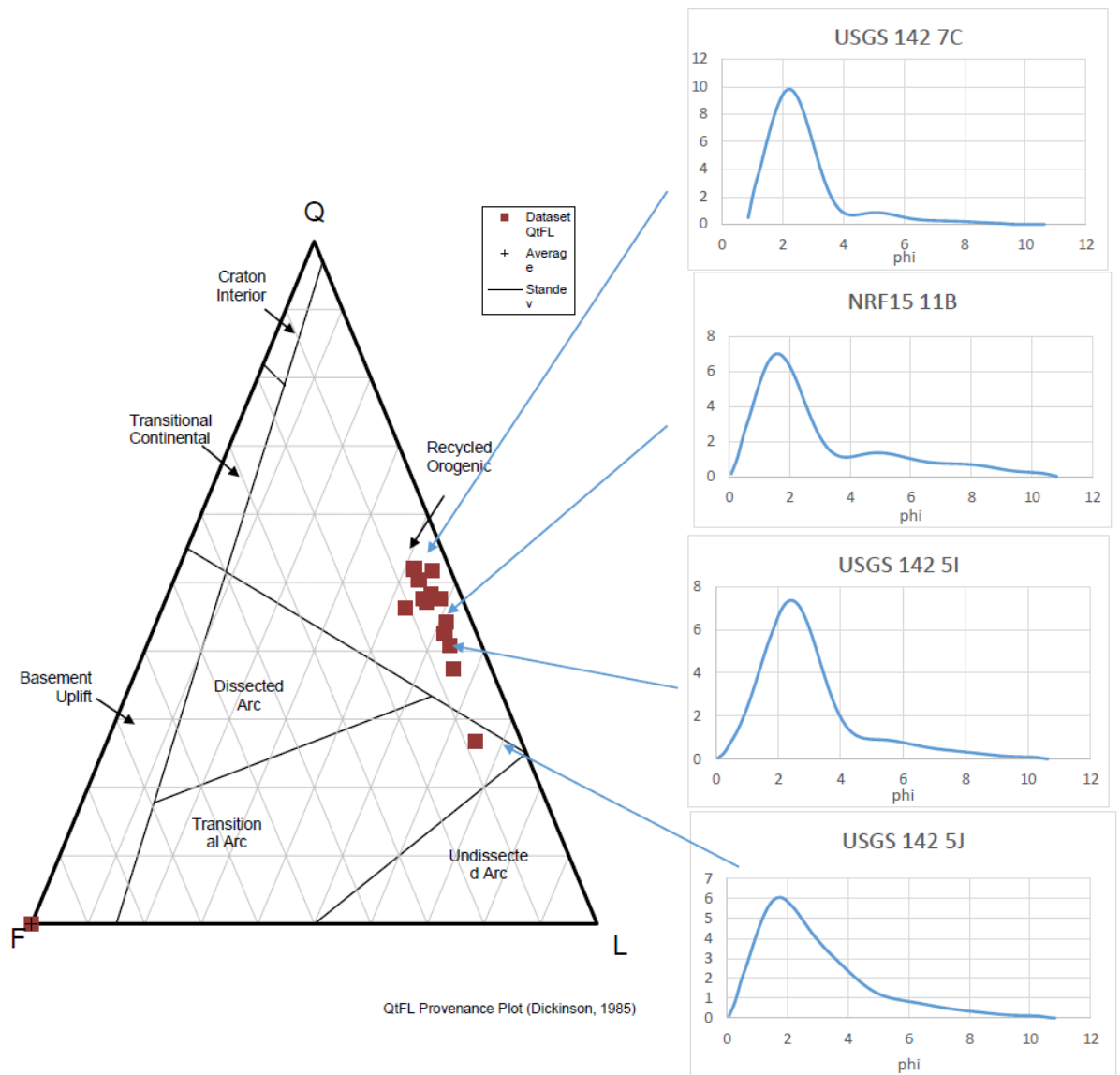


Figure 30: Ternary diagram QFL shows the results of point counting. Graphic grain size distributions on the right.

Figure 30 shows point count results for a series of 13 samples. The samples were chosen based on their lack of cementation, and were thought to represent shoreline facies. The results in the above Quartz-Feldspar-Lithic (QFL) plot show a dominance of quartz and lithics and a distinct lack of feldspars. In these point counts we also see that 58% of the grains are lithics, and of the grains that are lithics 63% are volcanic lithics with 54% of volcanic lithics being felsitic in texture. Grain size distributions show that as the samples become more mineralogically mature,

or contains a larger abundance of quartz, the grain size distributions become more well sorted. As the samples become more well sorted the skewness value becomes lower. Figure 31 shows a predominance of volcanic lithics, and with all samples plotting in the magmatic arc provenance. This means that there is an abundance of volcanic deposits in the region, coming from Challis dacitic volcanics north of the ESRP.

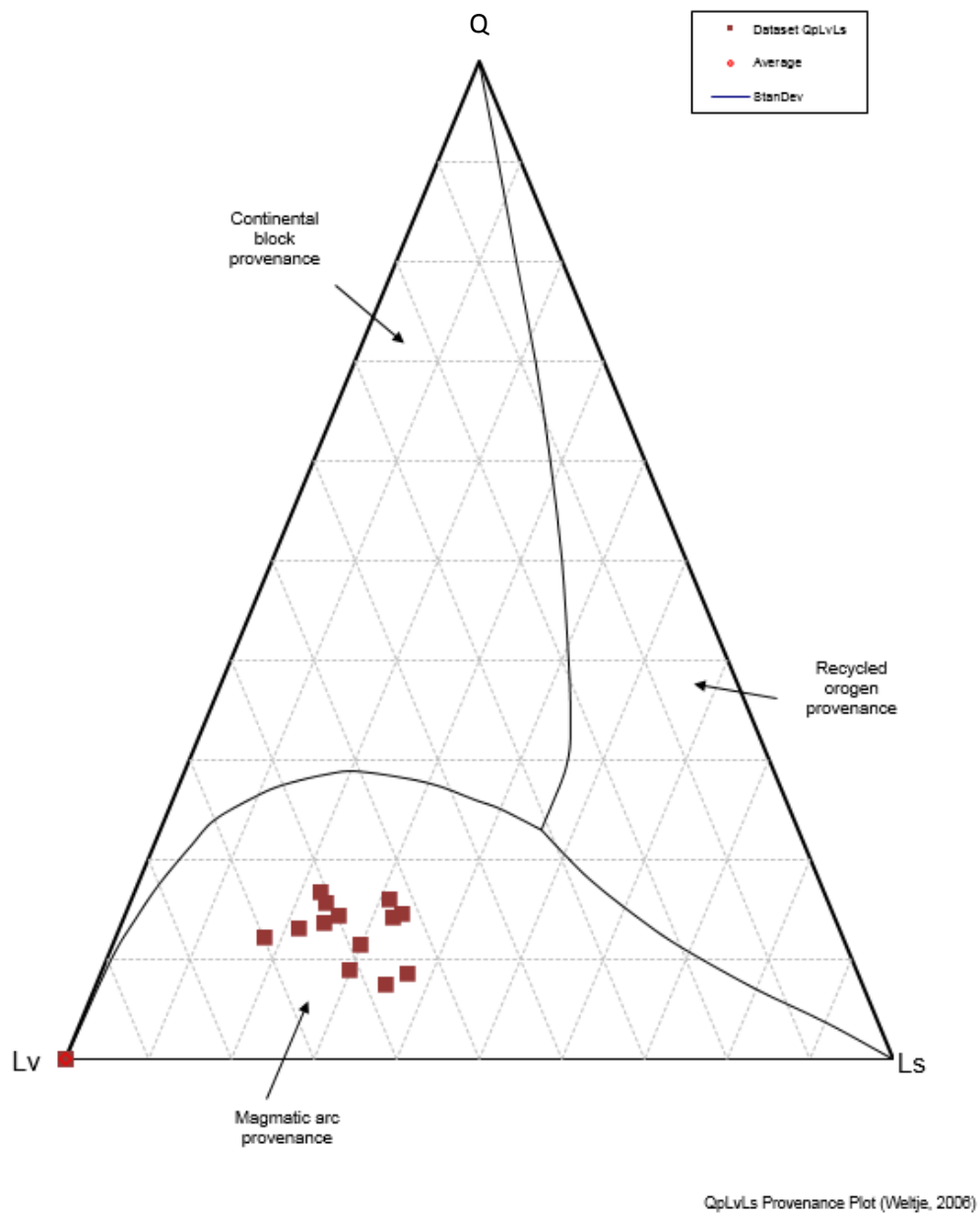


Figure 31: Ternary diagram QLvLs, lithic distributions from point counting.

3.7 Detrital Zircons (Data are presented in appendix E)

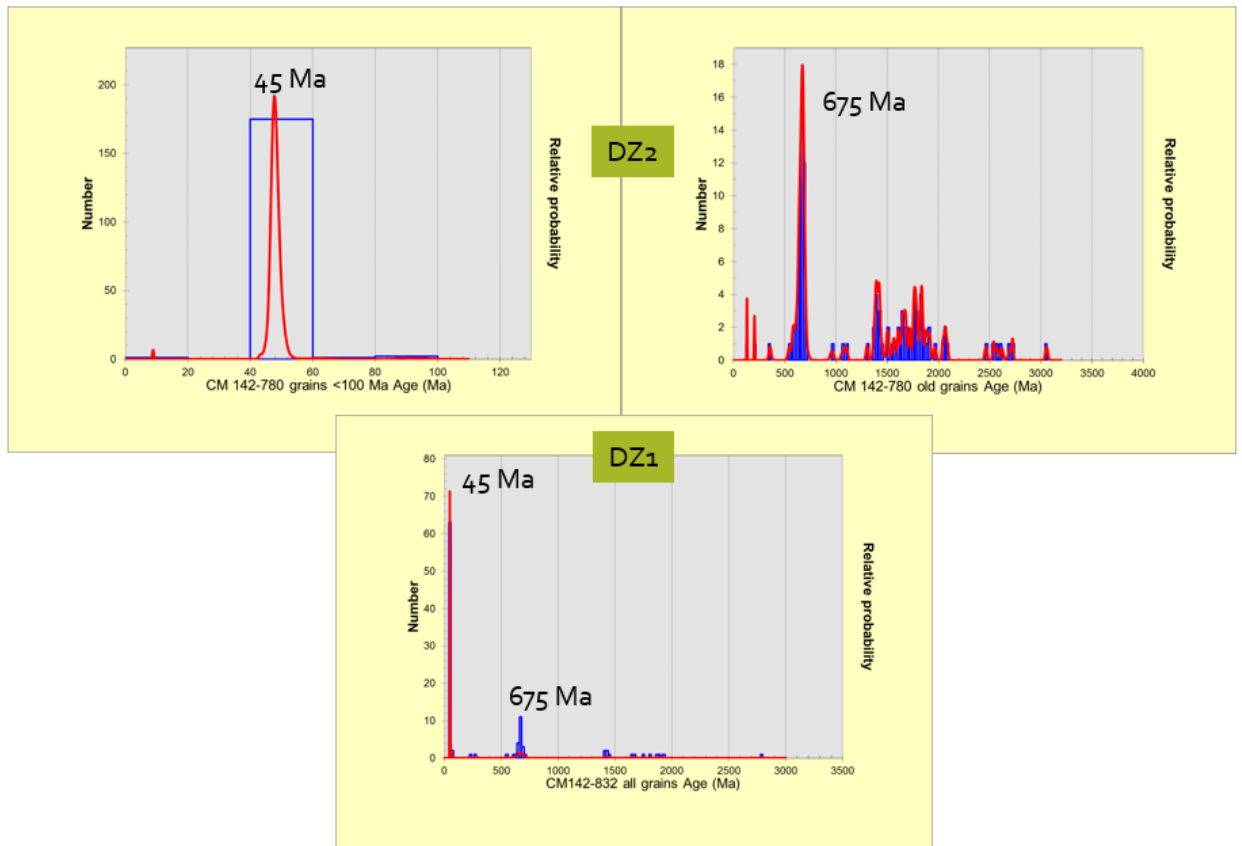


Figure 32: Detrital Zircon age distribution, based on probability density plots for detrital zircon populations of samples DZ1 and DZ2, two prominent peaks are seen in each sample at 45 Ma to 675 Ma, representing sediment sourced from the Challis volcanics and igneous rocks intruded into the Pioneer mountains core complex.

Detrital zircon samples were taken at two stratigraphic intervals in USGS 142. DZ2 was taken at 780 feet BLS while DZ1 was taken at 832 feet BLS (Fig. 32). Both samples weighed roughly two kilograms, and were taken from what we interpreted as shoreline deposits. The above results show two distinct populations. We have a population at 45 Ma and a smaller peak at 675 Ma. Both graphs are very similar in their distribution of zircon grains, and show a source as the paleo Big Lost River, with grains coming from both the Pioneer core complex (675 Ma) and southern Challis volcanics (45 Ma).

3.8 Hydraulic conductivity

Hydraulic conductivity ranges from near zero feet per day to near 12 feet per day (Fig. 33, Table 1, Table 2). This creates a number of zones with little to no conductivity, and also zones with high conductivity. Within each of the correlated intervals, low conductive fine grained silt and clay coarsen up into more conductive fine to medium sands. Non recovered zones could be areas of high conductivity because we assume that these areas are uncemented coarse grained material. In recovered intervals all uncemented material is coarse grained. Though with no grain size values associated with non-recovery zones it is hard to calculate and speculate true grain size and conductivity. Other areas with high conductivity are near the tops and bottoms of lava flows, because these areas are porous and vesiculated (Hodges et al., 2015).

This method does have its limits though. True conductivity values could be off by a magnitude of up to 2, so each sample needs to be considered individually to access true values. Properties that could affect conductivity are sorting and angularity of sediments. With all samples seen in this thesis, sorting ranges from poor to very poor, and sediments are mostly angular. So the hydraulic conductivity given here is probably a good representation of estimated hydraulic conductivity.

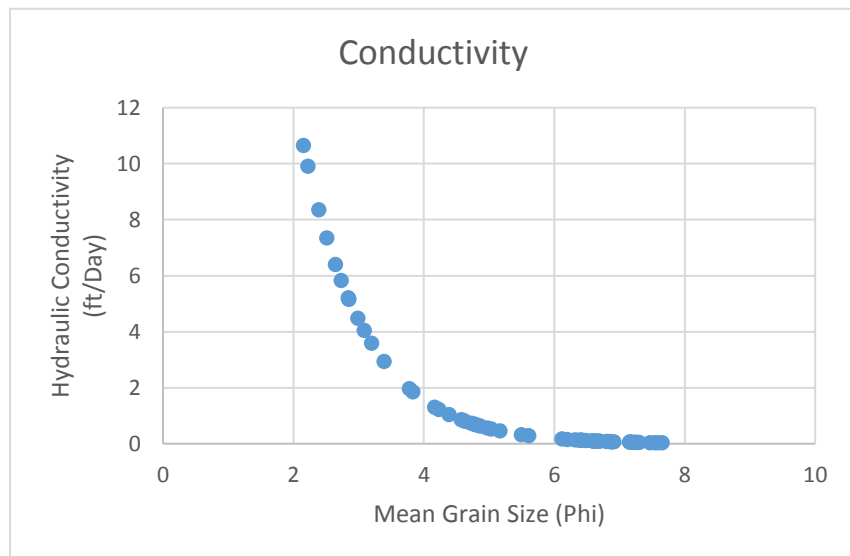
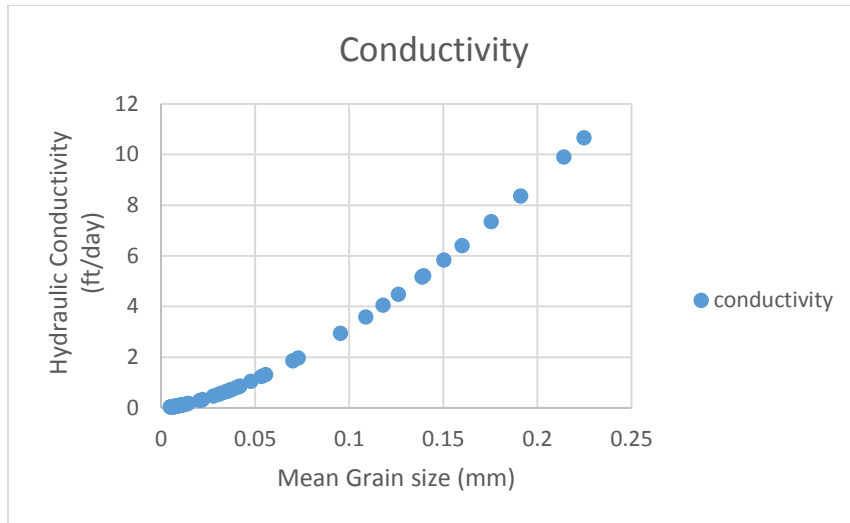


Figure 33: Hydraulic Conductivity and mean grain size. Values range from a few fractions of an inch to upwards of 12 feet per day.

<i>Sample Name</i>	<i>Depth (Ft)</i>	<i>Conductivity Feet/Day</i>	<i>Mean (Phi)</i>	<i>Mean (mm)</i>
USGS 142 569	569.0	4.48	2.99	0.126
USGS 142 5A	738.7	No data		
USGS 142 5B	739.5	No data		
USGS 142 5C	740.3	No data		
USGS 142 5D	740.7	9.91	2.22	0.214
USGS 142 5E	745.0	4.05	3.08	0.118
USGS 142 5F	758.5	0.690	4.79	0.036
USGS 142 5G	759.5	0.709	4.76	0.037
USGS 142 5H	768.1	1.05	4.39	0.048
USGS 142 5I	769.7	5.83	2.73	0.150
USGS 142 5J	772.5	6.40	2.64	0.160
USGS 142 5K	775.2	0.465	5.17	0.028
USGS 142 5L	776.5	1.86	3.83	0.070
USGS 142 5M	777.5	1.23	4.23	0.053
USGS 142 5N	779.4	5.22	2.84	0.140
USGS 142 5O	781.1	1.31	4.17	0.056
USGS 142 5P	782.3	5.18	2.85	0.139
USGS 142 5Q	783.0	2.95	3.39	0.095
USGS 142 5R	784.0	3.59	3.2	0.109
USGS 142 5S	785.3	0.812	4.63	0.040
USGS 142 6A	804.5	0.635	4.87	0.034
USGS 142 6B	805.6	0.294	5.61	0.021
USGS 142 6C	807	0.668	4.82	0.035
USGS 142 6D	808.8	0.863	4.57	0.042
USGS 142 6E	807.5	1.97	3.78	0.073
USGS 142 7A	830.1	7.36	2.51	0.176
USGS 142 7B	832.0	10.66	2.15	0.225
USGS 142 7C	832.5	8.36	2.39	0.191
USGS 142 7E	833.0	0.085	6.8	0.009
USGS 142 7F	838.9	0.837	4.6	0.041
USGS 142 7G	840.8	0.106	6.59	0.010
USGS 142 7H	842.5	0.159	6.20	0.014
USGS 142 7I	845.2	0.127	6.41	0.012

Table 1: Hydraulic conductivity of sediment intervals in USGS 142. No data represents sections that were sampled but did not go through grain size analysis.

<i>Sample Name</i>	<i>Depth (Ft)</i>	<i>Conductivity Feet/Day</i>	<i>Mean (Phi)</i>	<i>Mean (mm)</i>
NRF 15 2A	535.9	No data		
NRF 15 2B	539.5	0.173	6.12	0.014
NRF 15 2C	537.5	0.099	6.65	0.010
NRF 15 2D	538.4	0.131	6.38	0.012
NRF 15 2E	538.9	0.118	6.48	0.011
NRF 15 2F	539.2	0.127	6.42	0.012
NRF 15 2G	540.0	0.101	6.63	0.010
NRF 15 2H	540.6	0.060	7.15	0.007
NRF 15 9A	550.8	0.568	4.97	0.032
NRF 15 9B	551.6	0.053	7.25	0.007
NRF 15 9C	553.3	0.056	7.20	0.007
NRF 15 9D	555.2	0.053	7.25	0.007
NRF 15 9E	556.3	0.053	7.25	0.007
NRF 15 9F	557.0	0.051	7.3	0.006
NRF 15 10A	562.0	0.0374	7.59	0.005
NRF 15 10B	564.0	0.043	7.47	0.006
NRF 15 10C	565.3	0.039	7.55	0.005
NRF 15 10D	567.3	0.035	7.65	0.005
NRF 15 10E	568.8	0.141	6.32	0.013
NRF 15 11A	580.6	0.534	5.03	0.030
NRF 15 11B	582.0	5.165	2.85	0.140
NRF 15 11C	584.0	0.330	5.49	0.022
NRF 15 11D	585.7	0.058	7.16	0.00
NRF 15 11E	586.8	0.058	7.17	0.007
NRF 15 11F	588.5	0.736	4.72	0.038
NRF 15 5B	732.0	0.079	6.87	0.009
NRF 15 5D	733.1	0.055	7.22	0.007
NRF 15 5E	733.8	0.076	6.91	0.008
NRF 15 6A	737.9	0.096	6.68	0.010
NRF 15 6B	738.5	0.105	6.6	0.010
NRF 15 6C	739.5	0.669	6.85	0.009
NRF 15 6D	740.4	0.095	6.69	0.009
NRF 15 6E	741.2	0.107	6.58	0.010
NRF 15 6F	742.5	No data		
NRF 15 8A	753.0	No data		
NRF 15 8B	754.0	No data		
NRF 15 8C	755.1	No data		
NRF 15 8D	756.2	No data		
NRF 15 8F	758.5	0.079	6.88	0.009

Table 2: Hydraulic Conductivity of sediment intervals found in NRF 15. No data represents sections that were sampled but did not go through grain size analysis.

Chapter 4

4.1 Interpretations

4.1.1 Sedimentary Environments

Several depositional environments have been observed on the Snake River Plain (Geslin et al., 1997; Gianniny et al., 1997; Mark and Thackray, 2002; and Bestland et al., 2002). Six surficial facies were described across the BLT by Mark and Thackray (2002): lake floor, playa bottom, dune, loess, channel, and interfluvium. In this thesis there are three facies interpretations, lake, shoreline and loess. These three environments are identified based on grain size distribution, skewness, sorting and bioturbation.

As demonstrated here, lake deposits are made up of massive silt and clay and commonly contain rhizoliths (rhizoliths are indicative of shallow lake deposits). Lake facies have a mean grain size of 6 to 8 phi (Mark and Thackray, 2002), are poorly to very poorly sorted, and have symmetrical to slightly coarse skewed grain size distribution. Within lake facies there are commonly lenses of sandy material ranging in thickness from an inch to >3 inches. These lenses are associated with increased sedimentation during flooding events (Benda and Thomas, 1997). In the Pleistocene on the BLT reduced evaporation and more spring runoff created the lake environments present in the cores, and on the ESRP (Pierce et al., 1982; Gianniny et al., 1997; Gianniny et al., 2002).

Shoreline facies are defined by silty sand that overlies lake facies. The transition is gradational between shoreline and lake sediments. Characteristics of the shoreline facies include a mean grain size of 2.5 to 3.5 phi (fine to medium sand), poor sorting, and strongly fine skewed grain size distribution. This increase in medium to fine sand is likely a result of sediment coming out of the paleo Big Lost River (Gianniny et al., 1997).

The loess facies is sparse compared with lake and shoreline, and has a unique bi-modal grain size distribution. Characteristics of loess include grain sizes from 3-5.5 phi (silt to clay), grain size distribution that is skewed to the fine, and poor to very poor sorting. A bi-modal distribution reflects equal parts sand and silty clay. These sediments are derived from glacial erosional processes, and subsequent eolian reworking (Lewis and Fosberg, 1982; Sun et al., 2004). The fine fraction created from eolian reworking represents entrainment of silt and clay in upper atmosphere winds. The silt and clay then settles out during decreases in wind strengths (Sun et al., 2004). Loess is indicative of glacial climates across the INL, and shows how sediment gets redistributed in the Eastern Snake River Plain region (Forman et al., 1993).

4.1.2 Cyclicity

Cyclicity of sediment facies is seen in both cores NRF 15 and USGS 142 (Fig. 20-Fig.24). The cycle has at its base, a 6-9 foot thick lake deposit that gradually coarsens up, shallowing into shoreline deposits, and in some cases loess. The cycle repeats itself as accommodation space is created through either subsidence (Wetmore, 1998), and a change in lake base level. Sediment deposition moves to a new low. Lakes form, then are overrun by shorelines and then a basaltic event fills in the low. The depocenter migrates as sediment is drawn to a new location in the BLT. Lakes and the related sediment are found as thin units deposited during volcanic quiescence in the BLT during the last 988 ka (Bestland et al., 2002), thus cores are dominated by basalt. This is seen in Fig. 3, Fig. 7, Fig. 34A and Fig. 34B.

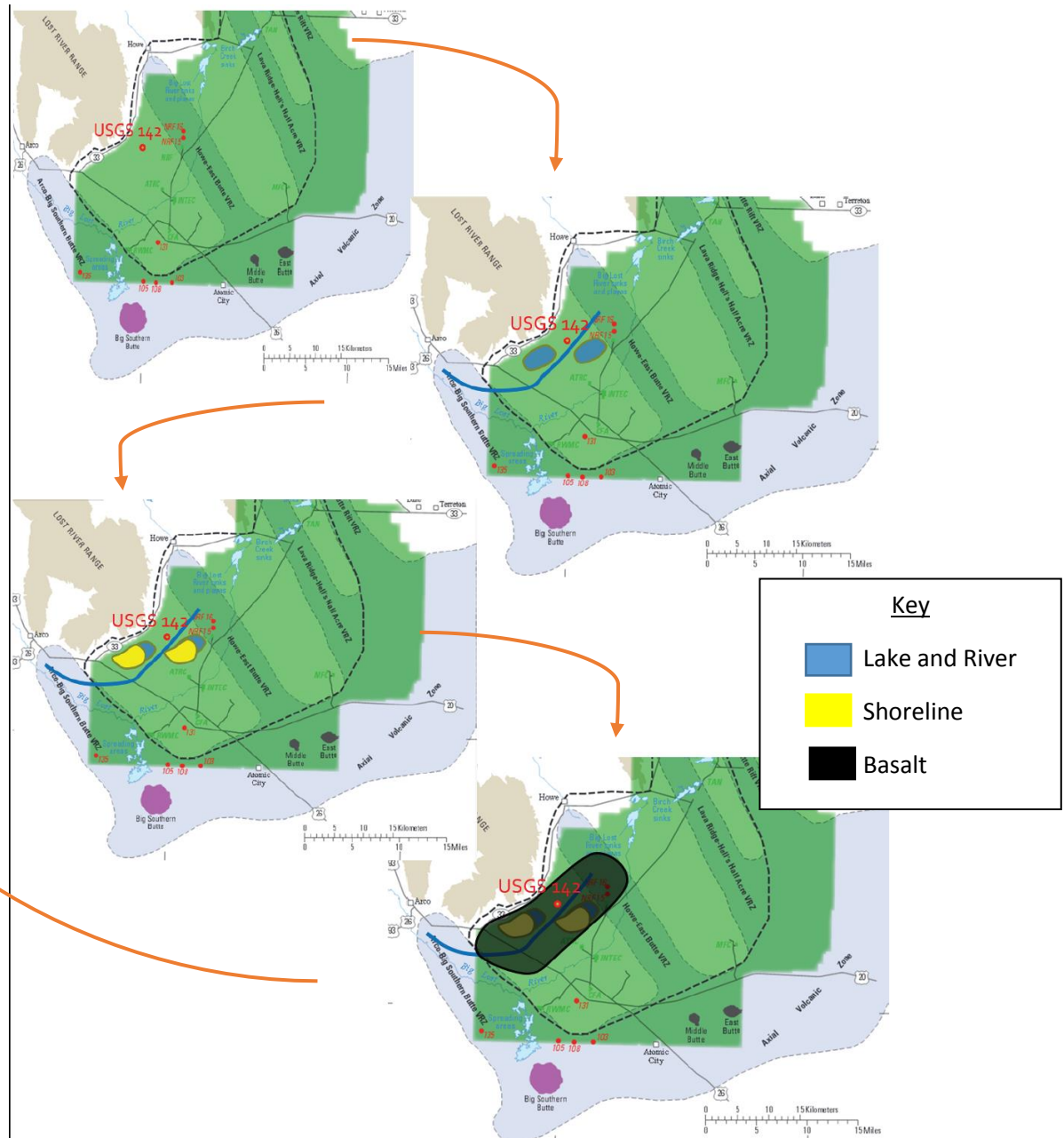


Figure 34A: Sedimentary and basaltic effusive cyclic evolution of the BLT, blue represents lakes and rivers, yellow is shoreline deposits and black is basaltic effusive material, green is the extent of the INL, and grey is both our axial volcanic zone and volcanic rift zones.

Evolution of sediment deposits on the Big Lost Trough

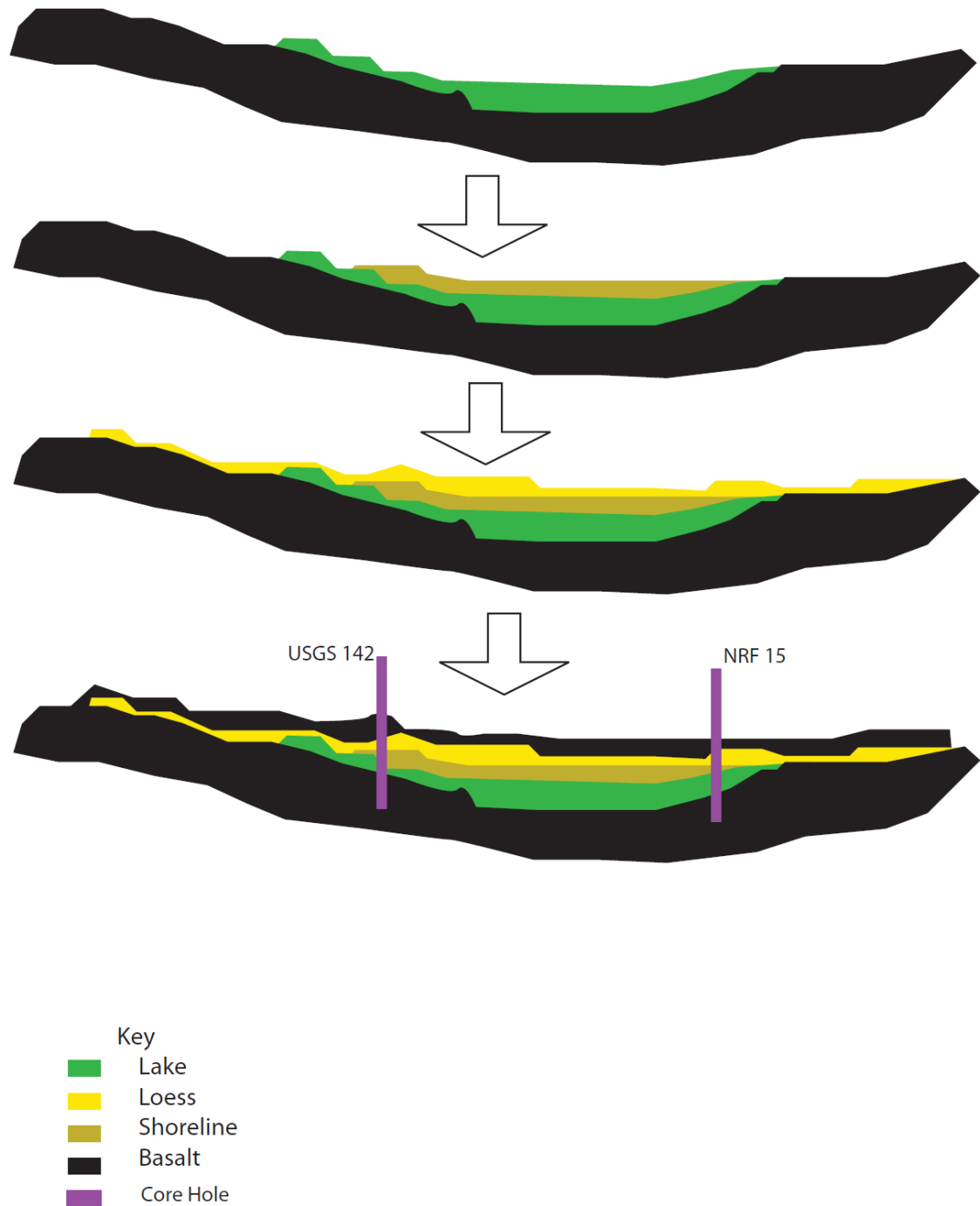


Figure 34B: This shows the evolution of the Big Lost Trough. The environments described shift from lake to shoreline to loess, infilled with basaltic volcanic material, and then subsidence, change in climate, or base level change allows for the cycle to repeat.

4.1.3 Inferred relationships with climatic cyclicity

As much as one hundred thousand years of deposits (884 ka to 988 ka) are represented in the three correlative units found in NRF 15 and USGS 142. This time span is based on paleomagnetic and age constraints on basalt and the sediments themselves could represent less than one hundred thousand years. This time span is correlative to Marine Isotope Stages (MIS) 22-25, two complete glacial to interglacial cycles (Lisiecki and Raymo, 2005). Loess deposition on the ESRP represents glaciation (Lewis and Fosberg, 1982; Pierce et al., 1982; Forman et al., 1993). Cyclicity is made up of cold wet periods or cold arid conditions (glacial) that transition into the modern analog, then back into glacial conditions (Fig. 35 and Fig. 36).

4.1.4 Recurrence intervals

There are 33 identified basaltic flows in USGS 142. If the bottom of the core is 840 ft BSL and is dated 1.045 Ma (Jaramillo). There is an average of one flow per 31 thousand years at the core scale, and each flow is on average 25 ft thick. More accurately, the recurrence interval is longer than this because of multiple flows per basaltic event, and ranges from 30 ka to 150 ka. This gives long periods of volcanic quiescence. Maximum subsidence on the core hole scale is 1 ft per 1.2 ka, calculated from the depth of material deposited and number of years that have passed during that deposition.

During periods of decreased volcanism or quiescence, sedimentation increases across the BLT. The correlated sediment in this thesis spans glacial-interglacial cycles (884ka-1.045 Ma, MIS 22-25). If each glacial cycle is 50 ka (Lisiecki and Raymo, 2005) then we may see sediment corresponding to two to three cycles in core. The accommodation space for sediment is first created by cycles of volcanic damming on long time scales, then rapid climate change represents cycles on shorter time scales. The BLT being a flat low relief surface means that a slight shift in regional climate can cause lakes to dry up into playas and provide space for loess deposition, then

this surface fills with water as the climate becomes wetter. In the sediment presented in this thesis there are two interbeds of loess. This may reflect two glacial interglacial cycle.

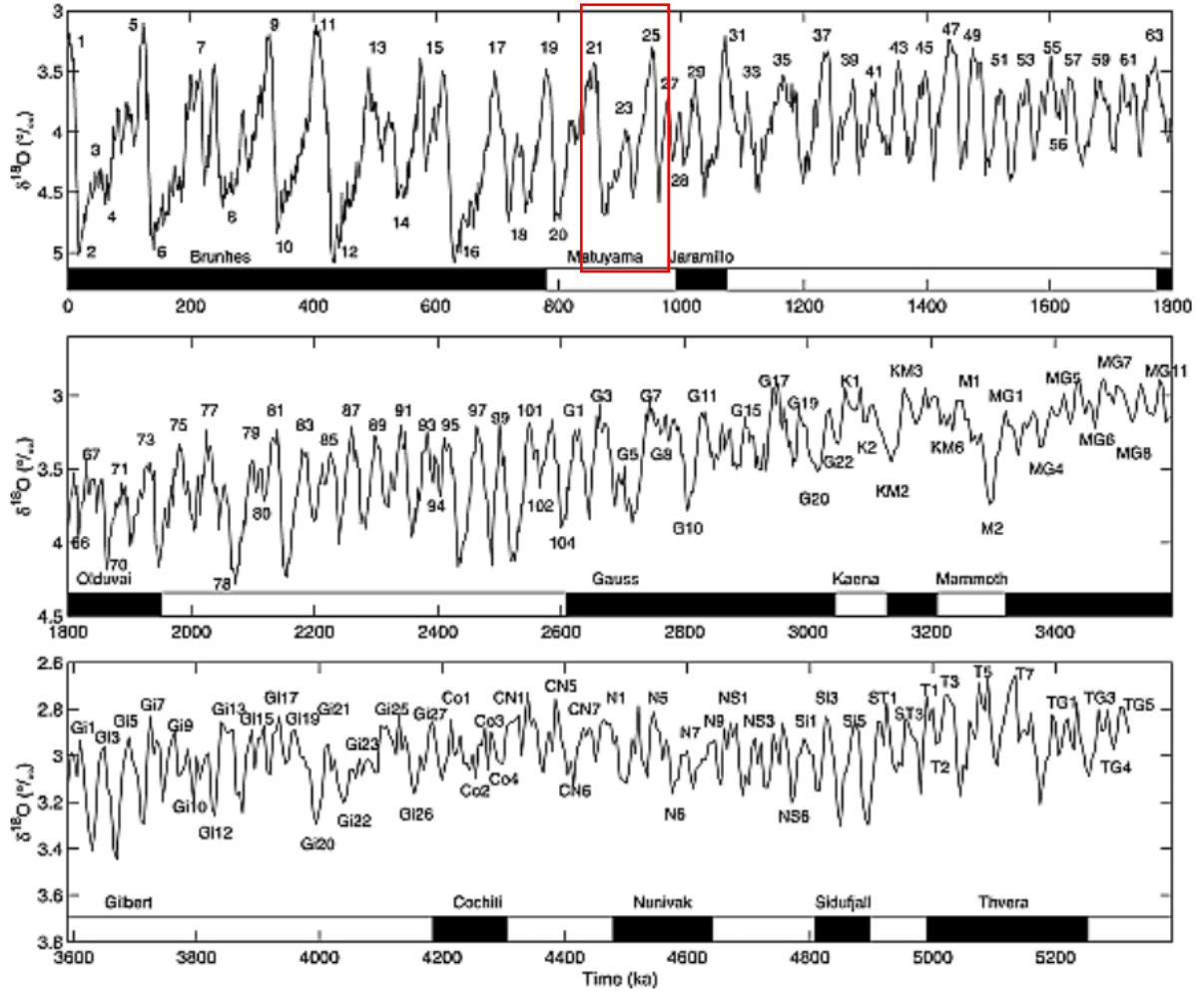


Figure 35: Marine Isotope Stages, defining glacial periods even numbers, and interglacial periods odd numbers, represented by increases and decreases, respectively, in the isotopic record of oxygen ($\delta^{18}O$), our sediment matches up with MIS 22-25 (From Lisiecki and Raymo, 2005).

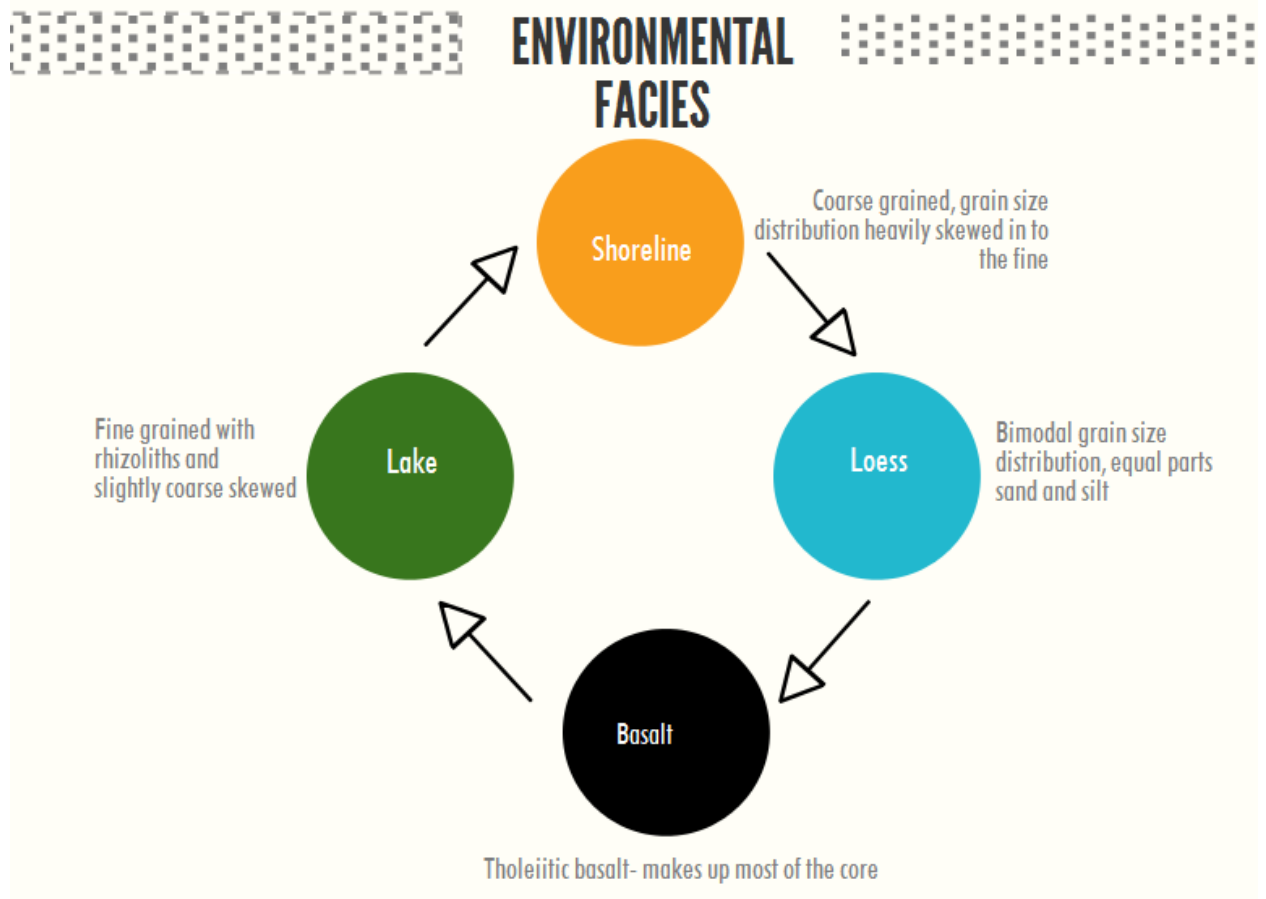


Figure 36: Evolution of cyclic facies across the Big Lost Trough.

4.1.5 Provenance

As seen in both DZ analysis and point counting, samples are dominated by volcanic lithics; more precisely an abundance of felsitic volcanic lithics. Felsitic volcanic lithics are sourced from the Challis volcanics in the region. Extensive areas of Challis volcanic material are found just north and west of the BLT, where the dominant extrusive rock type is dacitic to rhyodacitic in composition. This inference is supported by the other major DZ population, which is 675 Ma, the only known source of that age is an orthogneiss in the Pioneer Mountains metamorphic core complex at the source of the Big Lost River (Link et al., 2005). This indicates sedimentation into the western BLT, during MIS 22-25, is dominated by the paleo Big Lost River.

4.1.6 Hydraulic conductivity values reveal a number of confining units within the correlated sediment zone identified in NRF 15 and USGS 142. These aquitards are defined as fine to medium sand that are highly conductive intervals on top of low conductive silt and clay intervals. A good example of a possible confining unit is USGS 142 interval 7E to 7H. USGS 142 7A to 7C have a conductivity ranging from 7.36 feet per day to 10.66 feet per day. These deposits are above samples, USGS 142 7E to 7H, having a conductivity of 0.085 to 0.837 feet per day.

Differential subsidence between NRF 15 and USGS 142 in the last 1.045 Ma is at least 100 ft. This is seen by the depth difference between the three sediment intervals in the two core holes presented in this thesis.

Chapter 5

5.1 Discussion and Implication

Environment cyclicity of facies identified in core, tells a story of landscape evolution. This evolution is portrayed by changes in depositional environments across the BLT. Environments shift through time from basalt to lake to shoreline to loess and back to basalt, and then the cycle repeats. Currently on the INL there are dry playas and sinks, dunes, and loess, with mainly eolian sediment reworking during arid episodes, superimposed on lacustrine and high energy fluvial deposits that were deposited during the last glaciation.

The age of sediment intervals in USGS 142 and NRF 15 is interpreted to lie between 884 ka to 988 ka (north late Matuyama to Jaramillo). This time interval is interpreted to coincide with Marine Isotope Stage 22 through 25 (Lisiecki and Raymo, 2005) (Fig. 35.). This time period spans two glacial interglacial cycles with a maximum time span of 104 ka. These glacial periods might be correlated to wet lake dominated environments, as well as loess deposition.

Detrital zircon analysis show a definite Big Lost River signature. This signature is dominated by a 45 Ma peak, correlating closely with Challis volcanic deposits seen in the proximal mountains north and west of the INL and the BLT. There is also a 675 Ma peak seen in the detrital zircon data, this shows zircons sourced from an orthogneiss in the Pioneer Metamorphic Core Complex, which is exposed in the headwaters or source of the Big Lost River (Link et al., 2005). This signature shows that fluvial material from the paleo Big Lost River was deposited into the Big Lost Trough creating playas and sinks that evolve in to loess and windblown sediment, and are ultimately overrun by effusive basaltic material.

Point counting reveals that 58% of grains are lithics with 63% of those being volcanic lithics and 54% of volcanic lithics being felsitic. The Challis volcanic deposits in the region are dacitic and rhyodacitic in composition. This indicates that volcanic grains in the BLT are coming from the proximal Challis volcanics. Point counting shows us that more mineralogically mature

samples or the more quartz in the sample the tighter the grain size distribution peak. This in turn shows the effect of sediment reworking on grain size distribution.

This project contributes to further understanding of the subsurface of the Snake River Plain. The knowledge of hydraulic conductivity can identify fast paths or aquitards. Grain size helps to identify depositional environments, and allows hydraulic conductivity calculations. Detrital zircon and point counting show a paleo Big Lost River signature.

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Appendix:

Depth (ft)	Sample Name	Treatment	Clastic Comp %	Clay mineral Fraction	Q	Plagi	Dolitic Carb Cor/pitted/ rhom	others	Authigenic Comp %	Calcite Size Cor/ rhom/ twinned	Micrite Size range	Bio Comp	Special Comments				
	Dom >50%	Abund 25- 50%	Com 5-25%	Rare 1-5%	Trace <1%												
535.9	NRF152A	HCI	50 Dom	present			rare Cor/pit	Volc Frags	50 Rhom			1 plant material	Lithics heavily incrustated in clay and iron				
536.5	NRF152B	HCI	70 Abund	present				beat up Volc frags	30 Rhom		clay and silt		Lithics heavily incrustated in clay				
537.5	NRF152C	HCI	60 Dom	angular			Corroded/pitted	Volc Frags	40 Rhom/Twin		clay to sand		Dominantly clay material				
538.4	NRF152D	HCI	60 Dom	angular			Corroded/pitted	Volc Frags	40 Rhom		clay to silt		clay coating				
538.9	NRF152E	HCI	75 Dom	angular			in clays	Volc Frags	25		clay to silt						
539.2	NRF152F	HCI	70 Dom	com angular	1 or 2 grains		Corroded/pitted	Volc Frags	30 Corroded/Rhom		clay to sand		Lithics heavily incrustated				
540	NRF152G	HCI	95 Dom	angular	1 grain .3mm			Volc Frags	5		intermixed with clay		heavily mud				
540.6	NRF152H	HCI	90 Dom	Rare			Corroded/pitted	Volc Frags	10 rhom		clay		Red lithics				
569	NRF153A	HCI	80 Com	angular	angular/rare		Corroded/pitted	Volc Frags	20	large grains/twinned							
683.5	NRF154A	HCI		Com	Rare		Corroded/pitted	Volc Frags				1 plant material	Poor smear slide so not a lot of good data				
730.2	NRF155A	HCI	75 Dom					Volc Frags	25	coating grains			Poor smear slide so not a lot of good data				
732	NRF155B	HCI	95 Dom	Rare angular			Corroded/pitted	Volc Frags	5	in clay matrix		root frags					
732.5	NRF155C	HCI		Dom	Rare angular		in clay fraction	Volc Frags					grains coated in clay and oxide				
733.1	NRF155D	HCI		Dom	com angular		in clay fraction						Red lithics rare/trace				
733.8	NRF155E	HCI	90 Dom					Rhyolitic ash one g	10	in clay matrix							
737.9	NRF156A	HCI	50 Abund					Black clay	50	Rhom clay sized		One shell frag?					
738.5	NRF156B	HCI	50 Abund	com angular	Rare			Volc Frags	50	Silt and Clay Rhom			?				
739.5	NRF156C	HCI	40 Abund	com angular				Basaltic Frags	60	Rhombic	silt to clay	Shell Frag					
740.4	NRF156D	HCI	40 Abund	com angular			Corroded		60		Clay to silt sized						
741.2	NRF156E	HCI	90	present			corroded	Volc Frags	10	in matrix			Poor Slide				
742.5	NRF156F	HCI	50 Abund	com angular				Volc Frags/Biotite	50		clay and silt						
748.5	NRF157A	HCI	40 Abund	angular				Rhyolitic ash one g	60	clay to silt							
753	NRF158A	HCI	40 Abund	angular	2 grains	Pitted		Volc/biotite Pyroxi	60	Rhom	silt to clay						
754	NRF158B	HCI	40 Abund	angular	1 grain .3mm	Corroded/pitted		Volc Frags	60	Dom	silt to clay		Olivine grain				
755.1	NRF158C	HCI	60 Dom	angular					40	Rhom/Dom	silt to clay						
756.2	NRF158D	HCI	40 Abund	angular					60		clay						
758.5	NRF158F	HCI	70 Dom	laths				Volc Frags	30	Rhom	Clay						
550.8	NRF159A	HCI	70 Com	com angular	Rare	Corroded/pitted		Volc frags	30	Rhom	silt						
551.6	NRF159B	HCI	60 Dom	com angular				Volc frags	40	Rhom	silt to clay		Globular grains of clay				
553.3	NRF159C	HCI	40 Abund	com angular					60	Rhom	silt to clay						
555.2	NRF159D	HCI	40 Abund	Rare/Silt					60	Rhom	silt to clay		Globular clay				
556.3	NRF159E	HCI	40 Abund	Rare/Angular					60	Rhom	silt to clay						
557	NRF159F	HCI	60 Dom	Rare/Angular	1 grain .3mm			Volc Frags	40		silt to clay		Poor skewed to the mud sized spectrum				
562	NRF1510A	HCI	40 Abund	com angular			Corroded/pitted	volc Frags	60		silt to clay						
565.3	NRF1510C	HCI	60 dom	rare				Biotite/ Volc Frags	40	Rhom	silt to clay						
567.3	NRF1510D	HCI	40 Abund	Rare/Angular		Pitted		Volc Frags	60	Rhom	silt to clay						
568.8	NRF1510E	HCI	75 Abund	com angular			Corroded/pitted	volc frags	25	Rhom	clay						
580.6	NRF1511A	HCI	80 Dom	com angular			Corroded/pitted silt to sand		20		silt to clay						
585.7	NRF1511D	HCI	60 Abund	com angular			corroded/pitted	Mafic Glass frag	40	Rhom	silt to clay						
586.8	NRF1511E	HCI	50 Dom	angular			corroded/pitted	Volc Frags	50	Rhom	clay						
588.5	NRF1511F	HCI	90 Dom	angular/abund	Rare	Corroded/pitted	abund/ volc frags		10		Clay						

562.4+563.5	USGS142 8A +8	HCI											Poor slides no recovery	
565.3	USGS1428C	HCI	50	Abund	com angular		corroded/pitted		50		Silt to clay			
566.5	USGS1428D	HCI	70	dom	com silt to clay		pitted		30		clay		Mud coating grains	
568.2	USGS1428E	HCI	60	Dom	com silt angular		corroded/pitted	volc frags	40	Rhom	Silt to clay		Mud coating grains	
834.7	USGS142 7D	HCI	60		Abund angular	Rare		Olivine+volc frags	35		Silt to clay		Coarse Grained	
836.7	USGS142 7E	HCI	80	Abund	Abund angular			volc frags	20	Rhom	Silt to clay		globular grains coated in mud	
	USGS142 2A	HCI											Poor slide	
367	USGS1421A	HCI	70	Abund	angular		corroded/pitted		30	Rhom	silt to clay		Coarse Grained/coated grains	
187.5	USGS1423A	HCI											Poor slide	
670.9	USGS1424A	HCI	90	Dom	com angular			Biotite/volc frags	10	Rhom	Silt			
671.5	USGS1424B	HCI	90	dom	angular		corroded/pitted	Volc frags com	10	Rhom	silt to clay			
672.2	USGS1424D	HCI	80	dom	angular/silt		corroded/pitted	Volc frags com	20	Rhom	silt to clay		coating grains	
738.7	USGS1425A	HCI	100	com	com angular			Volc frags 40um					coated grains Silt to fine sand	
739.5	USGS1425B	HCI	100	abund	com angular			angular volc frags					oxide and clay coatings	
740.3	USGS1425C	HCI	95	com	Subrounded			subrounded/volc f	5	Rhom	silt		Coarse grained and coated grains globular	
758.5	USGS1425F	HCI	95	com	Subrounded			Biotite/volc frags	5	Rhom	Silt and clay		Mostly fine grained	
759.5	USGS1425G	HCI	90	abund	com angular	rare		Volc frags com	10	Rhom	silt and clay		coated grains	
768.1	USGS1425H	HCI	95	abund	com angular	rare		Biotite/volc frags	5	Rhom	Silt and clay		Coarse grained and coated grains globular	
775.2	USGS1425K	HCI	90	abund	com angular		corroded/pitted	Biotite/volc frags					fine grained	
776.5	USGS1425L	HCI	90	Dom	Abund angular	rare	corroded/pitted	volc frags	10		silt and clay		Coarse grained and coated grains globular	
777.5	USGS1425M	HCI	85	Dom	com angular		corroded/pitted	Biotite/volc frags	15	Rhom	silt		Silty	
779.4	USGS1425N	HCI	90	Dom	com angular		corroded/pitted	volc lithics	10	Rhom	silt		Coarse grained silty	
781.1	USGS1425O	HCI	60	Dom	silt/rare	trace	pitted	Biotite/volc frags	40	Rhom	Silt and clay	root frags		
782.3	USGS1425P	HCI	90	Rare 1-5%	dom angular		corroded/pitted	volc frags dom	10		sand		coarse grained	
785.3	USGS1425S	HCI	75	Abund	com angular		corroded/pitted	Biotite/volc frags	25	Rhom	silt to clay			
804.5	USGS1426A	HCI	95	dom	com angular			Biotite/volc frags	5	rhom	Silt and clay		medium grained	
805.6	USGS1426B	HCI	90	Dom	com angular			trace Biotite/volc f	10	Rhom	Silt and clay		Fine grained	
807	USGS1426C	HCI	95	Dom	Abund angular			Biotite	5	Rhom	silt to clay		V Fine grained	
808.8	USGS142 6D	HCI	90	Dom	com angular			Volc frags	10		silt to clay		Fine grained	
807.5	USGS1426E	HCI	100	com	com angular			Biotite/volc frags					Coarse grained	
838.9	USGS1427F	HCI	65	dom	subangular com			trace Biotite/volc f	35	Rhom	silt to clay		Fine grained mud coating grains	
840.8	USGS1427G	HCI	70	Dom	com angular				30		silt to clay		globular clay coating grains	
842.5	USGS1427H	HCI	70	Dom	angular			volc covered in clay	30	rhom	clay to silt			
845.2	USGS1427I	HCI	80	dom	subangular com			volc covered in clay	20	Rhom	silt to clay		fine grained and coated in mud	

Appendix A: Smear Slide Raw Data. (Dom=dominate, Abund= Abundant, Com=Common, Cor=corroded, Volc=volcanic, Frags=fragments, Rhom=Rhombic)

Sample Number	NRF 15 10C		NRF 15 9C	NRF 15 9D	NRF 15 9E	NRF 15 9F	NRF 15 11A	Nrf 15 11E	NRF 15 8F	NRF15 2B	NRF 15 2C	NRF 15 2D	NRF 15 10B
Sx													
mean	7.64		7.1	7.24	7.24	7.3	4.6	7.3	6.8	7.1	7.46	7.3	7.4
Φ 84	9		9	9	8.9	9.1	7.8	9.2	8.83	9.05	9.2	9.2	9.2
Φ16	6		5.49	5.5	5.6	5.5	2.7	5	5	2.2	3.3	2.65	5.8
Φ95	10		9.9	9.9	9.8	10	9.6	9.9	9.8	9.83	9.9	9.9	9.9
Φ5	4.9		4.7	4.85	4.8	4.5	1.8	3.9	3.6	1.5	1.7	1.6	4.65
Sorting Number	1.523		1.665	1.640	1.583	1.733	2.457	1.959	1.897	2.975	2.717	2.895	1.645
Mean	7.547	0.000	7.197	7.247	7.247	7.300	5.033	7.167	6.877	6.117	6.653	6.383	7.467
Skewness	-0.084	#DIV/0!	0.080	0.030	0.015	-0.009	0.268	-0.114	0.014	-0.388	-0.408	-0.397	0.006
very well =<.35													
well 0.35-.50													
Mod well .5-.71													
Mod 0.71-1													
poor 1-2													
very poor >2													
mm d50	0.005		0.007	0.007	0.007	0.006	0.031	0.007	0.009	0.014	0.010	0.012	0.006
Conductivity (ft per day)	0.039		0.056	0.053	0.053	0.051	0.534	0.058	0.079	0.173	0.099	0.131	0.043
Linda Mark Conductivity (cm/s)	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000

Sample Number	NRF 15 11C	NRF15 11F	USGS142 7H	USGS 142 7I	USGS 142 6C	USGS 142 6B	USGS 142 5G	NRF15 10D	NRF 15 10E	NRF 15 6C	NRF 15 10A	NRF 15 5D	USGS 142 5K	USGS 142 5L	USGS 142 5M
Sx															
mean	4.68	4.1	6.19	6.44	4.48	5.26	4.35	7.93	7.25	6.84	7.64	6.94	4.85	3.42	4
Φ 84	8.3	7.78	8.4	8.7	7.1	7.9	6.9	9.63	9.2	8.85	9.4	9.97	7.5	5.81	6.24
Φ16	3.5	2.29	4	4.1	2.87	3.66	3.03	5.4	2.5	4.87	5.73	4.75	3.15	2.27	2.44
Φ95	9.5	9.43	9.6	9.63	9.03	9.43	8.8	10.3	10.1	10	10.21	9.93	9.13	8.04	8.33
Φ5	3.95	1.49	1.66	1.95	2.28	3.03	2.3	2.85	1.47	3.45	4.47	3.69	2.26	1.69	1.68
Sorting Number	2.041	2.576	2.303	2.314	2.080	2.030	1.952	2.186	2.983	1.987	1.787	2.250	2.128	1.847	1.958
Mean	5.493	4.723	6.197	6.413	4.817	5.607	4.760	7.653	6.317	6.853	7.590	7.220	5.167	3.833	4.227
Skewness	0.623	0.342	-0.068	-0.093	0.293	0.274	0.344	-0.280	-0.379	-0.013	-0.073	0.060	0.232	0.403	0.241
very well =<.35															
well 0.35-.50															
Mod well .5-.71															
Mod 0.71-1															
poor 1-2															
very poor >2															
mm d50	0.022	0.038	0.014	0.012	0.035	0.021	0.037	0.005	0.013	0.009	0.005	0.007	0.028	0.070	0.053
Conductivity (ft per day)	0.331	0.737	0.159	0.127	0.668	0.294	0.709	0.035	0.141	0.080	0.037	0.055	0.465	1.858	1.234
Linda Mark Conductivity (cm/s)	0.000	0.001	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.001

Sample Number	USGS 142 5N	USGS 142 5S	USGS 142 6D	USGS 142 6E	USGS 142 7G	NRF 15 2E	NRF 15 2F	NRF 15 2G	NRF 15 2H	NRF 15 5B	NRF 15 5E	NRF 15 6A	NRF 15 6B	NRF 15 6D	NRF 15 6E	USGS 142 5P
Sx																
mean	2.06	4.3	4.26	3.27	6.44	6.36	6.26	6.85	7.41	6.86	6.82	6.61	6.34	7.27	7	2.43
Φ 84	5.6	6.24	6.6	6.01	8.45	8.6	8.44	9.04	9.22	8.81	8.66	8.6	8.43	9.13	9.05	4.61
Φ16	0.86	3.35	2.85	2.05	4.87	4.49	4.55	4	4.83	4.95	5.26	4.84	5.03	3.67	3.69	1.5
Φ95	8.23	8.33	8.53	8.2	9.81	9.65	9.73	10.05	10.14	9.87	9.83	9.83	9.79	9.95	9.99	7.03
Φ5	0.27	2.87	1.83	1.57	4.15	3.63	3.83	2.95	3.47	3.75	4.45	3.84	4.39	2.32	2.4	1.06
Sorting Number	2.391	1.550	1.953	1.995	1.753	1.940	1.866	2.336	2.108	1.892	1.665	1.848	1.668	2.521	2.490	1.682
Mean	2.840	4.630	4.570	3.777	6.587	6.483	6.417	6.630	7.153	6.873	6.913	6.683	6.600	6.690	6.580	2.847
Skewness	0.522	0.409	0.261	0.436	0.157	0.092	0.149	-0.115	-0.178	-0.003	0.101	0.067	0.254	-0.308	-0.224	0.471
very well =<.35																
well 0.35-.50																
Mod well .5-.71																
Mod 0.71-1																
poor 1-2																
very poor >2																
mm d50	0.140	0.040	0.042	0.073	0.010	0.011	0.012	0.010	0.007	0.009	0.008	0.010	0.010	0.010	0.010	0.139
Conductivity (ft per day)	5.219	0.812	0.864	1.971	0.106	0.118	0.127	0.101	0.059	0.079	0.076	0.096	0.105	0.095	0.107	5.183
Linda Mark Conductivity (cm/s)	0.006	0.001	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006

Sample Number	USGS 142 7F	NRF 15 9A	NRF 15 11D	NRF 15 9B	USGS 142 7E	USGS 142 5F	USGS 142 6A	USGS 142 5O	USGS 142 5H	USGS 142 5D	USGS 142 5E	USGS 142 5I	USGS 142 5J	USGS 142 5Q	USGS 142 5R	USGS 142 569	USGS 142 7A	USGS 142 7B	USGS 142 7C	NRF 15 11B
Sx																				
mean	4.15	4.67	6.87	7.2	6.7	4.41	4.63	4.07	4	2.06	2.56	2.55	2.3	3.08	3	2.85	1.87	1.86	2.27	2.06
Φ 84	7.24	6.81	9.98	8.87	8.59	6.74	6.44	7.4	6.54	3.45	5.62	4.15	4.47	5.01	4.84	4.04	4.05	3.64	3.35	5.45
Φ16	2.41	3.44	4.64	5.69	5.11	3.21	3.53	1.03	2.62	1.16	1.07	1.5	1.16	2.08	1.76	2.07	1.61	0.96	1.54	1.04
Φ95	9.03	8.73	10	9.99	9.73	8.6	8.44	9.05	8.44	6.54	7.93	6.64	6.74	7.34	7.14	7.24	6.27	6.02	5.54	8.03
Φ5	1.6	2.86	2.87	4.85	4.43	2.62	3.03	0.4	2.03	0.7	0.51	0.89	0.63	1.49	1.16	1.68	0.63	0.52	1.16	0.49
Sorting Number	2.333	1.732	2.415	1.574	1.673	1.789	1.547	2.903	1.951	1.457	2.262	1.534	1.753	1.619	1.676	1.335	1.465	1.503	1.116	2.245
Mean	4.600	4.973	7.163	7.253	6.800	4.787	4.867	4.167	4.387	2.223	3.083	2.733	2.643	3.390	3.200	2.987	2.510	2.153	2.387	2.850
Skewness	0.297	0.327	0.021	0.068	0.115	0.361	0.326	0.098	0.341	0.374	0.396	0.315	0.382	0.387	0.290	0.394	0.674	0.421	0.343	0.560
very well = <.35																				
well 0.35-.50																				
Mod well .5-.71																				
Mod 0.71-1																				
poor 1-2																				
very poor >2																				
mm d50	0.041	0.032	0.007	0.007	0.009	0.036	0.034	0.056	0.048	0.214	0.118	0.150	0.160	0.095	0.109	0.126	0.176	0.225	0.191	0.139
Conductivity (ft per day)	0.837	0.568	0.058	0.053	0.085	0.690	0.635	1.314	1.045	9.910	4.053	5.831	6.403	2.946	3.590	4.481	7.356	10.658	8.362	5.165
Linda Mark Conductivity (cm/s)	0.001	0.001	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.013	0.005	0.007	0.008	0.003	0.004	0.005	0.009	0.014	0.011	0.006

Appendix B: Sorting, skewness, Hydraulic conductivity calculated from grain size found in Appendix D

	Qm	Qp	Fp	Biotite	Chert	Qmf agg	Lvf	Lvl	Lvml	Ls silt	Ls carb (auth)
Redo point counts											
DZ1 USGS 142 832	197	20	11	6	43	21	96	30	23	12	41
DZ2 USGS 142 780	143	13	4	13	43	25	112	77	27	12	32
USGS 142 569	173	15	5	9	50	24	109	25	16	8	66
USGS 142 5D	198	27	7	2	54	11	115	34	8	14	30
USGS 142 5E	185	26	12	2	49	6	95	34	16	8	67
USGS 142 5I	153	22	11	6	58	16	134	33	21	4	42
USGS 142 5J	110	14	8	7	110	13	156	19	32	15	16
USGS 142 5R	187	27	7	9	83	10	100	16	16	1	44
USGS 142 5Q	175	11	11	9	62	16	70	35	32	7	74
USGS 142 7A	169	23	9	6	80	25	80	37	41	13	17
USGS 142 7B	211	19	12	11	66	17	64	30	40	15	17
USGS 142 7C	194	12	12	6	58	4	61	25	14	10	104
NRF15 11B	185	18	8		64	5	97	32	28	12	51

	Q	F	L	Lithics	M	V	S	Volcanic Lith	Felsic	Micro	Lathwork	
Redo point counts												
DZ1 USGS 142 832	500	238	11	204		41	149	55		96	23	30
DZ2 USGS 142 780	501	181	4	271		38	216	55		112	27	77
USGS 142 569	500	212	5	208		39	150	58		109	16	25
USGS 142 5D	500	236	7	225		38	157	68		115	8	34
USGS 142 5E	500	217	12	202		32	145	57		95	16	34
USGS 142 5I	500	191	11	250		38	188	62		134	21	33
USGS 142 5J	500	137	8	332		27	207	125		156	32	19
USGS 142 5R	500	224	7	216		37	132	84		100	16	16
USGS 142 5Q	502	202	11	206		27	137	69		70	32	35
USGS 142 7A	500	217	9	251		48	158	93		80	41	37
USGS 142 7B	502	247	12	215		36	134	81		64	40	30
USGS 142 7C	500	210	12	168		16	100	68		61	14	25
NRF15 11B	500	208	8	233		23	157	76		97	28	32

	New F		Fp diff from old	percentage of 500		New	Q	F	L
Redo point counts									
DZ1 USGS 142 832	29	DZ1 USGS 142 832	18	3.6	1.8		229.432	29	196.656
DZ2 USGS 142 780	31	DZ2 USGS 142 780	27	5.4	2.7		171.226	31	256.366
USGS 142 569	28	USGS 142 569	23	4.6	2.3		202.248	28	198.432
USGS 142 5D	33	USGS 142 5D	26	5.2	2.6		223.728	33	213.3
USGS 142 5E	47	USGS 142 5E	35	7	3.5		201.81	47	187.86
USGS 142 5I	26	USGS 142 5I	15	3	1.5		185.27	26	242.5
USGS 142 5J	39	USGS 142 5J	31	6.2	3.1		128.506	39	311.416
USGS 142 5R	23	USGS 142 5R	16	3.2	1.6		216.832	23	209.088
USGS 142 5Q	16	USGS 142 5Q	5	1	0.5		199.98	16	203.94
USGS 142 7A	22	USGS 142 7A	13	2.6	1.3		211.358	22	244.474
USGS 142 7B	15	USGS 142 7B	3	0.6	0.3		245.518	15	213.71
USGS 142 7C	25	USGS 142 7C	13	2.6	1.3		204.54	25	163.632
NRF15 11B	27	NRF15 11B	19	3.8	1.9		200.096	27	224.146

Depth (ft)	Sample No.	Sample Name	Result Between User Sizes (Sizes in um)																													
			0.36	0.42	0.48	0.55	0.63	0.72	0.83	0.95	1.10	1.26	1.45	1.66	1.91	2.19	2.51	2.88	3.31	3.80	4.37	5.01	5.75	6.61	7.59	8.71	10.00	11.48	13.18	15.14	17.38	19.95
535.9	NRF152A	No Grain Size																														
536.5	NRF152B	NRF15 2Bc			0.00	0.48	1.04	1.42	1.73	1.93	2.07	2.20	2.37	2.61	2.91	3.25	3.56	3.82	3.99	4.05	3.99	3.83	3.58	3.26	2.92	2.56	2.24	1.95	1.71	1.52	1.39	1.30
					0.00	0.46	1.01	1.39	1.70	1.90	2.04	2.17	2.35	2.59	2.91	3.25	3.57	3.84	4.02	4.08	4.03	3.87	3.62	3.31	2.96	2.61	2.28	1.99	1.75	1.57	1.44	1.35
					0.00	0.44	0.98	1.35	1.65	1.84	1.98	2.11	2.29	2.54	2.85	3.19	3.52	3.78	3.96	4.03	3.99	3.84	3.60	3.29	2.95	2.61	2.29	2.00	1.77	1.59	1.46	1.37
					0.06	0.59	1.15	1.54	1.86	2.07	2.22	2.35	2.52	2.74	3.02	3.31	3.58	3.78	3.89	3.89	3.78	3.56	3.26	2.90	2.52	2.15	1.82	1.54	1.32	1.17	1.07	1.01
					0.00	0.55	1.13	1.50	1.83	2.04	2.19	2.32	2.49	2.72	3.00	3.29	3.57	3.77	3.89	3.90	3.79	3.58	3.28	2.92	2.54	2.17	1.84	1.56	1.35	1.19	1.09	1.03
					0.00	0.53	1.09	1.46	1.78	1.99	2.14	2.27	2.44	2.67	2.95	3.24	3.51	3.72	3.84	3.85	3.75	3.54	3.25	2.90	2.52	2.16	1.83	1.55	1.34	1.19	1.09	1.03
					0.00	0.62	1.29	1.73	2.11	2.35	2.53	2.69	2.89	3.14	3.45	3.78	4.06	4.27	4.38	4.36	4.21	3.95	3.60	3.19	2.76	2.35	1.98	1.66	1.41	1.22	1.08	0.98
					0.00	0.58	1.22	1.64	2.00	2.24	2.41	2.57	2.76	3.02	3.32	3.64	3.93	4.14	4.24	4.23	4.09	3.84	3.50	3.11	2.70	2.30	1.94	1.63	1.39	1.20	1.07	0.97
					0.00	0.55	1.18	1.59	1.95	2.18	2.36	2.51	2.71	2.96	3.27	3.59	3.87	4.08	4.20	4.19	4.06	3.81	3.48	3.09	2.69	2.29	1.94	1.63	1.40	1.22	1.08	0.99
537.5	NRF152C	NRF15 2Cc			0.00	0.60	1.30	1.77	2.15	2.39	2.57	2.73	2.94	3.24	3.62	4.04	4.43	4.76	4.97	5.05	4.99	4.78	4.46	4.05	3.60	3.13	2.70	2.30	1.95	1.65	1.41	1.20
					0.00	0.57	1.26	1.72	2.10	2.34	2.52	2.68	2.90	3.20	3.59	4.01	4.42	4.76	4.98	5.07	5.01	4.81	4.50	4.09	3.64	3.18	2.74	2.34	2.00	1.70	1.45	1.24
					0.00	0.54	1.20	1.65	2.02	2.25	2.42	2.58	2.80	3.10	3.48	3.91	4.31	4.64	4.87	4.97	4.92	4.73	4.42	4.02	3.59	3.13	2.71	2.32	1.98	1.69	1.45	1.25
					0.00	0.58	1.24	1.68	2.05	2.29	2.47	2.64	2.84	3.12	3.46	3.83	4.16	4.41	4.56	4.58	4.46	4.22	3.88	3.47	3.04	2.61	2.22	1.86	1.56	1.30	1.08	0.89
					0.00	0.57	1.23	1.67	2.05	2.30	2.48	2.66	2.88	3.17	3.53	3.91	4.25	4.52	4.68	4.70	4.58	4.34	4.00	3.59	3.15	2.71	2.31	1.95	1.64	1.38	1.15	0.95
					0.00	0.52	1.14	1.55	1.91	2.14	2.32	2.49	2.70	2.98	3.33	3.69	4.03	4.29	4.44	4.47	4.36	4.14	3.82	3.43	3.02	2.60	2.23	1.88	1.59	1.33	1.11	0.92
					0.06	0.74	1.48	1.99	2.41	2.68	2.87	3.03	3.23	3.51	3.85	4.22	4.56	4.81	4.95	4.96	4.82	4.56	4.19	3.75	3.28	2.81	2.37	1.99	1.67	1.40	1.19	1.02
					0.00	0.69	1.44	1.93	2.34	2.61	2.80	2.96	3.17	3.45	3.80	4.17	4.52	4.78	4.92	4.94	4.81	4.54	4.18	3.74	3.28	2.81	2.38	2.00	1.69	1.42	1.22	1.05
					0.00	0.65	1.37	1.84	2.24	2.49	2.68	2.84	3.05	3.33	3.67	4.04	4.37	4.63	4.77	4.79	4.67	4.42	4.07	3.65	3.20	2.75	2.33	1.96	1.65	1.39	1.19	1.02
538.4	NRF152D	NRF15 2Dc			0.00	0.51	1.14	1.56	1.92	2.15	2.31	2.46	2.66	2.92	3.25	3.60	3.93	4.20	4.37	4.43	4.37	4.21	3.95	3.63	3.29	2.94	2.61	2.30	2.04	1.82	1.63	1.48
					0.00	0.47	1.06	1.47	1.80	2.02	2.18	2.33	2.52	2.78	3.10	3.44	3.77	4.03	4.20	4.26	4.21	4.06	3.82	3.53	3.21	2.88	2.56	2.27	2.02	1.80	1.61	1.44
					0.00	0.44	1.01	1.41	1.73	1.94	2.10	2.24	2.43	2.69	3.01	3.35	3.67	3.93	4.10	4.17	4.13	3.98	3.75	3.47	3.16	2.84	2.55	2.27	2.02	1.80	1.60	1.44
					0.13	0.72	1.36	1.81	2.18	2.43	2.61	2.77	2.95	3.18	3.46	3.74	3.98	4.15	4.20	4.15	3.98	3.70	3.36	2.97	2.58	2.20	1.86	1.56	1.32	1.13	0.97	0.85
					0.12	0.71	1.34	1.79	2.17	2.42	2.60	2.76	2.94	3.18	3.46	3.75	3.99	4.15	4.21	4.16	3.99	3.72	3.37	2.99	2.59	2.21	1.88	1.58	1.34	1.14	0.99	0.86
					0.11	0.71	1.36	1.81	2.19	2.44	2.63	2.79	2.98	3.23	3.52	3.81	4.06	4.23	4.29	4.24	4.06	3.79	3.44	3.05	2.65	2.26	1.92	1.62	1.38	1.18	1.02	0.89
					0.17	0.78	1.44	1.90	2.29	2.54	2.72	2.88	3.06	3.30	3.57	3.85	4.09	4.24	4.29	4.22	4.04	3.75	3.40	2.99	2.59	2.20	1.85	1.55	1.30	1.10	0.94	0.82
					0.15	0.75	1.40	1.85	2.23	2.48	2.67	2.82	3.01	3.24	3.52	3.80	4.04	4.19	4.24	4.18	4.00	3.72	3.37	2.98	2.58	2.19	1.84	1.54	1.30	1.10	0.95	0.82
					0.14	0.74	1.38	1.84	2.22	2.47	2.66	2.82	3.01	3.25	3.53	3.81	4.05	4.21	4.26	4.20	4.02	3.75	3.40	3.00	2.60	2.21	1.86	1.56	1.32	1.12	0.96	0.83
538.9	NRF152E	NRF15 2Ec			0.37	0.75	0.99	1.19	1.31	1.38	1.44	1.52	1.65	1.81	2.01	2.21	2.40	2.57	2.71	2.81	2.88	2.93	2.95	2.96	2.98	3.01	3.07	3.15	3.26	3.40	3.57	
					0.36	0.74	0.98	1.17	1.29	1.37	1.43	1.51	1.63	1.80	1.99	2.19	2.38	2.55	2.69	2.79	2.86	2.91	2.94	2.96	2.98	3.01	3.07	3.15	3.27	3.41	3.58	
					0.36	0.73	0.97	1.16	1.28	1.36	1.42	1.50	1.62	1.79	1.98	2.18	2.37	2.54	2.68	2.78	2.86	2.91	2.94	2.96	2.98	3.02	3.08	3.16	3.28	3.43	3.60	
					0.27	0.66	0.96	1.21	1.36	1.45	1.53	1.63	1.79	2.02	2.28	2.56	2.83	3.06	3.25	3.39	3.48	3.53	3.54	3.54	3.52	3.51	3.51	3.52	3.54	3.58	3.64	
					0.26	0.65	0.95	1.19	1.34	1.44	1.51	1.61	1.78	2.00	2.27	2.55	2.82	3.05	3.25	3.39	3.48	3.53	3.54	3.54	3.53	3.52	3.51	3.52	3.54	3.58	3.63	
					0.26	0.64	0.93	1.17	1.31	1.41	1.48	1.58	1.74	1.96	2.23	2.50	2.76	3.00	3.19	3.32	3.42	3.47	3.49	3.48	3.48	3.48	3.48	3.49	3.52	3.55	3.60	
					0.30	0.70	1.00	1.25	1.39	1.48	1.56	1.65	1.81	2.02	2.27	2.54	2.79	3.01	3.18	3.31	3.38	3.42	3.42	3.41	3.39	3.38	3.38	3.40	3.44	3.50	3.58	
					0.30	0.69	0.99	1.23	1.38	1.47	1.54	1.64	1.79	2.00	2.26	2.52	2.77	2.99	3.17	3.29	3.37	3.41	3.42	3.40	3.39	3.38	3.38	3.40	3.45	3.51	3.59	
					0.29	0.68	0.98	1.22	1.36	1.46	1.53	1.63	1.78	1.99	2.24	2.51	2.76	2.98	3.16	3.29	3.37	3.40	3.41	3.40	3.39	3.38	3.38	3.40	3.45	3.51	3.59	
539.2	NRF152F	NRF15 2Fc			0.26	0.63	0.90	1.11	1.23	1.30	1.34	1.42	1.55	1.74	1.97	2.22	2.47	2.70	2.89	3.04	3.15	3.23	3.29	3.34	3.40	3.47	3.55	3.66	3.79	3.92	4.06	
					0.25	0.61	0.88	1.09	1.21	1.28	1.32	1.40	1.53	1.72	1.95	2.21	2.45	2.68	2.87	3.03	3.14	3.23	3.29	3.34	3.40	3.47	3.56	3.66	3.79	3.93	4.06	
					0.25	0.60	0.87	1.08	1.20	1.27	1.31	1.39	1.52	1.71	1.95	2.20	2.45	2.68	2.88	3.04	3.15	3.24	3.31	3.36	3.42	3.49	3.58	3.69	3.81	3.95	4.09	
					0.29	0.67	0.95	1.18	1.30	1.38	1.43	1.50	1.63	1.83	2.06	2.31	2.55	2.77	2.95	3.09	3.18	3.24	3.28	3.30	3.34	3.39	3.47	3.57	3.71	3.86	4.00	
					0.28	0.66	0.94	1.16	1.29	1.36	1.41	1.49	1.62	1.81	2.05	2.30	2.54	2.76	2.94	3.08	3.18	3.24	3.27	3.30	3.34	3.40	3.48	3.59	3.73	3.87	4.02	
					0.27	0.65	0.92	1.14	1.27	1.34	1.39	1.47	1.60	1.79	2.03	2.28	2.52	2.74	2.93	3.07	3.17	3.23	3.27									

90

Depth (ft)	Sample No.	Sample Name	Result Between User Sizes (Sizes in um)																																				
			0.36	0.42	0.48	0.55	0.63	0.72	0.83	0.95	1.10	1.26	1.45	1.66	1.91	2.19	2.51	2.88	3.31	3.80	4.37	5.01	5.75	6.61	7.59	8.71	10.00	11.48	13.18	15.14	17.38	19.95							
540.6	NRF152H	NRF15 2Hc			0.12	0.67	1.24	1.62	1.91	2.08	2.18	2.25	2.35	2.52	2.76	3.03	3.31	3.56	3.75	3.88	3.92	3.89	3.80	3.66	3.50	3.32	3.15	2.98	2.83	2.68	2.54	2.41							
					0.11	0.63	1.19	1.56	1.84	2.00	2.10	2.17	2.27	2.43	2.66	2.93	3.20	3.44	3.62	3.75	3.80	3.78	3.71	3.59	3.46	3.32	3.19	3.06	2.94	2.81	2.68	2.54							
					0.10	0.61	1.14	1.50	1.78	1.94	2.03	2.09	2.19	2.35	2.57	2.83	3.09	3.32	3.50	3.62	3.67	3.66	3.60	3.50	3.39	3.28	3.18	3.08	2.99	2.88	2.77	2.65							
					0.09	0.71	1.37	1.82	2.18	2.39	2.52	2.63	2.77	2.97	3.25	3.57	3.89	4.16	4.36	4.48	4.49	4.40	4.22	3.98	3.69	3.38	3.07	2.78	2.52	2.29	2.11	1.96							
					0.07	0.68	1.33	1.77	2.12	2.33	2.47	2.57	2.71	2.92	3.20	3.52	3.84	4.11	4.32	4.43	4.45	4.37	4.20	3.95	3.67	3.36	3.06	2.77	2.52	2.30	2.11	1.97							
					0.06	0.67	1.31	1.75	2.10	2.31	2.44	2.55	2.69	2.90	3.19	3.51	3.82	4.10	4.31	4.43	4.45	4.37	4.21	3.97	3.69	3.38	3.08	2.79	2.53	2.30	2.11	1.96							
					0.29	0.93	1.52	1.98	2.31	2.51	2.63	2.71	2.82	3.00	3.24	3.52	3.79	4.01	4.18	4.25	4.23	4.11	3.92	3.65	3.36	3.04	2.74	2.45	2.20	1.99	1.82	1.68							
					0.27	0.92	1.50	1.95	2.28	2.48	2.60	2.69	2.80	2.98	3.22	3.50	3.77	4.00	4.16	4.24	4.22	4.10	3.91	3.65	3.35	3.04	2.74	2.45	2.21	1.99	1.82	1.69							
					0.27	0.90	1.49	1.94	2.27	2.47	2.59	2.67	2.79	2.97	3.21	3.49	3.76	3.99	4.16	4.24	4.22	4.11	3.91	3.65	3.36	3.05	2.75	2.46	2.21	2.00	1.83	1.69							
			569	683.5	NRF154A	No Grain Size																																	
730.2	NRF155A	No Grain Size																																					
							732	NRF155B	NRF15 5Bc																														
												0.34	0.82	1.18	1.45	1.62	1.74	1.83	1.97	2.16	2.42	2.72	3.03	3.33	3.61	3.85	4.05	4.21	4.33	4.42	4.48	4.49	4.46	4.37	4.23	4.01	3.73	3.40	
												0.33	0.81	1.16	1.43	1.60	1.71	1.81	1.94	2.14	2.40	2.69	3.00	3.30	3.58	3.82	4.01	4.17	4.29	4.38	4.43	4.45	4.42	4.34	4.20	3.99	3.72	3.39	
												0.33	0.80	1.15	1.42	1.59	1.70	1.80	1.93	2.12	2.38	2.68	2.99	3.28	3.55	3.79	3.98	4.14	4.26	4.35	4.41	4.43	4.41	4.34	4.21	4.00	3.72	3.39	
												0.36	0.83	1.16	1.42	1.58	1.69	1.79	1.91	2.08	2.30	2.56	2.82	3.07	3.29	3.48	3.63	3.74	3.82	3.87	3.90	3.92	3.91	3.88	3.81	3.69	3.54	3.35	
												0.35	0.82	1.14	1.40	1.56	1.67	1.76	1.88	2.05	2.28	2.53	2.79	3.04	3.26	3.44	3.59	3.70	3.78	3.83	3.87	3.88	3.87	3.84	3.77	3.66	3.51	3.33	
												0.34	0.80	1.12	1.37	1.53	1.64	1.73	1.84	2.01	2.23	2.48	2.74	2.98	3.19	3.37	3.52	3.63	3.70	3.78	3.76	3.79	3.81	3.81	3.78	3.72	3.61	3.47	3.29
												0.37	0.87	1.21	1.49	1.67	1.78	1.88	2.00	2.17	2.39	2.65	2.90	3.14	3.35	3.52	3.64	3.73	3.78	3.80	3.80	3.78	3.74	3.68	3.59	3.47	3.34	3.18	
					0.37	0.85				1.20	1.47	1.64	1.76	1.85	1.97	2.14	2.37	2.62	2.88	3.11	3.32	3.49	3.61	3.69	3.74	3.76	3.76	3.75	3.71	3.65	3.57	3.46	3.33	3.18					
		0.36	0.84	1.18	1.46	1.63				1.74	1.83	1.95	2.12	2.35	2.60	2.85	3.09	3.29	3.46	3.58	3.67	3.72	3.75	3.75	3.73	3.69	3.63	3.54	3.43	3.29	3.14								
732.5	NRF155C	733.1	NRF155D	No Grain Size																																			
							0.35	0.85	1.22	1.52	1.73	1.88	2.02	2.19	2.41	2.68	2.96	3.22	3.44	3.59	3.68	3.69	3.65	3.56	3.45	3.35	3.26	3.20	3.17	3.17	3.19	3.21	3.21						
							0.34	0.84	1.22	1.52	1.72	1.88	2.02	2.18	2.40	2.67	2.95	3.21	3.43	3.58	3.66	3.68	3.63	3.55	3.44	3.33	3.24	3.18	3.16	3.19	3.21	3.21	3.23						
							0.35	0.85	1.22	1.52	1.72	1.88	2.02	2.18	2.40	2.67	2.95	3.21	3.43	3.58	3.67	3.68	3.64	3.55	3.44	3.33	3.24	3.18	3.16	3.16	3.18	3.21	3.22						
							0.37	0.88	1.26	1.57	1.78	1.94	2.09	2.26	2.48	2.74	3.02	3.27	3.48	3.62	3.70	3.70	3.65	3.55	3.43	3.31	3.21	3.14	3.10	3.08	3.08	3.09	3.10						
							0.37	0.88	1.25	1.56	1.77	1.93	2.07	2.24	2.46	2.72	3.00	3.25	3.46	3.60	3.68	3.68	3.62	3.53	3.41	3.30	3.20	3.13	3.08	3.07	3.08	3.08	3.08						
							0.37	0.89	1.26	1.58	1.79	1.95	2.09	2.26	2.48	2.74	3.02	3.27	3.48	3.63	3.70	3.70	3.65	3.55	3.44	3.33	3.23	3.16	3.12	3.10	3.11	3.11	3.11						
							0.37	0.89	1.28	1.59	1.81	1.97	2.12	2.29	2.52	2.78	3.06	3.32	3.53	3.67	3.74	3.74	3.68	3.58	3.46	3.34	3.24	3.17	3.12	3.10	3.09	3.09	3.09	3.08					
							0.37	0.89	1.27	1.59	1.80	1.96	2.11	2.28	2.50	2.77	3.04	3.30	3.51	3.65	3.72	3.72	3.66	3.56	3.45	3.33	3.23	3.15	3.11	3.09	3.08	3.07	3.07	3.06					
							0.37	0.88	1.26	1.57	1.79	1.95	2.09	2.26	2.48	2.75	3.02	3.28	3.48	3.63	3.70	3.70	3.64	3.54	3.43	3.31	3.21	3.14	3.10	3.07	3.06	3.06	3.04						
733.8	NRF155E	NRF15 5Ec																																					
					0.22	0.61	0.93	1.19	1.37	1.48	1.57	1.69	1.87	2.11	2.39	2.69	2.99	3.27	3.53	3.77	3.99	4.20	4.40	4.59	4.77	4.93	5.03	5.05	4.96	4.74	4.40								
					0.22	0.60	0.92	1.18	1.35	1.46	1.55	1.67	1.85	2.09	2.36	2.66	2.95	3.23	3.49	3.73	3.95	4.15	4.35	4.55	4.73	4.88	4.98	5.00	4.90	4.69	4.34								
					0.33	0.79	1.11	1.37	1.54	1.64	1.73	1.84	2.00	2.21	2.45	2.71	2.95	3.19	3.40	3.59	3.76	3.92	4.08	4.23	4.37	4.49	4.57	4.58	4.51	4.35	4.08								
					0.44	0.92	1.23	1.49	1.65	1.76	1.84	1.95	2.10	2.30	2.53	2.76	2.99	3.20	3.39	3.56	3.71	3.85	3.99	4.12	4.24	4.34	4.40	4.40	4.34	4.20	3.98								
					0.44	0.91	1.22	1.48	1.63	1.74	1.83	1.93	2.08	2.28	2.50	2.73	2.96	3.17	3.36	3.53	3.68	3.82	3.96	4.09	4.21	4.30	4.36	4.37	4.31	4.17	3.95								
					0.43	0.90	1.20	1.46	1.62	1.73	1.81	1.92	2.07	2.26	2.48	2.72	2.94	3.15	3.34	3.50	3.66	3.80	3.93	4.06	4.18	4.28	4.34	4.35	4.29	4.15	3.93								
					0.25	0.65	0.97	1.24	1.41	1.53	1.62	1.74	1.91	2.14	2.42	2.70	2.99	3.25	3.50	3.71	3.91	4.09	4.27	4.44	4.60	4.74	4.84	4.86	4.79	4.61	4.31								
					0.25	0.65	0.97	1.24	1.41	1.53	1.62	1.74	1.91	2.14	2.41	2.70	2.98	3.25	3.50	3.71	3.91	4.09	4.27	4.44	4.60	4.74	4.83	4.86	4.79	4.61	4.31								
					0.25	0.64	0.97	1.23	1.41	1.52	1.61	1.73	1.90	2.13	2.40	2.69	2.97	3.24	3.48	3.70	3.90	4.08	4.26	4.43	4.59	4.73	4.83	4.85	4.78	4.60	4.30								
737.9	NRF156A	NRF15 6Ac																																					
					0.19	0.54	0.83	1.06	1.20	1.29	1.36	1.45	1.60	1.81	2.07	2.36	2.65	2.93	3.20	3.44	3.66	3.86	4.05	4.22	4.38	4.51	4.61	4.65	4.63	4.52	4.32								
					0.19	0.54	0.83	1.06	1.20	1.28	1.35	1.44	1.59	1.80	2.06	2.34	2.63	2.91	3.17	3.41	3.63	3.83	4.02	4.19	4.35	4.49	4.60	4.65	4.62	4.52	4.32								
					0.30	0.72	1.02	1.24	1.38	1.46	1.52	1.61	1.75	1.94	2.17	2.41	2.66	2.89	3.11	3.31	3.49	3.64	3.79	3.93	4.06	4.17	4.25	4.29	4.27	4.18	4.03								
					0.34	0.76	1.06	1.29	1.44	1.53	1.59	1.69	1.82	2.01	2.23	2.47	2.70	2.93	3.13	3.30	3.45	3.58	3.69	3.79	3.88	3.95	4.00	4.02	4.01	3.95	3.84								
					0.33	0.76	1.05	1.28	1.42	1.51	1.58	1.67	1.80	1.99	2.21	2.45	2.68	2.90	3.10	3.27	3.42	3.55	3.66	3.76	3.85	3.92	3.97	4.00	3.98	3.92	3.82								
					0.33	0.75	1.04	1.27	1.41	1.50	1.57	1.66	1.79	1.98	2.20	2.43	2.66	2.88	3.08	3.25	3.40	3.53	3.64	3.74	3.83	3.90	3.95	3.97	3.96	3.91	3.80								
					0.35	0.78	1.08	1.32	1.46	1.56	1.63	1.72	1.86	2.05	2.28	2.52	2.75	2.97	3.18	3.35	3.50</																		

22.91	26.30	30.20	34.67	39.81	45.71	52.48	60.26	69.18	79.43	91.20	104.71	120.23	138.04	158.49	181.97	208.93	239.88	275.42	316.23	363.08	416.87	478.63	549.54	630.96	724.44	831.76	954.99	1096.48
2.28	2.17	2.08	2.00	1.94	1.87	1.80	1.71	1.60	1.47	1.31	1.13	0.94	0.74	0.55	0.34	0.16	0.00	0.00										
2.41	2.28	2.17	2.08	2.00	1.93	1.86	1.77	1.66	1.53	1.37	1.19	0.99	0.79	0.59	0.42	0.20	0.00	0.00										
2.52	2.38	2.26	2.16	2.07	1.99	1.91	1.82	1.71	1.58	1.43	1.25	1.06	0.86	0.65	0.47	0.31	0.19	0.06										
1.85	1.78	1.74	1.71	1.67	1.62	1.55	1.45	1.31	1.13	0.91	0.66	0.45	0.12	0.00	0.00	0.00	0.00	0.00										
1.86	1.79	1.75	1.71	1.68	1.64	1.57	1.48	1.36	1.20	1.01	0.79	0.58	0.31	0.12	0.00	0.00	0.00	0.00										
1.86	1.78	1.74	1.71	1.68	1.64	1.59	1.51	1.39	1.24	1.05	0.82	0.59	0.31	0.11	0.00	0.00	0.00	0.00										
1.58	1.52	1.50	1.50	1.52	1.56	1.58	1.59	1.56	1.49	1.37	1.22	1.02	0.81	0.59	0.39	0.21	0.09	0.00										
1.59	1.53	1.51	1.52	1.54	1.58	1.60	1.61	1.58	1.51	1.39	1.24	1.04	0.84	0.62	0.42	0.24	0.12	0.00										
1.59	1.53	1.51	1.51	1.54	1.57	1.60	1.61	1.58	1.52	1.41	1.25	1.06	0.85	0.63	0.43	0.25	0.12	0.00										
3.04	2.67	2.30	1.94	1.61	1.31	1.06	0.84	0.67	0.54	0.44	0.37	0.31	0.25	0.19	0.13	0.07	0.00	0.00										
3.03	2.66	2.29	1.94	1.63	1.36	1.12	0.92	0.76	0.63	0.52	0.43	0.36	0.28	0.22	0.15	0.10	0.07	0.00										
3.02	2.64	2.27	1.92	1.62	1.36	1.14	0.97	0.82	0.71	0.61	0.52	0.44	0.34	0.25	0.16	0.08	0.00	0.00										
3.14	2.91	2.67	2.44	2.20	1.97	1.74	1.52	1.31	1.12	0.94	0.78	0.63	0.49	0.37	0.24	0.13	0.00	0.00										
3.12	2.89	2.66	2.43	2.20	1.98	1.76	1.55	1.35	1.17	1.01	0.86	0.72	0.60	0.46	0.34	0.20	0.08	0.00										
3.08	2.86	2.64	2.42	2.21	2.00	1.81	1.63	1.45	1.29	1.14	1.00	0.87	0.74	0.59	0.45	0.31	0.18	0.08										
3.01	2.84	2.67	2.48	2.29	2.08	1.86	1.64	1.41	1.18	0.97	0.78	0.61	0.47	0.34	0.24	0.14	0.06	0.00										
3.02	2.85	2.67	2.47	2.28	2.07	1.86	1.64	1.43	1.23	1.04	0.87	0.72	0.58	0.45	0.32	0.18	0.06	0.00										
2.99	2.83	2.66	2.49	2.31	2.11	1.91	1.70	1.49	1.29	1.09	0.91	0.75	0.61	0.47	0.35	0.23	0.13	0.00										
3.19	3.11	2.98	2.79	2.53	2.22	1.87	1.53	1.20	0.93	0.73	0.58	0.48	0.42	0.38	0.34	0.29	0.24	0.18	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.20	3.12	2.99	2.78	2.52	2.20	1.86	1.53	1.23	0.98	0.79	0.65	0.56	0.48	0.42	0.35	0.28	0.21	0.14	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.20	3.13	3.00	2.80	2.54	2.23	1.89	1.55	1.24	0.98	0.77	0.62	0.52	0.45	0.39	0.33	0.27	0.21	0.14	0.08	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.08	3.02	2.92	2.76	2.54	2.27	1.95	1.62	1.30	1.01	0.78	0.61	0.49	0.41	0.35	0.30	0.25	0.19	0.14	0.08	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.06	3.01	2.90	2.75	2.53	2.26	1.95	1.63	1.32	1.05	0.83	0.66	0.53	0.44	0.38	0.32	0.27	0.22	0.17	0.12	0.08	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.08	3.02	2.92	2.76	2.54	2.26	1.95	1.63	1.32	1.04	0.82	0.64	0.51	0.41	0.33	0.26	0.19	0.13	0.08	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.05	2.99	2.89	2.73	2.52	2.26	1.95	1.62	1.30	1.00	0.75	0.56	0.42	0.34	0.28	0.23	0.19	0.15	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.03	2.96	2.86	2.71	2.51	2.25	1.95	1.63	1.31	1.02	0.77	0.58	0.44	0.35	0.29	0.26	0.22	0.19	0.16	0.12	0.08	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.01	2.94	2.84	2.69	2.49	2.23	1.94	1.62	1.30	1.01	0.77	0.58	0.45	0.36	0.31	0.27	0.23	0.20	0.17	0.14	0.10	0.08	0.06	0.06	0.07	0.09	0.10	0.09	0.09
3.95	3.42	2.85	2.28	1.74	1.26	0.85	0.52	0.30	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
3.90	3.37	2.81	2.26	1.74	1.28	0.89	0.59	0.37	0.22	0.13	0.09	0.08	0.08	0.08	0.09	0.07	0.06	0.04	0.00	0.00								
3.72	3.30	2.84	2.36	1.90	1.48	1.11	0.81	0.57	0.40	0.30	0.24	0.22	0.21	0.20	0.19	0.16	0.12	0.08	0.01	0.00								
3.68	3.33	2.93	2.49	2.06	1.63	1.23	0.88	0.60	0.38	0.23	0.15	0.12	0.11	0.12	0.12	0.11	0.09	0.07	0.00	0.00								
3.66	3.30	2.90	2.48	2.04	1.62	1.24	0.90	0.63	0.43	0.30	0.23	0.21	0.21	0.21	0.20	0.18	0.14	0.10	0.01	0.00								
3.64	3.28	2.88	2.45	2.02	1.61	1.24	0.92	0.67	0.48	0.36	0.30	0.28	0.27	0.27	0.25	0.22	0.17	0.12	0.08	0.01								
3.91	3.43	2.90	2.35	1.83	1.36	0.96	0.64	0.40	0.24	0.14	0.09	0.06	0.06	0.05	0.04	0.03	0.00	0.00	0.00	0.00								
3.91	3.43	2.90	2.35	1.83	1.36	0.96	0.64	0.41	0.25	0.15	0.10	0.07	0.06	0.05	0.04	0.02	0.00	0.00	0.00	0.00								
3.90	3.42	2.89	2.35	1.84	1.37	0.98	0.67	0.44	0.28	0.18	0.12	0.09	0.08	0.07	0.06	0.03	0.00	0.00	0.00	0.00								
4.05	3.71	3.34	2.93	2.50	2.08	1.67	1.29	0.96	0.69	0.47	0.32	0.22	0.15	0.11	0.08	0.05	0.03	0.00	0.00	0.00								
4.05	3.71	3.32	2.91	2.48	2.07	1.67	1.31	1.00	0.74	0.54	0.39	0.28	0.20	0.15	0.10	0.06	0.02	0.00	0.00	0.00								
3.81	3.54	3.24	2.90	2.56	2.20	1.86	1.53	1.23	0.96	0.73	0.56	0.42	0.31	0.23	0.17	0.11	0.07	0.00	0.00	0.00								
3.69	3.48	3.24	2.97	2.66	2.34	2.01	1.69	1.38	1.09	0.84	0.64	0.48	0.37	0.27	0.20	0.13	0.07	0.00	0.00	0.00								
3.66	3.46	3.22	2.95	2.65	2.34	2.02	1.71	1.41	1.15	0.92	0.73	0.58	0.46	0.35	0.26	0.17	0.10	0.00	0.00	0.00								
3.65	3.45	3.21	2.94	2.65	2.34	2.03	1.74	1.45	1.20	0.98	0.79	0.63	0.50	0.39	0.29	0.19	0.11	0.00	0.00	0.00								
3.68	3.46	3.20	2.91	2.59	2.26	1.92	1.59	1.27	0.99	0.74	0.55	0.39	0.28	0.20	0.15	0.12	0.09	0.08	0.07	0.01								
3.64	3.42	3.17	2.88	2.57	2.25	1.93	1.62	1.33	1.08	0.86	0.69	0.54	0.42	0.32	0.24	0.17	0.12	0.08	0.00	0.00								
3.63	3.41	3.16	2.88	2.58	2.26	1.95	1.65	1.38	1.13	0.91	0.72	0.57	0.44	0.34	0.25	0.17	0.10	0.00	0.00	0.00								

Depth (ft)		Sample No.	Sample Name	Result Between User Sizes (Sizes in um)																															
				0.36	0.42	0.48	0.55	0.63	0.72	0.83	0.95	1.10	1.26	1.45	1.66	1.91	2.19	2.51	2.88	3.31	3.80	4.37	5.01	5.75	6.61	7.59	8.71	10.00	11.48	13.18	15.14	17.38	19.95		
	738.5	NRF156B	NRF15 6Bc				0.33	0.72	0.98	1.18	1.29	1.35	1.39	1.44	1.54	1.69	1.86	2.05	2.24	2.42	2.61	2.79	2.99	3.22	3.48	3.79	4.14	4.51	4.87	5.19	5.42	5.52	5.46		
							0.33	0.72	0.98	1.18	1.28	1.34	1.38	1.43	1.53	1.68	1.85	2.04	2.22	2.41	2.59	2.78	2.98	3.20	3.47	3.77	4.12	4.49	4.85	5.16	5.40	5.50	5.44		
							0.33	0.72	0.97	1.17	1.28	1.33	1.37	1.43	1.52	1.67	1.84	2.03	2.22	2.40	2.58	2.76	2.96	3.19	3.45	3.76	4.11	4.47	4.84	5.16	5.39	5.50	5.44		
							0.38	0.77	1.01	1.21	1.32	1.38	1.42	1.47	1.57	1.71	1.87	2.05	2.23	2.40	2.57	2.74	2.93	3.14	3.39	3.69	4.02	4.38	4.74	5.06	5.29	5.40	5.36		
							0.37	0.77	1.01	1.21	1.32	1.38	1.41	1.47	1.57	1.71	1.87	2.05	2.23	2.40	2.57	2.75	2.93	3.15	3.40	3.69	4.03	4.39	4.75	5.07	5.30	5.41	5.36		
							0.37	0.77	1.01	1.21	1.31	1.37	1.41	1.46	1.56	1.70	1.87	2.04	2.22	2.39	2.57	2.74	2.92	3.14	3.39	3.69	4.03	4.38	4.75	5.06	5.30	5.41	5.36		
							0.33	0.72	0.98	1.18	1.29	1.35	1.38	1.43	1.53	1.68	1.85	2.04	2.24	2.43	2.62	2.80	3.00	3.23	3.48	3.78	4.12	4.48	4.83	5.14	5.37	5.46	5.40		
							0.32	0.72	0.98	1.18	1.28	1.34	1.37	1.43	1.52	1.67	1.84	2.03	2.23	2.42	2.60	2.79	2.99	3.21	3.47	3.77	4.11	4.47	4.83	5.14	5.37	5.47	5.41		
						0.32	0.71	0.97	1.17	1.28	1.33	1.36	1.42	1.51	1.66	1.83	2.02	2.22	2.41	2.59	2.78	2.98	3.20	3.46	3.76	4.10	4.46	4.82	5.13	5.37	5.47	5.41			
	739.5	NRF156C	NRF 15 6Cc				0.40	0.91	1.28	1.57	1.75	1.87	1.96	2.07	2.23	2.43	2.66	2.89	3.10	3.28	3.43	3.56	3.67	3.77	3.86	3.95	4.03	4.09	4.10	4.06	3.94	3.76	3.50		
							0.39	0.91	1.27	1.56	1.74	1.86	1.95	2.07	2.23	2.43	2.66	2.88	3.09	3.27	3.42	3.55	3.66	3.75	3.85	3.95	4.03	4.09	4.11	4.07	3.95	3.76	3.49		
							0.39	0.90	1.25	1.54	1.72	1.84	1.93	2.05	2.20	2.40	2.63	2.85	3.06	3.23	3.38	3.51	3.62	3.72	3.81	3.91	3.99	4.05	4.06	4.02	3.91	3.72	3.46		
							0.41	0.92	1.27	1.55	1.73	1.85	1.94	2.04	2.19	2.38	2.59	2.79	2.99	3.16	3.30	3.42	3.52	3.61	3.68	3.75	3.79	3.82	3.81	3.75	3.65	3.50	3.30		
							0.41	0.92	1.26	1.55	1.73	1.85	1.93	2.04	2.18	2.37	2.58	2.78	2.97	3.14	3.29	3.41	3.51	3.59	3.67	3.74	3.79	3.81	3.80	3.74	3.64	3.48	3.28		
							0.41	0.91	1.26	1.55	1.73	1.84	1.93	2.04	2.18	2.37	2.58	2.78	2.97	3.14	3.28	3.40	3.50	3.59	3.66	3.73	3.78	3.80	3.80	3.75	3.64	3.49	3.30		
							0.40	0.92	1.28	1.57	1.75	1.87	1.96	2.07	2.23	2.42	2.64	2.86	3.05	3.23	3.37	3.49	3.59	3.67	3.75	3.82	3.87	3.90	3.89	3.83	3.71	3.54	3.32		
							0.40	0.91	1.27	1.56	1.74	1.86	1.95	2.06	2.21	2.41	2.63	2.84	3.04	3.21	3.35	3.47	3.57	3.65	3.73	3.79	3.84	3.87	3.86	3.80	3.68	3.51	3.29		
						0.39	0.90	1.26	1.55	1.73	1.85	1.94	2.05	2.20	2.39	2.61	2.82	3.02	3.19	3.33	3.45	3.54	3.63	3.70	3.77	3.82	3.84	3.83	3.77	3.66	3.49	3.27			
	740.4	NRF156D	NRF15 6Dc				0.38	0.92	1.34	1.70	1.96	2.18	2.37	2.60	2.86	3.15	3.44	3.67	3.84	3.90	3.88	3.76	3.56	3.32	3.04	2.78	2.53	2.33	2.16	2.04	1.96	1.90	1.86		
							0.38	0.92	1.34	1.70	1.96	2.17	2.37	2.60	2.86	3.15	3.44	3.67	3.83	3.90	3.87	3.75	3.56	3.31	3.04	2.77	2.53	2.32	2.16	2.04	1.96	1.91	1.87		
							0.38	0.92	1.33	1.69	1.95	2.16	2.36	2.58	2.85	3.14	3.42	3.66	3.82	3.89	3.86	3.74	3.54	3.30	3.03	2.77	2.53	2.33	2.16	2.05	1.96	1.90	1.86		
							0.45	1.04	1.48	1.87	2.15	2.39	2.60	2.84	3.11	3.40	3.68	3.90	4.03	4.06	3.99	3.82	3.57	3.28	2.96	2.65	2.36	2.13	1.94	1.80	1.69	1.62	1.57		
							0.45	1.05	1.49	1.88	2.16	2.40	2.61	2.85	3.12	3.41	3.69	3.91	4.04	4.07	4.00	3.83	3.58	3.28	2.96	2.66	2.37	2.14	1.95	1.81	1.70	1.63	1.58		
							0.45	1.05	1.50	1.89	2.17	2.41	2.62	2.86	3.13	3.43	3.71	3.93	4.06	4.09	4.02	3.85	3.60	3.30	2.98	2.67	2.39	2.15	1.96	1.82	1.72	1.64	1.59		
							0.47	1.07	1.51	1.90	2.18	2.42	2.63	2.87	3.14	3.43	3.71	3.93	4.06	4.09	4.02	3.85	3.60	3.29	2.97	2.65	2.36	2.11	1.92	1.77	1.67	1.60	1.55		
							0.46	1.06	1.49	1.88	2.16	2.39	2.60	2.83	3.10	3.39	3.67	3.88	4.02	4.05	3.97	3.80	3.56	3.26	2.93	2.62	2.33	2.09	1.90	1.76	1.66	1.59	1.55		
						0.46	1.06	1.49	1.88	2.16	2.39	2.61	2.84	3.11	3.40	3.67	3.89	4.02	4.06	3.98	3.81	3.56	3.27	2.94	2.63	2.34	2.10	1.91	1.77	1.66	1.59	1.55			
	741.2	NRF156E	NRF15 6Ec				0.33	0.84	1.23	1.55	1.79	1.99	2.17	2.37	2.62	2.89	3.16	3.39	3.55	3.63	3.62	3.53	3.36	3.16	2.93	2.70	2.50	2.34	2.22	2.15	2.11	2.10	2.12		
							0.33	0.83	1.22	1.55	1.79	1.98	2.16	2.36	2.60	2.87	3.14	3.37	3.53	3.61	3.60	3.50	3.34	3.14	2.91	2.69	2.49	2.33	2.21	2.14	2.10	2.09	2.10		
							0.33	0.83	1.22	1.54	1.78	1.97	2.14	2.35	2.59	2.86	3.12	3.35	3.50	3.58	3.57	3.48	3.32	3.12	2.90	2.68	2.48	2.33	2.21	2.13	2.09	2.08	2.09		
							0.40	0.95	1.37	1.74	2.01	2.24	2.44	2.66	2.91	3.18	3.43	3.63	3.74	3.76	3.69	3.52	3.29	3.02	2.73	2.46	2.21	2.01	1.86	1.77	1.71	1.68	1.70		
							0.40	0.96	1.39	1.76	2.03	2.26	2.46	2.69	2.94	3.22	3.47	3.67	3.78	3.80	3.73	3.56	3.33	3.05	2.76	2.49	2.24	2.04	1.89	1.79	1.73	1.70	1.71		
							0.40	0.95	1.37	1.74	2.01	2.23	2.43	2.65	2.91	3.18	3.43	3.62	3.74	3.76	3.68	3.52	3.29	3.02	2.73	2.46	2.22	2.02	1.88	1.78	1.73	1.71	1.72		
							0.40	0.96	1.39	1.76	2.03	2.26	2.46	2.68	2.93	3.20	3.44	3.63	3.74	3.75	3.67	3.50	3.26	2.99	2.69	2.42	2.18	1.98	1.83	1.74	1.68	1.66	1.67		
							0.40	0.96	1.38	1.75	2.02	2.25	2.45	2.67	2.92	3.18	3.43	3.62	3.72	3.74	3.65	3.48	3.25	2.97	2.69	2.41	2.17	1.98	1.83	1.73	1.68	1.65	1.66		
						0.40	0.96	1.38	1.75	2.03	2.25	2.45	2.67	2.92	3.19	3.43	3.62	3.73	3.74	3.66	3.49	3.26	2.98	2.70	2.43	2.19	1.99	1.85	1.75	1.69	1.66				
	742.5	NRF156F	No Grain Size																																
	748.5	NRF157A	No Grain Size																																
	753	NRF158A	No Grain Size																																

22.91	26.30	30.20	34.67	39.81	45.71	52.48	60.26	69.18	79.43	91.20	104.71	120.23	138.04	158.49	181.97	208.93	239.88	275.42	316.23	363.08	416.87	478.63	549.54	630.96	724.44	831.76	954.99	1096.48
5.24	4.84	4.29	3.64	2.93	2.22	1.51	0.84	0.03	0.00	0.00	0.00																	
5.22	4.82	4.28	3.62	2.91	2.19	1.52	0.95	0.36	0.02	0.00	0.00																	
5.22	4.82	4.28	3.63	2.91	2.20	1.53	0.95	0.54	0.04	0.00	0.00																	
5.15	4.77	4.25	3.61	2.92	2.23	1.59	1.03	0.59	0.30	0.03	0.00																	
5.15	4.77	4.24	3.60	2.91	2.22	1.58	1.03	0.59	0.30	0.03	0.00																	
5.15	4.77	4.24	3.61	2.92	2.23	1.59	1.04	0.61	0.31	0.10	0.02																	
5.16	4.75	4.20	3.55	2.84	2.15	1.50	0.95	0.53	0.19	0.04	0.00																	
5.17	4.76	4.20	3.55	2.85	2.15	1.51	0.98	0.55	0.28	0.03	0.00																	
5.18	4.77	4.22	3.56	2.86	2.17	1.53	0.99	0.57	0.29	0.11	0.03																	
3.20	2.86	2.52	2.18	1.86	1.57	1.32	1.10	0.93	0.80	0.69	0.62	0.55	0.48	0.40	0.32	0.24	0.16	0.09	0.01	0.00	0.00	0.00						
3.18	2.82	2.46	2.10	1.77	1.49	1.26	1.09	0.97	0.90	0.84	0.78	0.71	0.60	0.46	0.32	0.18	0.08	0.00	0.00	0.00	0.00	0.00						
3.15	2.81	2.45	2.11	1.80	1.53	1.31	1.15	1.04	0.97	0.92	0.86	0.78	0.67	0.53	0.39	0.24	0.13	0.00	0.00	0.00	0.00	0.00						
3.07	2.82	2.56	2.30	2.04	1.79	1.55	1.33	1.15	1.00	0.88	0.80	0.73	0.67	0.61	0.54	0.45	0.35	0.26	0.18	0.11	0.08	0.02						
3.05	2.80	2.54	2.28	2.03	1.79	1.57	1.36	1.19	1.06	0.95	0.88	0.82	0.76	0.68	0.58	0.47	0.35	0.23	0.13	0.02	0.00	0.00						
3.06	2.81	2.55	2.28	2.02	1.77	1.54	1.34	1.18	1.06	0.97	0.90	0.84	0.78	0.69	0.59	0.47	0.34	0.23	0.13	0.02	0.00	0.00						
3.06	2.79	2.52	2.24	1.98	1.72	1.48	1.26	1.08	0.94	0.83	0.76	0.69	0.63	0.56	0.48	0.38	0.29	0.20	0.12	0.01	0.00	0.00						
3.03	2.76	2.49	2.21	1.95	1.70	1.47	1.27	1.11	0.99	0.91	0.84	0.79	0.72	0.64	0.54	0.42	0.31	0.20	0.11	0.01	0.00	0.00						
3.02	2.76	2.49	2.22	1.96	1.71	1.48	1.29	1.13	1.02	0.94	0.88	0.82	0.75	0.67	0.57	0.45	0.34	0.24	0.16	0.09	0.02	0.00						
1.84	1.81	1.78	1.74	1.70	1.65	1.61	1.58	1.58	1.60	1.65	1.69	1.72	1.70	1.62	1.47	1.25	1.00	0.73	0.48	0.27	0.09	0.02	0.00	0.00	0.00	0.00	0.00	0.00
1.84	1.82	1.80	1.76	1.72	1.67	1.63	1.60	1.60	1.61	1.65	1.69	1.70	1.68	1.59	1.44	1.23	0.98	0.72	0.48	0.28	0.10	0.02	0.00	0.00	0.00	0.00	0.00	0.00
1.83	1.81	1.78	1.75	1.71	1.67	1.64	1.63	1.64	1.67	1.72	1.76	1.77	1.72	1.61	1.44	1.21	0.96	0.69	0.45	0.25	0.09	0.02	0.00	0.00	0.00	0.00	0.00	0.00
1.54	1.51	1.50	1.48	1.46	1.45	1.45	1.46	1.49	1.55	1.63	1.70	1.75	1.75	1.68	1.53	1.31	1.05	0.77	0.52	0.30	0.16	0.08	0.05	0.07	0.10	0.14	0.13	
1.54	1.52	1.50	1.49	1.48	1.48	1.48	1.50	1.53	1.58	1.64	1.69	1.71	1.69	1.60	1.45	1.23	0.99	0.73	0.49	0.30	0.16	0.08	0.06	0.07	0.10	0.13	0.12	
1.56	1.53	1.52	1.51	1.50	1.49	1.49	1.51	1.53	1.58	1.64	1.69	1.71	1.69	1.61	1.46	1.25	1.00	0.74	0.50	0.30	0.14	0.03	0.00	0.00	0.00	0.00	0.00	0.00
1.52	1.50	1.49	1.48	1.46	1.45	1.44	1.45	1.48	1.53	1.60	1.66	1.70	1.70	1.63	1.51	1.32	1.09	0.85	0.61	0.39	0.23	0.11	0.03	0.00	0.00	0.00	0.00	0.00
1.52	1.50	1.48	1.46	1.44	1.43	1.42	1.43	1.47	1.53	1.61	1.68	1.74	1.74	1.68	1.55	1.35	1.12	0.86	0.61	0.40	0.24	0.15	0.10	0.10	0.11	0.13	0.12	
1.52	1.50	1.48	1.47	1.46	1.44	1.44	1.45	1.48	1.53	1.59	1.66	1.71	1.72	1.67	1.56	1.39	1.18	0.94	0.70	0.47	0.29	0.14	0.04	0.00	0.00	0.00	0.00	0.00
2.15	2.18	2.22	2.25	2.26	2.24	2.21	2.17	2.11	2.05	1.97	1.87	1.75	1.59	1.38	1.15	0.89	0.63	0.39	0.19	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.13	2.17	2.21	2.24	2.26	2.26	2.24	2.20	2.15	2.08	2.00	1.89	1.76	1.59	1.38	1.15	0.90	0.65	0.42	0.24	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.12	2.16	2.20	2.24	2.26	2.27	2.25	2.22	2.17	2.11	2.02	1.91	1.78	1.61	1.41	1.18	0.94	0.69	0.46	0.27	0.11	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.74	1.80	1.86	1.92	1.97	2.00	2.02	2.03	2.02	2.02	1.99	1.95	1.88	1.76	1.58	1.37	1.12	0.86	0.62	0.41	0.24	0.13	0.08	0.06	0.08	0.11	0.13	0.12	
1.75	1.80	1.86	1.92	1.97	2.01	2.04	2.05	2.06	2.05	2.03	1.98	1.89	1.76	1.57	1.35	1.09	0.82	0.57	0.36	0.18	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.75	1.80	1.86	1.91	1.95	1.99	2.01	2.02	2.02	2.03	2.02	1.99	1.93	1.83	1.67	1.46	1.20	0.94	0.67	0.44	0.25	0.10	0.02	0.00	0.00	0.00	0.00	0.00	0.00
1.71	1.77	1.84	1.91	1.97	2.02	2.05	2.07	2.08	2.07	2.06	2.02	1.95	1.84	1.67	1.45	1.20	0.93	0.67	0.43	0.25	0.10	0.02	0.00	0.00	0.00	0.00	0.00	0.00
1.70	1.75	1.82	1.89	1.96	2.00	2.04	2.05	2.06	2.05	2.04	2.01	1.95	1.84	1.69	1.49	1.25	1.00	0.74	0.51	0.31	0.15	0.04	0.00	0.00	0.00	0.00	0.00	0.00
1.71	1.77	1.84	1.91	1.98	2.03	2.06	2.07	2.07	2.06	2.04	2.00	1.93	1.81	1.65	1.45	1.21	0.95	0.70	0.48	0.29	0.14	0.03	0.00	0.00	0.00	0.00	0.00	0.00
2.59	2.18	1.81	1.50	1.26	1.08	0.95	0.85	0.77	0.69	0.61	0.52	0.43	0.33	0.25	0.16	0.08	0.00	0.00	0.00									
2.58	2.18	1.82	1.52	1.28	1.11	0.99	0.90	0.83	0.77	0.71	0.63	0.55	0.45	0.35	0.26	0.16	0.08	0.00	0.00									
2.56	2.16	1.80	1.50	1.27	1.10	0.99	0.92	0.87	0.83	0.79	0.74	0.67	0.59	0.49	0.38	0.27	0.17	0.09	0.01									
2.68	2.34	2.02	1.74	1.50	1.31	1.16	1.04	0.94																				

Depth (ft)	Sample No.	Sample Name	Result Between User Sizes (Sizes in um)																																	
			0.36	0.42	0.48	0.55	0.63	0.72	0.83	0.95	1.10	1.26	1.45	1.66	1.91	2.19	2.51	2.88	3.31	3.80	4.37	5.01	5.75	6.61	7.59	8.71	10.00	11.48	13.18	15.14	17.38	19.95				
	550.8	NRF159Ac				0.19	0.36	0.45	0.51	0.53	0.53	0.52	0.55	0.62	0.70	0.79	0.89	0.99	1.08	1.17	1.26	1.35	1.45	1.58	1.73	1.91	2.13	2.38	2.67	3.00	3.35					
				0.19	0.36	0.44	0.51	0.52	0.52	0.51	0.52	0.55	0.61	0.69	0.79	0.89	0.98	1.08	1.16	1.25	1.35	1.45	1.58	1.73	1.91	2.13	2.38	2.67	2.99	3.35						
				0.19	0.35	0.44	0.50	0.52	0.52	0.51	0.51	0.55	0.61	0.69	0.79	0.89	0.98	1.07	1.16	1.25	1.34	1.45	1.58	1.73	1.92	2.14	2.39	2.68	3.00	3.35						
				0.16	0.33	0.42	0.48	0.50	0.50	0.48	0.49	0.52	0.58	0.67	0.77	0.86	0.96	1.06	1.15	1.24	1.33	1.44	1.58	1.74	1.93	2.15	2.40	2.69	3.01	3.36						
				0.16	0.32	0.41	0.48	0.49	0.49	0.48	0.48	0.52	0.58	0.66	0.76	0.86	0.96	1.05	1.15	1.24	1.33	1.45	1.58	1.74	1.93	2.16	2.41	2.70	3.02	3.38						
				0.15	0.31	0.40	0.47	0.49	0.48	0.47	0.48	0.51	0.57	0.66	0.75	0.85	0.95	1.05	1.14	1.23	1.33	1.44	1.57	1.74	1.93	2.15	2.40	2.69	3.01	3.36						
				0.17	0.34	0.43	0.49	0.51	0.50	0.49	0.49	0.53	0.59	0.68	0.77	0.87	0.97	1.06	1.15	1.24	1.33	1.43	1.56	1.72	1.91	2.15	2.41	2.72	3.05	3.42						
				0.16	0.33	0.42	0.48	0.50	0.49	0.48	0.49	0.52	0.58	0.67	0.77	0.87	0.97	1.06	1.15	1.23	1.32	1.43	1.56	1.72	1.91	2.14	2.41	2.71	3.04	3.41						
						0.16	0.33	0.42	0.48	0.49	0.49	0.48	0.48	0.51	0.58	0.66	0.76	0.86	0.96	1.05	1.14	1.23	1.32	1.42	1.55	1.71	1.90	2.14	2.40	2.71	3.04	3.40				
	551.6	NRF159Bc				0.17	0.61	1.12	1.49	1.77	1.91	1.98	2.02	2.11	2.27	2.53	2.87	3.25	3.63	4.00	4.32	4.59	4.78	4.90	4.96	4.95	4.88	4.76	4.56	4.31	3.98	3.59	3.14			
				0.25	0.81	1.31	1.68	1.93	2.07	2.13	2.17	2.24	2.39	2.62	2.90	3.22	3.54	3.83	4.09	4.30	4.46	4.55	4.60	4.59	4.54	4.44	4.29	4.09	3.82	3.51	3.14					
				0.25	0.80	1.30	1.67	1.92	2.06	2.12	2.16	2.23	2.38	2.61	2.90	3.21	3.53	3.83	4.09	4.30	4.45	4.55	4.59	4.59	4.54	4.44	4.29	4.09	3.83	3.52	3.15					
				0.00	0.37	0.86	1.21	1.49	1.63	1.70	1.74	1.83	2.00	2.28	2.64	3.05	3.48	3.91	4.31	4.66	4.95	5.17	5.32	5.38	5.36	5.24	5.03	4.71	4.30	3.81	3.27					
				0.00	0.35	0.83	1.18	1.45	1.59	1.65	1.70	1.79	1.96	2.24	2.60	3.01	3.45	3.88	4.28	4.63	4.93	5.15	5.30	5.37	5.36	5.24	5.03	4.71	4.30	3.81	3.28					
				0.00	0.48	1.02	1.35	1.61	1.74	1.80	1.85	1.93	2.09	2.34	2.65	3.00	3.36	3.70	4.03	4.31	4.54	4.72	4.84	4.90	4.89	4.81	4.65	4.41	4.08	3.69	3.25					
				0.00	0.39	0.89	1.25	1.53	1.68	1.76	1.81	1.91	2.09	2.38	2.74	3.16	3.59	4.00	4.39	4.72	4.98	5.16	5.27	5.29	5.24	5.10	4.88	4.56	4.16	3.70	3.18					
				0.00	0.37	0.86	1.21	1.49	1.64	1.71	1.77	1.87	2.05	2.34	2.71	3.12	3.55	3.97	4.36	4.70	4.96	5.15	5.27	5.30	5.25	5.12	4.89	4.57	4.16	3.69	3.16					
				0.00	0.51	1.06	1.40	1.67	1.80	1.88	1.93	2.02	2.19	2.44	2.76	3.11	3.47	3.81	4.12	4.39	4.60	4.75	4.84	4.87	4.84	4.73	4.55	4.30	3.97	3.58	3.15					
				553.3	NRF159Cc				0.12	0.71	1.33	1.75	2.07	2.25	2.35	2.41	2.50	2.66	2.88	3.15	3.43	3.69	3.93	4.11	4.24	4.32	4.34	4.32	4.27	4.20	4.10	3.98	3.84	3.65	3.41	3.11
							0.05	0.52	1.09	1.53	1.88	2.08	2.19	2.26	2.36	2.54	2.80	3.12	3.46	3.79	4.08	4.32	4.49	4.60	4.64	4.64	4.60	4.52	4.42	4.28	4.10	3.85	3.55	3.17		
							0.05	0.50	1.07	1.50	1.84	2.04	2.15	2.22	2.32	2.50	2.75	3.07	3.41	3.73	4.03	4.27	4.45	4.56	4.61	4.61	4.58	4.53	4.44	4.33	4.16	3.93	3.63	3.25		
	0.18	0.69				1.30	1.76	2.11	2.31	2.42	2.48	2.58	2.74	3.00	3.30	3.63	3.94	4.21	4.41	4.55	4.61	4.61	4.56	4.48	4.36	4.23	4.06	3.86	3.61	3.31	2.95					
	0.17	0.67				1.27	1.72	2.07	2.27	2.38	2.44	2.54	2.71	2.96	3.27	3.60	3.91	4.18	4.38	4.52	4.59	4.59	4.54	4.46	4.35	4.22	4.06	3.87	3.63	3.33	2.98					
	0.16	0.66				1.26	1.71	2.05	2.25	2.36	2.42	2.52	2.69	2.94	3.25	3.58	3.89	4.16	4.38	4.52	4.59	4.59	4.55	4.47	4.36	4.23	4.07	3.88	3.64	3.35	3.00					
	0.14	0.62				1.19	1.61	1.95	2.14	2.24	2.30	2.39	2.54	2.77	3.05	3.34	3.61	3.85	4.05	4.20	4.31	4.39	4.59	4.45	4.48	4.49	4.48	4.41	4.28	4.07	3.79	3.41				
	0.13	0.59				1.14	1.55	1.88	2.06	2.15	2.21	2.29	2.44	2.66	2.92	3.20	3.45	3.68	3.87	4.02	4.14	4.23	4.32	4.40	4.46	4.50	4.50	4.43	4.27	4.01	3.65					
	0.12	0.57				1.11	1.51	1.82	2.00	2.09	2.14	2.22	2.36	2.57	2.83	3.09	3.34	3.56	3.74	3.89	4.00	4.11	4.21	4.31	4.41	4.49	4.53	4.51	4.40	4.18	3.86					
	555.2	NRF159Dc							0.10	0.62	1.25	1.73	2.09	2.30	2.40	2.46	2.55	2.71	2.97	3.28	3.61	3.91	4.17	4.35	4.46	4.48	4.45	4.37	4.27	4.17	4.08	3.97	3.85	3.69	3.46	3.16
							0.09	0.60	1.22	1.69	2.05	2.25	2.36	2.42	2.51	2.68	2.94	3.26	3.60	3.91	4.17	4.36	4.47	4.50	4.47	4.40	4.31	4.21	4.11	4.01	3.89	3.72	3.50	3.19		
							0.08	0.58	1.20	1.66	2.02	2.23	2.33	2.39	2.49	2.66	2.92	3.24	3.58	3.90	4.16	4.36	4.47	4.51	4.49	4.42	4.33	4.24	4.14	4.04	3.92	3.75	3.52	3.21		
				0.12	0.65	1.30	1.79	2.16	2.37	2.47	2.53	2.62	2.78	3.04	3.35	3.67	3.97	4.22	4.40	4.49	4.50	4.45	4.36	4.25	4.13	4.01	3.89	3.75	3.57	3.33	3.04					
				0.10	0.63	1.27	1.75	2.12	2.33	2.44	2.49	2.59	2.75	3.01	3.33	3.65	3.96	4.21	4.39	4.49	4.51	4.46	4.37	4.27	4.15	4.04	3.92	3.79	3.61	3.39	3.09					
				0.09	0.61	1.25	1.72	2.09	2.30	2.40	2.46	2.56	2.73	2.99	3.30	3.63	3.94	4.20	4.38	4.48	4.51	4.47	4.38	4.28	4.17	4.07	3.95	3.83	3.65	3.42	3.12					
				0.15	0.70	1.36	1.85	2.23	2.44	2.54	2.59	2.67	2.83	3.07	3.38	3.69	3.98	4.22	4.39	4.48	4.49	4.44	4.35	4.23	4.11	3.98	3.85	3.69	3.50	3.27	2.97					
				0.14	0.68	1.33	1.82	2.19	2.40	2.50	2.55	2.64	2.80	3.05	3.36	3.68	3.97	4.22	4.39	4.48	4.50	4.45	4.37	4.26	4.14	4.02	3.89	3.75	3.56	3.32	3.01					
				0.13	0.67	1.31	1.80	2.17	2.38	2.48	2.53	2.62	2.78	3.04	3.35	3.67	3.97	4.22	4.40	4.49	4.51	4.47	4.38	4.27	4.16	4.04	3.91	3.76	3.57	3.34	3.03					
				556.3	NRF159Ec				0.04	0.45	0.97	1.38	1.72	1.93	2.07	2.17	2.31	2.52	2.82	3.18	3.56	3.91	4.22	4.46	4.61	4.68	4.68	4.61	4.52	4.40	4.28	4.14	3.98	3.79	3.54	3.22
							0.04	0.45	0.97	1.38	1.71	1.92	2.05	2.15	2.29	2.51	2.81	3.17	3.55	3.90	4.21	4.45	4.60	4.67	4.66	4.60	4.50	4.39	4.27	4.13	3.98	3.78	3.53	3.22		
							0.04	0.51	1.11	1.57	1.93	2.15	2.28	2.37	2.50	2.71	3.01	3.36	3.73	4.07	4.36	4.56	4.68	4.71	4.66	4.56	4.43	4.28	4.13	3.97	3.78	3.57	3.30	2.98		
	0.00	0.49				1.14	1.61	1.99	2.21	2.33	2.41	2.54	2.75	3.06	3.42	3.80	4.14	4.43	4.62	4.73	4.74	4.69	4.59	4.46	4.31	4.16	3.99	3.79	3.55	3.27	2.93					
	0.00	0.47				1.09	1.56	1.93	2.14	2.26	2.35	2.48	2.70	3.01	3.38	3.76	4.11	4.40	4.61	4.72	4.75	4.70	4.61	4.49	4.35	4.21	4.04	3.84	3.60	3.31	2.97					
	0.00	0.45				1.06	1.51	1.87	2.09	2.21	2.30	2.43	2.66	2.97	3.35	3.73	4.09	4.39	4.60	4.72	4.75	4.72	4.63	4.51	4.38	4.23	4.07	3.87	3.63	3.34	3.00					
	0.04	0.55				1.19	1.67	2.05	2.27	2.39	2.48	2.60	2.80	3.09	3.44	3.80	4.13	4.40	4.59	4.69	4.71	4.65	4.54	4.42	4.28	4.13	3.98	3.79	3.56	3.28	2.93					
	0.03	0.53				1.15	1.62	2.00	2.22	2.34	2.43	2.55	2.76	3.05	3.41	3.77	4.11	4.39	4.59	4.70	4.72	4.67	4.57	4.45	4.32	4.18	4.02	3.84	3.60	3.31	2.95					
	0.03	0.51				1.13	1.60	1.97	2.18	2.31	2.40	2.52	2.73	3.03	3.38	3.75	4.10	4.38	4.59	4.70	4.73	4.69	4.60	4.48	4.35	4.21	4.05	3.86	3.62	3.32	2.96</					

22.91	26.30	30.20	34.67	39.81	45.71	52.48	60.26	69.18	79.43	91.20	104.71	120.23	138.04	158.49	181.97	208.93	239.88	275.42	316.23	363.08	416.87	478.63	549.54	630.96	724.44	831.76	954.99	1096.48
3.74	4.14	4.55	4.95	5.30	5.57	5.73	5.72	5.52	5.13	4.56	3.84	3.04	2.25	1.49	0.90	0.37												
3.73	4.14	4.55	4.95	5.31	5.59	5.74	5.74	5.54	5.14	4.56	3.84	3.04	2.24	1.49	0.90	0.37												
3.72	4.13	4.53	4.94	5.30	5.58	5.75	5.75	5.56	5.17	4.59	3.87	3.05	2.25	1.48	0.88	0.36												
3.74	4.14	4.55	4.96	5.33	5.62	5.79	5.80	5.61	5.22	4.63	3.90	3.09	2.26	1.52	0.85	0.20												
3.75	4.15	4.56	4.97	5.33	5.62	5.79	5.80	5.62	5.24	4.67	3.95	3.14	2.32	1.58	0.68	0.05												
3.73	4.13	4.53	4.93	5.29	5.57	5.74	5.75	5.58	5.21	4.65	3.94	3.13	2.33	1.56	0.95	0.41												
3.81	4.21	4.62	5.02	5.37	5.64	5.79	5.77	5.55	5.13	4.53	3.80	2.98	2.18	1.43	0.85	0.35												
3.80	4.21	4.63	5.03	5.38	5.66	5.81	5.79	5.57	5.16	4.55	3.81	2.99	2.18	1.43	0.85	0.35												
3.79	4.20	4.61	5.01	5.36	5.64	5.79	5.78	5.57	5.17	4.57	3.85	3.03	2.23	1.48	0.89	0.37												
2.67	2.18	1.72	1.29	0.93	0.63	0.41	0.26	0.15	0.09	0.06	0.04	0.04	0.03	0.03	0.02	0.00	0.00	0.00										
2.74	2.32	1.91	1.51	1.15	0.84	0.59	0.40	0.27	0.18	0.12	0.10	0.09	0.08	0.08	0.07	0.05	0.00	0.00										
2.74	2.31	1.89	1.48	1.12	0.82	0.58	0.40	0.28	0.20	0.16	0.14	0.13	0.13	0.11	0.09	0.06	0.00	0.00										
2.73	2.19	1.70	1.27	0.91	0.62	0.41	0.25	0.14	0.08	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00										
2.73	2.21	1.72	1.30	0.94	0.65	0.44	0.28	0.17	0.11	0.07	0.05	0.05	0.05	0.05	0.05	0.04	0.03	0.00										
2.79	2.33	1.90	1.50	1.16	0.88	0.66	0.49	0.38	0.30	0.26	0.23	0.22	0.21	0.19	0.16	0.13	0.10	0.07										
2.65	2.13	1.66	1.25	0.90	0.62	0.41	0.26	0.16	0.09	0.05	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00										
2.63	2.11	1.64	1.24	0.91	0.65	0.46	0.32	0.22	0.16	0.12	0.09	0.07	0.05	0.04	0.02	0.00	0.00	0.00										
2.70	2.25	1.83	1.46	1.14	0.88	0.67	0.52	0.41	0.33	0.27	0.22	0.18	0.15	0.11	0.08	0.05	0.00	0.00										
2.77	2.38	1.97	1.56	1.18	0.85	0.58	0.39	0.27	0.21	0.19	0.18	0.17	0.13	0.07	0.00													
2.74	2.28	1.81	1.36	0.97	0.65	0.41	0.25	0.16	0.11	0.09	0.09	0.07	0.05	0.02	0.00													
2.81	2.33	1.85	1.39	0.99	0.67	0.43	0.27	0.17	0.13	0.12	0.11	0.10	0.07	0.02	0.00													
2.55	2.12	1.69	1.27	0.90	0.59	0.35	0.18	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00													
2.59	2.16	1.73	1.31	0.94	0.62	0.38	0.21	0.10	0.05	0.03	0.03	0.04	0.05	0.05	0.03													
2.60	2.17	1.74	1.33	0.95	0.64	0.39	0.22	0.12	0.06	0.04	0.04	0.04	0.05	0.04	0.02													
2.98	2.49	2.00	1.51	1.08	0.70	0.41	0.21	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00													
3.22	2.72	2.21	1.70	1.23	0.82	0.51	0.28	0.12	0.05	0.00	0.00	0.00	0.00	0.00	0.00													
3.44	2.94	2.41	1.86	1.36	0.92	0.56	0.31	0.14	0.06	0.01	0.00	0.00	0.00	0.00	0.00													
2.80	2.38	1.93	1.48	1.06	0.70	0.42	0.22	0.09	0.01																			
2.82	2.39	1.93	1.47	1.05	0.69	0.41	0.22	0.09	0.04																			
2.84	2.41	1.95	1.49	1.06	0.70	0.41	0.22	0.09	0.01																			
2.68	2.28	1.86	1.44	1.05	0.71	0.44	0.23	0.09	0.01																			
2.73	2.32	1.89	1.45	1.05	0.70	0.42	0.22	0.08	0.01																			
2.76	2.34	1.90	1.47	1.06	0.71	0.43	0.23	0.09	0.01																			
2.62	2.23	1.82	1.40	1.02	0.69	0.42	0.22	0.09	0.01																			
2.65	2.24	1.82	1.39	1.01	0.68	0.41	0.22	0.09	0.01																			
2.67	2.26	1.83	1.41	1.01	0.67	0.40	0.21	0.08	0.01																			
2.86	2.44	2.00	1.57	1.16	0.81	0.51	0.29	0.13	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
2.85	2.43	1.99	1.56	1.15	0.80	0.51	0.30	0.15	0.07	0.04	0.03	0.04	0.06	0.06	0.06	0.04												
2.62	2.21	1.80	1.40	1.03	0.71	0.45	0.26	0.13	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00												
2.55	2.14	1.72	1.31	0.93	0.61	0.35	0.17	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
2.59	2.18	1.76	1.35	0.98	0.65	0.39	0.20	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
2.62	2.22	1.81	1.40	1.01	0.68	0.40	0.21	0.08	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
2.53	2.10	1.67	1.26	0.88	0.57	0.33	0.16	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
2.54	2.11	1.68	1.27	0.90	0.59	0.35	0.18	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
2.56	2.12	1.70	1.29	0.92	0.61	0.37	0.20	0.08	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
2.49	2.18	1.86	1.54	1.24	0.95	0.70	0.49	0.33	0.22	0.15	0.11	0.10	0.10	0.09	0.08	0.06	0.00											
2.76	2.43	2.08	1.73	1.38	1.06	0.78	0.54	0.36	0.24	0.16	0.13	0.12	0.12	0.13	0.12	0.11	0.09											
2.55	2.23	1.91	1.57	1.26	0.96	0.70	0.48	0.32	0.20	0.14	0.10	0.09	0.09	0.08	0.06	0.00	0.00											
2.38	2.07	1.74	1.43	1.13	0.86	0.63	0.44	0.29	0.19	0.12	0.09																	

Depth (ft)	Sample No.	Sample Name	Result Between User Sizes (Sizes in um)																													
			0.36	0.42	0.48	0.55	0.63	0.72	0.83	0.95	1.10	1.26	1.45	1.66	1.91	2.19	2.51	2.88	3.31	3.80	4.37	5.01	5.75	6.61	7.59	8.71	10.00	11.48	13.18	15.14	17.38	19.95
562	NRF1510A	NRF 15 10Ac			0.29	0.97	1.61	2.10	2.47	2.69	2.83	2.92	3.03	3.20	3.44	3.71	3.98	4.20	4.36	4.44	4.43	4.33	4.18	3.97	3.74	3.49	3.26	3.03	2.82	2.61	2.40	2.19
					0.27	0.95	1.57	2.06	2.42	2.64	2.78	2.87	2.98	3.16	3.40	3.67	3.94	4.16	4.32	4.41	4.40	4.31	4.16	3.95	3.73	3.49	3.26	3.03	2.82	2.61	2.40	2.19
					0.26	0.91	1.52	2.00	2.36	2.59	2.72	2.82	2.94	3.12	3.37	3.65	3.92	4.16	4.33	4.42	4.42	4.34	4.19	3.99	3.77	3.54	3.31	3.09	2.88	2.66	2.46	2.24
					0.22	0.90	1.54	2.05	2.43	2.67	2.81	2.92	3.04	3.23	3.49	3.78	4.06	4.30	4.48	4.57	4.58	4.50	4.35	4.15	3.92	3.68	3.44	3.20	2.97	2.74	2.51	2.26
					0.20	0.87	1.51	2.01	2.39	2.63	2.77	2.88	3.01	3.20	3.46	3.75	4.04	4.28	4.46	4.56	4.56	4.49	4.34	4.14	3.92	3.68	3.44	3.21	2.98	2.75	2.51	2.27
					0.19	0.86	1.49	1.99	2.36	2.60	2.75	2.85	2.98	3.18	3.44	3.73	4.02	4.26	4.44	4.54	4.55	4.48	4.33	4.14	3.91	3.68	3.44	3.21	2.98	2.75	2.51	2.27
					0.31	1.00	1.63	2.13	2.51	2.74	2.88	2.98	3.10	3.27	3.52	3.79	4.07	4.30	4.47	4.55	4.55	4.46	4.31	4.10	3.86	3.61	3.37	3.13	2.90	2.68	2.45	2.22
					0.30	0.97	1.59	2.09	2.46	2.69	2.83	2.93	3.05	3.23	3.47	3.75	4.02	4.25	4.42	4.51	4.51	4.43	4.27	4.07	3.84	3.59	3.35	3.11	2.89	2.66	2.43	2.20
					0.29	0.96	1.58	2.07	2.44	2.67	2.82	2.92	3.04	3.22	3.47	3.75	4.03	4.26	4.44	4.53	4.53	4.45	4.30	4.10	3.86	3.62	3.38	3.14	2.92	2.69	2.47	2.24
NRF1510B	NRF15 10Bc		0.00	0.55	1.17	1.59	1.94	2.15	2.30	2.43	2.59	2.83	3.16	3.53	3.91	4.27	4.57	4.79	4.92	4.95	4.90	4.78	4.60	4.38	4.12	3.82	3.51	3.16	2.81	2.46		
			0.00	0.51	1.11	1.51	1.86	2.07	2.23	2.36	2.54	2.79	3.13	3.52	3.92	4.29	4.61	4.85	5.00	5.05	5.01	4.90	4.73	4.52	4.27	3.98	3.66	3.32	2.97	2.60		
			0.00	0.49	1.08	1.49	1.83	2.04	2.20	2.33	2.51	2.77	3.11	3.51	3.91	4.29	4.61	4.86	5.01	5.06	5.03	4.93	4.76	4.55	4.30	4.01	3.70	3.36	3.00	2.62		
			0.19	0.84	1.45	1.93	2.29	2.53	2.68	2.79	2.94	3.16	3.46	3.79	4.13	4.44	4.68	4.84	4.90	4.86	4.74	4.54	4.29	3.99	3.68	3.34	3.00	2.64	2.30	1.96		
			0.18	0.82	1.44	1.91	2.28	2.51	2.66	2.78	2.93	3.15	3.45	3.79	4.13	4.44	4.68	4.84	4.91	4.87	4.75	4.56	4.30	4.01	3.69	3.35	3.00	2.65	2.30	1.95		
			0.18	0.78	1.42	1.87	2.24	2.47	2.62	2.74	2.89	3.12	3.41	3.75	4.10	4.40	4.65	4.81	4.88	4.85	4.73	4.54	4.29	4.00	3.69	3.35	3.01	2.66	2.31	1.96		
			0.26	0.93	1.55	2.04	2.40	2.64	2.79	2.90	3.04	3.25	3.53	3.86	4.18	4.47	4.70	4.84	4.88	4.83	4.69	4.48	4.22	3.91	3.59	3.25	2.91	2.56	2.22	1.89		
			0.24	0.90	1.51	1.99	2.36	2.59	2.74	2.86	3.00	3.21	3.50	3.83	4.15	4.44	4.67	4.81	4.86	4.81	4.68	4.47	4.21	3.91	3.59	3.25	2.91	2.56	2.22	1.89		
			0.24	0.89	1.50	1.98	2.34	2.58	2.72	2.84	2.98	3.20	3.48	3.81	4.13	4.42	4.64	4.79	4.83	4.78	4.65	4.44	4.18	3.88	3.56	3.23	2.89	2.54	2.20	1.87		
565.3	NRF1510C	NRF15 10Cc	0.13	0.80	1.53	2.05	2.48	2.75	2.93	3.06	3.22	3.44	3.73	4.05	4.36	4.63	4.82	4.93	4.93	4.84	4.66	4.42	4.14	3.83	3.51	3.18	2.85	2.52	2.20	1.89		
			0.10	0.76	1.48	2.00	2.42	2.69	2.87	3.01	3.17	3.40	3.70	4.03	4.35	4.63	4.84	4.96	4.97	4.89	4.72	4.49	4.21	3.90	3.59	3.25	2.92	2.58	2.25	1.94		
			0.09	0.74	1.46	1.97	2.39	2.66	2.84	2.97	3.14	3.37	3.67	4.01	4.34	4.63	4.84	4.96	4.98	4.91	4.75	4.52	4.25	3.94	3.62	3.29	2.95	2.61	2.28	1.96		
			0.15	0.85	1.61	2.15	2.59	2.86	3.04	3.17	3.33	3.55	3.85	4.17	4.49	4.75	4.93	5.01	4.99	4.87	4.67	4.40	4.10	3.77	3.43	3.09	2.74	2.39	2.04	1.70		
			0.13	0.82	1.56	2.09	2.52	2.80	2.98	3.11	3.28	3.50	3.80	4.13	4.45	4.72	4.91	5.00	4.99	4.87	4.67	4.41	4.11	3.78	3.45	3.11	2.77	2.43	2.08	1.74		
			0.12	0.79	1.53	2.05	2.48	2.75	2.93	3.07	3.23	3.46	3.76	4.10	4.42	4.70	4.89	4.98	4.97	4.86	4.67	4.41	4.11	3.78	3.46	3.12	2.78	2.44	2.10	1.76		
			0.15	0.84	1.61	2.14	2.59	2.87	3.05	3.19	3.35	3.57	3.87	4.20	4.53	4.80	4.99	5.09	5.08	4.96	4.75	4.48	4.16	3.83	3.49	3.13	2.79	2.43	2.07	1.72		
			0.13	0.83	1.58	2.12	2.56	2.84	3.02	3.15	3.31	3.54	3.84	4.17	4.49	4.77	4.96	5.06	5.05	4.93	4.73	4.45	4.14	3.80	3.46	3.12	2.77	2.42	2.07	1.72		
			0.12	0.80	1.55	2.08	2.51	2.79	2.97	3.11	3.28	3.51	3.81	4.14	4.47	4.75	4.94	5.04	5.03	4.92	4.72	4.46	4.15	3.82	3.48	3.14	2.80	2.44	2.09	1.74		
567.3	NRF1510D	NRF 15 10Dc	0.71	1.47	2.13	2.68	3.07	3.32	3.46	3.53	3.61	3.71	3.85	3.99	4.11	4.17	4.16	4.07	3.90	3.66	3.37	3.04	2.71	2.40	2.12	1.87	1.66	1.48	1.34	1.23		
			0.70	1.46	2.11	2.65	3.03	3.28	3.41	3.48	3.56	3.66	3.80	3.95	4.07	4.13	4.13	4.05	3.88	3.65	3.36	3.04	2.72	2.41	2.13	1.89	1.68	1.50	1.37	1.26		
			0.70	1.45	2.11	2.65	3.03	3.27	3.40	3.48	3.55	3.66	3.80	3.95	4.07	4.15	4.15	4.07	3.90	3.67	3.39	3.07	2.75	2.44	2.16	1.91	1.71	1.54	1.40	1.29		
			0.36	1.10	1.78	2.33	2.75	3.02	3.19	3.30	3.43	3.61	3.83	4.07	4.27	4.42	4.49	4.46	4.33	4.12	3.85	3.54	3.22	2.90	2.61	2.33	2.09	1.86	1.66	1.48		
			0.39	1.22	1.97	2.57	3.00	3.28	3.43	3.53	3.64	3.80	4.01	4.23	4.41	4.53	4.57	4.51	4.35	4.12	3.82	3.49	3.16	2.83	2.53	2.24	1.99	1.76	1.56	1.38		
			0.33	1.06	1.74	2.28	2.69	2.96	3.13	3.25	3.38	3.56	3.78	4.02	4.24	4.39	4.46	4.44	4.32	4.12	3.86	3.55	3.24	2.93	2.64	2.36	2.12	1.89	1.68	1.50		
			0.60	1.35	2.02	2.57	2.98	3.24	3.39	3.49	3.60	3.74	3.94	4.14	4.32	4.44	4.48	4.43	4.29	4.06	3.76	3.43	3.09	2.75	2.44	2.16	1.91	1.69	1.50	1.33		
			0.59	1.33	1.99	2.54	2.95	3.21	3.36	3.46	3.57	3.72	3.91	4.12	4.30	4.42	4.46	4.41	4.27	4.04	3.76	3.43	3.09	2.76	2.45	2.18	1.93	1.71	1.51	1.33		
			0.66	1.49	2.21	2.80	3.22	3.48	3.61	3.69	3.78	3.91	4.08	4.27	4.42	4.51	4.52	4.43	4.26	4.00	3.69	3.35	3.00	2.66	2.35	2.07	1.82	1.60	1.40	1.22		
568.8	NRF1510E	NRF 15 10Ec	0.07	0.60	1.18	1.59	1.93	2.16	2.33	2.48	2.65	2.86	3.11	3.35	3.54	3.67	3.70	3.62	3.46	3.21	2.91	2.58	2.26	1.96	1.70	1.49	1.33	1.20	1.12	1.06		
			0.00	0.57	1.13	1.52	1.86	2.08	2.25	2.40	2.57	2.77	3.02	3.25	3.45	3.57	3.60	3.53	3.37	3.13	2.84	2.52	2.21	1.92	1.67	1.47	1.31	1.19	1.10	1.04		
			0.05	0.56	1.11	1.51	1.84	2.06	2.23	2.38	2.55	2.77	3.01	3.25	3.45	3.57	3.60	3.54	3.38	3.14	2.85	2.53	2.22	1.93	1.68	1.48	1.32	1.20	1.12	1.06		
			0.00	0.50	1.10	1.52	1.88	2.12	2.30	2.46	2.64	2.87	3.14	3.39	3.60	3.74	3.77	3.69	3.52	3.26	2.94	2.60	2.27	1.97	1.71	1.49	1.33	1.20	1.12	1.07		
			0.00	0.48	1.07	1.48	1.83	2.07	2.26	2.42	2.60	2.83	3.10	3.36	3.57	3.70	3.73	3.65	3.48	3.22	2.92	2.58	2.26	1.96	1.71	1.51	1.35	1.23	1.14	1.08		
			0.00	0.47	1.06	1.48	1.84	2.08	2.27	2.43	2.62	2.86	3.13	3.39	3.61	3.74	3.77	3.70	3.52	3.27	2.96	2.62	2.30	2.00	1.75	1.54	1.38	1.26	1.17	1.11		

22.91	26.30	30.20	34.67	39.81	45.71	52.48	60.26	69.18	79.43	91.20	104.71	120.23	138.04	158.49	181.97	208.93	239.88	275.42	316.23	363.08	416.87	478.63	549.54	630.96	724.44	831.76	954.99	1096.48
1.97	1.74	1.51	1.29	1.07	0.87	0.70	0.54	0.42	0.33	0.26	0.22	0.20	0.18	0.17	0.16	0.14	0.13	0.12	0.12	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.14	
1.97	1.74	1.51	1.29	1.07	0.88	0.70	0.55	0.44	0.37	0.32	0.30	0.30	0.30	0.29	0.27	0.25	0.22	0.18	0.15	0.12	0.10	0.10	0.10	0.12	0.14	0.16	0.14	
2.01	1.78	1.55	1.33	1.12	0.93	0.77	0.64	0.54	0.47	0.43	0.41	0.39	0.37	0.34	0.29	0.23	0.18	0.13	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.02	1.76	1.51	1.27	1.04	0.82	0.63	0.47	0.34	0.26	0.20	0.18	0.17	0.17	0.16	0.14	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.01	1.76	1.50	1.26	1.03	0.82	0.64	0.49	0.38	0.30	0.26	0.24	0.23	0.22	0.20	0.17	0.13	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.02	1.76	1.51	1.26	1.03	0.82	0.64	0.50	0.39	0.32	0.28	0.26	0.25	0.24	0.22	0.20	0.16	0.12	0.08	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.98	1.73	1.48	1.23	0.99	0.78	0.59	0.44	0.33	0.26	0.22	0.21	0.20	0.19	0.17	0.14	0.11	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.96	1.71	1.46	1.22	0.99	0.79	0.62	0.48	0.38	0.33	0.30	0.29	0.29	0.29	0.27	0.24	0.20	0.15	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00	1.75	1.49	1.25	1.01	0.80	0.63	0.49	0.39	0.33	0.30	0.28	0.26	0.24	0.21	0.18	0.14	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.11	1.77	1.44	1.13	0.83	0.57	0.35	0.19	0.10	0.07	0.08	0.12	0.15	0.18	0.19	0.18	0.15	0.12	0.08	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.24	1.87	1.52	1.18	0.85	0.56	0.32	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.25	1.88	1.52	1.17	0.83	0.54	0.29	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.64	1.35	1.09	0.88	0.69	0.54	0.41	0.29	0.19	0.13	0.09	0.09	0.12	0.17	0.22	0.25	0.27	0.25	0.22	0.18	0.14	0.11	0.04	0.00	0.00	0.00	0.00	0.00	0.00
1.63	1.34	1.09	0.88	0.70	0.55	0.42	0.31	0.22	0.16	0.12	0.12	0.14	0.18	0.21	0.22	0.21	0.20	0.17	0.15	0.13	0.11	0.10	0.10	0.09	0.08	0.05	0.00	0.00
1.65	1.35	1.10	0.88	0.70	0.55	0.42	0.31	0.22	0.16	0.13	0.13	0.16	0.20	0.24	0.26	0.27	0.26	0.24	0.22	0.19	0.16	0.14	0.11	0.10	0.09	0.05	0.00	0.00
1.58	1.29	1.04	0.82	0.64	0.50	0.39	0.30	0.24	0.19	0.17	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.15	0.14	0.13	0.11	0.10	0.09	0.04	0.00	0.00	0.00	0.00
1.58	1.29	1.04	0.83	0.65	0.51	0.40	0.32	0.26	0.22	0.20	0.20	0.20	0.21	0.22	0.22	0.22	0.21	0.20	0.19	0.17	0.15	0.12	0.10	0.09	0.04	0.00	0.00	0.00
1.56	1.28	1.03	0.82	0.65	0.51	0.40	0.32	0.26	0.23	0.22	0.22	0.23	0.24	0.24	0.23	0.21	0.20	0.18	0.17	0.17	0.16	0.16	0.15	0.15	0.14	0.14	0.14	0.11
1.61	1.37	1.15	0.95	0.78	0.61	0.46	0.32	0.21	0.13	0.09	0.08	0.08	0.09	0.10	0.07	0.00	0.00											
1.65	1.40	1.18	0.98	0.80	0.63	0.47	0.33	0.21	0.12	0.09	0.02	0.00	0.00	0.00	0.00	0.00	0.00											
1.67	1.42	1.20	1.00	0.82	0.64	0.48	0.32	0.20	0.11	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
1.40	1.13	0.91	0.74	0.61	0.50	0.40	0.32	0.24	0.18	0.14	0.11	0.10	0.10	0.11	0.11	0.11	0.09											
1.44	1.16	0.94	0.76	0.61	0.49	0.39	0.32	0.26	0.22	0.20	0.19	0.19	0.18	0.17	0.14	0.10	0.00											
1.46	1.19	0.97	0.79	0.65	0.53	0.44	0.37	0.32	0.28	0.26	0.24	0.23	0.21	0.18	0.12	0.07	0.00											
1.40	1.12	0.88	0.70	0.56	0.45	0.36	0.29	0.22	0.15	0.11	0.03	0.00	0.00	0.00	0.00	0.00	0.00											
1.41	1.13	0.90	0.72	0.58	0.46	0.37	0.29	0.23	0.17	0.13	0.10	0.10	0.10	0.10	0.09	0.06	0.00											
1.42	1.14	0.91	0.73	0.59	0.48	0.39	0.31	0.25	0.20	0.17	0.15	0.14	0.14	0.13	0.11	0.07	0.00											
1.15	1.09	1.05	1.03	1.01	0.99	0.96	0.92	0.88	0.84	0.81	0.80	0.80	0.80	0.79	0.77	0.73	0.67	0.59	0.51	0.43	0.36	0.30	0.25	0.21	0.18	0.15	0.11	
1.18	1.12	1.09	1.07	1.05	1.03	1.00	0.95	0.90	0.84	0.80	0.76	0.75	0.75	0.75	0.75	0.74	0.70	0.65	0.58	0.50	0.41	0.34	0.27	0.22	0.18	0.15	0.11	
1.22	1.16	1.13	1.11	1.08	1.05	1.01	0.96	0.89	0.83	0.78	0.75	0.73	0.72	0.72	0.71	0.68	0.63	0.56	0.48	0.41	0.35	0.30	0.26	0.24	0.21	0.19	0.14	
1.33	1.21	1.12	1.05	0.98	0.91	0.83	0.75	0.66	0.59	0.54	0.52	0.53	0.56	0.58	0.59	0.56	0.49	0.39	0.29	0.20	0.13	0.10	0.10	0.12	0.14	0.16	0.13	
1.22	1.10	1.00	0.93	0.87	0.82	0.77	0.71	0.66	0.62	0.59	0.58	0.58	0.58	0.57	0.55	0.49	0.40	0.29	0.19	0.10	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.34	1.22	1.12	1.04	0.98	0.92	0.86	0.80	0.74	0.69	0.65	0.63	0.62	0.63	0.62	0.60	0.55	0.46	0.36	0.26	0.17	0.10	0.08	0.09	0.11	0.14	0.17	0.14	
1.19	1.06	0.96	0.88	0.82	0.77	0.72	0.68	0.64	0.62	0.60	0.60	0.60	0.60	0.59	0.57	0.52	0.45	0.37	0.30	0.23	0.18	0.16	0.15	0.15	0.15	0.15	0.12	
1.17	1.03	0.92	0.83	0.78	0.75	0.74	0.75	0.77	0.79	0.79	0.78	0.75	0.70	0.63	0.54	0.46	0.38	0.31	0.24	0.18	0.15	0.13	0.12	0.13	0.13	0.13	0.11	
1.07	0.93	0.83	0.75	0.70	0.67	0.67	0.68	0.70	0.71	0.71	0.69	0.65	0.59	0.52	0.44	0.37	0.31	0.26	0.22	0.18	0.15	0.13	0.13	0.12	0.12	0.12	0.09	
1.02	1.00	1.00	1.01	1.02	1.05	1.09	1.15	1.24	1.37	1.54	1.72	1.91	2.10	2.25	2.34	2.37	2.31	2.17	1.94	1.65	1.33	1.00	0.68	0.42	0.18	0.05		
1.00	0.97	0.96	0.96	0.97	1.00	1.05	1.12	1.23	1.38	1.56	1.76	1.97	2.18	2.36	2.49	2.55	2.52	2.39	2.16	1.85	1.50	1.13	0.78	0.49	0.22	0.07		
1.01	0.99	0.97	0.97	0.98	1.00	1.05	1.13	1.25	1.40	1.60	1.81	2.04	2.24	2.39	2.49	2.50	2.43	2.27	2.04	1.75	1.43	1.11	0.80	0.54	0.28	0.12		
1.05	1.05	1.07	1.09	1.11	1.13	1.15	1.19	1.26	1.37	1.52	1.71	1.91	2.11	2.29	2.40	2.42	2.35	2.16	1.90	1.56	1.20	0.85	0.55	0.28	0.11	0.00		
1.04	1.02	1.02	1.03	1.03	1.05	1.08	1.13	1.23	1.37	1.54	1.74	1.95	2.15	2.32	2.42	2.46	2.41	2.26	2.03	1.72	1.36	0.99	0.63	0.35	0.09	0.00		
1.08	1.06	1.05	1.05	1.05	1.05	1.07	1.13	1.23	1.38	1.58	1.81	2.05	2.25	2.40	2.46	2.42	2.29	2.06	1.78	1.45	1.11	0.80	0.53	0.32	0.16	0.06		
1.01	0.98	0.96	0.96	0.98	1.00	1.04	1.10	1.17	1.26	1.36	1.46	1.57	1.65	1.70	1.70	1.65	1.54	1.38	1.18	0.95	0.72	0.50	0.33	0.18	0.07	0.00		
0.99	0.95	0.93	0.93	0.94	0.96	1.00	1.05	1.13	1.22	1.33	1.45	1.58	1.68	1.76	1.80	1.77	1.69	1.55	1.35	1.13	0.89	0.67	0.47	0.31	0.18	0.09		
1.01	0.96	0.94	0.93	0.94	0.96	1.01	1.07	1.16	1.26	1.38	1.50	1.62	1.71	1.77	1.80	1.76	1.67	1.51	1.31	1.07	0.82	0.59	0.39	0.23	0.11	0.04		
2.68	3.02	3.40	3.77	4.10	4.34	4.46	4.45	4.31	4.05	3.71																		

Depth (ft)	Sample No.	Sample Name	Result Between User Sizes (Sizes in um)																																
			0.36	0.42	0.48	0.55	0.63	0.72	0.83	0.95	1.10	1.26	1.45	1.66	1.91	2.19	2.51	2.88	3.31	3.80	4.37	5.01	5.75	6.61	7.59	8.71	10.00	11.48	13.18	15.14	17.38	19.95			
	582	NRF1511B	NRF15 11Bc				0.05	0.11	0.17	0.20	0.23	0.25	0.27	0.30	0.34	0.39	0.45	0.51	0.56	0.60	0.63	0.66	0.67	0.68	0.69	0.69	0.71	0.74	0.77	0.82	0.88	0.95	1.03		
							0.00	0.10	0.16	0.20	0.23	0.25	0.27	0.30	0.34	0.39	0.44	0.50	0.55	0.59	0.63	0.65	0.66	0.67	0.68	0.69	0.70	0.73	0.77	0.81	0.87	0.94	1.01		
							0.00	0.10	0.16	0.21	0.23	0.25	0.27	0.30	0.34	0.40	0.45	0.51	0.56	0.61	0.64	0.66	0.68	0.69	0.69	0.70	0.72	0.75	0.78	0.83	0.89	0.96	1.04		
							0.06	0.13	0.20	0.25	0.28	0.30	0.33	0.36	0.41	0.47	0.54	0.60	0.66	0.71	0.75	0.78	0.79	0.80	0.81	0.82	0.84	0.88	0.93	0.99	1.06	1.14	1.23		
							0.06	0.13	0.20	0.24	0.27	0.30	0.32	0.36	0.40	0.46	0.53	0.60	0.66	0.71	0.74	0.77	0.79	0.80	0.81	0.82	0.84	0.87	0.92	0.98	1.05	1.13	1.21		
							0.06	0.13	0.21	0.25	0.28	0.31	0.33	0.37	0.41	0.48	0.54	0.61	0.67	0.73	0.77	0.79	0.81	0.82	0.83	0.84	0.86	0.90	0.95	1.01	1.08	1.17	1.25		
							0.00	0.09	0.16	0.20	0.22	0.24	0.26	0.29	0.33	0.38	0.43	0.49	0.54	0.58	0.61	0.64	0.65	0.67	0.68	0.69	0.71	0.73	0.77	0.82	0.88	0.95	1.02		
							0.00	0.09	0.15	0.19	0.22	0.24	0.26	0.29	0.32	0.37	0.43	0.48	0.53	0.58	0.61	0.63	0.65	0.66	0.67	0.68	0.70	0.73	0.77	0.81	0.87	0.94	1.01		
							0.00	0.09	0.15	0.19	0.21	0.23	0.25	0.28	0.32	0.37	0.42	0.48	0.53	0.57	0.60	0.63	0.65	0.66	0.67	0.68	0.70	0.72	0.76	0.81	0.87	0.93	1.01		
	NRF1511C	NRF15 11Cc				0.27	0.58	0.79	0.95	1.05	1.10	1.14	1.18	1.24	1.33	1.43	1.53	1.62	1.69	1.75	1.79	1.82	1.83	1.83	1.83	1.82	1.82	1.84	1.90	2.03	2.25	2.60			
						0.27	0.58	0.79	0.95	1.05	1.10	1.13	1.17	1.24	1.33	1.43	1.53	1.61	1.69	1.75	1.79	1.82	1.83	1.83	1.83	1.82	1.83	1.85	1.91	2.04	2.26	2.60			
						0.27	0.58	0.78	0.95	1.04	1.09	1.13	1.17	1.23	1.32	1.42	1.52	1.61	1.69	1.74	1.79	1.81	1.83	1.83	1.83	1.82	1.82	1.85	1.91	2.04	2.26	2.60			
						0.26	0.57	0.76	0.92	1.01	1.06	1.09	1.12	1.18	1.26	1.35	1.44	1.53	1.60	1.65	1.69	1.72	1.74	1.75	1.75	1.74	1.75	1.77	1.82	1.95	2.19	2.55			
						0.26	0.56	0.76	0.91	1.00	1.05	1.08	1.11	1.17	1.25	1.34	1.43	1.52	1.59	1.65	1.69	1.72	1.73	1.74	1.74	1.74	1.74	1.76	1.81	1.95	2.18	2.54			
						0.26	0.56	0.76	0.91	1.00	1.05	1.08	1.11	1.17	1.25	1.34	1.43	1.52	1.59	1.65	1.69	1.72	1.74	1.74	1.74	1.74	1.74	1.76	1.82	1.95	2.18	2.55			
						0.30	0.61	0.81	0.97	1.06	1.10	1.13	1.16	1.21	1.28	1.37	1.46	1.54	1.61	1.66	1.71	1.73	1.75	1.75	1.75	1.74	1.73	1.75	1.81	1.94	2.16	2.53			
						0.29	0.61	0.81	0.97	1.05	1.10	1.12	1.15	1.20	1.27	1.36	1.45	1.53	1.60	1.66	1.70	1.73	1.74	1.75	1.75	1.74	1.74	1.75	1.81	1.94	2.16	2.52			
						0.29	0.61	0.80	0.97	1.05	1.10	1.12	1.15	1.20	1.27	1.36	1.45	1.53	1.60	1.66	1.70	1.73	1.75	1.75	1.75	1.74	1.74	1.75	1.81	1.94	2.17	2.53			
	585.7 NRF1511D	NRF15 11Dc				0.42	0.96	1.35	1.67	1.90	2.07	2.21	2.38	2.58	2.81	3.04	3.25	3.40	3.49	3.51	3.48	3.41	3.32	3.22	3.13	3.07	3.03	3.02	3.03	3.05	3.05	3.03			
						0.41	0.95	1.33	1.66	1.88	2.05	2.19	2.35	2.55	2.78	3.01	3.21	3.36	3.45	3.48	3.45	3.38	3.29	3.19	3.11	3.05	3.01	3.00	3.01	3.02	3.03	3.01			
						0.41	0.94	1.32	1.64	1.86	2.02	2.16	2.32	2.52	2.75	2.98	3.18	3.32	3.41	3.44	3.41	3.34	3.25	3.16	3.07	3.01	2.98	2.98	2.99	3.01	3.01	2.95			
						0.37	0.89	1.28	1.59	1.81	1.97	2.11	2.27	2.48	2.72	2.96	3.17	3.34	3.44	3.48	3.46	3.40	3.31	3.22	3.14	3.08	3.05	3.05	3.07	3.11	3.14	3.15			
						0.37	0.89	1.27	1.59	1.80	1.96	2.10	2.26	2.47	2.71	2.95	3.16	3.33	3.43	3.47	3.45	3.39	3.30	3.21	3.13	3.07	3.05	3.05	3.07	3.10	3.14	3.15			
						0.37	0.89	1.28	1.59	1.81	1.97	2.11	2.27	2.47	2.71	2.96	3.17	3.34	3.44	3.48	3.46	3.40	3.32	3.23	3.15	3.09	3.07	3.07	3.09	3.12	3.16	3.17			
						0.40	0.93	1.32	1.64	1.87	2.03	2.18	2.35	2.55	2.79	3.03	3.24	3.40	3.50	3.53	3.51	3.44	3.35	3.25	3.16	3.10	3.07	3.07	3.10	3.13	3.15	3.15			
						0.39	0.91	1.29	1.61	1.83	2.00	2.14	2.30	2.51	2.74	2.98	3.18	3.34	3.44	3.47	3.45	3.38	3.30	3.20	3.12	3.06	3.04	3.04	3.06	3.08	3.09	3.08			
						0.39	0.91	1.29	1.61	1.83	2.00	2.14	2.30	2.51	2.74	2.98	3.18	3.34	3.44	3.47	3.45	3.39	3.30	3.20	3.12	3.07	3.04	3.05	3.07	3.10	3.11	3.10			
	586.8 NRF1511E	NRF15 11Ec			0.00	0.53	1.17	1.61	2.00	2.28	2.49	2.68	2.88	3.13	3.42	3.70	3.94	4.12	4.23	4.24	4.18	4.04	3.86	3.64	3.42	3.21	3.03	2.88	2.77	2.68	2.61	2.54			
					0.00	0.53	1.16	1.61	2.00	2.27	2.49	2.67	2.88	3.13	3.41	3.70	3.94	4.12	4.23	4.24	4.18	4.04	3.86	3.64	3.43	3.22	3.05	2.90	2.78	2.69	2.62	2.55			
					0.00	0.53	1.16	1.61	2.00	2.27	2.48	2.67	2.88	3.12	3.41	3.69	3.93	4.11	4.22	4.23	4.17	4.04	3.85	3.64	3.42	3.22	3.04	2.90	2.78	2.69	2.62	2.56			
					0.00	0.57	1.22	1.67	2.08	2.36	2.58	2.78	2.99	3.23	3.51	3.78	4.01	4.17	4.25	4.24	4.14	3.98	3.76	3.52	3.28	3.05	2.85	2.69	2.56	2.48	2.42	2.38			
					0.00	0.56	1.22	1.67	2.07	2.35	2.58	2.77	2.98	3.22	3.50	3.77	4.00	4.16	4.24	4.23	4.13	3.97	3.76	3.51	3.27	3.04	2.85	2.68	2.56	2.47	2.42	2.38			
					0.00	0.56	1.21	1.67	2.07	2.35	2.57	2.76	2.97	3.21	3.49	3.76	3.99	4.14	4.22	4.21	4.12	3.96	3.75	3.51	3.27	3.04	2.85	2.68	2.56	2.47	2.41	2.37			
					0.09	0.67	1.30	1.76	2.16	2.45	2.67	2.87	3.07	3.31	3.57	3.82	4.03	4.17	4.24	4.21	4.12	3.95	3.74	3.50	3.27	3.04	2.85	2.69	2.56	2.46	2.39	2.33			
					0.09	0.67	1.30	1.76	2.16	2.44	2.66	2.85	3.06	3.29	3.55	3.80	4.01	4.15	4.22	4.20	4.10	3.94	3.73	3.49	3.26	3.04	2.85	2.69	2.57	2.47	2.40	2.34			
					0.09	0.66	1.29	1.75	2.15	2.43	2.65	2.84	3.04	3.27	3.53	3.78	3.99	4.13	4.19	4.18	4.08	3.92	3.71	3.48	3.25	3.04	2.85	2.69	2.57	2.47	2.40	2.34			
	588.5 NRF1511F	NRF15 11Fc				0.19	0.43	0.59	0.72	0.80	0.85	0.89	0.95	1.03	1.13	1.24	1.34	1.44	1.52	1.58	1.61	1.64	1.66	1.67	1.69	1.72	1.76	1.80	1.84	1.88	1.92	1.97			
						0.19	0.43	0.58	0.71	0.79	0.84	0.89	0.94	1.02	1.12	1.24	1.34	1.44	1.52	1.58	1.62	1.64	1.66	1.68	1.70	1.73	1.76	1.81	1.85	1.89	1.93	1.98			
						0.19	0.42	0.58	0.71	0.79	0.84	0.89	0.94	1.02	1.12	1.24	1.35	1.44	1.52	1.58	1.62	1.65	1.67	1.69	1.71	1.74	1.77	1.82	1.86	1.91	1.95	2.00			
						0.19	0.43	0.59	0.72	0.80	0.86	0.90	0.96	1.03	1.14	1.25	1.36	1.46	1.54	1.59	1.63	1.65	1.66	1.67	1.68	1.70	1.73	1.77	1.80	1.84	1.88	1.92			
						0.19	0.43	0.59	0.72	0.80	0.85	0.90	0.95	1.03	1.13	1.25	1.36	1.46	1.54	1.60	1.63	1.66	1.67	1.68	1.69	1.71	1.74	1.78	1.82	1.85	1.89	1.93			
						0.19	0.42	0.58	0.71	0.79	0.84	0.88	0.94	1.02	1.12	1.24	1.35	1.45	1.53	1.58	1.62	1.64	1.66	1.67	1.68	1.70	1.74	1.77	1.81	1.85	1.89	1.93			
						0.21	0.46	0.63	0.77	0.86	0.92	0.97	1.03	1.11	1.22	1.34	1.45	1.55	1.62	1.67	1.70	1.72	1.72	1.72	1.73	1.74	1.76	1.79	1.82	1.85	1.87	1.91			
						0.21	0.46	0.64	0.78	0.86	0.92	0.97	1.03	1.12	1.23	1.35	1.46	1.56	1.64	1.69	1.72	1.74	1.74	1.74	1.75	1.76	1.78	1.81	1.84	1.87	1.90	1.93			
						0.20	0.45	0.62	0.76	0.84	0.90	0.95	1.01	1.09	1.20	1.32	1.43	1.53	1.60	1.65	1.69	1.70	1.70	1.71	1.71	1.71	1.73	1.75	1.78	1.81	1.85	1.87	1.91		
562.4+563	USGS142 8A	No Grain Size																																	

22.91	26.30	30.20	34.67	39.81	45.71	52.48	60.26	69.18	79.43	91.20	104.71	120.23	138.04	158.49	181.97	208.93	239.88	275.42	316.23	363.08	416.87	478.63	549.54	630.96	724.44	831.76	954.99	1096.48
1.10	1.16	1.20	1.20	1.16	1.08	0.97	0.85	0.75	0.72	0.82	1.08	1.56	2.25	3.15	4.19	5.30	6.32	7.14	7.61	7.66	7.25	6.44	5.33	4.12	2.95	1.71	0.59	
1.08	1.14	1.18	1.18	1.14	1.06	0.95	0.83	0.73	0.71	0.81	1.09	1.57	2.28	3.20	4.25	5.37	6.40	7.22	7.68	7.71	7.29	6.46	5.33	4.10	2.92	1.66	0.53	
1.10	1.16	1.20	1.20	1.16	1.08	0.97	0.86	0.77	0.75	0.85	1.12	1.59	2.28	3.19	4.23	5.34	6.36	7.18	7.65	7.69	7.28	6.46	5.34	4.08	2.83	1.51	0.35	
1.30	1.35	1.37	1.36	1.30	1.20	1.09	0.97	0.91	0.93	1.08	1.40	1.92	2.63	3.50	4.44	5.40	6.23	6.84	7.12	7.01	6.50	5.65	4.59	3.39	2.32	0.97	0.10	
1.28	1.33	1.36	1.34	1.29	1.20	1.09	0.98	0.92	0.94	1.09	1.40	1.92	2.62	3.50	4.47	5.46	6.33	6.97	7.26	7.14	6.60	5.70	4.57	3.32	2.20	0.77	0.00	
1.32	1.37	1.39	1.38	1.32	1.23	1.11	1.01	0.94	0.96	1.11	1.43	1.95	2.65	3.51	4.45	5.40	6.23	6.83	7.10	6.97	6.45	5.59	4.50	3.29	2.23	0.81	0.00	
1.09	1.15	1.19	1.19	1.15	1.08	0.98	0.88	0.82	0.85	1.02	1.37	1.95	2.73	3.70	4.76	5.83	6.76	7.43	7.73	7.58	7.00	6.04	4.86	3.55	2.42	0.88	0.00	
1.08	1.14	1.17	1.17	1.14	1.06	0.97	0.87	0.81	0.85	1.02	1.37	1.94	2.70	3.66	4.70	5.76	6.68	7.35	7.66	7.54	7.00	6.09	4.93	3.68	2.47	1.18	0.09	
1.07	1.13	1.17	1.17	1.13	1.06	0.96	0.86	0.80	0.83	1.01	1.37	1.96	2.76	3.74	4.82	5.90	6.83	7.50	7.78	7.63	7.03	6.06	4.86	3.54	2.39	0.86	0.00	
3.07	3.66	4.33	5.00	5.57	5.94	6.04	5.83	5.31	4.55	3.64	2.71	1.80	1.16	0.39	0.00													
3.08	3.67	4.33	4.99	5.55	5.92	6.01	5.79	5.26	4.50	3.60	2.67	1.80	1.08	0.55	0.17													
3.07	3.66	4.33	4.99	5.56	5.93	6.04	5.83	5.31	4.56	3.65	2.73	1.82	1.18	0.40	0.00													
3.06	3.70	4.41	5.13	5.74	6.15	6.26	6.04	5.50	4.72	3.77	2.81	1.88	1.21	0.41	0.00													
3.05	3.69	4.41	5.13	5.74	6.14	6.25	6.03	5.49	4.70	3.76	2.79	1.89	1.14	0.58	0.17													
3.05	3.69	4.41	5.13	5.74	6.14	6.25	6.04	5.50	4.71	3.77	2.80	1.89	1.13	0.56	0.15													
3.02	3.65	4.35	5.05	5.65	6.05	6.17	5.96	5.44	4.68	3.75	2.80	1.90	1.15	0.59	0.18													
3.01	3.63	4.33	5.04	5.65	6.06	6.19	6.00	5.49	4.72	3.79	2.82	1.91	1.14	0.57	0.16													
3.02	3.64	4.34	5.04	5.65	6.05	6.17	5.97	5.46	4.69	3.77	2.81	1.91	1.16	0.60	0.18													
2.98	2.89	2.75	2.56	2.31	2.03	1.72	1.41	1.14	0.91	0.74	0.64	0.59	0.58	0.59	0.59	0.57	0.53	0.46	0.38	0.29	0.21	0.14	0.09	0.03	0.00	0.00	0.00	
2.96	2.87	2.73	2.55	2.31	2.04	1.74	1.45	1.17	0.94	0.76	0.64	0.58	0.55	0.53	0.53	0.51	0.49	0.46	0.41	0.36	0.31	0.26	0.20	0.16	0.11	0.08	0.05	
2.94	2.84	2.69	2.50	2.27	2.00	1.72	1.44	1.19	0.98	0.83	0.72	0.66	0.63	0.62	0.61	0.60	0.57	0.53	0.49	0.43	0.37	0.30	0.23	0.17	0.12	0.06	0.00	
3.13	3.05	2.90	2.68	2.40	2.07	1.72	1.38	1.07	0.82	0.64	0.53	0.48	0.48	0.51	0.54	0.56	0.57	0.55	0.52	0.46	0.37	0.28	0.18	0.07	0.00	0.00	0.00	
3.12	3.03	2.88	2.66	2.39	2.07	1.74	1.41	1.13	0.89	0.71	0.60	0.53	0.51	0.50	0.50	0.50	0.49	0.47	0.45	0.41	0.36	0.30	0.23	0.15	0.10	0.04	0.00	
3.14	3.05	2.91	2.69	2.41	2.10	1.76	1.44	1.15	0.91	0.73	0.61	0.54	0.52	0.52	0.52	0.52	0.50	0.46	0.41	0.34	0.26	0.19	0.11	0.04	0.00	0.00	0.00	
3.10	3.01	2.85	2.63	2.35	2.02	1.68	1.36	1.06	0.82	0.65	0.54	0.49	0.48	0.49	0.51	0.53	0.53	0.50	0.44	0.35	0.25	0.09	0.02	0.00	0.00	0.00	0.00	
3.03	2.93	2.77	2.56	2.30	2.00	1.69	1.40	1.13	0.92	0.75	0.64	0.58	0.56	0.55	0.56	0.57	0.58	0.57	0.54	0.48	0.39	0.29	0.14	0.04	0.00	0.00	0.00	
3.04	2.93	2.77	2.54	2.27	1.97	1.66	1.37	1.12	0.92	0.77	0.67	0.62	0.60	0.60	0.61	0.61	0.60	0.57	0.52	0.45	0.35	0.22	0.07	0.00	0.00	0.00	0.00	
2.48	2.39	2.29	2.14	1.96	1.73	1.47	1.20	0.93	0.69	0.48	0.33	0.22	0.15	0.11	0.08	0.05												
2.48	2.38	2.27	2.12	1.93	1.70	1.45	1.19	0.93	0.70	0.51	0.36	0.25	0.18	0.12	0.07	0.00												
2.49	2.41	2.29	2.15	1.96	1.73	1.47	1.19	0.93	0.69	0.49	0.34	0.23	0.16	0.11	0.08	0.05												
2.35	2.32	2.26	2.16	2.02	1.83	1.60	1.35	1.08	0.83	0.61	0.42	0.28	0.19	0.11	0.06	0.00												
2.35	2.32	2.25	2.16	2.01	1.83	1.60	1.34	1.07	0.83	0.61	0.44	0.30	0.21	0.15	0.11	0.07												
2.34	2.31	2.25	2.16	2.02	1.84	1.62	1.37	1.11	0.86	0.65	0.47	0.33	0.22	0.15	0.10	0.06												
2.29	2.24	2.17	2.07	1.92	1.74	1.53	1.28	1.03	0.79	0.58	0.41	0.28	0.19	0.12	0.07	0.00												
2.29	2.24	2.16	2.06	1.92	1.74	1.53	1.29	1.04	0.81	0.60	0.43	0.30	0.21	0.15	0.10	0.06												
2.30	2.24	2.17	2.07	1.93	1.76	1.55	1.31	1.07	0.85	0.64	0.47	0.33	0.24	0.15	0.10	0.05												
2.03	2.12	2.25	2.44	2.69	2.98	3.29	3.61	3.90	4.12	4.25	4.26	4.14	3.91	3.58	3.17	2.72	2.26	1.81	1.41	1.05	0.76	0.54	0.36	0.24	0.15	0.09	0.04	
2.04	2.14	2.27	2.46	2.70	2.99	3.30	3.62	3.91	4.14	4.27	4.29	4.19	3.96	3.62	3.20	2.72	2.23	1.75	1.33	0.96	0.68	0.46	0.32	0.22	0.15	0.11	0.07	
2.07	2.16	2.29	2.48	2.71	2.99	3.29	3.59	3.87	4.09	4.22	4.24	4.14	3.93	3.61	3.21	2.76	2.29	1.83	1.41	1.04	0.73	0.49	0.31	0.17	0.07	0.00	0.00	
1.98	2.06	2.19	2.36	2.58	2.85	3.14	3.44	3.71	3.94	4.10	4.16	4.12	3.97	3.71	3.36	2.94	2.47	1.99	1.53	1.12	0.79	0.54	0.38	0.28	0.22	0.19	0.15	
1.99	2.07	2.20	2.38	2.61	2.88	3.18	3.47	3.75	3.97	4.11	4.15	4.09	3.94	3.68	3.35	2.95	2.52	2.05	1.60	1.18	0.83	0.55	0.34	0.19	0.10	0.04	0.00	
1.98	2.06	2.18	2.36	2.58	2.86	3.16	3.47	3.76	4.00	4.16	4.23	4.19	4.03	3.76	3.40	2.95	2.47	1.96	1.48	1.05	0.72	0.48	0.33	0.25	0.21	0.20	0.17	
1.95	2.03	2.15	2.32	2.54	2.81	3.11	3.41	3.69	3.91	4.05	4.10	4.03	3.86	3.59	3.25	2.85	2.42	1.98	1.56	1.18	0.84	0.57	0.36	0.20	0.08	0.00	0.00	
1.98	2.06	2.18	2.35	2.58	2.85	3.16	3.47	3.76	3.98	4.13	4.17	4.08	3.89	3.58	3.20	2.76	2.30	1.84	1.42	1.04	0.72	0.47	0.29	0.16	0.07	0.00	0.00	
1.95	2.02	2.13	2.29	2.52	2.79	3.10	3.41	3.71	3.95	4.10	4.14	4.06	3.86	3.55	3.17	2.72	2.27	1.83	1.43	1.08	0.81	0.62	0.49	0.40	0.35	0.30	0.22	

Depth (ft)	Sample No.	Sample Name	Result Between User Sizes (Sizes in um)																															
			0.36	0.42	0.48	0.55	0.63	0.72	0.83	0.95	1.10	1.26	1.45	1.66	1.91	2.19	2.51	2.88	3.31	3.80	4.37	5.01	5.75	6.61	7.59	8.71	10.00	11.48	13.18	15.14	17.38	19.95		
569	USGS142 56c	USGS 142 569c						0.07	0.11	0.14	0.16	0.17	0.18	0.21	0.24	0.28	0.33	0.38	0.42	0.46	0.48	0.49	0.49	0.48	0.46	0.45	0.46	0.49	0.55	0.65	0.76	0.87	0.96	
								0.07	0.11	0.14	0.16	0.17	0.18	0.21	0.24	0.28	0.33	0.38	0.42	0.46	0.48	0.49	0.49	0.48	0.46	0.45	0.46	0.49	0.56	0.65	0.76	0.87	0.96	
								0.07	0.11	0.14	0.15	0.17	0.18	0.20	0.24	0.28	0.33	0.38	0.42	0.46	0.48	0.49	0.49	0.48	0.46	0.45	0.46	0.49	0.55	0.64	0.76	0.87	0.95	
								0.00	0.04	0.07	0.08	0.09	0.10	0.11	0.13	0.16	0.19	0.23	0.26	0.29	0.31	0.31	0.31	0.31	0.30	0.29	0.28	0.28	0.31	0.36	0.44	0.54	0.64	0.72
								0.06	0.10	0.13	0.14	0.15	0.17	0.19	0.22	0.25	0.30	0.35	0.39	0.42	0.45	0.46	0.46	0.45	0.43	0.42	0.42	0.45	0.51	0.59	0.70	0.81	0.90	
								0.06	0.11	0.14	0.15	0.16	0.18	0.20	0.23	0.27	0.32	0.37	0.41	0.45	0.47	0.49	0.49	0.48	0.46	0.45	0.45	0.48	0.53	0.62	0.73	0.84	0.94	
								0.07	0.12	0.15	0.17	0.18	0.20	0.22	0.25	0.30	0.35	0.40	0.45	0.49	0.52	0.53	0.53	0.53	0.52	0.51	0.50	0.51	0.54	0.60	0.70	0.81	0.93	1.02
								0.07	0.12	0.15	0.17	0.18	0.20	0.22	0.25	0.30	0.35	0.40	0.45	0.49	0.52	0.53	0.53	0.52	0.51	0.50	0.51	0.54	0.61	0.70	0.81	0.93	1.02	
								0.07	0.12	0.15	0.17	0.18	0.20	0.22	0.25	0.30	0.35	0.40	0.45	0.49	0.52	0.54	0.54	0.53	0.52	0.51	0.52	0.55	0.61	0.70	0.82	0.93	1.02	
670.9	USGS1424A	No Grain Size																																
671.5	USGS1424B	No Grain Size																																
672.2	USGS1424D	No Grain Size																																
738.7	USGS1425A	No Grain Size																																
739.5	USGS1425B	No Grain Size																																
740.3	USGS1425C	No Grain Size																																
740.7	USGS1425D	USGS 142 5Dc						0.05	0.09	0.10	0.11	0.12	0.14	0.16	0.18	0.21	0.24	0.27	0.30	0.32	0.34	0.36	0.38	0.40	0.42	0.44	0.46	0.48	0.51	0.53	0.56	0.59		
								0.04	0.08	0.10	0.11	0.12	0.13	0.15	0.18	0.21	0.23	0.26	0.29	0.31	0.33	0.35	0.37	0.39	0.41	0.43	0.45	0.47	0.49	0.51	0.54	0.56		
								0.04	0.08	0.10	0.11	0.12	0.13	0.15	0.18	0.21	0.23	0.26	0.29	0.31	0.33	0.35	0.37	0.39	0.41	0.42	0.44	0.47	0.49	0.52	0.54	0.56		
								0.04	0.08	0.09	0.10	0.12	0.13	0.15	0.17	0.20	0.23	0.26	0.28	0.31	0.33	0.35	0.37	0.39	0.40	0.42	0.44	0.46	0.48	0.50	0.52	0.55		
								0.04	0.08	0.10	0.11	0.12	0.13	0.15	0.18	0.20	0.23	0.26	0.29	0.31	0.34	0.36	0.38	0.39	0.41	0.43	0.45	0.47	0.49	0.51	0.53	0.56		
								0.04	0.08	0.09	0.10	0.11	0.13	0.15	0.17	0.20	0.22	0.25	0.28	0.30	0.32	0.34	0.36	0.38	0.39	0.41	0.43	0.45	0.47	0.49	0.51	0.53		
								0.05	0.09	0.10	0.11	0.12	0.14	0.16	0.18	0.21	0.24	0.27	0.30	0.32	0.35	0.37	0.39	0.40	0.42	0.43	0.45	0.47	0.49	0.51	0.54	0.56		
								0.05	0.09	0.10	0.11	0.13	0.14	0.16	0.19	0.22	0.25	0.27	0.30	0.33	0.35	0.37	0.39	0.41	0.42	0.44	0.46	0.48	0.50	0.52	0.54	0.57		
								0.05	0.09	0.10	0.11	0.13	0.14	0.16	0.19	0.22	0.24	0.27	0.30	0.33	0.35	0.37	0.39	0.41	0.42	0.44	0.46	0.48	0.50	0.52	0.54	0.56		
745	USGS1425E	USGS 142 5Ec						0.09	0.16	0.23	0.27	0.29	0.30	0.31	0.33	0.36	0.41	0.48	0.54	0.61	0.68	0.74	0.79	0.84	0.89	0.92	0.96	0.99	1.02	1.04	1.05	1.06	1.05	1.04
								0.08	0.15	0.22	0.25	0.28	0.29	0.30	0.31	0.35	0.39	0.45	0.52	0.58	0.65	0.71	0.76	0.81	0.85	0.89	0.93	0.96	0.99	1.01	1.02	1.03	1.02	1.00
								0.08	0.16	0.23	0.26	0.28	0.29	0.30	0.32	0.35	0.40	0.47	0.53	0.60	0.67	0.73	0.79	0.84	0.88	0.93	0.96	1.00	1.03	1.05	1.07	1.07	1.06	1.04
								0.09	0.17	0.24	0.28	0.31	0.32	0.33	0.35	0.39	0.44	0.51	0.58	0.66	0.73	0.80	0.86	0.92	0.97	1.01	1.05	1.08	1.10	1.12	1.13	1.12	1.11	1.09
								0.08	0.15	0.22	0.26	0.29	0.30	0.31	0.33	0.36	0.41	0.48	0.55	0.62	0.69	0.75	0.81	0.87	0.91	0.95	0.99	1.02	1.05	1.06	1.07	1.07	1.06	1.03
								0.08	0.15	0.22	0.26	0.29	0.30	0.31	0.33	0.36	0.41	0.48	0.55	0.62	0.69	0.76	0.82	0.87	0.92	0.96	1.00	1.03	1.06	1.08	1.09	1.08	1.07	1.05
								0.05	0.11	0.15	0.19	0.20	0.21	0.22	0.24	0.27	0.31	0.35	0.40	0.45	0.51	0.55	0.60	0.64	0.68	0.72	0.76	0.80	0.83	0.86	0.89	0.90	0.90	0.89
								0.00	0.09	0.14	0.18	0.19	0.21	0.22	0.23	0.26	0.30	0.34	0.39	0.44	0.49	0.54	0.58	0.62	0.66	0.70	0.74	0.78	0.81	0.84	0.87	0.88	0.88	0.86
								0.00	0.09	0.15	0.18	0.20	0.21	0.22	0.24	0.26	0.30	0.35	0.40	0.45	0.50	0.54	0.59	0.63	0.68	0.72	0.76	0.80	0.83	0.86	0.88	0.90	0.90	0.89
758.5	USGS1425F	USGS142 5Fc						0.11	0.22	0.32	0.37	0.40	0.41	0.41	0.43	0.47	0.54	0.61	0.70	0.78	0.87	0.94	1.02	1.09	1.15	1.23	1.30	1.38	1.47	1.57	1.68	1.82	2.00	2.24
								0.11	0.22	0.32	0.37	0.40	0.41	0.42	0.43	0.48	0.54	0.62	0.70	0.79	0.87	0.95	1.02	1.09	1.16	1.23	1.31	1.39	1.48	1.57	1.69	1.83	2.01	2.26
								0.11	0.22	0.32	0.37	0.40	0.41	0.42	0.44	0.48	0.54	0.62	0.71	0.79	0.88	0.95	1.03	1.10	1.17	1.24	1.32	1.40	1.48	1.58	1.69	1.83	2.02	2.26
								0.12	0.25	0.37	0.43	0.46	0.47	0.47	0.49	0.53	0.60	0.69	0.79	0.90	1.00	1.10	1.20	1.29	1.38	1.47	1.55	1.65	1.75	1.87	2.02	2.22	2.49	2.85
								0.12	0.25	0.37	0.42	0.46	0.46	0.47	0.49	0.53	0.60	0.69	0.79	0.90	1.00	1.10	1.19	1.29	1.37	1.46	1.55	1.64	1.74	1.86	2.01	2.21	2.47	2.83
								0.12	0.25	0.37	0.43	0.46	0.47	0.47	0.49	0.53	0.61	0.70	0.80	0.90	1.01	1.11	1.20	1.29	1.38	1.47	1.55	1.65	1.75	1.87	2.01	2.21	2.48	2.83
								0.13	0.26	0.39	0.45	0.49	0.50	0.52	0.54	0.60																		

22.91	26.30	30.20	34.67	39.81	45.71	52.48	60.26	69.18	79.43	91.20	104.71	120.23	138.04	158.49	181.97	208.93	239.88	275.42	316.23	363.08	416.87	478.63	549.54	630.96	724.44	831.76	954.99	1096.48
0.99	0.94	0.82	0.66	0.54	0.55	0.82	1.44	2.49	3.91	5.61	7.32	8.82	9.79	10.09	9.62	8.47	6.85	5.00	3.18	1.29	0.08							
0.99	0.94	0.82	0.67	0.54	0.56	0.83	1.46	2.50	3.93	5.63	7.35	8.84	9.81	10.10	9.62	8.45	6.83	4.96	3.13	1.22	0.07							
0.98	0.94	0.82	0.66	0.54	0.55	0.81	1.44	2.48	3.91	5.60	7.32	8.81	9.79	10.09	9.64	8.49	6.87	5.01	3.19	1.30	0.08							
0.74	0.69	0.56	0.40	0.26	0.26	0.50	1.11	2.15	3.61	5.39	7.25	8.96	10.18	10.73	10.49	9.47	7.90	5.99	4.06	2.28	0.20							
0.94	0.91	0.81	0.66	0.52	0.50	0.72	1.27	2.23	3.59	5.24	6.98	8.55	9.66	10.13	9.85	8.85	7.33	5.51	3.69	1.96	0.16							
0.98	0.96	0.86	0.71	0.58	0.56	0.76	1.31	2.25	3.59	5.22	6.93	8.47	9.56	10.01	9.72	8.72	7.22	5.42	3.62	1.91	0.16							
1.06	1.02	0.92	0.76	0.63	0.63	0.86	1.43	2.41	3.76	5.39	7.05	8.53	9.52	9.85	9.46	8.38	6.84	5.05	3.27	1.49	0.11							
1.06	1.02	0.92	0.77	0.65	0.64	0.87	1.43	2.39	3.72	5.33	6.98	8.45	9.45	9.81	9.45	8.41	6.89	5.11	3.35	1.61	0.12							
1.06	1.03	0.92	0.77	0.65	0.64	0.87	1.44	2.42	3.76	5.37	7.02	8.49	9.47	9.81	9.43	8.36	6.84	5.05	3.29	1.52	0.11							
0.61	0.63	0.64	0.66	0.67	0.70	0.76	0.88	1.11	1.46	1.99	2.71	3.61	4.66	5.78	6.85	7.76	8.34	8.52	8.24	7.50	6.40	5.07	3.64	2.36	0.68	0.00		
0.58	0.60	0.61	0.62	0.63	0.66	0.72	0.84	1.06	1.41	1.93	2.63	3.52	4.54	5.64	6.69	7.59	8.18	8.39	8.15	7.49	6.48	5.24	3.95	2.69	1.37	0.24		
0.58	0.60	0.61	0.62	0.64	0.66	0.72	0.85	1.07	1.42	1.94	2.65	3.54	4.57	5.68	6.73	7.63	8.22	8.41	8.16	7.48	6.47	5.21	3.91	2.64	1.29	0.19		
0.57	0.59	0.61	0.62	0.63	0.64	0.67	0.75	0.92	1.23	1.71	2.39	3.28	4.35	5.54	6.69	7.71	8.42	8.72	8.53	7.87	6.81	5.48	4.06	2.67	1.14	0.04		
0.58	0.60	0.61	0.62	0.62	0.63	0.67	0.76	0.94	1.25	1.75	2.44	3.34	4.40	5.58	6.71	7.71	8.38	8.65	8.44	7.76	6.71	5.40	4.01	2.66	1.19	0.08		
0.55	0.57	0.58	0.59	0.59	0.61	0.64	0.72	0.89	1.19	1.66	2.32	3.19	4.23	5.38	6.50	7.51	8.23	8.56	8.44	7.86	6.91	5.68	4.36	3.02	1.66	0.39		
0.58	0.60	0.60	0.59	0.58	0.56	0.57	0.64	0.81	1.13	1.64	2.38	3.33	4.45	5.66	6.83	7.82	8.48	8.71	8.46	7.76	6.69	5.38	4.01	2.68	1.25	0.13		
0.59	0.60	0.60	0.59	0.57	0.56	0.57	0.64	0.82	1.15	1.68	2.41	3.37	4.48	5.68	6.82	7.78	8.41	8.62	8.36	7.66	6.62	5.34	4.01	2.72	1.35	0.21		
0.58	0.59	0.59	0.58	0.57	0.56	0.58	0.66	0.84	1.17	1.69	2.42	3.36	4.45	5.63	6.75	7.72	8.35	8.57	8.33	7.64	6.62	5.37	4.07	2.79	1.46	0.29		
1.01	0.98	0.95	0.93	0.91	0.92	0.95	1.02	1.14	1.32	1.58	1.92	2.37	2.93	3.58	4.30	5.03	5.70	6.22	6.51	6.50	6.17	5.54	4.69	3.71	2.74	1.83	1.04	
0.98	0.95	0.93	0.90	0.89	0.90	0.93	1.00	1.11	1.28	1.53	1.87	2.32	2.88	3.56	4.31	5.10	5.81	6.38	6.70	6.71	6.38	5.73	4.84	3.80	2.79	1.79	0.82	
1.02	0.99	0.95	0.93	0.92	0.93	0.97	1.05	1.18	1.37	1.62	1.97	2.41	2.95	3.60	4.31	5.06	5.75	6.30	6.60	6.59	6.24	5.57	4.65	3.64	2.68	1.65	0.69	
1.05	1.01	0.97	0.93	0.91	0.91	0.96	1.08	1.27	1.55	1.93	2.41	3.00	3.65	4.36	5.04	5.66	6.12	6.38	6.37	6.06	5.49	4.69	3.76	2.79	1.92	0.84	0.13	
1.00	0.96	0.92	0.89	0.88	0.89	0.94	1.06	1.24	1.50	1.86	2.32	2.88	3.53	4.23	4.94	5.60	6.11	6.43	6.48	6.23	5.71	4.95	4.04	3.09	2.16	1.18	0.31	
1.01	0.97	0.93	0.90	0.88	0.90	0.95	1.06	1.24	1.51	1.86	2.31	2.85	3.46	4.12	4.79	5.41	5.90	6.21	6.27	6.06	5.60	4.91	4.08	3.19	2.34	1.57	0.91	
0.87	0.85	0.83	0.82	0.83	0.87	0.96	1.10	1.31	1.60	1.99	2.47	3.06	3.73	4.47	5.22	5.92	6.48	6.82	6.87	6.61	6.05	5.24	4.28	3.26	2.27	1.22	0.29	
0.85	0.82	0.80	0.79	0.80	0.84	0.93	1.07	1.27	1.54	1.91	2.37	2.93	3.59	4.33	5.09	5.83	6.45	6.87	7.00	6.81	6.29	5.49	4.50	3.44	2.43	1.34	0.38	
0.86	0.84	0.82	0.80	0.81	0.86	0.94	1.08	1.29	1.58	1.96	2.44	3.01	3.67	4.40	5.14	5.85	6.43	6.80	6.90	6.68	6.16	5.36	4.40	3.36	2.37	1.31	0.37	
2.58	3.01	3.55	4.17	4.85	5.52	6.11	6.53	6.70	6.57	6.13	5.42	4.49	3.48	2.47	1.58	0.87	0.37	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.59	3.02	3.56	4.18	4.85	5.52	6.10	6.51	6.68	6.55	6.11	5.40	4.49	3.48	2.47	1.58	0.88	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.59	3.03	3.56	4.19	4.87	5.54	6.12	6.53	6.69	6.56	6.11	5.39	4.47	3.47	2.45	1.62	0.85	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.31	3.86	4.48	5.11	5.69	6.15	6.40	6.40	6.11	5.57	4.81	3.93	3.00	2.13	1.37	0.79	0.37	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.28	3.82	4.43	5.05	5.63	6.08	6.33	6.34	6.08	5.57	4.84	3.99	3.08	2.23	1.48	0.88	0.45	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.28	3.82	4.43	5.05	5.63	6.08	6.34	6.35	6.09	5.57	4.84	3.98	3.07	2.20	1.44	0.86	0.41	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.84	3.22	3.64	4.11	4.57	5.00	5.33	5.52	5.53	5.32	4.91	4.34	3.63	2.90	2.19	1.58	1.09	0.75	0.53	0.41	0.36	0.35	0.36	0.36	0.34	0.32	0.27	0.20	0.20
2.86	3.23	3.66	4.13	4.60	5.02	5.35	5.54	5.54	5.33	4.92	4.34	3.64	2.91	2.20	1.58	1.09	0.74	0.51	0.38	0.32	0.30	0.30	0.29	0.27	0.24	0.20	0.14	0.14
2.84	3.20	3.62	4.08	4.54	4.96	5.29	5.48	5.49	5.30	4.91	4.34	3.66	2.93	2.21	1.59	1.09	0.73	0.49	0.37	0.32	0.32	0.34	0.36	0.37	0.36	0.32	0.24	0.24
2.73	3.07	3.47	3.91	4.35	4.75	5.09	5.30	5.37	5.27	5.01	4.59	4.04	3.42	2.75	2.10	1.50	1.01	0.63	0.36	0.20	0.12	0.10	0.11	0.14	0.16	0.18	0.15	0.15
2.74	3.09	3.49	3.94	4.39	4.80	5.15	5.37	5.45	5.36	5.10	4.68	4.12	3.48	2.79	2.12	1.51	1.00	0.60	0.32	0.14	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.76	3.12	3.53	3.97	4.42	4.83	5.16	5.38	5.45	5.35	5.09	4.67	4.12	3.48	2.78	2.11	1.49	0.98	0.59	0.32	0.14	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.71	3.05	3.45	3.88	4.32	4.73	5.06	5.27	5.33	5.22	4.95	4.54	3.99	3.38	2.71	2.07	1.47	0.97	0.58	0.30	0.14	0.07	0.07	0.12	0.18	0.24	0.27	0.24	0.24
2.73	3.07	3.46	3.90	4.35	4.77	5.11	5.33	5.40	5.31	5.05	4.64	4.09	3.46	2.78	2.12	1.51	0.99	0.59	0.31	0.11	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.69	3.03	3.42	3.86	4.31	4.74	5.09	5.33	5.41	5.32	5.04	4.61	4.04	3.40	2.71	2.06	1.47	0.99	0.61	0.35	0.18	0.10	0.08	0.08	0.11	0.12	0.14	0.12	0.12
2.66	2.99	3.37	3.80	4.24	4.65	4.98	5.21	5.28	5.19	4.93																		

Depth (ft)	Sample No.	Sample Name	Result Between User Sizes (Sizes in um)																																
			0.36	0.42	0.48	0.55	0.63	0.72	0.83	0.95	1.10	1.26	1.45	1.66	1.91	2.19	2.51	2.88	3.31	3.80	4.37	5.01	5.75	6.61	7.59	8.71	10.00	11.48	13.18	15.14	17.38	19.95			
768.1	USGS1425H	USGS142 5Hc				0.08	0.17	0.26	0.31	0.33	0.34	0.35	0.37	0.41	0.46	0.53	0.61	0.68	0.75	0.82	0.88	0.95	1.02	1.10	1.19	1.29	1.41	1.54	1.67	1.79	1.92	2.04			
						0.08	0.17	0.26	0.31	0.33	0.34	0.35	0.37	0.40	0.46	0.53	0.60	0.67	0.75	0.81	0.88	0.94	1.01	1.09	1.18	1.28	1.40	1.52	1.65	1.78	1.90	2.03			
						0.08	0.17	0.26	0.30	0.33	0.34	0.35	0.37	0.40	0.46	0.53	0.60	0.67	0.74	0.81	0.88	0.94	1.01	1.09	1.18	1.29	1.40	1.53	1.66	1.78	1.90	2.03			
						0.18	0.35	0.45	0.53	0.58	0.60	0.63	0.67	0.73	0.83	0.94	1.06	1.19	1.31	1.43	1.54	1.64	1.75	1.87	2.01	2.18	2.39	2.64	2.91	3.20	3.47	3.70			
						0.18	0.36	0.45	0.54	0.58	0.61	0.63	0.67	0.74	0.83	0.95	1.07	1.20	1.32	1.44	1.55	1.65	1.76	1.88	2.03	2.20	2.41	2.66	2.93	3.22	3.49	3.72			
						0.18	0.35	0.45	0.53	0.58	0.60	0.63	0.67	0.74	0.83	0.94	1.07	1.19	1.32	1.43	1.54	1.65	1.76	1.88	2.02	2.19	2.40	2.65	2.92	3.21	3.48	3.70			
						0.06	0.13	0.20	0.23	0.25	0.26	0.27	0.29	0.32	0.36	0.42	0.47	0.53	0.59	0.64	0.69	0.74	0.79	0.85	0.91	0.99	1.07	1.16	1.25	1.34	1.43	1.51			
						0.06	0.13	0.20	0.23	0.25	0.26	0.27	0.29	0.32	0.36	0.41	0.47	0.53	0.58	0.64	0.68	0.73	0.78	0.84	0.91	0.98	1.07	1.16	1.25	1.34	1.42	1.50			
						0.06	0.13	0.20	0.23	0.25	0.26	0.27	0.29	0.32	0.36	0.42	0.47	0.53	0.59	0.64	0.69	0.74	0.79	0.85	0.91	0.99	1.07	1.17	1.26	1.35	1.43	1.52			
769.7	USGS1425I	USGS 142 5Ic					0.05	0.09	0.10	0.11	0.12	0.13	0.15	0.17	0.20	0.23	0.26	0.30	0.33	0.36	0.39	0.41	0.44	0.47	0.51	0.55	0.60	0.66	0.73	0.79	0.85				
						0.05	0.09	0.10	0.11	0.12	0.13	0.15	0.17	0.20	0.23	0.26	0.30	0.33	0.36	0.39	0.41	0.44	0.47	0.51	0.55	0.60	0.66	0.73	0.79	0.84					
						0.05	0.09	0.10	0.11	0.12	0.13	0.15	0.17	0.20	0.23	0.26	0.29	0.32	0.35	0.38	0.41	0.44	0.47	0.50	0.55	0.60	0.65	0.71	0.77	0.83					
						0.05	0.09	0.10	0.11	0.12	0.13	0.15	0.17	0.20	0.23	0.27	0.30	0.33	0.36	0.39	0.42	0.45	0.48	0.52	0.56	0.62	0.68	0.74	0.81	0.86					
						0.05	0.09	0.10	0.11	0.12	0.13	0.15	0.17	0.20	0.23	0.26	0.30	0.33	0.36	0.38	0.41	0.44	0.47	0.51	0.56	0.61	0.67	0.74	0.80	0.86					
						0.04	0.08	0.09	0.10	0.11	0.12	0.14	0.16	0.19	0.22	0.25	0.28	0.31	0.34	0.37	0.40	0.43	0.46	0.50	0.55	0.60	0.66	0.72	0.78	0.84					
						0.04	0.08	0.09	0.10	0.11	0.12	0.13	0.16	0.18	0.21	0.24	0.27	0.30	0.33	0.35	0.38	0.41	0.45	0.49	0.53	0.58	0.64	0.70	0.76	0.81					
						0.04	0.08	0.09	0.10	0.11	0.12	0.14	0.16	0.19	0.22	0.25	0.28	0.31	0.34	0.37	0.40	0.43	0.46	0.50	0.55	0.60	0.66	0.72	0.78	0.83					
			772.5	USGS1425J	USGS 142 5Jc				0.00	0.05	0.09	0.10	0.11	0.12	0.14	0.16	0.19	0.22	0.25	0.28	0.31	0.34	0.38	0.41	0.46	0.50	0.55	0.60	0.66	0.71	0.76	0.81	0.87		
						0.00	0.05	0.09	0.10	0.11	0.12	0.13	0.14	0.17	0.19	0.22	0.25	0.28	0.32	0.35	0.38	0.42	0.47	0.51	0.56	0.62	0.67	0.72	0.78	0.83	0.88				
						0.00	0.05	0.09	0.10	0.11	0.12	0.13	0.14	0.16	0.19	0.22	0.25	0.28	0.31	0.34	0.38	0.42	0.46	0.50	0.55	0.61	0.66	0.71	0.76	0.82	0.87				
						0.05	0.09	0.11	0.12	0.13	0.14	0.15	0.17	0.19	0.22	0.26	0.29	0.33	0.36	0.40	0.44	0.48	0.53	0.58	0.63	0.69	0.75	0.80	0.86	0.91	0.98				
						0.05	0.09	0.11	0.12	0.13	0.13	0.15	0.16	0.19	0.22	0.25	0.28	0.32	0.35	0.39	0.43	0.47	0.51	0.56	0.61	0.67	0.72	0.78	0.83	0.89	0.94				
						0.05	0.09	0.11	0.12	0.13	0.14	0.15	0.16	0.19	0.22	0.25	0.29	0.32	0.35	0.39	0.43	0.47	0.51	0.56	0.62	0.67	0.73	0.78	0.84	0.89	0.95				
						0.00	0.05	0.09	0.10	0.11	0.12	0.13	0.14	0.17	0.19	0.22	0.25	0.28	0.31	0.35	0.38	0.42	0.46	0.51	0.56	0.61	0.66	0.72	0.77	0.81	0.86				
						0.00	0.05	0.09	0.10	0.11	0.12	0.13	0.14	0.16	0.19	0.22	0.25	0.28	0.31	0.34	0.38	0.42	0.46	0.51	0.56	0.61	0.66	0.71	0.76	0.81	0.85				
						0.00	0.05	0.09	0.10	0.11	0.12	0.13	0.14	0.17	0.19	0.22	0.25	0.28	0.31	0.34	0.38	0.42	0.46	0.51	0.56	0.61	0.66	0.71	0.76	0.80	0.85				
775.2	USGS1425K	USGS 142 5Kc				0.15	0.36	0.50	0.61	0.67	0.71	0.73	0.78	0.85	0.95	1.08	1.21	1.34	1.46	1.57	1.66	1.74	1.81	1.88	1.96	2.04	2.14	2.26	2.40	2.56	2.75	2.97			
						0.16	0.33	0.51	0.60	0.67	0.70	0.73	0.77	0.84	0.94	1.07	1.20	1.33	1.45	1.55	1.64	1.72	1.80	1.87	1.94	2.03	2.13	2.25	2.39	2.55	2.74	2.95			
						0.16	0.33	0.51	0.60	0.67	0.70	0.73	0.77	0.84	0.95	1.07	1.20	1.33	1.45	1.56	1.65	1.73	1.80	1.87	1.95	2.04	2.14	2.26	2.40	2.57	2.75	2.97			
						0.16	0.33	0.51	0.60	0.67	0.70	0.73	0.77	0.85	0.95	1.08	1.21	1.34	1.46	1.56	1.65	1.72	1.79	1.86	1.93	2.01	2.11	2.23	2.38	2.55	2.74	2.95			
						0.16	0.33	0.51	0.60	0.66	0.70	0.72	0.77	0.84	0.94	1.07	1.20	1.33	1.44	1.55	1.64	1.71	1.78	1.84	1.91	2.00	2.10	2.22	2.36	2.53	2.72	2.94			
						0.16	0.33	0.51	0.60	0.66	0.70	0.72	0.77	0.84	0.94	1.07	1.20	1.33	1.45	1.55	1.64	1.71	1.78	1.84	1.91	2.00	2.10	2.23	2.37	2.54	2.74	2.95			
						0.16	0.33	0.51	0.61	0.68	0.71	0.74	0.78	0.86	0.97	1.09	1.23	1.36	1.48	1.59	1.68	1.76	1.83	1.90	1.98	2.07	2.18	2.30	2.45	2.61	2.80	3.00			
						0.16	0.34	0.52	0.62	0.69	0.72	0.75	0.80	0.87	0.98	1.11	1.25	1.38	1.51	1.62	1.71	1.79	1.86	1.94	2.02	2.11	2.22	2.34	2.49	2.66	2.84	3.05			
						0.16	0.34	0.52	0.62	0.69	0.72	0.75	0.80	0.87	0.98	1.11	1.25	1.38	1.51	1.62	1.71	1.79	1.86	1.94	2.02	2.11	2.22	2.35	2.50	2.66	2.85	3.06			
776.5	USGS1425L	USGS 142 5Lc				0.08	0.16	0.25	0.29	0.32	0.34	0.35	0.38	0.41	0.46	0.52	0.59	0.65	0.70	0.75	0.79	0.83	0.87	0.92	0.98	1.05	1.12	1.21	1.29	1.37	1.45	1.53			
						0.07	0.16	0.24	0.29	0.32	0.34	0.35	0.37	0.41	0.46	0.52	0.58	0.64	0.70	0.74	0.78	0.82	0.87	0.91	0.97	1.04	1.12	1.20	1.28	1.37	1.44	1.53			
						0.07	0.16	0.25	0.29	0.33	0.34	0.36	0.38	0.41	0.46	0.52	0.59	0.65	0.70	0.75	0.79	0.83	0.87	0.92	0.98	1.05	1.13	1.21	1.29	1.38	1.46	1.54			
						0.07	0.15	0.23	0.27	0.30	0.31	0.33	0.35	0.38	0.43	0.49	0.54	0.60	0.65	0.69	0.73	0.77	0.81	0.85	0.90	0.96	1.03	1.10	1.17	1.23	1.28	1.35			
						0.07	0.14	0.22	0.26	0.29	0.31	0.32	0.34	0.38	0.42	0.48	0.53	0.59	0.63	0.68	0.72	0.75	0.79	0.84	0.89	0.95	1.01	1.08	1.14	1.20	1.26	1.32			
						0.07	0.15	0.22	0.26	0.29	0.31	0.32	0.34	0.38	0.42	0.48	0.54	0.59	0.64	0.68	0.72	0.75	0.79	0.84	0.89	0.95	1.02	1.09	1.15	1.21	1.27	1.33			
						0.06	0.14	0.21	0.25	0.28	0.29	0.31	0.33	0.36	0.41	0.46	0.52	0.57	0.62	0.66	0.69	0.72	0.76	0.80	0.85	0.91	0.98	1.04	1.11	1.16	1.20	1.24			
						0.06	0.13	0.21	0.25	0.28	0.29	0.31	0.33	0.36	0.41	0.46	0.51	0.57	0.61	0.65	0.69	0.72	0.75	0.79	0.84	0.90	0.97	1.03	1.10	1.15	1.20	1.24			
						0.06	0.14	0.21	0.25	0.28	0.29	0.31	0.33	0.36	0.41	0.46	0.51	0.57	0.61	0.65	0.69	0.72	0.75	0.80	0.84	0.90	0.97	1.04	1.10	1.15	1.20	1.24			
777.5	USGS1425M	USGS 142 5Mc				0.10	0.21	0.32	0.37	0.41	0.42	0.43	0.44	0.48	0.54	0.61	0.69	0.77	0.85	0.91	0.98	1.03	1.08	1.14	1.21	1.29	1.40	1.54	1.71	1.92	2.17	2.46			
						0.11	0.21	0.32	0.38	0.41	0.42	0.43	0.45	0.48	0.54	0.61	0.69	0.77	0.85	0.92	0.98	1.04	1.09	1.15	1.21	1.30	1.41	1.55	1.72	1.94	2.19	2.48			
						0.10	0.21	0.31	0.37	0.40	0.41	0.42	0.44	0.47																					

22.91	26.30	30.20	34.67	39.81	45.71	52.48	60.26	69.18	79.43	91.20	104.71	120.23	138.04	158.49	181.97	208.93	239.88	275.42	316.23	363.08	416.87	478.63	549.54	630.96	724.44	831.76	954.99	1096.48
2.18	2.36	2.59	2.90	3.32	3.84	4.43	5.07	5.67	6.14	6.42	6.42	6.11	5.51	4.67	3.71	2.71	1.79	0.87	0.02	0.00	0.00	0.00						
2.17	2.34	2.57	2.89	3.30	3.81	4.41	5.04	5.65	6.13	6.42	6.43	6.14	5.56	4.73	3.77	2.76	1.84	0.91	0.02	0.00	0.00	0.00						
2.16	2.33	2.56	2.87	3.28	3.79	4.39	5.02	5.62	6.11	6.40	6.41	6.12	5.55	4.72	3.78	2.84	1.92	1.01	0.03	0.00	0.00	0.00						
3.85	3.90	3.84	3.67	3.43	3.16	2.92	2.76	2.71	2.77	2.93	3.12	3.26	3.30	3.18	2.90	2.46	1.94	1.40	0.91	0.52	0.22	0.05						
3.87	3.92	3.86	3.69	3.45	3.18	2.93	2.76	2.69	2.75	2.89	3.06	3.20	3.23	3.12	2.85	2.43	1.93	1.40	0.92	0.54	0.23	0.05						
3.85	3.90	3.83	3.67	3.43	3.16	2.92	2.76	2.71	2.78	2.93	3.12	3.26	3.29	3.17	2.89	2.45	1.93	1.39	0.89	0.51	0.20	0.04						
1.60	1.73	1.90	2.15	2.51	2.98	3.59	4.29	5.06	5.79	6.42	6.84	6.97	6.76	6.21	5.39	4.37	3.29	2.25	1.35	0.73	0.07	0.00						
1.59	1.71	1.88	2.12	2.48	2.95	3.56	4.27	5.04	5.79	6.43	6.86	7.00	6.81	6.27	5.45	4.42	3.33	2.27	1.36	0.72	0.06	0.00						
1.61	1.72	1.89	2.14	2.49	2.96	3.56	4.27	5.03	5.78	6.42	6.85	6.99	6.79	6.24	5.42	4.39	3.30	2.25	1.35	0.71	0.06	0.00						
0.89	0.91	0.91	0.89	0.88	0.92	1.04	1.32	1.78	2.46	3.35	4.39	5.48	6.48	7.28	7.75	7.83	7.51	6.84	5.93	4.89	3.85	2.87	2.04	1.33	0.84	0.31	0.00	
0.89	0.91	0.90	0.89	0.88	0.92	1.05	1.32	1.78	2.46	3.34	4.37	5.47	6.47	7.29	7.77	7.86	7.55	6.88	5.96	4.91	3.85	2.86	2.02	1.30	0.82	0.30	0.00	
0.87	0.89	0.89	0.87	0.86	0.90	1.02	1.29	1.74	2.40	3.27	4.29	5.37	6.37	7.19	7.69	7.82	7.55	6.92	6.05	5.02	3.98	2.99	2.14	1.42	0.91	0.38	0.04	
0.89	0.91	0.92	0.91	0.91	0.97	1.11	1.39	1.86	2.53	3.40	4.39	5.43	6.38	7.14	7.58	7.65	7.34	6.70	5.84	4.86	3.88	2.96	2.16	1.47	0.97	0.45	0.09	
0.90	0.93	0.93	0.93	0.93	0.99	1.15	1.45	1.93	2.62	3.50	4.51	5.57	6.52	7.28	7.71	7.76	7.42	6.74	5.83	4.79	3.74	2.78	1.93	1.26	0.66	0.12	0.00	
0.90	0.92	0.93	0.91	0.91	0.96	1.10	1.39	1.87	2.57	3.48	4.52	5.62	6.63	7.44	7.90	7.95	7.60	6.88	5.91	4.80	3.69	2.67	1.78	1.14	0.44	0.05	0.00	
0.88	0.90	0.90	0.89	0.89	0.94	1.07	1.33	1.77	2.41	3.24	4.22	5.27	6.25	7.07	7.59	7.75	7.53	6.95	6.12	5.12	4.09	3.09	2.22	1.47	0.95	0.36	0.00	
0.85	0.87	0.87	0.87	0.87	0.91	1.03	1.27	1.69	2.29	3.09	4.03	5.05	6.01	6.83	7.37	7.58	7.43	6.94	6.20	5.29	4.33	3.38	2.52	1.78	1.17	0.69	0.33	
0.87	0.89	0.89	0.89	0.89	0.93	1.06	1.32	1.75	2.38	3.20	4.17	5.20	6.17	6.99	7.51	7.68	7.48	6.93	6.13	5.17	4.16	3.19	2.32	1.57	1.01	0.45	0.07	
0.93	1.00	1.09	1.19	1.32	1.47	1.65	1.84	2.07	2.32	2.63	2.99	3.43	3.95	4.53	5.15	5.76	6.26	6.60	6.67	6.45	5.91	5.11	4.14	3.10	2.10	1.03	0.12	
0.94	1.02	1.10	1.21	1.34	1.50	1.67	1.87	2.10	2.36	2.67	3.04	3.49	4.02	4.63	5.26	5.88	6.39	6.71	6.75	6.46	5.86	4.99	3.95	2.85	1.88	0.65	0.00	
0.93	1.00	1.08	1.19	1.32	1.47	1.64	1.84	2.07	2.33	2.64	3.01	3.46	3.98	4.56	5.17	5.76	6.24	6.55	6.61	6.38	5.85	5.07	4.12	3.10	2.13	1.09	0.19	
1.05	1.14	1.25	1.38	1.54	1.72	1.92	2.14	2.37	2.63	2.92	3.25	3.65	4.10	4.61	5.12	5.62	6.00	6.21	6.19	5.90	5.34	4.55	3.63	2.64	1.79	0.65	0.00	
1.01	1.10	1.21	1.34	1.50	1.68	1.88	2.09	2.33	2.58	2.87	3.20	3.59	4.05	4.56	5.08	5.59	5.99	6.23	6.23	5.96	5.43	4.66	3.76	2.81	1.90	0.93	0.11	
1.01	1.10	1.20	1.33	1.48	1.66	1.87	2.09	2.33	2.59	2.88	3.20	3.58	4.01	4.49	4.99	5.48	5.89	6.14	6.18	5.96	5.47	4.74	3.85	2.91	1.99	1.01	0.17	
0.92	0.99	1.07	1.18	1.32	1.49	1.68	1.90	2.16	2.44	2.77	3.15	3.60	4.11	4.68	5.27	5.83	6.30	6.58	6.62	6.36	5.80	4.97	3.98	2.90	1.96	0.71	0.00	
0.91	0.98	1.07	1.18	1.32	1.49	1.68	1.89	2.12	2.38	2.68	3.04	3.47	3.98	4.58	5.22	5.85	6.38	6.73	6.80	6.54	5.95	5.07	4.03	2.90	1.90	0.65	0.00	
0.90	0.97	1.06	1.17	1.31	1.48	1.67	1.88	2.12	2.40	2.71	3.09	3.54	4.07	4.67	5.29	5.89	6.38	6.68	6.72	6.44	5.85	5.00	3.98	2.89	1.93	0.68	0.00	
3.20	3.45	3.71	3.94	4.14	4.26	4.30	4.24	4.09	3.86	3.58	3.26	2.92	2.57	2.23	1.88	1.55	1.23	0.93	0.66	0.44	0.27	0.13	0.04	0.00	0.00	0.00	0.00	
3.18	3.44	3.69	3.93	4.13	4.26	4.31	4.26	4.11	3.89	3.60	3.27	2.91	2.55	2.18	1.84	1.50	1.20	0.92	0.69	0.49	0.34	0.22	0.14	0.10	0.04	0.00	0.00	
3.20	3.45	3.70	3.94	4.13	4.26	4.31	4.25	4.11	3.89	3.60	3.28	2.94	2.59	2.24	1.90	1.55	1.23	0.93	0.67	0.44	0.31	0.05	0.00	0.00	0.00	0.00	0.00	
3.19	3.45	3.72	3.97	4.18	4.33	4.41	4.39	4.27	4.06	3.78	3.44	3.06	2.66	2.24	1.83	1.43	1.07	0.75	0.49	0.29	0.14	0.03	0.00	0.00	0.00	0.00	0.00	
3.18	3.43	3.69	3.94	4.15	4.30	4.37	4.36	4.25	4.05	3.79	3.47	3.11	2.73	2.33	1.92	1.52	1.14	0.80	0.51	0.29	0.12	0.02	0.00	0.00	0.00	0.00	0.00	
3.19	3.44	3.69	3.93	4.13	4.28	4.36	4.35	4.24	4.06	3.80	3.48	3.12	2.72	2.30	1.88	1.46	1.08	0.76	0.49	0.30	0.17	0.09	0.03	0.00	0.00	0.00	0.00	
3.22	3.45	3.67	3.87	4.03	4.12	4.13	4.06	3.92	3.71	3.47	3.19	2.89	2.58	2.25	1.91	1.57	1.24	0.94	0.68	0.46	0.30	0.20	0.13	0.10	0.09	0.08	0.07	
3.27	3.51	3.73	3.94	4.10	4.18	4.19	4.11	3.94	3.72	3.44	3.13	2.80	2.46	2.11	1.77	1.43	1.12	0.84	0.60	0.41	0.27	0.17	0.11	0.08	0.08	0.08	0.07	
3.28	3.52	3.75	3.95	4.12	4.21	4.23	4.16	4.00	3.78	3.51	3.19	2.84	2.49	2.12	1.77	1.42	1.10	0.82	0.58	0.38	0.23	0.12	0.04	0.00	0.00	0.00	0.00	
1.64	1.78	1.99	2.27	2.65	3.13	3.68	4.28	4.87	5.40	5.81	6.04	6.06	5.85	5.43	4.84	4.11	3.35	2.58	1.87	1.26	0.78	0.44	0.19	0.06				
1.63	1.77	1.97	2.25	2.63	3.09	3.65	4.25	4.86	5.41	5.84	6.09	6.13	5.93	5.51	4.91	4.16	3.37	2.57	1.84	1.22	0.73	0.40	0.17	0.06				
1.65	1.79	1.99	2.27	2.64	3.10	3.65	4.24	4.84	5.39	5.82	6.08	6.12	5.92	5.50	4.89	4.14	3.34	2.54	1.82	1.20	0.73	0.40	0.18	0.06				
1.43	1.55	1.74	2.03	2.43	2.95	3.58	4.28	5.01	5.69	6.26	6.62	6.74	6.56	6.10	5.39	4.50	3.54	2.58	1.70	1.07	0.25	0.03	0.00	0.00				
1.39	1.51	1.70	1.99	2.38	2.90	3.51	4.21	4.93	5.60	6.16	6.53	6.65	6.50	6.06	5.40	4.55	3.63	2.71	1.87	1.18	0.65	0.33	0.05	0.00				
1.40	1.52	1.71	1.99	2.39	2.91	3.53	4.24	4.97	5.65	6.23	6.60	6.73	6.57	6.12	5.43	4.55	3.60	2.64	1.79	1.06	0.59	0.08	0.00	0.00				
1.29	1.38	1.53	1.78	2.15	2.64	3.26	3.98	4.75	5.50	6.16	6.63	6.85	6.78	6.42	5.79	4.94	3.99	3.00	2.09	1.29	0.76	0.10	0.00	0.00				
1.29	1.38	1.53	1.77	2.12	2.61	3.21	3.91	4.66	5.41	6.06	6.54	6.78	6.74	6.41	5.81	4.99	4.07	3.11	2.22	1.43	0.90	0.22	0.02	0.00				
1.29	1.38	1.53	1.77	2.12	2.61	3.22	3.93	4.70	5.45	6.12	6.61	6.86	6.81	6.46	5.84	5.00	4.04	3.05	2.14	1.33	0.81	0.11	0.00	0.00				
2.78	3.11	3.44	3.75	4.02	4																							

Depth (ft)		Sample No.	Sample Name	Result Between User Sizes (Sizes in um)																													
				0.36	0.42	0.48	0.55	0.63	0.72	0.83	0.95	1.10	1.26	1.45	1.66	1.91	2.19	2.51	2.88	3.31	3.80	4.37	5.01	5.75	6.61	7.59	8.71	10.00	11.48	13.18	15.14	17.38	19.95
779.4	USGS1425N	USGS 142 5Na				0.06	0.14	0.23	0.28	0.32	0.34	0.37	0.41	0.45	0.51	0.58	0.65	0.70	0.75	0.79	0.81	0.82	0.81	0.81	0.81	0.81	0.81	0.82	0.84	0.87	0.91	0.96	1.03
						0.06	0.14	0.22	0.27	0.31	0.33	0.36	0.39	0.44	0.50	0.56	0.62	0.68	0.72	0.76	0.78	0.79	0.79	0.78	0.78	0.78	0.78	0.79	0.81	0.84	0.88	0.93	1.00
						0.06	0.14	0.23	0.28	0.32	0.35	0.37	0.41	0.46	0.52	0.58	0.65	0.71	0.75	0.79	0.81	0.82	0.82	0.82	0.82	0.82	0.82	0.83	0.85	0.88	0.92	0.97	1.04
781.1	USGS1425O	USGS142 5Oc				0.23	0.49	0.65	0.78	0.86	0.91	0.95	1.00	1.08	1.19	1.32	1.46	1.60	1.72	1.85	1.96	2.08	2.19	2.33	2.47	2.63	2.80	2.96	3.11	3.24	3.34	3.40	3.40
						0.23	0.49	0.66	0.79	0.87	0.92	0.95	1.01	1.09	1.20	1.33	1.47	1.61	1.74	1.86	1.98	2.09	2.21	2.35	2.49	2.65	2.82	2.99	3.14	3.27	3.36	3.42	
						0.23	0.49	0.65	0.79	0.86	0.91	0.95	1.00	1.08	1.20	1.33	1.46	1.60	1.73	1.85	1.96	2.08	2.20	2.33	2.48	2.64	2.81	2.97	3.12	3.25	3.35	3.40	
						0.11	0.25	0.38	0.47	0.53	0.57	0.61	0.65	0.72	0.80	0.89	0.99	1.07	1.15	1.22	1.28	1.34	1.40	1.46	1.54	1.62	1.70	1.77	1.82	1.85	1.84	1.79	
						0.12	0.25	0.39	0.48	0.54	0.58	0.62	0.67	0.73	0.82	0.91	1.01	1.10	1.17	1.24	1.31	1.37	1.43	1.50	1.57	1.66	1.74	1.81	1.86	1.89	1.87	1.81	
						0.12	0.25	0.39	0.47	0.53	0.57	0.61	0.65	0.72	0.80	0.90	0.99	1.07	1.15	1.22	1.28	1.34	1.40	1.47	1.55	1.63	1.71	1.78	1.83	1.86	1.84	1.79	
						0.12	0.25	0.39	0.47	0.52	0.56	0.58	0.62	0.68	0.76	0.86	0.97	1.07	1.18	1.29	1.38	1.47	1.55	1.62	1.67	1.71	1.74	1.75	1.74	1.71	1.68	1.64	
						0.11	0.25	0.38	0.46	0.51	0.54	0.57	0.61	0.66	0.74	0.84	0.94	1.05	1.15	1.25	1.34	1.43	1.51	1.58	1.63	1.67	1.70	1.71	1.70	1.68	1.64	1.60	
						0.12	0.25	0.39	0.47	0.53	0.56	0.59	0.62	0.68	0.76	0.86	0.97	1.07	1.18	1.28	1.38	1.47	1.55	1.62	1.68	1.72	1.75	1.76	1.75	1.72	1.68	1.64	
782.3	USGS1425P	USGS 142 5Pc					0.04	0.08	0.09	0.09	0.10	0.11	0.13	0.15	0.18	0.21	0.24	0.28	0.31	0.34	0.38	0.41	0.44	0.48	0.53	0.58	0.64	0.72	0.81	0.90	1.00		
						0.04	0.08	0.09	0.09	0.10	0.11	0.13	0.15	0.18	0.21	0.24	0.28	0.31	0.35	0.38	0.41	0.45	0.49	0.53	0.58	0.65	0.73	0.81	0.91	1.00			
						0.04	0.08	0.09	0.10	0.10	0.11	0.13	0.15	0.18	0.21	0.25	0.28	0.32	0.35	0.38	0.42	0.45	0.49	0.54	0.59	0.66	0.74	0.83	0.92	1.01			
						0.04	0.08	0.09	0.09	0.10	0.11	0.13	0.15	0.18	0.21	0.24	0.28	0.31	0.34	0.38	0.41	0.44	0.48	0.53	0.58	0.64	0.71	0.79	0.87	0.94			
						0.04	0.08	0.09	0.09	0.10	0.11	0.13	0.15	0.17	0.21	0.24	0.27	0.30	0.34	0.37	0.40	0.44	0.48	0.52	0.57	0.63	0.70	0.78	0.86	0.93			
						0.04	0.08	0.09	0.09	0.10	0.11	0.13	0.15	0.18	0.21	0.24	0.28	0.31	0.35	0.38	0.41	0.45	0.49	0.54	0.59	0.65	0.72	0.80	0.88	0.95			
						0.04	0.07	0.08	0.09	0.10	0.11	0.12	0.15	0.17	0.20	0.23	0.27	0.30	0.33	0.36	0.39	0.43	0.46	0.50	0.55	0.60	0.66	0.73	0.80	0.87			
						0.04	0.07	0.08	0.09	0.10	0.11	0.12	0.14	0.17	0.20	0.23	0.26	0.30	0.33	0.36	0.39	0.42	0.46	0.50	0.54	0.60	0.66	0.73	0.80	0.87			
						0.04	0.07	0.08	0.09	0.09	0.10	0.12	0.14	0.17	0.20	0.23	0.26	0.29	0.32	0.35	0.38	0.42	0.45	0.49	0.53	0.58	0.64	0.71	0.78	0.85			
783	USGS1425Q	USGS 142 5Qc				0.08	0.14	0.17	0.18	0.19	0.20	0.21	0.24	0.27	0.32	0.37	0.42	0.47	0.52	0.56	0.60	0.64	0.69	0.74	0.80	0.87	0.94	1.01	1.08	1.12	1.15		
						0.08	0.14	0.17	0.18	0.19	0.20	0.21	0.24	0.28	0.32	0.37	0.42	0.47	0.52	0.56	0.60	0.65	0.69	0.75	0.81	0.88	0.95	1.02	1.09	1.14	1.17		
						0.08	0.14	0.17	0.18	0.19	0.20	0.21	0.24	0.28	0.32	0.37	0.42	0.47	0.52	0.56	0.60	0.65	0.69	0.75	0.81	0.88	0.95	1.02	1.08	1.13	1.16		
						0.07	0.12	0.15	0.16	0.17	0.17	0.19	0.21	0.24	0.29	0.33	0.38	0.42	0.47	0.50	0.54	0.58	0.62	0.67	0.72	0.79	0.85	0.92	0.98	1.03	1.06		
						0.07	0.12	0.15	0.16	0.17	0.18	0.19	0.21	0.25	0.29	0.34	0.39	0.43	0.47	0.51	0.55	0.59	0.63	0.68	0.73	0.80	0.87	0.94	1.00	1.04	1.07		
						0.07	0.12	0.15	0.16	0.17	0.17	0.19	0.21	0.24	0.29	0.33	0.38	0.42	0.47	0.50	0.54	0.58	0.62	0.67	0.72	0.79	0.86	0.92	0.98	1.03	1.06		
						0.07	0.12	0.15	0.17	0.18	0.20	0.22	0.25	0.30	0.34	0.39	0.44	0.48	0.52	0.55	0.59	0.64	0.69	0.75	0.81	0.88	0.95	1.01	1.06	1.08			
						0.07	0.12	0.15	0.17	0.17	0.18	0.20	0.22	0.25	0.30	0.34	0.39	0.43	0.48	0.51	0.55	0.59	0.64	0.69	0.75	0.81	0.88	0.95	1.01	1.06	1.08		
						0.07	0.12	0.15	0.17	0.17	0.18	0.20	0.22	0.25	0.30	0.34	0.39	0.43	0.48	0.51	0.55	0.59	0.64	0.69	0.75	0.81	0.89	0.95	1.01	1.06	1.08		
784	USGS1425R	USGS 142 5Rc				0.06	0.10	0.13	0.14	0.14	0.15	0.16	0.18	0.21	0.25	0.28	0.32	0.36	0.40	0.43	0.47	0.51	0.55	0.60	0.66	0.72	0.78	0.85	0.91	0.96	1.01		
						0.06	0.10	0.13	0.14	0.14	0.15	0.16	0.18	0.21	0.25	0.29	0.33	0.36	0.40	0.44	0.47	0.51	0.55	0.60	0.66	0.72	0.79	0.85	0.91	0.97	1.01		
						0.06	0.10	0.13	0.14	0.14	0.15	0.16	0.18	0.21	0.24	0.28	0.32	0.36	0.40	0.43	0.47	0.51	0.55	0.60	0.65	0.71	0.78	0.84	0.90	0.95	1.00		
						0.06	0.10	0.13	0.14	0.15	0.16	0.17	0.19	0.22	0.26	0.30	0.34	0.37	0.41	0.45	0.49	0.53	0.57	0.62	0.68	0.74	0.80	0.86	0.92	0.97	1.01		
						0.06	0.10	0.13	0.14	0.15	0.16	0.17	0.19	0.22	0.26	0.30	0.34	0.38	0.41	0.45	0.49	0.53	0.57	0.62	0.68	0.74	0.80	0.86	0.92	0.97	1.02		
						0.06	0.10	0.13	0.14	0.15	0.16	0.17	0.19	0.22	0.26	0.30	0.34	0.38	0.41	0.45	0.49	0.53	0.57	0.62	0.68	0.74	0.80	0.86	0.91	0.96	1.01		
						0.06	0.10	0.13	0.14	0.15	0.15	0.17	0.19	0.22	0.25	0.29	0.33	0.37	0.41	0.45	0.48	0.52	0.56	0.61	0.67	0.73	0.79	0.85	0.91	0.96	1.01		
						0.06	0.10	0.13	0.14	0.15	0.15	0.17	0.19	0.22	0.25	0.29	0.33	0.37	0.41	0.45	0.49	0.52	0.57	0.62	0.67	0.73	0.80	0.86	0.92	0.97	1.02		
						0.06	0.10	0.13	0.14	0.15	0.16	0.17	0.19	0.22	0.26	0.30	0.34	0.38	0.41	0.45	0.49	0.53	0.57	0.62	0.68	0.74	0.80	0.86	0.92	0.98	1.03		
785.3	USGS1425S	USGS 142 5Sc				0.10	0.20	0.30	0.34	0.37	0.38	0.38	0.39	0.41	0.46	0.51	0.57	0.64	0.71	0.78	0.85	0.93	1.01	1.09	1.16	1.22	1.26	1.30	1.35	1.43	1.61	1.91	
						0.10	0.20	0.30	0.34	0.37	0.38	0.38	0.39	0.41	0.46	0.51	0.57	0.64	0.71	0.78	0.85	0.93	1.01	1.09	1.16	1.22	1.26	1.30	1.35	1.43	1.61	1.91	
						0.10	0.20	0.30	0.34	0.37	0.38	0.38	0.39	0.41	0.46	0.51	0.57	0.64	0.71	0.78	0.86	0.93	1.01	1.09	1.16	1.22	1.27	1.30	1.35	1.44	1.61	1.92	
						0.11	0.22	0.33	0.38	0.41	0.42	0.42	0.43	0.45	0.50	0.56	0.63	0.71	0.80	0.88	0.97	1.06	1.14	1.22	1.28	1.34	1.39	1.45	1.55	1.71	1.99	2.42	
						0.11	0.22	0.33	0.38	0.41	0.42	0.42	0.43	0.45	0.50	0.56	0.64	0.72	0.80	0.88	0.97	1.06	1.14	1.22	1.29	1.35	1.41	1.47	1.56	1.72	1.99	2.42	
						0.11	0.22	0.32	0.37	0.40	0.41	0.41	0.42	0.43	0.44	0.49	0.55	0.62	0.70	0.78	0.87	0.95	1.04	1.12	1.20	1.27	1.33	1.39	1.45	1.54	1.70	1.96	2.37
						0.10	0.20	0.30	0.35	0.38	0.39	0.39	0.40	0.43	0.47	0.53	0.59	0.66	0.73	0.81	0.89	0.97	1.06	1.14	1.21	1.27	1.32	1.35	1.40	1.49	1.66	1.96	
						0.10	0.20	0.30	0.35	0.38	0.39	0.39	0.40	0.43	0.47	0.53	0.59	0.66	0.74	0													

22.91	26.30	30.20	34.67	39.81	45.71	52.48	60.26	69.18	79.43	91.20	104.71	120.23	138.04	158.49	181.97	208.93	239.88	275.42	316.23	363.08	416.87	478.63	549.54	630.96	724.44	831.76	954.99	1096.48
1.11	1.20	1.30	1.39	1.47	1.53	1.57	1.58	1.59	1.61	1.68	1.82	2.06	2.43	2.93	3.53	4.21	4.86	5.41	5.77	5.88	5.72	5.33	4.77	4.12	3.47	2.81	2.00	
1.07	1.16	1.25	1.33	1.41	1.46	1.50	1.52	1.54	1.57	1.65	1.81	2.06	2.43	2.92	3.51	4.16	4.79	5.33	5.69	5.84	5.74	5.43	4.96	4.38	3.78	3.14	2.27	
1.12	1.20	1.30	1.39	1.47	1.54	1.58	1.61	1.63	1.67	1.75	1.91	2.17	2.56	3.07	3.69	4.36	5.00	5.53	5.85	5.90	5.68	5.21	4.58	3.86	3.15	2.47	1.71	
3.43	3.42	3.39	3.33	3.25	3.13	2.99	2.81	2.60	2.38	2.14	1.91	1.70	1.52	1.38	1.29	1.23	1.21	1.20	1.19	1.16	1.09	0.99	0.86	0.70	0.54	0.37	0.20	
3.45	3.44	3.41	3.34	3.26	3.14	2.99	2.82	2.62	2.41	2.19	1.98	1.78	1.61	1.46	1.35	1.26	1.19	1.14	1.09	1.02	0.94	0.84	0.72	0.59	0.46	0.33	0.19	
3.43	3.42	3.39	3.33	3.24	3.13	2.99	2.82	2.63	2.42	2.20	1.98	1.78	1.61	1.47	1.36	1.28	1.22	1.17	1.13	1.07	0.99	0.88	0.76	0.61	0.47	0.32	0.17	
1.71	1.60	1.48	1.36	1.26	1.17	1.09	1.04	0.99	0.96	0.93	0.93	0.97	1.09	1.33	1.71	2.25	2.93	3.68	4.42	5.06	5.48	5.62	5.47	5.03	4.41	3.63	2.57	
1.73	1.62	1.50	1.38	1.27	1.18	1.11	1.06	1.02	0.98	0.96	0.97	1.03	1.19	1.46	1.89	2.47	3.15	3.89	4.57	5.10	5.40	5.42	5.15	4.63	3.97	3.20	2.23	
1.70	1.59	1.47	1.35	1.24	1.15	1.09	1.04	1.01	0.98	0.96	0.97	1.02	1.16	1.42	1.84	2.42	3.12	3.90	4.63	5.23	5.58	5.62	5.34	4.78	4.06	3.21	2.19	
1.60	1.58	1.57	1.58	1.61	1.63	1.65	1.65	1.63	1.59	1.54	1.52	1.54	1.65	1.89	2.25	2.74	3.31	3.90	4.41	4.76	4.88	4.73	4.32	3.72	3.02	2.28	1.47	
1.56	1.53	1.53	1.54	1.56	1.59	1.62	1.64	1.63	1.61	1.57	1.55	1.56	1.63	1.81	2.11	2.52	3.02	3.58	4.10	4.53	4.78	4.81	4.61	4.19	3.62	2.93	2.03	
1.59	1.57	1.56	1.58	1.61	1.65	1.68	1.70	1.69	1.66	1.61	1.56	1.56	1.64	1.85	2.19	2.67	3.25	3.86	4.40	4.77	4.90	4.75	4.33	3.71	2.99	2.23	1.43	
1.07	1.12	1.13	1.11	1.07	1.04	1.07	1.21	1.53	2.07	2.85	3.83	4.96	6.10	7.13	7.88	8.25	8.17	7.62	6.70	5.51	4.21	2.93	1.80	0.39				
1.08	1.13	1.14	1.12	1.08	1.05	1.08	1.22	1.54	2.07	2.85	3.83	4.96	6.10	7.12	7.86	8.22	8.13	7.58	6.67	5.48	4.21	2.93	1.83	0.41				
1.09	1.14	1.16	1.14	1.11	1.08	1.11	1.25	1.56	2.09	2.86	3.83	4.95	6.09	7.12	7.88	8.26	8.19	7.64	6.71	5.50	4.18	2.84	1.52	0.27				
1.00	1.03	1.03	1.00	0.96	0.93	0.97	1.12	1.45	1.99	2.77	3.75	4.88	6.02	7.08	7.88	8.31	8.30	7.82	6.94	5.76	4.45	3.10	1.92	0.42				
0.98	1.02	1.02	0.99	0.96	0.93	0.97	1.12	1.44	1.97	2.72	3.68	4.79	5.94	7.01	7.84	8.31	8.33	7.89	7.04	5.86	4.55	3.19	2.01	0.45				
1.01	1.04	1.04	1.02	0.98	0.96	1.00	1.15	1.47	2.01	2.78	3.75	4.88	6.03	7.09	7.89	8.34	8.32	7.83	6.94	5.74	4.40	3.03	1.72	0.34				
0.93	0.97	0.98	0.96	0.93	0.90	0.93	1.06	1.36	1.87	2.62	3.59	4.72	5.89	7.00	7.86	8.37	8.43	8.02	7.19	6.03	4.72	3.35	2.18	0.51				
0.93	0.96	0.97	0.95	0.91	0.89	0.92	1.06	1.37	1.89	2.65	3.62	4.75	5.92	7.02	7.88	8.39	8.44	8.02	7.19	6.03	4.71	3.32	2.14	0.50				
0.91	0.94	0.95	0.93	0.90	0.87	0.90	1.03	1.33	1.83	2.57	3.52	4.65	5.83	6.96	7.86	8.42	8.53	8.15	7.34	6.18	4.84	3.43	2.21	0.52				
1.17	1.18	1.22	1.31	1.50	1.82	2.30	2.93	3.70	4.54	5.38	6.13	6.71	7.02	7.04	6.76	6.20	5.42	4.49	3.51	2.57	1.70	1.08	0.30	0.02				
1.18	1.19	1.23	1.32	1.51	1.83	2.31	2.95	3.73	4.58	5.44	6.18	6.75	7.04	7.04	6.73	6.14	5.34	4.41	3.44	2.51	1.66	1.06	0.30	0.03				
1.18	1.19	1.23	1.33	1.53	1.85	2.33	2.96	3.72	4.55	5.39	6.13	6.69	7.01	7.03	6.75	6.19	5.42	4.49	3.52	2.56	1.73	0.97	0.15	0.00				
1.08	1.10	1.14	1.24	1.44	1.76	2.24	2.87	3.63	4.48	5.33	6.10	6.70	7.06	7.14	6.93	6.43	5.72	4.83	3.87	2.90	2.00	1.20	0.21	0.00				
1.09	1.11	1.16	1.26	1.46	1.79	2.28	2.93	3.71	4.57	5.43	6.21	6.81	7.15	7.21	6.96	6.42	5.66	4.73	3.75	2.77	1.82	0.81	0.09	0.00				
1.08	1.10	1.14	1.24	1.44	1.77	2.25	2.89	3.67	4.52	5.37	6.13	6.72	7.06	7.12	6.88	6.37	5.65	4.76	3.82	2.88	2.01	1.28	0.23	0.00				
1.10	1.11	1.16	1.26	1.48	1.83	2.34	3.03	3.84	4.73	5.62	6.38	6.95	7.24	7.21	6.87	6.24	5.41	4.43	3.43	2.47	1.61	1.02	0.20	0.00				
1.10	1.12	1.16	1.27	1.48	1.83	2.34	3.02	3.83	4.71	5.59	6.34	6.91	7.19	7.17	6.84	6.22	5.41	4.45	3.47	2.52	1.67	1.06	0.28	0.02				
1.10	1.11	1.16	1.26	1.47	1.82	2.34	3.02	3.85	4.74	5.62	6.39	6.95	7.24	7.21	6.86	6.23	5.40	4.43	3.43	2.48	1.61	1.03	0.20	0.00				
1.06	1.12	1.22	1.37	1.60	1.93	2.35	2.87	3.47	4.10	4.72	5.29	5.77	6.12	6.32	6.36	6.21	5.87	5.35	4.67	3.88	3.03	2.17	1.46	0.36	0.00			
1.06	1.12	1.22	1.37	1.60	1.93	2.37	2.90	3.50	4.13	4.75	5.31	5.77	6.10	6.28	6.30	6.15	5.81	5.30	4.65	3.86	3.04	2.19	1.45	0.44	0.02			
1.05	1.11	1.21	1.36	1.59	1.91	2.34	2.85	3.44	4.05	4.67	5.23	5.71	6.06	6.28	6.33	6.20	5.90	5.40	4.75	3.96	3.12	2.25	1.50	0.46	0.03			
1.06	1.13	1.23	1.38	1.60	1.90	2.29	2.77	3.30	3.87	4.43	4.96	5.42	5.79	6.04	6.16	6.13	5.92	5.51	4.93	4.19	3.36	2.49	1.66	0.76	0.09			
1.07	1.13	1.23	1.38	1.60	1.90	2.29	2.76	3.30	3.87	4.45	5.00	5.48	5.87	6.14	6.26	6.21	5.96	5.52	4.89	4.12	3.27	2.38	1.61	0.56	0.08			
1.07	1.14	1.24	1.39	1.61	1.91	2.30	2.76	3.28	3.83	4.38	4.91	5.39	5.79	6.09	6.25	6.25	6.06	5.64	5.02	4.23	3.34	2.41	1.60	0.47	0.02			
1.07	1.14	1.25	1.40	1.63	1.93	2.33	2.80	3.34	3.91	4.48	5.02	5.49	5.87	6.14	6.26	6.21	5.97	5.52	4.90	4.12	3.26	2.36	1.57	0.49	0.04			
1.08	1.15	1.25	1.41	1.63	1.94	2.33	2.81	3.35	3.92	4.49	5.04	5.52	5.91	6.18	6.30	6.25	6.00	5.54	4.89	4.08	3.20	2.27	1.51	0.36	0.00			
1.08	1.15	1.25	1.41	1.63	1.94	2.34	2.82	3.37	3.95	4.53	5.08	5.57	5.94	6.20	6.30	6.22	5.96	5.49	4.84	4.03	3.16	2.25	1.48	0.35	0.00			
2.40	3.07	3.92	4.90	5.91	6.82	7.50	7.84	7.75	7.24	6.37	5.24	4.00	2.77	1.77	0.77	0.05												
2.39	3.06	3.91	4.90	5.91	6.83	7.51	7.84	7.76	7.25	6.37	5.24	4.00	2.77	1.78	0.77	0.05												
2.40	3.07	3.92	4.91	5.92	6.84	7.52	7.85	7.75	7.23	6.35	5.21	3.97	2.75	1.76	0.77	0.05												
3.03	3.81	4.71	5.66	6.54	7.21	7.57	7.54	7.10	6.30	5.25	4.08	2.92	1.89	1.07	0.44	0.12												
3.01	3.79	4.69	5.64	6.53	7.21	7.58	7.56	7.12	6.32	5.26	4.09	2.92	1.88	1.10	0.40	0.00												
2.94	3.69	4.57	5.51	6.40	7.12	7.54	7.58	7.22	6.48	5.45	4.27	3.07	1.99	1.12	0.45	0.11												
2.44	3.12	3.98	4.96	5.97	6.88	7.53	7.81	7.67	7.10	6.16	5.00	3.75	2.57	1.55	0.80	0.26												
2.45	3.13	3.99	4.97	5.98	6.88	7.53	7.81	7.66	7.08	6.14	4.99	3.74	2.57	1.55	0.80	0.26</												

Depth (ft)	Sample No.	Sample Name	Result Between User Sizes (Sizes in um)																																
			0.36	0.42	0.48	0.55	0.63	0.72	0.83	0.95	1.10	1.26	1.45	1.66	1.91	2.19	2.51	2.88	3.31	3.80	4.37	5.01	5.75	6.61	7.59	8.71	10.00	11.48	13.18	15.14	17.38	19.95			
804.5	USGS1426A	USGS142 6Ac					0.12	0.24	0.35	0.40	0.43	0.44	0.43	0.44	0.44	0.48	0.53	0.59	0.66	0.74	0.83	0.93	1.03	1.14	1.24	1.24	1.34	1.44	1.52	1.62	1.75	1.96	2.27	2.75	
							0.12	0.23	0.35	0.40	0.43	0.43	0.42	0.42	0.44	0.47	0.53	0.59	0.66	0.74	0.82	0.92	1.03	1.13	1.24	1.34	1.44	1.52	1.62	1.74	1.94	2.25	2.72		
							0.12	0.24	0.35	0.40	0.43	0.43	0.42	0.44	0.48	0.53	0.59	0.66	0.74	0.82	0.92	1.03	1.13	1.24	1.34	1.44	1.52	1.62	1.74	1.94	2.25	2.72			
							0.15	0.28	0.40	0.45	0.48	0.47	0.46	0.46	0.48	0.53	0.60	0.67	0.74	0.81	0.87	0.92	0.99	1.07	1.20	1.38	1.65	2.01	2.46	2.99	3.58	4.18	4.76		
							0.15	0.28	0.40	0.45	0.48	0.47	0.46	0.46	0.48	0.53	0.60	0.67	0.74	0.81	0.87	0.92	0.99	1.07	1.19	1.38	1.65	2.00	2.45	2.98	3.57	4.17	4.76		
							0.15	0.28	0.40	0.45	0.48	0.47	0.46	0.46	0.48	0.53	0.60	0.67	0.74	0.81	0.87	0.92	0.98	1.07	1.19	1.38	1.65	2.00	2.45	2.98	3.56	4.16	4.74		
							0.12	0.23	0.34	0.39	0.41	0.41	0.41	0.41	0.43	0.47	0.53	0.59	0.66	0.73	0.81	0.88	0.97	1.05	1.15	1.27	1.40	1.54	1.72	1.93	2.18	2.50	2.90		
							0.12	0.23	0.34	0.39	0.41	0.41	0.41	0.41	0.43	0.48	0.53	0.59	0.66	0.73	0.81	0.88	0.97	1.06	1.16	1.27	1.40	1.55	1.72	1.93	2.18	2.50	2.89		
				0.12	0.23	0.34	0.39	0.41	0.41	0.41	0.41	0.43	0.48	0.53	0.59	0.66	0.74	0.81	0.89	0.97	1.06	1.16	1.27	1.40	1.55	1.73	1.94	2.19	2.51	2.90					
805.6	USGS1426B	USGS 142 6Bc					0.20	0.46	0.63	0.76	0.82	0.84	0.86	0.89	0.95	1.06	1.20	1.35	1.52	1.69	1.85	2.01	2.16	2.29	2.41	2.51	2.59	2.66	2.72	2.78	2.86	2.97	3.14		
							0.20	0.46	0.63	0.75	0.81	0.84	0.85	0.88	0.95	1.05	1.19	1.34	1.51	1.68	1.84	2.00	2.14	2.27	2.39	2.49	2.58	2.65	2.71	2.77	2.85	2.96	3.12		
							0.20	0.46	0.62	0.75	0.81	0.83	0.85	0.88	0.95	1.05	1.19	1.34	1.51	1.68	1.84	2.00	2.14	2.28	2.40	2.50	2.58	2.65	2.71	2.78	2.86	2.97	3.14		
							0.22	0.48	0.65	0.78	0.84	0.87	0.88	0.91	0.98	1.08	1.21	1.37	1.54	1.71	1.88	2.05	2.20	2.34	2.46	2.56	2.64	2.70	2.74	2.79	2.85	2.94	3.09		
							0.22	0.48	0.65	0.77	0.84	0.87	0.88	0.91	0.98	1.08	1.22	1.37	1.54	1.71	1.89	2.05	2.21	2.34	2.47	2.57	2.65	2.71	2.75	2.80	2.86	2.95	3.10		
							0.21	0.47	0.64	0.77	0.83	0.86	0.88	0.91	0.97	1.07	1.21	1.36	1.53	1.70	1.87	2.04	2.19	2.33	2.46	2.56	2.64	2.70	2.75	2.80	2.85	2.95	3.09		
							0.24	0.53	0.72	0.86	0.94	0.98	1.00	1.04	1.12	1.23	1.38	1.55	1.73	1.91	2.09	2.26	2.42	2.55	2.66	2.73	2.77	2.77	2.75	2.72	2.72	2.75	2.85		
							0.24	0.53	0.72	0.86	0.93	0.97	1.00	1.04	1.11	1.23	1.37	1.54	1.72	1.90	2.08	2.26	2.41	2.55	2.65	2.72	2.76	2.76	2.75	2.72	2.72	2.75	2.85		
				0.24	0.52	0.71	0.85	0.93	0.97	0.99	1.03	1.10	1.22	1.36	1.53	1.71	1.89	2.07	2.24	2.40	2.53	2.64	2.71	2.75	2.76	2.74	2.72	2.71	2.74	2.84					
807	USGS1426C	USGS 142 6Cc					0.13	0.28	0.43	0.51	0.57	0.60	0.62	0.66	0.72	0.80	0.89	0.99	1.08	1.16	1.23	1.30	1.37	1.46	1.57	1.71	1.87	2.04	2.23	2.41	2.57	2.70	2.80		
							0.13	0.28	0.43	0.51	0.56	0.59	0.62	0.66	0.72	0.80	0.89	0.98	1.07	1.15	1.23	1.30	1.37	1.46	1.57	1.70	1.86	2.04	2.23	2.41	2.57	2.69	2.79		
							0.14	0.28	0.43	0.51	0.57	0.59	0.62	0.66	0.72	0.80	0.89	0.98	1.07	1.15	1.23	1.30	1.37	1.46	1.57	1.70	1.86	2.04	2.23	2.41	2.57	2.69	2.79		
							0.14	0.29	0.44	0.52	0.58	0.61	0.63	0.66	0.72	0.80	0.89	0.98	1.07	1.15	1.23	1.31	1.39	1.48	1.59	1.72	1.87	2.04	2.22	2.40	2.57	2.71	2.82		
							0.14	0.29	0.44	0.52	0.58	0.60	0.63	0.66	0.72	0.79	0.88	0.98	1.07	1.15	1.23	1.30	1.38	1.48	1.59	1.72	1.87	2.04	2.23	2.40	2.57	2.71	2.83		
							0.14	0.29	0.44	0.52	0.57	0.60	0.62	0.66	0.71	0.79	0.88	0.97	1.06	1.14	1.22	1.29	1.37	1.46	1.57	1.71	1.86	2.03	2.22	2.40	2.57	2.71	2.84		
							0.14	0.29	0.44	0.52	0.58	0.61	0.63	0.67	0.72	0.80	0.90	0.99	1.08	1.17	1.25	1.32	1.40	1.49	1.60	1.73	1.88	2.05	2.23	2.40	2.56	2.69	2.80		
							0.14	0.29	0.44	0.52	0.58	0.61	0.63	0.67	0.72	0.80	0.90	0.99	1.08	1.17	1.25	1.32	1.40	1.49	1.60	1.73	1.88	2.05	2.23	2.40	2.56	2.69	2.80		
808.8	USGS142 6D	USGS 142 6Dc					0.11	0.22	0.32	0.38	0.41	0.42	0.43	0.45	0.49	0.55	0.62	0.70	0.79	0.87	0.94	1.02	1.09	1.16	1.23	1.31	1.41	1.51	1.63	1.78	1.95	2.15	2.40		
							0.11	0.22	0.33	0.38	0.41	0.43	0.43	0.45	0.49	0.55	0.63	0.71	0.79	0.88	0.95	1.02	1.10	1.16	1.24	1.32	1.41	1.52	1.64	1.79	1.96	2.17	2.42		
							0.11	0.22	0.32	0.38	0.41	0.43	0.43	0.45	0.49	0.55	0.63	0.71	0.79	0.87	0.95	1.02	1.09	1.16	1.24	1.32	1.41	1.52	1.64	1.78	1.96	2.16	2.41		
							0.12	0.23	0.34	0.40	0.44	0.45	0.46	0.48	0.51	0.57	0.65	0.73	0.81	0.90	0.98	1.06	1.13	1.21	1.29	1.38	1.47	1.58	1.70	1.85	2.03	2.25	2.52		
							0.12	0.23	0.34	0.40	0.43	0.44	0.45	0.47	0.51	0.57	0.64	0.72	0.81	0.89	0.97	1.05	1.12	1.20	1.28	1.36	1.46	1.56	1.68	1.83	2.01	2.23	2.50		
							0.12	0.23	0.34	0.40	0.43	0.44	0.45	0.47	0.51	0.57	0.64	0.72	0.81	0.89	0.97	1.05	1.12	1.20	1.28	1.36	1.46	1.56	1.69	1.83	2.01	2.24	2.51		
							0.11	0.23	0.34	0.40	0.43	0.44	0.45	0.47	0.50	0.56	0.64	0.72	0.81	0.89	0.97	1.05	1.13	1.21	1.30	1.39	1.49	1.61	1.75	1.92	2.13	2.37	2.68		
							0.11	0.23	0.34	0.40	0.43	0.44	0.45	0.46	0.50	0.56	0.64	0.72	0.80	0.89	0.97	1.05	1.13	1.21	1.29	1.38	1.49	1.61	1.75	1.91	2.12	2.36	2.67		
807.5	USGS1426E	USGS 142 6Ec					0.11	0.23	0.36	0.43	0.48	0.51	0.54	0.57	0.63	0.71	0.80	0.89	0.98	1.07	1.14	1.21	1.28	1.34	1.41	1.49	1.57	1.67	1.78	1.91	2.05	2.20	2.37		
							0.11	0.23	0.36	0.43	0.48	0.51	0.54	0.57	0.63	0.71	0.80	0.89	0.98	1.06	1.14	1.21	1.28	1.34	1.41	1.49	1.58	1.68	1.79	1.92	2.06	2.21	2.37		
							0.11	0.23	0.36	0.43	0.48	0.51	0.53	0.57	0.62	0.70	0.79	0.88	0.97	1.05	1.13	1.20	1.26	1.32	1.39	1.47	1.56	1.66	1.77	1.90	2.04	2.19	2.36		
							0.06	0.13	0.20	0.23	0.26	0.28	0.29	0.31	0.34	0.38	0.43	0.49	0.54	0.58	0.62	0.66	0.69	0.72	0.75	0.79	0.84	0.91	0.99	1.08	1.19	1.32	1.45		
							0.06	0.13	0.20	0.24	0.26	0.28	0.29	0.31	0.34	0.38	0.43	0.49	0.54	0.58	0.63	0.66	0.69	0.72	0.75	0.79	0.84	0.91	0.99	1.09	1.20	1.32	1.46		
							0.06	0.13	0.20	0.23	0.26	0.28	0.29	0.31	0.34	0.38	0.43	0.48	0.54	0.58	0.62	0.66	0.69	0.72	0.75	0.79	0.84	0.90	0.99	1.08	1.19	1.32	1.45		
							0.00	0.09	0.16	0.19	0.21	0.23	0.24	0.25	0.28	0.32	0.36	0.41	0.45	0.49	0.53	0.56	0.58	0.61	0.63	0.66	0.70	0.75	0.82	0.90	1.00	1.12	1.25		
							0.00	0.09	0.15	0.19	0.21	0.22	0.23	0.25	0.28	0.31	0.36	0.40	0.44	0.48	0.52	0.55	0.58	0.60	0.63	0.66	0.70	0.75	0.81	0.89	0.99	1.11	1.24		
				0.00	0.09	0.15	0.19	0.21	0.22	0.24	0.25	0.28	0.31	0.36	0.40	0.45	0.49	0.52	0.55	0.58	0.60	0.63	0.66	0.70	0.75	0.82	0.90	1.00	1.11	1.24					
830.1	USGS1427A	USGS 142 7Ac								0.03	0.07	0.07	0.09	0.10	0.13	0.15	0.18	0.21	0.24	0.27	0.30	0.33	0.36	0.39	0.42	0.44	0.47	0.49	0.52	0.56	0.61	0.68			
										0.03	0.07	0.07	0.09	0.10	0.13	0.15	0.18	0.21	0.24	0.27	0.31	0.34	0.36	0.39	0.42	0.44	0.47	0.49	0.52	0.56	0.61	0.			

22.91	26.30	30.20	34.67	39.81	45.71	52.48	60.26	69.18	79.43	91.20	104.71	120.23	138.04	158.49	181.97	208.93	239.88	275.42	316.23	363.08	416.87	478.63	549.54	630.96	724.44	831.76	954.99	1096.48
3.39	4.21	5.15	6.11	6.98	7.60	7.87	7.70	7.09	6.11	4.88	3.56	2.37	0.78	0.05	0.00	0.00	0.00	0.00	0.00									
3.36	4.17	5.10	6.07	6.93	7.56	7.84	7.69	7.10	6.13	4.91	3.63	2.40	1.05	0.08	0.00	0.00	0.00	0.00	0.00									
3.36	4.18	5.11	6.08	6.95	7.58	7.86	7.70	7.10	6.13	4.90	3.62	2.39	1.03	0.06	0.00	0.00	0.00	0.00	0.00									
5.27	5.68	5.95	6.06	6.01	5.80	5.46	5.00	4.45	3.84	3.21	2.58	1.98	1.45	1.00	0.63	0.36	0.17	0.06	0.00									
5.27	5.68	5.94	6.06	6.00	5.80	5.45	4.99	4.44	3.84	3.20	2.58	1.99	1.47	1.01	0.65	0.38	0.19	0.07	0.00									
5.24	5.64	5.91	6.02	5.97	5.77	5.44	4.99	4.46	3.87	3.24	2.63	2.03	1.50	1.04	0.67	0.39	0.20	0.08	0.01									
3.38	3.95	4.58	5.23	5.85	6.34	6.65	6.71	6.48	5.99	5.25	4.36	3.38	2.45	1.60	0.96	0.41	0.00	0.00	0.00									
3.37	3.94	4.57	5.22	5.84	6.34	6.65	6.71	6.49	6.00	5.26	4.37	3.39	2.45	1.59	0.95	0.40	0.00	0.00	0.00									
3.38	3.94	4.57	5.21	5.82	6.32	6.63	6.69	6.48	5.99	5.26	4.37	3.40	2.46	1.60	0.96	0.40	0.00	0.00	0.00									
3.37	3.65	3.97	4.30	4.57	4.75	4.78	4.66	4.36	3.91	3.35	2.73	2.09	1.50	0.97	0.56	0.25	0.07											
3.34	3.61	3.92	4.23	4.50	4.68	4.73	4.63	4.35	3.93	3.39	2.79	2.17	1.59	1.07	0.65	0.33	0.14											
3.35	3.63	3.94	4.25	4.51	4.68	4.72	4.60	4.31	3.89	3.35	2.76	2.16	1.59	1.08	0.68	0.36	0.17											
3.30	3.58	3.90	4.23	4.51	4.69	4.72	4.58	4.26	3.80	3.24	2.65	2.06	1.53	1.06	0.70	0.37	0.08											
3.31	3.59	3.91	4.23	4.52	4.70	4.73	4.59	4.28	3.81	3.25	2.65	2.06	1.52	1.03	0.67	0.31	0.00											
3.30	3.57	3.88	4.20	4.48	4.67	4.71	4.58	4.28	3.83	3.28	2.69	2.09	1.55	1.06	0.68	0.36	0.16											
3.03	3.28	3.59	3.92	4.22	4.43	4.51	4.44	4.19	3.79	3.26	2.67	2.06	1.49	0.98	0.61	0.27	0.00											
3.02	3.27	3.58	3.90	4.19	4.40	4.49	4.42	4.18	3.80	3.29	2.71	2.10	1.54	1.03	0.65	0.30	0.00											
3.01	3.26	3.56	3.89	4.18	4.39	4.48	4.42	4.19	3.81	3.30	2.73	2.13	1.56	1.05	0.65	0.34	0.15											
2.88	2.95	3.05	3.18	3.37	3.62	3.92	4.24	4.53	4.75	4.85	4.78	4.53	4.10	3.50	2.82	2.09	1.41	0.73	0.02	0.00								
2.87	2.94	3.03	3.16	3.35	3.60	3.90	4.22	4.52	4.74	4.83	4.77	4.51	4.08	3.49	2.81	2.08	1.41	0.85	0.20	0.02								
2.86	2.94	3.03	3.17	3.37	3.63	3.93	4.25	4.55	4.76	4.84	4.76	4.49	4.05	3.45	2.78	2.06	1.40	0.84	0.21	0.02								
2.92	3.00	3.10	3.22	3.40	3.63	3.91	4.21	4.50	4.71	4.81	4.74	4.49	4.04	3.44	2.75	2.02	1.35	0.79	0.15	0.01								
2.93	3.02	3.12	3.25	3.43	3.66	3.94	4.23	4.50	4.70	4.78	4.69	4.43	3.99	3.39	2.72	2.01	1.36	0.82	0.20	0.02								
2.94	3.04	3.14	3.27	3.45	3.67	3.94	4.23	4.50	4.69	4.77	4.70	4.43	4.00	3.41	2.74	2.02	1.37	0.82	0.19	0.02								
2.88	2.96	3.06	3.18	3.36	3.60	3.89	4.20	4.50	4.73	4.83	4.78	4.52	4.08	3.47	2.77	2.02	1.34	0.77	0.11	0.01								
2.89	2.97	3.06	3.19	3.36	3.60	3.88	4.19	4.49	4.72	4.83	4.78	4.53	4.09	3.48	2.78	2.03	1.34	0.76	0.10	0.00								
2.90	2.98	3.07	3.19	3.37	3.60	3.88	4.19	4.49	4.73	4.84	4.79	4.54	4.09	3.47	2.76	2.00	1.30	0.73	0.02	0.00								
2.70	3.05	3.44	3.86	4.27	4.64	4.94	5.14	5.20	5.13	4.91	4.57	4.11	3.59	3.02	2.46	1.94	1.51	1.15	0.89	0.71	0.58	0.49	0.41	0.34	0.27	0.20	0.13	
2.72	3.07	3.46	3.87	4.28	4.66	4.95	5.14	5.20	5.12	4.89	4.54	4.08	3.56	3.01	2.48	1.98	1.57	1.23	0.97	0.77	0.61	0.47	0.35	0.26	0.15	0.07	0.00	
2.71	3.06	3.45	3.87	4.28	4.65	4.94	5.13	5.19	5.10	4.88	4.54	4.09	3.59	3.04	2.52	2.02	1.60	1.25	0.97	0.76	0.60	0.46	0.35	0.25	0.15	0.07	0.00	
2.86	3.25	3.68	4.13	4.56	4.93	5.19	5.30	5.25	5.04	4.67	4.19	3.63	3.07	2.52	2.05	1.66	1.36	1.14	0.97	0.82	0.69	0.55	0.42	0.31	0.18	0.08	0.00	
2.83	3.21	3.63	4.07	4.49	4.85	5.11	5.23	5.19	4.98	4.62	4.16	3.62	3.06	2.52	2.05	1.67	1.38	1.17	1.01	0.89	0.77	0.65	0.53	0.41	0.30	0.21	0.13	
2.84	3.22	3.65	4.08	4.50	4.86	5.11	5.23	5.19	4.99	4.64	4.18	3.64	3.08	2.53	2.06	1.66	1.37	1.15	0.99	0.86	0.74	0.62	0.50	0.38	0.28	0.19	0.12	
3.04	3.45	3.90	4.35	4.76	5.09	5.29	5.34	5.22	4.93	4.50	3.99	3.41	2.84	2.31	1.85	1.49	1.22	1.02	0.88	0.75	0.64	0.52	0.41	0.31	0.22	0.15	0.09	
3.03	3.44	3.89	4.34	4.75	5.08	5.29	5.34	5.21	4.92	4.50	3.98	3.41	2.84	2.31	1.87	1.51	1.26	1.08	0.95	0.83	0.71	0.58	0.43	0.31	0.16	0.06	0.00	
3.04	3.45	3.90	4.35	4.76	5.08	5.28	5.32	5.20	4.92	4.50	3.99	3.43	2.86	2.33	1.87	1.49	1.22	1.01	0.87	0.75	0.64	0.53	0.42	0.31	0.22	0.13	0.08	
2.55	2.74	2.92	3.09	3.24	3.36	3.45	3.51	3.55	3.59	3.66	3.76	3.87	3.97	4.01	3.94	3.72	3.35	2.84	2.24	1.59	1.03	0.24	0.02					
2.54	2.71	2.88	3.04	3.19	3.32	3.44	3.53	3.62	3.71	3.80	3.91	4.01	4.07	4.06	3.94	3.68	3.27	2.74	2.13	1.50	0.97	0.13	0.00					
2.52	2.69	2.86	3.01	3.15	3.27	3.36	3.44	3.51	3.59	3.69	3.82	3.95	4.05	4.09	4.01	3.78	3.40	2.88	2.28	1.67	1.07	0.42	0.03					
1.59	1.74	1.89	2.05	2.22	2.43	2.68	3.00	3.42	3.95	4.56	5.22	5.84	6.34	6.61	6.57	6.18	5.47	4.50	3.42	2.32	1.34	0.17	0.00					
1.60	1.75	1.90	2.06	2.24	2.44	2.69	3.01	3.43	3.95	4.56	5.22	5.85	6.35	6.62	6.58	6.19	5.47	4.49	3.40	2.28	1.22	0.14	0.00					
1.59	1.74	1.89	2.04	2.21	2.41	2.66	2.99	3.41	3.93	4.55	5.22	5.86	6.36	6.65	6.61	6.22	5.51	4.53	3.43	2.30	1.24	0.14	0.00					
1.39	1.53	1.67	1.81	1.96	2.12	2.33	2.64	3.06	3.64	4.35	5.16	5.98	6.69	7.17	7.30	7.01	6.32	5.28	4.07	2.80	1.69	0.22	0.00					
1.37	1.52	1.66	1.79	1.93	2.09	2.31	2.61	3.04	3.62	4.35	5.17	6.01	6.74	7.24	7.38	7.09	6.39	5.33	4.09	2.79	1.63	0.20	0.00					
1.38	1.52	1.65	1.79	1.93	2.10	2.32	2.62	3.06	3.64	4.36	5.17	5.99	6.70	7.18	7.31	7.02	6.34	5.31	4.11	2.84	1.75	0.23	0.00					
0.77	0.87	0.98	1.09	1.17	1.21	1.20	1.15	1.10	1.08	1.17	1.44	1.96	2.75	3.81	5.04	6.35	7.51	8.39	8.80	8.66	7.95	6.77	5.27	3.68	2.13	0.56		
0.77	0.87	0.98	1.08	1.16	1.20	1.19	1.14	1.09	1.09	1.20	1.50	2.03	2.83	3.89	5.10	6.37	7.50	8.33	8.71	8.55	7.86	6.69	5.24	3.68	2.18	0.61		
0.77	0.88	0.98	1.08	1.16	1.20	1.19	1.15	1.10	1.11	1.22	1.52	2.06	2.86	3.92	5.13	6.39	7.50	8.32	8.69	8.52	7.81	6.65	5.20	3.65	2.16	0.60		
0.78	0.88	0.99	1.09	1.17	1.20	1.19	1.15	1.10	1.09	1.19	1.46	1.99	2.77	3.83	5.05	6.33	7.49	8.35	8.75	8.61	7.91	6.73	5.25	3.67				

Depth (ft)	Sample No.	Sample Name	Result Between User Sizes (Sizes in um)																																	
			0.36	0.42	0.48	0.55	0.63	0.72	0.83	0.95	1.10	1.26	1.45	1.66	1.91	2.19	2.51	2.88	3.31	3.80	4.37	5.01	5.75	6.61	7.59	8.71	10.00	11.48	13.18	15.14	17.38	19.95				
832	USGS1427B	USGS 142 7Bc								0.00	0.03	0.07	0.07	0.08	0.10	0.11	0.13	0.15	0.18	0.20	0.22	0.24	0.26	0.29	0.31	0.33	0.35	0.37	0.40	0.42	0.45	0.49	0.53			
									0.00	0.03	0.07	0.07	0.08	0.10	0.11	0.13	0.15	0.18	0.20	0.22	0.24	0.26	0.28	0.31	0.33	0.35	0.38	0.40	0.42	0.45	0.49	0.53				
									0.00	0.03	0.07	0.07	0.08	0.09	0.11	0.13	0.15	0.17	0.19	0.21	0.24	0.26	0.28	0.30	0.32	0.34	0.37	0.39	0.41	0.44	0.47	0.52				
									0.03	0.07	0.07	0.08	0.09	0.10	0.12	0.14	0.16	0.19	0.21	0.23	0.25	0.28	0.30	0.32	0.35	0.37	0.39	0.42	0.44	0.47	0.51	0.56				
									0.03	0.07	0.07	0.08	0.09	0.10	0.12	0.14	0.16	0.18	0.21	0.23	0.25	0.28	0.30	0.32	0.34	0.37	0.39	0.41	0.44	0.47	0.51	0.56				
									0.03	0.06	0.07	0.08	0.09	0.10	0.12	0.14	0.16	0.18	0.20	0.23	0.25	0.27	0.29	0.31	0.34	0.36	0.38	0.41	0.43	0.46	0.50	0.55				
									0.03	0.07	0.08	0.08	0.10	0.11	0.13	0.15	0.18	0.20	0.22	0.25	0.27	0.30	0.32	0.35	0.37	0.40	0.42	0.45	0.48	0.51	0.55	0.60				
									0.04	0.07	0.08	0.09	0.10	0.11	0.13	0.16	0.18	0.21	0.23	0.26	0.28	0.31	0.33	0.36	0.38	0.41	0.44	0.46	0.49	0.53	0.57	0.61				
									0.03	0.07	0.08	0.08	0.10	0.11	0.13	0.15	0.18	0.20	0.23	0.25	0.27	0.30	0.32	0.35	0.37	0.40	0.42	0.45	0.48	0.51	0.55	0.60				
832.5	USGS1427C	USGS 142 7Cc								0.00	0.01	0.07	0.08	0.10	0.12	0.15	0.17	0.19	0.21	0.23	0.24	0.25	0.26	0.27	0.29	0.32	0.37	0.45	0.54	0.64						
									0.00	0.01	0.07	0.08	0.10	0.12	0.15	0.17	0.19	0.21	0.23	0.24	0.25	0.26	0.27	0.29	0.32	0.37	0.44	0.54	0.64							
									0.00	0.01	0.07	0.08	0.10	0.12	0.14	0.17	0.19	0.21	0.22	0.24	0.24	0.25	0.26	0.28	0.32	0.37	0.44	0.53	0.63							
									0.00	0.01	0.07	0.08	0.10	0.12	0.14	0.16	0.18	0.20	0.22	0.23	0.24	0.25	0.26	0.28	0.31	0.36	0.43	0.52	0.62							
									0.00	0.01	0.07	0.08	0.10	0.12	0.14	0.17	0.19	0.21	0.22	0.24	0.24	0.25	0.25	0.27	0.29	0.32	0.37	0.44	0.54	0.64						
									0.00	0.01	0.07	0.08	0.10	0.12	0.14	0.16	0.18	0.20	0.22	0.23	0.24	0.25	0.26	0.28	0.31	0.36	0.43	0.52	0.62							
									0.01	0.06	0.07	0.09	0.11	0.13	0.15	0.18	0.20	0.22	0.23	0.24	0.25	0.26	0.28	0.30	0.34	0.39	0.48	0.57	0.68							
									0.01	0.06	0.07	0.09	0.11	0.13	0.15	0.17	0.20	0.21	0.23	0.24	0.25	0.26	0.27	0.29	0.33	0.39	0.47	0.56	0.67							
									0.01	0.06	0.07	0.09	0.11	0.13	0.15	0.18	0.20	0.22	0.23	0.24	0.25	0.26	0.28	0.30	0.34	0.39	0.47	0.57	0.67							
834.7	USGS142 7E	No Grain Size																																		
836.7	USGS142 7E	USGS142 7Ec								0.30	0.68	0.95	1.17	1.29	1.36	1.42	1.52	1.69	1.94	2.24	2.58	2.91	3.22	3.48	3.67	3.81	3.89	3.94	3.97	4.00	4.06	4.14	4.25	4.37	4.45	4.47
																									</											

22.91	26.30	30.20	34.67	39.81	45.71	52.48	60.26	69.18	79.43	91.20	104.71	120.23	138.04	158.49	181.97	208.93	239.88	275.42	316.23	363.08	416.87	478.63	549.54	630.96	724.44	831.76	954.99	1096.48
0.59	0.67	0.75	0.84	0.93	1.00	1.06	1.12	1.19	1.31	1.52	1.88	2.42	3.16	4.11	5.18	6.30	7.30	8.07	8.44	8.36	7.79	6.79	5.50	4.05	2.74	1.08	0.04	
0.59	0.66	0.74	0.83	0.92	0.99	1.06	1.13	1.20	1.33	1.54	1.89	2.41	3.14	4.06	5.12	6.23	7.24	8.03	8.45	8.41	7.88	6.89	5.59	4.10	2.78	1.00	0.00	
0.57	0.65	0.73	0.81	0.90	0.98	1.04	1.10	1.17	1.28	1.48	1.82	2.34	3.05	3.98	5.04	6.17	7.19	7.99	8.43	8.41	7.90	6.96	5.70	4.28	2.88	1.39	0.12	
0.62	0.69	0.77	0.85	0.92	0.98	1.03	1.07	1.14	1.26	1.48	1.85	2.41	3.18	4.14	5.22	6.34	7.33	8.07	8.42	8.31	7.72	6.72	5.44	4.01	2.71	1.09	0.07	
0.62	0.69	0.76	0.84	0.92	0.98	1.02	1.07	1.13	1.25	1.47	1.84	2.42	3.20	4.18	5.29	6.43	7.44	8.19	8.53	8.39	7.76	6.71	5.38	3.90	2.58	0.90	0.00	
0.60	0.67	0.75	0.82	0.89	0.94	0.99	1.02	1.08	1.20	1.43	1.80	2.38	3.15	4.13	5.22	6.35	7.35	8.10	8.46	8.36	7.79	6.80	5.52	4.09	2.79	1.17	0.13	
0.66	0.72	0.79	0.86	0.91	0.95	0.98	1.00	1.04	1.14	1.35	1.71	2.28	3.07	4.05	5.15	6.29	7.30	8.05	8.40	8.30	7.72	6.74	5.48	4.11	2.78	1.37	0.16	
0.67	0.74	0.81	0.88	0.94	0.98	1.01	1.03	1.07	1.17	1.39	1.76	2.35	3.14	4.15	5.28	6.43	7.44	8.18	8.51	8.34	7.70	6.63	5.30	3.84	2.54	0.88	0.00	
0.65	0.72	0.78	0.85	0.91	0.95	0.98	1.01	1.07	1.17	1.39	1.75	2.30	3.06	4.01	5.08	6.19	7.18	7.94	8.32	8.26	7.73	6.79	5.56	4.20	2.86	1.44	0.22	
0.74	0.81	0.83	0.79	0.68	0.55	0.45	0.45	0.68	1.22	2.13	3.41	4.99	6.68	8.29	9.54	10.23	10.23	9.51	8.20	6.49	4.60	2.98	0.56					
0.73	0.80	0.82	0.78	0.68	0.55	0.44	0.45	0.67	1.20	2.10	3.38	4.97	6.67	8.30	9.56	10.28	10.28	9.56	8.23	6.51	4.60	2.95	0.55					
0.72	0.79	0.81	0.77	0.67	0.54	0.44	0.45	0.67	1.20	2.10	3.37	4.94	6.62	8.24	9.51	10.23	10.26	9.58	8.29	6.60	4.69	3.07	0.58					
0.72	0.79	0.81	0.77	0.67	0.55	0.45	0.46	0.68	1.21	2.12	3.40	4.98	6.68	8.31	9.58	10.30	10.30	9.58	8.26	6.52	4.60	2.93	0.54					
0.73	0.80	0.82	0.78	0.68	0.56	0.47	0.49	0.73	1.28	2.20	3.48	5.06	6.74	8.34	9.57	10.25	10.23	9.48	8.15	6.41	4.50	2.82	0.51					
0.71	0.78	0.80	0.77	0.67	0.55	0.45	0.47	0.70	1.24	2.16	3.43	5.02	6.71	8.34	9.59	10.29	10.29	9.56	8.23	6.49	4.56	2.88	0.52					
0.77	0.84	0.85	0.80	0.70	0.57	0.49	0.54	0.82	1.42	2.39	3.71	5.31	6.97	8.51	9.64	10.19	10.04	9.19	7.79	6.04	4.19	2.52	0.44					
0.76	0.82	0.83	0.78	0.68	0.55	0.47	0.53	0.81	1.42	2.41	3.75	5.36	7.04	8.57	9.70	10.23	10.05	9.18	7.76	6.00	4.17	2.52	0.44					
0.77	0.83	0.84	0.79	0.69	0.56	0.49	0.54	0.83	1.44	2.43	3.76	5.37	7.03	8.57	9.68	10.22	10.04	9.16	7.74	5.97	4.13	2.47	0.43					
4.39	4.17	3.82	3.33	2.76	2.15	1.56	1.03	0.60	0.31	0.10	0.02	0.00																
4.38	4.17	3.82	3.34	2.77	2.16	1.57	1.05	0.63	0.34	0.14	0.06	0.01																
4.39	4.18	3.82	3.34	2.77	2.16	1.57	1.05	0.64	0.35	0.15	0.07	0.01																
4.16	3.87	3.48	2.99	2.44	1.86	1.31	0.84	0.47	0.19	0.07	0.00	0.00																
4.15	3.86	3.47	2.98	2.44	1.87	1.33	0.87	0.50	0.25	0.08	0.02	0.00																
4.15	3.86	3.46	2.97	2.43	1.86	1.33	0.87	0.51	0.26	0.09	0.02	0.00																
3.95	3.68	3.31	2.86	2.35	1.81	1.29	0.83	0.47	0.22	0.05	0.01	0.00																
3.97	3.70	3.34	2.89	2.37	1.82	1.30	0.83	0.47	0.22	0.06	0.01	0.00																
4.01	3.76	3.40	2.95	2.42	1.85	1.31	0.82	0.45	0.17	0.03	0.00	0.00																
2.12	2.18	2.23	2.29	2.36	2.49	2.69	2.95	3.29	3.67	4.03	4.34	4.53	4.58	4.46	4.19	3.77	3.28	2.72	2.18	1.66	1.22	0.85	0.57	0.36	0.20	0.09		
2.12	2.18	2.22	2.27	2.35	2.47	2.67	2.94	3.29	3.68	4.07	4.39	4.59	4.64	4.52	4.23	3.80	3.29	2.72	2.17	1.65	1.21	0.84	0.57	0.36	0.22	0.11	0.05	
2.12	2.18	2.22	2.27	2.34	2.47	2.66	2.94	3.29	3.68	4.08	4.42	4.64	4.72	4.61	4.34	3.92	3.39	2.80	2.21	1.65	1.17	0.76	0.47	0.22	0.08	0.00	0.00	
2.68	2.74	2.78	2.81	2.83	2.88	2.97	3.10	3.27	3.46	3.63	3.76	3.80	3.73	3.54	3.24	2.85	2.42	1.96	1.52	1.12	0.79	0.52	0.33	0.18	0.07	0.00	0.00	
2.65	2.70	2.74	2.77	2.81	2.87	2.97	3.11	3.29	3.48	3.67	3.80	3.84	3.78	3.60	3.31	2.93	2.50	2.04	1.59	1.18	0.84	0.55	0.35	0.17	0.06	0.00	0.00	
2.66	2.72	2.76	2.79	2.82	2.88	2.97	3.12	3.30	3.50	3.69	3.82	3.87	3.80	3.60	3.29	2.89	2.43	1.95	1.50	1.09	0.76	0.51	0.33	0.21	0.12	0.06	0.00	
2.40	2.49	2.56	2.63	2.71	2.82	2.99	3.22	3.50	3.80	4.10	4.32	4.44	4.41	4.22	3.89	3.42	2.88	2.30	1.75	1.25	0.85	0.53	0.31	0.15	0.06	0.00	0.00	
2.37	2.46	2.53	2.60	2.68	2.79	2.96	3.18	3.45	3.74	4.02	4.24	4.35	4.32	4.15	3.84	3.41	2.92	2.39	1.88	1.41	1.03	0.72	0.48	0.32	0.19	0.09	0.00	
2.40	2.49	2.56	2.63	2.71	2.82	2.99	3.22	3.50	3.80	4.09	4.31	4.42	4.40	4.22	3.90	3.46	2.95	2.39	1.84	1.34	0.91	0.60	0.23	0.05	0.00	0.00	0.00	
4.49	4.27	3.96	3.55	3.07	2.54	2.00	1.47	1.01	0.63	0.36	0.17	0.05	0.00	0.00	0.00	0.00												
4.49	4.28	3.97	3.56	3.09	2.56	2.02	1.50	1.04	0.66	0.38	0.17	0.05	0.00	0.00	0.00	0.00												
4.51	4.29	3.97	3.56	3.07	2.54	2.00	1.48	1.02	0.64	0.37	0.17	0.05	0.00	0.00	0.00	0.00												
4.42	4.15	3.80	3.35	2.84	2.30	1.76	1.25	0.82	0.48	0.25	0.10	0.03	0.00	0.00	0.00	0.00												
4.42	4.16	3.80	3.35	2.84	2.30	1.76	1.27	0.85	0.53	0.30	0.17	0.11	0.10	0.09	0.08	0.06												
4.42	4.15	3.79	3.34	2.83	2.28	1.75	1.27	0.86	0.56	0.35	0.23	0.17	0.15	0.14	0.12	0.08												
4.35	4.17	3.90	3.55	3.12	2.64	2.15	1.68	1.24	0.87	0.56	0.34	0.16	0.05	0.00	0.00	0.00												
4.37	4.19	3.91	3.54	3.11	2.63	2.15	1.68	1.25	0.88	0.58	0.36	0.18	0.07	0.00	0.00	0.00												
4.38	4.19	3.91	3.54	3.11	2.63	2.15	1.68	1.27	0.91	0.61	0.40	0.21	0.08	0.00	0.00	0.00												

Depth (ft)	Sample No.	Sample Name	Result Between User Sizes (Sizes in um)																													
			0.36	0.42	0.48	0.55	0.63	0.72	0.83	0.95	1.10	1.26	1.45	1.66	1.91	2.19	2.51	2.88	3.31	3.80	4.37	5.01	5.75	6.61	7.59	8.71	10.00	11.48	13.18	15.14	17.38	19.95
842.5	USGS1427H	USGS 142 7Hc				0.31	0.70	0.96	1.17	1.30	1.38	1.44	1.54	1.69	1.89	2.12	2.35	2.57	2.75	2.88	2.97	3.01	3.02	3.00	2.98	2.98	3.00	3.06	3.16	3.29	3.42	3.53
						0.32	0.71	0.98	1.19	1.31	1.39	1.46	1.56	1.71	1.92	2.15	2.39	2.60	2.79	2.93	3.02	3.06	3.07	3.05	3.03	3.03	3.06	3.13	3.23	3.37	3.51	3.62
						0.32	0.72	0.99	1.20	1.33	1.41	1.48	1.58	1.74	1.94	2.18	2.42	2.64	2.83	2.97	3.06	3.11	3.12	3.10	3.09	3.09	3.12	3.19	3.30	3.43	3.56	3.67
						0.35	0.79	1.08	1.32	1.46	1.56	1.64	1.76	1.93	2.15	2.41	2.66	2.89	3.09	3.22	3.30	3.33	3.31	3.26	3.21	3.16	3.15	3.17	3.22	3.30	3.39	3.47
						0.35	0.78	1.07	1.31	1.45	1.55	1.63	1.74	1.91	2.13	2.39	2.64	2.87	3.07	3.21	3.29	3.31	3.30	3.25	3.19	3.15	3.13	3.15	3.20	3.29	3.39	3.46
						0.34	0.77	1.06	1.29	1.43	1.52	1.61	1.72	1.89	2.11	2.36	2.61	2.84	3.03	3.17	3.25	3.28	3.26	3.21	3.16	3.11	3.09	3.12	3.17	3.27	3.36	3.44
						0.34	0.76	1.04	1.27	1.41	1.50	1.59	1.70	1.86	2.07	2.31	2.55	2.77	2.95	3.08	3.16	3.18	3.17	3.12	3.06	3.00	2.97	2.98	3.02	3.11	3.20	3.30
						0.34	0.77	1.05	1.28	1.42	1.52	1.60	1.71	1.87	2.09	2.33	2.57	2.80	2.98	3.11	3.19	3.21	3.19	3.15	3.09	3.04	3.01	3.02	3.07	3.15	3.25	3.34
						0.34	0.77	1.05	1.28	1.42	1.52	1.60	1.71	1.88	2.09	2.33	2.58	2.80	2.98	3.12	3.20	3.22	3.20	3.16	3.10	3.05	3.03	3.04	3.10	3.18	3.28	3.36
845.2	USGS1427I	USGS 142 7Ic				0.30	0.72	1.03	1.27	1.43	1.55	1.66	1.80	2.01	2.26	2.55	2.83	3.07	3.27	3.40	3.47	3.48	3.44	3.37	3.28	3.20	3.15	3.13	3.16	3.22	3.30	3.38
						0.30	0.72	1.03	1.28	1.44	1.56	1.67	1.82	2.02	2.28	2.57	2.85	3.10	3.30	3.43	3.50	3.51	3.47	3.40	3.32	3.24	3.19	3.18	3.20	3.25	3.33	3.40
						0.29	0.71	1.01	1.25	1.41	1.52	1.63	1.78	1.98	2.24	2.52	2.79	3.04	3.23	3.37	3.44	3.45	3.41	3.34	3.26	3.19	3.14	3.13	3.15	3.21	3.28	3.35
						0.34	0.78	1.08	1.34	1.51	1.64	1.76	1.92	2.13	2.39	2.68	2.97	3.21	3.40	3.53	3.58	3.57	3.50	3.39	3.26	3.13	3.02	2.94	2.90	2.90	2.94	3.00
						0.34	0.77	1.08	1.33	1.50	1.62	1.75	1.90	2.11	2.38	2.67	2.95	3.19	3.38	3.51	3.56	3.54	3.48	3.37	3.24	3.11	3.01	2.93	2.89	2.90	2.94	2.99
						0.34	0.77	1.08	1.33	1.50	1.62	1.75	1.90	2.12	2.38	2.67	2.95	3.19	3.38	3.51	3.56	3.55	3.48	3.37	3.25	3.12	3.01	2.94	2.90	2.91	2.95	3.00
						0.35	0.77	1.07	1.32	1.48	1.62	1.74	1.90	2.12	2.38	2.66	2.92	3.15	3.32	3.42	3.45	3.41	3.32	3.19	3.04	2.89	2.76	2.66	2.60	2.58	2.60	2.64
						0.35	0.79	1.09	1.34	1.51	1.64	1.77	1.93	2.15	2.42	2.70	2.97	3.20	3.37	3.47	3.50	3.46	3.37	3.24	3.09	2.94	2.81	2.71	2.65	2.63	2.65	2.69
						0.34	0.76	1.05	1.30	1.47	1.60	1.72	1.88	2.10	2.35	2.63	2.89	3.12	3.29	3.39	3.42	3.38	3.29	3.16	3.02	2.88	2.76	2.66	2.61	2.59	2.61	2.65

22.91	26.30	30.20	34.67	39.81	45.71	52.48	60.26	69.18	79.43	91.20	104.71	120.23	138.04	158.49	181.97	208.93	239.88	275.42	316.23	363.08	416.87	478.63	549.54	630.96	724.44	831.76	954.99	1096.48
3.58	3.55	3.40	3.13	2.76	2.32	1.86	1.42	1.06	0.80	0.65	0.59	0.60	0.65	0.72	0.79	0.84	0.89	0.92	0.95	0.95	0.94	0.90	0.84	0.76	0.66	0.55	0.40	
3.67	3.63	3.47	3.19	2.80	2.34	1.87	1.43	1.07	0.83	0.70	0.66	0.69	0.75	0.81	0.85	0.87	0.86	0.83	0.79	0.75	0.70	0.64	0.58	0.51	0.45	0.38	0.28	
3.71	3.66	3.50	3.22	2.84	2.38	1.91	1.47	1.11	0.86	0.73	0.69	0.72	0.78	0.84	0.88	0.89	0.87	0.81	0.73	0.64	0.54	0.44	0.36	0.28	0.23	0.19	0.14	
3.49	3.44	3.30	3.05	2.71	2.30	1.87	1.46	1.12	0.88	0.73	0.67	0.67	0.71	0.74	0.76	0.75	0.72	0.66	0.59	0.51	0.42	0.32	0.24	0.15	0.10	0.04	0.00	
3.49	3.45	3.30	3.05	2.70	2.29	1.85	1.43	1.09	0.84	0.69	0.64	0.66	0.71	0.77	0.81	0.83	0.82	0.78	0.70	0.60	0.49	0.36	0.26	0.13	0.04	0.00	0.00	
3.48	3.43	3.28	3.02	2.67	2.25	1.82	1.41	1.08	0.85	0.71	0.66	0.67	0.70	0.75	0.77	0.78	0.77	0.74	0.70	0.65	0.58	0.50	0.42	0.33	0.24	0.17	0.11	
3.35	3.34	3.23	3.02	2.70	2.32	1.90	1.49	1.13	0.86	0.69	0.62	0.61	0.66	0.73	0.80	0.86	0.91	0.93	0.93	0.89	0.83	0.73	0.63	0.51	0.40	0.29	0.19	
3.38	3.36	3.24	3.02	2.71	2.32	1.90	1.50	1.15	0.88	0.71	0.63	0.62	0.66	0.73	0.79	0.85	0.89	0.90	0.88	0.83	0.74	0.64	0.52	0.40	0.29	0.20	0.12	
3.41	3.38	3.25	3.03	2.71	2.33	1.92	1.53	1.19	0.94	0.77	0.69	0.67	0.69	0.72	0.75	0.78	0.79	0.78	0.76	0.71	0.65	0.57	0.48	0.39	0.30	0.23	0.16	
3.44	3.45	3.38	3.22	2.96	2.61	2.20	1.77	1.36	1.02	0.75	0.58	0.48	0.44	0.43	0.42	0.41	0.38	0.34	0.29	0.25	0.21	0.18	0.16	0.15	0.15	0.14	0.11	
3.44	3.44	3.36	3.19	2.93	2.59	2.20	1.80	1.42	1.09	0.84	0.67	0.56	0.50	0.46	0.43	0.40	0.36	0.31	0.25	0.19	0.14	0.09	0.03	0.00	0.00	0.00	0.00	
3.40	3.39	3.31	3.14	2.88	2.55	2.16	1.78	1.41	1.12	0.89	0.74	0.65	0.60	0.56	0.52	0.48	0.43	0.38	0.33	0.29	0.25	0.21	0.17	0.13	0.10	0.05	0.00	
3.06	3.08	3.03	2.90	2.67	2.36	2.00	1.62	1.27	0.99	0.78	0.65	0.58	0.56	0.56	0.55	0.54	0.52	0.50	0.47	0.43	0.40	0.37	0.34	0.31	0.27	0.23	0.17	
3.04	3.05	3.00	2.86	2.64	2.33	1.98	1.62	1.28	1.01	0.82	0.70	0.64	0.62	0.61	0.60	0.59	0.56	0.53	0.49	0.45	0.42	0.38	0.35	0.31	0.28	0.24	0.18	
3.05	3.06	3.01	2.87	2.65	2.35	1.99	1.64	1.31	1.04	0.85	0.74	0.68	0.65	0.63	0.61	0.58	0.55	0.51	0.48	0.44	0.41	0.37	0.32	0.27	0.21	0.15	0.10	
2.70	2.73	2.73	2.65	2.49	2.24	1.92	1.57	1.23	0.93	0.71	0.57	0.51	0.52	0.56	0.62	0.68	0.73	0.78	0.81	0.85	0.88	0.92	0.94	0.95	0.93	0.86	0.67	
2.74	2.78	2.76	2.68	2.51	2.26	1.95	1.60	1.27	0.98	0.76	0.63	0.58	0.59	0.64	0.71	0.78	0.84	0.87	0.87	0.84	0.79	0.72	0.65	0.57	0.49	0.41	0.30	
2.70	2.74	2.73	2.65	2.49	2.25	1.95	1.62	1.29	1.01	0.79	0.65	0.59	0.59	0.64	0.71	0.78	0.85	0.90	0.93	0.94	0.93	0.90	0.85	0.79	0.72	0.63	0.47	

Appendix D: Grain size data for NRF 15 and USGS 142

Table _____, U-Pb geochronologic analyses for CM142-780.																			
						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)	(%)
-Spot 151	306	479	2.1	46.1848	29.1	0.0041	29.2	0.0014	2.4	0.08	8.9	0.2	4.2	1.2	2301.5	552.8	8.9	0.2	NA
-Spot 273	7073	1369122	0.9	20.8897	0.6	0.0444	1.3	0.0067	1.2	0.88	43.2	0.5	44.1	0.6	92.9	14.6	43.2	0.5	NA
-Spot 257	2385	56375	1.0	21.0843	1.0	0.0454	1.6	0.0069	1.3	0.79	44.6	0.6	45.1	0.7	70.9	23.7	44.6	0.6	NA
-Spot 134	2140	32988	1.9	21.0591	0.9	0.0455	2.0	0.0070	1.7	0.89	44.7	0.8	45.2	0.9	73.7	21.3	44.7	0.8	NA
-Spot 104	1499	6289	34.1	21.1634	1.1	0.0464	1.8	0.0071	1.5	0.82	45.7	0.7	46.0	0.8	62.0	25.1	45.7	0.7	NA
-Spot 276	539	5542	2.9	21.3713	2.5	0.0463	3.0	0.0072	1.8	0.58	46.1	0.8	45.9	1.4	38.6	59.2	46.1	0.8	NA
-Spot 211	2445	78186	3.6	20.9620	1.1	0.0473	2.8	0.0072	2.6	0.93	46.2	1.2	46.9	1.3	84.7	25.1	46.2	1.2	NA
-Spot 29	1398	7922	3.1	21.7393	1.5	0.0457	2.4	0.0072	1.9	0.79	46.3	0.9	45.4	1.0	2.4	35.1	46.3	0.9	NA
-Spot 95	124	3128	2.8	23.0732	3.0	0.0431	3.7	0.0072	2.3	0.61	46.3	1.1	42.8	1.6	148.0	73.3	46.3	1.1	NA
-Spot 26	1950	17040	3.4	21.0010	0.7	0.0474	1.4	0.0072	1.2	0.85	46.4	0.5	47.1	0.6	80.2	17.5	46.4	0.5	NA
-Spot 55	595	3782	2.5	20.3714	2.0	0.0490	2.4	0.0072	1.4	0.57	46.5	0.6	48.6	1.1	152.0	46.3	46.5	0.6	NA
-Spot 188	1801	20229	3.1	21.4338	1.2	0.0466	2.3	0.0072	2.0	0.86	46.6	0.9	46.3	1.0	31.6	27.7	46.6	0.9	NA
-Spot 258	391	6030	2.8	21.1039	1.8	0.0474	2.5	0.0073	1.8	0.70	46.6	0.8	47.1	1.2	68.7	43.2	46.6	0.8	NA
-Spot 161	210	2267	2.5	23.3433	2.5	0.0430	3.4	0.0073	2.3	0.69	46.8	1.1	42.8	1.4	176.9	61.2	46.8	1.1	NA
-Spot 11	3227	34296	3.8	21.3362	0.7	0.0471	1.5	0.0073	1.3	0.89	46.8	0.6	46.7	0.7	42.5	15.9	46.8	0.6	NA
-Spot 221	1099	36077	2.2	21.3626	1.0	0.0470	1.8	0.0073	1.5	0.82	46.8	0.7	46.6	0.8	39.6	25.0	46.8	0.7	NA
-Spot 113	99	1793	2.2	24.9334	3.4	0.0403	4.2	0.0073	2.3	0.56	46.8	1.1	40.1	1.6	344.0	88.7	46.8	1.1	NA
-Spot 214	380	7686	1.0	20.4749	2.0	0.0491	2.9	0.0073	2.1	0.74	46.8	1.0	48.7	1.4	140.2	46.1	46.8	1.0	NA
-Spot 63	951	15668	2.9	21.1863	1.4	0.0475	2.0	0.0073	1.4	0.72	46.8	0.7	47.1	0.9	59.4	33.0	46.8	0.7	NA
-Spot 144	495	3759	1.7	22.8792	3.3	0.0440	3.7	0.0073	1.7	0.45	46.9	0.8	43.7	1.6	127.1	82.3	46.9	0.8	NA
-Spot 94	419	9465	2.9	21.0412	1.7	0.0478	2.4	0.0073	1.7	0.71	46.9	0.8	47.5	1.1	75.7	40.9	46.9	0.8	NA
-Spot 298	221	3697	2.8	23.2707	3.5	0.0433	3.9	0.0073	1.8	0.46	46.9	0.9	43.0	1.7	169.2	86.9	46.9	0.9	NA
-Spot 173	985	48514	2.8	20.8709	0.8	0.0483	1.6	0.0073	1.3	0.85	47.0	0.6	47.9	0.7	95.0	19.6	47.0	0.6	NA
-Spot 248	279	4203	2.8	21.7479	2.6	0.0464	3.4	0.0073	2.1	0.63	47.0	1.0	46.0	1.5	3.3	63.9	47.0	1.0	NA
-Spot 36	210	5825	1.8	21.7028	2.4	0.0465	3.6	0.0073	2.6	0.74	47.1	1.2	46.2	1.6	1.6	58.7	47.1	1.2	NA
-Spot 259	1116	31521	3.9	21.1279	1.2	0.0478	2.2	0.0073	1.9	0.84	47.1	0.9	47.4	1.0	65.9	28.8	47.1	0.9	NA
-Spot 224	194	1081	2.7	31.1153	3.1	0.0325	3.6	0.0073	1.8	0.50	47.1	0.8	32.4	1.2	952.2	92.1	47.1	0.8	NA
-Spot 3	1126	8663	2.1	21.7092	1.6	0.0465	2.2	0.0073	1.5	0.67	47.1	0.7	46.2	1.0	0.9	39.8	47.1	0.7	NA
-Spot 143	843	116720	1.5	20.6448	1.3	0.0490	1.6	0.0073	1.0	0.64	47.1	0.5	48.5	0.8	120.7	29.6	47.1	0.5	NA
-Spot 121	155	3038	2.3	22.6905	3.0	0.0446	4.0	0.0073	2.6	0.66	47.1	1.2	44.3	1.7	106.7	74.4	47.1	1.2	NA
-Spot 222	365	148240	3.4	19.8682	3.2	0.0509	3.8	0.0073	1.9	0.52	47.1	0.9	50.4	1.9	210.3	74.7	47.1	0.9	NA
-Spot 215	820	41782	0.7	21.2420	1.9	0.0476	2.7	0.0073	1.9	0.72	47.1	0.9	47.2	1.2	53.1	44.6	47.1	0.9	NA
-Spot 109	481	11389	1.6	20.6580	1.4	0.0490	2.3	0.0073	1.8	0.79	47.1	0.9	48.5	1.1	119.3	33.8	47.1	0.9	NA
-Spot 73	278	3143	2.0	23.8580	2.3	0.0424	3.1	0.0073	2.0	0.66	47.1	1.0	42.2	1.3	231.6	58.1	47.1	1.0	NA
-Spot 249	348	4035	1.9	22.3162	2.0	0.0453	2.4	0.0073	1.5	0.60	47.1	0.7	45.0	1.1	65.9	47.9	47.1	0.7	NA
-Spot 37	265	8768	1.8	21.4034	2.1	0.0473	3.0	0.0073	2.1	0.72	47.2	1.0	46.9	1.4	35.0	49.5	47.2	1.0	NA
-Spot 131	594	8699	1.1	21.1979	2.3	0.0478	3.0	0.0073	1.9	0.63	47.2	0.9	47.4	1.4	58.0	55.2	47.2	0.9	NA
-Spot 15	468	11464	2.4	21.4819	1.3	0.0472	2.3	0.0073	1.9	0.82	47.2	0.9	46.8	1.1	26.2	31.6	47.2	0.9	NA
-Spot 219	403	5021	2.5	22.7593	1.5	0.0445	2.3	0.0073	1.7	0.76	47.2	0.8	44.2	1.0	114.1	36.6	47.2	0.8	NA
-Spot 86	421	2695	2.2	23.3059	2.0	0.0435	2.6	0.0074	1.7	0.64	47.2	0.8	43.3	1.1	173.0	50.5	47.2	0.8	NA
-Spot 243	1259	28727	3.3	20.2835	1.3	0.0500	2.0	0.0074	1.6	0.78	47.3	0.7	49.6	1.0	162.2	29.3	47.3	0.7	NA
-Spot 266	508	4030	1.9	22.6070	2.8	0.0449	3.2	0.0074	1.5	0.47	47.3	0.7	44.6	1.4	97.6	68.5	47.3	0.7	NA
-Spot 226	328	2513	1.8	24.1517	2.5	0.0420	3.0	0.0074	1.7	0.55	47.3	0.8	41.8	1.2	262.6	64.0	47.3	0.8	NA
-Spot 30	363	8939	2.2	22.2181	1.7	0.0457	2.4	0.0074	1.7	0.70	47.3	0.8	45.4	1.1	55.2	41.6	47.3	0.8	NA
-Spot 205	390	45314	1.8	20.2090	1.4	0.0502	2.3	0.0074	1.8	0.80	47.3	0.9	49.8	1.1	170.8	32.0	47.3	0.9	NA
-Spot 234	497	3870	7.4	22.7180	1.6	0.0447	2.3	0.0074	1.7	0.74	47.3	0.8	44.4	1.0	109.7	38.7	47.3	0.8	NA
-Spot 126	485	34548	2.6	20.4985	1.5	0.0496	2.3	0.0074	1.7	0.76	47.3	0.8	49.1	1.1	137.5	35.5	47.3	0.8	NA
-Spot 96	241	2052	1.5	23.4670	3.3	0.0433	4.1	0.0074	2.5	0.60	47.3	1.2	43.0	1.7	190.1	82.8	47.3	1.2	NA
-Spot 23	401	4217	3.4	22.5156	2.4	0.0451	3.0	0.0074	1.7	0.58	47.3	0.8	44.8	1.3	87.7	59.9	47.3	0.8	NA
-Spot 105	1285	64720	0.8	21.0474	1.0	0.0483	1.8	0.0074	1.5	0.82	47.4	0.7	47.9	0.9	75.0	24.8	47.4	0.7	NA
-Spot 203	255	1088	2.6	27.3409	2.3	0.0372	3.3	0.0074	2.4	0.71	47.4	1.1	37.1	1.2	587.7	63.4	47.4	1.1	NA
-Spot 119	382	11956	5.5	21.5433	1.9	0.0472	2.8	0.0074	2.2	0.76	47.4	1.0	46.9	1.3	19.4	44.8	47.4	1.0	NA
-Spot 269	581	4744	4.4	17.7356	4.9	0.0574	5.3	0.0074	1.9	0.35	47.4	0.9	56.7	2.9	467.5	109.4	47.4	0.9	NA
-Spot 246	426	4580	3.7	22.6877	2.2	0.0449	2.9	0.0074	1.9	0.67	47.4	0.9	44.6	1.3	106.4	53.1	47.4	0.9	NA

-Spot 176	1149	26380	1.8	21.1753	1.2	0.0481	2.4	0.0074	2.1	0.87	47.4	1.0	47.7	1.1	60.6	28.4	47.4	1.0	NA
-Spot 178	1296	16705	3.9	21.3771	1.1	0.0476	1.6	0.0074	1.2	0.73	47.4	0.6	47.3	0.8	37.9	26.4	47.4	0.6	NA
-Spot 108	257	2884	2.5	24.0058	4.2	0.0424	4.6	0.0074	1.9	0.41	47.4	0.9	42.2	1.9	247.2	106.1	47.4	0.9	NA
-Spot 174	1136	15330	2.0	21.1172	1.0	0.0483	1.7	0.0074	1.3	0.79	47.5	0.6	47.9	0.8	67.1	24.5	47.5	0.6	NA
-Spot 265	239	4173	3.2	21.6263	4.0	0.0471	4.4	0.0074	1.8	0.41	47.5	0.9	46.8	2.0	10.2	96.4	47.5	0.9	NA
-Spot 206	208	4347	1.5	23.1573	3.6	0.0440	4.4	0.0074	2.5	0.56	47.5	1.2	43.8	1.9	157.0	90.7	47.5	1.2	NA
-Spot 150	172	2640	2.2	23.1678	3.3	0.0440	3.8	0.0074	1.8	0.48	47.5	0.9	43.8	1.6	158.2	83.0	47.5	0.9	NA
-Spot 84	936	30740	1.6	20.6069	1.1	0.0495	2.0	0.0074	1.7	0.85	47.5	0.8	49.1	1.0	125.0	25.0	47.5	0.8	NA
-Spot 90	348	18555	2.6	21.2253	1.4	0.0481	2.5	0.0074	2.0	0.83	47.5	1.0	47.7	1.2	55.0	33.2	47.5	1.0	NA
-Spot 231	435	8460	2.5	21.9587	1.3	0.0465	2.2	0.0074	1.8	0.81	47.5	0.8	46.1	1.0	26.7	31.3	47.5	0.8	NA
-Spot 22	221	83057	2.5	20.4076	2.3	0.0500	3.7	0.0074	2.8	0.77	47.6	1.3	49.6	1.8	147.9	55.0	47.6	1.3	NA
-Spot 167	288	2396	2.0	24.7276	4.1	0.0413	4.5	0.0074	1.8	0.41	47.6	0.9	41.1	1.8	322.7	104.9	47.6	0.9	NA
-Spot 74	318	2515	2.4	23.0882	2.5	0.0442	3.1	0.0074	1.9	0.59	47.6	0.9	43.9	1.3	149.6	62.5	47.6	0.9	NA
-Spot 290	487	5520	1.8	22.1099	1.6	0.0462	2.4	0.0074	1.8	0.74	47.6	0.8	45.9	1.1	43.3	38.9	47.6	0.8	NA
-Spot 162	228	6896	3.6	20.8728	2.0	0.0490	3.1	0.0074	2.4	0.76	47.6	1.1	48.6	1.5	94.8	47.5	47.6	1.1	NA
-Spot 56	1678	24482	1.4	21.0713	0.8	0.0486	2.3	0.0074	2.1	0.94	47.7	1.0	48.1	1.1	72.3	19.1	47.7	1.0	NA
-Spot 256	185	1213	2.5	28.0434	3.3	0.0365	4.0	0.0074	2.2	0.56	47.7	1.1	36.4	1.4	657.0	91.7	47.7	1.1	NA
-Spot 268	532	7850	2.4	20.9375	1.4	0.0489	2.3	0.0074	1.8	0.79	47.7	0.9	48.5	1.1	87.5	33.8	47.7	0.9	NA
-Spot 59	259	4506	1.8	22.2031	2.1	0.0461	2.8	0.0074	1.8	0.64	47.7	0.8	45.8	1.2	53.5	51.4	47.7	0.8	NA
-Spot 16	208	19828	2.4	20.0084	2.7	0.0512	3.9	0.0074	2.8	0.72	47.7	1.3	50.7	1.9	194.0	63.5	47.7	1.3	NA
-Spot 186	366	3967	2.3	23.4735	1.9	0.0437	2.6	0.0074	1.8	0.68	47.7	0.9	43.4	1.1	190.8	48.2	47.7	0.9	NA
-Spot 136	251	15962	1.9	21.2961	2.0	0.0481	2.6	0.0074	1.7	0.64	47.7	0.8	47.7	1.2	47.0	48.4	47.7	0.8	NA
-Spot 7	384	5776	2.2	21.6529	1.7	0.0473	2.3	0.0074	1.6	0.69	47.7	0.8	47.0	1.1	7.2	40.4	47.7	0.8	NA
-Spot 1	399	12296	2.4	21.8827	1.5	0.0468	2.3	0.0074	1.7	0.75	47.7	0.8	46.5	1.0	18.3	36.1	47.7	0.8	NA
-Spot 97	755	6318	2.3	22.5393	1.5	0.0455	2.3	0.0074	1.7	0.77	47.7	0.8	45.2	1.0	90.3	36.0	47.7	0.8	NA
-Spot 169	740	10674	1.5	21.1823	1.2	0.0484	2.1	0.0074	1.7	0.81	47.8	0.8	48.0	1.0	59.8	29.1	47.8	0.8	NA
-Spot 255	731	9262	0.8	21.7858	1.6	0.0471	2.1	0.0074	1.3	0.63	47.8	0.6	46.7	1.0	7.5	39.4	47.8	0.6	NA
-Spot 163	267	2754	2.7	22.9756	2.3	0.0446	2.9	0.0074	1.8	0.61	47.8	0.8	44.3	1.3	137.5	56.8	47.8	0.8	NA
-Spot 307	215	2168	2.2	24.0952	6.5	0.0426	6.9	0.0074	2.4	0.34	47.8	1.1	42.3	2.9	256.6	164.2	47.8	1.1	NA
-Spot 288	384	353636	1.9	20.6883	2.0	0.0496	2.7	0.0074	1.8	0.67	47.8	0.8	49.2	1.3	115.8	47.0	47.8	0.8	NA
-Spot 130	192	2204	3.1	24.3191	8.6	0.0422	8.8	0.0074	1.9	0.22	47.8	0.9	42.0	3.6	280.1	219.4	47.8	0.9	NA
-Spot 112	565	107827	3.1	20.8539	1.3	0.0492	2.0	0.0074	1.4	0.73	47.8	0.7	48.8	0.9	96.9	31.9	47.8	0.7	NA
-Spot 46	238	2075	2.2	25.3172	6.9	0.0406	7.4	0.0075	2.4	0.33	47.9	1.2	40.4	2.9	383.6	180.5	47.9	1.2	NA
-Spot 69	663	19792	2.3	20.9962	1.3	0.0489	2.3	0.0075	1.8	0.80	47.9	0.9	48.5	1.1	80.8	31.9	47.9	0.9	NA
-Spot 216	341	61997	2.2	20.2991	1.5	0.0506	2.7	0.0075	2.2	0.83	47.9	1.1	50.1	1.3	160.4	35.0	47.9	1.1	NA
-Spot 149	275	3670	2.4	23.1336	2.5	0.0444	3.4	0.0075	2.3	0.68	47.9	1.1	44.1	1.5	154.5	62.6	47.9	1.1	NA
-Spot 263	1651	40721	1.7	20.9457	0.9	0.0491	1.8	0.0075	1.6	0.86	47.9	0.7	48.6	0.9	86.5	21.8	47.9	0.7	NA
-Spot 190	1755	18779	2.7	21.2641	0.6	0.0483	1.4	0.0075	1.3	0.91	47.9	0.6	47.9	0.7	50.7	14.2	47.9	0.6	NA
-Spot 207	828	20045	1.4	21.4715	1.4	0.0479	2.2	0.0075	1.7	0.77	47.9	0.8	47.5	1.0	27.4	33.4	47.9	0.8	NA
-Spot 34	382	200945	2.1	21.2562	1.7	0.0484	2.6	0.0075	2.0	0.75	47.9	0.9	48.0	1.2	51.5	41.4	47.9	0.9	NA
-Spot 314	391	2562	2.4	24.4311	5.0	0.0421	5.3	0.0075	1.7	0.31	47.9	0.8	41.9	2.2	291.8	127.4	47.9	0.8	NA
-Spot 89	248	3308	3.0	22.7871	1.9	0.0452	2.9	0.0075	2.3	0.77	47.9	1.1	44.8	1.3	117.1	46.1	47.9	1.1	NA
-Spot 179	817	35025	3.0	21.1566	1.3	0.0487	1.8	0.0075	1.3	0.72	47.9	0.6	48.2	0.9	62.7	30.6	47.9	0.6	NA
-Spot 201	581	66631	11.5	20.7441	1.2	0.0496	2.4	0.0075	2.1	0.86	48.0	1.0	49.2	1.2	109.4	29.2	48.0	1.0	NA
-Spot 264	203	5053	1.6	21.6808	1.7	0.0475	2.4	0.0075	1.7	0.72	48.0	0.8	47.1	1.1	4.1	40.3	48.0	0.8	NA
-Spot 27	170	2680	2.5	23.7850	2.8	0.0433	3.7	0.0075	2.5	0.67	48.0	1.2	43.0	1.6	223.9	69.6	48.0	1.2	NA
-Spot 311	157	3609	1.3	22.2477	4.4	0.0463	5.0	0.0075	2.4	0.47	48.0	1.1	46.0	2.2	58.4	107.4	48.0	1.1	NA
-Spot 297	254	2868	2.6	23.8890	4.1	0.0431	4.4	0.0075	1.7	0.39	48.0	0.8	42.9	1.9	234.9	103.1	48.0	0.8	NA
-Spot 289	615	7509	1.6	21.4675	1.4	0.0480	2.8	0.0075	2.4	0.87	48.0	1.2	47.6	1.3	27.9	32.5	48.0	1.2	NA
-Spot 261	242	2567	2.2	23.5194	2.1	0.0439	2.8	0.0075	1.9	0.67	48.0	0.9	43.6	1.2	195.7	53.0	48.0	0.9	NA
-Spot 180	675	21113	2.1	20.9909	1.4	0.0491	2.0	0.0075	1.4	0.72	48.0	0.7	48.7	0.9	81.4	32.1	48.0	0.7	NA
-Spot 267	485	5714	2.5	21.1504	2.0	0.0488	2.6	0.0075	1.6	0.64	48.0	0.8	48.3	1.2	63.4	47.0	48.0	0.8	NA
-Spot 238	492	3912	2.9	22.8666	4.6	0.0451	4.9	0.0075	1.7	0.34	48.1	0.8	44.8	2.1	125.7	113.4	48.1	0.8	NA
-Spot 21	510	99907	1.7	21.0087	1.1	0.0491	1.8	0.0075	1.5	0.82	48.1	0.7	48.7	0.9	79.4	25.3	48.1	0.7	NA
-Spot 47	974	17665	6.5	21.4848	1.3	0.0481	2.1	0.0075	1.7	0.79	48.1	0.8	47.7	1.0	25.9	31.1	48.1	0.8	NA
-Spot 39	516	11721	2.4	21.4690	1.4	0.0481	2.3	0.0075	1.8	0.79	48.1	0.9	47.7	1.1	27.7	33.9	48.1	0.9	NA
-Spot 217	92	1157	2.6	27.7932	4.3	0.0372	5.3	0.0075	3.1	0.58	48.1	1.5	37.1	1.9	632.4	118.2	48.1	1.5	NA
-Spot 54	426	4816	1.7	22.1983	1.4	0.0466	2.3	0.0075	1.8	0.79	48.2	0.9	46.2	1.0	53.0	34.8	48.2	0.9	NA
-Spot 61	336	2542	2.3	24.4309	1.9	0.0423	2.9	0.0075	2.1	0.74	48.2	1.0	42.1	1.2	291.8	49.1	48.2	1.0	NA
-Spot 285	138	3771	2.3	22.6784	3.6	0.0456	4.6	0.0075	2.9	0.63	48.2	1.4	45.3	2.0	105.4	87.7	48.2	1.4	NA

-Spot 12	347	12023	2.8	20.9930	1.7	0.0493	2.5	0.0075	1.8	0.72	48.2	0.9	48.8	1.2	81.1	41.0	48.2	0.9	NA
-Spot 49	1226	23849	2.4	21.6627	1.1	0.0478	1.7	0.0075	1.3	0.77	48.2	0.6	47.4	0.8	6.1	25.4	48.2	0.6	NA
-Spot 45	308	9946	1.9	21.6799	1.6	0.0477	2.5	0.0075	1.9	0.77	48.2	0.9	47.3	1.2	4.2	38.4	48.2	0.9	NA
-Spot 194	247	2184	1.7	24.7010	2.3	0.0419	3.0	0.0075	1.9	0.64	48.2	0.9	41.7	1.2	320.0	59.6	48.2	0.9	NA
-Spot 98	211	3770	2.1	21.8339	2.0	0.0474	2.7	0.0075	1.9	0.68	48.3	0.9	47.1	1.3	12.9	48.4	48.3	0.9	NA
-Spot 79	526	13381	3.6	21.1076	1.5	0.0491	2.1	0.0075	1.6	0.73	48.3	0.8	48.6	1.0	68.2	34.7	48.3	0.8	NA
-Spot 299	776	11093	5.1	21.6331	1.2	0.0479	2.0	0.0075	1.6	0.81	48.3	0.8	47.5	0.9	9.4	28.3	48.3	0.8	NA
-Spot 68	272	7473	1.6	20.9621	2.0	0.0494	2.9	0.0075	2.0	0.70	48.3	1.0	49.0	1.4	84.6	48.4	48.3	1.0	NA
-Spot 272	233	51322	2.5	21.2806	2.2	0.0487	3.0	0.0075	2.1	0.70	48.3	1.0	48.3	1.4	48.8	51.8	48.3	1.0	NA
-Spot 102	257	3514	2.7	22.2651	2.3	0.0466	3.5	0.0075	2.6	0.75	48.3	1.2	46.2	1.6	60.3	56.1	48.3	1.2	NA
-Spot 287	1204	122076	2.6	20.6225	0.9	0.0503	1.8	0.0075	1.5	0.85	48.3	0.7	49.8	0.9	123.3	21.9	48.3	0.7	NA
-Spot 302	393	26903	1.4	21.3807	1.9	0.0486	2.6	0.0075	1.8	0.69	48.4	0.9	48.2	1.2	37.5	44.8	48.4	0.9	NA
-Spot 182	442	6016	1.8	22.5034	1.9	0.0462	2.4	0.0075	1.4	0.61	48.4	0.7	45.9	1.1	86.4	46.4	48.4	0.7	NA
-Spot 31	195	2630	2.2	24.1562	2.5	0.0431	3.4	0.0075	2.2	0.66	48.5	1.1	42.8	1.4	263.1	64.0	48.5	1.1	NA
-Spot 183	267	4547	2.2	20.7074	2.0	0.0503	2.7	0.0076	1.8	0.68	48.5	0.9	49.8	1.3	113.6	46.8	48.5	0.9	NA
-Spot 170	274	2557	2.1	24.2061	2.1	0.0430	2.4	0.0076	1.3	0.52	48.5	0.6	42.8	1.0	268.3	53.1	48.5	0.6	NA
-Spot 72	158	937	2.3	24.4168	4.9	0.0427	5.6	0.0076	2.6	0.47	48.6	1.3	42.5	2.3	290.4	125.3	48.6	1.3	NA
-Spot 228	429	3452	1.6	22.4408	2.2	0.0465	2.6	0.0076	1.3	0.51	48.6	0.6	46.2	1.2	79.5	55.0	48.6	0.6	NA
-Spot 193	167	5953	2.3	22.4105	2.3	0.0466	3.9	0.0076	3.1	0.79	48.6	1.5	46.2	1.7	76.2	57.3	48.6	1.5	NA
-Spot 245	486	8525	2.4	21.0601	2.1	0.0496	2.7	0.0076	1.8	0.66	48.6	0.9	49.1	1.3	73.6	49.1	48.6	0.9	NA
-Spot 4	160	9364	1.9	22.2601	2.8	0.0469	3.7	0.0076	2.5	0.67	48.7	1.2	46.6	1.7	59.8	67.3	48.7	1.2	NA
-Spot 48	224	2007	1.0	24.8639	2.9	0.0420	3.6	0.0076	2.2	0.59	48.7	1.0	41.8	1.5	336.9	75.6	48.7	1.0	NA
-Spot 111	463	46275	1.4	20.9952	1.3	0.0498	2.3	0.0076	1.9	0.82	48.7	0.9	49.3	1.1	80.9	31.7	48.7	0.9	NA
-Spot 301	393	9419	2.4	20.9247	1.9	0.0500	2.8	0.0076	2.1	0.74	48.7	1.0	49.5	1.4	88.9	44.9	48.7	1.0	NA
-Spot 292	402	5965	2.4	21.9792	1.4	0.0476	2.7	0.0076	2.3	0.86	48.7	1.1	47.2	1.2	28.9	33.4	48.7	1.1	NA
-Spot 274	230	9970	1.3	21.1097	1.9	0.0496	2.9	0.0076	2.1	0.74	48.7	1.0	49.1	1.4	68.0	46.4	48.7	1.0	NA
-Spot 279	400	5357	2.1	21.5306	3.4	0.0486	3.9	0.0076	2.0	0.50	48.8	1.0	48.2	1.9	20.8	81.7	48.8	1.0	NA
-Spot 189	356	3709	8.9	23.1888	2.1	0.0453	2.9	0.0076	1.9	0.67	48.9	0.9	45.0	1.3	160.4	53.2	48.9	0.9	NA
-Spot 280	444	9245	1.8	20.9737	1.8	0.0501	2.3	0.0076	1.5	0.64	49.0	0.7	49.6	1.1	83.3	42.5	49.0	0.7	NA
-Spot 52	148	10905	1.5	21.2872	2.6	0.0494	3.5	0.0076	2.3	0.67	49.0	1.1	48.9	1.7	48.0	61.9	49.0	1.1	NA
-Spot 282	364	11193	1.8	14.4985	6.5	0.0726	6.9	0.0076	2.2	0.32	49.0	1.1	71.1	4.8	897.9	135.1	49.0	1.1	NA
-Spot 304	515	3490	0.9	20.1866	2.5	0.0522	2.9	0.0076	1.5	0.50	49.1	0.7	51.7	1.5	173.3	59.2	49.1	0.7	NA
-Spot 122	496	11306	3.2	21.5540	1.6	0.0489	2.3	0.0076	1.7	0.72	49.1	0.8	48.5	1.1	18.2	38.5	49.1	0.8	NA
-Spot 87	1412	8843	2.8	21.5822	1.5	0.0489	2.1	0.0076	1.5	0.70	49.1	0.7	48.4	1.0	15.1	35.5	49.1	0.7	NA
-Spot 128	812	5915	2.5	22.0202	1.3	0.0479	2.4	0.0076	2.0	0.84	49.1	1.0	47.5	1.1	33.4	31.6	49.1	1.0	NA
-Spot 239	99	1456	2.5	31.1978	4.6	0.0338	5.3	0.0076	2.6	0.49	49.1	1.3	33.8	1.8	960.0	135.5	49.1	1.3	NA
-Spot 153	164	3041	2.4	23.0906	3.8	0.0457	4.5	0.0076	2.4	0.53	49.1	1.2	45.3	2.0	149.9	94.2	49.1	1.2	NA
-Spot 283	1198	23064	1.9	21.4884	0.9	0.0491	1.5	0.0076	1.2	0.79	49.1	0.6	48.6	0.7	25.5	21.4	49.1	0.6	NA
-Spot 147	175	15078	2.0	21.3896	1.7	0.0494	3.1	0.0077	2.5	0.82	49.3	1.2	49.0	1.5	36.5	41.7	49.3	1.2	NA
-Spot 62	344	9012	3.4	21.8472	2.4	0.0484	2.8	0.0077	1.6	0.55	49.3	0.8	48.0	1.3	14.3	57.0	49.3	0.8	NA
-Spot 35	215	2088	2.1	24.8523	5.7	0.0426	6.3	0.0077	2.8	0.45	49.3	1.4	42.4	2.6	335.7	146.2	49.3	1.4	NA
-Spot 17	459	2260	1.7	23.5078	1.7	0.0450	2.3	0.0077	1.6	0.67	49.3	0.8	44.7	1.0	194.5	42.9	49.3	0.8	NA
-Spot 187	363	6870	2.5	19.6780	3.4	0.0539	3.8	0.0077	1.6	0.43	49.4	0.8	53.3	2.0	232.6	79.1	49.4	0.8	NA
-Spot 159	314	827632	2.0	19.6707	1.8	0.0540	2.8	0.0077	2.1	0.75	49.5	1.0	53.4	1.5	233.5	42.5	49.5	1.0	NA
-Spot 28	490	45559	3.0	20.8405	1.3	0.0510	2.3	0.0077	1.9	0.83	49.5	1.0	50.5	1.1	98.4	30.5	49.5	1.0	NA
-Spot 99	229	5609	2.3	22.7354	2.0	0.0469	3.1	0.0077	2.3	0.77	49.6	1.2	46.5	1.4	111.6	48.2	49.6	1.2	NA
-Spot 19	469	2217	1.4	23.2596	1.7	0.0459	2.3	0.0077	1.5	0.66	49.7	0.7	45.6	1.0	168.0	43.0	49.7	0.7	NA
-Spot 160	204	2940	2.0	21.6537	2.4	0.0493	3.2	0.0077	2.0	0.64	49.8	1.0	48.9	1.5	7.1	58.6	49.8	1.0	NA
-Spot 281	149	2560	1.7	22.8802	4.1	0.0467	5.0	0.0078	2.7	0.55	49.8	1.3	46.4	2.2	127.2	102.3	49.8	1.3	NA
-Spot 154	295	3469	1.4	19.2559	4.5	0.0556	4.9	0.0078	2.0	0.41	49.8	1.0	54.9	2.6	282.4	102.0	49.8	1.0	NA
-Spot 284	221	4465	1.2	21.3336	2.8	0.0502	3.5	0.0078	2.2	0.62	49.9	1.1	49.7	1.7	42.8	66.2	49.9	1.1	NA
-Spot 192	172	1799	1.7	23.4199	2.6	0.0458	3.2	0.0078	2.0	0.60	50.0	1.0	45.5	1.4	185.1	64.5	50.0	1.0	NA
-Spot 286	874	24141	3.4	21.3496	1.2	0.0505	2.1	0.0078	1.8	0.82	50.2	0.9	50.0	1.0	41.1	29.2	50.2	0.9	NA
-Spot 198	190	5858	0.9	21.8925	3.7	0.0494	4.4	0.0078	2.5	0.56	50.3	1.2	48.9	2.1	19.3	88.5	50.3	1.2	NA
-Spot 103	354	24451	2.2	21.2048	2.0	0.0513	2.8	0.0079	1.9	0.70	50.6	1.0	50.8	1.4	57.3	46.8	50.6	1.0	NA
-Spot 148	550	4433	2.3	22.0418	2.0	0.0494	2.7	0.0079	1.8	0.66	50.8	0.9	49.0	1.3	35.8	49.0	50.8	0.9	NA
-Spot 296	438	4000	0.9	22.7627	1.8	0.0480	2.6	0.0079	1.9	0.73	50.9	1.0	47.6	1.2	114.5	44.4	50.9	1.0	NA
-Spot 308	1031	12574	1.5	21.4797	1.1	0.0509	2.1	0.0079	1.7	0.83	50.9	0.9	50.4	1.0	26.5	27.2	50.9	0.9	NA
-Spot 229	239	2499	1.9	19.3117	5.1	0.0567	5.4	0.0079	1.9	0.35	51.0	1.0	56.0	2.9	275.8	116.0	51.0	1.0	NA
-Spot 303	86	7001	1.3	20.1432	3.0	0.0546	4.1	0.0080	2.7	0.67	51.2	1.4	54.0	2.1	178.4	70.5	51.2	1.4	NA

-Spot 141	293	806	1.7	9.2180	15.2	0.1228	15.3	0.0082	2.3	0.15	52.7	1.2	117.6	17.0	1774.1	278.6	52.7	1.2	NA
-Spot 270	140	598	1.8	7.5280	21.2	0.1595	22.6	0.0087	7.6	0.34	55.9	4.2	150.3	31.5	2135.8	376.1	55.9	4.2	NA
-Spot 233	108	321	2.4	3.5570	2.2	0.3785	5.2	0.0098	4.8	0.91	62.6	3.0	325.9	14.6	3369.2	34.6	62.6	3.0	NA
-Spot 40	685	43733	2.0	18.0803	2.3	0.1054	2.9	0.0138	1.7	0.58	88.5	1.5	101.7	2.8	424.7	51.9	88.5	1.5	NA
-Spot 278	184	7565	2.2	19.4365	2.3	0.1045	3.2	0.0147	2.3	0.70	94.3	2.1	100.9	3.1	261.0	52.7	94.3	2.1	NA
-Spot 70	178	23910	22.9	17.3612	1.4	0.1637	2.4	0.0206	1.9	0.81	131.5	2.5	153.9	3.4	514.5	31.3	131.5	2.5	NA
-Spot 133	503	10852	24.0	13.3636	1.1	0.3335	2.1	0.0323	1.8	0.86	205.1	3.6	292.2	5.2	1064.0	21.5	205.1	3.6	NA
-Spot 305	165	3006	4.3	12.3142	4.3	0.6356	5.4	0.0568	3.3	0.61	355.9	11.4	499.6	21.3	1226.4	84.5	355.9	11.4	NA
-Spot 8	83	7025	2.3	16.5061	1.1	0.7347	2.6	0.0879	2.4	0.91	543.4	12.3	559.3	11.2	624.5	23.2	543.4	12.3	87.0
-Spot 146	4847	321569	4.9	16.8199	0.6	0.7640	1.8	0.0932	1.7	0.95	574.4	9.4	576.3	7.9	583.7	12.1	574.4	9.4	98.4
-Spot 118	922	208257	1.5	15.9366	0.6	0.8241	1.7	0.0953	1.6	0.94	586.5	8.8	610.3	7.7	699.7	12.6	586.5	8.8	83.8
-Spot 260	304	162609	0.6	15.9916	0.7	0.8408	2.5	0.0975	2.4	0.96	599.8	14.0	619.6	11.7	692.4	14.4	599.8	14.0	86.6
-Spot 212	70	5641	1.2	16.2905	1.8	0.8435	3.0	0.0997	2.5	0.81	612.4	14.4	621.1	14.1	652.8	38.1	612.4	14.4	93.8
-Spot 14	369	267715	2.9	16.0033	0.6	0.8658	1.9	0.1005	1.8	0.95	617.3	10.7	633.3	9.1	690.8	12.8	617.3	10.7	89.4
-Spot 139	132	19650	3.1	16.1488	0.8	0.8836	2.7	0.1035	2.6	0.96	634.8	15.5	642.9	12.7	671.5	16.8	634.8	15.5	94.5
-Spot 218	178	71419	3.5	15.8533	0.7	0.9004	1.8	0.1035	1.7	0.93	635.0	10.1	651.9	8.6	710.9	14.1	635.0	10.1	89.3
-Spot 247	126	14704	2.2	16.2432	1.1	0.8832	2.7	0.1040	2.5	0.92	638.1	15.1	642.7	12.9	659.0	22.7	638.1	15.1	96.8
-Spot 242	236	28640	3.1	16.0950	0.7	0.8914	1.7	0.1041	1.6	0.91	638.1	9.7	647.1	8.4	678.6	15.4	638.1	9.7	94.0
-Spot 80	146	28644	2.3	16.0263	0.7	0.8982	2.3	0.1044	2.2	0.95	640.1	13.3	650.7	11.0	687.8	15.7	640.1	13.3	93.1
-Spot 168	50	37159	3.0	15.7218	1.2	0.9173	3.2	0.1046	3.0	0.93	641.3	18.5	660.9	15.8	728.6	24.9	641.3	18.5	88.0
-Spot 230	840	176838	0.8	16.0867	0.6	0.8984	1.4	0.1048	1.3	0.91	642.6	8.0	650.9	6.8	679.7	12.3	642.6	8.0	94.5
-Spot 277	459	136259	0.5	15.8578	0.7	0.9133	1.8	0.1050	1.7	0.92	643.9	10.2	658.8	8.7	710.3	14.7	643.9	10.2	90.7
-Spot 18	116	10533	1.5	16.3160	0.9	0.9033	2.6	0.1069	2.4	0.94	654.7	14.9	653.5	12.3	649.4	19.2	654.7	14.9	100.8
-Spot 184	112	43508	2.3	16.2266	0.7	0.9087	2.2	0.1069	2.0	0.94	655.0	12.6	656.4	10.4	661.2	16.1	655.0	12.6	99.1
-Spot 251	248	110864	4.4	15.9436	0.7	0.9270	1.8	0.1072	1.7	0.92	656.4	10.4	666.0	8.8	698.8	14.9	656.4	10.4	93.9
-Spot 33	140	14877	2.8	15.9488	1.0	0.9291	2.5	0.1075	2.3	0.92	658.1	14.6	667.2	12.4	698.1	20.8	658.1	14.6	94.3
-Spot 117	162	80734	3.0	15.8050	0.7	0.9394	2.2	0.1077	2.1	0.94	659.3	13.0	672.6	10.8	717.3	15.4	659.3	13.0	91.9
-Spot 38	124	25172	3.9	15.9240	0.9	0.9325	2.3	0.1077	2.2	0.93	659.3	13.5	668.9	11.4	701.4	18.7	659.3	13.5	94.0
-Spot 71	232	237421	1.9	15.8278	0.7	0.9420	1.9	0.1081	1.8	0.94	661.9	11.4	673.9	9.5	714.3	14.2	661.9	11.4	92.7
-Spot 123	213	61004	2.3	16.0209	0.6	0.9314	2.3	0.1082	2.2	0.96	662.4	13.8	668.3	11.1	688.5	13.0	662.4	13.8	96.2
-Spot 67	374	938649	3.7	15.7782	0.6	0.9483	1.7	0.1085	1.6	0.93	664.1	9.9	677.2	8.3	720.9	13.1	664.1	9.9	92.1
-Spot 116	250	13948	2.7	16.1116	0.7	0.9304	2.0	0.1087	1.9	0.94	665.3	11.9	667.9	9.8	676.4	15.1	665.3	11.9	98.4
-Spot 185	239	233672	1.2	15.8313	0.6	0.9479	2.0	0.1088	1.9	0.95	666.0	12.2	677.0	10.0	713.8	13.3	666.0	12.2	93.3
-Spot 60	230	512421	2.9	15.8205	0.6	0.9526	2.1	0.1093	2.0	0.95	668.7	12.5	679.4	10.2	715.3	13.2	668.7	12.5	93.5
-Spot 156	265	50781	3.0	15.8221	0.7	0.9571	1.7	0.1098	1.6	0.91	671.8	10.1	681.8	8.7	715.1	15.4	671.8	10.1	93.9
-Spot 124	118	55324	3.0	15.7143	0.7	0.9646	1.9	0.1099	1.8	0.93	672.4	11.5	685.7	9.7	729.6	15.1	672.4	11.5	92.2
-Spot 91	122	26836	3.1	15.8709	1.1	0.9557	3.3	0.1100	3.1	0.95	672.8	20.1	681.1	16.5	708.5	22.8	672.8	20.1	95.0
-Spot 244	422	52735	3.7	16.0831	0.6	0.9444	1.8	0.1102	1.7	0.93	673.7	10.7	675.2	8.8	680.2	13.9	673.7	10.7	99.0
-Spot 227	226	64934	2.3	15.9731	0.7	0.9510	1.7	0.1102	1.6	0.93	673.8	10.3	678.6	8.6	694.9	14.1	673.8	10.3	97.0
-Spot 306	135	34403	2.2	15.9846	0.9	0.9535	2.2	0.1105	2.0	0.92	675.9	12.9	679.9	10.8	693.3	18.1	675.9	12.9	97.5
-Spot 199	169	24190	2.5	16.0318	0.8	0.9507	2.5	0.1105	2.4	0.95	675.9	15.3	678.5	12.4	687.1	16.2	675.9	15.3	98.4
-Spot 145	43	48698	2.9	16.0173	1.0	0.9529	2.7	0.1107	2.4	0.92	676.8	15.7	679.6	13.2	689.0	22.2	676.8	15.7	98.2
-Spot 24	140	63858	2.5	15.8405	0.8	0.9640	2.6	0.1107	2.4	0.95	677.1	15.6	685.4	12.8	712.6	17.5	677.1	15.6	95.0
-Spot 220	97	72744	3.9	15.5413	0.8	0.9888	2.3	0.1115	2.1	0.94	681.2	13.8	698.1	11.4	753.0	16.2	681.2	13.8	90.5
-Spot 58	100	16641	3.1	15.9992	1.0	0.9605	2.8	0.1115	2.6	0.94	681.2	16.9	683.6	13.9	691.4	20.8	681.2	16.9	98.5
-Spot 66	280	150176	3.3	15.7913	0.5	0.9762	2.0	0.1118	1.9	0.97	683.2	12.6	691.7	10.1	719.2	11.0	683.2	12.6	95.0
-Spot 232	85	18875	2.3	16.2028	0.9	0.9524	2.6	0.1119	2.5	0.94	683.9	16.0	679.4	13.0	664.4	19.8	683.9	16.0	102.9
-Spot 110	108	10836	3.5	16.2827	1.1	0.9492	2.3	0.1121	2.0	0.88	684.9	12.9	677.7	11.2	653.8	23.3	684.9	12.9	104.8
-Spot 50	251	55843	2.6	15.9517	0.7	0.9690	2.3	0.1121	2.2	0.96	685.0	14.6	687.9	11.7	697.7	14.1	685.0	14.6	98.2
-Spot 132	165	102297	2.4	15.7903	0.7	0.9797	2.0	0.1122	1.9	0.94	685.5	12.5	693.4	10.2	719.3	14.4	685.5	12.5	95.3
-Spot 85	186	21318	3.6	16.0936	0.6	0.9636	1.8	0.1125	1.7	0.94	687.1	11.3	685.1	9.2	678.8	13.4	687.1	11.3	101.2
-Spot 210	71	28669	3.3	16.1333	0.9	0.9637	2.9	0.1128	2.8	0.96	688.7	18.1	685.2	14.4	673.5	18.3	688.7	18.1	102.3
-Spot 114	90	46868	2.6	15.5905	1.0	0.9993	2.1	0.1130	1.9	0.87	690.1	12.3	703.4	10.9	746.3	22.0	690.1	12.3	92.5
-Spot 142	129	33312	2.5	15.8036	0.8	0.9860	2.2	0.1130	2.1	0.94	690.2	13.6	696.7	11.1	717.5	16.3	690.2	13.6	96.2
-Spot 88	149	16163	2.8	16.1446	0.7	0.9668	2.5	0.1132	2.4	0.96	691.3	15.9	686.8	12.7	672.1	15.9	691.3	15.9	102.9
-Spot 76	43	16987	1.5	15.8844	1.4	1.0160	3.6	0.1171	3.3	0.91	713.6	22.0	711.9	18.2	706.7	30.8	713.6	22.0	101.0
-Spot 101	167	813568	4.6	14.0612	0.8	1.6287	2.5	0.1661	2.4	0.95	990.6	22.0	981.4	15.9	960.8	16.8	960.8	16.8	103.1
-Spot 262	41	11885	1.2	13.3365	0.9	1.8634	3.5	0.1802	3.4	0.97	1068.3	33.4	1068.2	23.2	1068.0	17.4	1068.0	17.4	100.0
-Spot 300	241	27886	2.8	13.1167	0.6	1.9580	1.5	0.1863	1.3	0.91	1101.1	13.6	1101.2	10.0	1101.3	12.5	1101.3	12.5	100.0
-Spot 200	1756	968284	8.8	11.8348	0.6	2.6560	1.8	0.2280	1.7	0.95	1323.9	20.3	1316.3	13.2	1304.0	10.8	1304.0	10.8	101.5

-Spot 158	89	25371	1.4	11.4232	0.7	2.5610	2.5	0.2122	2.4	0.96	1240.4	27.1	1289.6	18.3	1372.4	13.7	1372.4	13.7	90.4
-Spot 291	995	202098	2.5	11.4088	0.6	2.9709	1.5	0.2458	1.4	0.92	1416.9	17.6	1400.2	11.5	1374.8	11.6	1374.8	11.6	103.1
-Spot 271	876	583187	2.4	11.3196	0.6	2.9010	1.9	0.2382	1.8	0.94	1377.1	22.2	1382.2	14.3	1389.9	12.1	1389.9	12.1	99.1
-Spot 43	1030	177484	49.8	11.3103	0.6	2.7168	1.9	0.2229	1.8	0.95	1297.0	20.9	1333.1	13.9	1391.5	11.2	1391.5	11.2	93.2
-Spot 196	849	359204	2.4	11.2977	0.5	2.9785	1.5	0.2441	1.4	0.95	1407.7	18.0	1402.1	11.4	1393.6	9.2	1393.6	9.2	101.0
-Spot 78	63	40305	1.4	11.2768	0.6	3.0944	2.5	0.2531	2.4	0.97	1454.4	30.9	1431.3	18.9	1397.2	12.0	1397.2	12.0	104.1
-Spot 9	108	20391	1.5	11.2546	0.6	2.9748	2.8	0.2428	2.8	0.98	1401.3	35.2	1401.2	21.7	1401.0	10.7	1401.0	10.7	100.0
-Spot 5	549	481777	7.1	11.1609	0.6	2.6341	2.0	0.2132	1.9	0.96	1246.0	21.9	1310.2	14.8	1417.0	10.6	1417.0	10.6	87.9
-Spot 165	738	6124108	18.4	11.1552	0.6	2.7475	4.2	0.2223	4.2	0.99	1294.0	48.9	1341.4	31.3	1417.9	11.2	1417.9	11.2	91.3
-Spot 312	259	2606780	5.4	11.1238	0.4	2.9720	1.6	0.2398	1.6	0.97	1385.5	19.3	1400.5	12.2	1423.3	7.6	1423.3	7.6	97.3
-Spot 204	99	19286	2.2	11.1082	0.8	2.9586	2.7	0.2384	2.5	0.95	1378.1	31.4	1397.0	20.2	1426.0	15.6	1426.0	15.6	96.6
-Spot 92	254	34191	1.9	11.1053	0.7	3.0541	2.2	0.2460	2.1	0.95	1417.7	26.3	1421.3	16.7	1426.5	13.0	1426.5	13.0	99.4
-Spot 294	815	930894	5.2	11.0061	1.0	2.8538	3.9	0.2278	3.8	0.97	1323.0	45.3	1369.8	29.4	1443.6	18.6	1443.6	18.6	91.6
-Spot 25	156	110361	3.0	10.6816	0.6	3.2830	2.0	0.2543	1.9	0.96	1460.8	24.8	1477.0	15.4	1500.4	11.1	1500.4	11.1	97.4
-Spot 172	120	144609	2.5	10.6566	0.5	3.3516	2.6	0.2590	2.6	0.98	1485.0	34.0	1493.2	20.4	1504.9	9.4	1504.9	9.4	98.7
-Spot 64	78	45152	2.6	10.3825	0.8	3.3301	3.3	0.2508	3.2	0.97	1442.4	40.7	1488.1	25.4	1553.9	15.3	1553.9	15.3	92.8
-Spot 65	102	408861	1.0	10.3035	0.6	3.5778	3.0	0.2674	3.0	0.98	1527.4	40.3	1544.6	23.9	1568.3	10.6	1568.3	10.6	97.4
-Spot 81	102	64324	1.0	10.0937	0.6	3.7061	2.5	0.2713	2.4	0.97	1547.4	32.9	1572.7	19.6	1606.7	10.3	1606.7	10.3	96.3
-Spot 181	454	3826967	42.6	10.0695	0.6	3.9704	3.2	0.2900	3.2	0.98	1641.3	46.2	1628.2	26.3	1611.2	10.9	1611.2	10.9	101.9
-Spot 295	54	55129	0.8	9.9096	0.7	4.0513	3.0	0.2912	2.9	0.97	1647.4	42.7	1644.6	24.6	1640.9	13.2	1640.9	13.2	100.4
-Spot 254	314	118279	1.2	9.8682	0.6	3.7399	1.6	0.2677	1.5	0.94	1529.0	20.9	1580.0	13.1	1648.7	10.3	1648.7	10.3	92.7
-Spot 2	151	39814	0.7	9.8448	0.5	3.9726	1.6	0.2836	1.6	0.96	1609.7	22.5	1628.6	13.4	1653.1	8.4	1653.1	8.4	97.4
-Spot 106	185	54404	1.9	9.7570	0.5	4.1418	1.9	0.2931	1.8	0.96	1657.0	26.2	1662.6	15.3	1669.7	10.0	1669.7	10.0	99.2
-Spot 44	186	53316	1.6	9.7245	0.6	4.2433	2.0	0.2993	2.0	0.95	1687.7	29.0	1682.4	16.8	1675.9	11.4	1675.9	11.4	100.7
-Spot 202	235	193195	0.7	9.7015	0.6	4.1272	2.1	0.2904	2.0	0.96	1643.5	29.2	1659.7	17.2	1680.2	11.4	1680.2	11.4	97.8
-Spot 129	65	10230	2.3	9.6839	0.9	4.2898	2.9	0.3013	2.8	0.96	1697.7	41.8	1691.4	24.2	1683.6	16.0	1683.6	16.0	100.8
-Spot 82	122	45530	2.7	9.5012	0.5	4.3340	2.1	0.2986	2.0	0.97	1684.6	30.1	1699.8	17.3	1718.7	9.6	1718.7	9.6	98.0
-Spot 53	173	295917	1.9	9.4722	0.5	4.5267	1.8	0.3110	1.7	0.96	1745.5	26.5	1735.9	15.1	1724.3	9.6	1724.3	9.6	101.2
-Spot 137	196	201293	3.2	9.2995	0.5	4.5532	1.9	0.3071	1.8	0.96	1726.4	27.9	1740.7	15.9	1758.0	9.5	1758.0	9.5	98.2
-Spot 253	126	168959	2.0	9.2768	0.6	4.7577	2.1	0.3201	2.0	0.96	1790.3	30.8	1777.5	17.2	1762.5	10.5	1762.5	10.5	101.6
-Spot 135	448	591731	6.1	9.2656	0.6	4.4155	1.7	0.2967	1.6	0.93	1675.0	23.7	1715.2	14.3	1764.7	11.5	1764.7	11.5	94.9
-Spot 127	97	224220	4.9	9.2543	0.5	4.6939	2.6	0.3151	2.6	0.98	1765.5	39.9	1766.2	22.0	1766.9	9.0	1766.9	9.0	99.9
-Spot 20	173	125472	2.2	9.1922	0.6	4.2345	2.0	0.2823	1.9	0.95	1603.0	27.0	1680.7	16.4	1779.2	11.3	1779.2	11.3	90.1
-Spot 241	167	166284	1.3	9.1836	0.5	4.6878	2.0	0.3122	2.0	0.96	1751.7	30.0	1765.1	17.0	1780.9	9.9	1780.9	9.9	98.4
-Spot 250	336	8034454	2.7	9.1773	0.5	4.7378	1.7	0.3153	1.7	0.96	1767.0	26.0	1773.9	14.6	1782.2	8.4	1782.2	8.4	99.1
-Spot 166	213	104294	3.1	9.0900	0.5	4.8461	1.8	0.3195	1.7	0.96	1787.2	27.0	1792.9	15.2	1799.6	8.9	1799.6	8.9	99.3
-Spot 309	174	32496	2.2	8.9579	0.6	5.0500	1.9	0.3281	1.8	0.94	1829.1	28.0	1827.8	15.8	1826.2	11.2	1826.2	11.2	100.2
-Spot 93	186	173013	2.4	8.9424	0.7	5.0889	1.9	0.3300	1.7	0.93	1838.6	27.9	1834.3	15.9	1829.3	12.4	1829.3	12.4	100.5
-Spot 313	303	279248	2.1	8.9107	0.5	4.4671	1.7	0.2887	1.7	0.95	1635.0	24.1	1724.9	14.5	1835.7	9.5	1835.7	9.5	89.1
-Spot 171	67	29262	5.1	8.8973	0.5	5.1301	2.9	0.3310	2.8	0.98	1843.4	45.6	1841.1	24.6	1838.5	9.6	1838.5	9.6	100.3
-Spot 10	67	63233	1.9	8.8751	0.7	5.1485	2.9	0.3314	2.8	0.97	1845.2	44.8	1844.1	24.5	1843.0	12.4	1843.0	12.4	100.1
-Spot 75	53	124840	1.4	8.8721	0.7	5.2233	3.3	0.3361	3.2	0.98	1867.9	52.7	1856.4	28.3	1843.6	12.7	1843.6	12.7	101.3
-Spot 208	326	284812	1.8	8.7076	0.5	5.2789	1.5	0.3334	1.4	0.94	1854.7	23.1	1865.5	13.0	1877.4	9.2	1877.4	9.2	98.8
-Spot 107	47	66361	2.3	8.6560	0.6	5.2669	2.9	0.3307	2.8	0.98	1841.5	45.4	1863.5	24.8	1888.1	11.2	1888.1	11.2	97.5
-Spot 32	37	21836	1.4	8.5871	0.7	5.5416	2.6	0.3451	2.6	0.97	1911.3	42.3	1907.1	22.7	1902.5	11.9	1902.5	11.9	100.5
-Spot 293	81	35542	1.7	8.5159	0.5	5.3506	3.1	0.3305	3.1	0.99	1840.7	49.4	1877.0	26.7	1917.4	8.3	1917.4	8.3	96.0
-Spot 83	359	170900	1.4	8.2873	0.7	5.4072	2.3	0.3250	2.2	0.96	1814.1	35.1	1886.0	19.9	1966.1	12.1	1966.1	12.1	92.3
-Spot 57	113	66601	1.5	7.9360	0.5	6.4969	2.3	0.3739	2.3	0.98	2047.9	39.7	2045.5	20.4	2043.0	9.0	2043.0	9.0	100.2
-Spot 138	41	13110	1.5	7.8537	0.5	6.6926	2.7	0.3812	2.7	0.98	2082.0	47.3	2071.6	24.0	2061.4	9.6	2061.4	9.6	101.0
-Spot 191	167	42715	3.1	7.8230	0.5	5.3571	2.1	0.3040	2.0	0.97	1710.9	30.6	1878.0	18.0	2068.3	9.6	2068.3	9.6	82.7
-Spot 164	47	31875	1.1	7.7480	0.6	6.9026	3.4	0.3879	3.3	0.99	2113.0	60.0	2099.0	30.0	2085.3	10.2	2085.3	10.2	101.3
-Spot 51	181	331958	2.1	6.2218	0.7	9.7126	2.2	0.4383	2.1	0.95	2342.9	40.3	2407.9	19.9	2463.3	11.6	2463.3	11.6	95.1
-Spot 157	92	47603	2.8	5.9486	0.5	10.9843	3.0	0.4739	2.9	0.98	2500.6	60.6	2521.8	27.6	2538.9	8.7	2538.9	8.7	98.5
-Spot 125	194	404568	46.3	5.8402	0.8	9.6916	2.7	0.4105	2.6	0.96	2217.2	48.0	2405.9	24.6	2569.7	12.7	2569.7	12.7	86.3
-Spot 223	41	32445	1.2	5.6677	0.8	10.7327	3.6	0.4412	3.5	0.98	2355.9	68.7	2500.3	33.1	2619.7	12.6	2619.7	12.6	89.9
-Spot 100	23	13320	1.0	5.4140	0.9	13.5518	4.9	0.5321	4.8	0.98	2750.4	107.6	2718.9	46.2	2695.6	14.6	2695.6	14.6	102.0
-Spot 252	57	25392	1.0	5.3219	0.5	13.5797	2.1	0.5241	2.0	0.97	2716.7	44.3	2720.8	19.4	2723.9	7.9	2723.9	7.9	99.7
-Spot 152	773	361186	5.3	4.3371	0.7	15.7829	2.7	0.4965	2.6	0.96	2598.6	56.7	2863.7	26.3	3056.0	11.7	3056.0	11.7	85.0

Table _____. U-Pb geochronologic analyses for CM142-832.																			
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)	(%)
-Spot 44	92	1632	2.4	25.3198	6.9	0.0394	7.6	0.0072	3.0	0.40	46.4	1.4	39.2	2.9	383.9	179.9	46.4	1.4	NA
-Spot 48	270	8206	1.8	22.6136	2.2	0.0445	4.1	0.0073	3.4	0.84	46.9	1.6	44.2	1.8	98.3	53.7	46.9	1.6	NA
-Spot 15	351	2471	1.8	24.1450	3.0	0.0417	4.1	0.0073	2.8	0.68	46.9	1.3	41.5	1.7	261.9	75.8	46.9	1.3	NA
-Spot 103	376	37437	2.1	20.1956	2.1	0.0500	3.5	0.0073	2.8	0.80	47.1	1.3	49.6	1.7	172.3	50.0	47.1	1.3	NA
-Spot 86	558	8135	4.2	21.5609	1.5	0.0469	2.7	0.0073	2.2	0.83	47.1	1.0	46.5	1.2	17.4	35.2	47.1	1.0	NA
-Spot 36	288	2117	1.9	23.8484	2.4	0.0424	3.4	0.0073	2.5	0.72	47.1	1.2	42.2	1.4	230.6	60.5	47.1	1.2	NA
-Spot 40	363	4232	1.8	22.9168	2.4	0.0442	3.4	0.0073	2.5	0.72	47.1	1.2	43.9	1.5	131.2	59.0	47.1	1.2	NA
-Spot 60	264	2502	1.6	23.1379	2.7	0.0438	3.5	0.0074	2.2	0.62	47.3	1.0	43.6	1.5	155.0	68.3	47.3	1.0	NA
-Spot 57	394	12872	2.3	20.2199	1.1	0.0502	2.9	0.0074	2.7	0.92	47.3	1.3	49.7	1.4	169.5	25.7	47.3	1.3	NA
-Spot 100	263	16169	2.4	21.2626	2.3	0.0477	3.3	0.0074	2.4	0.72	47.3	1.1	47.4	1.5	50.8	55.0	47.3	1.1	NA
-Spot 75	312	3099	1.3	21.9103	1.8	0.0464	2.6	0.0074	1.9	0.72	47.3	0.9	46.0	1.2	21.3	43.5	47.3	0.9	NA
-Spot 9	368	3953	1.9	22.1281	4.3	0.0460	4.9	0.0074	2.2	0.46	47.4	1.1	45.7	2.2	45.3	105.6	47.4	1.1	NA
-Spot 69	167	2831	1.9	24.2115	2.8	0.0421	4.1	0.0074	2.9	0.73	47.4	1.4	41.8	1.7	268.9	70.8	47.4	1.4	NA
-Spot 94	939	21413	3.5	20.3933	1.1	0.0500	2.4	0.0074	2.2	0.90	47.5	1.0	49.5	1.2	149.5	25.2	47.5	1.0	NA
-Spot 89	256	6152	1.6	22.3022	2.6	0.0458	3.1	0.0074	1.7	0.55	47.5	0.8	45.4	1.4	64.4	63.4	47.5	0.8	NA
-Spot 55	217	9729	2.3	19.6690	3.4	0.0519	4.1	0.0074	2.2	0.55	47.6	1.1	51.4	2.1	233.7	79.1	47.6	1.1	NA
-Spot 109	517	18477	1.0	22.1399	1.6	0.0461	2.8	0.0074	2.3	0.82	47.6	1.1	45.8	1.3	46.6	40.0	47.6	1.1	NA
-Spot 24	192	1046	2.2	30.4123	2.8	0.0336	3.7	0.0074	2.4	0.65	47.6	1.1	33.5	1.2	885.7	80.1	47.6	1.1	NA
-Spot 80	1135	121508	0.5	20.8798	1.0	0.0489	2.2	0.0074	1.9	0.88	47.6	0.9	48.5	1.0	94.0	24.7	47.6	0.9	NA
-Spot 107	290	4335	1.8	22.7739	1.9	0.0449	3.4	0.0074	2.8	0.82	47.6	1.3	44.6	1.5	115.7	47.8	47.6	1.3	NA
-Spot 67	258	6952	1.2	17.5456	3.8	0.0583	4.9	0.0074	3.1	0.62	47.7	1.5	57.5	2.7	491.3	84.9	47.7	1.5	NA
-Spot 52	304	8353	0.8	22.5706	1.8	0.0453	3.0	0.0074	2.5	0.81	47.7	1.2	45.0	1.3	93.7	44.0	47.7	1.2	NA
-Spot 99	230	5387	2.5	22.3579	2.5	0.0459	3.6	0.0074	2.6	0.72	47.8	1.2	45.5	1.6	70.5	61.1	47.8	1.2	NA
-Spot 53	152	3578	1.4	22.8876	5.5	0.0448	6.0	0.0074	2.3	0.39	47.8	1.1	44.5	2.6	128.0	136.0	47.8	1.1	NA
-Spot 56	221	24217	1.6	18.8480	3.5	0.0545	4.2	0.0075	2.4	0.56	47.9	1.1	53.9	2.2	331.2	79.7	47.9	1.1	NA
-Spot 43	340	9109	3.5	22.0190	1.6	0.0467	2.7	0.0075	2.1	0.79	47.9	1.0	46.3	1.2	33.3	39.9	47.9	1.0	NA
-Spot 5	298	2487	2.1	24.9017	2.7	0.0413	4.1	0.0075	3.0	0.75	47.9	1.5	41.1	1.6	340.8	70.1	47.9	1.5	NA
-Spot 110	617	39137	1.2	21.4200	1.6	0.0480	2.8	0.0075	2.3	0.82	47.9	1.1	47.6	1.3	33.2	37.8	47.9	1.1	NA
-Spot 1	255	6184	1.8	21.8484	2.5	0.0471	3.5	0.0075	2.4	0.69	48.0	1.2	46.8	1.6	14.5	60.4	48.0	1.2	NA
-Spot 46	384	4601	1.9	22.3654	4.0	0.0461	4.5	0.0075	2.0	0.44	48.0	0.9	45.8	2.0	71.3	98.4	48.0	0.9	NA
-Spot 28	138	2074	2.4	24.5623	3.0	0.0420	4.4	0.0075	3.2	0.73	48.1	1.5	41.8	1.8	305.5	76.5	48.1	1.5	NA
-Spot 63	304	2625	2.3	23.0740	4.8	0.0447	5.4	0.0075	2.4	0.45	48.1	1.2	44.4	2.3	148.1	119.1	48.1	1.2	NA
-Spot 30	1283	19362	4.8	21.5730	1.0	0.0479	2.6	0.0075	2.4	0.93	48.1	1.1	47.5	1.2	16.1	23.3	48.1	1.1	NA
-Spot 37	390	9184	1.8	21.6187	1.5	0.0478	3.1	0.0075	2.7	0.88	48.2	1.3	47.4	1.4	11.0	35.6	48.2	1.3	NA
-Spot 84	977	40577	1.9	20.8642	1.6	0.0496	3.8	0.0075	3.4	0.90	48.2	1.6	49.2	1.8	95.8	38.1	48.2	1.6	NA
-Spot 73	1255	17870	2.7	21.5638	1.2	0.0480	2.3	0.0075	2.0	0.85	48.3	1.0	47.6	1.1	17.1	29.4	48.3	1.0	NA
-Spot 97	274	3629	3.2	22.8221	2.3	0.0454	3.7	0.0075	3.0	0.79	48.3	1.4	45.1	1.7	120.9	56.3	48.3	1.4	NA
-Spot 88	296	4513	2.1	22.7749	2.4	0.0455	3.4	0.0075	2.4	0.72	48.3	1.2	45.2	1.5	115.8	58.1	48.3	1.2	NA
-Spot 16	280	2743	2.3	23.4408	2.5	0.0442	3.8	0.0075	2.9	0.76	48.3	1.4	44.0	1.6	187.3	62.2	48.3	1.4	NA
-Spot 12	152	1889	1.9	25.7829	7.7	0.0402	8.2	0.0075	3.0	0.36	48.3	1.4	40.0	3.2	431.2	201.7	48.3	1.4	NA
-Spot 4	217	23490	2.3	21.7585	1.9	0.0477	2.8	0.0075	2.1	0.73	48.4	1.0	47.3	1.3	4.5	46.5	48.4	1.0	NA
-Spot 95	215	264288	2.5	20.9263	1.9	0.0497	3.6	0.0075	3.1	0.85	48.4	1.5	49.2	1.7	88.7	44.8	48.4	1.5	NA
-Spot 13	150	1491	3.8	26.6708	5.1	0.0390	5.9	0.0075	3.0	0.50	48.4	1.4	38.8	2.3	520.9	136.8	48.4	1.4	NA
-Spot 35	158	2383	1.5	23.4671	2.8	0.0444	3.9	0.0075	2.7	0.70	48.5	1.3	44.1	1.7	190.2	69.8	48.5	1.3	NA

-Spot 72	217	2372	3.2	23.6896	7.9	0.0440	8.2	0.0076	2.2	0.27	48.6	1.1	43.7	3.5	213.8	198.5	48.6	1.1	NA
-Spot 101	223	10260	2.1	22.7977	2.2	0.0459	4.1	0.0076	3.4	0.84	48.7	1.7	45.5	1.8	118.3	55.0	48.7	1.7	NA
-Spot 93	209	73534	1.6	21.3229	2.5	0.0491	3.9	0.0076	3.0	0.77	48.8	1.5	48.7	1.8	44.0	58.6	48.8	1.5	NA
-Spot 77	929	53257	4.8	21.1385	1.2	0.0497	2.3	0.0076	1.9	0.85	48.9	0.9	49.3	1.1	64.7	28.2	48.9	0.9	NA
-Spot 96	166	5561	2.6	22.1423	2.6	0.0475	3.5	0.0076	2.3	0.65	49.0	1.1	47.1	1.6	46.9	64.2	49.0	1.1	NA
-Spot 105	192	6888	2.8	22.2377	2.3	0.0474	3.6	0.0076	2.8	0.78	49.0	1.4	47.0	1.7	57.3	55.4	49.0	1.4	NA
-Spot 11	1842	90072	2.3	20.1983	1.5	0.0522	2.5	0.0076	2.0	0.80	49.1	1.0	51.6	1.2	172.0	34.8	49.1	1.0	NA
-Spot 23	191	12427	2.3	20.9308	2.8	0.0505	4.2	0.0077	3.1	0.74	49.2	1.5	50.0	2.0	88.2	67.3	49.2	1.5	NA
-Spot 31	289	12312	1.1	21.7612	2.1	0.0488	3.7	0.0077	3.0	0.82	49.5	1.5	48.4	1.7	4.8	50.8	49.5	1.5	NA
-Spot 33	144	7418	2.1	20.3870	2.9	0.0522	4.1	0.0077	3.0	0.72	49.5	1.5	51.6	2.1	150.3	67.0	49.5	1.5	NA
-Spot 34	94	1648	1.6	27.1396	10.5	0.0393	11.0	0.0077	3.1	0.28	49.7	1.5	39.2	4.2	567.7	284.9	49.7	1.5	NA
-Spot 104	873	81066	3.0	21.2165	1.4	0.0504	2.9	0.0077	2.6	0.87	49.8	1.3	49.9	1.4	56.0	34.6	49.8	1.3	NA
-Spot 47	162	2854	2.3	23.7668	3.0	0.0451	4.3	0.0078	3.1	0.71	50.0	1.5	44.8	1.9	222.0	76.8	50.0	1.5	NA
-Spot 85	145	7950	2.1	21.1095	2.0	0.0513	3.7	0.0079	3.1	0.84	50.4	1.6	50.8	1.8	68.0	47.5	50.4	1.6	NA
-Spot 92	321	4904	3.2	22.8671	1.5	0.0483	2.8	0.0080	2.4	0.84	51.4	1.2	47.9	1.3	125.8	38.0	51.4	1.2	NA
-Spot 98	1603	27043	2.4	21.1950	1.1	0.0528	2.7	0.0081	2.5	0.91	52.2	1.3	52.3	1.4	58.4	26.6	52.2	1.3	NA
-Spot 51	5262	83521	14.3	21.1305	0.8	0.0561	2.1	0.0086	2.0	0.93	55.2	1.1	55.4	1.1	65.7	18.2	55.2	1.1	NA
-Spot 7	210	764	0.8	7.0497	1.2	0.1689	2.8	0.0086	2.6	0.91	55.4	1.4	158.4	4.1	2249.9	20.3	55.4	1.4	NA
-Spot 91	123	690	0.4	6.8796	1.6	0.1768	3.3	0.0088	2.8	0.87	56.6	1.6	165.3	5.0	2292.0	28.0	56.6	1.6	NA
-Spot 65	84	237	0.2	3.9696	1.1	0.3470	3.2	0.0100	3.0	0.93	64.1	1.9	302.5	8.3	3196.8	17.9	64.1	1.9	NA
-Spot 66	89	397	0.2	3.5656	1.0	0.4130	2.7	0.0107	2.5	0.92	68.5	1.7	351.0	8.2	3365.5	16.3	68.5	1.7	NA
-Spot 78	66	3554	2.9	17.5050	4.9	0.2875	9.3	0.0365	7.9	0.85	231.1	17.9	256.6	21.1	496.4	109.0	231.1	17.9	NA
-Spot 25	87	10783	6.5	16.9991	1.7	0.3574	5.4	0.0441	5.1	0.95	278.0	14.0	310.3	14.5	560.7	36.5	278.0	14.0	NA
-Spot 90	7	1778	2.3	16.4446	4.1	0.7369	8.1	0.0879	6.9	0.86	543.0	36.1	560.6	34.7	632.5	88.1	543.0	36.1	85.8
-Spot 76	54	424619	1.5	16.0855	1.2	0.8486	3.8	0.0990	3.5	0.95	608.6	20.6	623.9	17.5	679.9	26.2	608.6	20.6	89.5
-Spot 18	211	17709	1.9	16.1574	0.8	0.8857	2.7	0.1038	2.6	0.95	636.6	15.8	644.1	13.0	670.4	17.4	636.6	15.8	95.0
-Spot 39	178	17786	1.9	16.1412	1.0	0.9005	3.0	0.1054	2.9	0.95	646.1	17.7	652.0	14.6	672.5	20.7	646.1	17.7	96.1
-Spot 8	2831	250663	2.7	16.1699	1.1	0.9155	2.9	0.1074	2.7	0.93	657.4	16.6	660.0	13.9	668.7	22.7	657.4	16.6	98.3
-Spot 79	164	20364	1.4	15.9361	0.9	0.9305	2.6	0.1075	2.4	0.94	658.5	15.2	667.9	12.7	699.8	19.3	658.5	15.2	94.1
-Spot 58	754	206378	3.0	16.0678	0.9	0.9250	2.4	0.1078	2.2	0.92	659.9	13.6	665.0	11.5	682.2	20.2	659.9	13.6	96.7
-Spot 14	30	21490	1.0	15.7091	1.5	0.9479	5.7	0.1080	5.5	0.97	661.1	34.8	677.0	28.4	730.3	31.8	661.1	34.8	90.5
-Spot 3	126	31668	2.1	15.9408	0.9	0.9388	3.3	0.1085	3.2	0.96	664.3	20.1	672.3	16.2	699.2	18.8	664.3	20.1	95.0
-Spot 22	75	7898	3.9	16.3306	1.6	0.9184	3.3	0.1088	2.9	0.88	665.6	18.2	661.5	16.0	647.5	34.1	665.6	18.2	102.8
-Spot 2	1285	137862	5.2	16.0830	0.8	0.9386	2.2	0.1095	2.0	0.93	669.7	13.0	672.2	10.8	680.2	16.8	669.7	13.0	98.5
-Spot 83	89	23723	1.4	15.7732	1.1	0.9572	3.1	0.1095	2.9	0.93	669.9	18.4	681.9	15.4	721.6	23.8	669.9	18.4	92.8
-Spot 87	187	1116114	2.4	16.1270	0.9	0.9421	2.4	0.1102	2.2	0.93	673.8	14.4	674.0	11.8	674.4	18.2	673.8	14.4	99.9
-Spot 62	105	19156	2.3	16.1146	1.0	0.9435	3.1	0.1103	2.9	0.95	674.3	18.9	674.7	15.3	676.0	21.2	674.3	18.9	99.7
-Spot 82	174	35203	3.4	16.2781	0.9	0.9346	2.4	0.1103	2.3	0.94	674.7	14.5	670.1	11.9	654.4	18.3	674.7	14.5	103.1
-Spot 64	213	38287	2.8	16.2430	0.8	0.9379	2.7	0.1105	2.6	0.96	675.6	16.6	671.8	13.3	659.1	17.0	675.6	16.6	102.5
-Spot 49	226	63122	1.7	15.8506	0.9	0.9640	2.7	0.1108	2.6	0.94	677.5	16.6	685.4	13.6	711.2	19.1	677.5	16.6	95.3
-Spot 42	181	83706	2.4	16.0868	1.1	0.9516	2.4	0.1110	2.2	0.90	678.7	14.1	678.9	12.1	679.7	22.8	678.7	14.1	99.9
-Spot 68	135	17149	2.1	16.0719	1.0	0.9676	2.7	0.1128	2.5	0.93	688.9	16.6	687.2	13.6	681.7	20.7	688.9	16.6	101.1
-Spot 81	1062	1298144	34.3	15.0667	1.4	1.0356	6.7	0.1132	6.5	0.98	691.1	42.7	721.7	34.4	818.1	29.1	691.1	42.7	84.5
-Spot 50	142	200156	3.6	15.9330	0.8	0.9839	2.5	0.1137	2.4	0.95	694.2	16.0	695.6	12.8	700.2	16.3	694.2	16.0	99.1
-Spot 20	142	42407	2.8	15.9980	0.8	0.9916	3.3	0.1151	3.2	0.97	702.0	21.1	699.5	16.6	691.5	18.0	702.0	21.1	101.5
-Spot 74	1166	1566935	2.5	11.2214	0.8	3.1409	2.3	0.2556	2.1	0.94	1467.4	28.0	1442.8	17.5	1406.6	14.8	1406.6	14.8	104.3
-Spot 106	245	391800	4.6	11.1816	0.7	2.8999	3.2	0.2352	3.1	0.97	1361.5	38.0	1381.9	24.0	1413.4	13.8	1413.4	13.8	96.3
-Spot 61	260	61767	2.1	11.1245	0.7	3.0179	2.1	0.2435	2.0	0.94	1404.8	25.0	1412.2	16.1	1423.2	14.2	1423.2	14.2	98.7
-Spot 32	500	163549	2.1	11.0294	0.9	3.0156	2.5	0.2412	2.3	0.93	1393.0	29.4	1411.6	19.3	1439.6	17.8	1439.6	17.8	96.8
-Spot 26	385	496839	5.8	11.0027	0.8	2.9307	2.4	0.2339	2.3	0.95	1354.7	28.2	1389.9	18.4	1444.2	14.6	1444.2	14.6	93.8
-Spot 70	139	1198451	1.0	9.8956	0.7	4.1003	2.7	0.2943	2.6	0.97	1662.9	38.5	1654.4	22.2	1643.6	12.7	1643.6	12.7	101.2
-Spot 19	666	1645360	11.1	9.7271	0.8	3.3079	3.4	0.2334	3.3	0.97	1352.1	40.3	1482.9	26.5	1675.4	14.8	1675.4	14.8	80.7
-Spot 10	563	400867	3.5	9.2927	0.8	4.6076	2.3	0.3105	2.1	0.93	1743.4	32.3	1750.7	19.0	1759.3	15.2	1759.3	15.2	99.1
-Spot 41	102	22231	1.9	8.9987	0.7	4.9683	2.9	0.3243	2.8	0.97	1810.5	44.6	1813.9	24.6	1817.9	12.7	1817.9	12.7	99.6
-Spot 54	28	13919	0.7	8.7575	0.7	5.5556	3.8	0.3529	3.7	0.98	1948.3	62.6	1909.3	32.5	1867.1	11.8	1867.1	11.8	104.3
-Spot 38	208	157857	1.9	8.6441	0.8	5.0044	2.7	0.3137	2.5	0.96	1759.1	39.2	1820.1	22.5	1890.6	13.7	1890.6	13.7	93.0
-Spot 59	56	9191	1.3	8.4214	0.8	5.8163	4.2	0.3552	4.1	0.98	1959.6	69.1	1948.8	36.2	1937.4	15.1	1937.4	15.1	101.1
-Spot 108	90	1158904	1.9	5.1120	0.6	14.7828	2.7	0.5481	2.6	0.97	2817.2	60.1	2801.4	25.8	2790.0	10.5	2790.0	10.5	101.0

Appendix E: Detrital Zircon U-Pb age data