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Finding the Time: Age-Depth Models in Rockshelters and Their Paleoenvironmental Implications

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FINDING THE TIME: AGE-DEPTH MODELS IN ROCKSHELTERS AND THEIR PALEOENVIRONMENTAL IMPLICATIONS

by

Caleb E. Ferbrache

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Anthropology

Approved:

Judson Byrd Finley, Ph.D. Major Professor	Tammy Rittenour, Ph.D. Committee Member
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ABSTRACT

Finding the Time: Age-Depth Models in Rockshelters and Their Paleoenvironmental Implications

by

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Utah State University, 2019

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The site of Last Canyon Cave (LCC) in Montana's Pryor Mountains possesses a deep sedimentary deposit rich with environmental data reaching back into the Late Pleistocene (Kornfeld et al. 2012), which was used to create an extensive environmental reconstruction (Minckley et al. 2015). This reconstruction was based on a smooth-spline age-depth model built from radiocarbon ages (mostly acquired from bighorn sheep feces) and was applied to a variety of environmental proxies, including a pollen. Using these radiocarbon ages to build an age-depth model for a pollen analysis could be a problem if the material used for the radiocarbon ages are not synchronous with the surrounding sediment. A solution is to use optically stimulated luminescence (OSL) to find an age for the eolian sediment that was most certainly deposited at the same time as the pollen.

This study creates age-depth models at LCC using radiocarbon, small aliquot OSL, and single-grain OSL in order to determine how differing age-depth models influence the interpretation of paleoenvironmental proxies and granulometry samples. I did this by re-evaluating the stratigraphy at LCC, collecting OSL and granulometry samples from three exposures, and using the results to construct new age-depth models for the site and interpret the granulometry data. After all of the ages were acquired, I created age-depth models using Bchron Bayesian modeling software (Haslett and Parnell 2008). While the small aliquot OSL was determined to be a sub-optimal representation of age, the single-grain OSL resulted in an age-depth model that produced ages that according to a t-test, were statistically distinct from the radiocarbon model.

I conclude that significant differences could be observed between the single-grain OSL and radiocarbon age-depth models at LCC, therefore bringing the existing environmental reconstruction into question. In addition, the use of granulometry aided in clarifying the site formation. Altogether, both single-grain OSL and granulometry should be consistently factored into the development of age-depth models of rockshelters.

(246 pages)

PUBLIC ABSTRACT

Finding the Time: Age-Depth Models in Rockshelters and Their Paleoenvironmental Implications

Caleb E. Ferbrache

Rockshelters are capable of preserving excellent environmental records within their sediments. But the matter of interpreting an environmental record from rockshelter sediments presents a significant hurdle in the form of dating. An "age-depth model" is typically used to estimate the age of environmental information extending through the deposit. An age-depth model calculates the changes in time between direct ages (like a radiocarbon age) and can provide an estimated age for any depth. While radiocarbon dating can provide an age for organic remains, optically stimulated luminescence (OSL) can provide a direct age on quartz sand deposition and is particularly effective when applied to deposits formed by the wind. This study compares radiocarbon and OSL age-depth models from Last Canyon Cave (LCC) in the Pryor Mountains of south-central Montana. While radiocarbon ages are quite frequently used to construct age-depth models, it is possible they fail to provide accurate ages for the environmental material they aim to date.

I re-evaluated the stratigraphy at LCC and then collected OSL samples as well as samples for grain-size analysis from three different sedimentary exposures. Radiocarbon ages had already been produced for one of the exposures (Kornfeld et al. 2012). The OSL samples were most reliable when analyzed on a single-grain level. After creating age-depth models and collecting the grain-size data, I applied ages to all of the grain-size samples according to each of the three age-depth models. Ultimately, the single-grain OSL proved to be fundamentally different than the radiocarbon age-depth model, thereby challenging the current paleoenvironmental reconstruction of the site (Minckley et al. 2015).

I conclude that the radiocarbon and single-grain OSL age-depth models were not sufficiently similar, and therefore both dating methods should always be used together when investigating deposits in rockshelters in order to understand how they relate to one another and to the site formation. The use of granulometry also proved to be an important part of reconstruction site formation history. Ultimately, both single-grain OSL and granulometry were determined to be essential parts of studying environmental records in sedimentary deposits in rockshelters.

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Finally, I would like to dedicate this thesis to the memory of my parents, Edgar and Deborah Ferbrache. They showed me a world far greater than the backwoods of southern Ohio, and that whatever is good and beautiful is worth pursuing. Their labor and love showed me how to live generously, even through the bleakest of times. Without their lives and legacies near me, I would not have achieved the goals I can now claim.

Caleb E. Ferbrache

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CHAPTER 1:

INTRODUCTION

Rockshelters are important in archaeological research due to their ability to preserve stratified cultural, biological, and paleontological remains commonly with material available for age control (Aikens 1970; Barton et al. 2016; Frison 1962; Husted and Edgar 2002; Jelinek 1982; Jennings 1957; Kennett et al. 2014). In addition, these combined records can serve as reliable climate proxies for regional paleoenvironmental reconstruction (Davis 1990; Farrand 1979; Woodward and Goldberg 2001). Age-depth models are important tools in the construction and analysis of environmental records where a series of absolute ages of known depth can be used to model stratigraphically intervening samples of unknown age (Lowe et al. 1999; Mauquoy et al. 2002; Walker et al. 2003). Age-depth models allow researchers to assign an age to an archaeological, geological, or paleoecological sample that has not been directly dated, and thus create a time-series that facilitates comparison of independent datasets. However, applying an age-depth model to rockshelter deposits without fully considering the processes that formed the deposit could generate significant uncertainties with age estimates. While radiocarbon dating has typically been the default method used in most Quaternary research, optically stimulated luminescence (OSL) dating provides a reliable alternative and provides an age estimate of sediment deposition itself (Huntley et al. 1985). Researchers must carefully consider exactly what they seek to date and how accurately their selected method reflects their targeted reconstruction.

This thesis compares age-depth models created using three independent chronologies from a single site, Last Canyon Cave, located in the Pryor Mountains of southern Montana (Kornfeld et al. 2012). The rockshelter contains an eolian sedimentary deposit (with contributions from sandstone roof fall and granular disintegration) reaching back >40,000 years, yielding environmental records from fossilized bighorn sheep (*Ovis catclawensis*) fecal pellets and eolian pollen (Minckley et al. 2015). Radiocarbon from the feces provided the majority of ages for an age-depth model, allowing interpretation of the environmental records. Because plant pollen is deposited as part of the eolian sediment rain, I argue that direct ages on sediment deposition provide more accurate age models for analyzing pollen from terrestrial sediments like rockshelter deposits. I compare the effectiveness of radiocarbon and luminescence chronologies in age-depth models focusing on the ability of independent chronologies to reconstruct deposit formation and place environmental data in time with a reasonable level of accuracy and precision. Ultimately, I question whether data used in paleoenvironmental reconstructions are more accurately interpreted through OSL dating of eolian sediment or through radiocarbon dating based on specimens of unknown association or built-in age. This research challenges the current default strategy of basing age control on radiocarbon dating alone and has major implications for environmental reconstruction using terrestrial paleoecological proxies preserved in rockshelters. In particular, it may result in archaeologists more frequently using OSL when constructing age-depth models for rockshelters. In addition, it may result in the re-evaluation of existing studies where radiocarbon ages may have been misinterpreted.

I hypothesize that due to the fundamental difference in the forces placing the material for radiocarbon dating versus the forces placing the material for OSL dating, that age-depth models built from the two methods at Last Canyon Cave will not be in statistically supported agreement. But in order evaluate the paleoenvironmental interpretation of Last Canyon Cave, I collected and analyzed OSL and granulometry samples from three columns of a re-occupied original excavation site. The OSL samples were analyzed using traditional small and more refined single-grain techniques, allowing for the construction of alternative chronologies, while the granulometry provided an environmental proxy that could be interpreted through both the radiocarbon and OSL chronologies. This was accomplished by first creating age-depth models from the radiocarbon and OSL ages and using the age-depth models to assign dates to the granulometry samples. Then the modeled OSL and radiocarbon ages were compared by performing a two-tailed t-test between the two sets of ages to determine the existence of statistically significant differences between the two age-depth models. The granulometry could then be discussed in context of the previous environmental reconstruction in 2015 and any conflicts between the reconstruction and granulometry could be identified. This step is particularly important if significant differences were to be found between the OSL and radiocarbon age-depth models.

At the completion of these analyses, I found that an age-depth model built from radiocarbon ages was not compatible with an age-depth model build from single-grain OSL ages. I concluded five things about building age-depth models in rockshelters: 1) that single-grain OSL should be used rather than small aliquot OSL, 2) that single-grain OSL should be used to either challenge or confirm radiocarbon ages, 3) that in situations where radiocarbon and single-grain OSL ages are in agreement, an age-depth model built on a combination of the two sets of ages are ideal, 4) that granulometry aids in understanding the formation and stratigraphy of the site, and 5) that sampling multiple walls from the back towards the front of the shelter further aids in perceiving the formation history of the deposit. But in order to successfully describe these methods, their results, and interpretation, it should first be established how radiocarbon and OSL dating differ from each other, the existing variations in age-depth modeling procedures, and why Last Canyon Cave provides an excellent opportunity to study age-depth modeling of rockshelter sediments.

CHAPTER 2:

BACKGROUND

Age-Depth Models

The use of radiocarbon for the development of age-depth models has a long application in paleoenvironmental research where the age of non-directly dated boundaries in lake cores and other sedimentary records were needed for identification and correlation between sites (Godwin 1961; Pilcher 1969, 1973; Van Geel 1978). While radiocarbon dating remains the basis for most age-depth models, the manner of extrapolating the ages has seen many advances (Bennett 1994; Blaauw 2010; Bronk Ramsay 2008; Telford et al.

2004; Traschel and Telford 2017). Modern age-depth models include smooth spline and polynomial regression models (Bennett 1994), “wiggle matching” (Van Geel and Mook 1989), which can improve the calibration of a series of radiocarbon dates, Markov Chain Monte Carlo (MCMC) simulations to estimate uncertainty (Bennett 1994), and Bayesian models, which are most widely applied today (Blaauw and Christen 2005; Bronk Ramsey 2008).

Bayesian Models

Bayesian age-depth models are based in Bayesian statistics, which is in turn based in Bayes’ Theorem (Bayes 1763). Bayes’ Theorem describes the influence prior information has on probability calculations. Consequently, Bayesian Statistics operates within the conceptual structure of “degrees of belief,” as opposed to probability based in frequency (Daston 1994). Bayes’ Theorem is typically used to update an existing belief as new information becomes available. Essentially, Bayesian statistics analyze data by incorporating “prior probabilities” into the calculation, and then producing “posterior probabilities,” which summarize the degree of belief in a proposition or random event. A prior probability (or sometimes simply called a “prior”) is a pre-existing piece of information, and the posterior probability (or simply a “posterior”) is the probability that results from considering new information/priors.

Direct ages such as those provided by radiocarbon and OSL act as priors for Bayesian age-depth models, and Bayesian algorithms are able to process that information into posterior models providing ages through the entire sedimentary column. Currently, a number of software programs are available which incorporate Bayesian statistics into their modeling routines, including OxCal (Bronk Ramsey 2008), Bchron (Haslett and Parnell 2008), and Bacon (Blaauw and Christen 2011). While these programs were developed with radiocarbon ages specifically in mind, other dating methods such as OSL can be used as priors. These tools are still fairly new to professional archaeologists, and their integration into the discipline has not been without its challenges (Hamilton and Krus 2018). However, Bayesian age-depth models are still proving their innate value in archaeology. For example, they can provide assistance in understanding the complex structures of archaeological sites (Pelton et al. 2017), and they more broadly provide an effective way to model the formation of the site and estimate ages for the material therein. This is particularly true of rockshelter sites since the deposit formation can be reliably modeled due to the frequent absence of strong erosional forces erasing parts of the depositional record.

Optically Stimulated Luminescence (OSL) & Radiocarbon Dating: Advantages and Limitations

Optically Stimulated Luminescence. Optically stimulated luminescence, or OSL (Huntley et al. 1985), provides a method for calculating the date when quartz grains were buried. Once a grain of quartz is buried, ionizing radiation from local elements as well as cosmic sources will cause electrons to become trapped in defects in the crystal lattice. These electrons will remain stored in the defects until stimulated by light or heat. Once stimulated, the energy will leave the trap and enter a “recombination center” and release a photon. Since the process of electron entrapment should steadily continue once the quartz has been buried, an age can be calculated once the rate of radiation exposure and the amount of radiation the quartz received have been quantified. The amount of radiation received over time, or “equivalent dose” (D_E) can be calculated by collecting sediment in a light-protected tube and studying the luminescence responses of quartz grains in a laboratory setting. The rate of radiation exposure, or “dose rate,” can be largely calculated by collecting sediment surrounding the D_E sample, and analyzing it for minerals that produce ionizing radiation. However, these methods cannot produce reliable results unless the quartz had been thoroughly “bleached” upon deposition, meaning that any trapped electrons have been cleared out, typically by sunlight, immediately prior to the targeted depositional event.

OSL dating is a particularly useful tool in dating Quaternary geological deposits including archaeological sites (Feathers 2003a; Rittenour 2008). It provides an important alternative to radiocarbon, particularly where organic materials are absent or deposit age exceeds the limits of radiocarbon dating. Recent advances in OSL dating, particularly the single aliquot regenerative (SAR) dose method (Murray and Wintle 2000) and single-grain dating (Duller et al. 1999; Duller 2008) provide more accurate age estimates. While its application in archaeology was originally focused on dating ceramics (Aitken 1997; Aitken et al. 1964; 1968; Mejdahl 1969), its usefulness in dating sedimentary deposits at archaeological sites has been proven repeatedly (Chazan et al. 2013; Feathers et al. 2006; Pederson et al. 2014; Rittenour et al. 2015; Vafiadou et al. 2007). Particularly, advances in single-grain analysis have shown to be invaluable for discerning the finer details of site formation including the potential for post-depositional mixing (Bateman et al. 2007). However, radiocarbon dating still dominates archaeological work, and luminescence dating may be underused, particularly in the development of age-depth models. While radiocarbon and OSL are the most frequently used dating methods at archaeological sites, not all sites are well-suited for one or the other. Site-specific factors can determine the acceptability of results from either method, which in turn impacts the quality of age-depth models that can be constructed.

Radiocarbon Dating. Radiocarbon dating (Libby 1955) is based on the idea that if a radioactive isotope begins decaying at a constant, known rate after an organism dies, then the date of death should be calculatable. The isotope ^{14}C (alternatively referred to as "radiocarbon") provides the opportunity to make this calculation, being present in all organic matter and possessing a half-life is about 5,730 years (Godwin 1962). ^{14}C is formed in the atmosphere when cosmic rays create energized neutrons, and when such a neutron collides with an ^{14}N atom, the result will be ^{14}C and a proton. Living organisms will absorb the elements in the atmosphere, maintaining the same ratios of elemental isotopes present in the atmosphere. When the organism dies, it will cease to absorb elements from the atmosphere, meaning that the isotopic ratios present in the organism at the time of death should match those that were present in the atmosphere at the time of death. Stable isotopes will remain, while radioactive isotopes will begin decaying. Radiocarbon in particular will begin transforming into ^{14}N through the emission of beta particles. So, if the ratio of ^{14}C to ^{12}C (a stable isotope) in the atmosphere at the time of the organism's death is known, then the approximate date of the organism's death can be calculated after identifying the ratios of ^{14}C to ^{12}C currently present in the organism's remains. Due to the limited occurrence of ^{14}C in an organism, radiocarbon dating tends to be limited to ages younger than 50,000 years BP. The current method for detecting quantities of carbon isotopes is accelerator mass spectrometry, or AMS (Bronk Ramsey et al. 2004; Kromer et al. 2013; Steier et al.

2004). This process uses a beam of accelerated ions to separate the isotopes and counts the quantities using Faraday cups and particle detectors (usually a gas or solid-state detector). But even when this process is performed without reproach, there are a few spaces for error and necessary adjustments that require attention.

Comparison of OSL and Radiocarbon. A well-known hazard in radiocarbon dating is the "old wood" problem, whereby a piece of wood from a tree that died decades or even centuries earlier could be re-deposited in a much younger context (Schiffer 1986). Additional sources of error can come from contamination, isotopic fractionation, variations in atmospheric radiocarbon production, and from reservoir effects (Walker 2005). Contamination predominantly results from improper handling or from existing environmental factors. A handling error could be as simple as touching the sample with a bare hand, and environmental contamination can include naturally occurring hydrocarbons in the bedrock (Rittenour et al. 2015), or incorporation of ancient carbon from ^{14}C-deficient sources such as carbonate rocks (Lee et al. 2011). Isotopic fractionation refers to the tendency of organisms to absorb lighter isotopes faster than heavier ones such as ^{14}C, and this fact needs accounted for when calculating a radiocarbon age (Craig 1953; Harkness 1979; O'Leary 1981). Within this context, the rates of ^{14}C absorption can vary from species to species. The radiocarbon produced in the atmosphere varies over time, and calibration curves based on tree rings (and other proxies) are required to correct for these changes (de Vries 1958; 1959; Stuiver and Suess 1966; Reimer et al. 2013). Reservoir effects generally refer to an environment where the radiocarbon content is not in equilibrium with the atmospheric content. A major example are marine reservoirs, where the slow movement of atmospheric carbon from the surface of a body of water down to its deepest reaches, which later upwells towards the surface, bringing old carbon with it (Arnold and Anderson 1957; Broecker 1963; Revelle and Seuss 1957). The result is that datable material taken from a deep body of water may appear deceptively old and will require a calibration of the date (Jull et al. 2013; Mangerud 1972; Oana and Deevey 1960). Consumers of aquatic life can also be impacted (Philippsen 2013).

Where OSL is concerned, the calculations to produce an age rely on a number of significant assumptions. These assumptions include a constant dose rate from surrounding elements, a constant cosmic contribution, a constant moisture content, and that the sediment was fully bleached (complete solar resetting) before deposition. Perhaps the most common problem with OSL is that the sediment was partially bleached before deposition (Alexanderson 2007; King et al. 2014; Li et al. 2018; Rittenour 2018), or that sediment underwent mixing (Jacobs et al. 2006; Porat et al. 2006). While eolian sediments have the highest probability of being fully bleached (Bailey and Arnold 2006; Olley et al. 1998; Rittenour 2018), partial bleaching can be expected in fluvial deposits in relationship to depth, mode of transport, and distance transported (Rittenour 2008). In addition, some amount of mixing is to be expected from factors like erosion and water turbidity (Rittenour 2008; 2018). Therefore, environments that have been heavily shaped by water may be a problematic place for OSL, though advances in single-grain OSL have yielded ages for sediments that were previously difficult to date (Duller 2008; Jacobs and Roberts 2007). However, dry and undisturbed eolian deposits remain the ideal setting for OSL (Nathan et al. 2003; Olley et al. 1998; Rittenour 2018).

Both radiocarbon and OSL have limits on their applicable time intervals. For radiocarbon, the maximum age obtainable is about 50,000 years (Reimer et al. 2013) due to the time it takes ^{14}C to decay into nearly undetectable amounts. For OSL, sediment can reach a saturation point where all electron traps have been filled and it will no longer build a greater luminescence signal. This limits the use of OSL to about 100-150 ka, but this is dependent on indirect sample properties, and reliable ages up to one million years are possible in ideal settings (Rhodes 2011).

OSL in Rockshelters

When rockshelters are excavated, OSL is frequently disqualified from dating methods due to the presence of colluvial and/or alluvial sediments that have been subject to mixing, partial bleaching, and varying moisture content over time (Fuller et al. 1994; Gemmell 1994). But as established, OSL is effective on eolian sediments within rockshelters. One of the earliest and most notable applications of OSL on eolian sediments in a rockshelter occurred at Jinmium Cave in Australia during the 1990s. When excavations began in 1992 (Fullagar et al. 1996), 17 samples were taken for thermoluminescence dating, an older luminescence dating technique (Nanson et al. 1991; Redhead 1984; 1988; Shepherd and Price 1990). The initial results of this study led the authors to conclude that humans occupied Australia prior to 116 ka. These results were re-evaluated, particularly through the use of single-grain luminescence, which revealed that partially bleached contributions from the shelter ceiling influenced the thermoluminescence ages (Roberts et al. 1998; 1999). The revised ages were comparable to the radiocarbon ages acquired at the site and placed human occupation at Jinmium after 10 ka. In addition to establishing the effectiveness of single-grain OSL in rockshelters, the OSL samples were interpreted with the assistance of age models such as the minimum and central age models to constrain OSL ages (Galbraith and Roberts 2012). Due to the ability of OSL dating to identify ages greater than those achievable through radiocarbon, it has been particularly important in investigating Paleolithic sites in rockshelters, such as Taforalt (Clark-Balzan et al. 2012), Rhafas Cave (Mercier et al. 2007), Blombos Cave (Jacobs et al. 2003; 2006), Rose Cottage Cave (Pienaar et al. 2008), Gorham's Cave (Blasco et al. 2015) and Sibudu Cave (Wadley and Jacobs 2004). Single-grain analysis tends to be the preferred method, though small aliquots are still used at times (Jacobs et al. 2003).

The current research illustrates that OSL is effective and reliable at sites where viable radiocarbon is absent, or where the deposit reaches ages outside the range of radiocarbon dating. But what other reasons should prompt OSL dating? This question confronts some problems specific to archaeological excavations. First of all, while archaeologists aim to understand human behavior, they are also interested in the context where this behavior took place. This means that environmental reconstructions are frequently part of their research. But as a discipline oriented towards human behavior, datable organic remains associated with human behavior, such as hearths, are frequently the sought-after source of a defined age. While this is a good and reasonable strategy for the study of human activity, a potential for error is raised when those same carbon dates are used in an age-depth model intended for application to environmental information in eolian sediments, such as pollen. Can organic material deposited by the disruptive forces of humans and animals create the appropriate age-depth model for studying eolian pollen? Or does this organic material end up at depths that do not accurately represent the age-

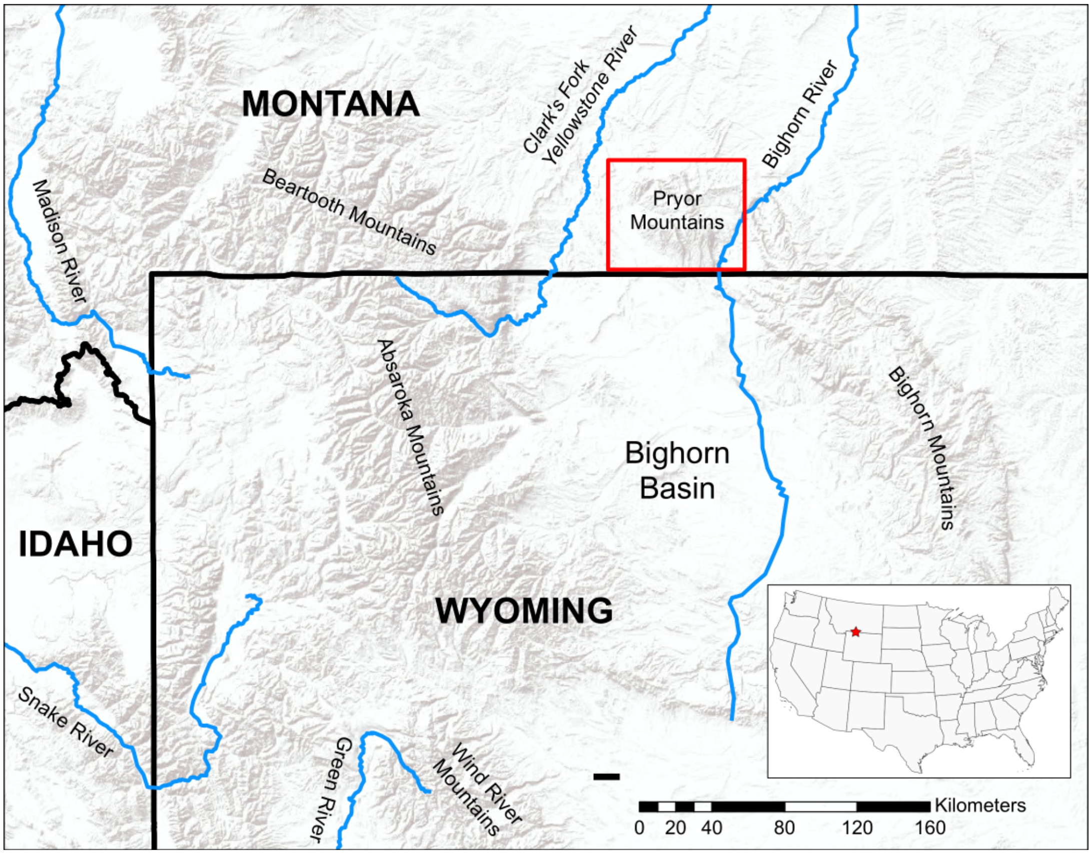

Figure 1. Location of the Pryor Mountains and Last Canyon Cave in South-Central Montana.

depth relationship in the eolian sediments? To critically evaluate these questions, I examine the stratigraphy and chronology of Last Canyon Cave.

Last Canyon Cave: Late Quaternary Paleoecology of the Northern Bighorn Basin

Last Canyon Cave (24CB879) is a small rockshelter situated at 2,597 m above sea level (ASL) within the Tensleep Formation Sandstone on the southwestern edge of the Pryor Mountains in south-central Montana, USA (Figures 1-4). Major work was conducted at the site during 2007-2012 (Kornfeld et al. 2012). The excavation (Figure 4b) yielded a few stone artifacts and 530 bones, including specimens identified as Pleistocene horse

(*Equus sp.*) and Pleistocene bighorn sheep (*Ovis catclawensis*). A total of 11 radiocarbon ages (Table 1) were acquired to build the chronology of the site, with feces providing the majority of ages, along with two ages from bone collagen and one from charcoal. The charcoal came from a presumed hearth at the highest point sampled in the column and provided the age 12,800-12,690 cal BP[1] (Beta 242805; Table 1), while the lowest sample was an *Ovis catclawensis* fecal pellet, offering an age of 44,690-42,200 cal BP (Beta 242808). The well-sorted silty very fine sand compromising the bulk of the rockshelter deposit was determined to largely be the result of eolian sedimentation (Kornfeld et al. 2012), though autogenic sedimentation from the parent Tensleep Sandstone were undoubtedly included in the deposit as well. Late Pleistocene environmental conditions near the site were reconstructed using pollen extracted from 125 contiguous 1-cm samples and a smooth spline age-depth model based on the radiocarbon ages of *Ovis catclawensis* fecal pellets, bone collagen, and charcoal (Minckley et al. 2015). Stable isotopes extracted from the fecal pellets serve as a second, independent paleoenvironmental proxy in the reconstruction.

Radiocarbon age control suggests the environmental reconstruction covered the period between 45,500 – 11,500 cal BP, which included depths below the lowest radiocarbon sample. Producing ages for these deeper environmental samples was solved by extending the age-depth model beyond the lowest radiocarbon sample and applying the

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[1] All radiocarbon ages are presented with 2 sigma standard deviations using the IntCal13 dataset (Reimer et al. 2013).

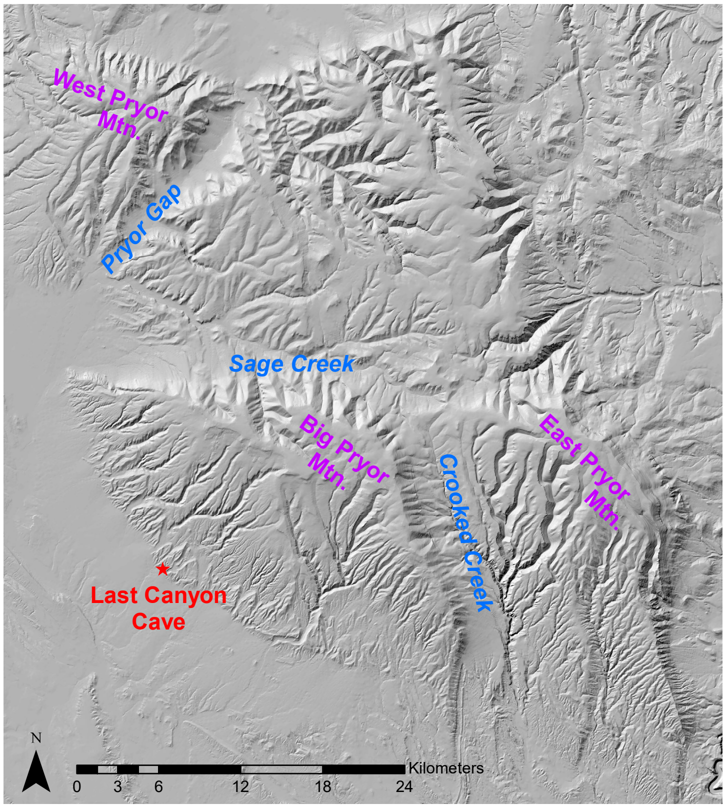

Figure 2. The Pryor Mountains, showing the location of Last Canyon Cave.

ages produced by the model. The environmental record was divided into five pollen zones, which was further analyzed by integrating the stable isotope data, producing a final interpretation of the environmental record at the site (Table 8). The beginning of the record shows a cool climate, followed by a warmer period between 45,500 and 38,500 cal BP that transitions to cooler conditions between 38,500 and 27,500 cal BP. The build-up and aftermath of the Last Glacial Maximum (LGM) is indicated by an increase in arboreal pollen from 27,500 to 13,800 cal BP. Warming conditions are suggested for the period between 13,800 and 11,500 cal BP, which also includes the Younger Dryas chron from 12,900-11,700 cal BP (Alley et al. 1993). The environmental reconstruction from Last Canyon Cave (LCC) stands out among other environmental studies from the Central Rockies (Larsen et al. 2016; Moser and Kimball 2009; Pribyl and Shuman 2014; Whitlock

1993) due to its terrestrial formation, lower elevation, and depositional age range, making it a valuable record in western paleoclimatology.

The methods behind the LCC environmental reconstruction are worthy of deeper consideration. Prior to the arrival of humans, the three dominant forces that appear to have created LCC's deposit are weathering of the parent rock, eolian sedimentation, and zoogenic contributions. While pollen in the sediment would have been laid down through the same eolian processes that deposited most of the quartz sediment, coprolites and bones were deposited through zoogenic processes. OSL should provide an accurate age on pollen deposition due to the stable environment in the shelter, ensuring pollen and nearby quartz grains remain associated long after deposition. It may intuitively seem that there should not be any difference between radiocarbon and OSL ages in a rockshelter since both the sediment and coprolites are put in place through the pull of gravity, creating a continuous

Figure 3. View of Last Canyon Cave, looking northeast. Photo taken about 50 m from site. Shelter opening is about 6 m wide.

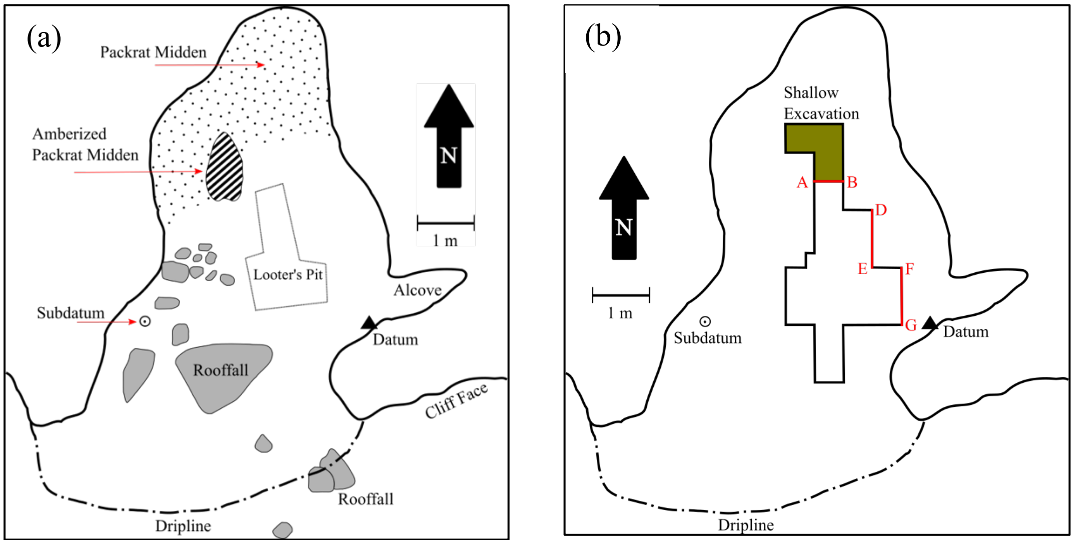

Figure 4. Plan view of the Last Canyon Cave interior. (a) Site prior to formal excavations. Packrat middens on map were limited to the top surface of the shelter floor. (b) View of excavation units from 2013; walls that were sampled for this study are shown in red.

and superimposed record. While this may be true, the radiocarbon dates could still misrepresent the rate of sediment deposition in the shelter and thus distort the age-depth model.

For example, during a period of reduced sedimentation, coprolites covering a broad range of dates could be deposited over a similar elevation before eolian sedimentation returned to a faster rate. While these processes would not impact the expected superposition of datable material, it could result in problems modeling the age-depth relationship of the deposit, particularly the deposits immediately above the radiocarbon sample. In other words, if feces that were deposited at the beginning of a thousand-year break in eolian sedimentation were collected for radiocarbon dating, the sediment immediately above the radiocarbon sample will return an inaccurately old age estimation by the age-depth model. In addition, the activity of animals such as packrats inside the shelter could have altered the position of feces. A number of studies have used both AMS radiocarbon and OSL dating methods (Bishop et al. 2016; Crombé et al. 2012; Lang et al. 2003; Újvári et al. 2014; Yu et al. 2016), and the consensus is that multiple dating methods are better than one. This is because one method can reveal flaws in the other or can provide complementary details about the site formation chronology (Bishop et al. 2016; Rittenour et al. 2015; Roberts et al. 1998; 1999; Yu et al. 2016). Since the deposition of organic material in LCC including coprolites, bone, and charcoal may not have coincided with the deposition of eolian pollen at similar depths, the chronology produced by the radiocarbon samples may not coincide with the analyzed pollen samples. The result is that inappropriate ages may have been applied to the pollen record and the resulting environmental reconstruction is unreliable. The best way to determine if the ages between these two environmental records are indeed mismatched is to build an independent OSL chronology as a second approximation of the pollen timeline.

Potential mismatches between depositional chronologies built on sediment versus paleontological ages highlight the need to clarify the LCC formation processes and determine the best age-depth model for the specific set of circumstances provided by the site. There are two possible outcomes to this research: 1) the radiocarbon chronology is significantly different from the OSL chronology, and therefore does not accurately represent the eolian sedimentation; or 2) both age-depth models will overlap enough that they can be considered equally valid. If the radiocarbon age-depth model is an inaccurate representation of eolian sedimentation, then age-depth models based on OSL ages should provide the best ages for studying records coeval with eolian sedimentation. If the models are statistically indistinguishable, then the two methods should inform and support one

Table 1. Radiocarbon samples used to construct the age-depth model.

Lab ID	Sample ID	Depth (cm)	Stratum	Context	δ13C	^{14}C age^{2} (BP)	2σ calibrated age range [relative area]	Median age^{3} (cal BP$_{2010}$
Beta 242805	24CB879-1	0	2b	Hearth/ Charcoal	--	10,860±40	12,692-12,798 cal BP [1.0]	12,810±50
Beta 242806	24CB879-2	9	2b	Feces	--	11,100±40	12,831-13,074 cal BP [1.0]	13,010±120
LC15-151	--	10	2b	Bone/ Collagen	-19.99	11,600±80	13,278-13,574 cal BP [1.0]	13,490±150
UGAMS 9821 29	--	19	2b	Feces	--	12,030±35	13,759-14,009 cal BP [1.0]	13,940±130
UGAMS 9822 38	--	20	2b	Feces	--	12,140±35	13,901-14,148 cal BP [0.037] 13,856-13,898 cal BP [0.963]	14,060±150
UGAMS 51	--	34	2b	Feces	--	12,440±80	14,176-15,008 cal BP [1.0]	14,650±420
UGAMS 11347 64	--	42	2b	Feces	--	16,010±50	19,142-19,525 cal BP [1.0]	19,390±190
UGAMS 11348 61	--	44	2b	Feces	--	16,940±70	20,190-20,639 cal BP [1.0]	20,470±220
LC17-57-c2	513LC57-c2	51	2a	Bone/ Collagen	--	21,700±210	25,582-26,405 cal BP [1.0]	26,050±410
Beta 242807	24CB879-5	72	2a	Packrat midden/ Feces	--	38,670±700	41,683-43,778 cal BP [1.0]	42,790±1,050
Beta 242808	24CB879-6	90	1	Feces	--	39,570±800	42,201-44,685 cal BP [1.0]	43,500±1,240

[2] Conventional radiocarbon age with ±1σ error, shown in radiocarbon years before AD 1950 (BP)

[3] 2σ calibrated ages were rounded to the nearest decade, then 60 years were added in order to show the age relative to the year 2010.

another, producing a refined sedimentation model. Either outcome may provide a valid argument for making OSL a routine part of age-depth modeling in rockshelters.

CHAPTER 3:

METHODS

To address the problems and objectives identified in this study, I use data gathered from Last Canyon Cave. Specifically, I use field observations of stratigraphic relationships, OSL dating, the construction of age-depth models for OSL and radiocarbon ages, and comparative granulometry data for each age-depth model. But in order to plan the sampling methods for OSL and granulometry, the stratigraphy had to first be exposed, evaluated, and mapped.

LCC's stratigraphy was initially identified and described during the 2007-2011 field seasons (Kornfeld et al. 2012). In May 2016, Dr. Judson Finley and I re-evaluated the stratigraphy in the exposures targeted for sampling (Figures 5 and 6). This involved removing backfill that had been placed in the excavation units at the end of the 2011 excavation season and examining the sedimentary profiles of the old excavation units. Official stratigraphic profiles were published in 2012 (Kornfeld et al. 2012), but these designations needed confirmed to ensure that major sedimentary units were identified for strategic OSL and granulometry sampling. The corners of the excavation units received alphabetical designations on the 2012 maps, and these designations were carried over onto the updated maps (Figures 4, 5, and 6), and were used to create identifiers for the sampled exposures by conjoining the corner IDs on either side of the exposure into a single ID for the wall. For example, the exposure that went from corner A to corner B became “Wall AB.” The specific exposures that were targeted for sampling were designated Wall AB, Wall DE, and Wall FG. Some sediment had been removed or had collapsed from the face of Wall AB since the last time a profile was sketched, which likely accounts for most of the variations in the shape of the lines separating strata depicted between the 2012 and the current sketches.

OSL samples were collected from the three columns designated Wall AB, Wall DE, and Wall FG (Table 2). Wall AB was near the back (northern end) of the shelter and was the same location of the existing radiocarbon chronology (Figure 5). Walls DE and FG were in the eastern exposures, with Wall DE being on the northern end (towards the back of the shelter) of the eastern exposures, and Wall FG being on the southern end (towards the entrance) of the eastern exposures (Figure 6). While Wall AB was the location of the existing radiocarbon age-depth model and environmental reconstruction and therefore required sampling for this study in order to have new data that was directly comparable to the existing data, Walls DE and FG were sampled in order to provide additional details regarding the site formation history by detailing the growth of the deposit in relation to the shelter mouth. When sampling the stratigraphy itself, the OSL samples were collected from the top and bottom of each stratum in order to bracket stratigraphic changes.

In order to demonstrate that differing age-depth models can affect the interpretations of environmental proxies, I analyzed sediment grain-size distributions from LCC (Table 2). These granulometry samples would not only generate new environmental information from the LCC sedimentary deposit, but could also be used as points to compare the various age-depth models generated for this study. In addition, the granulometry data could be used to analyze the stratigraphy and broader formation history of the site. Broadly speaking, a dominant value of granulometry as an environmental proxy is its ability to reflect changes in the environmental conditions that influence depositional processes. But more specifically, grain-size distributions in rockshelters ranging between coarse sand and clay can reveal changing eolian sedimentation processes, as well as the

Table 2. Total Samples Collected in 2016

OSL Samples					Granulometry Samples				
ID	**Wall**	**Stratum**	**Depth (cm)**	**Thickness (cm)**	**ID**	**Wall**	**Stratum**	**Depth (cm)**	**Thickness (cm)**
AB-1	AB	1	137	3.81	AB-1	AB	1	134	5
AB-2	AB	2a	119	3.81	AB-2	AB	2a	124	5
AB-3	AB	2a	87	3.81	AB-3	AB	2a	113	5
AB-4	AB	2b	73	3.81	AB-4	AB	2a	105	5
AB-5	AB	2b	44	3.81	AB-5	AB	2a	94	5
DE-1	DE	2a	102	3.81	AB-6	AB	2b	86	5
DE-2	DE	2b	72	3.81	AB-7	AB	2b	75	5
DE-3	DE	2a	39	3.81	AB-8	AB	2b	64	5
FG-1	FG	2b	78	3.81	AB-9	AB	2b	55	5
FG-2	FG	2b	47	3.81	AB-10	AB	2b	41	5
FG-3	FG	2b	18	3.81	AB-11	AB	2b	32	5
					DE-1	DE	2b	107	5
					DE-2	DE	2a	97	5
					DE-3	DE	2a	87	5
					DE-4	DE	2a	77	5
					DE-5	DE	2a	67	5
					DE-6	DE	2b	57	5
					DE-7	DE	2b	47	5
					DE-8	DE	2b	37	5
					FG-1	FG	1	84	5
					FG-2	FG	2b	74	5
					FG-3	FG	2b	64	5
					FG-4	FG	2b	54	5
					FG-5	FG	2b	44	5
					FG-6	FG	2b	34	5
					FG-7	FG	2b	24	5

influence of autogenic sedimentation (Abbot 1997; Donahue and Adavasio 1990; Finley 2008; 2012; Kibler 1998). Sediment for granulometry was collected from each stratum exposed in the same three columns that were sampled for OSL. The samples were collected with the ultimate goal of gaining insight into the formation of the entire deposit, but for the purposes of testing the two age-depth models, only the samples from the wall toward the back of the shelter were used in the comparative analysis. Sediment was collected from Walls AB, DE, and FG, each one adjacent to a column where OSL samples were collected. Samples were collected up the column at 10 cm intervals, and each one generally contained 300-500 grams of sediment.

OSL Methods

OSL samples were collected according to the guidelines established for the USU Luminescence Laboratory (Nelson et al. 2015). In order to collect samples for the equivalent dose (D_E), aluminum conduit tubes measuring 1.5-x-6" were pounded into the sedimentary profiles, the exposed end of the tube was stuffed with paper tissue to keep the sediment tightly packed inside, then the tubes were carefully pulled out with the sediment secured inside. Both ends of the tube were carefully wrapped with black duct tape to ensure that the sediment would neither leak nor undergo light exposure. Afterwards, a sample for the dose rate calculation and a sample to measure the moisture content were collected from the 15 cm surrounding the space left by the extracted conduit tube. The dose rate sample filled about half of a quart-sized zipper bag and would be used to identify the amount of ionizing radiation contributed by local material. The moisture sample was collected in a water-tight film canister, which was then sealed with duct tape. Since water attenuates the penetration of radioactive particles (Aitken 1998; Mejdahl 1979), the moisture content of the sediment needed factored into the relevant calculations.

The equivalent dose samples were prepared and tested at the Utah State University Luminescence Lab under dim amber lights. In order to prepare the sample, quartz grains that had been protected from light during the collection process needed isolated and sieved to a known range of grain sizes. First, two centimeters of sediment was removed from each side of the OSL sample and discarded. The remaining sediment was wet-sieved to a narrow range of grain sizes, ideally ones that are within the ranges of very fine to fine sand (63 µm – 250 µm) (Aitken 1998) and would still retain a large portion of collected material. The relevant samples were sieved to 90 µm – 150 µm or 90 µm – 180 µm. The sieved sediment was washed with 10% hydrochloric acid to remove carbonates, then bleach was used to remove organic material. Although quartz was prioritized for dating, feldspar was also collected from the samples as back-up in case quartz failed to produce acceptable results. A 2.58 g/cm^3 solution of sodium polytungstate was used to separate grains of feldspar from the rest of the sample, which were collected and stored at the lab. A 2.70 g/cm^3 solution of sodium polytungstate was used to separate grains of quartz from the rest of the sample. Hydrofluoric acid was applied to the quartz to etch it and remove any remaining feldspar.

Before the equivalent dose samples were tested on the OSL reader, the dose rate samples and moisture samples were prepared and analyzed. The dose rate sample was homogenized with a mortar and pestle, and a representative split of about 20 g was shipped to Chemex in Elko, Nevada to undergo inductively coupled plasma mass spectrometry (ICP-MS) and inductively coupled plasma atomic emission spectroscopy (ICP-AES) to identify radioisotopes of potassium, uranium, thorium, and rubidium. The moisture sample was measured, left to dry in a warm oven overnight until completely dry, and then measured again so that the water content could be calculated through the difference in weight.

Small Aliquot OSL. The OSL testing on the equivalent dose samples was performed on a Risø TL/OSL DA-20 reader with a single-grain attachment (Bøtter-Jensen et al. 2000). Initial testing used small aliquots under the single-aliquot regenerative (SAR) protocol (Murray and Wintle 2000). Aliquots of sediment measuring 2 mm in diameter were mounted on metal disks with a silicone-based spray adhesive. Once the aliquots were loaded onto the Risø machine, the protocol began by exposing the aliquot to light and measuring the natural luminescence response. The machine took the aliquots through a series of regenerative cycles which built a response curve that allowed for equivalent dose identification. For small aliquot testing, the machine used blue-green LEDs (470 nm) for stimulation, and photons were detected with a 7-mm UV filter.

The OSL reader applied a series of regenerative dose cycles to the sediment to build a luminescence response curve that allowed equivalent dose calculation. Each regenerative cycle dosed the quartz with beta particles from a 90Sr/90Y source, then preheated it for 10 seconds at 240˚C, stimulated it with 470 nm (blue) diodes at 90% power for 40 seconds, and measured the luminescence response. The aliquots were then given a test dose (100 seconds of beta particles), followed by cut heat of 160˚C, and stimulated it with the blue diodes and measured the luminescence response. The next regenerative cycle gave the aliquot an increased dose of radiation, then completed the subsequent actions as before. All measurements were conducted at 125˚C. The regenerative cycle described above was run a total of five times on an aliquot of sediment, with each initial dose of radiation changing as the procedure continued, the final cycle repeating the same dose that was given to the sample at the beginning of the regeneration process. The doses of beta radiation applied to the LCC samples were as follows: 0 seconds (this cycle measures the initial luminescence), 50 seconds, 100 seconds, 150 seconds, and 50 seconds. At the end of the process, an infrared source stimulated the sample to check for feldspar. Six small aliquots were tested at a time for each sample.

Single-Grain OSL. After initial testing of the small aliquots, signs of partial bleaching were observed (Figure 8; Figure 9; Appendix A). Since the shelter was formed in sandstone, grains from the shelter ceiling were undoubtedly a part of the floor deposit, and subsequently influenced the OSL age results. Since these grains would not be fully bleached, the results would show mixing of the reset eolian and non-reset roof fall grains and ultimately produce excessively old ages, similar to those observed at Jinmium Shelter (Roberts et al. 1998). Single-grain OSL was performed on the LCC samples on the Risø TL/OSL DA-20 reader with a single-grain attachment at the Utah State University Luminescence Lab, using the SAR protocol (Murray and Wintle 2000). A green laser (532 nm) at 90% power provided the stimulation source. After dosing the sample, it was heated to 200 ˚C for 10 seconds and then stimulated by the laser for 1 second. The doses during regeneration followed the same pattern as the small aliquot tests. Test doses of 10 seconds were applied between regeneration cycles and cut heat of 160˚C was applied for 10 seconds before stimulation. The final luminescence signal was measured by subtracting the average signal during the last 0.2 seconds of stimulation from the initial 0.05 seconds of stimulation.

Age-Depth Model

Age-depth models were constructed using the ages produced by both the small aliquot OSL (Figure 11) and the single-grain OSL (Figure 12), as well as the radiocarbon ages (Figure 10) from the northern exposure used in the environmental reconstruction (Minckley et al. 2015). The updated age-depth model from the previously acquired radiocarbon ages was needed for comparison with the OSL models in order to observe any distinguishable differences. Both models were calculated using the Bchron package in R (Haslett and Parnell 2008). This software used Bayesian statistics and piecewise linear accumulations to create a model that was more accurate than "classical" models (Blaauw 2010), taking particular care to represent the best error ranges. In a comparison of existing programs that use Bayesian analysis in the construction of age-depth models (Traschel and Telford 2007), the predominant critique was that Bchron tends to over-estimate the error ranges. Even so, the models provided by Bchron have performed well when compared to similar software packages (Traschel and Telford 2007).

In order to construct the models in Bchron, tables including uncalibrated ages, 2σ error ranges, sample depth, and approximate sample thickness were loaded into R (See Appendix D for complete R code). Bchron requires the user to specify a calibration curve to apply towards each age, so IntCal13 (Reimer et al. 2013) was used to calibrate the radiocarbon dates in cal yr BP. A normal distribution curve was applied to the OSL ages. While a normal distribution curve is included with the Bchron package, it does not go beyond 50,000 BP. I created a user-defined curve called "ExpandedNormal" (see Appendix D for R code and data tables) that would extend the range of the normal distribution curve to 100,000 BP and applied it to all OSL ages. The range of depths modeled were 0-140 cm, which an age prediction every 1 cm. Otherwise, I left all other parameters within Bchron at their default settings.

In order to compare the radiocarbon and OSL chronologies, the ages need to be modeled through the entire deposit. This was achieved by using the *bchronology* function in Bchron. By providing the software with uncalibrated ages, error ranges, depth values, and a calibration curve (IntCal13 for radiocarbon dates and normal distribution for OSL), Bchron provides an age-depth model based on the processes described by Haslett and Parnell (2008). Based on the plots for Wall AB (Figures 10-12), there is an immediate distinction between the radiocarbon and OSL models based on the overall breadth of OSL error ranges and the exceptionally narrow error ranges in the upper elevations of the radiocarbon models due to the greater number of direct ages.

By using the age-depth models to apply ages to the granulometry samples, a one-to-one comparison could be made between chronologies. Using the *summary* function in R, I generated tables for each age-depth model (Appendix D). Age predictions at 2.5%, 10%, 50%, 90%, and 97.5% quantiles were provided for each centimeter of depth through the exposure. In order to acquire a 95% confidence interval, the values provided at the 2.5% and 97.5% quantiles were rounded to the nearest decade and used as the error range extremities for the corresponding granulometry sample. In order to find a central age, the median for each pair of error range extremities was identified by adding them together and dividing the result by two. The result was rounded to the nearest decade as well. Bchron produced an age-depth model for the radiocarbon ages that was calibrated with the year 1950 as the present day. The ages produced by OSL, on the other hand, use the terminology "ka," which refers to how many thousands of years had passed since deposition up to the date when the sample was analyzed. In order to compare the radiocarbon and OSL, the radiocarbon ages needed updated to a present day in the year 2010. This was done by adding 60 years to the 2.5% and 97.5% quantiles produced by Bchron, rounding them to the nearest decade, and proceeding with the rest of the previously described calculations.

Grain Size Analysis

Before any of the granulometry samples could be analyzed, they were sifted to isolate the fine sediments. A set of nested screens were used to perform the sifting, with a two-millimeter screen resting on top of a one-millimeter screen, which rested on top of a solid-bottomed pan. The sifting process separated all samples into three size classes: particles greater than two millimeters, particles less than two millimeters but greater than one millimeter, and particles less than one millimeter. The fine sediment less than one millimeter was poured through a sample splitter, and then recombined in order to ensure it was properly mixed. Finally, each size group was weighed and bagged.

After isolating particles less than one millimeter, they were taken to the Utah State University geochemistry lab for grain-size analysis on a Malvern Mastersizer 2000 with a Hydro 2000 MU attachment. The instrument used laser diffraction to analyze the particle size distribution in the sediment and was capable of detecting particles as small as 0.02 microns (Malvern Instruments 2007). Laser diffraction functions by measuring the light patterns that result when the particles are exposed to a laser, and the patterns are interpreted into grain sizes through "Mie scattering theory" (Mie 1908). That is, when light comes into contact with a particle, the light is scattered in predictable patterns, which the instrument can detect and interpret into a grain size.

The first step in the process was to turn on the instrument and put a fresh beaker of water under the pump. The pump was set to 3,000 revolutions per minute and turned on. The sediment was analyzed according to a pre-programmed operating procedure that takes three measurements for 30 seconds each. As sediment was added to the water, the obscuration level increases. In order to get an acceptable reading for these samples, the obscuration needed to be between 5% and 15%. Before the sample could be analyzed, it needed sonicated for a minute. This caused any lingering clumps of fine sediment to break apart and also caused the obscuration to increase. I typically added enough sediment to the water prior to sonication so that it was at about 5% obscuration, and after sonicating, the obscuration would be approximately 10% making it ready for analysis. After the machine had finished taking measurements, the beaker of sediment was dumped, and the system rinsed by allowing it to pump through two 1,000 milliliter beakers of deionized water for two minutes each. After that, another 1,000-milliliter beaker of deionized water was placed under the pump, and the analysis would begin again. Each sediment sample had three aliquots analyzed on the Malvern, and each aliquot was measured three times by the instrument. Altogether, each sediment sample had a set of nine total granulometry readings. After completing all of these measurements, I was able to begin organizing the data in preparation for analysis relating it to the site stratigraphy and chronology.

In order to simplify the set of six readings produced by the Malvern for each sample, I calculated the average of the six readings for each grain size category. The data were then corrected to ensure that the percentages provided for each grain size category were a proper representation of the entire sample rather than just the fine fraction less than one millimeter. The total sample weight was divided by the weight of the sediment less than one millimeter in diameter in order to identify the percentage of the sample that was less than one millimeter. The averaged quantity for each grain size category was divided by the fine fraction weight percentage in order to ensure that the grain size percentage is in appropriate proportion to the whole sample. In order to calculate the significant statistical values described above, I inserted the adjusted values into the GRADISTAT (Blott and Pye 2001) spreadsheet, which automatically performed the calculations.

CHAPTER 4:

RESULTS

Stratigraphy

Stratum 1 was situated immediately above bedrock. While it was divided into two subunits in 2012 (Kornfeld et al. 2012), Strata 1a and 1b were consolidated into a single unit called Stratum 1 due to the absence of distinguishing characteristics necessitating the subdivision. Stratum 2 is marked by darker sediment color and contains more silt and clay than Stratum 1. It makes up the majority of the deposit and is divided into 3 subunits. Stratum 2a was not altered from the previous designation. It is distinguished by the high content of bighorn sheep feces, which in Wall AB was periodically exposed in thin, curvilinear concentrations. Stratum 2b was a consolidation of Strata 2b and 2c from 2012 (Kornfeld et al. 2012). Fecal pellets are more dispersed through 2b, and there is an increase in grain size accompanied by the presence of angular to subangular sandstone clasts 3-5 cm in diameter, which are probably the products of roof fall. Stratum 2b also contained some $CaCO_3$ flecking, which differentiates it from overlying strata. Stratum 2c was previously identified as Stratum 2d in 2012 (Kornfeld et al. 2012). It contains a mixture of bedded eolian sands and animal midden materials. Stratum 3 is made of a Holocene packrat midden. The establishment of visible stratigraphic boundaries then allowed for strategic sampling and a contextualized analysis of those samples.

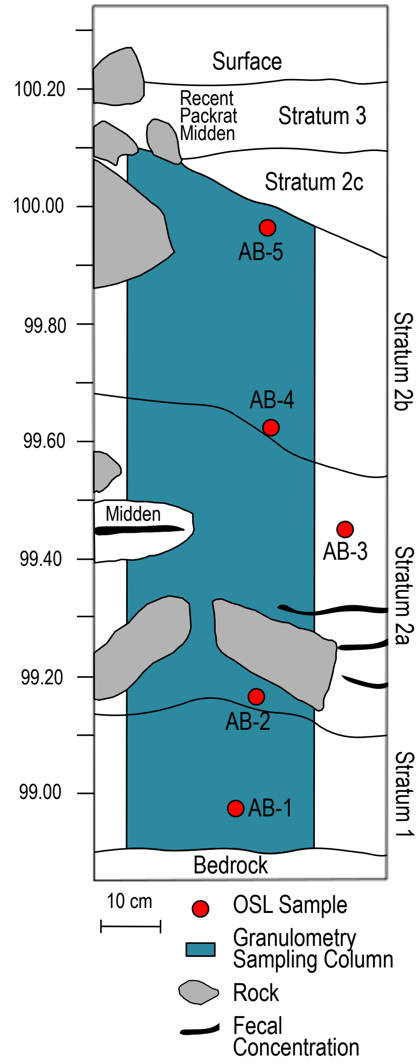

Figure 5. Stratigraphic profile of Wall AB.

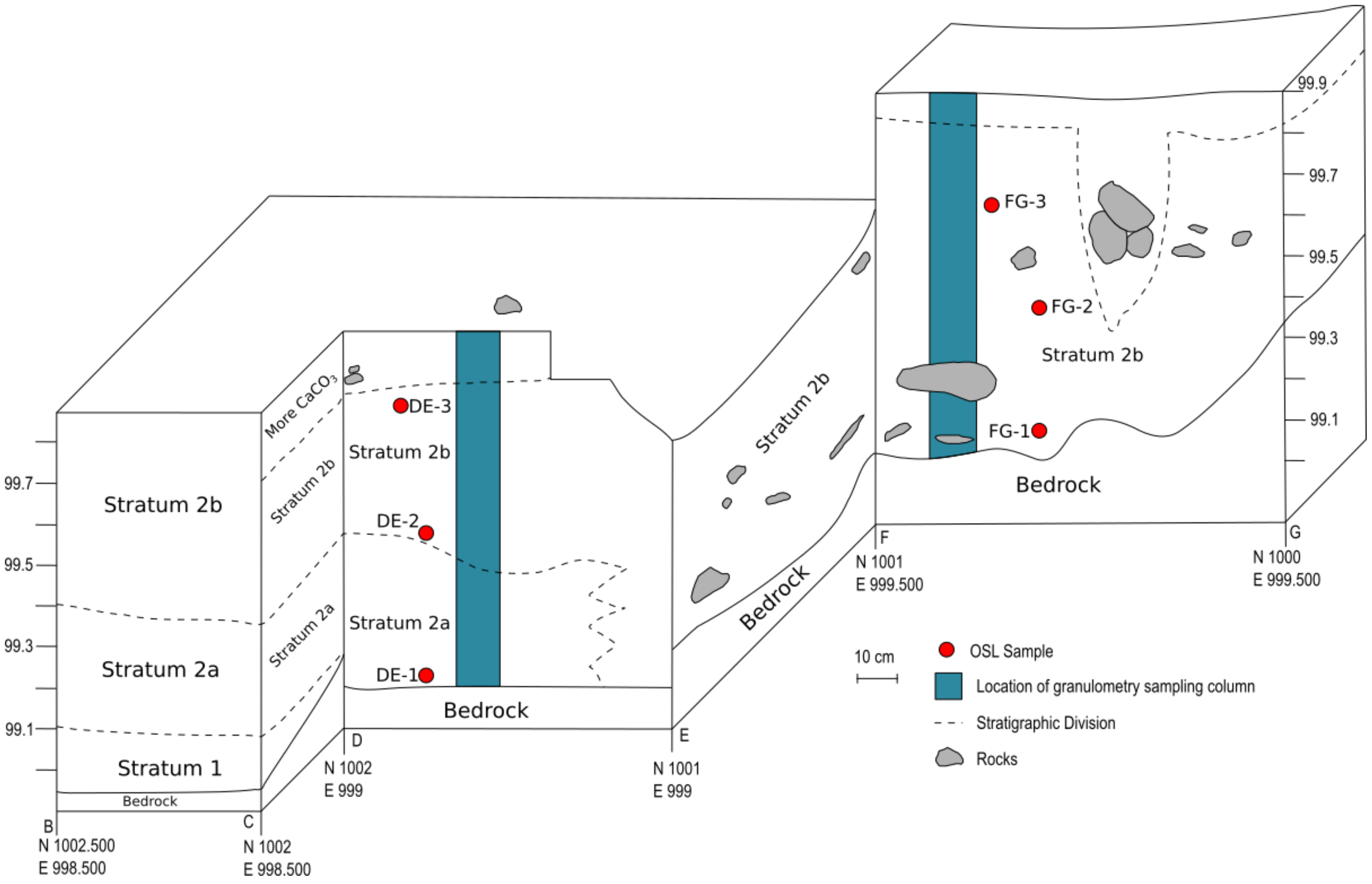

Figure 6. Stratigraphic profile of the eastern exposure, including Walls DE and FG.

Granulometry

For the purpose of clarity, it should be reiterated that the collection of the granulometry samples had three primary purposes: 1) to provide a new set of environmental data from the LCC sediments, 2) to provide insight into the stratigraphy and formation history of the site, and 3) provide points (specifically points associated with environmental data) on each of the profiles targeted for age-depth modeling that could be used for comparing the relevant age-depth models. In any case, after the granulometry data was collected and simplified, it was inserted into the GRADISTAT (Blott and Pye 2001) spreadsheet (see Appendix C for all GRADISTAT results). It was immediately clear that the majority of the deposit was fine sand that was poorly sorted and finely skewed. After creating plots demonstrating the changes in the sand:silt/clay ratio (Figure 7), the first notable quality observed was the increasing deposition of silt and clay over time exhibited in all three exposures. In addition, there was a slight but noticeable increase in overall silt/clay content as the sampling columns moved closer to the shelter entrance. While the sediment from Wall AB possessed the most sand in relation to silt/clay, the sand proportions declined in Wall DE, and then declined even more in Wall FG. But before these results could be considered any further, they required a chronology.

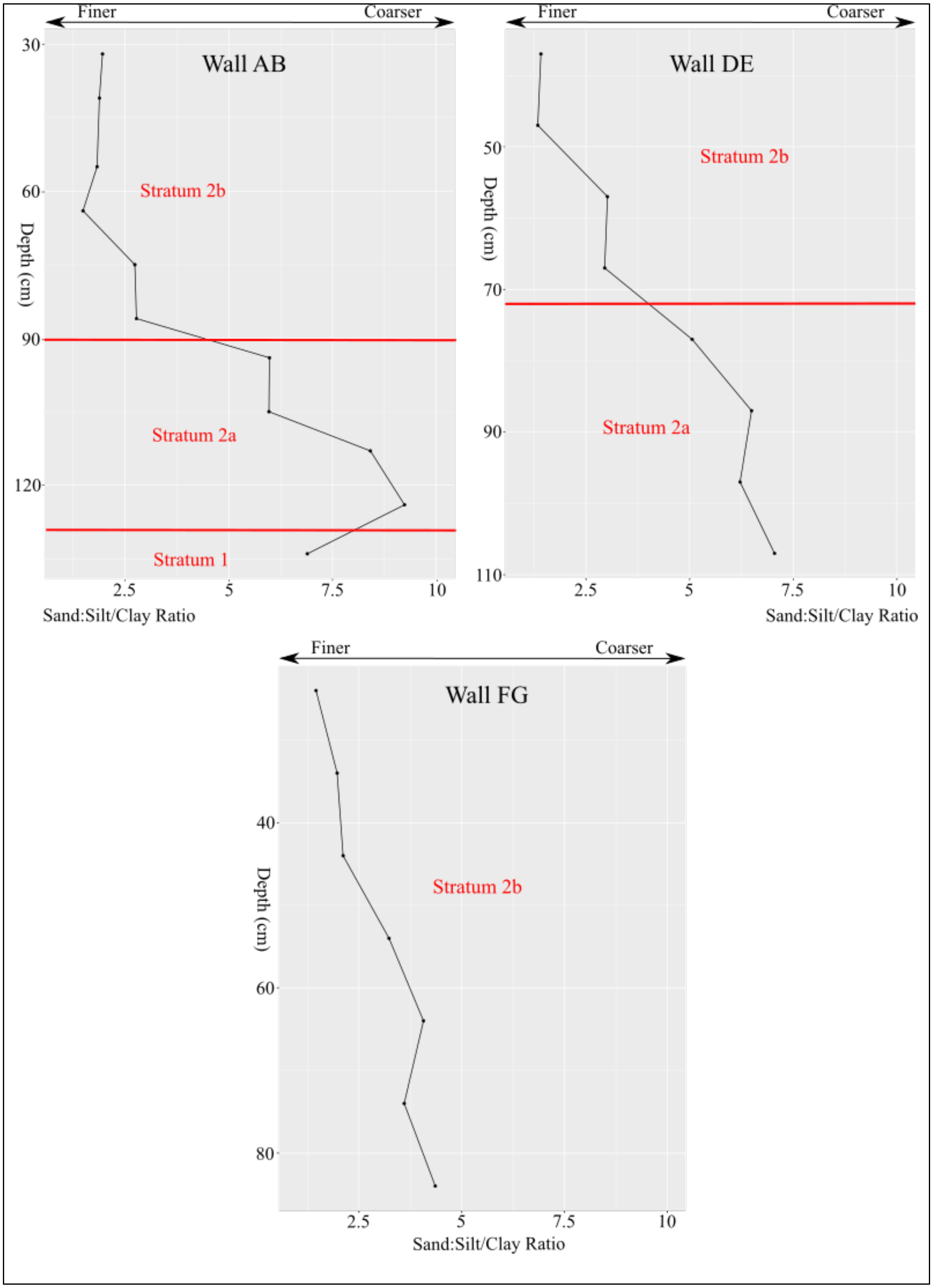

Figure 7. Sand:Silt/Clay ratio in Wall AB, Wall DE, and Wall FG. Higher numbers on the x-axis indicate more sand, while lower numbers indicate more silt/clay.

Chronology

The OSL samples were initially run as small aliquots (Table 3; Table 5; Appendix A). However, it became clear that there were partially bleached grains in the sediment (Table 3; Figure 8; Figure 9; Appendix A). As a result, the small aliquot OSL ages could easily overestimate the age of sediment deposition. This is because there are many grains of sediment included on a single small aliquot which have their luminescence measured together as a unit. If there are partially bleached grains in the aliquot, the overall luminescence of the aliquot will be brighter than a fully bleached sample, and consequently the age calculations will be inappropriately old. A few common signs of partial bleaching include: a D_E distribution with a long tail stretching toward higher levels of radiation

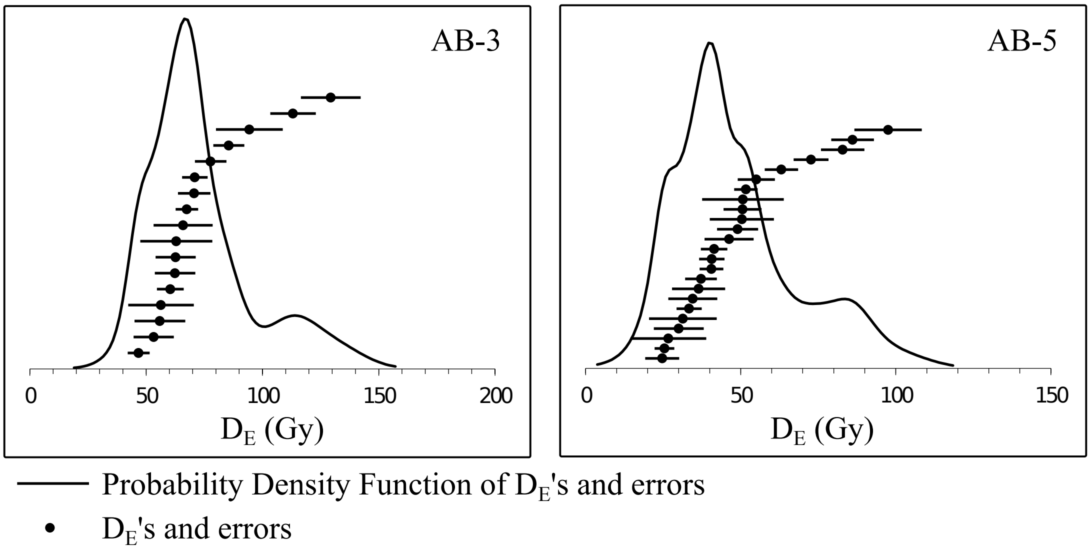

Figure 8. Probability functions from small aliquot OSL results for samples (a) AB-3 and (b) AB-5. These results are clear examples of samples that have been contaminated by partially bleached grains on account of the skewed D_E distribution.

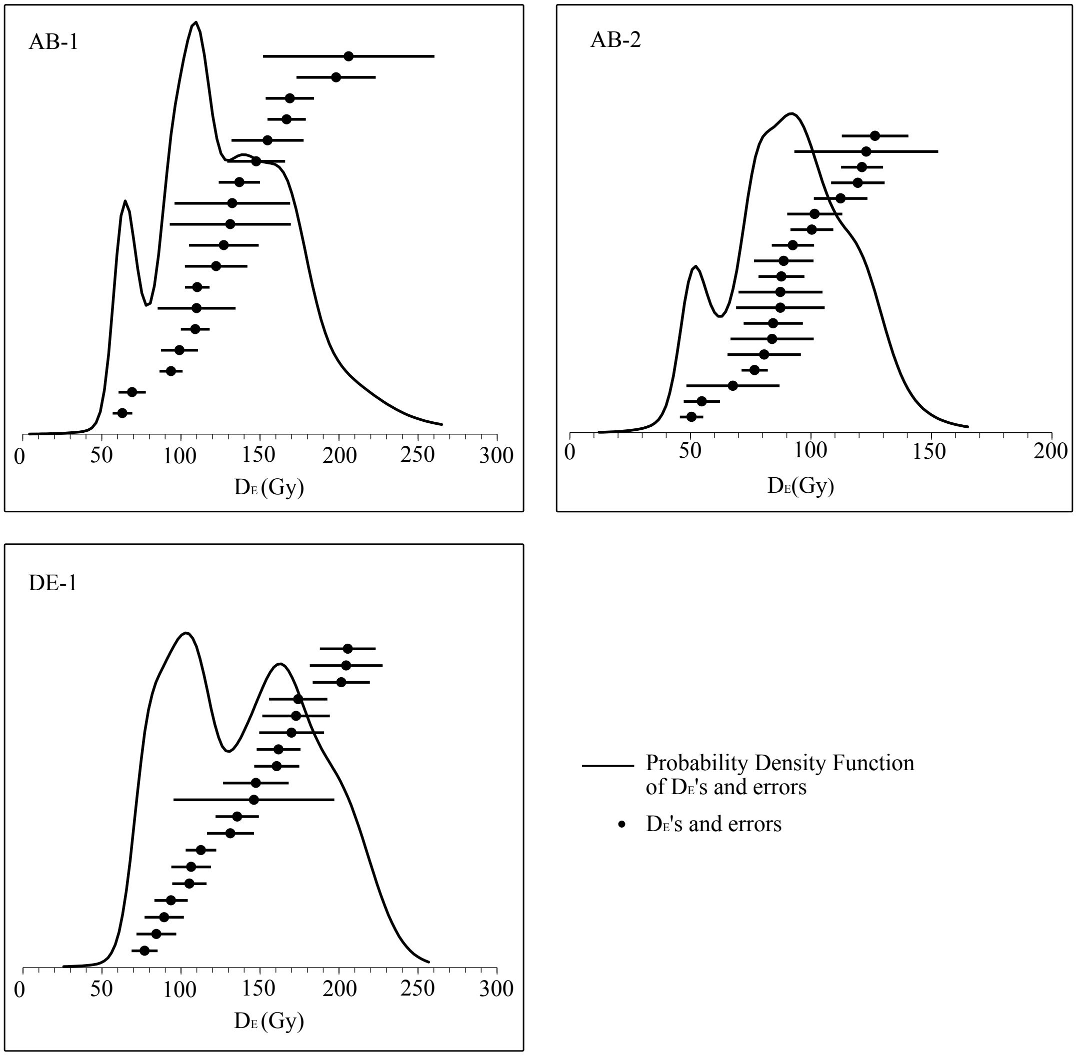

Figure 9. Probability functions and radial plots from small aliquot OSL results for samples AB-1, AB-2, and DE-1. These results are clear examples of samples that have been contaminated by partially bleached grains on account of polymodal D_E distribution.

(Murray and Roberts 1997), polymodal D_E distribution (Bateman et al. 2007), and high overdispersion (OD) values, typically greater than 20% (Galbraith and Roberts 2012). Samples AB-3 and AB-5 are good examples of skewed distributions (Figure 8; Appendix A), while AB-1, AB-2, and DE-1 are clear examples of polymodal distributions (Figure 9; Appendix A). All but two samples (AB-4 and DE-2) had overdispersions over 20% (Table

Table 3. Small Aliquot OSL results

Sample Number	USU Lab Number	Number of Aliquots[4]	Dose Rate (Gy)	Equivalent Dose (Gy)[5]	Overdispersion (%)	OSL Age (yr) ± 2 se[6]
AB-1	USU-2326	18 (27)	1.07 ± 0.05	71.53 ± 14.72	28.9 ± 6.0	**66.81 ± 15.16**
AB-2	USU-2327	19 (28)	1.16 ± 0.06	59.62 ± 11.80	22.5 ± 4.9	**51.57 ± 11.33**
AB-3	USU-2328	17 (31)	1.76 ± 0.08	51.91 ± 11.69	24.0 ± 5.3	**29.46 ± 7.20**
AB-4	USU-2329	19 (25)	1.82 ± 0.08	48.35 ± 6.50	17.6 ± 3.8	**26.56 ± 4.28**
AB-5	USU-2330	24 (29)	1.95 ± 0.09	29.50 ± 6.85	34.1 ± 6.0	**15.17 ± 3.81**
DE-1	USU-2331	19 (33)	1.12 ± 0.05	87.39 ± 16.10	28.6 ± 5.4	**78.26 ± 16.24**
DE-2	USU-2332	20 (34)	1.45 ± 0.07	58.50 ± 9.97	18.1 ± 4.2	**40.27 ± 7.85**
DE-3	USU-2333	20 (24)	1.85 ± 0.08	54.63 ± 9.21	22.8 ± 4.7	**29.51 ± 5.71**
FG-1	USU-2334	20 (23)	1.40 ± 0.07	39.04 ± 13.23	39.0 ± 6.9	**27.83 ± 9.79**
FG-2	USU-2335	19 (24)	1.73 ± 0.08	61.56 ± 8.97	27.2 ± 5.6	**35.55 ± 6.18**
FG-3	USU-2336	14 (25)	2.05 ± 0.09	48.70 ± 8.50	23.2 ± 5.8	**23.79 ± 4.73**

[4] Aliquots used in age calculation with total number of aliquots analyzed in parentheses

[5] Calculated using Minimum Age Model from Galbraith and Roberts (2012)

[6] Age datum is 2010.

Table 4. Single grain OSL results

Sample Number	USU Lab Number	Number of Grains[7]	Dose Rate (Gy)	Equivalent Dose (Gy)[8]	Overdispersion (%)	OSL Age (yr) ± 2 se[9]
AB-1	USU-2326	80 (1400)	1.07 ± 0.05	66.48 ± 9.91	38.1 ± 4.1	**62.09 ± 11.00**
AB-2	USU-2327	38 (900)	1.16 ± 0.06	42.24 ± 7.34	28.2 ± 5.4	**36.53 ± 7.24**
AB-3	USU-2328	94 (1300)	1.76 ± 0.08	42.15 ± 5.54	38.0 ± 4.0	**23.93 ± 3.88**
AB-4	USU-2329	60 (600)	1.82 ± 0.08	38.18 ± 4.53	21.6 ± 3.5	**20.97 ± 3.19**
AB-5	USU-2330	63 (700)	1.95 ± 0.09	27.96 ± 5.37	38.1 ± 4.5	**14.37 ± 3.08**
DE-1	USU-2331	59 (700)	1.12 ± 0.05	97.94 ± 12.57	27.5 ± 3.9	**87.70 ± 14.03**
DE-2	USU-2332	47 (500)	1.45 ± 0.07	34.25 ± 4.46	36.0 ± 4.7	**23.58 ± 3.80**
DE-3	USU-2333	73 (600)	1.85 ± 0.08	29.37 ± 3.87	28.9 ± 3.5	**15.86 ± 2.58**
FG-1	USU-2334	47 (900)	1.40 ± 0.07	52.49 ± 9.96	32.4 ± 5.2	**37.42 ± 7.94**
FG-2	USU-2335	63 (900)	1.73 ± 0.08	52.41 ± 10.17	28.3 ± 4.4	**30.27 ± 6.54**
FG-3	USU-2336	72 (700)	2.05 ± 0.09	37.20 ± 4.13	25.7 ± 3.6	**18.17 ± 2.66**

[7] Grains used in age calculation with total number of grains analyzed in parentheses

[8] Calculated using Minimum Age Model from Galbraith and Roberts (2012)

[9] Age datum is 2010.

3), but those two samples were still close enough to 20% to be treated cautiously on the basis of overdispersion, particularly in light of the consistently large values through the deposit.

In order to improve the OSL ages, single-grain analysis was performed on all samples (Table 4; Table 5; Appendix A). While overall D_E distributions still showed the characteristics of incomplete solar resetting, the single-grain results allowed for the productive application of the minimum age model (MAM; Galbraith and Roberts 2012).

The MAM is frequently applied to single-grain samples that include both fully and partially bleached grains. It attempts to target the completely bleached grains and provide the youngest possible age for the sample. Partially bleached grains can return deceptively old ages (Roberts et al. 1998; 1999), and by disregarding them as much as possible, the model provides an improved calculation of the sample age. It should be noted that the MAM could not be applied as effectively on the small aliquot samples, since one sample could contain any ratio of fully bleached to partially bleached grains, and there would be no consistency in the ratio from sample to sample. On the other hand, the single grain testing allowed for the two types of grains to be more readily isolated and the model to work more successfully. In any case, the single-grain OSL produced on the whole (with two exceptions: DE-1 and FG-1) noticeably younger ages than the small aliquot OSL. In addition, while the single-grain results were entirely in proper chronological order, there was a reversal in the small aliquot results. Namely, the small aliquot age for FG-2 was older than FG-1.

Table 5. Dose rate information

Sample Number	USU Lab Number	H_2O (%)	Grain Size (µm)	K%	Rb (ppm)	Th (ppm)	U (ppm)	Cosmic (Gy/ka)
AB-1	USU-2326	0.8	90-150	0.57±0.01	17.9±0.7	1.3±0.2	1.2±0.1	0.16±0.02
AB-2	USU-2327	1.1	90-180	0.65±0.02	20.2±0.8	1.5±0.2	1.2±0.1	0.17±0.02
AB-3	USU-2328	0.8	90-180	1.02±0.03	33.6±1.3	3.5±0.3	1.7±0.1	0.17±0.02
AB-4	USU-2329	1.1	90-180	1.09±0.03	35.8±1.4	3.7±0.3	1.6±0.1	0.17±0.02
AB-5	USU-2330	0.8	90-180	1.16±0.03	35.1±1.4	3.8±0.3	1.8±0.1	0.18±0.02
DE-1	USU-2331	0.7	75-150	0.60±0.02	18.3±0.7	1.5±0.2	1.2±0.1	0.17±0.02
DE-2	USU-2332	1.4	75-150	0.84±0.02	25.9±1.0	2.3±0.2	1.4±0.1	0.17±0.02
DE-3	USU-2333	1.2	75-150	1.12±0.03	34.8±1.4	3.4±0.3	1.6±0.1	0.18±0.02
FG-1	USU-2334	1.1	75-150	0.78±0.02	22.8±0.9	1.7±0.2	1.6±0.1	0.17±0.02
FG-2	USU-2335	1.8	75-150	1.04±0.03	30.6±1.2	2.8±0.3	1.6±0.1	0.18±0.02
FG-3	USU-2336	1.4	75-150	1.25±0.03	38.1±1.5	3.7±0.3	1.8±0.1	0.18±0.02

Age-Depth Models Results and Analysis

Results. After the age-depth models had been generated with Bchron, it was possible to visualize them using the *plot* function in R (Figures 10-12). After using the models to estimate ages for the granulometry samples (Table 6), plots were created for the results (Figure 13). The small aliquot and single-grain OSL chronologies both possess the distinctively large error ranges associated with OSL ages (Figures 11-12). When the modeled mean ages of the granulometry samples from both the small aliquot and single-grain OSL chronologies are shown as overlapping line plots (Figure 13), some differences were immediately visible, particularly in the amount of space between the single-grain OSL and small aliquot OSL results in Walls AB and DE. It should be mentioned that while the single-grain and small aliquot OSL results in Wall FG appear quite similar, the small aliquot results should be disregarded not only due to the innate problems with small aliquot OSL at the site, but also because of the age reversal with sample FG-2.

Analysis. A paired 2-tailed t-test performed on the mean ages of the granulometry samples according to the single-grain OSL and small aliquot OSL resulted in ($t = 0$; $df = 10$; $p < 0.05$) for Wall AB, ($t = 0.01$; $df = 10$; $p < 0.05$) for Wall DE, and ($t = 0.26$; $df = 10$; $p < 0.05$) for Wall FG (Table 7). This indicates that there is a significant difference between the two OSL age-depth models in Wall DE and AB. Even though the t-test did not

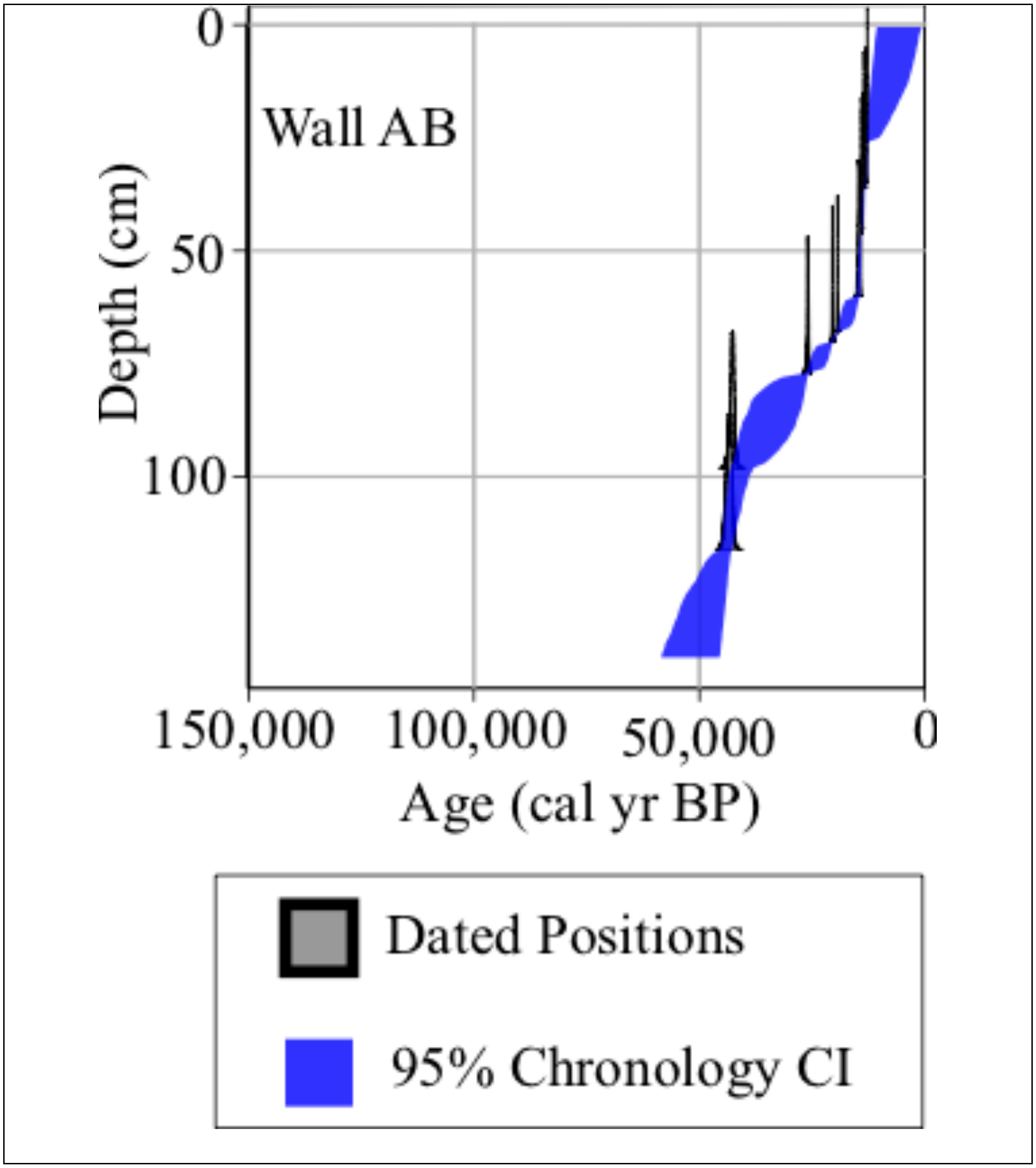

Figure 10. Age-Depth model for radiocarbon samples in Wall AB.

indicate such difference between single-grain and small aliquot OSL in Wall FG, due to the age reversal with sample FG-2, the small aliquot age-depth model is particularly unreliable and therefore the results of the t-test cannot be considered valid. Overall, these results continue to support the problems with using small aliquot OSL in a rockshelter setting, and that single-grain OSL is preferable.

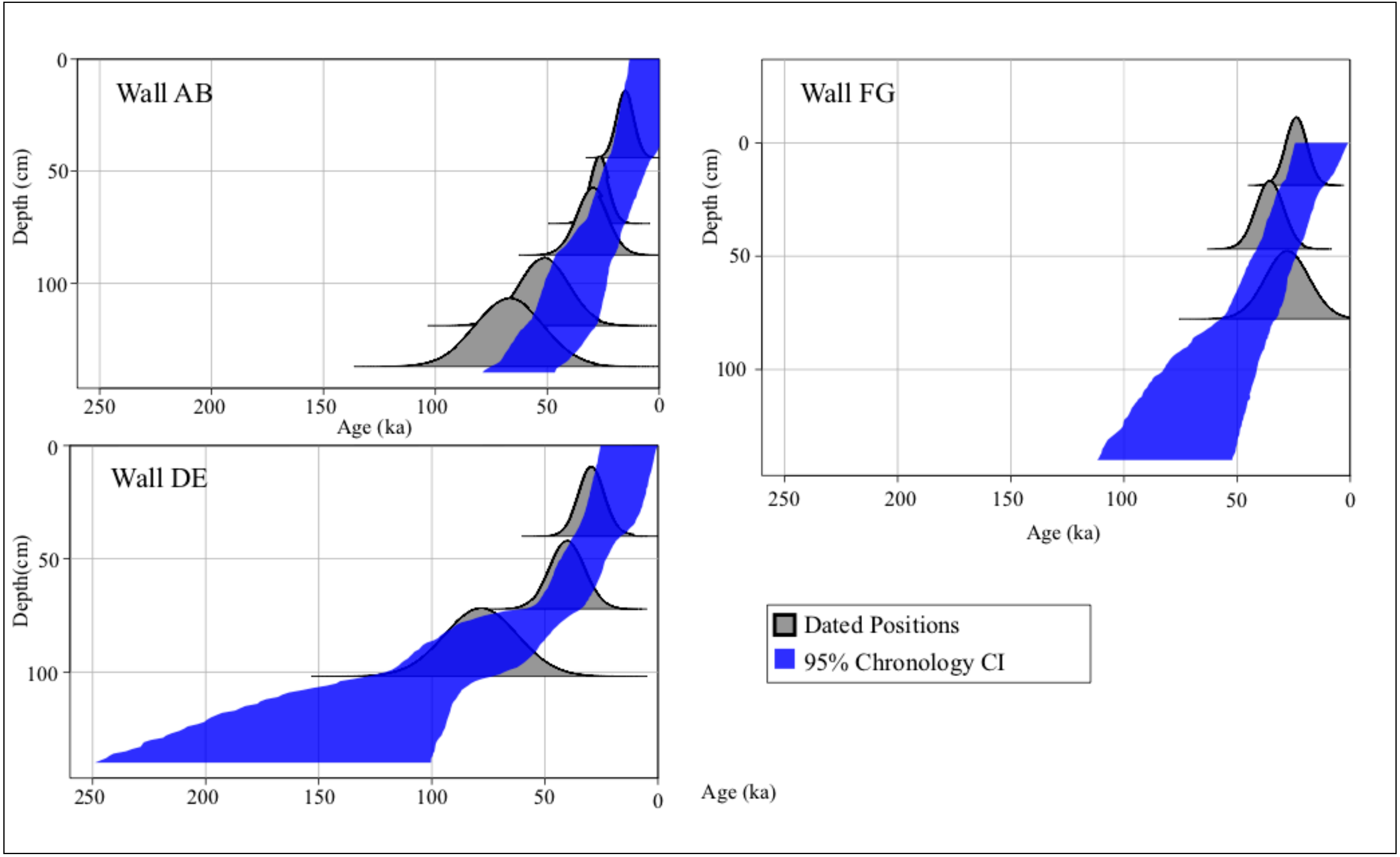

Figure 11. Age-Depth models for small aliquot tests on (a) Wall AB, (b) Wall DE, and (c) Wall FG OSL samples.

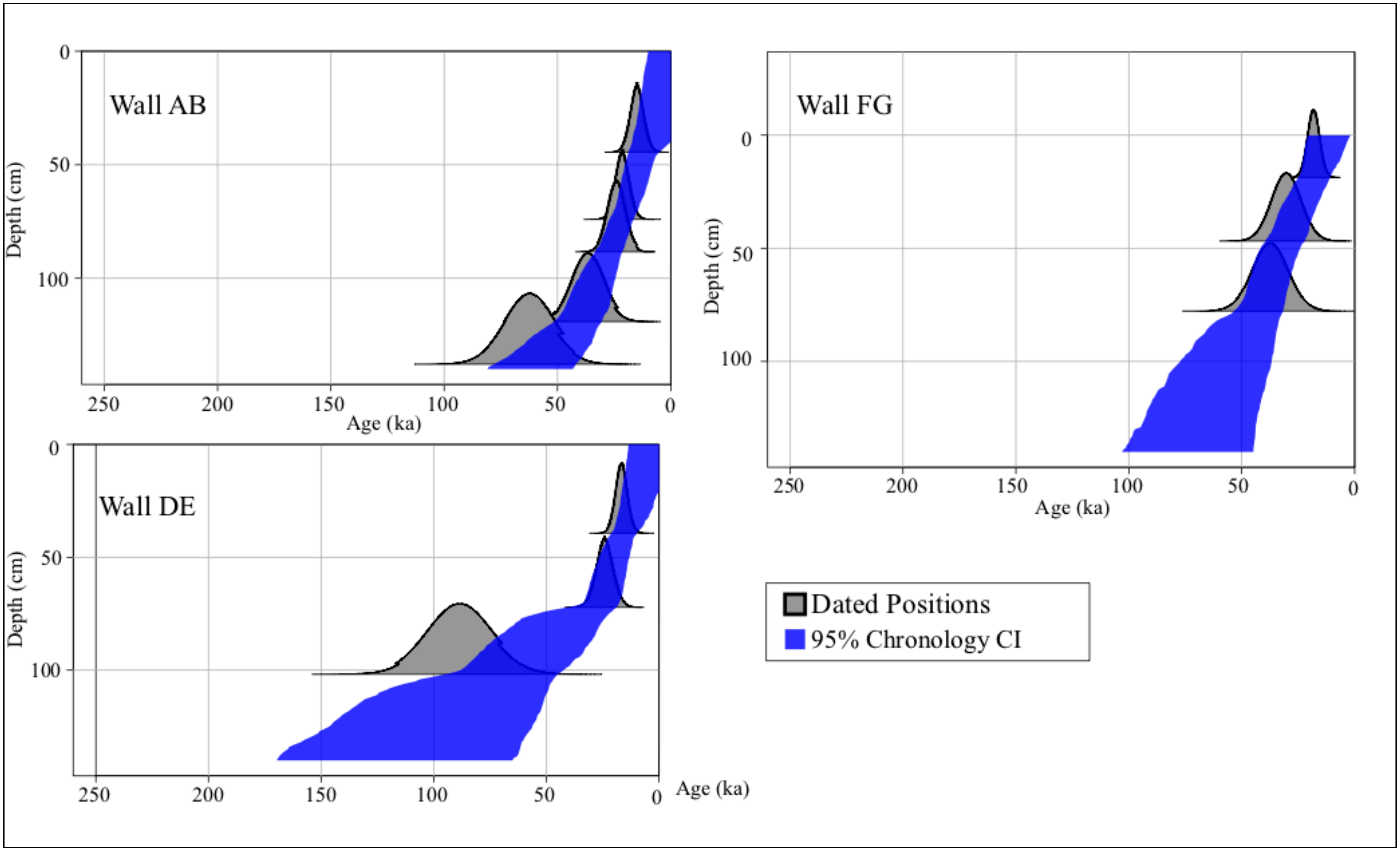

Figure 12. Age-Depth models for single-grain tests on (a) Wall AB, (b) Wall DE, and (c) Wall FG OSL samples.

Since the single-grain OSL age-depth model has been demonstrated as preferable over the small aliquot, the single-grain model should then be checked against the radiocarbon age-depth model from Wall AB for similarities. When the modeled granulometry ages from both the radiocarbon and single-grain OSL age-depth models from Wall AB are shown as overlapping line plots (Figure 13), possess a few places of close proximity, particularly between 50 cm and 75 cm beneath the surface, while also possessing areas where there appears to be substantial difference, with the single-grain OSL maintaining noticeably younger ages and the central radiocarbon ages tending to line up near the older extremities of the error range from the single-grain OSL model. The

Table 6. Modeled ages of granulometry samples.

Sample Number	Depth (cm)	Stratum	^{14}C Age (cal BP$_{2010}$ ± 95% Conf. Int.)	Single Grain OSL (ka ± 95% Conf. Int.)	Small Aliquot OSL (ka ± 95% Conf. Int.)
AB-1	134	1	51,580 ± 6,400	54.91 ± 16.31	68.04 ± 11.65
AB-2	124	2a	48,020 ± 4,110	45.91 ± 12.69	63.46 ± 12.56
AB-3	113	2a	42,830 ± 2,240	37.05 ± 9.8	55.32 ± 12.51
AB-4	105	2a	40,590 ± 3,580	34.47 ± 8.82	50.27 ± 12.25
AB-5	94	2a	36,690 ± 5,120	30.2 ± 7.19	43.39 ± 10.82
AB-6	86	2b	33,530 ± 5,840	26.01 ± 5.65	37.32 ± 9.76
AB-7	75	2b	23,790 ± 1,890	22.22 ± 5.35	29.03 ± 7.93
AB-8	64	2b	17,090 ± 1,690	17.61 ± 5.58	21.79 ± 7.67
AB-9	55	2b	14,560 ± 350	15.32 ± 6.08	18.36 ± 7.89
AB10	41	2b	13,700 ± 180	9.32 ± 8.15	9.15 ± 8.57
AB-11	32	2b	12,940 ± 130	7.58 ± 7.58	7.87 ± 7.87
DE-1	107	1	-	108.34 ± 35.47	105 ± 29.34
DE-2	97	2a	-	78.33 ± 32.17	79.18 ± 19.84
DE-3	87	2a	-	62.23 ± 28.37	68.65 ± 17.88
DE-4	77	2a	-	48.26 ± 22.92	58.18 ± 14.6
DE-5	67	2a	-	23.7 ± 7.51	44.52 ± 10.52
DE-6	57	2b	-	20.27 ± 6.58	38.73 ± 10.79
DE-7	47	2b	-	17.94 ± 6.58	34.25 ± 10.3
DE-8	37	2b	-	13.46 ± 6.63	25.76 ± 10.08
FG-1	84	1	-	42.45 ± 12.95	33.39 ± 8.8
FG-2	74	2b	-	37.75 ± 11.34	32.49 ± 8.39
FG-3	64	2b	-	34.07 ± 10.07	31.03 ± 8.28
FG-4	54	2b	-	31.08 ± 9.06	29.78 ± 7.99
FG-5	44	2b	-	26.37 ± 8.3	28.54 ± 7.77
FG-6	34	2b	-	23.52 ± 7.13	27.02 ± 7.72
FG-7	24	2b	-	21.43 ± 6.22	25.54 ± 8.13

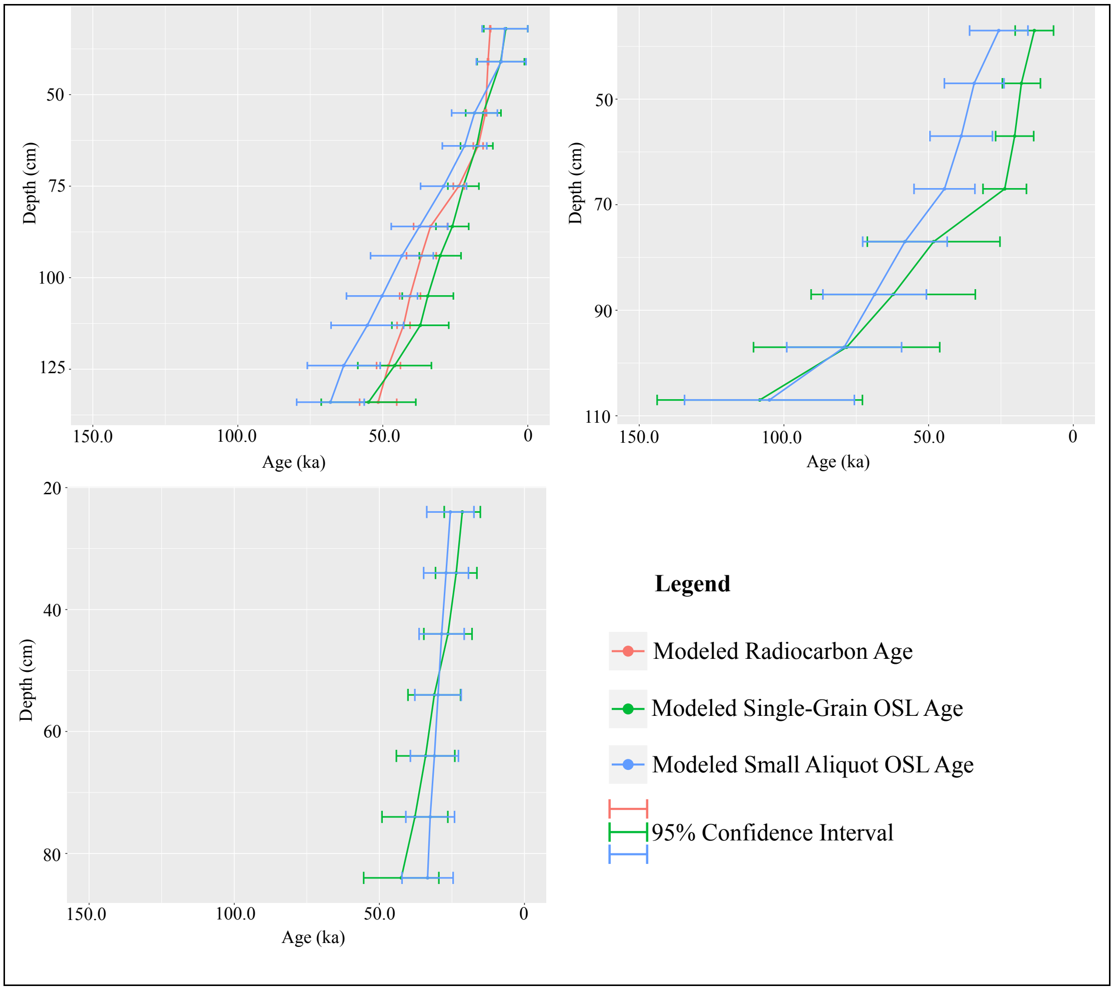

Figure 13. Modeled mean ages for the granulometry samples in (a) Wall AB, (b) Wall DE, and (c) Wall FG.

differences are accentuated by a paired two-tailed t-test on the mean granulometry ages from the radiocarbon and single-grain OSL chronologies in Wall AB ($t = 0.0.01$; $df = 10$; $p < 0.05$) (Table 7). This t-test supports the idea that the radiocarbon and OSL modeled ages would be fundamentally different, and rather informs us that we cannot dismiss the null hypothesis and that the two chronologies are not fundamentally different.

Additionally, the null hypothesis was dismissed when a two-tailed t-test was performed on the granulometry samples according to the radiocarbon and small aliquot

OSL age depth models ($t = 0.01$; $df = 10$; $p < 0.05$) (Table 7). This should not be too surprising considering the gap that exists between the predicted radiocarbon ages and the small aliquot OSL, particularly at depths lower than 90 cm (Figure 13). Neither does it detract from the conclusions that the single-grain is the more reliable of the OSL models.

Table 7. T-Tests on Modeled Ages on Granulometry Samples.

Wall AB

Group 1	Group 2	t-value	df	p	Interpretation	Summary
Radiocarbon	Single Grain OSL	0.01	10	<0.05	Reject null hypothesis	Models are different
Radiocarbon	Small Aliquot OSL	0.01	10	<0.05	Reject null hypothesis	Models are different
Small Aliquot OSL	Single Grain OSL	0	10	<0.05	Reject null hypothesis	Models are different

Wall DE

Group 1	Group 2	t-value	df	p	Interpretation	Summary
Small Aliquot OSL	Single Grain OSL	0.01	10	<0.05	Reject null hypothesis	Models are different

Wall FG

Group 1	Group 2	t-value	df	p	Interpretation	Summary
Small Aliquot OSL	Single Grain OSL	0.22	10	<0.05	Fail to reject null hypothesis	Models are similar

CHAPTER 5:

DISCUSSION

The chronologies provided by this study offer a detailed perspective into the formation of the Last Canyon Cave deposit. But do these new data have the potential to change the Minckley et al. (2015) environmental interpretation? In this section, I will make the connection between the radiocarbon, small aliquot OSL, and single grain OSL age-depth models and an environmental interpretation. First, I will discuss the strengths and weaknesses of each age-depth model, and what they all communicate about the formation of the deposit. Then I will provide an interpretation of the granulometry data according to each age-depth model. Finally, I will consider if any of these interpretations are potentially at odds with the Minckley et al. (2015). By doing this, I ensure that the data analysis remains consistent when applied to an interpretation of the site, as well as formulate conclusions concerning the reliability of the age-depth model used in Minckley et al. (2015).

Comparison of Chronologies

Small Aliquot OSL. To begin with, it should be noted that the small aliquot OSL chronology presents an immediate concern due to the accuracy problems resulting from analyzing sediment that included partially bleached grains. As a result, the chronology produced by the small aliquot OSL should not be viewed as reliable set of ages, but rather as tainted by partially bleached grains of quartz. Even though the Minimum Age Model was applied to the small aliquot results, the influence of the partially bleached grains should still cause the results to appear inappropriately old. In addition, the small aliquot OSL returned an age reversal in Wall FG. However, the single-grain results provide a better way to examine the influence of partially bleached grains since the single-grain results show the spread of specific grains rather than data points which represent the average of many grains. Even though the small aliquot tests ultimately analyzed a greater number of grains overall than the single-grain tests, the inability to estimate the ratio of fully bleached to partially bleached grains in each aliquot still makes the results difficult to meaningfully apply to the current study.

Single Grain OSL. Previous studies (Duller 2008; Galbraith et al. 1999, Roberts et al. 1998; 1999) have recommended the use of single-grain OSL and the application of a Minimum Age Model when dealing with sediments where partially bleached grains are mixed with grains that had been fully bleached upon deposition. Since a partially bleached grain will possess more electrons upon deposition than a fully bleached grain, the partially bleached grain will produce a greater luminescence signal and therefore appear older. This will result in small aliquot tests consistently providing deceptively old ages. By analyzing single grains, the analyst can achieve a finer level of detail that allows the exclusion of most grains impacted by partial bleaching and isolating the youngest age that could apply to the sample by using the MAM. By excluding most of the partially bleached grains and finding an acceptable minimum age, the single-grain analysis performed at LCC is ideally more accurate than small aliquot.

Even though the single-grain ages are more accurate than the small aliquot, they still suffer from very wide error ranges. The impact of these error ranges can be readily observed when comparing the OSL models in Figures 11 and 12 to the radiocarbon model in Figure 10. In spite of this, the single grain OSL provides an excellent way to perceive the sedimentation history of the LCC deposit by clarifying the relationship of the radiocarbon chronology to broader sedimentation processes and resolving the problems with the small aliquot OSL.

Radiocarbon. One of the greatest advantages of working with the radiocarbon age-depth model is that the error ranges are already narrower than either OSL method, and when those ages are modeled, the error ranges are able to remain particularly narrow at elevations where a greater number of ages were acquired. Due to the nature of OSL sample collection, particularly the need to collect the sediment surrounding the D_E sample, it is uncommon to see OSL samples taken at a density similar to the number of radiocarbon ages that were acquired from the upper elevations of the LCC deposit. However, the radiocarbon tells us little about the deposit formation, and to use these ages as a basis for an age-depth model requires the major assumption that the analyzed material has always been at the elevation where it was discovered. If the sample moved locations from the time it was deposited to the time it was collected, the radiocarbon dating process itself could not perceive this problem, but an analysis of the surrounding sediments would be needed to identify processes that may have moved the sample.

Comparative Accuracy of Age-Depth Models

The most important aspect of assessing the relative accuracy of each age-depth model is that if the dating method is more accurate, then the age-depth model will be more accurate. As a result, the small aliquot OSL age-depth model cannot be considered reliably accurate when the samples were taken from mixed sediments. Further consideration needs to be given to the radiocarbon and single-grain OSL models. In order to appropriately assess these two age-depth models, the formation processes within the shelter and the assumptions made about them should be evaluated. First, as has been previously stated, the radiocarbon age-depth model assumes that the organic material sampled was deposited synchronously with the surrounding eolian sediment. It also assumes that the organic material was not subject to bioturbation or the “old wood problem” (Schiffer 1986). Single-grain OSL is notable for its ability to recover from some of the negative impacts of sedimentary mixing. However, the MAM that was applied to the LCC samples assumes that the youngest ages are the most accurate, and that the primary sources of contamination in the sample would come from older grains. The underlying assumption is that younger sediment was not moved down to lower elevations. However, there is no physical evidence of such downward movement taking place, and there was no reason to doubt the accuracy of the MAM.

Two other questions need to be considered when addressing the accuracy of the single-grain OSL and radiocarbon age-depth models: 1) what specific event am I targeting to date, and 2) is one age-depth model enough, or are two models built on different methods needed? The first question addresses the fundamental concern of this thesis, that being the possibility that radiocarbon samples may not accurately date the dominant sedimentation processes. The data acquired suggests that radiocarbon samples are not the most reliable way to date granular sedimentation, but as Figure 13 shows, the modeled radiocarbon ages can still fall within the error ranges of single-grain OSL, even though the central ages for each sample do not necessarily maintain the desired proximity. In the case of LCC, the radiocarbon ages modeled for the granulometry samples in Wall AB all fell within the (albeit broad) error ranges for the single-grain OSL ages. The full error range of the modeled radiocarbon ages fit within the error range of the modeled single-grain OSL ages on several occasions, such as granulometry samples AB-2, AB-2, and AB-3. Otherwise, only most of the radiocarbon error range overlapped with that of the single-grain OSL error range, such as in granulometry samples AB-4, and AB-5. Granulometry sample AB-6 had the least amount of overlap out of any of the granulometry samples, but there was still some overlap of error ranges between modeled radiocarbon and single-grain OSL ages.

When OSL is used applied to a sedimentary deposit in a rockshelter, namely one with substantial levels of eolian sedimentation, it can provide certainty that sedimentation is the targeted event, whereas the use of radiocarbon to date the surrounding sediment requires bridging arguments defending the relationship between the dated material and the targeted event. The more direct approach to dating a targeted event should remove the layer of uncertainty that an indirect method creates. As long as the OSL ages themselves are accurate, one can be confident that the resulting age-depth model should properly date material deposited through the relevant processes.

As for the need for multiple age-depth models, having two or more age-depth models built from different dating methods can only refine the understanding of the deposit and ensure that acquired ages are accurate. At LCC, the relationship between the radiocarbon and single-grain OSL age-depth models aids in understanding the formation of the site. For example, the largest gap between the radiocarbon and single-grain OSL occurs around 125 cm – 75 cm in depth, which is almost entirely contained in Stratum 2a, which is noted for dense concentrations of fecal material. In addition, the single-grain OSL at these depths leans significantly younger than the radiocarbon. This means that the fecal material was probably older than the surrounding sediment. Perhaps animal activity in the site pushed old feces deeper into the sediment. In any case, Wall AB at LCC demonstrates that the construction of multiple age-depth models, particularly one based on radiocarbon and one on single-grain OSL can be of great assistance in understanding the formation of the site and the relationship of the sediments to the objects they contain.

LCC Stratigraphy

Since chronologies, age-depth models, and granulometry have been established for the deposit at Last Canyon Cave, the stratigraphy can be more carefully described and dated. In order to do this, the field observations for each stratum will be summarized, then the granulometry will be discussed, and finally the maximum and minimum age for each stratum will be discussed and evaluated. An important part of this process involves noting discrepancies between the field observations and the lab data. For instance, there may be some inconsistencies in the stratigraphic ages between sampled columns. Finally, this information will be used to make a statement about the formation history of that particular stratigraphic unit.

Stratum 1. The initial interpretation of Stratum 1 was that the relatively higher levels of sand-sized grains were evidence that granular disintegration of the shelter walls and ceiling was a major contributor to the stratum formation (Kornfeld et al. 2012). This is consistent with the current granulometry analysis, since the sediment from Stratum 1 was indeed sandier than any part of Stratum 2. Stratum 1 was strategically sampled for OSL in Wall AB and produced a single-grain age of 62.09 ± 11 ka. The sample was collected slightly below the middle elevation in Stratum 1's exposure in Wall AB. In the 2012 LCC report (Kornfeld et al. 2012), it notes that Stratum 1 is older than 39,570 ± 800 ^{14}C BP, referring to the earliest radiocarbon age that was acquired from Stratum 2a, which is consistent with the single-grain OSL results. Granulometry sample AB-1 was collected from Stratum 1, about three centimeters above the location of OSL sample AB-1. The radiocarbon age-depth model produced an age for this sample of 51,580 ± 6,400 BP_{2010}, while the single-grain OSL age-depth model provided an age of 54.91 ± 16.31 ka. While OSL sample AB-1 provides a good approximation of the earliest sedimentation in Stratum 1, the modeled single-grain OSL age should be used to identify an age for the higher elevations of Stratum 1, since the OSL age is a more direct approximation of the sediment deposition. Also, the granulometry sample is lower than the lowest direct radiocarbon age, which tends to increase the uncertainty of the age-depth model (Table 1; Table 6). Therefore, Stratum 1 can be said to cover 62.09 ± 11 ka to 54.91 ± 16.31 ka. It should be noted that this exposure is limited to Wall AB. Stratum 1 was therefore deposited early in the MIS 2 (Pinedale) glacial period and represents a period where there was significant disintegration of the shelter walls that supplemented the eolian deposition.

Stratum 2a. The entirety of Stratum 2 comprises the bulk of the deposit, and is divided into two subunits, primarily based on color and density of fecal deposits. As a unified whole, Stratum 2 possesses a consistent texture and appears roughly parallel to the shelter floor. Stratum 2a is distinguished by its dark reddish-brown color and numerous lenses of concentrated bighorn sheep droppings. It predominantly appears in Wall AB, but also extends into Wall DE. However, the extension into Wall DE is largely based on color, since the concentrations of bighorn sheep dropping do not extend into Wall DE. The granulometry from 2012 (Kornfeld et al. 2012) reported that the silt and clay content was still fairly low, but consistent with eolian deposition. This is in agreement with the current granulometry, which shows a distinct increase in silt/clay content when compared to Stratum 1.

OSL samples were collected at the top and bottom of the exposure in Wall AB and at the bottom of the exposure in Wall DE. The single-grain OSL results for Wall AB are 36.53 ± 7.24 ka to 23.93 ± 3.88 ka, and the lower age for Wall DE is 87.7 ± 14.03 ka. The age from Wall DE is notable for being wildly different from the Wall AB ages for Stratum 2a, and for having a greater age than Stratum 1. There are three ways to interpret this. First, it could be part of a new stratigraphic unit that did not stand out during the field observations, and is in fact older than Stratum 1. On the other hand, the stratigraphic divisions could have been incorrectly observed in the field, and OSL sample DE-1 actually belongs in Stratum 1 and not Stratum 2a. Finally, it could be that what was described as Stratum 2a was the first of the exposed strata to begin forming, and that Stratum 1 was a localized development in Wall AB, and when it finished forming, Stratum 2a continued forming over top of it. The most likely explanation is that it is actually part of Stratum 1.

One piece of evidence in favor of this is that the granulometry sample AB-1 from Stratum 1 possesses nearly identical grain-size distributions to granulometry sample DE-1, which was located 5.2 cm above OSL sample DE-1. This would mean that Stratum 1 actually covers 87.7 ± 14.03 ka to 60.43 ± 0.45 ka, and therefore Stratum 1 would cover a portion of the MIS 5a-4 (Sangamon) Interglacial to glacial conditions. If sample DE-1 is excluded from Stratum 2a, then Stratum 2a is only present in Wall AB and covers 36.53 ± 7.24 ka to 23.93 ± 3.88 ka. Overall, while there is an increase in the abundance of silt and clay in Stratum 2a, the difference is not necessarily stark when compared to Stratum 1. The most defining feature of this stratum are indeed the concentrations of bighorn sheep droppings, which seem to be isolated to Wall AB. The ages on this stratum place it cleanly in the Pinedale Glaciation (MIS 2), and seems to show an uptick in eolian deposition as well as wildlife visitation.

Stratum 2b. Stratum 2b is a light brown color, in opposition to the dark reddish-brown observed in Stratum 2a. Stratum 2b is the only unit that clearly appears in all three exposures. Rather than dense lenses of bighorn sheep droppings that are found in Stratum 2a, Stratum 2b possesses dispersed bighorn sheep droppings. Kornfeld et al. (2013) has little in regard of specifics used to describe this stratum, but it is understood that the granulometry trends highlighting eolian deposition that were observed in 2a continue into 2b. The current granulometry generally displays an increase in silt/clay content, suggesting an increase in eolian sedimentation. Upper and lower limits of the stratum were sampled for OSL in Walls AB, DE, and FG. In addition, an OSL sample was collected mid-height from the exposure in Wall FG. The single-grain OSL ages for Wall AB were 20.97 ± 3.19 ka to 14.37 ± 3.08 ka, for Wall DE they were 23.58 ± 3.8 ka to 15.86 ± 2.58 ka, and in Wall FG they were 37.42 ± 7.94 ka to 18.17 ± 2.66 ka. This reduces to an overall range of 37.42 ± 7.94 ka to 14.37 ± 3.08 ka. The earliest age comes from Wall FG and the latest comes from Wall AB. It should be reiterated that the ages for Stratum 2a was 36.53 ± 7.24 ka to 23.93 ± 3.88 ka, placing it in the MIS 2 (Pinedale). This shows strata 2a and 2b having roughly synchronous beginning ages, while Stratum 2b last a considerably longer time.

Relationships Between Columns. The single-grain OSL ages acquired for this study isolates the earliest sedimentation to Wall DE, with a modeled age of 108.34 ± 35.47 ka at 99 m elevation (107 cm beneath the surface), and a direct age of 87.7 ± 14.03 ka at 99.052 m elevation (101.8 cm beneath the surface). This formation would have been the result of both eolian sedimentation and autogenic granular disintegration of the Tensleep Sandstone.

Sedimentation later shows up in Wall AB with a direct age of 62.09 ± 11 ka at 98.973 m elevation (136.7 cm beneath the surface). At an early point in the MIS 2 (early Pinedale) glaciation, eolian sedimentation increased, resulting in the formation of Strata 2a and 2b. The separation of these two strata is somewhat confusing, since the separation is not based on chronological differences. Stratum 2a was forming in Wall AB at the same time Stratum 2b was forming in Wall FG. However, since Wall AB possessed a distinctive physical appearance (probably in part caused by the heightened use by bighorn sheep), it gives the false impression that it is altogether older than the entirety of the light brown sediment identified as Stratum 2b.

The transition from Stratum 1 to Stratum 2 likely occurs somewhere between granulometry samples DE-4 (taken at elevation 99.3 m [77 cm beneath the surface]) and DE-5 (taken at elevation 99.4 m [67 cm beneath the surface]). First of all, the age for DE-4 according to the single-grain OSL age-depth model is 48.26 ± 22.92 ka, and for DE-5 it is 23.7 ± 7.51 ka. If Stratum 2 begins around 36.53 ± 7.24 ka in Wall AB, and 37.42 ± 7.94 ka in Wall FG, then Stratum 2 would be expected a short elevation above granulometry sample DE-4. Also, the 50% quantile of predicted ages produced by the single-grain OSL age-depth model for granulometry sample DE-4 was 35.26 ka, further supporting an age at around 99.3 m in Wall DE that is close to the earliest ages for Stratum 2 elsewhere. In addition, if there is a stratigraphic separation between these two granulometry samples, then it should be expected that the granulometry itself would show some differences.

There is indeed a difference, though a slight one. Granulometry sample DE-4 is unimodal, poorly sorted, coarse silty fine sand with a mean grain size of 126.2 μm (2.986 φ). Granulometry samples DE-1 through DE-3 are all also unimodal, poorly sorted, coarse silty fine sands with mean grain sizes ranging from 136.4 µm (2.874 φ) to 144.4 µm (2.792 φ). Samples DE-1 through DE-4 all have a grain size mode of 170.2 µm (2.558 φ). In addition, Granulometry sample AB-1 is unimodal, poorly sorted, coarse silty fine sand with a mean grain size of 143.1 µm (2.804 φ) and a grain size mode of 170.2 µm (2.558 φ). Granulometry sample AB-1 is the only one that was positively identified as originating from Stratum 1 when collected, but the fact that granulometry samples DE-1 through DE-4 all have matching granulometry with AB-1, and also have ages derived from the single-grain OSL model that places them in the age range of Stratum 1 makes it likely that they were all collected from an exposure of Stratum 1 in Wall DE that was not identified in the field. On the other hand, granulometry sample DE-5 is a unimodal, poorly sorted, very coarse silty fine sand with a mean grain size of 92.76 µm (3.430 φ) and a grain size mode of 148.3 µm (2.757 φ). At this point, the sediment has become finer in agreement with the description of Stratum 2b being the result of greater eolian sedimentation than Stratum 1. This pattern continues through the rest of Wall DE, and becomes particularly silty in the top two granulometry samples (DE-7 and DE-8). It also matches very closely with granulometry sample AB-6, which is the lowest granulometry sample taken from Stratum 2b in Wall AB.

Finally, the proposed Stratum 1 boundary in Wall DE is comparable in thickness to Stratum 1 in Wall AB. The proposed Stratum 1/Stratum 2 division exists at around 99.35 m in elevation in Wall DE, while it is at about 99.15 m in Wall AB. In addition, the shelter floor at Wall DE was at about 99.0 m, and 98.9 m in Wall AB. This means that while Stratum 1 is about 35 cm thick in Wall DE, it is about 25 cm thick in Wall AB. Since Stratum 1 began deposition earlier in Wall DE, it makes sense that it is slightly thicker there than it is in Wall AB. However, the shape Stratum 1 between points C and D, as well as between E and F on the larger site profile (Figure 17) remains unclear.

Therefore, Stratum 1 represents the earliest formation with the largest autogenic contributions, beginning around 87.7 ± 14.03 ka in Wall DE. Strata 2a and 2b built up from fairly uniformly from an increase in eolian deposition, while processes around Wall AB (animal activity being the most obvious) resulted in a slightly different morphology from the rest of the sediment that was being deposited. Sedimentation in Stratum 2 tapered off around 14.37. ± 3.08 ka. The suggested revisions to the LCC stratigraphy are presented in Figures 16 and 17.

Sedimentation Rates

Sedimentation rates were generated in Bchron (R code is in Appendix D) for all 3 walls using the single-grain OSL model and using the radiocarbon model for Wall AB (Figure 14; Appendix D). The intent was to gain further insight into the site formation and to perceive any further differences between the single-grain OSL and radiocarbon age-depth models. It should first be noted that spikes appear on the plotted sedimentation rates around where direct ages were collected. In any case, there were indeed noticeable differences between the two models for Wall AB. While the 50% quantile rates for the radiocarbon model show relatively low rates up until the depths of 100 cm and 60 cm. This covers a small part of the upper portion of Stratum 2a and a significant lower portion of Stratum 2b. Between the depths of 100 cm and 120 cm (the majority of Stratum 2a) on the radiocarbon model, the sedimentation slows considerably when compared to the depths preceding them. But according to the single-grain OSL age-depth model, the 50% quantile rates are noticeably higher between the elevations of 120 cm and 140 cm when compared to the radiocarbon, and between the depths of 100 cm and 60 cm, the single-grain OSL model shows lower rates that continue a tapering down trend.

Though the single-grain OSL ideally represents a more accurate picture of sedimentation, it is worth noting that more dramatic variations appear on the radiocarbon model. The most notable point of change according the single-grain age-depth model occurs a little above 120 cm, where there is a sudden drop in the sedimentation rate, as seen in the plotted 50% quantile. This is approximately the location of the Stratum 1 and Stratum 2a division, and it is near granulometry sample AB-2, which has the largest sand content of any of any samples considered in this study. But because the rates produced by the radiocarbon model have such noticeable variations, there are more points to look for connections between the sedimentation rates, the stratigraphy, and the granulometry. But such connections may not be valid on account of the level of uncertainty when using a radiocarbon age-depth model to study sedimentation processes.

But as an example of an connection it would be tempting to make when studying the sedimentation rates produced by the radiocarbon age-depth model, at around 60 cm (the end of the period of high sedimentation rates), there is a corresponding increase of silt/clay contributions occurring between granulometry samples AB-5 and AB-6. This increase in silt/clay contributions does not end with the slowing of the depositional rate at around 60 cm in depth, but rather the deposit continues to increase its silt/clay content up to the top elevations. Even though connecting the radiocarbon age-depth model to the

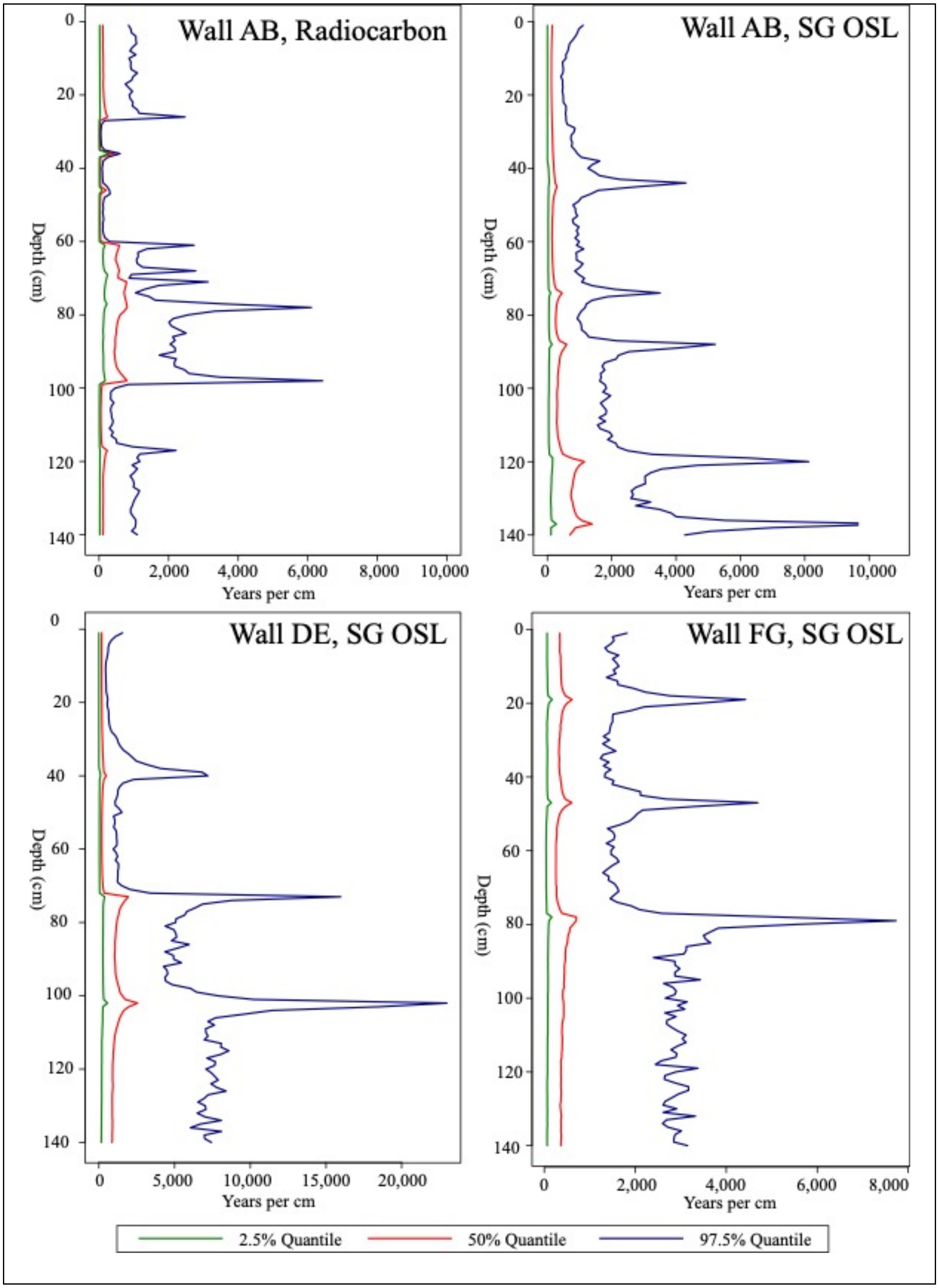

Figure 14. Sedimentation rates for Wall AB according to the radiocarbon age-depth model, and Walls AB, DE, and FG according to the single-grain OSL age depth model.

granulometry seems inadvisable, there may be some value in applying it to the biological material that contributes to the deposit. Between the depths of 100 cm and 120 cm, where the radiocarbon sedimentation rate slows considerably when compared to the depths preceding them, it generally corresponds to the area where concentrations of sheep feces occur in Stratum 2a. This sedimentation rate may be indicating a slow build-up of the fecal material.

Finally, the sedimentation rates for Walls DE and FG are mostly linear. The primary exception occurs at around 70 cm on wall DE, where the 50% quantile rate drops suddenly. This is in part due to the spike created by OSL sample DE-2, but after the spike, the rate is noticeably lower than before. This is the approximate location of the proposed division between Strata 1 and 2. As discussed earlier, there is the additional shift in granulometry that occurs in this area between granulometry samples DE-4 (sand:silt/clay ratio is 5.06) and DE-5 (sand:silt/clay ratio is 2.95). This means that the increase in silt/clay sizes was accompanied by a lower sedimentation rate.

Age-Depth Models and the LCC Paleoenvironment

One of the driving questions behind all of this research has been: how should formation processes influence the interpretation of environmental proxies? Namely, when modeling ages for eolian proxies such as pollen, should OSL ages derived from eolian sediment take priority over the more routine radiocarbon tests based on samples from non-eolian sources? Perhaps the best way to deal with this question is to consider the Minckley et al. (2015) reconstruction and attempt to find any ways that these new chronologies challenge the reconstruction as it was originally presented. To do this, I simply applied the names of the pollen zones defined in Minckley et al. (2015; Table 8) to the granulometry samples matching the appropriate age, according to each chronology (Table 9). The pollen zones represent periods of environmental change through the history of the site and provide date ranges for environmental phases at LCC.

It should be mentioned that the age ranges for the pollen zones are based on the original smooth-spline model made in CLAM (Figure 15), rather than a Bchron model. Because of this, some disagreement between the Bchron age-depth models and the CLAM model is possible. But in any case, the main purpose of this exercise is to demonstrate the relationship between an age depth model and the subsequent interpretation of the proxy. That is, it will demonstrate how variations in the age-depth model can create variations in the possible interpretations of the proxy. Fully integrating the granulometry data into the existing paleoenvironmental reconstruction is beyond the scope of this study, but the age-depth models created here can certainly be used in a future reevaluation and synthesis of all the existing environmental data, including granulometry. In addition, recognition should be given to the fact that by assigning each granulometry sample to an age range purely based on the central age value will to some extent overlook the error range of each modeled age. It should be expected that this will result in some discrepancies, particularly in the location of boundaries between zones from the environmental reconstruction. But if the models generally agree, then there should be some consistency in the sequence of pollen zone categories associated with the granulometry samples.

In any case, after associating each one of the granulometry samples with one of Minckley's pollen zones, according to the ages produced by each age-depth model, a

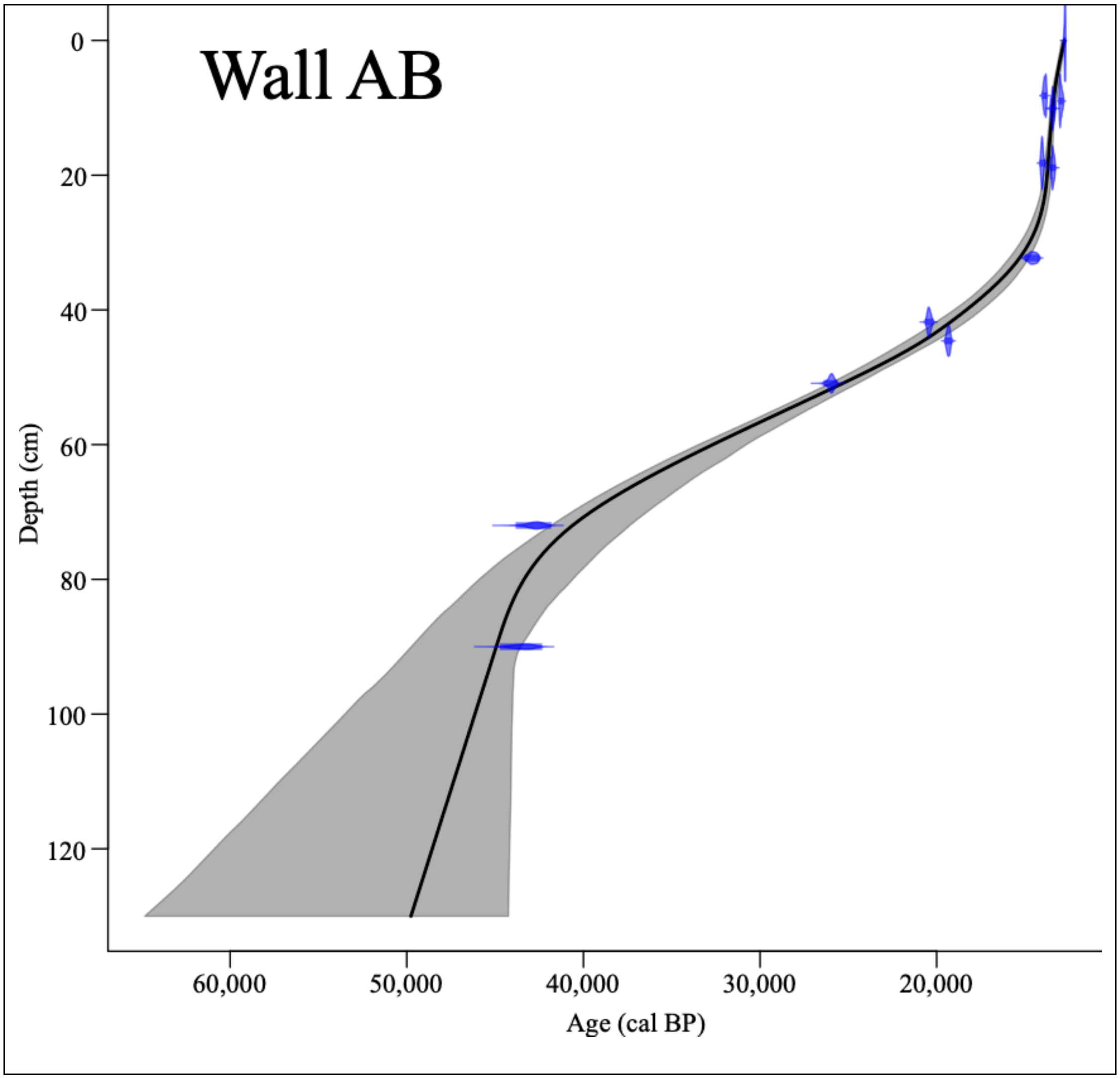

Figure 15. Smooth-spline age-depth model made in CLAM, used for the Minckley et al. (2015) environmental reconstruction. Adapted from Minckley et al. (2015).

considerable amount of variation was immediately apparent. In Wall AB, granulometry samples AB-1 and AB-2 fit with LCan I in all three age-depth models, but they began diverging soon afterwards. The radiocarbon model went through a complete sequence of all the listed pollen zones, typically including two granulometry samples in each zone. The only exception was LCan IV, which covered three granulometry samples (AB-7 through AB-9). In both OSL age-depth models, a few pollen zones went unrepresented. For the single-grain OSL model, it was LCan II and V, and for the small aliquot OSL, it was just

LCan V. LCan V went unrepresented in both OSL age-depth models because the two samples nearest the surface returned ages younger than the age limits provided for LCan V. There were no pollen zones defined for ages younger than LCan V, so granulometry samples AB-10 and AB-11 did receive pollen zone associations according to the two OSL models. In summary, the differences observed between the radiocarbon and single-grain OSL models were not problematic throughout the profile, but samples taken between the depths of 86 cm – 113 cm (granulometry samples AB-3 through AB-6) are significant enough that an environmental reconstruction would look fairly different at these elevations depending on the age-depth model that was used. As for the small-aliquot OSL model for Wall AB, the conflicts with the other two models were pretty consistent, primarily due to the large number of samples that fell within the age range of LCan I. This is further support of the idea that small aliquot OSL in a rockshelter setting should be avoided in favor of single-grain OSL.

In Wall DE, samples DE-5 through DE-7 were all assigned to LCan IV with the single-grain OSL model, while according to the small aliquot OSL, DE-5 was LCan II and DE-6 and DE-7 were LCan III. LCan II and III did not appear in the single-grain model in Wall DE, while they both appeared in the less-reliable small aliquot OSL model. In addition, the sample closest to the surface is identified as LCan V in the single-grain OSL model, and LCan IV in the small aliquot OSL model. To summarize for Wall DE, the single-grain OSL model does not include two pollen zones that appeared in the small aliquot model, but rather it showed the bulk of the deposit as belonging to LCan IV, while this pollen zone only appeared at the terminal sample with the small aliquot model. In Wall FG, there was disagreement between both age-depth models concerning the points where one pollen zone ends and the other begins, but they both had enough overlap that they could be considered quite similar, as the results of the t-test also suggested. However, it should be reiterated that the small aliquot age-depth model for Wall FG is particularly unreliable due to the age reversal in the direct ages the model is built on. Therefore, although this is a good example of agreement between two age-depth models, the fact that one of the models is so unreliable means that it has little illustrative value.

Altogether, this exercise shows that the age-depth model that is chosen can influence an environmental reconstruction. To further relate this idea to the LCC data, the sand:silt/clay ratio undergoes a major shift from 5.98 in sample AB-5, to 2.77 in sample AB-6. Both of these samples are in LCan III according to the radiocarbon age-depth model, but according to the single-grain OSL model, AB-5 in is LCan III and AB-6 is in LCan IV. So, the changes in the sand:silt/clay ratio clearly represents an environmental shift that took place between these two granulometry samples. If applying the radiocarbon age-depth model, it would be a challenge to try and explain this change in grain-size distributions as part of a cohesive environmental unit. Whereas the shift makes complete sense when the single-grain OSL model is applied. Before moving on, it should be reiterated that the existing pollen zones were aged with a radiocarbon model built in CLAM, and while this shift in the granulometry when aged with the single-grain OSL model relates nicely to the existing pollen zone ages, the ages of the pollen zones would probably need re-evaluated with the use of the single-grain OSL model before a confident connection could be made.

Table 8. Environmental reconstruction of Last Canyon Cave. Adapted from Minckley et al. (2015).

Pollen Zone	Major Pollen Types (% Abundance)	Isotopic Values					Geography of Modern Analogues	Climate Interpretation
		Mean Sediment Organic Matter			Coprolites			
		C:N	$\delta^{13}C$	C_4% wet glacial (dry glacial)	Small $\delta^{13}C$	Large $\delta^{13}C$		
LCan I >45.5 kyr BP	*Artemisia* (74%) *Asteraceae (9%)*	5.7 ± 0.8	-24.4± 0.2‰	12.1± 1.5% (0%)	-25.2± 0.9‰	-25.3± 0.8‰	Columbia Basin, WA (low elevation), Albion Mountains, ID, (high elevation), Great Basin	High winter precip., low spring-summer precip.
LCan II 45.5-38.5 kyr BP	*Artemisia (52%)* *Asteraceae (28%)* *Pinus (4%)*	6.6 ± 0.8	-24.6± 0.3‰	<10% (0%)	-25.3± 0.9‰	-25.6± 1.1‰	Snake River Plain, ID, Great Plains, SD	Increased spring-summer precip.
LCan III 38.5-27.5 kyr BP	*Artemisia* (54%) *Amaranth. (7%)* *Asteraceae (13%)* *Fabaceae (5%)* *Poaceae (6%)* *Pinus (2%)*	8.6 ± 1.4	-18.5± 2.0‰	40.4± 15.1% (31.0 ± 19.3%)	-26.5± 0.6‰	-24.0± 0.9‰	Snake River Plain, ID, Great Plains, SD	Increased spring-summer precip.
LCan IV 27.5-13.8 kyr BP	*Artemisia* (33%) *Amaranth. (13%)* *Fabaceae (10%)* *Poaceae (10%)* *Rosaceae (6%)* *Pinus (4%)*	9.7 ± 0.5	-16.3± 1.7‰	62.6± 14.0% (53.4±17.4%)	-26.7± 0.6‰	-25.8± 0.9‰	Great Basin, Snake River Plain, ID, Great Plains, SD	Increased spring-summer precip., warmer-than-previous winter
LCan V 13.8-11.5 kyr BP	*Artemisia* (24%) *Asteraceae (32%)* *Amaranth. (17%)* *Pinus (<1%)*	8.8 ± 1.2	-22.9± 2.3‰	22.3± 15.3% (9.2±14.7%)	-26.3± 0.6‰	-	Southern CA, Colorado Plateau, Snake River Plain, ID	Warmer-than-previous annual temp.

Table 9. Description of sand/silt/clay content, ages, and pollen zone of LCC granulometry samples.

Granulometry Sample	Depth	Stratum	Sand Content (Relative %)	Silt/Clay Content (Relative %)	Sand to Silt/Clay Ratio	Modeled Radiocarbon Age (BP$_{2010}$)	Minckley (2015) Pollen Zone	Modeled Single-Grain OSL Age (ka)	Minckley (2015) Pollen Zone	Modeled Small Aliquot OSL Age (ka)	Minckley (2015) Pollen Zone
AB-1	134	1	87.33	12.67	6.89	51,580 ± 6,400	LCan I	54.91 ± 16.31	LCan I	68.04 ± 11.65	LCan I
AB-2	124	2a	90.23	9.77	9.24	48,020 ± 4,110	LCan I	45.91 ± 12.69	LCan I	63.46 ± 12.56	LCan I
AB-3	113	2a	89.38	10.62	8.41	42,830 ± 2,240	LCan II	37.05 ± 9.8	LCan III	55.32 ± 12.51	LCan I
AB-4	105	2a	85.65	14.35	5.97	40,590 ± 3,580	LCan II	34.47 ± 8.82	LCan III	50.27 ± 12.25	LCan I
AB-5	94	2a	85.67	14.33	5.98	36,690 ± 5,120	LCan III	30.2 ± 7.19	LCan III	43.39 ± 10.82	LCan II
AB-6	86	2b	73.49	26.51	2.77	33,530 ± 5,840	LCan III	26.01 ± 5.65	LCan IV	37.32 ± 9.76	LCan III
AB-7	75	2b	73.22	26.78	2.73	23,790 ± 1,890	LCan IV	22.22 ± 5.35	LCan IV	29.03 ± 7.93	LCan III
AB-8	64	2b	59.73	40.27	1.48	17,090 ± 1,690	LCan IV	17.61 ± 5.58	LCan IV	21.79 ± 7.67	LCan IV
AB-9	55	2b	64.58	35.42	1.82	14,560 ± 350	LCan IV	15.32 ± 6.08	LCan IV	18.36 ± 7.89	LCan IV
AB-10	41	2b	65.28	34.72	1.88	13,700 ± 180	LCan V	9.32 ± 8.15	-	9.15 ± 8.57	-
AB-11	32	2b	66.15	33.85	1.95	12,940 ± 130	LCan V	7.58 ± 7.58	-	7.87 ± 7.87	-
DE-1	107	1	87.58	12.42	7.05	-	-	108.34 ± 35.47	LCan I	105 ± 29.34	LCan I
DE-2	97	2a	86.14	13.86	6.21	-	-	78.33 ± 32.17	LCan I	79.18 ± 19.84	LCan I
DE-3	87	2a	86.66	13.34	6.49	-	-	62.23 ± 28.37	LCan I	68.65 ± 17.88	LCan I
DE-4	77	2a	83.5	16.5	5.06	-	-	48.26 ± 22.92	LCan I	58.18 ± 14.6	LCan I
DE-5	67	2a	74.68	25.32	2.95	-	-	23.7 ± 7.51	LCan IV	44.52 ± 10.52	LCan II
DE-6	57	2b	75.11	24.89	3.02	-	-	20.27 ± 6.58	LCan IV	38.73 ± 10.79	LCan II
DE-7	47	2b	57.19	42.81	1.34	-	-	17.94 ± 6.58	LCan IV	34.25 ± 10.3	LCan III
DE-8	37	2b	58.52	41.48	1.41	-	-	13.46 ± 6.63	LCan V	25.76 ± 10.08	LCan IV
FG-1	84	1	81.33	18.67	4.36	-	-	42.45 ± 12.95	LCan II	33.39 ± 8.8	LCan III
FG-2	74	2b	78.26	21.74	3.6	-	-	37.75 ± 11.34	LCan III	32.49 ± 8.39	LCan III
FG-3	64	2b	80.27	19.73	4.07	-	-	34.07 ± 10.07	LCan III	31.03 ± 8.28	LCan III
FG-4	54	2b	46.45	53.55	0.87	-	-	31.08 ± 9.06	LCan III	29.78 ± 7.99	LCan III
FG-5	44	2b	67.88	32.12	2.11	-	-	26.37 ± 8.3	LCan IV	28.54 ± 7.77	LCan III
FG-6	34	2b	66.31	33.69	1.97	-	-	23.52 ± 7.13	LCan IV	27.02 ± 7.72	LCan IV
FG-7	24	2b	59.27	40.73	1.46	-	-	21.43 ± 6.22	LCan IV	25.54 ± 8.13	LCan IV

Combining Radiocarbon and Single-Grain OSL Together

Even though the radiocarbon and single-grain OSL age-depth models showed significant differences, this may not be the case at all site. In situations where a t-test performed on central ages from a selection of modeled ages between a radiocarbon and single-grain OSL age-depth models returns a result where the null hypothesis cannot be rejected, indicating that the two models are sufficiently similar, it should be safe to combine them into a single age-depth model. The resulting age-depth model should provide the best results possible for the sedimentary exposure. The radiocarbon ages assist in keeping the error ranges narrow, while the singe-grain OSL ages keep the model closer to the timeline of eolian sedimentation. The primary methodological challenge is that the radiocarbon ages will need to be adjusted past the 1950 date they are typically calibrated to in order to make them comparable to comparable to the OSL ages. In any case, the combination of radiocarbon and single-grain OSL into a single age-depth model should be considered the ideal method to model ages in a rockshelter deposit since it combines the strengths of radiocarbon with those of single-grain OSL into one reliable model.

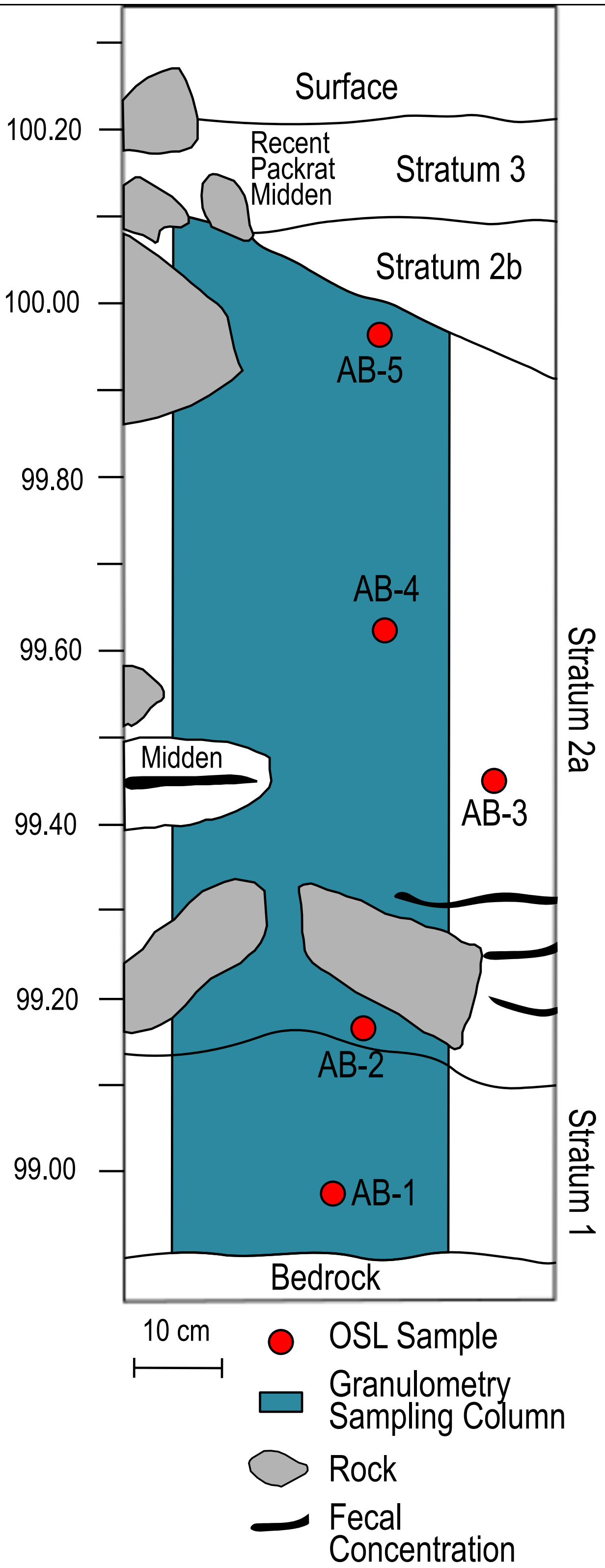

Figure 16. Revised stratigraphy for Wall AB.

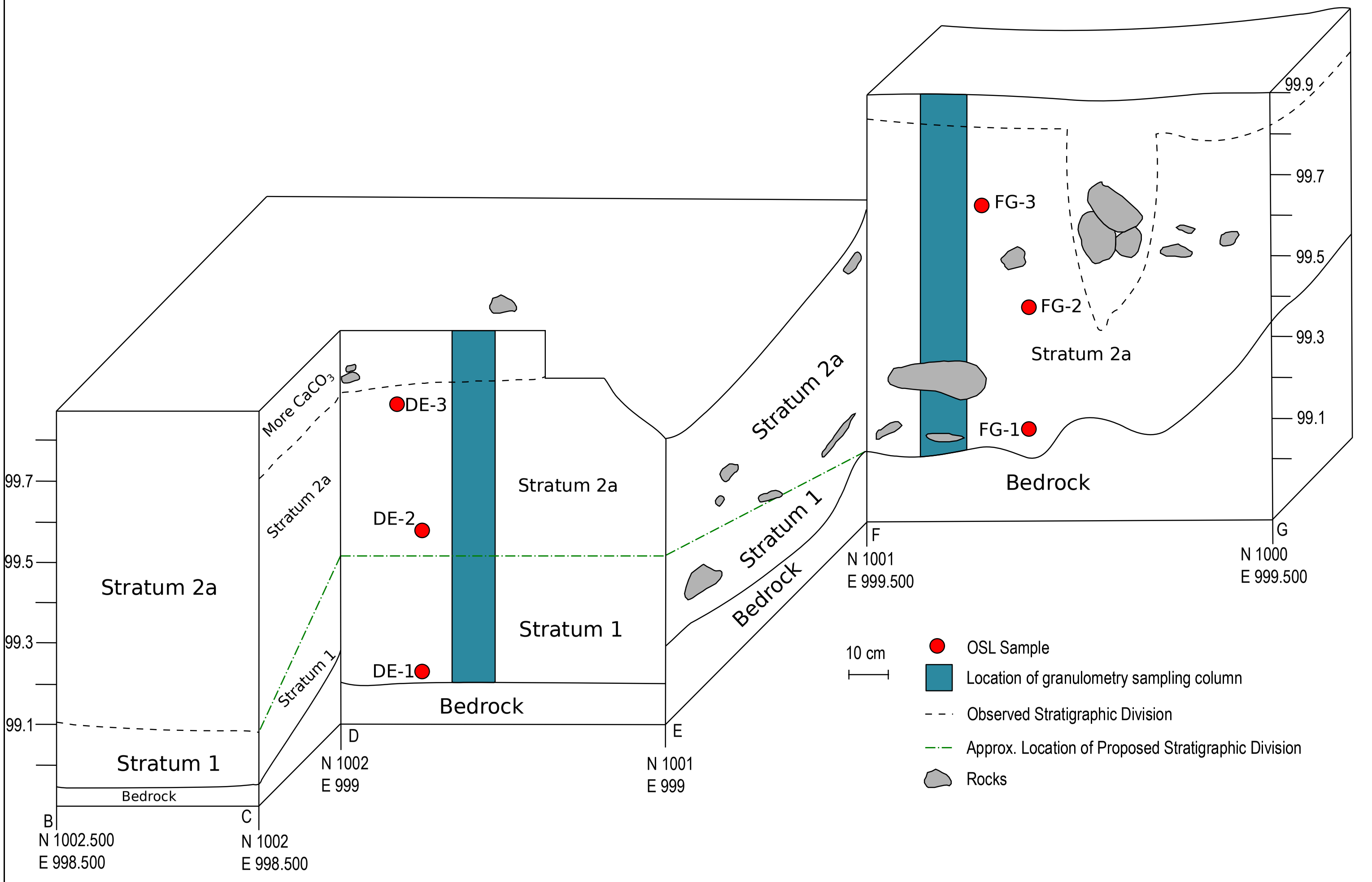

Figure 17. Revised stratigraphy for Walls DE and FG.

CHAPTER 6:

CONCLUSIONS

The central question of this study was whether or not OSL provided a more accurate method to age environmental proxies in rockshelter sediments when compared to radiocarbon. The results have shown that radiocarbon and single-grain OSL can create age-depth models in a rockshelter with statistically significant differences. Further, the use of both single-grain OSL and radiocarbon dating provide the best insights into the formation of the site, particularly when granulometry was integrated into the study. Altogether, there are five primary lessons about building age-depth models in rockshelters that can be gleaned from this study: 1) that single-grain OSL should be used while small aliquot OSL should generally be avoided, 2) that single-grain OSL is an effective way to verify or challenge radiocarbon ages collected from the same profile, 3) the ideal age-depth model, when circumstances allow it, is one built on a combination of radiocarbon and single-grain OSL ages, 4) that granulometry can clarify the site formation and stratigraphy, and 5) that sampling multiple exposures from the back towards the front of the shelter can further clarify the site formation history.

Even though the sampled material for radiocarbon ages was assumed to be deposited at the same time as the surrounding eolian sediment, that assumption could not be validated without the addition of another dating method. In the case of a deposit like LCC where a substantial portion of the sediment was deposited through eolian processes, OSL was a reasonable method to apply (Feathers 1997; Murray and Olley 2002; Prescott and Hutton 1995). Not only would it verify or refute the radiocarbon age-depth model, but it could potentially be used to reinterpret the pollen assemblage from the site, if necessary. In this particular circumstance, the single-grain OSL and radiocarbon age-depth models were not entirely similar, and the existing environmental reconstruction should be reconsidered in light of this. While some of the differences could be seen visually when modelled central ages were plotted out (Figure 13), a t-test of the central ages (Table 7) further indicated that the differences were significant. Finally, when both the single-grain OSL and radiocarbon modeled ages of the granulometry samples were placed within the Minckley et al. (2015) pollen zones according to the cited ages for each zone, there were a few troubling disagreements between the two models.

The addition of the OSL ages to the existing data repertoire at LCC also clarified the extent to which the disintegration of the parent Tensleep Sandstone contributed to the development of the deposit. Even though the initial discussion of the stratigraphy (Kornfeld et al. 2012) mentioned sedimentary contributions from the parent rock, the OSL analysis helped to further validate and clarify this aspect of the shelter's sedimentary history. As a result, the small aliquot OSL ages were problematic, whereas the single-grain OSL ages (with the aid of the MAM) proved to be reliable. As a result of this experience, it is recommended that single-grain OSL always be used instead of small aliquot OSL in a rockshelter setting.

Although the radiocarbon and single-grain age-depth models in Wall AB were not similar enough, there may be other sites where this is not the case. When radiocarbon and single-grain OSL age-depth models from the same exposure can be statistically demonstrated to be sufficiently similar, the next logical step should be to combine the two sets of ages into a single age-depth model. Ideally, the resulting ages from the model should be preferable to those produced by a model built on a single dating method since not only would there would be a greater number of ages through the column and thus producing more reliable modeled ages, but the integration of multiple methods should produce improved ages. This is because if one method produced a direct age that was a bit too old or too young, a nearby direct age from the alternate method should provide a slight corrective force in the model. In addition, OSL samples can be collected more strategically than radiocarbon, thus allowing for the establishment of important benchmarks such as points adjacent to apparent stratigraphic divisions. Ultimately, a hybridized age-depth model finds the middle-ground between the single-grain OSL ages and the radiocarbon ages. Not only should the ages produced by this hybrid model preferable, but it should produce ages with tighter error ranges than the single-grain OSL model alone.

In addition to the direct importance of dating methodologies in the construction of age-depth models, the inclusion of granulometry from the targeted sedimentary exposure aided with the process of applying and interpreting the model. At LCC, the granulometry particularly helped clarify stratigraphic divisions. While the single-grain OSL ages brought attention to problems in the previously drawn stratigraphy as it progressed from the back to the front of the shelter, the granulometry in particular helped to identify the likely location for a previously overlooked division between Stratum 1 and Stratum 2a in Wall AB. Therefore, it is recommended that when building an age-depth model in a rockshelter, granulometry samples should be collected in addition to the samples collected for radiocarbon and single-grain OSL dating.

Finally, this study demonstrated that sampling multiple exposures from the back towards the front of the shelter can be very important for understanding the formation history, as well as identifying and dating the stratigraphy. At LCC, this was proven when the single-grain OSL showed similar dates for the beginning of Strata 2a and 2b, thus suggesting 2a began forming in Wall AB at the same time 2b was forming in the rest of the shelter. OSL dating was also able to acquire ages from locations where organic material was scarce, and that may be beyond the limits of radiocarbon dating, as we the case with samples like DE-1. By looking at the modeled ages for the granulometry samples and looking for signals of stratigraphic changes in the granulometry data, it was further possible to defend the common origin age for Strata 2a and 2b. Therefore, future work in rockshelters should employ a similar sampling strategy in order to similarly reconstruct the formation history of the deposit.

While this study provided helpful insights into the way archaeological and environmental remains in rockshelter sediments are studied, it also prompts some questions for future consideration. First of all, the Minckley et al. (2015) environmental reconstruction needs reevaluated in light of the present research. Also, further work could be done to understand the extent to which grains from the parent rock were included in the grain sizes targeted for OSL, and if it might be possible to intentionally exclude most of those grains when the OSL sample is being sieved. Also, the specific impact of large mammals on the development of an eolian deposit in a rockshelter remains ambiguous. For example, to what extent was the sediment mixing in the OSL results the product of contributions from the shelter ceiling, and to what extent was it caused by bioturbation from bighorn sheep?

In addition, the concentrations of sheep feces observed in Stratum 2a in Wall AB indicate some integrity to the deposit. These concentrations of sheep feces are exceptionally abundant proxies of animal behavior in the shelter and have the potential to provide further insight into the formation of the deposit in LCC. For example, why do they seem so specific to one isolated part of the deposit? Namely, do they represent a few events over a relatively short period of time, or did they somehow build up over a longer period of time? And how do they relate to the build-up of the deposit through eolian processes? It would be interesting to take multiple radiocarbon dates from a single concentration to see what the distribution of ages looks like. If all of the ages from a single concentration were limited to narrow age ranges that were in agreement with the current age-depth models, then there is little to be concerned about. But if there were many ages over a long period of time, especially time that is problematic in context of the current age-depth models, it may illustrate very specific, localized disturbances related to repeated use. While bioturbation is a frequent impact on rockshelter sites such as LCC, and there are many other forms of disturbance and destruction, this study has illustrated that such disturbances and variations in depositional formation do not always introduce unsolvable chronology problems.

This study ultimately confirmed my hypothesis that there would be a significant difference between a radiocarbon and an OSL age depth model. Furthermore, it was able to effectively demonstrate the value of incorporating single-grain OSL and granulometry into the research strategy of archaeological excavations inside rockshelters. In the case of Last Canyon Cave, acquiring single-grain OSL ages challenged the applications of the existing radiocarbon age-depth model, showed the impact of disintegrating parent rock, and with the additional aid of the granulometry samples, helped refine the site stratigraphy and formation history. To make a final reiteration of the lessons future researchers can take away from this study, when working in a rockshelter, multiple columns from the back to the front of the shelter should be targeted for sampling. Samples should be collected for radiocarbon dating, single-grain OSL dating, and granulometry from each of the targeted exposures. As long as they are compatible, single-grain OSL and radiocarbon ages should be combined into a single age depth model, otherwise they should operate separately and be applied with consideration towards the depositional processes under investigation, and the granulometry samples can be used in the process of applying and interpreting an age-depth model. By applying these recommendations, researchers should be able to produce better age-depth models and more complete formation histories for sedimentary deposits in rockshelters.

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APPENDIX A:

GLOSSARY OF KEY TERMS

Accelerator Mass Spectrometry (AMS): A common way to perform radiocarbon dating. It uses accelerated ions to separate isotopes in the targeted material for eventual quantification.

Age-Depth Model: A tool used to create an age estimate for any depth in a sedimentary column. Typically involves taking a series of direct dates through the column and then calculating a continuous series of ages between those points.

Aliquot: A portion of a sample.

Bayesian: A branch of statistics oriented towards understanding probability as a degree of belief, and which is capable of incorporating new information into its calculations.

Bleaching: Term used in OSL dating referring to the removal of electrons from traps in the quartz lattice through light exposure.

Cut Heat: A term used in relation to single aliquot regeneration (SAR) OSL It is the reduced preheat temperature applied to a sample following exposure to a “test dose” of radiation.

Dose Rate (D_R): The rate at which quartz grains sampled for OSL dating have been exposed to ionizing radiation.

Equivalent Dose (D_E): A calculated quantity of radiation that should be approximately equal to the total amount of radiation the sample received while buried.

Fully Bleached: Term used in OSL dating referring to the condition when a grain of quartz is deposited with all electron traps fully empty.

Granulometry: Measurement of the distribution of grain sizes in a sediment sample.

Gray (Gy): A unit of ionizing radiation, where one gray is equal to one joule of radiation per kilogram.

Minimum Age Model (MAM): A statistical calculation used to adjust the representative D_E from partially bleached samples, and which assumes that the youngest set of D_E values have been fully bleached.

Null Hypothesis: A standard term in statistics that refers to the circumstance where multiple datasets are *not* significantly different. If the null hypothesis cannot be rejected, then the sets of data lack statistically significant difference. If the null hypothesis is rejected, then there is sufficient statistical evidence to declare the datasets significantly different.

Optically Stimulated Luminescence (OSL): Process used to calculate an age for quartz sediment deposition.

Overdispersion: When there is greater variation in a dataset than predicted by a relevant statistical model

Partially Bleached: Term used in OSL dating to refer to the condition when a grain of quartz is deposited without all of the electron traps having first been emptied.

Pollen Zone: Designations given by palynologists to areas in a pollen core possessing a cohesive pollen population. Age ranges can be applied to a pollen zones with the assistance of an age-depth model.

Polymodal Distribution: When a dataset exhibits multiple modes, visible as multiple peaks on a histogram.

Posterior: A probability distribution that results from the integration of new evidence into a prior distribution.

Prior: A previously known probability distribution that is being integrated into a Bayesian calculation. For example, a radiocarbon age is often a prior in a Bayesian age-depth model.

Proxy: Material that can be used to reconstruct past environments. Pollen is a common example of an environmental proxy.

Sediment Mixing: Generally refers to the postdepositional disturbance of sediment consequently distorting the vertical consistency of the sediment.

Single Aliquot Regeneration (SAR): A method of OSL first described in Murray and Wintle (2000) that measures the natural luminescence signal, then builds a "regeneration curve" based on the response of the sample to laboratory-applied doses of radiation which can then be used to identify the D_E. Between dose cycles used in the construction of the regeneration curve, a standardized "test dose" is given to detect changes in sample sensitivity.

Single-Grain OSL: OSL performed on individual grains of quartz.

Small Aliquot OSL: OSL performed on a small collection of quartz grains together, typically a small dot of sediment on the disc that is placed in the OSL machine.

Radiocarbon Dating: A method to date organic remains by determining the amount of ^{14}C (radiocarbon) that has broken down over time.

Regenerative Cycle: A repeated process in single aliquot regeneration (SAR) OSL where the aliquot is given a dose of radiation, preheated, stimulated with light, and has the luminescence response measured.

Test Dose: A repeated amount of radiation applied to an aliquot of sediment undergoing single aliquot regeneration (SAR) OSL. The test does is given after each regenerative cycle, and is followed by the application of cut heat, light stimulation, and luminescence measurement.

t-Test (Paired, 2-Tailed): A t-test checks two datasets to determine if they are distinct populations by analyzing their means (averages). A 2-tailed test means that there is no "direction" in the relationship between the two datasets, and therefore a 2-tailed test compares the two datasets bidirectionally. A paired t-test couples specific observations together and looks at the difference between them. In the context of this thesis, the observations were paired at each elevation where predicted ages were being compared between the two models.

APPENDIX B:

OSL RADIAL PLOTS & PROBABILITY DISTRIBUTIONS

OSL D_E DISTRIBUTIONS AND RADIAL PLOTS

Small-Aliquot Equivalent dose (D_E) Distributions

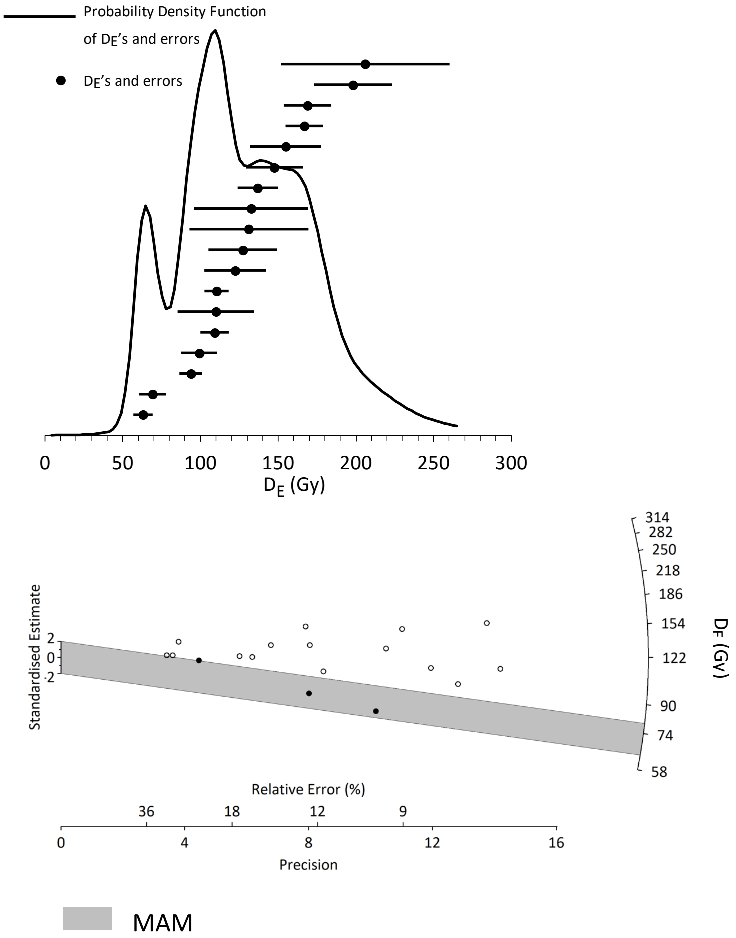

Figure 18. Small aliquot D_E distributions for sample AB-1 (USU-2326).

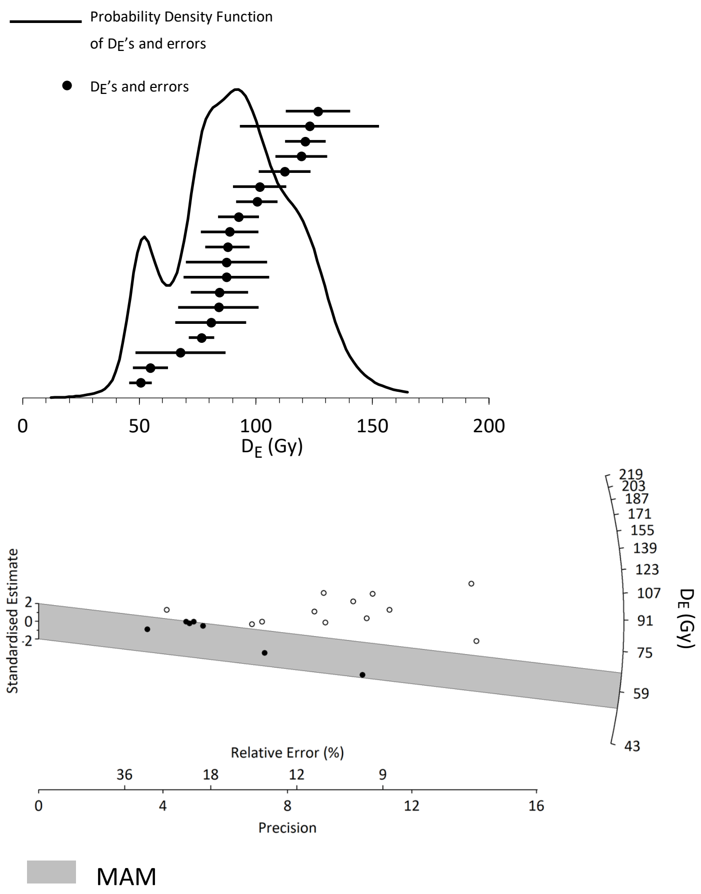

Figure 19. Small aliquot D_E distributions for sample AB-2 (USU-2327).

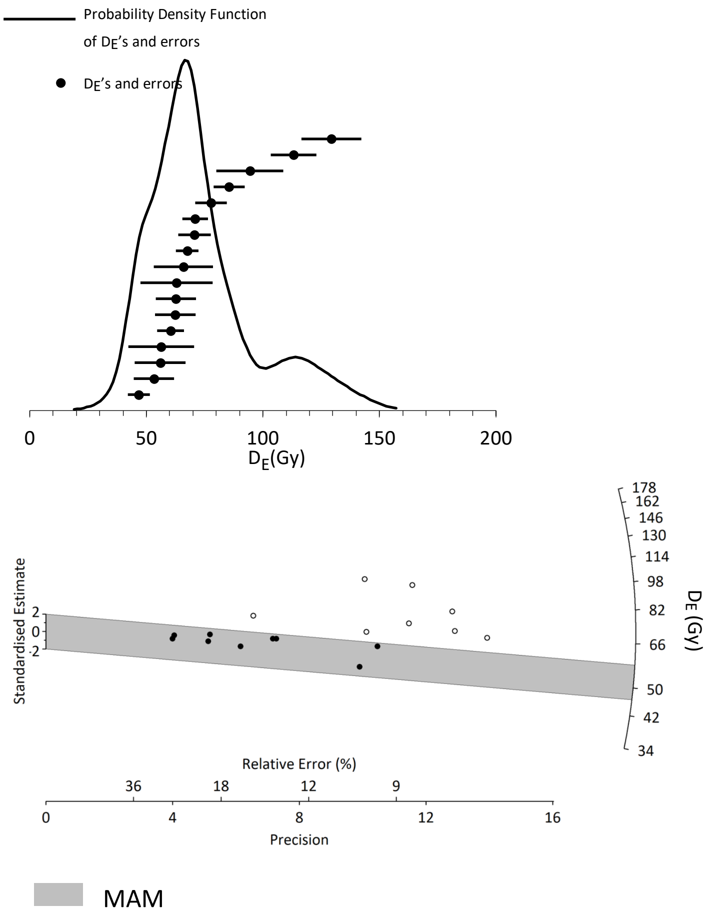

Figure 20. Small aliquot D_E distributions for sample AB-3 (USU-2328).

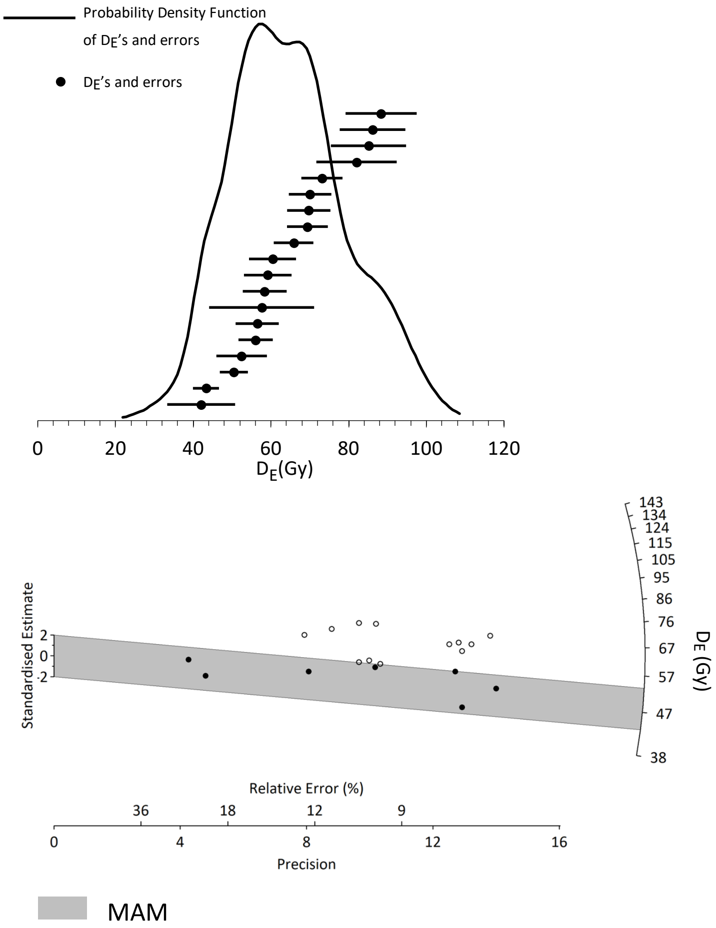

Figure 21. Small aliquot D_E distributions for sample AB-4 (USU-2329).

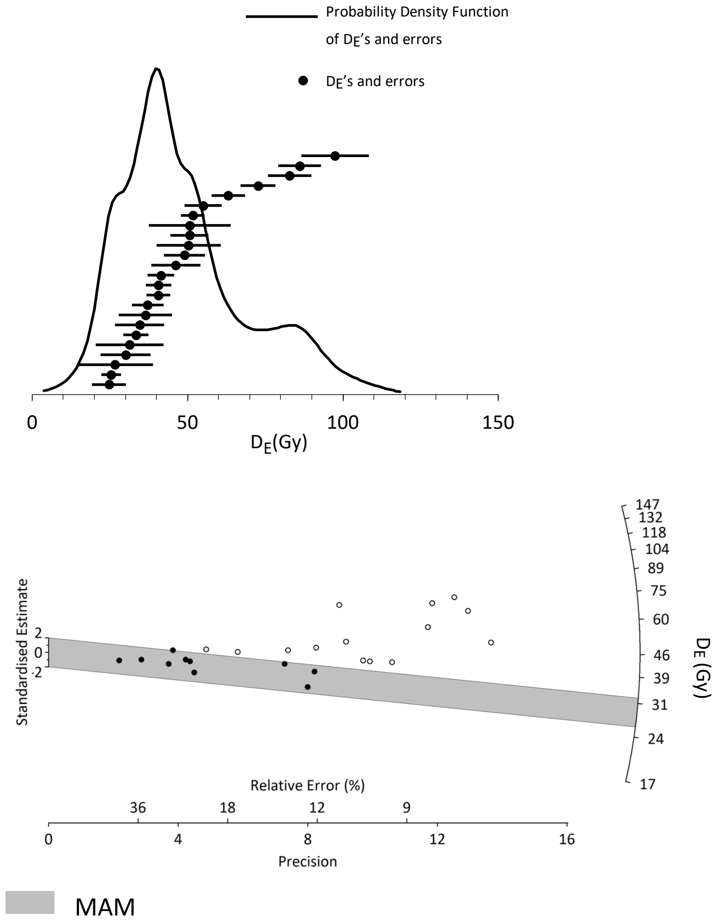

Figure 22. Small aliquot D_E distributions for sample AB-5 (USU-2330).

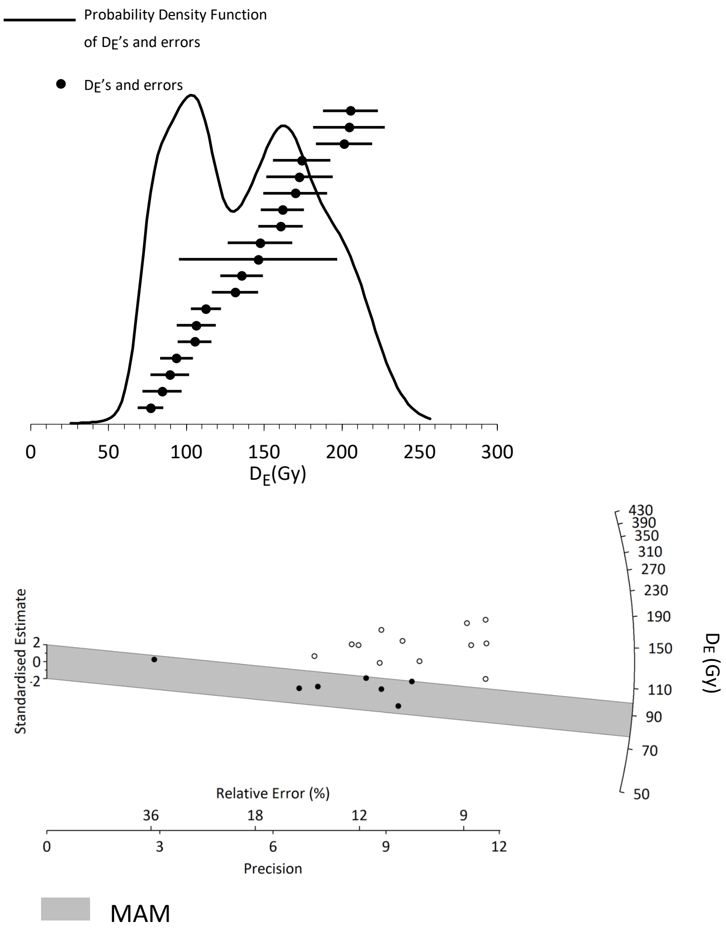

Figure 23. Small aliquot D_E distributions for sample DE-1 (USU-2331).

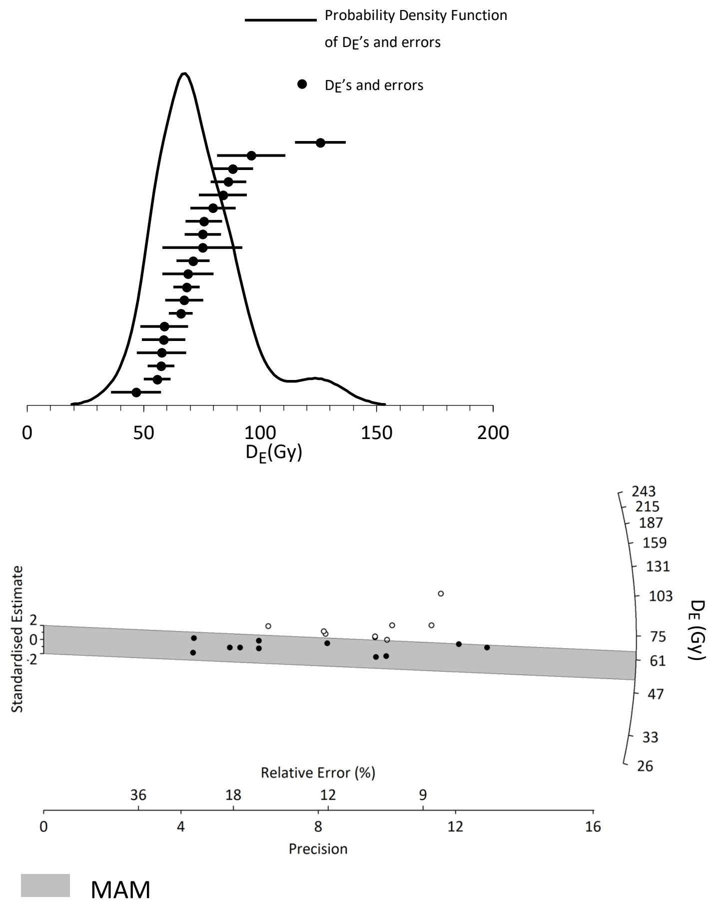

Figure 24. Small aliquot D_E distributions for sample DE-2 (USU-2332).

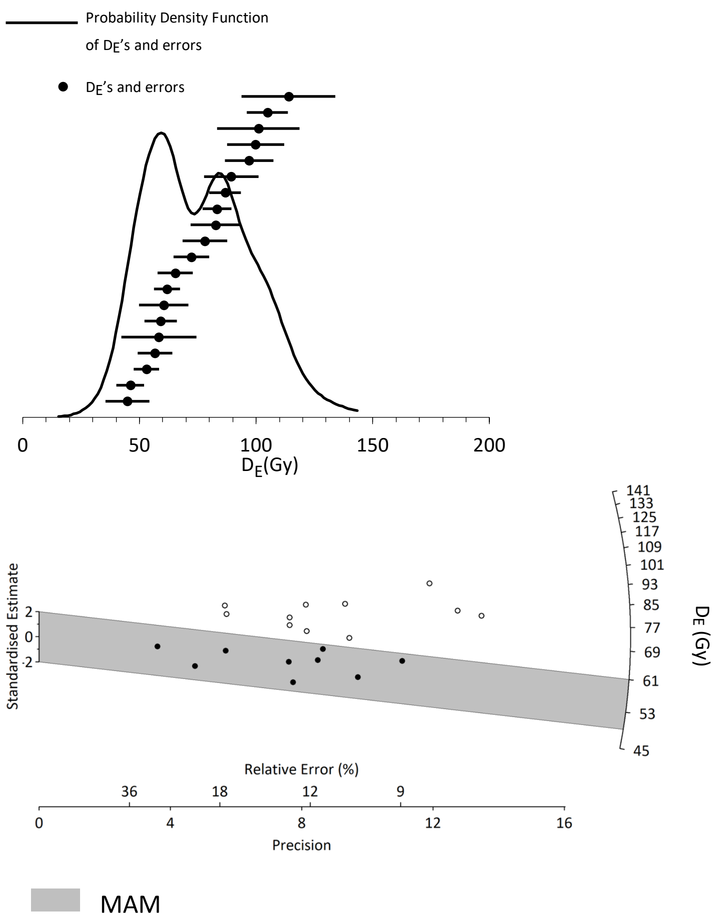

Figure 25. Small aliquot D_E distributions for sample DE-3 (USU-2333).

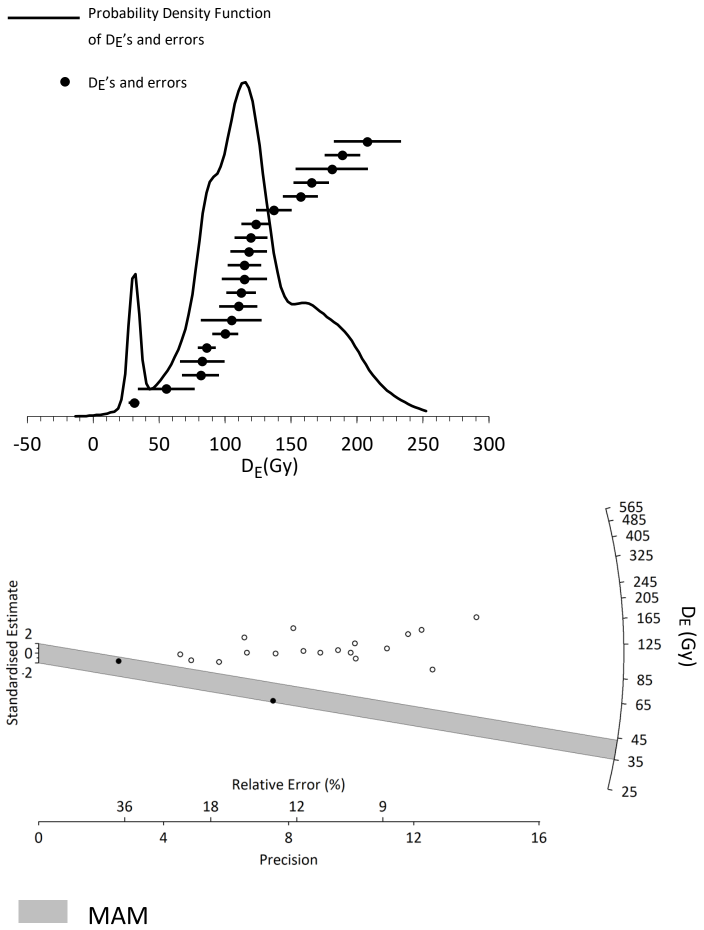

Figure 26. Small aliquot D_E distributions for sample FG-1 (USU-2334).

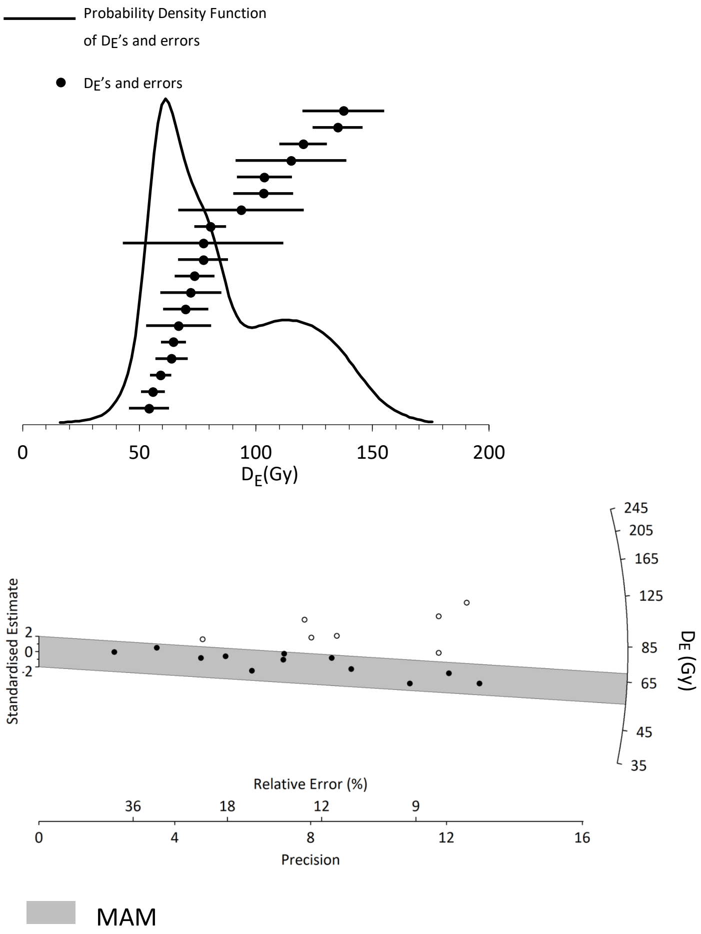

Figure 27. Small aliquot D_E distributions for sample FG-2 (USU-2335).

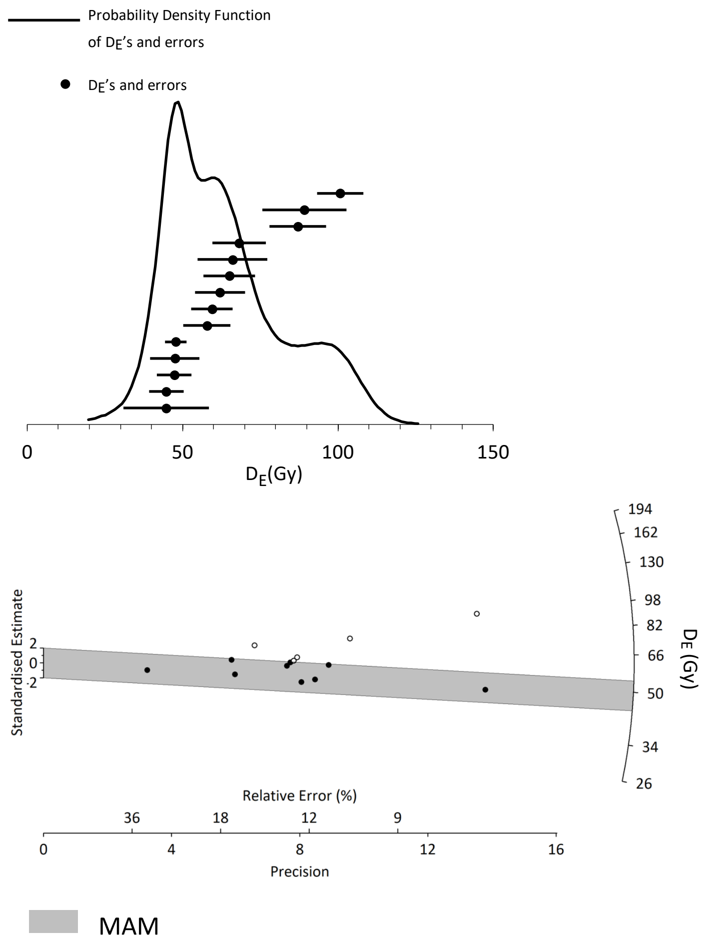

Figure 28. Small aliquot D_E distributions for sample FG-3 (USU-2336).

Single-Grain Equivalent dose (DE) Distributions

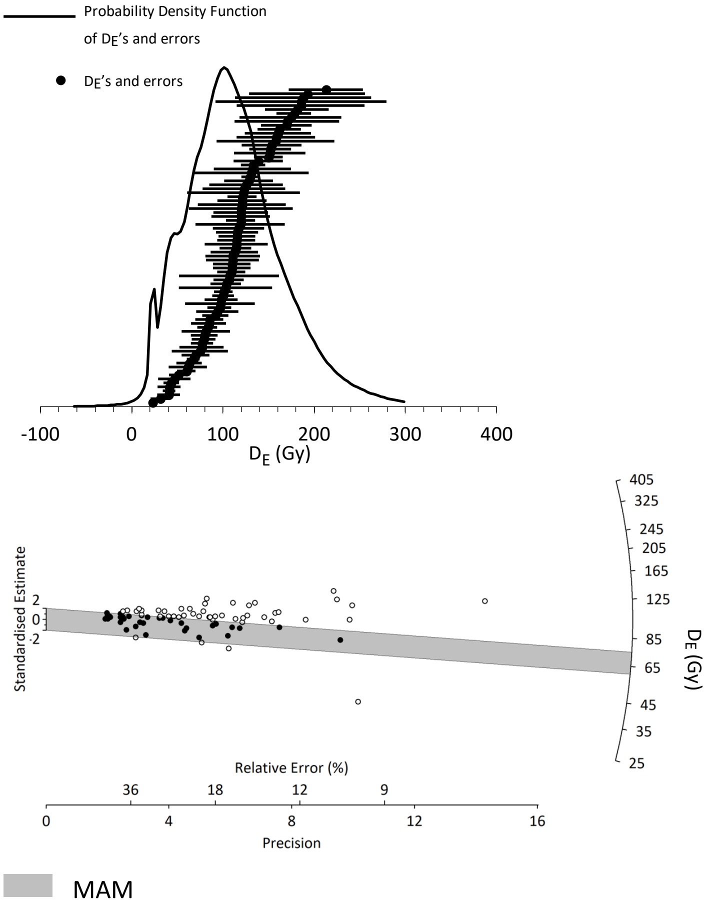

Figure 29. Single-grain D_E distributions for sample AB-1 (USU-2326).

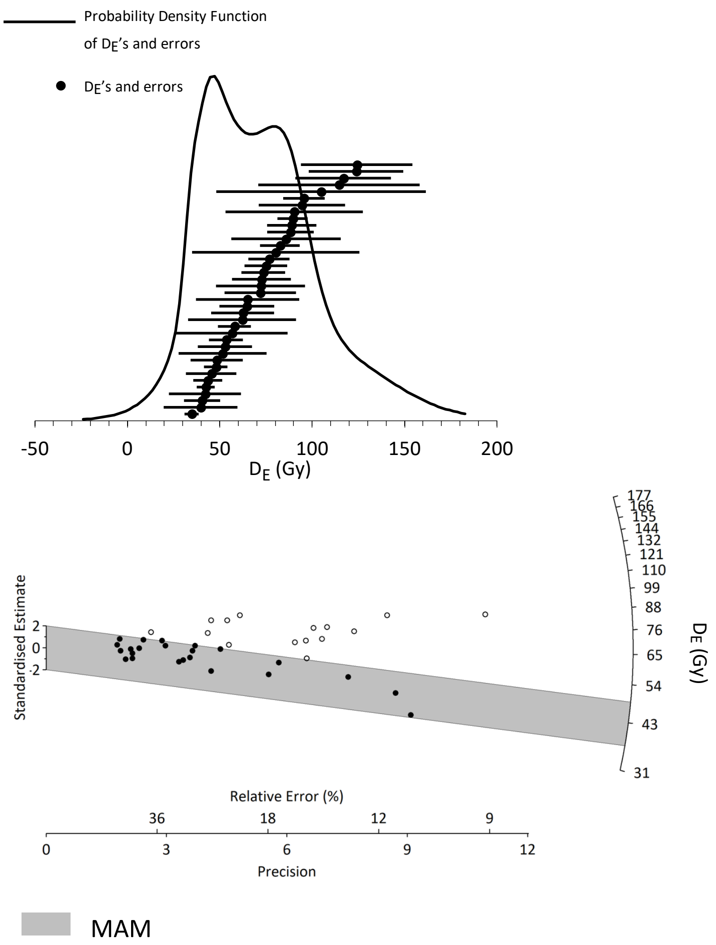

Figure 30. Single-grain D_E distributions for sample AB-2 (USU-2327).

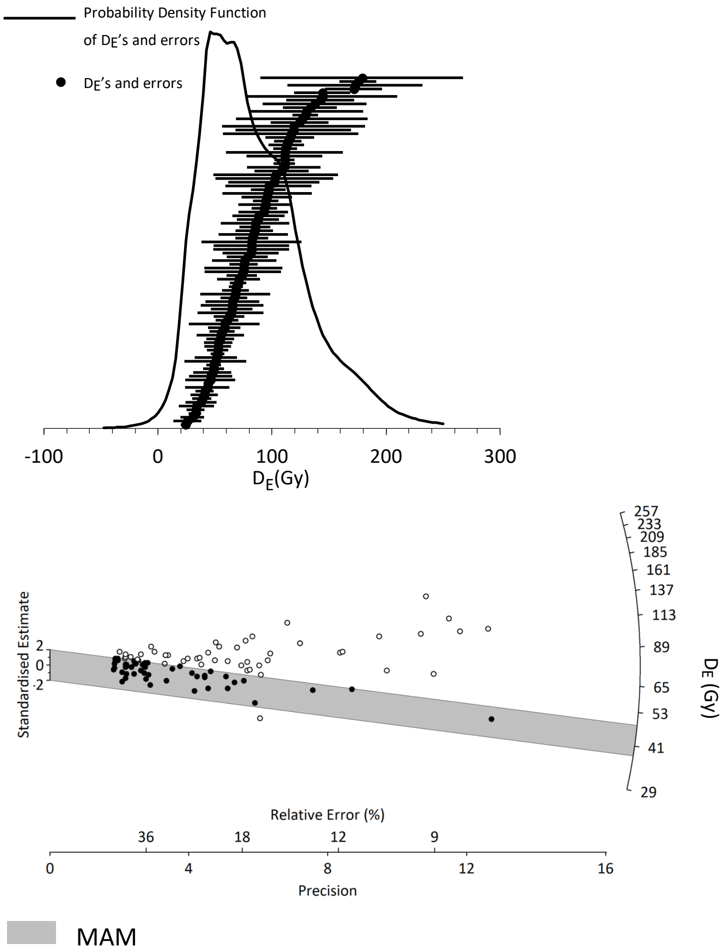

Figure 31. Single-grain D_E distributions for sample AB-3 (USU-2328).

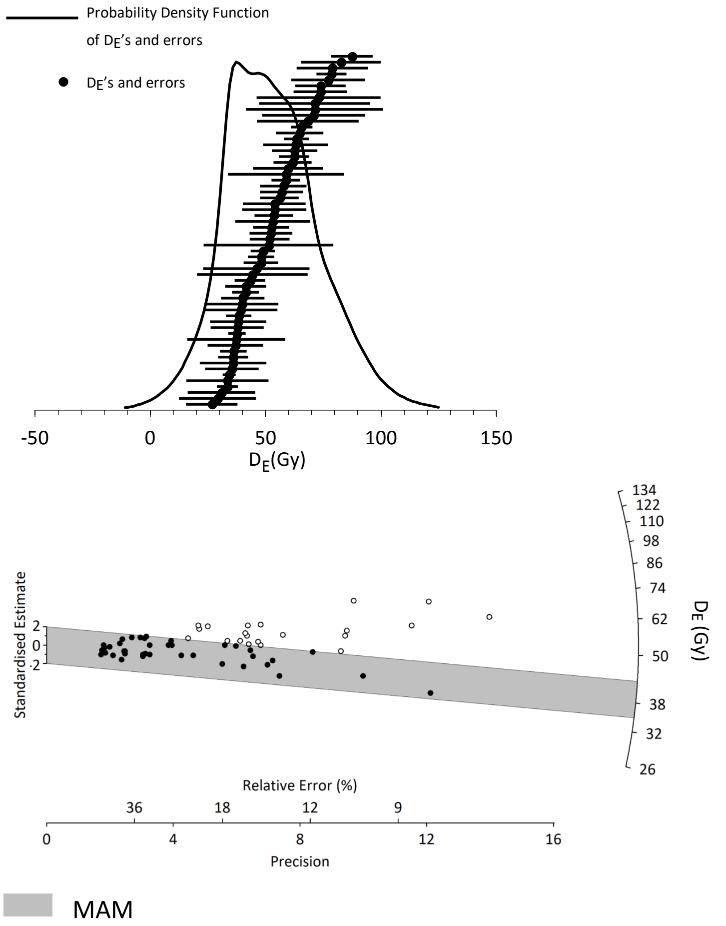

Figure 32. Single-grain D_E distributions for sample AB-4 (USU-2329).

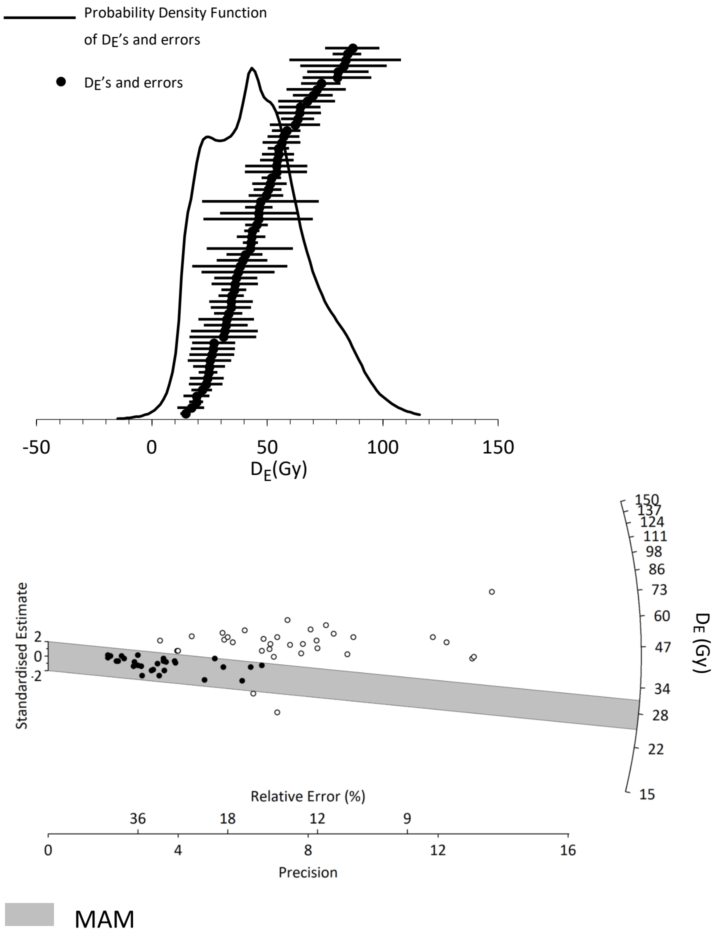

Figure 33. Single-grain D_E distributions for sample AB-5 (USU-2330).

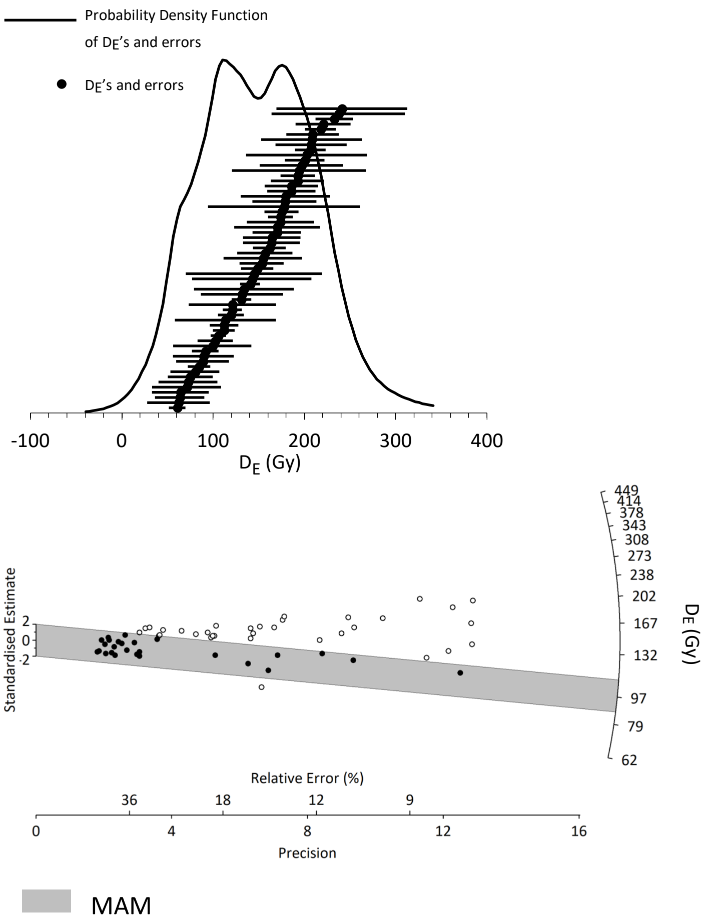

Figure 34. Single-grain D_E distributions for sample DE-1 (USU-2331).

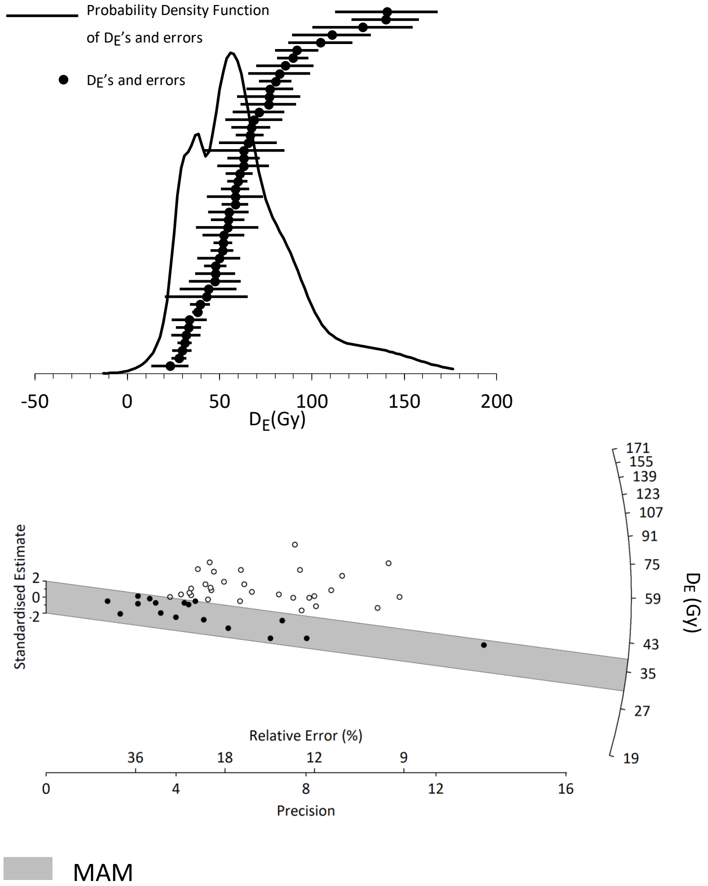

Figure 35. Single-grain D_E distributions for sample DE-2 (USU-2332).

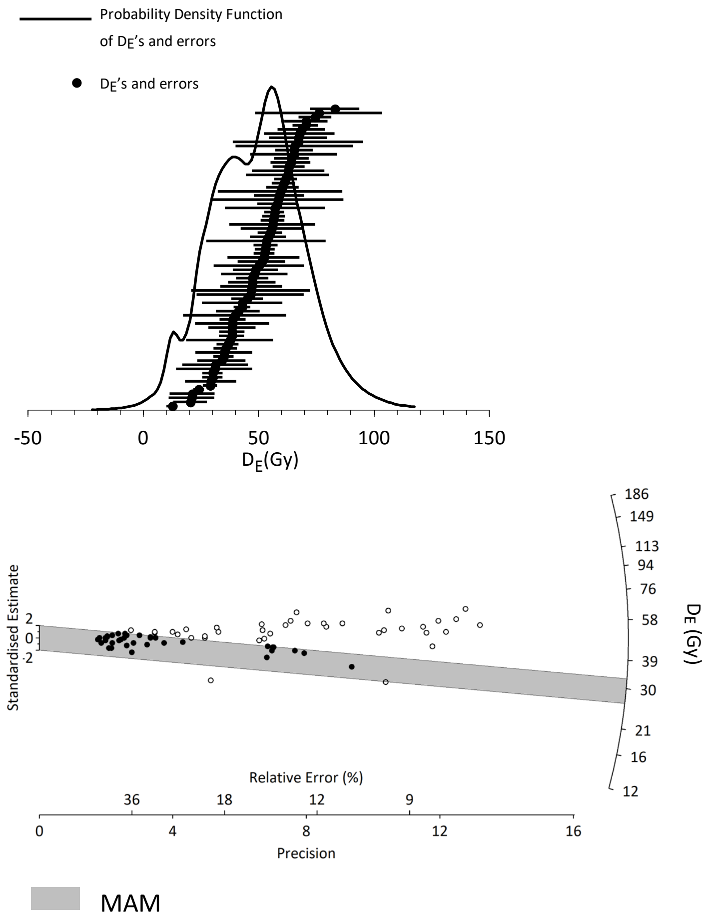

Figure 36. Single-grain D_E distributions for sample DE-3 (USU-2333).

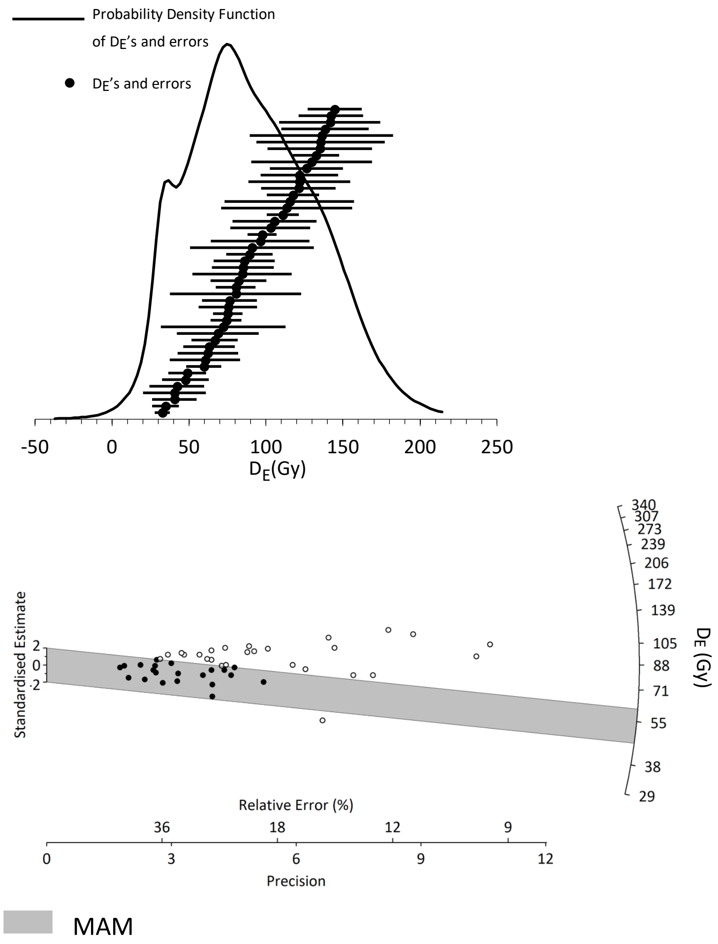

Figure 37. Single-grain D_E distributions for sample FG-1 (USU-2334).

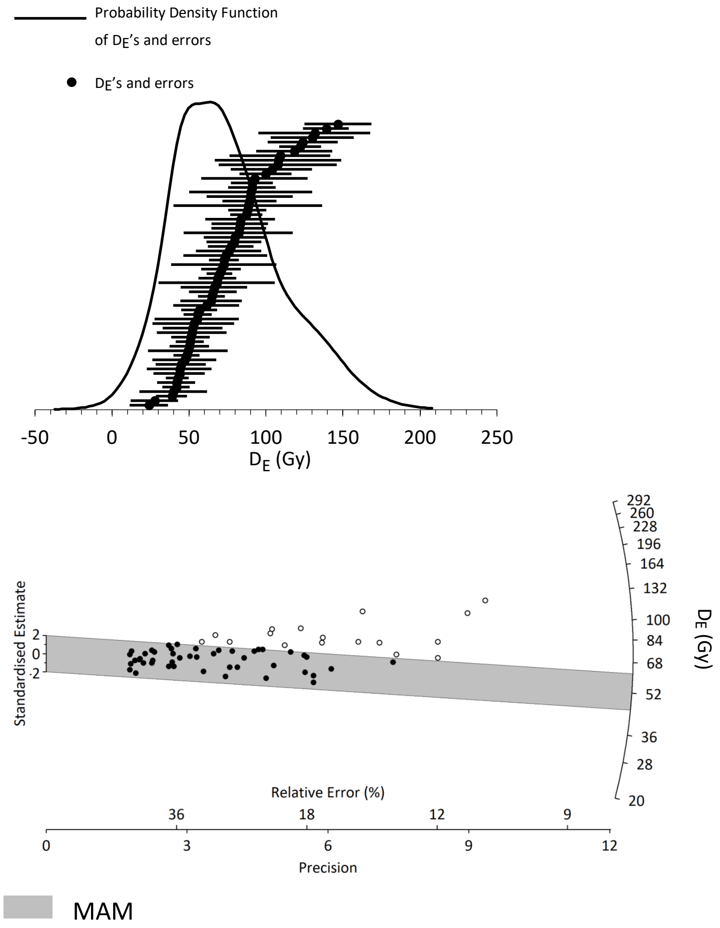

Figure 38. Single-grain D_E distributions for sample FG-2 (USU-2335).

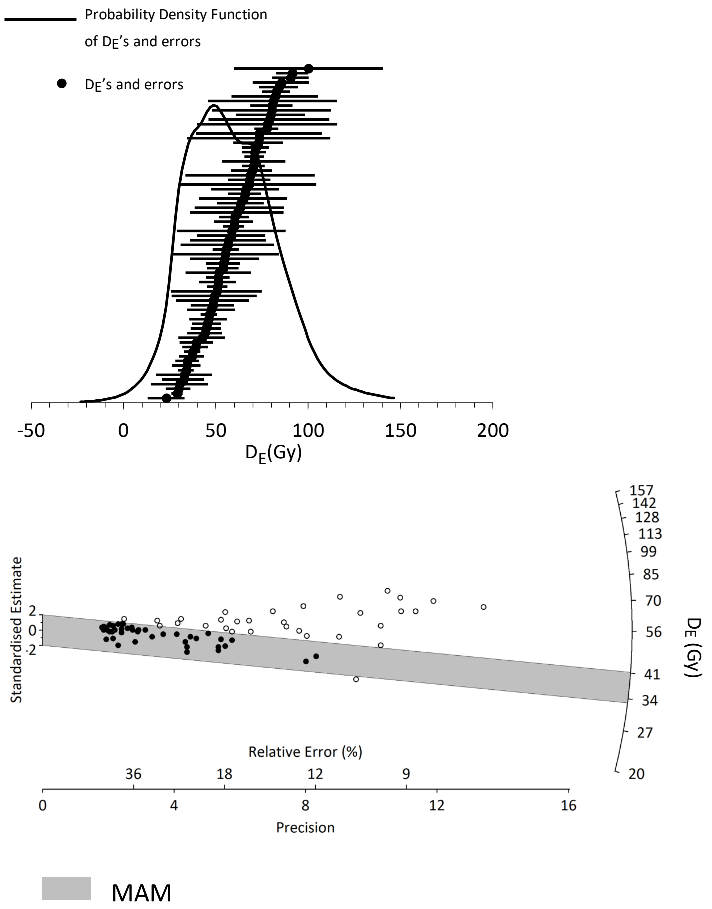

Figure 39. Single-grain D_E distributions for sample FG-3 (USU-2336).

APPENDIX C:

GRANULOMETRY RESULTS

Table 10. Sample Weights and Content of Pebbles, Very Coarse Sand, and Sediment Finer than Very Coarse Sand.

Sample Name	**Total Weight**	**>2mm Weight**	**<2, >1 mm Weight**	**<1mm Weight**	**>2mm Content**	**<2, >1mm Content**	**<1 mm Content**
AB-1	316.40	43.2	6.90	266.30	13.65%	2.18%	84.17%
AB-2	220.90	20.2	4.40	196.30	9.14%	1.99%	88.86%
AB-3	315.10	40.6	7.30	267.20	12.88%	2.32%	84.80%
AB-4	368.70	23.2	3.80	341.70	6.29%	1.03%	92.68%
AB-5	316.30	20.5	4.80	291.00	6.48%	1.52%	92.00%
AB-6	396.80	21.8	8.40	366.60	5.49%	2.12%	92.39%
AB-7	366.60	23.9	6.00	336.70	6.52%	1.64%	91.84%
AB-8	332.30	29.9	9.10	293.30	9.00%	2.74%	88.26%
AB-9	315.60	35.5	6.60	273.50	11.25%	2.09%	86.66%
AB-10	398.40	40.6	8.20	349.60	10.19%	2.06%	87.75%
AB-11	320.80	27.4	10.20	283.20	8.54%	3.18%	88.28%
DE-1	448.00	45.9	8.60	393.50	10.25%	1.92%	87.83%
DE-2	444.00	66.2	3.70	374.10	14.91%	0.83%	84.26%
DE-3	441.30	14.7	2.80	423.80	3.33%	0.63%	96.03%
DE-4	463.70	10.5	2.90	450.30	2.26%	0.63%	97.11%
DE-5	574.50	15.3	6.10	553.10	2.66%	1.06%	96.28%
DE-6	480.80	7.5	3.90	469.40	1.56%	0.81%	97.63%
DE-7	410.30	23.5	1.30	385.50	5.73%	0.32%	93.96%
DE-8	437.70	27.8	1.90	408.00	6.35%	0.43%	93.21%
FG-1	498.00	35.4	5.10	457.50	7.11%	1.02%	91.87%
FG-2	493.10	26.9	2.40	463.80	5.46%	0.49%	94.06%
FG-3	483.20	16.8	4.10	462.30	3.48%	0.85%	95.67%
FG-4	578.20	25	2.40	550.80	4.32%	0.42%	95.26%
FG-5	438.20	15.9	0.90	421.40	3.63%	0.21%	96.17%
FG-6	457.40	11.7	0.70	445.00	2.56%	0.15%	97.29%
FG-7	469.60	26.1	1.90	441.60	5.56%	0.40%	94.04%

Table 11. Device Settings for Granulometry Analysis.

Particle name	Particle refractive index	Particle absorption index	Dispersant name	Dispersant refractive index	Accessory name	Analysis model	Start result channel size	Last result channel size	Result emulation	Result transform type
Dirt	1.56	0.1	Water	1.33	Hydro 2000MU (A)	General purpose	0.1	1000	Off	Volume

Table 12. General Data from Wall AB Granulometry Tests.

Sample Name	Run	Reading	Obscuration	Residual	Concentration	Span	D [4, 3]	Uniformity	Specific surface area	D [3, 2]	d (0.1)	d (0.5)	d (0.9)
AB-1	A	1	7.25	0.549	0.045	1.557	140.336	0.452	0.135	44.39	36.076	133.729	244.231
		2	7.3	0.55	0.0457	1.549	140.406	0.451	0.134	44.782	36.937	133.753	244.13
		3	7.23	0.553	0.045	1.558	140.168	0.452	0.135	44.525	35.817	133.6	243.933
	B	1	7.54	0.519	0.0462	1.561	139.734	0.453	0.137	43.701	35.345	133.278	243.418
		2	7.63	0.513	0.0474	1.558	140.431	0.454	0.135	44.297	36.424	133.735	244.796
		3	7.55	0.523	0.0464	1.557	138.924	0.453	0.137	43.845	35.617	132.465	241.854
	C	1	8.52	0.577	0.0522	1.568	138.775	0.456	0.138	43.47	35.031	132.173	242.304
		2	8.46	0.565	0.0518	1.572	138.783	0.457	0.138	43.475	34.844	132.162	242.558
		3	8.46	0.553	0.0518	1.571	138.568	0.457	0.138	43.51	34.933	131.914	242.18
AB-2	A	1	8.36	0.617	0.061	1.383	142.8	0.428	0.115	52.351	55.782	135.484	243.2
		2	8.34	0.619	0.0586	1.386	141.821	0.428	0.12	49.846	54.857	134.687	241.554
		3	8.37	0.59	0.0611	1.385	142.393	0.428	0.115	52.332	55.533	135.056	242.632
	B	1	7.66	0.665	0.0576	1.354	145.762	0.421	0.111	54.155	59.888	138.218	246.987
		2	7.71	0.665	0.0581	1.358	145.727	0.422	0.111	54.168	59.533	138.155	247.18
		3	7.85	0.671	0.0601	1.351	146.16	0.42	0.109	54.972	60.497	138.476	247.612
	C	1	8.68	0.609	0.0602	1.405	140.931	0.432	0.122	49.083	52.754	133.823	240.798
		2	8.74	0.624	0.0608	1.4	140.714	0.431	0.122	49.261	53.105	133.624	240.21
		3	8.75	0.621	0.0612	1.4	140.869	0.431	0.121	49.444	53.18	133.778	240.446
AB-3	A	1	9.4	0.591	0.0643	1.432	140.92	0.436	0.124	48.213	49.991	133.871	241.752
		2	9.49	0.579	0.0653	1.436	141.337	0.438	0.124	48.458	50.303	134.102	242.815
		3	9.57	0.59	0.0661	1.431	141.281	0.436	0.123	48.643	50.536	134.128	242.415
	B	1	8.2	0.55	0.0574	1.403	143.15	0.431	0.121	49.67	53.783	135.945	244.524
		2	8.16	0.547	0.0567	1.408	142.543	0.432	0.122	49.341	53.013	135.4	243.652
		3	8.23	0.544	0.0579	1.401	142.903	0.431	0.12	49.852	53.919	135.677	244.064
	C	1	8.72	0.505	0.0592	1.452	142.134	0.44	0.125	48.069	48.864	134.909	244.759
		2	8.8	0.531	0.0603	1.438	142.041	0.437	0.124	48.457	49.931	134.908	243.972
		3	8.81	0.518	0.0604	1.439	142.164	0.437	0.124	48.52	49.804	135.048	244.188
AB-4	A	1	9.89	0.46	0.0557	1.612	134.934	0.469	0.154	39.076	31.679	128.161	238.292
		2	10.01	0.451	0.057	1.61	135.363	0.468	0.152	39.42	32.141	128.499	239.009
		3	10.06	0.466	0.0573	1.604	135.066	0.467	0.152	39.446	32.23	128.333	238.138
	B	1	8.91	0.428	0.048	1.647	133.491	0.478	0.16	37.563	28.857	126.838	237.737
		2	8.99	0.438	0.0488	1.645	133.716	0.478	0.159	37.835	29.186	126.97	238.097
		3	8.97	0.418	0.0484	1.656	133.866	0.481	0.159	37.625	28.905	126.927	239.144
	C	1	9.43	0.494	0.0532	1.627	136.846	0.473	0.153	39.227	31.831	129.629	242.686
		2	9.54	0.498	0.0544	1.62	137.138	0.472	0.151	39.655	32.511	129.873	242.9
		3	9.53	0.512	0.0538	1.62	136.075	0.471	0.153	39.273	31.848	129.005	240.891
AB-5	A	1	10.45	0.468	0.0631	1.623	136.045	0.475	0.142	42.36	32.955	128.588	241.66
		2	10.52	0.462	0.0637	1.625	135.922	0.476	0.141	42.498	33.146	128.321	241.644
		3	10.68	0.464	0.0659	1.622	137.135	0.476	0.139	43.206	34.2	129.259	243.827
	B	1	9.75	0.414	0.057	1.649	135.598	0.482	0.146	41.225	30.965	128.138	242.286
		2	9.78	0.41	0.0571	1.649	135.212	0.481	0.146	41.205	30.843	127.794	241.559
		3	9.77	0.418	0.0571	1.658	135.442	0.484	0.146	41.185	30.75	127.764	242.6
	C	1	10.09	0.472	0.0607	1.619	135.602	0.475	0.142	42.296	33.323	128.111	240.731
		2	10.08	0.46	0.0603	1.627	135.062	0.477	0.143	42.035	32.808	127.496	240.238
		3	10.19	0.473	0.0618	1.614	135.597	0.473	0.141	42.625	33.656	128.116	240.473
AB-6	A	1	11.66	0.324	0.0415	1.944	112.165	0.593	0.25	24.013	17.258	103.769	218.957
		2	11.72	0.322	0.042	1.95	112.606	0.594	0.248	24.215	17.407	103.945	220.052
		3	11.79	0.318	0.0427	1.95	113.152	0.594	0.246	24.411	17.536	104.384	221.107

	B	1	11.06	0.324	0.0391	1.953	113.2	0.596	0.25	23.956	17.112	104.621	221.489
		2	11.17	0.313	0.04	1.958	114.026	0.597	0.248	24.236	17.331	105.174	223.266
		3	11.26	0.318	0.0405	1.953	114.001	0.596	0.246	24.376	17.433	105.209	222.938
	C	1	8.84	0.391	0.0307	1.96	113.48	0.597	0.251	23.886	16.83	104.817	222.28
		2	8.89	0.393	0.0311	1.955	112.918	0.595	0.25	24.034	16.932	104.29	220.861
		3	8.91	0.383	0.0312	1.956	112.745	0.595	0.25	24.037	16.899	104.129	220.559
AB-7	A	1	11.41	0.341	0.0424	1.932	112.995	0.589	0.239	25.11	18.331	104.337	219.898
		2	11.45	0.337	0.0428	1.941	113.548	0.592	0.238	25.205	18.378	104.606	221.402
		3	11.57	0.336	0.0436	1.944	113.943	0.592	0.236	25.418	18.548	104.8	222.23
	B	1	9.04	0.318	0.0319	1.973	110.102	0.606	0.249	24.118	17.286	101.013	216.572
		2	9.18	0.313	0.0331	1.955	111.285	0.599	0.243	24.683	17.767	102.355	217.896
		3	9.32	0.307	0.0337	1.961	110.916	0.601	0.242	24.743	17.815	101.774	217.428
	C	1	10.35	0.306	0.0375	1.968	112.416	0.602	0.243	24.646	17.757	103.097	220.697
		2	10.41	0.318	0.038	1.963	112.411	0.6	0.242	24.775	17.829	103.18	220.413
		3	10.46	0.305	0.038	1.975	112.072	0.605	0.243	24.676	17.707	102.615	220.341
AB-8	A	1	11.46	0.182	0.0252	2.727	85.167	0.852	0.405	14.822	8.144	66.9	190.607
		2	11.56	0.178	0.026	2.727	87.714	0.855	0.395	15.191	8.447	68.75	195.96
		3	11.65	0.184	0.0265	2.7	87.588	0.847	0.392	15.322	8.563	69.014	194.929
	B	1	9.27	0.307	0.0221	2.59	94.836	0.813	0.369	16.267	9.388	76.761	208.164
		2	9.45	0.305	0.0229	2.574	95.491	0.807	0.363	16.549	9.613	77.503	209.119
		3	9.62	0.313	0.024	2.532	96.636	0.791	0.353	16.986	9.996	79.385	210.983
	C	1	8.49	0.456	0.0196	2.632	93.5	0.828	0.378	15.887	8.988	75.046	206.536
		2	8.77	0.451	0.021	2.597	95.479	0.814	0.365	16.426	9.441	77.154	209.812
		3	8.94	0.452	0.0219	2.587	97.35	0.814	0.357	16.8	9.758	78.593	213.074
AB-9	A	1	9.12	0.355	0.0258	2.319	97.642	0.716	0.311	19.323	13.179	82.172	203.777
		2	9.46	0.364	0.0276	2.322	99.888	0.719	0.302	19.899	13.766	83.611	207.902
		3	9.79	0.37	0.0293	2.306	101.329	0.716	0.294	20.382	14.257	84.715	209.611
	B	1	10.04	0.352	0.0255	2.444	94.809	0.757	0.346	17.32	10.833	78.362	202.328
		2	10.36	0.364	0.0277	2.411	98.12	0.752	0.33	18.162	11.692	81.045	207.072
		3	10.54	0.363	0.0288	2.411	99.971	0.755	0.323	18.561	12.078	82.198	210.254
	C	1	12.16	0.248	0.031	2.436	93.116	0.752	0.349	17.194	10.769	77.06	198.46
		2	12.36	0.253	0.0324	2.407	94.117	0.744	0.34	17.631	11.185	78.305	199.627
		3	12.48	0.257	0.0331	2.395	94.818	0.744	0.336	17.843	11.379	78.803	200.101
AB-10	A	1	9.68	0.266	0.0253	2.36	94.516	0.728	0.337	17.829	11.768	79.187	198.653
		2	9.96	0.271	0.0271	2.312	95.962	0.714	0.324	18.523	12.542	81.065	200.002
		3	10.24	0.268	0.029	2.317	99.972	0.723	0.311	19.293	13.38	83.495	206.804
	B	1	10.61	0.299	0.0284	2.331	97.239	0.725	0.33	18.195	11.989	81.627	202.291
		2	10.87	0.306	0.03	2.278	97.4	0.705	0.32	18.75	12.614	82.776	201.165
		3	11.05	0.314	0.031	2.278	98.239	0.707	0.315	19.038	12.923	83.201	202.495
	C	1	9.77	0.187	0.0247	2.391	94.336	0.738	0.346	17.328	10.89	78.868	199.487
		2	10.01	0.205	0.0265	2.361	97.311	0.733	0.332	18.09	11.732	81.39	203.859
		3	10.21	0.206	0.0281	2.431	104.358	0.79	0.321	18.708	12.394	83.048	214.263
AB-11	A	1	10.55	0.29	0.0311	2.42	94.516	0.728	0.337	17.829	11.768	79.187	198.653
		2	10.83	0.29	0.0333	2.398	95.962	0.714	0.324	18.523	12.542	81.065	200.002
		3	10.99	0.303	0.0348	2.445	99.972	0.723	0.311	19.293	13.38	83.495	206.804
	B	1	9.32	0.389	0.0269	2.385	97.239	0.725	0.33	18.195	11.989	81.627	202.291
		2	9.53	0.384	0.0285	2.388	97.4	0.705	0.32	18.75	12.614	82.776	201.165
		3	9.83	0.395	0.0307	2.405	98.239	0.707	0.315	19.038	12.923	83.201	202.495
	C	1	10.04	0.362	0.0306	2.385	94.336	0.738	0.346	17.328	10.89	78.868	199.487
		2	10.35	0.364	0.0329	2.387	99.701	0.776	0.3	20.029	14.017	78.807	204.75
		3	10.67	0.367	0.0352	2.434	102.452	0.773	0.288	20.848	14.839	80.991	209.065

Table 13. General Data from Wall DE Granulometry Tests.

Sample Name	Run	Reading	Obscuration	Residual	Concentration	Span	D [4, 3]	Uniformity	Specific surface area	D [3, 2]	d (0.1)	d (0.5)	d (0.9)
DE-1	A	1	7.94	0.824	0.0402	1.573	140.629	0.448	0.168	35.79	32.07	134.667	243.865
		2	8.01	0.813	0.0409	1.569	140.717	0.447	0.166	36.07	32.686	134.665	243.975
		3	8.01	0.809	0.0404	1.58	139.999	0.449	0.168	35.645	31.142	134.07	243.036
	B	1	8.75	0.707	0.0439	1.586	139.918	0.451	0.17	35.335	30.828	133.954	243.25
		2	8.75	0.705	0.0435	1.593	138.889	0.452	0.172	34.92	29.808	133.023	241.765
		3	8.83	0.734	0.0445	1.588	140.001	0.451	0.169	35.436	30.754	134.007	243.494
	C	1	8.53	0.747	0.0416	1.594	137.58	0.451	0.175	34.331	28.66	131.985	239.083
		2	8.6	0.74	0.0422	1.593	137.48	0.451	0.174	34.501	28.937	131.816	238.913
		3	8.62	0.745	0.0422	1.594	137.608	0.451	0.174	34.482	28.798	131.986	239.223
DE-2	A	1	9.23	0.563	0.0462	1.61	133.548	0.457	0.171	35.027	27.419	128.098	233.612
		2	9.26	0.544	0.0461	1.615	133.13	0.459	0.172	34.882	27.072	127.654	233.239
		3	9.3	0.565	0.0465	1.612	133.111	0.458	0.171	35.027	27.217	127.67	233.03
	B	1	9.21	0.563	0.0455	1.618	133.593	0.46	0.173	34.622	26.811	128.167	234.149
		2	9.2	0.55	0.045	1.621	132.466	0.46	0.175	34.244	26.096	127.239	232.407
		3	9.27	0.548	0.0457	1.622	133.041	0.461	0.174	34.53	26.522	127.64	233.542
	C	1	9.01	0.547	0.0447	1.613	134.271	0.458	0.172	34.833	27.047	128.795	234.843

		2	9.17	0.54	0.0463	1.609	134.824	0.457	0.17	35.372	27.89	129.135	235.68
		3	9.2	0.54	0.0462	1.611	134.135	0.458	0.17	35.199	27.657	128.45	234.621
DE-3	A	1	8.61	0.546	0.0367	1.644	130.949	0.463	0.199	30.079	23.408	125.99	230.503
		2	8.6	0.534	0.0365	1.652	130.967	0.466	0.2	29.939	23.171	125.884	231.104
		3	8.66	0.534	0.037	1.647	131.068	0.464	0.199	30.13	23.316	126.045	230.965
	B	1	8.07	0.561	0.0367	1.611	136.664	0.452	0.186	32.234	26.917	130.979	237.947
		2	8.1	0.569	0.0372	1.607	137.262	0.452	0.184	32.524	27.365	131.551	238.824
		3	8.09	0.566	0.037	1.616	137.508	0.454	0.185	32.381	26.888	131.729	239.756
	C	1	8.67	0.581	0.039	1.623	136.19	0.455	0.189	31.754	25.846	130.534	237.7
		2	8.71	0.584	0.0395	1.617	136.319	0.453	0.188	31.99	26.194	130.707	237.562
		3	8.73	0.585	0.0397	1.621	136.718	0.455	0.187	32.065	26.237	130.992	238.559
DE-4	A	1	9.48	0.824	0.0367	1.706	127.104	0.484	0.221	27.182	19.97	122.136	228.346
		2	9.52	0.826	0.037	1.708	127.194	0.485	0.22	27.281	20.035	122.119	228.668
		3	9.53	0.824	0.037	1.706	126.672	0.484	0.221	27.196	19.882	121.784	227.666
	B	1	9.3	0.962	0.0369	1.698	129.369	0.482	0.215	27.903	20.754	124.159	231.629
		2	9.29	0.967	0.0367	1.702	129.024	0.483	0.216	27.718	20.464	123.911	231.309
		3	9.32	0.961	0.0368	1.709	129.518	0.486	0.216	27.756	20.472	124.194	232.684
	C	1	9	0.886	0.0357	1.708	130.41	0.486	0.215	27.888	20.764	124.983	234.191
		2	8.98	0.88	0.0354	1.71	129.832	0.486	0.216	27.759	20.555	124.464	233.343
		3	9	0.88	0.0353	1.713	129.438	0.488	0.217	27.624	20.332	124.099	232.91
DE-5	A	1	9.53	0.726	0.0282	1.91	112.237	0.572	0.295	20.363	13.866	106.058	216.41
		2	9.57	0.723	0.0281	1.912	111.26	0.573	0.297	20.234	13.68	105.152	214.729
		3	9.58	0.718	0.0282	1.919	111.772	0.576	0.296	20.267	13.701	105.447	216.08
	B	1	10.57	0.755	0.0319	1.9	113.705	0.569	0.291	20.654	14.206	107.513	218.452
		2	10.58	0.748	0.0316	1.9	112.545	0.569	0.293	20.46	13.967	106.542	216.442
		3	10.56	0.742	0.0314	1.906	112.424	0.571	0.295	20.353	13.826	106.378	216.575
	C	1	10.35	0.677	0.0306	1.908	111.768	0.571	0.296	20.244	13.826	105.667	215.432
		2	10.38	0.676	0.0307	1.915	111.644	0.574	0.296	20.238	13.774	105.359	215.564
		3	10.4	0.668	0.0308	1.912	111.781	0.573	0.296	20.284	13.831	105.581	215.701
DE-6	A	1	9.58	0.722	0.0283	1.893	110.015	0.566	0.295	20.343	14.323	104.165	211.496
		2	9.64	0.731	0.0288	1.885	110.325	0.563	0.292	20.531	14.471	104.557	211.607
		3	9.63	0.73	0.0284	1.902	109.925	0.57	0.296	20.28	14.151	103.91	211.796
	B	1	11.08	0.687	0.0342	1.892	114.157	0.565	0.285	21.044	15.081	107.601	218.66
		2	11.11	0.697	0.0344	1.888	114.211	0.564	0.284	21.107	15.112	107.752	218.553
		3	11.1	0.684	0.034	1.887	112.881	0.563	0.288	20.866	14.813	106.657	216.11
	C	1	11.83	0.724	0.0361	1.896	112.72	0.568	0.29	20.673	14.88	106.353	216.48
		2	11.89	0.731	0.0362	1.897	112.127	0.568	0.291	20.645	14.802	105.789	215.434
		3	11.95	0.734	0.0367	1.892	112.896	0.567	0.288	20.818	14.922	106.601	216.581
DE-7	A	1	9.96	0.455	0.0179	2.667	85.97	0.84	0.487	12.331	5.484	70.039	192.261
		2	10.01	0.45	0.0181	2.674	86.732	0.842	0.484	12.408	5.525	70.576	194.238
		3	10.01	0.44	0.0177	2.687	83.925	0.846	0.494	12.156	5.369	68.109	188.382
	B	1	11.55	0.447	0.0209	2.723	87.086	0.858	0.489	12.281	5.462	69.978	196.021
		2	11.56	0.446	0.0207	2.729	85.564	0.859	0.493	12.174	5.394	68.677	192.821
		3	11.58	0.447	0.0209	2.752	87.221	0.869	0.489	12.267	5.452	69.499	196.7
	C	1	9.83	0.464	0.0174	2.71	86.693	0.856	0.493	12.182	5.361	70.021	195.132
		2	9.82	0.466	0.0174	2.777	87.841	0.879	0.493	12.182	5.36	69.658	198.778
		3	9.83	0.473	0.0175	2.736	87.457	0.864	0.49	12.248	5.401	70.199	197.44
DE-8	A	1	8.7	0.417	0.0159	2.598	88.037	0.819	0.475	12.624	5.651	73.015	195.336
		2	8.73	0.416	0.0161	2.592	89.387	0.817	0.47	12.778	5.749	74.231	198.173
		3	8.72	0.405	0.016	2.616	88.611	0.825	0.473	12.684	5.686	73.159	197.081
	B	1	9.73	0.362	0.0178	2.674	90.179	0.846	0.478	12.549	5.574	73.358	201.728
		2	9.74	0.364	0.0177	2.657	89.357	0.839	0.479	12.525	5.552	73.161	199.968
		3	9.76	0.367	0.0179	2.695	90.44	0.85	0.476	12.594	5.594	73.331	203.242
	C	1	10.16	0.384	0.0178	2.682	89.191	0.85	0.497	12.063	5.165	72.884	200.654
		2	10.15	0.382	0.0179	2.719	90.753	0.861	0.494	12.136	5.207	73.487	205.004
		3	10.15	0.381	0.0178	2.683	88.921	0.851	0.498	12.049	5.154	72.657	200.072

Table 14. General Data from Wall FG Granulometry Tests.

Sample Name	Run	Reading	Obscuration	Residual	Concentration	Span	D [4, 3]	Uniformity	Specific surface area	D [3, 2]	d (0.1)	d (0.5)	d (0.9)
FG-1	A	1	7.84	0.665	0.0277	1.747	126.183	0.498	0.24	25.037	16.804	121.754	229.555
		2	7.84	0.659	0.0274	1.755	125.645	0.501	0.242	24.821	16.554	121.146	229.125
		3	7.84	0.642	0.0273	1.76	125.316	0.503	0.243	24.691	16.347	120.743	228.886
	B	1	8.51	0.611	0.029	1.759	123.701	0.504	0.253	23.757	16.106	119.361	226.004
		2	8.5	0.587	0.0289	1.761	123.451	0.505	0.254	23.656	15.978	119.142	225.737
		3	8.52	0.584	0.0289	1.761	123.573	0.505	0.254	23.668	15.939	119.292	226.017
	C	1	8.19	0.756	0.028	1.759	124.517	0.503	0.251	23.906	16.204	120.003	227.238
		2	8.24	0.763	0.0284	1.756	124.853	0.501	0.249	24.102	16.368	120.297	227.574
		3	8.25	0.754	0.0283	1.761	124.446	0.503	0.25	23.978	16.207	119.837	227.227
FG-2	A	1	7.72	0.565	0.0232	1.835	119.026	0.538	0.285	21.075	12.912	114.664	223.328
		2	7.71	0.556	0.0231	1.842	119.183	0.541	0.286	20.997	12.784	114.711	224.092

		3	7.73	0.556	0.0232	1.839	119.015	0.54	0.285	21.029	12.812	114.593	223.576
	B	1	8.87	0.559	0.0269	1.839	119.299	0.538	0.284	21.108	12.991	114.648	223.87
		2	8.92	0.567	0.0272	1.83	119.305	0.535	0.283	21.226	13.107	114.875	223.316
		3	8.92	0.563	0.0271	1.833	118.781	0.537	0.284	21.121	12.988	114.328	222.597
	C	1	8.1	0.612	0.0247	1.831	121.015	0.534	0.281	21.331	13.131	116.447	226.331
		2	8.06	0.609	0.0243	1.836	120.353	0.536	0.284	21.112	12.884	115.81	225.527
		3	8.06	0.601	0.0241	1.846	119.976	0.54	0.286	20.969	12.701	115.249	225.484
FG-3	A	1	7.96	0.552	0.0254	1.78	121.437	0.512	0.269	22.319	14.472	117.29	223.266
		2	7.99	0.538	0.0256	1.787	122.282	0.514	0.267	22.446	14.569	117.83	225.148
		3	7.97	0.539	0.0252	1.789	121.28	0.516	0.271	22.133	14.183	117.06	223.589
	B	1	8.84	0.562	0.0286	1.782	122.347	0.513	0.266	22.561	14.829	117.946	225.046
		2	8.82	0.541	0.0283	1.786	121.414	0.514	0.268	22.351	14.574	117.029	223.602
		3	8.84	0.545	0.0284	1.784	121.549	0.514	0.268	22.363	14.517	117.277	223.705
	C	1	8.88	0.618	0.0286	1.785	120.977	0.515	0.267	22.457	14.738	116.572	222.833
		2	8.89	0.621	0.0287	1.784	120.887	0.514	0.267	22.46	14.669	116.508	222.575
		3	8.92	0.622	0.0289	1.786	121.487	0.515	0.266	22.572	14.758	117.014	223.745
FG-4	A	1	9.43	0.487	0.0269	1.88	114.651	0.556	0.303	19.802	11.917	109.781	218.275
		2	9.43	0.51	0.0271	1.875	114.824	0.554	0.301	19.91	12.033	109.997	218.3
		3	9.44	0.5	0.0271	1.882	115.137	0.556	0.301	19.92	12.022	110.099	219.246
	B	1	8.9	0.606	0.0254	1.873	114.065	0.554	0.303	19.803	11.975	109.437	216.907
		2	8.93	0.599	0.0258	1.876	115.397	0.555	0.299	20.048	12.216	110.46	219.422
		3	8.91	0.598	0.0255	1.876	114.585	0.555	0.302	19.888	11.993	109.828	218.042
	C	1	9.21	0.51	0.0265	1.873	115.361	0.554	0.301	19.956	12.079	110.621	219.243
		2	9.17	0.513	0.026	1.878	114.406	0.556	0.305	19.672	11.743	109.789	217.969
		3	9.21	0.508	0.0264	1.876	115.275	0.555	0.301	19.901	11.976	110.534	219.309
FG-5	A	1	10.79	0.437	0.0244	2.131	102.32	0.66	0.387	15.486	7.692	94.771	209.618
		2	10.8	0.434	0.0244	2.131	101.882	0.66	0.388	15.469	7.665	94.363	208.717
		3	10.79	0.433	0.0242	2.143	101.534	0.664	0.39	15.369	7.566	93.802	208.627
	B	1	11.65	0.389	0.0265	2.12	102.905	0.655	0.386	15.536	7.727	95.49	210.122
		2	11.67	0.389	0.0267	2.116	103.073	0.653	0.384	15.607	7.791	95.687	210.242
		3	11.67	0.392	0.0268	2.116	103.734	0.654	0.383	15.668	7.828	96.303	211.601
	C	1	9.89	0.377	0.022	2.147	102.234	0.666	0.39	15.371	7.513	94.445	210.28
		2	9.89	0.375	0.022	2.16	102.306	0.671	0.391	15.347	7.49	94.198	210.938
		3	9.9	0.383	0.022	2.148	102.165	0.667	0.391	15.343	7.475	94.416	210.298
FG-6	A	1	10.52	0.448	0.0252	2.164	98.489	0.669	0.366	16.386	9.238	89.45	202.774
		2	10.51	0.44	0.0251	2.175	98.221	0.673	0.368	16.315	9.154	88.994	202.685
		3	10.54	0.44	0.0253	2.177	99.228	0.673	0.365	16.431	9.259	89.819	204.784
	B	1	9.84	0.339	0.0233	2.18	98.661	0.675	0.368	16.282	9.031	89.324	203.758
		2	9.82	0.35	0.0231	2.178	97.56	0.675	0.371	16.155	8.902	88.475	201.602
		3	9.84	0.338	0.0232	2.176	97.608	0.674	0.371	16.177	8.921	88.549	201.601
	C	1	9.71	0.439	0.0233	2.148	98.238	0.663	0.364	16.48	9.295	89.515	201.559
		2	9.72	0.427	0.0233	2.159	98.159	0.667	0.365	16.451	9.241	89.224	201.917
		3	9.72	0.423	0.0232	2.159	97.587	0.668	0.366	16.381	9.165	88.728	200.717
FG-7	A	1	11.25	0.326	0.0219	2.602	90.716	0.82	0.453	13.249	6.265	74.879	201.065
		2	11.3	0.334	0.0223	2.585	91.63	0.816	0.448	13.403	6.376	75.779	202.265
		3	11.3	0.329	0.0221	2.574	90.211	0.811	0.451	13.309	6.308	74.938	199.232
	B	1	10.39	0.367	0.0203	2.55	89.89	0.803	0.449	13.355	6.339	75.135	197.97
		2	10.38	0.354	0.02	2.58	88.519	0.812	0.454	13.202	6.228	73.453	195.707
		3	10.38	0.358	0.0201	2.57	89.229	0.81	0.452	13.271	6.267	74.236	197.079
	C	1	9.76	0.368	0.0188	2.568	88.677	0.81	0.453	13.244	6.256	73.795	195.781
		2	9.74	0.36	0.0188	2.612	89.64	0.823	0.452	13.267	6.268	73.748	198.92
		3	9.75	0.366	0.0189	2.617	90.476	0.827	0.45	13.332	6.315	74.206	200.536

Table 15. Granulometry Averages and Standard Deviations.

	Mean			Standard Deviation			Corrected Percentage		
Sample Name	d (0.1)	d (0.5)	d (0.9)	d (0.1)	d (0.5)	d (0.9)	d (0.1)	d (0.5)	d (0.9)
AB-1	35.67	132.98	243.27	0.716105	0.784514	1.065742	30.02131	111.9224	204.7473
AB-2	56.13	135.70	243.40	3.08468	2.033718	3.05381	49.87517	120.5882	216.2962
AB-3	51.13	134.89	243.57	1.904838	0.729558	1.02025	43.35501	114.3826	206.5447
AB-4	31.02	128.25	239.65	1.550675	1.149187	2.005875	28.74922	118.8567	222.1049
AB-5	32.52	128.18	241.67	1.312673	0.518531	1.133316	29.91534	117.9238	222.3382
AB-6	17.19	104.48	221.28	0.259133	0.513171	1.385933	15.88456	96.52999	204.4375
AB-7	17.94	103.09	219.65	0.40118	1.303698	1.918042	16.47252	94.67858	201.738
AB-8	9.15	74.35	204.35	0.644022	4.780045	8.216022	8.074944	65.61968	180.37
AB-9	12.13	80.70	204.35	1.298413	2.673349	4.50043	10.50882	69.93209	177.0887
AB-10	12.25	81.63	203.22	0.740495	1.704553	4.82132	10.74774	71.62988	178.3314

AB-11	14.93	81.04	209.87	0.794459	2.200056	7.191706	13.18167	71.54027	185.2746
DE-1	30.41	133.35	241.84	1.455929	1.170594	2.174729	26.70989	117.13	212.424
DE-2	27.08	128.09	233.90	0.556309	0.614174	1.016945	22.81776	107.928	197.0787
DE-3	25.48	129.38	235.88	1.700183	2.581554	3.826897	24.47192	124.2484	226.526
DE-4	20.36	123.54	231.19	0.329168	1.186961	2.395464	19.77034	119.9688	224.513
DE-5	13.85	105.97	216.15	0.157714	0.745086	1.043864	13.33698	102.0191	208.1022
DE-6	14.73	105.93	215.19	0.336992	1.430482	2.869197	14.37912	103.42	210.0885
DE-7	5.42	69.64	194.64	0.059729	0.782521	3.155321	5.095319	65.43029	182.8766
DE-8	5.48	73.25	200.14	0.237452	0.446328	3.008447	5.109399	68.28306	186.5594
FG-1	16.28	120.18	227.48	0.2763	0.896297	1.435126	14.9547	110.4017	208.9845
FG-2	12.92	115.04	224.24	0.145145	0.684959	1.253031	12.15543	108.2007	210.9116
FG-3	14.59	117.17	223.72	0.193355	0.48936	0.875586	13.95883	112.1016	214.0465
FG-4	1.01	25.59	284.23	0.041325	6.245507	30.7734	0.958327	24.37966	270.7581
FG-5	7.64	94.83	210.05	0.132455	0.816791	0.957799	7.345704	91.19488	201.9962
FG-6	9.13	89.12	202.38	0.147891	0.463352	1.264536	8.88638	86.70376	196.891
FG-7	6.29	74.46	198.73	0.046594	0.764628	2.30859	5.916211	70.02334	186.8791

Table 16. Wall AB, Clay Sizes.

Sample Name	Run	Reading	0.549541	0.630957	0.724436	0.831764	0.954993	1.096478	1.258925	1.44544	1.659587	1.905461	2.187762	2.511886	2.884031	3.311311	3.801894
AB-1	A	1	0	0	0.041836	0.075274	0.08252	0.084303	0.087601	0.090065	0.096192	0.107061	0.122908	0.14275	0.164576	0.18569	0.203416
		2	0	0	0.041089	0.074081	0.081346	0.083264	0.086577	0.089012	0.094954	0.105478	0.120856	0.140181	0.161533	0.182286	0.199788
		3	0	0	0.041356	0.07448	0.081699	0.083499	0.086782	0.089249	0.095336	0.106099	0.121769	0.141403	0.163057	0.184093	0.201847
	B	1	0	0	0.044745	0.080253	0.087698	0.089045	0.091892	0.09352	0.098739	0.108667	0.123652	0.142831	0.164369	0.185716	0.204209
		2	0	0	0.043558	0.078253	0.085628	0.08709	0.089959	0.091631	0.096765	0.10645	0.121026	0.139667	0.16061	0.181404	0.199484
		3	0	0	0.04457	0.079916	0.08726	0.088386	0.090989	0.092356	0.097324	0.106997	0.121701	0.140549	0.161717	0.18271	0.200951
	C	1	0	0	0.045353	0.08106	0.088368	0.089573	0.092484	0.094242	0.099668	0.10976	0.124712	0.143504	0.164222	0.184392	0.201575
		2	0	0	0.045159	0.080799	0.088143	0.08938	0.09228	0.094024	0.099408	0.109425	0.124273	0.142968	0.163663	0.18395	0.201427
		3	0	0	0.04507	0.080644	0.087977	0.089205	0.092075	0.093766	0.099067	0.108979	0.123712	0.142295	0.162882	0.18305	0.200389
	Average		0.00	0.00	0.04	0.08	0.09	0.09	0.09	0.09	0.10	0.11	0.12	0.14	0.16	0.18	0.20
	Standard Deviation		0	0	0.001745	0.002901	0.002952	0.002662	0.00245	0.002093	0.001795	0.001571	0.001438	0.001386	0.001405	0.001475	0.001567
	Corrected Percentage		0.00	0.00	0.04	0.07	0.07	0.07	0.08	0.08	0.08	0.09	0.10	0.12	0.14	0.15	0.17
AB-2	A	1	0	0	0	0.036552	0.073582	0.07556	0.074628	0.078517	0.082739	0.091377	0.104071	0.12015	0.137773	0.15447	0.167803
		2	0	0	0.035995	0.065102	0.071676	0.073567	0.076408	0.078242	0.082929	0.091538	0.104401	0.120669	0.138463	0.155275	0.168642
		3	0	0	0	0.036414	0.073264	0.075167	0.074108	0.077881	0.082028	0.090671	0.103468	0.11974	0.137596	0.154495	0.167922
	B	1	0	0	0	0.034009	0.068956	0.071379	0.071245	0.075405	0.079836	0.088247	0.100329	0.11552	0.132188	0.148074	0.160879

		2	0	0	0	0.033595	0.068222	0.070748	0.070805	0.075065	0.079597	0.088051	0.10013	0.115275	0.131865	0.147672	0.160447
		3	0	0	0	0.032825	0.066695	0.069188	0.069198	0.073237	0.077487	0.085568	0.097264	0.112086	0.128458	0.144158	0.156907
	C	1	0	0	0.037613	0.067749	0.074359	0.076048	0.078787	0.080372	0.084793	0.09309	0.105611	0.121538	0.139058	0.155712	0.169034
		2	0	0	0.037099	0.06691	0.073523	0.075314	0.078099	0.079738	0.084164	0.092428	0.10489	0.120743	0.138173	0.154723	0.167939
		3	0	0	0.03675	0.066291	0.07285	0.074636	0.077409	0.079058	0.083487	0.091743	0.104188	0.120026	0.137456	0.154035	0.167324
	Average		0.00	0.00	0.02	0.05	0.07	0.07	0.07	0.08	0.08	0.09	0.10	0.12	0.14	0.15	0.17
	Standard Deviation		0	0	0.019434	0.016835	0.002781	0.002469	0.003463	0.002395	0.002419	0.002472	0.002798	0.003277	0.003799	0.004242	0.004511
	Corrected Percentage		0.00	0.00	0.01	0.04	0.06	0.07	0.07	0.07	0.07	0.08	0.09	0.11	0.12	0.14	0.15
AB-3	A	1	0	0	0.039079	0.070036	0.076587	0.078049	0.080775	0.082328	0.086824	0.095251	0.107928	0.12403	0.141786	0.158795	0.172624
		2	0	0	0.038836	0.06952	0.07595	0.077304	0.079946	0.081427	0.085852	0.094202	0.106794	0.122804	0.140465	0.157385	0.171148
		3	0	0	0.038323	0.068663	0.075079	0.076524	0.079219	0.080774	0.085234	0.093588	0.106167	0.122172	0.13985	0.156812	0.170633
	B	1	0	0	0.036442	0.065909	0.072594	0.074616	0.077585	0.079457	0.084023	0.092268	0.10452	0.120049	0.137229	0.153835	0.167592
		2	0	0	0.036791	0.066477	0.073148	0.075069	0.078002	0.079871	0.084522	0.092922	0.105361	0.121067	0.138385	0.155084	0.1689
		3	0	0	0.036181	0.065415	0.072014	0.073938	0.076828	0.078653	0.083195	0.091414	0.103604	0.119004	0.13598	0.152323	0.165801
	C	1	0	0	0.038837	0.069839	0.076556	0.078195	0.081	0.082634	0.087173	0.095606	0.10825	0.124327	0.142166	0.159506	0.174059
		2	0	0	0.038002	0.068604	0.07545	0.077399	0.08035	0.08209	0.08656	0.094755	0.107031	0.122682	0.140112	0.157116	0.171435
		3	0	0	0.038023	0.068506	0.075209	0.07695	0.079744	0.081342	0.085731	0.093923	0.106287	0.122116	0.139798	0.1571	0.171724
	Average		0.00	0.00	0.04	0.07	0.07	0.08	0.08	0.08	0.09	0.09	0.11	0.12	0.14	0.16	0.17
	Standard Deviation		0	0	0.001097	0.001738	0.001717	0.001544	0.00148	0.001375	0.00134	0.001383	0.001521	0.001744	0.00202	0.002303	0.002575
	Corrected Percentage		0.00	0.00	0.03	0.06	0.06	0.06	0.07	0.07	0.07	0.08	0.09	0.10	0.12	0.13	0.14
AB-4	A	1	0	0.046136	0.079063	0.093324	0.100275	0.103635	0.103651	0.104591	0.108968	0.118449	0.132909	0.151177	0.171302	0.190901	0.207712
		2	0	0.045209	0.077601	0.091705	0.098702	0.102153	0.102335	0.103403	0.107814	0.117195	0.131426	0.149375	0.169147	0.188437	0.205027
		3	0	0.045163	0.07751	0.091589	0.098562	0.101988	0.102136	0.103158	0.107519	0.116857	0.131068	0.149028	0.168844	0.188195	0.204876
	B	1	0	0.048221	0.083016	0.098162	0.105509	0.108897	0.108726	0.109505	0.113941	0.123816	0.139038	0.158435	0.180021	0.201333	0.219994
		2	0	0.047444	0.081783	0.096775	0.104098	0.107494	0.107392	0.108233	0.112692	0.122534	0.137671	0.156954	0.178418	0.199614	0.218174
		3	0	0.048129	0.082737	0.097728	0.104878	0.108119	0.107826	0.108541	0.112971	0.122901	0.138228	0.157775	0.179559	0.20113	0.220128
	C	1	0	0.045175	0.077849	0.092221	0.099546	0.103237	0.103667	0.104972	0.109629	0.119274	0.133784	0.152012	0.172042	0.191537	0.208301
		2	0	0.044361	0.076402	0.090477	0.097635	0.101257	0.101707	0.103065	0.107765	0.117405	0.131838	0.149901	0.169674	0.188853	0.205294

		3	0	0.044964	0.077463	0.091734	0.098958	0.102562	0.10292	0.104172	0.1088	0.11844	0.132961	0.151198	0.171218	0.190694	0.207458
	Average		0.00	0.05	0.08	0.09	0.10	0.10	0.10	0.11	0.11	0.12	0.13	0.15	0.17	0.19	0.21
	Standard Deviation		0	0.001469	0.002545	0.00297	0.003046	0.002951	0.002722	0.002536	0.002504	0.002696	0.003122	0.003773	0.004619	0.005599	0.006629
	Corrected Percentage		0.00	0.04	0.07	0.09	0.09	0.10	0.10	0.10	0.10	0.11	0.12	0.14	0.16	0.18	0.20
AB-5	A	1	0	0	0.048492	0.085485	0.092146	0.092066	0.094192	0.094948	0.09952	0.108814	0.123046	0.14127	0.161774	0.182339	0.200771
		2	0	0	0.048074	0.08473	0.091311	0.091205	0.093328	0.094145	0.098805	0.108181	0.122446	0.140619	0.160969	0.181282	0.199397
		3	0	0	0.046818	0.082631	0.089152	0.089164	0.091266	0.092043	0.096493	0.105493	0.119254	0.136867	0.156689	0.176586	0.194449
	B	1	0	0	0.04991	0.088101	0.095024	0.09493	0.097149	0.098085	0.103098	0.113076	0.128155	0.147318	0.168853	0.1906	0.210447
		2	0	0	0.04974	0.087801	0.094688	0.094552	0.096713	0.097593	0.102565	0.112543	0.127684	0.14698	0.168707	0.19068	0.210755
		3	0	0	0.049665	0.08763	0.09447	0.094295	0.09645	0.097365	0.10241	0.112489	0.127738	0.147128	0.16892	0.190934	0.21105
	C	1	0	0	0.048216	0.085113	0.091848	0.091925	0.094232	0.095285	0.100225	0.109911	0.124469	0.142863	0.163326	0.183641	0.201687
		2	0	0	0.048506	0.085617	0.092373	0.092398	0.09467	0.095687	0.100636	0.110384	0.125053	0.143602	0.164256	0.184799	0.203115
		3	0	0	0.047387	0.083668	0.090294	0.090344	0.092572	0.093577	0.098445	0.108053	0.122546	0.140905	0.161358	0.181679	0.199731
	Average		0.00	0.00	0.05	0.09	0.09	0.09	0.09	0.10	0.10	0.11	0.12	0.14	0.16	0.18	0.20
	Standard Deviation		0	0	0.001073	0.001896	0.002029	0.001969	0.001983	0.002011	0.002187	0.002524	0.002999	0.00358	0.004255	0.005035	0.005934
	Corrected Percentage		0.00	0.00	0.04	0.08	0.08	0.08	0.09	0.09	0.09	0.10	0.11	0.13	0.15	0.17	0.19
AB-6	A	1	0.063137	0.110573	0.152487	0.173854	0.184986	0.185801	0.183145	0.18278	0.189545	0.205349	0.229078	0.258422	0.290818	0.323625	0.354445
		2	0.062148	0.10905	0.15055	0.17169	0.182701	0.183493	0.180844	0.180452	0.18871	0.202672	0.226065	0.255006	0.286996	0.319476	0.350122
		3	0.061142	0.107514	0.148625	0.169577	0.180527	0.181374	0.178823	0.178509	0.185157	0.200621	0.223799	0.25244	0.28408	0.316213	0.346583
	B	1	0.062543	0.110202	0.152561	0.174209	0.185604	0.186618	0.184132	0.18394	0.190916	0.207003	0.231094	0.260876	0.293765	0.327086	0.358388
		2	0.061371	0.108219	0.149878	0.171155	0.182348	0.183333	0.180889	0.180727	0.187658	0.203609	0.227504	0.25707	0.289755	0.322913	0.354113
		3	0.060839	0.107299	0.14861	0.16969	0.180753	0.181669	0.179162	0.1789	0.185667	0.201394	0.225044	0.254392	0.286927	0.320026	0.351273
	C	1	0.059855	0.107665	0.15085	0.172907	0.18476	0.186229	0.18436	0.185053	0.193224	0.210775	0.23643	0.26767	0.301711	0.335766	0.367395
		2	0.059298	0.106701	0.149477	0.171223	0.182797	0.184034	0.181961	0.18247	0.190479	0.207899	0.233463	0.264636	0.298599	0.332528	0.363967
		3	0.059023	0.106358	0.149112	0.170833	0.182383	0.183585	0.181468	0.181928	0.189904	0.207335	0.232988	0.264352	0.29861	0.332921	0.364799
	Average		0.06	0.11	0.15	0.17	0.18	0.18	0.18	0.18	0.19	0.21	0.23	0.26	0.29	0.33	0.36
	Standard Deviation		0.001438	0.001482	0.001506	0.001666	0.0018	0.00188	0.001977	0.002196	0.002643	0.003365	0.004283	0.005264	0.006158	0.006846	0.007267
	Corrected Percentage		0.06	0.10	0.14	0.16	0.17	0.17	0.17	0.17	0.17	0.19	0.21	0.24	0.27	0.30	0.33

AB-7	A	1	0.061093	0.105924	0.14511	0.164913	0.174868	0.174916	0.171501	0.170073	0.175279	0.189	0.210281	0.236972	0.266641	0.296763	0.325036
		2	0.06061	0.105171	0.144138	0.163814	0.173692	0.173718	0.170308	0.168897	0.174124	0.187879	0.209217	0.235999	0.265792	0.296062	0.324504
		3	0.059972	0.103968	0.142397	0.161779	0.171484	0.17147	0.168089	0.166724	0.171961	0.185663	0.206873	0.233436	0.262903	0.292747	0.320693
	B	1	0.061425	0.108902	0.151076	0.172159	0.182749	0.182701	0.179012	0.17754	0.18326	0.198145	0.221118	0.249872	0.281859	0.314471	0.345347
		2	0.059435	0.105467	0.146393	0.166865	0.177162	0.177134	0.173561	0.172132	0.177687	0.192172	0.214571	0.24266	0.273956	0.305892	0.336132
		3	0.059376	0.105217	0.145898	0.166185	0.176293	0.176078	0.1723	0.170633	0.175926	0.19014	0.212297	0.240212	0.271435	0.303428	0.333873
	C	1	0.060024	0.106206	0.147219	0.167817	0.178236	0.178316	0.174806	0.173371	0.178843	0.193179	0.215414	0.243392	0.274704	0.306833	0.337455
		2	0.059345	0.105054	0.145679	0.166117	0.176502	0.176671	0.173301	0.172005	0.177567	0.191934	0.214149	0.242068	0.273278	0.305256	0.335681
		3	0.05958	0.105372	0.146004	0.166389	0.176692	0.176784	0.173387	0.172144	0.17785	0.192431	0.214888	0.243044	0.274489	0.306743	0.337546
	Average		0.06	0.11	0.15	0.17	0.18	0.18	0.17	0.17	0.18	0.19	0.21	0.24	0.27	0.30	0.33
	Standard Deviation		0.000777	0.001353	0.002365	0.002861	0.003127	0.003121	0.003041	0.00303	0.003199	0.003585	0.00416	0.004891	0.005761	0.006763	0.007888
	Corrected Percentage		0.06	0.10	0.13	0.15	0.16	0.16	0.16	0.16	0.16	0.18	0.20	0.22	0.25	0.28	0.31
AB-8	A	1	0.117028	0.201472	0.273903	0.309197	0.325953	0.324928	0.318999	0.318667	0.33205	0.361369	0.403323	0.453308	0.507728	0.564109	0.621042
		2	0.113359	0.195422	0.265888	0.300195	0.316462	0.315403	0.309547	0.30911	0.322005	0.350411	0.391133	0.439699	0.492612	0.547483	0.602991
		3	0.112144	0.193268	0.262819	0.296525	0.31234	0.311018	0.30502	0.304508	0.317348	0.345704	0.386388	0.434935	0.487828	0.542629	0.597947
	B	1	0.105191	0.181387	0.247086	0.279502	0.295279	0.294902	0.289754	0.289125	0.300273	0.325281	0.361392	0.404675	0.452045	0.501368	0.551462
		2	0.103122	0.177319	0.241105	0.27256	0.287843	0.287501	0.282635	0.282298	0.293515	0.318237	0.353683	0.395971	0.442126	0.49019	0.539194
		3	0.099741	0.171645	0.233501	0.263983	0.278767	0.278358	0.273515	0.273017	0.2837	0.307493	0.34175	0.382742	0.427597	0.474417	0.522264
	C	1	0.10668	0.185316	0.253532	0.287074	0.303343	0.30274	0.297088	0.296059	0.307308	0.33317	0.370955	0.416668	0.467046	0.519697	0.573175
		2	0.103103	0.178148	0.242901	0.274703	0.290035	0.289374	0.284013	0.283197	0.294212	0.319257	0.35574	0.399859	0.448539	0.499533	0.551471
		3	0.100338	0.173355	0.236334	0.267219	0.282039	0.281252	0.275848	0.274827	0.285303	0.309453	0.344822	0.387781	0.4354	0.485507	0.536748
	Average		0.11	0.18	0.25	0.28	0.30	0.30	0.29	0.29	0.30	0.33	0.37	0.41	0.46	0.51	0.57
	Standard Deviation		0.006099	0.010457	0.014107	0.015734	0.01637	0.016121	0.015746	0.015855	0.016887	0.018914	0.021662	0.024788	0.028032	0.031222	0.03424
	Corrected Percentage		0.09	0.16	0.22	0.25	0.26	0.26	0.26	0.26	0.27	0.29	0.32	0.36	0.41	0.45	0.50
AB-9	A	1	0.086201	0.148084	0.201539	0.22847	0.242222	0.243203	0.240508	0.241576	0.252115	0.273617	0.303492	0.338033	0.37408	0.409263	0.442105
		2	0.083641	0.143151	0.194338	0.220066	0.233084	0.233821	0.231022	0.231842	0.241779	0.262278	0.290885	0.324101	0.358959	0.393236	0.425532
		3	0.081587	0.139145	0.188457	0.213198	0.225631	0.226223	0.223439	0.224215	0.233857	0.253747	0.281485	0.313674	0.347458	0.380712	0.412108
	B	1	0.096847	0.167316	0.228737	0.260136	0.276846	0.27928	0.277734	0.280626	0.294346	0.320543	0.356234	0.397239	0.440008	0.481844	0.520971

		2	0.091825	0.158111	0.215655	0.24499	0.260486	0.262602	0.261052	0.26378	0.276786	0.301576	0.335269	0.373875	0.414051	0.453339	0.490206
		3	0.089459	0.153899	0.209771	0.238215	0.253179	0.255121	0.253493	0.256029	0.268589	0.292667	0.325505	0.363264	0.402723	0.441493	0.478062
	C	1	0.100084	0.17059	0.231225	0.262179	0.278415	0.280521	0.278769	0.281596	0.295379	0.32172	0.357549	0.398581	0.441189	0.482689	0.521421
		2	0.096814	0.164882	0.22334	0.253142	0.26875	0.270783	0.269196	0.272153	0.285785	0.311587	0.346514	0.386377	0.427674	0.467875	0.505487
		3	0.09517	0.162047	0.219463	0.248717	0.264013	0.265966	0.264372	0.26728	0.280753	0.306302	0.340956	0.380591	0.421712	0.461758	0.499196
	Average		0.09	0.16	0.21	0.24	0.26	0.26	0.26	0.26	0.27	0.29	0.33	0.36	0.40	0.44	0.48
	Standard Deviation		0.006481	0.011045	0.015107	0.017369	0.018805	0.019453	0.019965	0.020877	0.022562	0.025086	0.028195	0.031571	0.034946	0.038135	0.041024
	Corrected Percentage		0.08	0.14	0.18	0.21	0.22	0.22	0.22	0.22	0.23	0.25	0.28	0.32	0.35	0.38	0.41
AB-10	A	1	0.093026	0.161561	0.221751	0.252829	0.269774	0.272889	0.272106	0.275556	0.28942	0.315309	0.350307	0.390243	0.431395	0.470713	0.505935
		2	0.088801	0.153997	0.211105	0.240467	0.256341	0.259075	0.258184	0.261463	0.274825	0.299798	0.333541	0.371991	0.411494	0.449063	0.482517
		3	0.084828	0.146693	0.200737	0.228498	0.243425	0.245863	0.244843	0.247792	0.260387	0.284156	0.316466	0.353466	0.39162	0.427981	0.460375
	B	1	0.089963	0.156426	0.214868	0.245088	0.261701	0.265072	0.26493	0.269269	0.284132	0.311077	0.347111	0.387924	0.429573	0.468828	0.503373
		2	0.086805	0.150688	0.206772	0.23576	0.251651	0.254798	0.254538	0.258539	0.272602	0.298226	0.332562	0.371519	0.411388	0.449167	0.482732
		3	0.085105	0.147577	0.20237	0.230687	0.246188	0.24923	0.248948	0.252857	0.266657	0.291843	0.325643	0.364043	0.403374	0.440644	0.473739
	C	1	0.093343	0.16368	0.226062	0.258467	0.276597	0.280755	0.281234	0.286457	0.302752	0.331727	0.370219	0.413774	0.458404	0.500879	0.538859
		2	0.088872	0.155517	0.214483	0.245052	0.262064	0.265839	0.266147	0.270977	0.286334	0.313733	0.350173	0.391442	0.433795	0.474223	0.510563
		3	0.085354	0.149251	0.20577	0.235098	0.25142	0.255034	0.255287	0.259846	0.274493	0.300727	0.335707	0.375401	0.416187	0.455147	0.490194
	Average		0.09	0.15	0.21	0.24	0.26	0.26	0.26	0.26	0.28	0.31	0.34	0.38	0.42	0.46	0.49
	Standard Deviation		0.003242	0.005992	0.008602	0.010015	0.010909	0.011275	0.011524	0.011988	0.012895	0.014284	0.016002	0.017872	0.01976	0.021579	0.023267
	Corrected Percentage		0.08	0.14	0.19	0.21	0.23	0.23	0.23	0.23	0.24	0.27	0.30	0.33	0.37	0.40	0.43
AB-11	A	1	0.07933	0.137161	0.18721	0.212138	0.224807	0.225779	0.223845	0.226157	0.238064	0.260828	0.291752	0.327165	0.363985	0.399908	0.433458
		2	0.075266	0.129994	0.177289	0.200816	0.212748	0.213656	0.211886	0.21423	0.225755	0.247638	0.277287	0.311187	0.346394	0.38071	0.41275
		3	0.073017	0.126025	0.171802	0.194566	0.206097	0.206951	0.205216	0.207478	0.218651	0.239879	0.268643	0.301517	0.335609	0.368767	0.399656
	B	1	0.080676	0.139923	0.19145	0.217249	0.230445	0.231468	0.229228	0.231024	0.242451	0.265014	0.2962	0.332382	0.370342	0.4075	0.442035
		2	0.07729	0.133918	0.183066	0.207583	0.220037	0.220887	0.218698	0.220477	0.231568	0.253375	0.283438	0.318254	0.354759	0.390536	0.423916
		3	0.073738	0.127258	0.173475	0.196426	0.207952	0.208566	0.20641	0.208143	0.218805	0.239662	0.268277	0.301221	0.335513	0.368862	0.399785
	C	1	0.076071	0.131376	0.179193	0.202999	0.215049	0.21587	0.213872	0.215929	0.227232	0.249083	0.27897	0.313369	0.349215	0.384124	0.416496
		2	0.072743	0.125171	0.170315	0.192742	0.204018	0.204707	0.202805	0.204859	0.215793	0.236815	0.265476	0.298351	0.332464	0.365524	0.396051

		3	0.070273	0.120426	0.163382	0.184627	0.195186	0.195676	0.193793	0.195837	0.20652	0.226948	0.254679	0.286324	0.318944	0.350315	0.379058
	Average		0.08	0.13	0.18	0.20	0.21	0.21	0.21	0.21	0.22	0.25	0.28	0.31	0.35	0.38	0.41
	Standard Deviation		0.003337	0.006176	0.00882	0.010211	0.011003	0.011156	0.011058	0.01103	0.011341	0.012093	0.013234	0.01467	0.016322	0.018099	0.019887
	Corrected Percentage		0.07	0.11	0.16	0.18	0.19	0.19	0.19	0.19	0.20	0.22	0.24	0.27	0.30	0.34	0.36

Table 17. Wall DE, Clay Sizes.

Sample Name	Run	Reading	0.549541	0.630957	0.724436	0.831764	0.954993	1.096478	1.258925	1.44544	1.659587	1.905461	2.187762	2.511886	2.884031	3.311311	3.801894
DE-1	A	1	0	0.049172	0.086582	0.104173	0.115113	0.122107	0.126261	0.131946	0.141846	0.157646	0.178918	0.204093	0.230681	0.255742	0.276505
		2	0	0.04836	0.085272	0.102688	0.11359	0.120563	0.124725	0.130367	0.140151	0.155763	0.176804	0.201742	0.228107	0.252977	0.273585
		3	0	0.049314	0.086752	0.10431	0.115162	0.122077	0.126144	0.131765	0.141638	0.157457	0.178793	0.204075	0.230813	0.256079	0.277127
	B	1	0	0.050825	0.089204	0.107166	0.118269	0.125331	0.129328	0.134679	0.14407	0.159224	0.17981	0.204414	0.230726	0.255916	0.277214
		2	0	0.051703	0.090684	0.108865	0.119979	0.126975	0.130838	0.136094	0.145485	0.160758	0.181557	0.20643	0.233038	0.258555	0.280246
		3	0	0.050452	0.088556	0.106353	0.117268	0.124161	0.128031	0.133324	0.142748	0.158033	0.178821	0.203636	0.230094	0.25532	0.276558
	C	1	0	0.05287	0.092653	0.111188	0.122534	0.129761	0.133869	0.1395	0.149428	0.165388	0.186941	0.212515	0.239631	0.265329	0.286802
		2	0	0.052533	0.092012	0.11037	0.121546	0.128632	0.132615	0.138131	0.147949	0.163804	0.185254	0.210717	0.237707	0.263274	0.284626
		3	0	0.052187	0.091645	0.110106	0.12148	0.128704	0.132819	0.138393	0.148187	0.16394	0.185251	0.210613	0.237623	0.263402	0.285186
	Average		0.00	0.05	0.09	0.11	0.12	0.13	0.13	0.13	0.14	0.16	0.18	0.21	0.23	0.26	0.28
	Standard Deviation		0	0.001618	0.002661	0.003077	0.003253	0.003348	0.003321	0.003295	0.003317	0.00342	0.003599	0.003836	0.004108	0.004391	0.004682
	Corrected Percentage		0.00	0.04	0.08	0.09	0.10	0.11	0.11	0.12	0.13	0.14	0.16	0.18	0.20	0.23	0.25
DE-2	A	1	0	0.050548	0.08839	0.105782	0.115931	0.122074	0.125168	0.129817	0.138778	0.153744	0.174225	0.198558	0.224184	0.24815	0.267759
		2	0	0.050586	0.088493	0.105935	0.116148	0.122367	0.125569	0.13035	0.139444	0.154503	0.174992	0.199227	0.224676	0.248462	0.267992
		3	0	0.050393	0.088093	0.105371	0.115359	0.121381	0.124409	0.129069	0.138101	0.153145	0.173646	0.197897	0.223351	0.247114	0.266576
	B	1	0	0.051359	0.089524	0.106976	0.117135	0.123443	0.126816	0.131933	0.141503	0.157135	0.178208	0.202959	0.228804	0.252833	0.272465
		2	0	0.052106	0.090736	0.108333	0.118467	0.124731	0.128045	0.133191	0.142909	0.158795	0.18017	0.20521	0.231295	0.255521	0.275335
		3	0	0.051468	0.089656	0.107065	0.117094	0.123257	0.126458	0.131415	0.140858	0.15641	0.177464	0.202278	0.228301	0.252671	0.272841
	C	1	0	0.051098	0.089225	0.106689	0.116826	0.123026	0.126257	0.131216	0.140676	0.156301	0.177508	0.202511	0.228628	0.252797	0.272239
		2	0	0.049732	0.086952	0.104061	0.114085	0.12025	0.123533	0.128493	0.137834	0.153178	0.173951	0.1984	0.223889	0.247431	0.266341

		3	0	0.050036	0.087477	0.104678	0.114733	0.120908	0.124186	0.129155	0.138528	0.153923	0.174743	0.199216	0.224702	0.248218	0.267103
	Average		0.00	0.05	0.09	0.11	0.12	0.12	0.13	0.13	0.14	0.16	0.18	0.20	0.23	0.25	0.27
	Standard Deviation		0	0.000754	0.001176	0.001317	0.001351	0.001398	0.001436	0.001542	0.001731	0.001996	0.002293	0.002582	0.002843	0.003087	0.003354
	Corrected Percentage		0.00	0.04	0.07	0.09	0.10	0.10	0.11	0.11	0.12	0.13	0.15	0.17	0.19	0.21	0.23
DE-3	A	1	0	0.06601	0.108539	0.134038	0.147457	0.156101	0.161623	0.169256	0.182312	0.202573	0.229126	0.25977	0.291398	0.320535	0.343973
		2	0	0.066369	0.109136	0.134761	0.148201	0.156809	0.162251	0.169802	0.182812	0.203096	0.229768	0.260641	0.292618	0.322214	0.34622
		3	0	0.065591	0.107913	0.133337	0.146682	0.155248	0.160673	0.16818	0.181093	0.201219	0.227689	0.258341	0.290099	0.319507	0.343383
	B	1	0	0.056088	0.099691	0.120625	0.134241	0.143273	0.149323	0.157313	0.170214	0.189738	0.215109	0.244314	0.274398	0.301993	0.323984
		2	0	0.055127	0.098122	0.118819	0.132343	0.141323	0.14738	0.155344	0.16814	0.18745	0.212507	0.241346	0.271088	0.298462	0.320445
		3	0	0.055356	0.098519	0.119281	0.132824	0.141823	0.147921	0.155984	0.168945	0.188475	0.213772	0.24284	0.272788	0.300359	0.322566
	C	1	0	0.06015	0.099574	0.124048	0.137199	0.146048	0.151958	0.15984	0.172844	0.192787	0.218919	0.24913	0.280236	0.308582	0.330798
		2	0	0.059356	0.098321	0.122583	0.135638	0.144455	0.150367	0.158222	0.171119	0.190846	0.216665	0.246512	0.277279	0.305391	0.327547
		3	0	0.05907	0.097896	0.122127	0.13517	0.143975	0.149844	0.157609	0.170369	0.189939	0.215625	0.245409	0.276204	0.30444	0.326795
	Average		0.00	0.06	0.10	0.13	0.14	0.15	0.15	0.16	0.17	0.19	0.22	0.25	0.28	0.31	0.33
	Standard Deviation		0	0.004593	0.004967	0.006606	0.006608	0.006446	0.006181	0.005998	0.006059	0.006402	0.006964	0.007668	0.008453	0.009266	0.01006
	Corrected Percentage		0.00	0.06	0.10	0.12	0.13	0.14	0.15	0.15	0.17	0.19	0.21	0.24	0.27	0.30	0.32
DE-4	A	1	0	0.078993	0.128522	0.156568	0.170877	0.179419	0.184482	0.192124	0.206174	0.228494	0.257787	0.291284	0.325341	0.356052	0.379982
		2	0	0.078259	0.12745	0.155418	0.169661	0.178159	0.18317	0.190731	0.204672	0.226875	0.256085	0.289579	0.323746	0.354693	0.378985
		3	0	0.078435	0.127726	0.155718	0.16994	0.178396	0.183367	0.190911	0.204872	0.227141	0.256468	0.290146	0.324577	0.355869	0.380563
	B	1	0	0.075956	0.123847	0.151189	0.165066	0.173396	0.178415	0.186065	0.200078	0.222249	0.251257	0.284348	0.317914	0.348099	0.371513
		2	0	0.076466	0.124586	0.151953	0.165837	0.174181	0.179272	0.187093	0.201384	0.223922	0.253342	0.286857	0.320836	0.351417	0.375211
		3	0	0.076268	0.124241	0.151472	0.165245	0.173505	0.178571	0.186438	0.200846	0.22355	0.253143	0.286787	0.320821	0.351378	0.375103
	C	1	0	0.075403	0.123189	0.150826	0.165045	0.17382	0.179265	0.187241	0.201375	0.223407	0.252038	0.284636	0.317799	0.347907	0.371766
		2	0	0.075802	0.123848	0.151572	0.16572	0.17437	0.179704	0.187667	0.201936	0.224245	0.253236	0.28619	0.319626	0.349876	0.373723
		3	0	0.076127	0.12432	0.152065	0.166228	0.174897	0.180285	0.188359	0.202803	0.225344	0.254591	0.287795	0.321454	0.351898	0.375945
	Average		0.00	0.08	0.13	0.15	0.17	0.18	0.18	0.19	0.20	0.23	0.25	0.29	0.32	0.35	0.38
	Standard Deviation		0	0.001327	0.002005	0.002245	0.00237	0.002382	0.002306	0.00219	0.002094	0.002072	0.002175	0.002411	0.002739	0.003078	0.003356
	Corrected Percentage		0.00	0.07	0.12	0.15	0.16	0.17	0.18	0.18	0.20	0.22	0.25	0.28	0.31	0.34	0.37

DE-5	A	1	0.070878	0.130741	0.186917	0.217738	0.237108	0.24452	0.248353	0.255636	0.271966	0.299315	0.335481	0.376591	0.418273	0.45624	0.486883
		2	0.071502	0.131548	0.187773	0.218597	0.237948	0.245374	0.249305	0.256817	0.273512	0.301331	0.337994	0.379548	0.421555	0.459706	0.490425
		3	0.071225	0.13116	0.187294	0.218026	0.237288	0.244632	0.248499	0.255973	0.272666	0.300533	0.337301	0.379021	0.421253	0.459676	0.490686
	B	1	0.070902	0.12958	0.184443	0.21484	0.234163	0.241937	0.246217	0.25375	0.269836	0.296257	0.330769	0.369588	0.408578	0.443823	0.47216
		2	0.071736	0.130905	0.186101	0.216577	0.235857	0.243522	0.247759	0.25542	0.271874	0.298901	0.334183	0.373846	0.413669	0.449665	0.478623
		3	0.07187	0.131425	0.187072	0.217808	0.237273	0.245014	0.249262	0.256908	0.273364	0.300448	0.33588	0.375823	0.416089	0.452698	0.482415
	C	1	0.073024	0.133171	0.189233	0.220149	0.239645	0.247281	0.251363	0.258833	0.275142	0.30211	0.337447	0.377319	0.417545	0.454124	0.483736
		2	0.072719	0.132861	0.188999	0.219956	0.239485	0.247117	0.251151	0.258523	0.274692	0.3015	0.336696	0.376488	0.416746	0.453509	0.483489
		3	0.072502	0.132605	0.188711	0.219562	0.238915	0.246283	0.249979	0.256969	0.27279	0.299383	0.334606	0.374732	0.415603	0.453133	0.483843
	Average		0.07	0.13	0.19	0.22	0.24	0.25	0.25	0.26	0.27	0.30	0.34	0.38	0.42	0.45	0.48
	Standard Deviation		0.000784	0.00115	0.001523	0.001702	0.001762	0.001708	0.001628	0.001572	0.001589	0.001769	0.002227	0.002986	0.003939	0.004919	0.005752
	Corrected Percentage		0.07	0.13	0.18	0.21	0.23	0.24	0.24	0.25	0.26	0.29	0.32	0.36	0.40	0.44	0.47
DE-6	A	1	0.073027	0.133569	0.190058	0.221067	0.240458	0.247731	0.251255	0.258011	0.273522	0.299633	0.334042	0.372814	0.411585	0.446128	0.472932
		2	0.072033	0.13177	0.187499	0.218074	0.237191	0.244374	0.24479	0.254675	0.270153	0.296154	0.330387	0.368942	0.407489	0.44184	0.46854
		3	0.072915	0.133485	0.190045	0.221112	0.240572	0.247921	0.251522	0.258351	0.273914	0.300051	0.334469	0.373279	0.412198	0.447098	0.47456
	B	1	0.071507	0.128907	0.182309	0.212367	0.231745	0.239923	0.244487	0.251804	0.266879	0.291398	0.323257	0.358901	0.394459	0.426262	0.451344
		2	0.071101	0.128237	0.181392	0.211276	0.230511	0.238586	0.243068	0.250316	0.265333	0.289818	0.321694	0.357441	0.393209	0.42533	0.450818
		3	0.07217	0.130107	0.183912	0.21403	0.233297	0.241237	0.245586	0.252837	0.268088	0.293045	0.325544	0.361944	0.39828	0.430807	0.456508
	C	1	0.075522	0.134373	0.188386	0.218468	0.237391	0.244772	0.248466	0.255097	0.269899	0.294651	0.327207	0.363862	0.400503	0.433151	0.458507
		2	0.075259	0.134028	0.188006	0.218076	0.237019	0.244455	0.24824	0.254991	0.269932	0.294834	0.327546	0.364368	0.401198	0.43406	0.459657
		3	0.074183	0.132255	0.185669	0.215472	0.234309	0.24179	0.245668	0.25248	0.267386	0.292146	0.324641	0.36122	0.397826	0.43053	0.456085
	Average		0.07	0.13	0.19	0.22	0.24	0.24	0.25	0.25	0.27	0.29	0.33	0.36	0.40	0.44	0.46
	Standard Deviation		0.001592	0.002282	0.00322	0.003575	0.003594	0.003272	0.002904	0.002715	0.002896	0.003519	0.004518	0.005747	0.007019	0.008129	0.008891
	Corrected Percentage		0.07	0.13	0.18	0.21	0.23	0.24	0.24	0.25	0.26	0.29	0.32	0.36	0.39	0.42	0.45
DE-7	A	1	0.137929	0.245309	0.342101	0.393193	0.423029	0.431826	0.435189	0.44586	0.473374	0.520232	0.581775	0.651602	0.724105	0.79476	0.860111
		2	0.136658	0.242923	0.338645	0.389144	0.418622	0.427345	0.430804	0.441667	0.469401	0.516498	0.578314	0.648458	0.721304	0.7923	0.857974
		3	0.139757	0.248273	0.34592	0.397343	0.427258	0.435976	0.439364	0.450408	0.478816	0.52714	0.590597	0.66258	0.737256	0.809923	0.877031
	B	1	0.142156	0.24909	0.344505	0.395299	0.42514	0.434429	0.438477	0.449837	0.477819	0.524797	0.586059	0.655176	0.726509	0.795525	0.858847

		2	0.142582	0.250258	0.346443	0.397616	0.427735	0.43724	0.441615	0.45354	0.482363	0.53039	0.592721	0.662735	0.73466	0.803941	0.867309
		3	0.14119	0.247863	0.343146	0.393811	0.423624	0.433044	0.437438	0.449383	0.478139	0.525972	0.587994	0.657632	0.729178	0.798151	0.861355
	C	1	0.13908	0.247466	0.34529	0.397133	0.427714	0.437303	0.441655	0.453626	0.482735	0.531358	0.594566	0.665703	0.739013	0.810011	0.875438
		2	0.13834	0.246595	0.344422	0.396243	0.426853	0.436529	0.441046	0.453255	0.482633	0.531494	0.594835	0.665976	0.739219	0.810224	0.875933
		3	0.136473	0.243996	0.341428	0.393103	0.42375	0.433591	0.43828	0.450561	0.479829	0.528384	0.591292	0.661988	0.734905	0.805808	0.871695
	Average		0.14	0.25	0.34	0.39	0.42	0.43	0.44	0.45	0.48	0.53	0.59	0.66	0.73	0.80	0.87
	Standard Deviation		0.00225	0.0024	0.002488	0.002752	0.002984	0.003198	0.003491	0.003927	0.00449	0.005118	0.005721	0.006241	0.006698	0.007205	0.007907
	Corrected Percentage		0.13	0.23	0.32	0.37	0.40	0.41	0.41	0.42	0.45	0.49	0.55	0.62	0.69	0.75	0.81
DE-8	A	1	0.130845	0.235148	0.329947	0.380071	0.409782	0.419295	0.423921	0.436077	0.464877	0.512465	0.573898	0.642638	0.713123	0.781093	0.843514
		2	0.128485	0.231378	0.32504	0.374543	0.403886	0.413244	0.417731	0.429618	0.457943	0.504897	0.565683	0.633916	0.704133	0.772088	0.834686
		3	0.1288	0.232503	0.327054	0.376988	0.406591	0.416014	0.420514	0.432472	0.461011	0.508347	0.569663	0.638552	0.709548	0.778417	0.842088
	B	1	0.133231	0.237693	0.332223	0.382436	0.412293	0.422064	0.426964	0.43939	0.46847	0.516456	0.578548	0.648332	0.720248	0.789899	0.854022
		2	0.132984	0.237605	0.332326	0.382527	0.412299	0.421929	0.426727	0.439176	0.468478	0.516917	0.579676	0.650284	0.723109	0.793659	0.858573
		3	0.131434	0.235381	0.329656	0.379596	0.409219	0.418772	0.423483	0.435775	0.464837	0.513004	0.57556	0.646136	0.719146	0.790082	0.855518
	C	1	0.136102	0.245221	0.344906	0.398254	0.430734	0.442596	0.449791	0.465271	0.49841	0.551333	0.618666	0.693385	0.769445	0.842156	0.908149
		2	0.135068	0.243506	0.342624	0.395675	0.427985	0.439779	0.446897	0.462197	0.49499	0.547405	0.614147	0.688315	0.763997	0.836609	0.902822
		3	0.135859	0.245147	0.345118	0.39863	0.431208	0.443034	0.450059	0.465249	0.498049	0.550695	0.617967	0.692985	0.769794	0.843688	0.911165
	Average		0.13	0.24	0.33	0.39	0.42	0.43	0.43	0.45	0.48	0.52	0.59	0.66	0.73	0.80	0.87
	Standard Deviation		0.002857	0.005275	0.007792	0.009445	0.010836	0.01197	0.013185	0.014749	0.016793	0.019284	0.021989	0.024662	0.027091	0.02912	0.030636
	Corrected Percentage		0.12	0.22	0.31	0.36	0.39	0.40	0.40	0.41	0.44	0.49	0.55	0.61	0.68	0.75	0.81

Table 18. Wall FG, Clay Sizes.

Sample Name	Run	Reading	0.549541	0.630957	0.724436	0.831764	0.954993	1.096478	1.258925	1.44544	1.659587	1.905461	2.187762	2.511886	2.884031	3.311311	3.801894
FG-1	A	1	0	0.084522	0.138466	0.169753	0.185363	0.194777	0.200555	0.209546	0.225937	0.251685	0.285322	0.324088	0.364601	0.403292	0.436909
		2	0	0.085491	0.140092	0.171785	0.187555	0.197001	0.20269	0.211546	0.227819	0.253519	0.287222	0.326203	0.367098	0.406331	0.440613

		3	0	0.086065	0.140985	0.172762	0.188484	0.197818	0.203397	0.212225	0.228605	0.25457	0.288663	0.328105	0.36947	0.409128	0.44376
	B	1	0.047631	0.105304	0.143585	0.176064	0.191948	0.201076	0.206598	0.215429	0.23188	0.257839	0.29165	0.330335	0.370396	0.408314	0.441066
		2	0.047677	0.105736	0.144287	0.176991	0.192916	0.201991	0.207377	0.216063	0.232439	0.258476	0.29257	0.331751	0.372469	0.41111	0.444538
		3	0.047182	0.105153	0.143704	0.176499	0.192509	0.201707	0.207207	0.215987	0.232426	0.258493	0.292589	0.331756	0.372465	0.411144	0.444716
	C	1	0.046432	0.103908	0.14214	0.174679	0.190556	0.199724	0.205267	0.214098	0.230518	0.25644	0.290276	0.329145	0.369598	0.408055	0.441306
		2	0.045793	0.102674	0.140495	0.17265	0.18829	0.197306	0.202781	0.211591	0.228003	0.253901	0.287663	0.32637	0.366546	0.404609	0.437395
		3	0.046047	0.103246	0.141254	0.173526	0.189184	0.198188	0.203673	0.212574	0.229187	0.255389	0.289499	0.328522	0.368913	0.407057	0.439801
	Average		0.03	0.10	0.14	0.17	0.19	0.20	0.20	0.21	0.23	0.26	0.29	0.33	0.37	0.41	0.44
	Standard Deviation		0.023406	0.009547	0.001925	0.002404	0.002528	0.00244	0.00235	0.002284	0.002301	0.002398	0.002523	0.002607	0.002635	0.002676	0.002855
	Corrected Percentage		0.03	0.09	0.13	0.16	0.17	0.18	0.19	0.20	0.21	0.23	0.27	0.30	0.34	0.37	0.41
FG-2	A	1	0.05739	0.113994	0.169754	0.200805	0.221547	0.231162	0.237751	0.248032	0.267294	0.297478	0.336581	0.381251	0.42775	0.472385	0.511954
		2	0.057324	0.114157	0.170201	0.201387	0.222227	0.231904	0.238574	0.248988	0.268448	0.298879	0.338251	0.383195	0.429998	0.475011	0.515087
		3	0.057117	0.113888	0.169928	0.20114	0.222017	0.231712	0.238343	0.248631	0.267862	0.297969	0.336966	0.381555	0.428128	0.47315	0.513556
	B	1	0.058702	0.114954	0.170034	0.200847	0.221424	0.230979	0.237482	0.247607	0.266671	0.296718	0.335862	0.380764	0.427551	0.47231	0.511637
		2	0.05801	0.113886	0.168683	0.19934	0.219813	0.229292	0.235689	0.245643	0.264475	0.294273	0.333225	0.378048	0.424883	0.46979	0.509304
		3	0.058244	0.11443	0.16952	0.200293	0.220816	0.230294	0.23671	0.246757	0.265779	0.295853	0.335124	0.380269	0.427407	0.472582	0.512319
	C	1	0.056099	0.111616	0.166491	0.197298	0.218137	0.228186	0.235345	0.24621	0.26598	0.296612	0.336155	0.381261	0.428102	0.472833	0.512079
		2	0.056705	0.113006	0.168658	0.19983	0.220875	0.230974	0.238173	0.249168	0.269213	0.300238	0.340197	0.385656	0.432762	0.477707	0.517183
		3	0.057043	0.113788	0.169869	0.201222	0.222355	0.232463	0.239695	0.250821	0.271137	0.302561	0.342973	0.388854	0.436289	0.481457	0.521094
	Average		0.06	0.11	0.17	0.20	0.22	0.23	0.24	0.25	0.27	0.30	0.34	0.38	0.43	0.47	0.51
	Standard Deviation		0.000804	0.000954	0.001171	0.001295	0.001347	0.00134	0.001403	0.001626	0.002009	0.002467	0.00289	0.003208	0.003402	0.003491	0.003532
	Corrected Percentage		0.05	0.11	0.16	0.19	0.21	0.22	0.22	0.23	0.25	0.28	0.32	0.36	0.40	0.45	0.48
FG-3	A	1	0.053417	0.106048	0.158122	0.187555	0.207639	0.217586	0.224837	0.235634	0.254894	0.28446	0.32238	0.365257	0.409143	0.450123	0.484881
		2	0.049214	0.110932	0.152167	0.187629	0.205357	0.216212	0.223441	0.234472	0.25381	0.28337	0.321194	0.363925	0.407651	0.448482	0.483115
		3	0.053584	0.106675	0.159266	0.188971	0.209251	0.21931	0.226683	0.237684	0.257286	0.287348	0.325877	0.369419	0.413957	0.455527	0.490794
	B	1	0.05007	0.111467	0.152386	0.187429	0.204926	0.215492	0.222383	0.232917	0.251553	0.280201	0.317007	0.358788	0.401816	0.442291	0.476864
		2	0.053947	0.106592	0.158572	0.18798	0.208009	0.217844	0.224859	0.235232	0.253854	0.282596	0.319634	0.361755	0.405193	0.446101	0.481101

		3	0.053977	0.106514	0.158282	0.187463	0.207261	0.216926	0.223886	0.23436	0.25324	0.282356	0.319796	0.36225	0.405876	0.446801	0.481683
	C	1	0.054538	0.106688	0.157851	0.186732	0.206313	0.215886	0.222786	0.233145	0.251758	0.280366	0.317009	0.358375	0.400714	0.440351	0.474198
		2	0.054224	0.106277	0.15739	0.186236	0.205819	0.215446	0.222459	0.232992	0.251823	0.280663	0.317509	0.359013	0.401402	0.441002	0.474767
		3	0.050252	0.111329	0.151955	0.18663	0.203915	0.214343	0.221235	0.231875	0.250651	0.279333	0.315896	0.357024	0.399004	0.438271	0.471891
	Average		0.05	0.11	0.16	0.19	0.21	0.22	0.22	0.23	0.25	0.28	0.32	0.36	0.40	0.45	0.48
	Standard Deviation		0.002095	0.002401	0.003083	0.000812	0.001684	0.001511	0.001649	0.001766	0.002048	0.002525	0.003187	0.00397	0.004778	0.005501	0.006028
	Corrected Percentage		0.05	0.10	0.15	0.18	0.20	0.21	0.21	0.22	0.24	0.27	0.31	0.35	0.39	0.43	0.46
FG-4	A	1	0.067016	0.127846	0.186339	0.218786	0.24004	0.249513	0.255891	0.266434	0.286816	0.319041	0.360792	0.4082	0.456981	0.502998	0.542799
		2	0.066314	0.126787	0.185022	0.21733	0.238501	0.247926	0.254234	0.264645	0.284822	0.316794	0.358299	0.405517	0.454177	0.500125	0.539866
		3	0.066374	0.126838	0.185018	0.217244	0.238305	0.247602	0.25378	0.264073	0.284156	0.316066	0.357543	0.404777	0.45352	0.499654	0.539721
	B	1	0.066943	0.128026	0.186764	0.219189	0.2403	0.24952	0.255632	0.265969	0.286253	0.318474	0.360245	0.407622	0.456274	0.502067	0.541558
		2	0.06563	0.125837	0.183827	0.215848	0.236727	0.24588	0.25198	0.262264	0.282383	0.314305	0.355665	0.402544	0.45064	0.495854	0.534776
		3	0.066151	0.126865	0.185294	0.217466	0.23837	0.247448	0.253488	0.26382	0.284155	0.316467	0.358345	0.405821	0.454554	0.50042	0.540009
	C	1	0.065632	0.126022	0.184376	0.216852	0.238278	0.2488	0.254586	0.265167	0.285297	0.316914	0.35774	0.40405	0.451783	0.497021	0.536445
		2	0.066861	0.128261	0.187485	0.220319	0.241877	0.251543	0.258094	0.268829	0.289411	0.321783	0.363556	0.410875	0.459567	0.505662	0.545832
		3	0.065653	0.126184	0.184687	0.217202	0.238624	0.248302	0.254851	0.265442	0.285664	0.317472	0.358581	0.405251	0.453406	0.499124	0.539087
	Average		0.07	0.13	0.19	0.22	0.24	0.25	0.25	0.27	0.29	0.32	0.36	0.41	0.45	0.50	0.54
	Standard Deviation		0.000568	0.000895	0.001195	0.001367	0.0015	0.001607	0.001724	0.001852	0.001982	0.002117	0.002276	0.002481	0.002727	0.00299	0.003262
	Corrected Percentage		0.06	0.12	0.18	0.21	0.23	0.24	0.24	0.25	0.27	0.30	0.34	0.39	0.43	0.48	0.51
FG-5	A	1	0.097988	0.179021	0.254147	0.294873	0.320274	0.330244	0.336533	0.34883	0.374394	0.415303	0.467971	0.527226	0.588063	0.646151	0.698137
		2	0.097676	0.178726	0.253925	0.294646	0.320027	0.329961	0.336235	0.348568	0.374249	0.41537	0.468348	0.527994	0.589276	0.647827	0.700275
		3	0.098133	0.179783	0.255599	0.296635	0.322204	0.332183	0.338448	0.350791	0.376558	0.417873	0.471152	0.531214	0.593053	0.652338	0.705733
	B	1	0.098584	0.179081	0.2535	0.294056	0.319538	0.329906	0.336751	0.349622	0.375587	0.416579	0.46894	0.527511	0.587383	0.64435	0.695181
		2	0.097731	0.177795	0.251879	0.292227	0.317573	0.327868	0.334663	0.347473	0.373352	0.414243	0.466515	0.525025	0.584844	0.641716	0.692343
		3	0.096941	0.176696	0.250598	0.290839	0.316128	0.326388	0.33313	0.345834	0.371541	0.412214	0.464268	0.522625	0.582414	0.639423	0.690371
	C	1	0.095749	0.177341	0.253783	0.295337	0.321558	0.332192	0.33909	0.3552	0.378232	0.419908	0.473466	0.533792	0.595968	0.655751	0.709848
		2	0.095763	0.177549	0.254205	0.295835	0.32207	0.332647	0.339467	0.352317	0.378547	0.4203	0.47401	0.534539	0.596944	0.65697	0.711327
		3	0.095692	0.177367	0.25385	0.295307	0.321387	0.331881	0.338737	0.351784	0.378379	0.420635	0.474915	0.535999	0.598864	0.659194	0.713659

	Average		0.10	0.18	0.25	0.29	0.32	0.33	0.34	0.35	0.38	0.42	0.47	0.53	0.59	0.65	0.70
	Standard Deviation		0.00114	0.00103	0.001447	0.001822	0.00208	0.002139	0.002147	0.002225	0.002476	0.002948	0.003649	0.004578	0.005721	0.007064	0.008597
	Corrected Percentage		0.09	0.17	0.24	0.28	0.31	0.32	0.32	0.34	0.36	0.40	0.45	0.51	0.57	0.62	0.67
FG-6	A	1	0.096543	0.172914	0.242407	0.279465	0.301405	0.308095	0.310466	0.317583	0.336499	0.369454	0.413546	0.464217	0.516877	0.567317	0.612109
		2	0.096818	0.173568	0.243412	0.280585	0.302549	0.309188	0.311528	0.318699	0.337789	0.371024	0.415451	0.46646	0.519431	0.57015	0.615218
		3	0.096156	0.172269	0.241478	0.278266	0.299926	0.306345	0.308473	0.315404	0.334241	0.367274	0.411637	0.462766	0.516006	0.567046	0.612354
	B	1	0.095247	0.172388	0.243012	0.280492	0.302772	0.309761	0.312671	0.320686	0.340795	0.374999	0.420088	0.471387	0.524454	0.575389	0.621062
		2	0.095678	0.173459	0.244712	0.282456	0.304874	0.311898	0.314891	0.323148	0.343713	0.378561	0.424381	0.476386	0.530064	0.58148	0.627497
		3	0.095309	0.172984	0.244199	0.281927	0.304356	0.311411	0.314444	0.322735	0.343309	0.378123	0.423848	0.475678	0.529096	0.580185	0.625862
	C	1	0.094486	0.170378	0.239717	0.276608	0.29857	0.305528	0.308465	0.3164	0.336195	0.369799	0.413998	0.464079	0.515568	0.564615	0.608245
		2	0.093877	0.169951	0.239705	0.276869	0.299067	0.306142	0.30907	0.316867	0.336428	0.369763	0.413749	0.463768	0.51543	0.564942	0.609353
		3	0.093985	0.170464	0.240661	0.278019	0.300317	0.307388	0.310295	0.31811	0.337768	0.371279	0.41548	0.465718	0.517598	0.567352	0.612067
	Average		0.10	0.17	0.24	0.28	0.30	0.31	0.31	0.32	0.34	0.37	0.42	0.47	0.52	0.57	0.62
	Standard Deviation		0.001068	0.001405	0.001862	0.002113	0.002254	0.002304	0.002429	0.00276	0.003323	0.004017	0.004688	0.00528	0.005851	0.006463	0.007105
	Corrected Percentage		0.09	0.17	0.24	0.27	0.29	0.30	0.30	0.31	0.33	0.36	0.41	0.46	0.51	0.56	0.60
FG-7	A	1	0.13018	0.227824	0.314395	0.359686	0.385517	0.392456	0.394779	0.404106	0.428978	0.471408	0.526903	0.589539	0.654349	0.717546	0.776529
		2	0.127797	0.224104	0.30961	0.354304	0.379812	0.386698	0.389087	0.398468	0.423271	0.465463	0.520568	0.582702	0.646933	0.709506	0.76786
		3	0.128777	0.225842	0.311992	0.356956	0.382543	0.389327	0.391562	0.400841	0.425675	0.468059	0.523505	0.586118	0.650984	0.714372	0.77373
	B	1	0.126203	0.222956	0.309484	0.354862	0.381067	0.388556	0.39153	0.401517	0.426957	0.469774	0.525365	0.587689	0.651712	0.713698	0.771191
		2	0.126726	0.225119	0.312699	0.358593	0.385124	0.392785	0.395983	0.406387	0.432484	0.476128	0.532549	0.595577	0.660147	0.722592	0.780591
		3	0.126059	0.223284	0.310366	0.355962	0.382324	0.389952	0.393201	0.403706	0.429921	0.473701	0.530285	0.593503	0.658255	0.720806	0.778759
	C	1	0.126758	0.224701	0.312395	0.358099	0.384227	0.39122	0.393567	0.40304	0.428319	0.471461	0.527873	0.591448	0.657041	0.720781	0.780084
		2	0.126169	0.223909	0.311449	0.356992	0.382993	0.389918	0.39228	0.401844	0.427249	0.470476	0.526852	0.590244	0.655575	0.71914	0.778569
		3	0.125315	0.222467	0.309468	0.354673	0.380445	0.38727	0.389603	0.399158	0.424516	0.467623	0.523806	0.586954	0.652025	0.715357	0.774635
	Average		0.13	0.22	0.31	0.36	0.38	0.39	0.39	0.40	0.43	0.47	0.53	0.59	0.65	0.72	0.78
	Standard Deviation		0.001534	0.001649	0.001718	0.001883	0.002015	0.002116	0.002258	0.002492	0.002829	0.003236	0.003635	0.003943	0.00412	0.004206	0.004304
	Corrected Percentage		0.12	0.21	0.29	0.34	0.36	0.37	0.37	0.38	0.40	0.44	0.50	0.55	0.62	0.67	0.73

Table 19. Wall AB, Very Fine Silt to Fine Silt Sizes.

Sample Name	Run	Reading	4.365158	5.011872	5.754399	6.606934	7.585776	8.709636	10	11.481536	13.182567	15.135612
AB-1	A	1	0.215696	0.222309	0.225165	0.229136	0.241332	0.27075	0.324342	0.408367	0.518533	0.648041
		2	0.211974	0.218584	0.221482	0.2255	0.237733	0.267191	0.320831	0.404886	0.514974	0.644163
		3	0.214233	0.220985	0.223967	0.228048	0.240392	0.270114	0.324286	0.409276	0.520751	0.651824
	B	1	0.217606	0.225334	0.228794	0.232352	0.242796	0.269119	0.318874	0.399149	0.506876	0.636192
		2	0.212684	0.220465	0.224199	0.228157	0.238961	0.265416	0.314894	0.394361	0.500776	0.628385
		3	0.2143	0.222278	0.226341	0.230869	0.24255	0.270241	0.321242	0.402443	0.510547	0.639564
	C	1	0.213892	0.221163	0.225135	0.230345	0.243417	0.27296	0.325763	0.408254	0.516733	0.645157
		2	0.214199	0.222022	0.22652	0.232092	0.245213	0.274382	0.326374	0.407688	0.514901	0.642336
		3	0.213026	0.220781	0.225382	0.23135	0.245233	0.275543	0.328885	0.411519	0.519607	0.647102
	Average		0.21	0.22	0.23	0.23	0.24	0.27	0.32	0.41	0.51	0.64
	Standard Deviation		0.00168	0.001826	0.002011	0.002244	0.002602	0.003267	0.004292	0.00552	0.006555	0.007038
	Corrected Percentage		0.18	0.19	0.19	0.19	0.20	0.23	0.27	0.34	0.43	0.54
AB-2	A	1	0.175915	0.178554	0.177439	0.176812	0.183098	0.204309	0.246972	0.316674	0.409646	0.519068
		2	0.176718	0.179298	0.178177	0.17769	0.184356	0.206278	0.249999	0.321096	0.415616	0.526542
		3	0.175959	0.178337	0.176829	0.175797	0.181873	0.203312	0.246861	0.318274	0.413687	0.526062
	B	1	0.168787	0.171476	0.170531	0.170021	0.176211	0.196996	0.238892	0.307549	0.399384	0.507619
		2	0.16844	0.171399	0.170946	0.171164	0.178237	0.199959	0.242649	0.311777	0.403558	0.5111
		3	0.164882	0.167735	0.166986	0.166629	0.17284	0.193439	0.234882	0.302755	0.393468	0.500217
	C	1	0.177125	0.179702	0.178523	0.177975	0.184727	0.207122	0.251951	0.32508	0.422652	0.537735
		2	0.175946	0.1785	0.177401	0.177068	0.184184	0.207094	0.252542	0.326321	0.424403	0.539661
		3	0.175448	0.178145	0.177171	0.17689	0.183925	0.206572	0.251571	0.324752	0.422222	0.53701
	Average		0.17	0.18	0.17	0.17	0.18	0.20	0.25	0.32	0.41	0.52
	Standard Deviation		0.004564	0.004434	0.004225	0.004103	0.004274	0.004942	0.006242	0.008292	0.010988	0.014253
	Corrected Percentage		0.15	0.16	0.16	0.16	0.16	0.18	0.22	0.28	0.37	0.46

AB-3	A	1	0.181351	0.184635	0.184142	0.184211	0.191506	0.214491	0.260164	0.334759	0.434781	0.553759
		2	0.17986	0.183222	0.182936	0.183352	0.191087	0.214504	0.260427	0.334889	0.434211	0.551814
		3	0.179394	0.182759	0.182397	0.18264	0.190117	0.213232	0.258901	0.333271	0.432783	0.550941
	B	1	0.176669	0.180687	0.181078	0.181774	0.188899	0.210384	0.252942	0.322692	0.416653	0.528891
		2	0.17803	0.182138	0.182705	0.183718	0.191338	0.213532	0.256973	0.327726	0.422641	0.535635
		3	0.174639	0.178529	0.178977	0.179978	0.187672	0.209962	0.253406	0.323923	0.418252	0.530251
	C	1	0.184004	0.189031	0.190645	0.19289	0.201892	0.22558	0.270468	0.342564	0.438694	0.553077
		2	0.181239	0.18617	0.187667	0.189703	0.198381	0.221655	0.266145	0.337955	0.433974	0.548362
		3	0.1818	0.186943	0.188575	0.190669	0.199331	0.222526	0.26689	0.338561	0.434493	0.548934
	Average		0.18	0.18	0.18	0.19	0.19	0.22	0.26	0.33	0.43	0.54
	Standard Deviation		0.002866	0.003264	0.003818	0.004486	0.005113	0.005615	0.006065	0.006802	0.00813	0.010087
	Corrected Percentage		0.15	0.16	0.16	0.16	0.16	0.18	0.22	0.28	0.36	0.46
AB-4	A	1	0.220087	0.228076	0.233554	0.241065	0.256972	0.289554	0.345028	0.429425	0.538728	0.667082
		2	0.217341	0.225435	0.231159	0.238993	0.255188	0.287889	0.343173	0.426959	0.535236	0.662227
		3	0.217277	0.225449	0.231226	0.239079	0.255256	0.287914	0.343138	0.426845	0.534992	0.66174
	B	1	0.234206	0.243899	0.250819	0.259511	0.276404	0.31004	0.366969	0.453736	0.566755	0.700777
		2	0.232308	0.241957	0.248883	0.257641	0.27464	0.308358	0.365226	0.451635	0.563881	0.696642
		3	0.234759	0.244944	0.252385	0.261562	0.278786	0.312462	0.368993	0.454802	0.566338	0.698497
	C	1	0.220757	0.229025	0.235027	0.243328	0.260202	0.293741	0.349774	0.43387	0.541606	0.666943
		2	0.217493	0.225625	0.231644	0.240094	0.257165	0.290827	0.346763	0.430409	0.537278	0.661292
		3	0.219977	0.228418	0.234735	0.243506	0.260966	0.295161	0.351829	0.436478	0.544576	0.669971
	Average		0.22	0.23	0.24	0.25	0.26	0.30	0.35	0.44	0.55	0.68
	Standard Deviation		0.007603	0.008437	0.009055	0.009467	0.009744	0.010064	0.010646	0.011791	0.013807	0.017151
	Corrected Percentage		0.21	0.22	0.22	0.23	0.24	0.28	0.33	0.41	0.51	0.63
AB-5	A	1	0.215338	0.225895	0.23392	0.243511	0.260443	0.292489	0.345538	0.425536	0.529091	0.651293
		2	0.213648	0.223974	0.23195	0.241755	0.259184	0.29197	0.345837	0.426525	0.530356	0.652199
		3	0.208627	0.219014	0.227084	0.236866	0.253998	0.286075	0.338792	0.41791	0.519969	0.640036
	B	1	0.226701	0.239231	0.249406	0.261195	0.280101	0.313694	0.367621	0.447766	0.550867	0.672467

		2	0.227218	0.239938	0.250305	0.262339	0.281586	0.315647	0.370126	0.450826	0.554327	0.676037
		3	0.227592	0.240474	0.251121	0.263562	0.2833	0.317864	0.372731	0.453588	0.556914	0.678104
	C	1	0.215875	0.226231	0.234394	0.244541	0.262363	0.295403	0.349105	0.428888	0.530848	0.649719
		2	0.217622	0.228368	0.237003	0.247721	0.266199	0.299968	0.354408	0.434898	0.537444	0.656729
		3	0.21391	0.224228	0.232316	0.242356	0.260057	0.292989	0.346639	0.426466	0.528586	0.647698
	Average		0.22	0.23	0.24	0.25	0.27	0.30	0.35	0.43	0.54	0.66
	Standard Deviation		0.006943	0.008039	0.009145	0.010206	0.011133	0.011898	0.012458	0.012854	0.013188	0.013765
	Corrected Percentage		0.20	0.21	0.22	0.23	0.25	0.28	0.33	0.40	0.49	0.61
AB-6	A	1	0.381409	0.404528	0.42512	0.447547	0.477511	0.523769	0.593381	0.695769	0.831317	1.001914
		2	0.377128	0.400531	0.421625	0.444699	0.475295	0.521969	0.591543	0.693255	0.827462	0.996171
		3	0.373449	0.39689	0.418207	0.441656	0.472687	0.519737	0.589465	0.690949	0.824453	0.99198
	B	1	0.385731	0.409063	0.429672	0.45196	0.481751	0.527983	0.597916	0.701096	0.837793	1.009613
		2	0.38142	0.404766	0.425391	0.447616	0.477162	0.522858	0.591917	0.693868	0.829117	0.999423
		3	0.378736	0.402343	0.423307	0.445906	0.47578	0.521666	0.590664	0.692204	0.826663	0.995818
	C	1	0.394787	0.418118	0.438938	0.461866	0.492773	0.540467	0.611753	0.715534	0.85126	1.0198
		2	0.391132	0.414273	0.435057	0.458239	0.489783	0.53851	0.611033	0.715948	0.852204	1.020201
		3	0.392415	0.415976	0.437111	0.460553	0.492248	0.541009	0.613445	0.718161	0.85417	1.021967
	Average		0.38	0.41	0.43	0.45	0.48	0.53	0.60	0.70	0.84	1.01
	Standard Deviation		0.007422	0.007389	0.007317	0.007407	0.007863	0.008805	0.010093	0.011397	0.012142	0.011811
	Corrected Percentage		0.35	0.38	0.40	0.42	0.45	0.49	0.55	0.65	0.77	0.93
AB-7	A	1	0.349691	0.370784	0.389743	0.411027	0.440514	0.487121	0.558054	0.662875	0.801862	0.97685
		2	0.349339	0.370611	0.389724	0.4111	0.440567	0.486992	0.557551	0.661785	0.800033	0.974223
		3	0.345025	0.365849	0.384646	0.405873	0.435364	0.481948	0.552721	0.657123	0.795349	0.969185
	B	1	0.372656	0.396447	0.418085	0.442068	0.474261	0.523747	0.597773	0.706109	0.849064	1.028886
		2	0.362847	0.386058	0.407106	0.430417	0.461774	0.510097	0.582502	0.688543	0.828498	1.004536
		3	0.360946	0.384654	0.406279	0.430183	0.462043	0.5107	0.583184	0.689011	0.828496	1.003926
	C	1	0.364707	0.388526	0.41009	0.433633	0.464717	0.512087	0.582836	0.686589	0.823969	0.997409
		2	0.362704	0.386291	0.407673	0.431132	0.462284	0.509911	0.581104	0.685448	0.823417	0.997256

		3	0.36511	0.389437	0.411719	0.43616	0.468198	0.516444	0.587815	0.69185	0.829164	1.002337
	Average		0.36	0.38	0.40	0.43	0.46	0.50	0.58	0.68	0.82	0.99
	Standard Deviation		0.009107	0.010397	0.011682	0.012912	0.013999	0.014944	0.015751	0.016538	0.017449	0.018745
	Corrected Percentage		0.33	0.35	0.37	0.39	0.42	0.46	0.53	0.63	0.75	0.91
AB-8	A	1	0.677946	0.736737	0.79926	0.870587	0.953877	1.056119	1.179025	1.329969	1.505987	1.71149
		2	0.658652	0.716423	0.778175	0.848906	0.931646	1.03315	1.154854	1.303744	1.476609	1.677611
		3	0.653221	0.710356	0.771231	0.840907	0.922575	1.023139	1.144229	1.292961	1.466206	1.668116
	B	1	0.601934	0.654669	0.711587	0.777658	0.856133	0.953713	1.071683	1.216105	1.382499	1.573022
		2	0.588968	0.64156	0.698973	0.766115	0.845941	0.944672	1.062875	1.205879	1.368748	1.553547
		3	0.57096	0.622471	0.678687	0.744325	0.822219	0.91846	1.033731	1.173477	1.3332	1.515248
	C	1	0.626832	0.682425	0.741758	0.809815	0.889809	0.988513	1.10728	1.252395	1.419678	1.611704
		2	0.603719	0.657946	0.715838	0.782185	0.860083	0.956146	1.071726	1.212949	1.375657	1.562163
		3	0.588435	0.642109	0.699304	0.764625	0.841047	0.93506	1.048076	1.186253	1.345769	1.529161
	Average		0.62	0.67	0.73	0.80	0.88	0.98	1.10	1.24	1.41	1.60
	Standard Deviation		0.036993	0.039504	0.041781	0.043956	0.046118	0.048546	0.051541	0.055763	0.061783	0.070488
	Corrected Percentage		0.55	0.59	0.65	0.71	0.78	0.86	0.97	1.10	1.24	1.41
AB-9	A	1	0.47213	0.500888	0.530705	0.566317	0.612049	0.674503	0.756865	0.865463	0.998734	1.160325
		2	0.455356	0.484138	0.513992	0.549371	0.594309	0.655142	0.734973	0.840103	0.969324	1.126571
		3	0.441183	0.469346	0.498684	0.533604	0.578124	0.638532	0.717852	0.822159	0.949942	1.10468
	B	1	0.556581	0.590051	0.623525	0.661864	0.709611	0.773941	0.858723	0.971284	1.110857	1.281903
		2	0.524062	0.556377	0.589291	0.627473	0.675125	0.738916	0.822138	0.931438	1.065622	1.228697
		3	0.51181	0.544119	0.576993	0.614924	0.661934	0.724502	0.805827	0.912443	1.043291	1.202443
	C	1	0.556779	0.590367	0.624455	0.663855	0.712847	0.778304	0.863799	0.976603	1.116137	1.287347
		2	0.540083	0.573387	0.607723	0.647834	0.697755	0.763989	0.849581	0.961245	1.097993	1.2645
		3	0.533563	0.56658	0.600633	0.640567	0.690546	0.757142	0.843341	0.955638	1.092619	1.258485
	Average		0.51	0.54	0.57	0.61	0.66	0.72	0.81	0.92	1.05	1.21
	Standard Deviation		0.043553	0.045778	0.047744	0.049596	0.051426	0.053439	0.055794	0.058856	0.06288	0.068311
	Corrected Percentage		0.44	0.47	0.50	0.53	0.57	0.63	0.70	0.79	0.91	1.05

AB-10	A	1	0.535794	0.561205	0.584258	0.609831	0.643414	0.693072	0.76469	0.867001	1.001029	1.171863
		2	0.510705	0.534654	0.556625	0.581615	0.615206	0.665395	0.737761	0.840477	0.973727	1.141633
		3	0.487631	0.510696	0.531734	0.555579	0.587671	0.635801	0.705449	0.804584	0.933465	1.096151
	B	1	0.532043	0.556009	0.57777	0.60256	0.636062	0.686116	0.75782	0.858545	0.987691	1.148528
		2	0.511034	0.535228	0.557653	0.583243	0.617241	0.66702	0.737278	0.835079	0.959902	1.115171
		3	0.501621	0.525469	0.547664	0.573173	0.60726	0.65727	0.727794	0.825737	0.950401	1.105101
	C	1	0.571051	0.598456	0.623232	0.650337	0.685159	0.735516	0.806794	0.907112	1.03711	1.201742
		2	0.541622	0.568376	0.592858	0.619785	0.654243	0.703692	0.773217	0.870596	0.996365	1.155256
		3	0.520212	0.546209	0.57023	0.596897	0.63112	0.680075	0.748504	0.843736	0.96601	1.119794
	Average		0.52	0.55	0.57	0.60	0.63	0.68	0.75	0.85	0.98	1.14
	Standard Deviation		0.024771	0.02608	0.027153	0.027993	0.028576	0.028944	0.029206	0.029688	0.031001	0.034092
	Corrected Percentage		0.46	0.48	0.50	0.52	0.55	0.60	0.66	0.75	0.86	1.00
AB-11	A	1	0.464008	0.492762	0.521438	0.553883	0.593518	0.645978	0.714514	0.80589	0.921419	1.068328
		2	0.441965	0.469589	0.497382	0.529171	0.568341	0.620391	0.688345	0.778553	0.891828	1.034687
		3	0.427813	0.454568	0.481816	0.513472	0.552953	0.605693	0.674487	0.765347	0.878577	1.020158
	B	1	0.472956	0.501167	0.528274	0.558268	0.595197	0.645651	0.714226	0.809034	0.932201	1.091239
		2	0.454032	0.481842	0.508949	0.539248	0.576592	0.627291	0.69555	0.78901	0.909388	1.063777
		3	0.427672	0.453737	0.47986	0.510086	0.548257	0.600429	0.670197	0.764358	0.883537	1.033703
	C	1	0.445593	0.472537	0.499119	0.529334	0.566959	0.617945	0.685847	0.777436	0.893629	1.040768
		2	0.423449	0.448946	0.474466	0.504057	0.541498	0.592582	0.660516	0.751489	0.865693	1.008621
		3	0.404732	0.428715	0.453125	0.48214	0.519613	0.571259	0.639985	0.731475	0.845162	0.985688
	Average		0.44	0.47	0.49	0.52	0.56	0.61	0.68	0.77	0.89	1.04
	Standard Deviation		0.021541	0.022942	0.023951	0.024515	0.024643	0.024485	0.024376	0.024951	0.027202	0.032348
	Corrected Percentage		0.39	0.41	0.44	0.46	0.50	0.54	0.60	0.68	0.79	0.92

Table 20. Wall DE, Very Fine Silt to Fine Silt Sizes.

Sample	Run	Reading	4.365158	5.011872	5.754399	6.606934	7.585776	8.709636	10	11.481536	13.182567	15.135612

Name												
DE-1	A	1	0.290843	0.298486	0.301128	0.303208	0.311262	0.333446	0.376199	0.444813	0.535031	0.639215
		2	0.287813	0.295395	0.29803	0.300172	0.308366	0.330783	0.373865	0.442907	0.533599	0.638214
		3	0.291874	0.300115	0.303592	0.306804	0.31626	0.340097	0.384603	0.454951	0.546606	0.651698
	B	1	0.292374	0.300915	0.304267	0.306664	0.314536	0.336111	0.378147	0.44642	0.537262	0.643509
		2	0.295929	0.305215	0.309599	0.313371	0.322888	0.346275	0.389996	0.459541	0.550823	0.656374
		3	0.291644	0.300241	0.303931	0.30708	0.31612	0.339195	0.382776	0.452326	0.543736	0.649521
	C	1	0.301919	0.310481	0.314312	0.318093	0.328558	0.354097	0.401079	0.474645	0.569684	0.677512
		2	0.299644	0.308127	0.311894	0.315624	0.326068	0.351668	0.39885	0.472809	0.56839	0.676798
		3	0.300819	0.310002	0.314387	0.318482	0.328875	0.353923	0.400104	0.47276	0.567096	0.674697
	Average		0.29	0.30	0.31	0.31	0.32	0.34	0.39	0.46	0.55	0.66
	Standard Deviation		0.005006	0.005411	0.005935	0.006643	0.007601	0.008937	0.010664	0.012717	0.01468	0.01604
	Corrected Percentage		0.26	0.27	0.27	0.27	0.28	0.30	0.34	0.40	0.48	0.58
DE-2	A	1	0.281113	0.288329	0.291691	0.296437	0.309898	0.341188	0.397033	0.483122	0.593782	0.720105
		2	0.281483	0.289151	0.293335	0.299287	0.314224	0.347114	0.404388	0.491493	0.602483	0.728342
		3	0.27995	0.287462	0.291481	0.297294	0.312162	0.34507	0.402444	0.489719	0.600945	0.727136
	B	1	0.285991	0.293753	0.29821	0.304661	0.320203	0.353513	0.410598	0.496517	0.605263	0.728071
		2	0.289072	0.297141	0.302069	0.309235	0.325781	0.360447	0.419204	0.507106	0.617937	0.74276
		3	0.287096	0.295735	0.3011	0.308349	0.324415	0.357896	0.414824	0.500429	0.608994	0.73208
	C	1	0.28504	0.291385	0.293748	0.297605	0.310592	0.342067	0.398889	0.486714	0.599486	0.727758
		2	0.278807	0.285071	0.287612	0.291845	0.305271	0.337078	0.393904	0.481195	0.592754	0.719041
		3	0.279593	0.285996	0.288857	0.293651	0.307871	0.340662	0.398497	0.48664	0.598619	0.724665
	Average		0.28	0.29	0.29	0.30	0.31	0.35	0.40	0.49	0.60	0.73
	Standard Deviation		0.003724	0.004307	0.00515	0.00622	0.007325	0.008231	0.008658	0.008474	0.007787	0.00697
	Corrected Percentage		0.24	0.24	0.25	0.25	0.26	0.29	0.34	0.41	0.51	0.61
DE-3	A	1	0.359343	0.366435	0.367341	0.367199	0.373505	0.395318	0.439728	0.512142	0.607405	0.716372
		2	0.362256	0.3701	0.371792	0.372394	0.379253	0.401272	0.445406	0.51701	0.611087	0.718792

		3	0.359368	0.367264	0.369129	0.370043	0.377354	0.399957	0.444741	0.516988	0.611567	0.719538
	B	1	0.338085	0.344118	0.344176	0.343274	0.348706	0.369156	0.411328	0.48009	0.569947	0.671132
		2	0.334812	0.341397	0.342226	0.342192	0.348369	0.369222	0.411237	0.479163	0.56759	0.666984
		3	0.337231	0.344232	0.345603	0.346213	0.353032	0.374408	0.416685	0.484546	0.57261	0.671494
	C	1	0.344461	0.349442	0.348126	0.345983	0.35089	0.372038	0.416394	0.48881	0.58311	0.688619
		2	0.34135	0.346649	0.345741	0.343974	0.34909	0.370185	0.414208	0.486075	0.579808	0.68495
		3	0.340843	0.346388	0.345675	0.344	0.349063	0.369949	0.413639	0.48512	0.578564	0.6837
	Average		0.35	0.35	0.35	0.35	0.36	0.38	0.42	0.49	0.59	0.69
	Standard Deviation		0.010809	0.011529	0.012231	0.012928	0.013576	0.01419	0.014887	0.016035	0.018071	0.02144
	Corrected Percentage		0.33	0.34	0.34	0.34	0.34	0.37	0.41	0.47	0.56	0.66
DE-4	A	1	0.394835	0.4008	0.400672	0.400451	0.408483	0.43452	0.485796	0.567736	0.674274	0.795738
		2	0.394308	0.400826	0.401275	0.401585	0.409988	0.436119	0.487087	0.568236	0.673555	0.79352
		3	0.396305	0.403222	0.404008	0.404579	0.413166	0.43944	0.490581	0.572054	0.677976	0.798949
	B	1	0.385892	0.391406	0.390786	0.389906	0.397002	0.421711	0.471256	0.551009	0.655027	0.773744
		2	0.389953	0.395805	0.395468	0.394785	0.401977	0.426717	0.476341	0.556403	0.661169	0.781293
		3	0.389789	0.395671	0.395497	0.395113	0.402664	0.427705	0.477424	0.557281	0.661557	0.781058
	C	1	0.387193	0.394286	0.395463	0.396127	0.403864	0.427726	0.474657	0.550179	0.649389	0.764027
		2	0.388999	0.39585	0.396784	0.39733	0.405219	0.429633	0.477579	0.554616	0.655726	0.772547
		3	0.391481	0.398722	0.400232	0.401568	0.410397	0.435795	0.484549	0.562024	0.663031	0.779201
	Average		0.39	0.40	0.40	0.40	0.41	0.43	0.48	0.56	0.66	0.78
	Standard Deviation		0.003556	0.00375	0.00405	0.004514	0.005075	0.005711	0.00656	0.007935	0.009795	0.011715
	Corrected Percentage		0.38	0.39	0.39	0.39	0.39	0.42	0.47	0.54	0.64	0.76
DE-5	A	1	0.507872	0.519592	0.524912	0.53008	0.543528	0.575588	0.634326	0.727385	0.851585	1.002372
		2	0.511477	0.523381	0.529157	0.53518	0.549896	0.583586	0.644088	0.738841	0.86432	1.015716
		3	0.511993	0.524047	0.529787	0.535537	0.549758	0.58281	0.642729	0.737187	0.862916	1.01527
	B	1	0.491735	0.50327	0.50977	0.517327	0.533785	0.568688	0.629028	0.721554	0.842548	0.987412
		2	0.498661	0.510513	0.517219	0.524939	0.541599	0.576833	0.637691	0.730989	0.853013	0.999229
		3	0.503279	0.515923	0.523229	0.531219	0.547708	0.582331	0.642326	0.734839	0.856638	1.003613

	C	1	0.504289	0.516269	0.522488	0.529001	0.543889	0.577142	0.636486	0.729409	0.852758	1.002204
		2	0.50461	0.517359	0.524504	0.53204	0.547916	0.582005	0.641855	0.734827	0.857697	1.006182
		3	0.505438	0.518223	0.524866	0.531394	0.545976	0.578805	0.637879	0.730931	0.854945	1.005591
	Average		0.50	0.52	0.52	0.53	0.54	0.58	0.64	0.73	0.86	1.00
	Standard Deviation		0.00628	0.006411	0.006144	0.005603	0.00505	0.004753	0.004838	0.005345	0.006471	0.00848
	Corrected Percentage		0.49	0.50	0.50	0.51	0.52	0.56	0.61	0.70	0.82	0.97
DE-6	A	1	0.489916	0.497727	0.499659	0.502304	0.514522	0.546941	0.60781	0.704844	0.834475	0.991901
		2	0.48557	0.493631	0.496032	0.499344	0.51231	0.545397	0.606598	0.703368	0.831917	0.987278
		3	0.492553	0.501746	0.505351	0.50985	0.523859	0.557795	0.619641	0.717019	0.846411	1.003259
	B	1	0.467987	0.476875	0.480923	0.485967	0.499706	0.531558	0.588812	0.678635	0.798004	0.942764
		2	0.467906	0.477225	0.481613	0.486852	0.500596	0.532254	0.58915	0.678512	0.797416	0.941777
		3	0.473661	0.483005	0.48754	0.493235	0.507899	0.541068	0.600021	0.691921	0.813503	0.960365
	C	1	0.474579	0.481921	0.483582	0.485768	0.496924	0.527309	0.585156	0.678405	0.8043	0.958789
		2	0.476009	0.483701	0.485815	0.488595	0.500469	0.531663	0.590269	0.684062	0.810066	0.96411
		3	0.47255	0.480538	0.48313	0.486541	0.499094	0.530867	0.589729	0.68325	0.808313	0.960682
	Average		0.48	0.49	0.49	0.49	0.51	0.54	0.60	0.69	0.82	0.97
	Standard Deviation		0.009201	0.009111	0.008843	0.008741	0.009112	0.010092	0.011704	0.014133	0.017415	0.02157
	Corrected Percentage		0.47	0.47	0.48	0.48	0.49	0.53	0.58	0.67	0.80	0.94
DE-7	A	1	0.917628	0.967583	1.010813	1.051558	1.093959	1.145234	1.210416	1.297542	1.408129	1.546887
		2	0.915776	0.965953	1.009299	1.049989	1.09208	1.142717	1.206967	1.293004	1.402706	1.541212
		3	0.936018	0.987237	1.031653	1.073721	1.117762	1.171222	1.239213	1.329956	1.444903	1.58883
	B	1	0.914217	0.962304	1.00445	1.04522	1.088745	1.141823	1.208713	1.29679	1.40721	1.544918
		2	0.922741	0.971245	1.014517	1.05744	1.104202	1.161497	1.232958	1.325285	1.438578	1.577052
		3	0.916823	0.965589	1.009329	1.052861	1.100226	1.157947	1.229443	1.321247	1.433417	1.570244
	C	1	0.933067	0.983515	1.027897	1.070583	1.115552	1.169772	1.237812	1.327427	1.43973	1.579047
		2	0.934314	0.986122	1.032436	1.077452	1.124714	1.180741	1.249584	1.338697	1.449168	1.585569
		3	0.930531	0.983017	1.030114	1.075879	1.123669	1.179847	1.248346	1.336581	1.445751	1.580577
	Average		0.92	0.97	1.02	1.06	1.11	1.16	1.23	1.32	1.43	1.57

	Standard Deviation		0.008873	0.010064	0.011345	0.012651	0.013963	0.015355	0.016724	0.017888	0.018575	0.018726
	Corrected Percentage		0.87	0.92	0.96	1.00	1.04	1.09	1.15	1.24	1.34	1.47
DE-8	A	1	0.898434	0.946738	0.989848	1.032291	1.077964	1.133348	1.202019	1.290397	1.398296	1.529112
		2	0.889832	0.938198	0.980964	1.022452	1.066543	1.119881	1.186538	1.27349	1.381193	1.513426
		3	0.898482	0.948304	0.992694	1.035917	1.081653	1.13638	1.203961	1.291331	1.39902	1.531047
	B	1	0.910348	0.959416	1.002295	1.043275	1.086307	1.138169	1.203258	1.288932	1.396129	1.528866
		2	0.915489	0.964927	1.00801	1.049183	1.092586	1.145171	1.211353	1.298382	1.406842	1.540347
		3	0.912977	0.962829	1.006015	1.046819	1.089314	1.140507	1.205138	1.29093	1.399158	1.534019
	C	1	0.965229	1.014214	1.056549	1.096872	1.13932	1.190525	1.25443	1.337571	1.440042	1.564781
		2	0.960395	1.010003	1.052865	1.093367	1.135401	1.185425	1.247405	1.328025	1.427893	1.550502
		3	0.969767	1.019991	1.062926	1.102981	1.144273	1.193655	1.255605	1.337246	1.439325	1.565119
	Average		0.92	0.97	1.02	1.06	1.10	1.15	1.22	1.30	1.41	1.54
	Standard Deviation		0.031561	0.031885	0.03163	0.030856	0.02966	0.028073	0.026145	0.023757	0.020885	0.01739
	Corrected Percentage		0.86	0.91	0.95	0.99	1.03	1.08	1.14	1.22	1.31	1.44

Table 21. Wall FG, Very Fine Silt to Fine Silt Sizes.

Sample Name	Run	Reading	4.365158	5.011872	5.754399	6.606934	7.585776	8.709636	10	11.481536	13.182567	15.135612
FG-1	A	1	0.462876	0.480792	0.492023	0.501052	0.514235	0.539887	0.584481	0.653592	0.743312	0.846557
		2	0.467308	0.485968	0.497913	0.507618	0.521406	0.547571	0.592532	0.661835	0.75155	0.85462
		3	0.470719	0.489581	0.501736	0.511791	0.526197	0.553358	0.599645	0.670481	0.761569	0.865454
	B	1	0.466471	0.484584	0.497167	0.508905	0.525912	0.55601	0.604702	0.676773	0.767569	0.86982
		2	0.470468	0.488892	0.501542	0.513117	0.529779	0.559423	0.607682	0.679496	0.770414	0.873347
		3	0.47093	0.489779	0.502943	0.515047	0.532149	0.562069	0.61038	0.682024	0.772627	0.875235
	C	1	0.466909	0.484678	0.496262	0.506431	0.521682	0.550356	0.598604	0.671649	0.764797	0.870194
		2	0.462551	0.47999	0.491468	0.501828	0.517568	0.546962	0.59599	0.66971	0.763223	0.868534
		3	0.464857	0.482237	0.49382	0.504554	0.52098	0.551361	0.601539	0.676416	0.770838	0.876639

	Average		0.47	0.49	0.50	0.51	0.52	0.55	0.60	0.67	0.76	0.87
	Standard Deviation		0.003223	0.003714	0.004256	0.004894	0.005724	0.006793	0.007936	0.008978	0.009707	0.009965
	Corrected Percentage		0.43	0.45	0.46	0.47	0.48	0.51	0.55	0.62	0.70	0.80
FG-2	A	1	0.544053	0.568639	0.587224	0.604442	0.626134	0.660037	0.711361	0.78486	0.876051	0.978494
		2	0.54784	0.573217	0.592628	0.610561	0.632653	0.666498	0.717267	0.789826	0.880006	0.981708
		3	0.546961	0.573214	0.59351	0.612074	0.634247	0.667413	0.716727	0.787194	0.87508	0.974692
	B	1	0.543018	0.566458	0.583725	0.599753	0.620664	0.654267	0.705673	0.779334	0.870258	0.971324
		2	0.540827	0.564282	0.581371	0.597009	0.617367	0.650359	0.701283	0.774777	0.866027	0.96799
		3	0.544013	0.567603	0.584816	0.600615	0.621225	0.654625	0.706138	0.780411	0.872526	0.975321
	C	1	0.543263	0.566237	0.582572	0.597027	0.615759	0.646786	0.695781	0.767738	0.858169	0.959935
		2	0.548682	0.572114	0.58907	0.60432	0.623995	0.656126	0.706326	0.77953	0.871046	0.973528
		3	0.552796	0.576607	0.594214	0.610423	0.631249	0.664533	0.715592	0.789155	0.880392	0.981983
	Average		0.55	0.57	0.59	0.60	0.62	0.66	0.71	0.78	0.87	0.97
	Standard Deviation		0.003672	0.004116	0.004912	0.005882	0.006725	0.007249	0.007375	0.007211	0.006994	0.006953
	Corrected Percentage		0.51	0.54	0.55	0.57	0.59	0.62	0.67	0.73	0.82	0.92
FG-3	A	1	0.511084	0.528853	0.540218	0.550243	0.565464	0.593916	0.641137	0.711496	0.799691	0.897566
		2	0.50922	0.52691	0.538196	0.548112	0.563188	0.591474	0.638552	0.7088	0.796859	0.894397
		3	0.51745	0.53568	0.547574	0.558259	0.574295	0.603772	0.652226	0.724038	0.81371	0.912776
	B	1	0.503072	0.520861	0.532097	0.541709	0.556161	0.583445	0.629187	0.697905	0.784726	0.882017
		2	0.50772	0.525945	0.537706	0.548022	0.563397	0.591827	0.638784	0.708559	0.795868	0.892687
		3	0.508146	0.526313	0.53825	0.549086	0.565338	0.59495	0.643197	0.71417	0.802301	0.899406
	C	1	0.500132	0.518413	0.531073	0.543017	0.560337	0.590513	0.638396	0.707877	0.793647	0.888127
		2	0.500655	0.519027	0.532019	0.544606	0.562868	0.594209	0.64325	0.713627	0.79968	0.893542
		3	0.497898	0.516662	0.530233	0.543439	0.562154	0.593614	0.642337	0.711982	0.797113	0.890194
	Average		0.51	0.52	0.54	0.55	0.56	0.59	0.64	0.71	0.80	0.89
	Standard Deviation		0.006244	0.006087	0.005611	0.00506	0.004869	0.005287	0.006068	0.006893	0.007685	0.008564
	Corrected Percentage		0.48	0.50	0.51	0.52	0.54	0.57	0.61	0.68	0.76	0.86
FG-4	A	1	0.573959	0.596647	0.612825	0.627609	0.647379	0.680255	0.731825	0.80714	0.9018	1.009472

		2	0.570933	0.593458	0.609392	0.623861	0.643286	0.675843	0.72721	0.80253	0.897484	1.005761
		3	0.571255	0.594359	0.610887	0.62585	0.645521	0.677956	0.728793	0.803229	0.897149	1.004474
	B	1	0.572345	0.594626	0.610399	0.624788	0.644169	0.67661	0.727656	0.802377	0.896619	1.004513
		2	0.565024	0.586805	0.602147	0.616234	0.635548	0.668248	0.719887	0.79543	0.89044	0.998706
		3	0.57097	0.593578	0.609912	0.625194	0.645826	0.679868	0.732674	0.809086	0.904549	1.012857
	C	1	0.567656	0.590739	0.607478	0.622781	0.642813	0.675563	0.726614	0.801167	0.895196	1.002873
		2	0.577708	0.601447	0.618889	0.635008	0.655971	0.68978	0.741946	0.817647	0.912784	1.021569
		3	0.065653	0.126184	0.184687	0.217202	0.238624	0.248302	0.254851	0.265442	0.285664	0.317472
	Average		0.57	0.59	0.61	0.63	0.65	0.68	0.73	0.81	0.90	1.01
	Standard Deviation		0.003574	0.003972	0.004453	0.004967	0.00542	0.005773	0.006027	0.006235	0.006433	0.006661
	Corrected Percentage		0.54	0.57	0.58	0.60	0.61	0.65	0.70	0.77	0.86	0.96
FG-5	A	1	0.097988	0.179021	0.254147	0.294873	0.320274	0.330244	0.336533	0.34883	0.374394	0.415303
		2	0.097676	0.178726	0.253925	0.294646	0.320027	0.329961	0.336235	0.348568	0.374249	0.41537
		3	0.098133	0.179783	0.255599	0.296635	0.322204	0.332183	0.338448	0.350791	0.376558	0.417873
	B	1	0.098584	0.179081	0.2535	0.294056	0.319538	0.329906	0.336751	0.349622	0.375587	0.416579
		2	0.097731	0.177795	0.251879	0.292227	0.317573	0.327868	0.334663	0.347473	0.373352	0.414243
		3	0.096941	0.176696	0.250598	0.290839	0.316128	0.326388	0.33313	0.345834	0.371541	0.412214
	C	1	0.095749	0.177341	0.253783	0.295337	0.321558	0.332192	0.33909	0.352	0.378232	0.419908
		2	0.095763	0.177549	0.254205	0.295835	0.32207	0.332647	0.339467	0.352317	0.378547	0.4203
		3	0.095692	0.177367	0.25385	0.295307	0.321387	0.331881	0.338737	0.351784	0.378379	0.420635
	Average		0.75	0.78	0.81	0.84	0.88	0.92	0.98	1.07	1.17	1.29
	Standard Deviation		0.010271	0.012037	0.013754	0.015292	0.016453	0.017129	0.017275	0.017071	0.01693	0.017458
	Corrected Percentage		0.72	0.75	0.78	0.81	0.84	0.89	0.95	1.03	1.12	1.24
FG-6	A	1	0.096543	0.172914	0.242407	0.279465	0.301405	0.308095	0.310466	0.317583	0.336499	0.369454
		2	0.096818	0.173568	0.243412	0.280585	0.302549	0.309188	0.311528	0.318699	0.337789	0.371024
		3	0.096156	0.172269	0.241478	0.278266	0.299926	0.306345	0.308473	0.315404	0.334241	0.367274
	B	1	0.095247	0.172388	0.243012	0.280492	0.302772	0.309761	0.312671	0.320686	0.340795	0.374999
		2	0.095678	0.173459	0.244712	0.282456	0.304874	0.311898	0.314891	0.323148	0.343713	0.378561

		3	0.095309	0.172984	0.244199	0.281927	0.304356	0.311411	0.314444	0.322735	0.343309	0.378123
	C	1	0.094486	0.170378	0.239717	0.276608	0.29857	0.305528	0.308465	0.3164	0.336195	0.369799
		2	0.093877	0.169951	0.239705	0.276869	0.299067	0.306142	0.30907	0.316867	0.336428	0.369763
		3	0.093985	0.170464	0.240661	0.278019	0.300317	0.307388	0.310295	0.31811	0.337768	0.371279
	Average		0.65	0.68	0.71	0.74	0.77	0.82	0.89	1.00	1.13	1.30
	Standard Deviation		0.007729	0.008309	0.008816	0.009191	0.009282	0.008951	0.008259	0.007712	0.008288	0.010298
	Corrected Percentage		0.64	0.67	0.69	0.72	0.75	0.80	0.87	0.97	1.10	1.26
FG-7	A	1	0.13018	0.227824	0.314395	0.359686	0.385517	0.392456	0.394779	0.404106	0.428978	0.471408
		2	0.127797	0.224104	0.30961	0.354304	0.379812	0.386698	0.389087	0.398468	0.423271	0.465463
		3	0.128777	0.225842	0.311992	0.356956	0.382543	0.389327	0.391562	0.400841	0.425675	0.468059
	B	1	0.126203	0.222956	0.309484	0.354862	0.381067	0.388556	0.39153	0.401517	0.426957	0.469774
		2	0.12726	0.225119	0.312699	0.358593	0.385124	0.392785	0.395983	0.406387	0.432484	0.476128
		3	0.126059	0.223284	0.310366	0.355962	0.382324	0.389952	0.393201	0.403706	0.429921	0.473701
	C	1	0.126758	0.224701	0.312395	0.358099	0.384227	0.39122	0.393567	0.40304	0.428319	0.471461
		2	0.126169	0.223909	0.311449	0.356992	0.382993	0.389918	0.39228	0.401844	0.427249	0.470476
		3	0.125315	0.222467	0.309468	0.354673	0.380445	0.38727	0.389603	0.399158	0.424516	0.467623
	Average		0.83	0.88	0.92	0.97	1.03	1.10	1.18	1.29	1.41	1.56
	Standard Deviation		0.004531	0.004968	0.005585	0.00629	0.006959	0.007561	0.008093	0.00861	0.009196	0.01014
	Corrected Percentage		0.78	0.83	0.87	0.91	0.97	1.03	1.11	1.21	1.33	1.47

Table 22. Wall AB, Medium Silt to Coarse Silt Sizes.

Sample Name	Run	Reading	17.378008	19.952623	22.908677	26.30268	30.199517	34.673685	39.810717	45.708819	52.480746	60.255959
AB-1	A	1	0.77506	0.877578	0.928313	0.911092	0.827881	0.708837	0.620042	0.65835	0.938067	1.562201
		2	0.77052	0.872007	0.921501	0.903093	0.819126	0.700111	0.612435	0.653145	0.936554	1.565498
		3	0.780409	0.884305	0.936042	0.919393	0.836282	0.716844	0.62717	0.664193	0.942417	1.565238
	B	1	0.765912	0.874273	0.933724	0.927822	0.857568	0.75165	0.673518	0.717094	0.994218	1.607151

		2	0.756317	0.863136	0.921705	0.915894	0.846919	0.743503	0.668827	0.716215	0.996489	1.610563
		3	0.768234	0.874749	0.931666	0.92283	0.850089	0.74351	0.668384	0.720398	1.012262	1.645304
	C	1	0.772608	0.877937	0.934553	0.927006	0.857523	0.756238	0.688032	0.747688	1.046343	1.683175
		2	0.769603	0.876054	0.935399	0.932201	0.868105	0.772268	0.70815	0.769157	1.065459	1.69608
		3	0.773313	0.877496	0.933655	0.926917	0.859885	0.762716	0.69977	0.764943	1.068291	1.707959
	Average		0.77	0.88	0.93	0.92	0.85	0.74	0.66	0.71	1.00	1.63
	Standard Deviation		0.006697	0.005688	0.005651	0.009308	0.016205	0.025193	0.035137	0.044839	0.052997	0.058392
	Corrected Percentage		0.65	0.74	0.78	0.77	0.71	0.62	0.56	0.60	0.84	1.37
AB-2	A	1	0.624493	0.704709	0.734784	0.700991	0.609276	0.494089	0.425702	0.504102	0.844562	1.54811
		2	0.633072	0.713689	0.743231	0.708012	0.614472	0.498009	0.430206	0.51231	0.860253	1.574568
		3	0.634312	0.716487	0.746771	0.710881	0.614937	0.494515	0.421992	0.499743	0.844809	1.558307
	B	1	0.611615	0.689371	0.714662	0.67184	0.565119	0.42765	0.330257	0.375322	0.682818	1.360189
		2	0.613811	0.689918	0.713724	0.67025	0.564425	0.42985	0.337174	0.387843	0.700179	1.379673
		3	0.602479	0.67842	0.702218	0.658722	0.552711	0.41772	0.324505	0.374834	0.687529	1.368618
	C	1	0.6492	0.735225	0.770065	0.739773	0.650625	0.538228	0.474361	0.560322	0.911611	1.627749
		2	0.650731	0.735576	0.768363	0.735198	0.64281	0.527589	0.462446	0.54977	0.905791	1.630057
		3	0.647962	0.73321	0.766995	0.735356	0.644707	0.530916	0.466201	0.552366	0.905444	1.625355
	Average		0.63	0.71	0.74	0.70	0.61	0.48	0.41	0.48	0.82	1.52
	Standard Deviation		0.017806	0.021605	0.025692	0.030679	0.037489	0.047369	0.061022	0.078326	0.097766	0.116297
	Corrected Percentage		0.56	0.63	0.66	0.63	0.54	0.43	0.36	0.43	0.73	1.35
AB-3	A	1	0.670678	0.763703	0.80629	0.783321	0.699172	0.587505	0.518441	0.592477	0.925437	1.618218
		2	0.666821	0.757715	0.79858	0.774977	0.691899	0.583292	0.518986	0.598547	0.936203	1.630851
		3	0.666828	0.758768	0.800476	0.777049	0.693012	0.582058	0.514196	0.589648	0.923735	1.61668
	B	1	0.639477	0.727286	0.76631	0.741052	0.654702	0.538883	0.461515	0.521577	0.83537	1.507195
		2	0.646603	0.73436	0.772989	0.747276	0.660864	0.545892	0.470732	0.534618	0.853741	1.531817
		3	0.639913	0.726204	0.763462	0.736662	0.649591	0.534432	0.459552	0.524147	0.844354	1.523825
	C	1	0.666144	0.757627	0.802435	0.786013	0.711662	0.610295	0.547545	0.618932	0.936411	1.600043
		2	0.661382	0.752498	0.796333	0.778103	0.701115	0.596556	0.53077	0.600328	0.918467	1.586438

		3	0.662231	0.753906	0.798548	0.78122	0.704889	0.600288	0.533278	0.600095	0.914008	1.576847
	Average		0.66	0.75	0.79	0.77	0.69	0.58	0.51	0.58	0.90	1.58
	Standard Deviation		0.012308	0.014555	0.016841	0.019685	0.023539	0.028329	0.033268	0.037655	0.041504	0.045463
	Corrected Percentage		0.56	0.63	0.67	0.65	0.58	0.49	0.43	0.49	0.76	1.34
AB-4	A	1	0.794322	0.900788	0.962044	0.965429	0.915722	0.845106	0.818128	0.926627	1.274996	1.952177
		2	0.788018	0.893214	0.953727	0.957164	0.908437	0.839573	0.81453	0.924219	1.272105	1.946714
		3	0.787125	0.891728	0.951512	0.95417	0.904745	0.835401	0.810269	0.920517	1.269995	1.947708
	B	1	0.835847	0.952564	1.025937	1.042582	1.005567	0.945097	0.923085	1.028655	1.363804	2.016288
		2	0.830074	0.944985	1.016808	1.032579	0.995761	0.936765	0.91743	1.026489	1.36527	2.020786
		3	0.831786	0.947424	1.02123	1.04054	1.008704	0.955612	0.941891	1.054633	1.393314	2.043353
	C	1	0.790114	0.892211	0.950031	0.951888	0.902937	0.834586	0.809255	0.915566	1.254457	1.912599
		2	0.78277	0.882876	0.938621	0.938531	0.888087	0.818982	0.7939	0.901645	1.243229	1.905249
		3	0.792733	0.893773	0.949858	0.949497	0.898484	0.829203	0.805289	0.916457	1.264199	1.93483
	Average		0.80	0.91	0.97	0.98	0.94	0.87	0.85	0.96	1.30	1.96
	Standard Deviation		0.021992	0.028377	0.035756	0.043547	0.050792	0.056655	0.060168	0.060465	0.056922	0.049878
	Corrected Percentage		0.74	0.84	0.90	0.91	0.87	0.81	0.79	0.89	1.20	1.82
AB-5	A	1	0.773819	0.879034	0.944733	0.960088	0.930271	0.88615	0.887906	1.020658	1.380426	2.048595
		2	0.773643	0.877153	0.94092	0.95468	0.924358	0.881561	0.887016	1.026004	1.394098	2.071493
		3	0.760004	0.862469	0.925644	0.939033	0.908176	0.864216	0.867544	1.003341	1.367361	2.040146
	B	1	0.795049	0.901971	0.971763	0.993736	0.971948	0.935169	0.940623	1.070622	1.419386	2.068267
		2	0.798359	0.904697	0.973796	0.995262	0.973482	0.937487	0.944642	1.077294	1.429589	2.082688
		3	0.79968	0.905263	0.973937	0.995649	0.975049	0.941251	0.951397	1.087297	1.4422	2.09613
	C	1	0.767386	0.866793	0.927051	0.938757	0.908557	0.868273	0.8783	1.023258	1.398012	2.082253
		2	0.774591	0.874035	0.934379	0.94662	0.917915	0.880592	0.895294	1.046549	1.428573	2.119707
		3	0.765558	0.864938	0.924792	0.935659	0.904286	0.862713	0.871723	1.016476	1.392494	2.079965
	Average		0.78	0.88	0.95	0.96	0.93	0.90	0.90	1.04	1.41	2.08
	Standard Deviation		0.015044	0.017516	0.021218	0.025741	0.030082	0.033031	0.033315	0.030293	0.025224	0.023793
	Corrected Percentage		0.72	0.81	0.87	0.89	0.86	0.82	0.83	0.96	1.29	1.91

AB-6	A	1	1.194102	1.396874	1.587792	1.754269	1.888279	2.003033	2.130949	2.326459	2.654214	3.171128
		2	1.186355	1.387542	1.577974	1.7456	1.88262	2.002076	2.135654	2.336636	2.668152	3.185528
		3	1.180717	1.380483	1.569867	1.736929	1.873699	1.992767	2.125353	2.324554	2.653807	3.169185
	B	1	1.202589	1.405177	1.594383	1.757094	1.884995	1.991117	2.108064	2.290659	2.604366	3.107222
		2	1.191122	1.392917	1.582062	1.745576	1.875098	1.983409	2.102592	2.286785	2.600658	3.101463
		3	1.186173	1.386647	1.574835	1.738049	1.868141	1.97792	2.0993	2.286173	2.603026	3.107158
	C	1	1.206941	1.401287	1.580987	1.734341	1.854882	1.956911	2.073602	2.259353	2.578505	3.087764
		2	1.205425	1.396497	1.572233	1.722081	1.841261	1.945769	2.070019	2.268732	2.605251	3.133872
		3	1.207176	1.398535	1.574885	1.725571	1.845597	1.950793	2.07552	2.274585	2.61144	3.140376
	Average		1.20	1.39	1.58	1.74	1.87	1.98	2.10	2.29	2.62	3.13
	Standard Deviation		0.010162	0.007848	0.007826	0.011899	0.017266	0.021935	0.025223	0.0277	0.030723	0.035259
	Corrected Percentage		1.10	1.29	1.46	1.61	1.73	1.83	1.94	2.12	2.42	2.90
AB-7	A	1	1.174086	1.382601	1.579914	1.7537	1.895881	2.019482	2.156204	2.359674	2.693732	3.214501
		2	1.170825	1.37912	1.576888	1.751943	1.896048	2.021731	2.159842	2.363085	2.694572	3.210072
		3	1.165007	1.372081	1.568385	1.742093	1.885525	2.011761	2.152058	2.359174	2.695746	3.21655
	B	1	1.232206	1.448866	1.656845	1.844333	2.002702	2.143623	2.295751	2.508629	2.841455	3.346516
		2	1.20354	1.415527	1.618894	1.802064	1.956739	2.094812	2.245336	2.458461	2.794277	3.306015
		3	1.202453	1.414463	1.61883	1.804478	1.963452	2.107847	2.266526	2.489109	2.834534	3.354207
	C	1	1.194135	1.404239	1.606079	1.787764	1.940681	2.076546	2.224461	2.434544	2.766508	3.272896
		2	1.193939	1.403338	1.60371	1.783216	1.933594	2.067097	2.213577	2.423909	2.758396	3.269703
		3	1.198893	1.409329	1.61241	1.796563	1.953178	2.093672	2.246404	2.460605	2.795134	3.301851
	Average		1.19	1.40	1.60	1.79	1.94	2.07	2.22	2.43	2.76	3.28
	Standard Deviation		0.020637	0.023386	0.027132	0.032111	0.038255	0.045206	0.051919	0.056902	0.058432	0.055184
	Corrected Percentage		1.10	1.29	1.47	1.64	1.78	1.90	2.04	2.23	2.54	3.01
AB-8	A	1	1.937084	2.180992	2.4294	2.677629	2.916008	3.146207	3.372887	3.610918	3.878026	4.188643
		2	1.897614	2.135228	2.377606	2.620981	2.856683	3.086987	3.316744	3.560507	3.835186	4.154079
		3	1.889379	2.128365	2.371928	2.616196	2.852636	3.083962	3.315618	3.562817	3.843047	4.169886
	B	1	1.777118	1.991885	2.204817	2.413052	2.611607	2.807267	3.010921	3.242874	3.525532	3.876947

		2	1.750561	1.958152	2.165844	2.372559	2.574562	2.778823	2.99523	3.242365	3.540404	3.904927
		3	1.710251	1.916571	2.123548	2.32975	2.53122	2.734984	2.951306	3.199346	3.500022	3.86988
	C	1	1.818205	2.036454	2.25355	2.465647	2.665842	2.858652	3.053418	3.270801	3.535768	3.869792
		2	1.762314	1.973572	2.184148	2.391773	2.591658	2.790146	2.997445	3.23369	3.5217	3.879694
		3	1.726665	1.935862	2.145029	2.351835	2.551617	2.751189	2.961573	3.203729	3.500752	3.870235
	Average		1.81	2.03	2.25	2.47	2.68	2.89	3.11	3.35	3.63	3.98
	Standard Deviation		0.082105	0.096887	0.113914	0.132183	0.149593	0.164102	0.17327	0.174849	0.166637	0.146793
	Corrected Percentage		1.60	1.79	1.99	2.18	2.37	2.55	2.74	2.95	3.20	3.51
AB-9	A	1	1.343906	1.551102	1.776413	2.025683	2.302095	2.619895	2.990727	3.428927	3.939932	4.514575
		2	1.306113	1.509931	1.732896	1.98091	2.25716	2.575928	2.949087	3.391394	3.908667	4.491824
		3	1.280358	1.478751	1.695147	1.936239	2.206772	2.522786	2.897908	3.348099	3.87956	4.482499
	B	1	1.477769	1.699101	1.937292	2.193824	2.466092	2.762671	3.091538	3.466701	3.89811	4.385576
		2	1.414298	1.623432	1.848921	2.093852	2.358105	2.652796	2.988393	3.380532	3.839167	4.361997
		3	1.383924	1.58904	1.811161	2.053846	2.317532	2.613763	2.953184	3.351279	3.817513	4.348921
	C	1	1.48423	1.708137	1.950998	2.21482	2.497088	2.806321	3.149882	3.540816	3.987184	4.485779
		2	1.455102	1.671709	1.907513	2.165758	2.445313	2.755637	3.104464	3.504568	3.963283	4.476615
		3	1.4472	1.660517	1.89197	2.145459	2.420986	2.729188	3.078889	3.483552	3.95068	4.47577
	Average		1.40	1.61	1.84	2.09	2.36	2.67	3.02	3.43	3.91	4.45
	Standard Deviation		0.075116	0.08311	0.091136	0.097581	0.100096	0.096495	0.085718	0.069664	0.056992	0.062911
	Corrected Percentage		1.21	1.40	1.59	1.81	2.05	2.31	2.62	2.97	3.39	3.85
AB-10	A	1	1.3728	1.603734	1.854717	2.126744	2.417519	2.737782	3.098194	3.515463	4.00005	4.548271
		2	1.336791	1.558672	1.798017	2.057151	2.336404	2.649496	3.010336	3.438272	3.945134	4.526427
		3	1.285545	1.501234	1.734383	1.987545	2.261516	2.570434	2.928858	3.35697	3.867674	4.457577
	B	1	1.333464	1.541927	1.765815	2.008803	2.273545	2.575798	2.93116	3.359319	3.87116	4.46063
		2	1.293997	1.49646	1.715515	1.955786	2.220973	2.527667	2.891942	3.333625	3.863368	4.474624
		3	1.282984	1.484291	1.702348	1.942243	2.20817	2.517045	2.884928	3.331329	3.866249	4.482211
	C	1	1.395078	1.61803	1.86209	2.128774	2.415151	2.729644	3.079795	3.479564	3.938871	4.457066
		2	1.341499	1.556008	1.79087	2.048288	2.326808	2.636587	2.987175	3.394178	3.868419	4.409125

		3	1.299682	1.507202	1.73586	1.989377	2.267884	2.582525	2.942844	3.363182	3.85155	4.402992
	Average		1.33	1.54	1.77	2.03	2.30	2.61	2.97	3.40	3.90	4.47
	Standard Deviation		0.039641	0.047868	0.057855	0.068216	0.076581	0.080364	0.077143	0.066197	0.051449	0.04753
	Corrected Percentage		1.16	1.35	1.56	1.78	2.02	2.29	2.61	2.98	3.42	3.92
AB-11	A	1	1.246234	1.462931	1.718262	2.021741	2.37526	2.788616	3.26282	3.798621	4.384747	4.994732
		2	1.20623	1.413681	1.657123	1.946743	2.286475	2.688716	3.15769	3.696892	4.296679	4.93042
		3	1.188756	1.391239	1.627754	1.908654	2.238595	2.630805	3.09077	3.623169	4.21923	4.85252
	B	1	1.284375	1.517542	1.787368	2.100719	2.457385	2.866762	3.330886	3.8524	4.422349	5.016932
		2	1.250413	1.475283	1.735697	2.039159	2.386606	2.788582	3.24866	3.771049	4.348165	4.956761
		3	1.212404	1.425249	1.670458	1.956918	2.288169	2.677345	3.1308	3.654842	4.242914	4.871141
	C	1	1.217193	1.429359	1.676373	1.967716	2.306779	2.705805	3.169299	3.701394	4.293518	4.92072
		2	1.178131	1.380401	1.615354	1.893774	2.221444	2.613026	3.075325	3.613831	4.220154	4.868268
		3	1.150345	1.345105	1.570697	1.839184	2.158407	2.544917	3.007002	3.550456	4.165735	4.824409
	Average		1.21	1.43	1.67	1.96	2.30	2.70	3.16	3.70	4.29	4.92
	Standard Deviation		0.040864	0.052634	0.0663	0.08032	0.092367	0.100364	0.102364	0.097203	0.084741	0.066125
	Corrected Percentage		1.07	1.26	1.48	1.73	2.03	2.38	2.79	3.26	3.79	4.34

Table 23. Wall DE, Medium Silt to Coarse Silt Sizes.

Sample Name	Run	Reading	17.378008	19.952623	22.908677	26.30268	30.199517	34.673685	39.810717	45.708819	52.480746	60.255959
DE-1	A	1	0.736223	0.803792	0.816459	0.759554	0.638921	0.488577	0.379296	0.411795	0.703204	1.357454
		2	0.73542	0.802718	0.814453	0.755957	0.633456	0.48167	0.372267	0.406655	0.702106	1.361962
		3	0.748768	0.815335	0.825948	0.766282	0.643032	0.491356	0.383246	0.42019	0.719151	1.382726
	B	1	0.744115	0.816646	0.834939	0.783604	0.667602	0.520438	0.412728	0.445512	0.736497	1.39011
		2	0.755061	0.824689	0.839877	0.786271	0.670068	0.525802	0.424591	0.467263	0.770427	1.436582
		3	0.748528	0.818526	0.833977	0.780195	0.662839	0.515751	0.409481	0.444603	0.73806	1.393363
	C	1	0.775458	0.840096	0.845743	0.7788	0.648045	0.491555	0.384781	0.432222	0.752379	1.446734

		2	0.775156	0.839857	0.845127	0.77743	0.645837	0.488955	0.382964	0.433076	0.758115	1.459158
		3	0.773135	0.839132	0.846948	0.782765	0.654909	0.501043	0.396227	0.444634	0.764375	1.456569
	Average		0.75	0.82	0.83	0.77	0.65	0.50	0.39	0.43	0.74	1.41
	Standard Deviation		0.016155	0.014725	0.012342	0.011091	0.01296	0.016063	0.017826	0.019039	0.025531	0.040502
	Corrected Percentage		0.66	0.72	0.73	0.68	0.57	0.44	0.35	0.38	0.65	1.24
DE-2	A	1	0.837795	0.922464	0.946791	0.897022	0.782427	0.643118	0.556554	0.628423	0.975826	1.695329
		2	0.844871	0.928012	0.951042	0.900854	0.787289	0.650755	0.568622	0.646146	0.999564	1.72412
		3	0.844111	0.927809	0.951414	0.90168	0.78823	0.651252	0.567976	0.643725	0.995188	1.718545
	B	1	0.841529	0.922457	0.945002	0.89633	0.785684	0.652084	0.570947	0.645468	0.990327	1.70067
		2	0.857828	0.939748	0.962553	0.913595	0.802597	0.669258	0.589708	0.667724	1.018194	1.735792
		3	0.846547	0.929385	0.954698	0.909565	0.802971	0.673731	0.596987	0.675683	1.024021	1.736211
	C	1	0.846411	0.930294	0.95149	0.895849	0.772684	0.622422	0.523553	0.583158	0.919988	1.632186
		2	0.835082	0.915957	0.934298	0.876564	0.752784	0.603929	0.508697	0.573885	0.917407	1.636098
		3	0.839656	0.918664	0.934658	0.874732	0.749981	0.602601	0.512372	0.586619	0.942769	1.675941
	Average		0.84	0.93	0.95	0.90	0.78	0.64	0.56	0.63	0.98	1.69
	Standard Deviation		0.006584	0.007123	0.009124	0.013135	0.019008	0.02596	0.03265	0.037724	0.04014	0.039647
	Corrected Percentage		0.71	0.78	0.80	0.76	0.66	0.54	0.47	0.53	0.82	1.43
DE-3	A	1	0.815759	0.881921	0.889807	0.827929	0.708499	0.574049	0.503559	0.602684	0.986139	1.745319
		2	0.817365	0.883694	0.893155	0.834404	0.719294	0.589634	0.523253	0.624551	1.007092	1.76152
		3	0.818044	0.883887	0.89236	0.832012	0.714677	0.582212	0.512702	0.610975	0.991291	1.745226
	B	1	0.760087	0.812345	0.80242	0.717788	0.570567	0.403469	0.297577	0.36201	0.716898	1.460394
		2	0.754308	0.805639	0.79599	0.712949	0.568123	0.403107	0.29742	0.358688	0.706234	1.438786
		3	0.758446	0.809889	0.801156	0.720002	0.577868	0.415832	0.312393	0.373748	0.717627	1.441618
	C	1	0.780408	0.833008	0.820586	0.731316	0.579126	0.40892	0.303597	0.372692	0.734804	1.484837
		2	0.776761	0.829778	0.81792	0.728911	0.576139	0.40411	0.295748	0.361188	0.720206	1.469097
		3	0.776007	0.830228	0.82033	0.733922	0.583914	0.414089	0.306406	0.370054	0.724169	1.465028
	Average		0.78	0.84	0.84	0.76	0.62	0.47	0.37	0.45	0.81	1.56
	Standard Deviation		0.026259	0.032942	0.041953	0.054084	0.069304	0.087057	0.105729	0.123401	0.137734	0.146089

	Corrected Percentage		0.75	0.81	0.80	0.73	0.60	0.45	0.36	0.43	0.78	1.50
DE-4	A	1	0.907739	0.986564	1.007209	0.959405	0.856425	0.741629	0.692732	0.81146	1.205201	1.955672
		2	0.904107	0.981981	1.002557	0.955857	0.855218	0.743812	0.698824	0.821253	1.217627	1.968874
		3	0.910942	0.990509	1.012709	0.967164	0.866847	0.75484	0.708543	0.829398	1.224464	1.975144
	B	1	0.883151	0.959747	0.978463	0.928174	0.820699	0.697685	0.635923	0.737691	1.11301	1.84789
		2	0.892839	0.97229	0.994227	0.947044	0.841817	0.719466	0.656166	0.753942	1.123041	1.850188
		3	0.892157	0.971683	0.994505	0.949151	0.846552	0.727217	0.666495	0.765221	1.132238	1.853105
	C	1	0.871737	0.950158	0.97458	0.933374	0.836617	0.723397	0.666943	0.765758	1.126789	1.83527
		2	0.882436	0.962782	0.988496	0.947662	0.850198	0.735392	0.677202	0.775271	1.13765	1.849981
		3	0.888095	0.967463	0.992743	0.952509	0.856967	0.74535	0.691081	0.792947	1.157978	1.870917
	Average		0.89	0.97	0.99	0.95	0.85	0.73	0.68	0.78	1.16	1.89
	Standard Deviation		0.012973	0.013156	0.012492	0.01215	0.013596	0.01723	0.023048	0.031803	0.043975	0.058591
	Corrected Percentage		0.87	0.94	0.97	0.92	0.82	0.71	0.66	0.76	1.13	1.84
DE-5	A	1	1.159881	1.306365	1.418169	1.485054	1.51136	1.527407	1.588924	1.772041	2.156303	2.799751
		2	1.17292	1.318124	1.427956	1.492862	1.51832	1.535897	1.602277	1.793827	2.189225	2.84443
		3	1.174102	1.321431	1.433475	1.500256	1.526762	1.544109	1.608498	1.795782	2.184202	2.82968
	B	1	1.13713	1.275007	1.378924	1.439577	1.461745	1.475221	1.534699	1.715312	2.096698	2.738832
		2	1.150647	1.290708	1.397349	1.46135	1.487379	1.505055	1.56869	1.752933	2.136764	2.779386
		3	1.156968	1.300032	1.410107	1.477147	1.50488	1.522327	1.583582	1.763388	2.141009	2.776104
	C	1	1.158338	1.303891	1.415675	1.483706	1.512258	1.531332	1.596195	1.782768	2.170941	2.819555
		2	1.16112	1.305607	1.416987	1.485802	1.516698	1.539781	1.609952	1.80226	2.195131	2.845637
		3	1.163259	1.310473	1.423814	1.493208	1.522836	1.542659	1.60787	1.794172	2.180961	2.826434
	Average		1.16	1.30	1.41	1.48	1.51	1.52	1.59	1.77	2.16	2.81
	Standard Deviation		0.011161	0.014073	0.016661	0.018752	0.020456	0.0222	0.024479	0.027726	0.031899	0.035984
	Corrected Percentage		1.12	1.25	1.36	1.42	1.45	1.47	1.53	1.71	2.08	2.70
DE-6	A	1	1.156802	1.311629	1.432839	1.51077	1.550116	1.58185	1.661875	1.866248	2.273907	2.941606
		2	1.149213	1.300337	1.417599	1.491828	1.528325	1.558492	1.638563	1.844809	2.25628	2.929679

		3	1.167609	1.322249	1.443884	1.522912	1.56377	1.596897	1.677486	1.880896	2.285424	2.947315
	B	1	1.094119	1.235333	1.344018	1.410951	1.441421	1.466545	1.54227	1.744321	2.151101	2.818922
		2	1.09286	1.233928	1.342529	1.409259	1.439129	1.46296	1.536594	1.735975	2.140133	2.806308
		3	1.113244	1.25501	1.36297	1.427892	1.455531	1.477933	1.552406	1.756043	2.168176	2.845083
	C	1	1.122202	1.276915	1.398769	1.477171	1.515791	1.544635	1.618796	1.813621	2.207731	2.858576
		2	1.126577	1.280096	1.401026	1.479424	1.519656	1.552273	1.63246	1.835097	2.237607	2.895616
		3	1.120885	1.271709	1.389763	1.4651	1.501969	1.530621	1.606086	1.80329	2.200062	2.852875
	Average		1.13	1.28	1.39	1.47	1.50	1.53	1.61	1.81	2.21	2.88
	Standard Deviation		0.026285	0.031425	0.036634	0.041711	0.046243	0.049897	0.052309	0.053367	0.053359	0.053091
	Corrected Percentage		1.10	1.25	1.36	1.43	1.47	1.49	1.57	1.77	2.16	2.81
DE-7	A	1	1.707967	1.889229	2.078851	2.272019	2.461898	2.653888	2.859602	3.101962	3.406429	3.79194
		2	1.703091	1.886358	2.078727	2.274321	2.464712	2.653797	2.852367	3.083593	3.374348	3.745803
		3	1.75551	1.94243	2.136835	2.332953	2.523003	2.712071	2.912355	3.148069	3.446003	3.825503
	B	1	1.704905	1.886249	2.078314	2.27686	2.474317	2.674018	2.884183	3.124077	3.416176	3.778163
		2	1.735257	1.91244	2.098965	2.292076	2.486227	2.686651	2.902946	3.154616	3.462591	3.840977
		3	1.726576	1.90194	2.086934	2.27869	2.471214	2.668923	2.880549	3.125064	3.423739	3.792012
	C	1	1.738843	1.91602	2.097924	2.279168	2.453437	2.627099	2.813452	3.037001	3.324738	3.696718
		2	1.742087	1.916534	2.097415	2.280243	2.458991	2.639405	2.832939	3.061304	3.348181	3.710864
		3	1.735485	1.908364	2.087735	2.268934	2.445762	2.623801	2.814526	3.039892	3.324268	3.686246
	Average		1.73	1.91	2.09	2.28	2.47	2.66	2.86	3.10	3.39	3.76
	Standard Deviation		0.0185	0.01822	0.018311	0.019501	0.022801	0.028702	0.036399	0.044423	0.051287	0.056119
	Corrected Percentage		1.62	1.79	1.97	2.15	2.32	2.50	2.69	2.91	3.19	3.54
DE-8	A	1	1.676808	1.83958	2.007559	2.177942	2.346994	2.522757	2.719613	2.962754	3.279378	3.688849
		2	1.664059	1.830663	2.00197	2.17351	2.339974	2.508604	2.694233	2.923582	3.226226	3.624332
		3	1.681602	1.848539	2.020739	2.193779	2.362349	2.533772	2.722843	2.955879	3.261386	3.659849
	B	1	1.680976	1.849861	2.023952	2.198468	2.367406	2.536733	2.71921	2.939107	3.224168	3.596419
		2	1.692237	1.859497	2.030406	2.200354	2.364086	2.528627	2.708077	2.927855	3.216311	3.595117
		3	1.689105	1.861259	2.037904	2.213301	2.380745	2.546084	2.722633	2.93567	3.214155	3.580964

	C	1	1.705089	1.857722	2.011698	2.163082	2.308331	2.456	2.621731	2.831301	3.112392	3.486057
		2	1.689866	1.843211	1.999666	2.154977	2.304651	2.455878	2.622606	2.829164	3.102546	3.464271
		3	1.707812	1.863662	2.020809	2.174555	2.320759	2.467734	2.631174	2.83722	3.114302	3.484491
	Average		1.69	1.85	2.02	2.18	2.34	2.51	2.68	2.90	3.19	3.58
	Standard Deviation		0.013664	0.011137	0.012927	0.019179	0.027441	0.036397	0.045589	0.055534	0.067134	0.080509
	Corrected Percentage		1.57	1.72	1.88	2.04	2.18	2.34	2.50	2.71	2.98	3.33

Table 24. Wall FG, Medium Silt to Coarse Silt Sizes.

Sample Name	Run	Reading	17.378008	19.952623	22.908677	26.30268	30.199517	34.673685	39.810717	45.708819	52.480746	60.255959
FG-1	A	1	0.943199	1.012762	1.032554	0.991908	0.9007	0.796247	0.74816	0.850187	1.204652	1.894101
		2	0.951023	1.020485	1.040636	1.001183	0.912239	0.811164	0.767318	0.874033	1.232989	1.925786
		3	0.96165	1.029625	1.047151	1.004456	0.912588	0.809884	0.766554	0.876304	1.240558	1.939995
	B	1	0.963733	1.029658	1.046425	1.005293	0.918268	0.824442	0.794107	0.920337	1.302845	2.019661
		2	0.968554	1.036286	1.054976	1.015369	0.9289	0.834357	0.802164	0.925947	1.306137	2.021371
		3	0.970306	1.038271	1.057643	1.019101	0.933758	0.839844	0.807044	0.928304	1.303738	2.012268
	C	1	0.966672	1.032885	1.045907	0.995752	0.894625	0.783389	0.736247	0.851191	1.2326	1.960679
		2	0.964348	1.029201	1.040151	0.987267	0.883066	0.768815	0.719261	0.832951	1.214871	1.945708
		3	0.972428	1.036837	1.047212	0.994057	0.89039	0.777912	0.73155	0.849638	1.236373	1.971147
	Average		0.96	1.03	1.05	1.00	0.91	0.81	0.76	0.88	1.25	1.97
	Standard Deviation		0.009509	0.00829	0.007605	0.010655	0.017349	0.025255	0.032225	0.037016	0.040189	0.044742
	Corrected Percentage		0.88	0.95	0.96	0.92	0.83	0.74	0.70	0.81	1.15	1.81
FG-2	A	1	1.073887	1.144671	1.171539	1.146851	1.081347	1.010809	0.999551	1.13328	1.503794	2.182471
		2	1.077007	1.148594	1.177213	1.155048	1.092242	1.023641	1.012357	1.143038	1.506982	2.175954
		3	1.068604	1.139773	1.169013	1.148356	1.087689	1.021746	1.013658	1.148177	1.5165	2.189979
	B	1	1.063635	1.12927	1.149447	1.11784	1.047602	0.977148	0.97286	1.120816	1.51072	2.209663
		2	1.061627	1.128684	1.149778	1.117939	1.045799	0.971649	0.962408	1.105262	1.491381	2.189322

		3	1.069545	1.136783	1.157566	1.12503	1.052216	0.978121	0.970511	1.117166	1.509171	2.214082
	C	1	1.053459	1.11952	1.137603	1.099578	1.017497	0.929691	0.904212	1.030009	1.400758	2.087923
		2	1.067169	1.132679	1.149689	1.110415	1.027434	0.939597	0.915329	1.043612	1.417717	2.108295
		3	1.074346	1.138538	1.154713	1.115635	1.034396	0.950195	0.931394	1.066395	1.447169	2.142439
	Average		1.07	1.14	1.16	1.13	1.05	0.98	0.96	1.10	1.48	2.17
	Standard Deviation		0.00733	0.008896	0.012783	0.01923	0.027109	0.034814	0.040611	0.043643	0.044384	0.044278
	Corrected Percentage		1.00	1.07	1.09	1.06	0.99	0.92	0.91	1.04	1.39	2.04
FG-3	A	1	0.984863	1.041793	1.048267	0.997271	0.903525	0.808875	0.786042	0.929113	1.33624	2.080829
		2	0.980952	1.036597	1.041378	0.988635	0.893649	0.798741	0.776781	0.921342	1.329228	2.071926
		3	1.000483	1.056657	1.061148	1.007287	0.910614	0.813945	0.790825	0.935354	1.344402	2.088936
	B	1	0.970197	1.030095	1.041783	0.997805	0.911451	0.822774	0.802528	0.943321	1.342691	2.074635
		2	0.979157	1.03608	1.044071	0.996654	0.908627	0.821621	0.807621	0.959608	1.374154	2.122797
		3	0.985541	1.041506	1.047919	0.998148	0.906781	0.815222	0.795639	0.941669	1.350956	2.096052
	C	1	0.972542	1.029044	1.039569	0.99844	0.920196	0.845371	0.843948	1.00677	1.428315	2.178409
		2	0.976274	1.029977	1.036809	0.991388	0.908875	0.83056	0.827437	0.991275	1.41707	2.174403
		3	0.972716	1.027074	1.035423	0.991991	0.911091	0.832957	0.827532	0.985881	1.403061	2.149785
	Average		0.98	1.04	1.04	1.00	0.91	0.82	0.81	0.96	1.37	2.12
	Standard Deviation		0.00931	0.009271	0.007781	0.005401	0.007113	0.013952	0.022264	0.03048	0.037568	0.042588
	Corrected Percentage		0.94	0.99	1.00	0.95	0.87	0.79	0.77	0.92	1.31	2.02
FG-4	A	1	1.11171	1.191377	1.229856	1.221347	1.178407	1.138652	1.166148	1.343788	1.756332	2.464108
		2	1.10879	1.189157	1.227769	1.218305	1.173002	1.129566	1.152799	1.326865	1.738149	2.448437
		3	1.106932	1.187326	1.226671	1.218599	1.175091	1.133489	1.158091	1.332488	1.742434	2.449216
	B	1	1.108317	1.191667	1.236179	1.235572	1.200808	1.167697	1.198722	1.376044	1.784585	2.48584
		2	1.102077	1.18383	1.225423	1.220608	1.180774	1.142224	1.167951	1.340372	1.744609	2.442445
		3	1.115932	1.197178	1.238218	1.232952	1.192897	1.154419	1.180522	1.35355	1.758538	2.457286
	C	1	1.106278	1.188533	1.230586	1.225517	1.184087	1.142051	1.162058	1.32652	1.721336	2.410159
		2	1.126079	1.209452	1.252524	1.248258	1.207327	1.165549	1.185706	1.350217	1.744669	2.432044
		3	1.113369	1.195736	1.237673	1.232079	1.18964	1.146219	1.164762	1.327916	1.721507	2.408664

	Average		1.11	1.19	1.23	1.23	1.19	1.15	1.17	1.34	1.75	2.44
	Standard Deviation		0.006967	0.007502	0.00847	0.009976	0.011749	0.013372	0.014682	0.016291	0.019489	0.024792
	Corrected Percentage		1.06	1.14	1.18	1.17	1.13	1.09	1.12	1.28	1.66	2.33
FG-5	A	1	1.411513	1.533455	1.632776	1.702162	1.744239	1.78202	1.858297	2.032999	2.369638	2.915473
		2	1.417925	1.537447	1.633222	1.698461	1.736926	1.773009	1.8509	2.031378	2.377824	2.936134
		3	1.424581	1.545324	1.644165	1.714177	1.758279	1.799622	1.880801	2.061159	2.40307	2.95215
	B	1	1.386816	1.499172	1.588455	1.6489	1.685141	1.721897	1.803383	1.990281	2.345486	2.91358
		2	1.3893	1.50008	1.585666	1.640735	1.671252	1.703627	1.783752	1.973171	2.334536	2.911205
		3	1.384217	1.497159	1.585888	1.644279	1.676899	1.708625	1.784093	1.96433	2.312611	2.87429
	C	1	1.424074	1.541838	1.63836	1.706969	1.750193	1.789867	1.866778	2.038695	2.367698	2.901169
		2	1.427658	1.546271	1.644123	1.714573	1.760035	1.802176	1.881416	2.0549	2.383761	2.914319
		3	1.433566	1.552433	1.649888	1.718989	1.761813	1.799684	1.872934	2.039019	2.360173	2.884658
	Average		1.41	1.53	1.62	1.69	1.73	1.76	1.84	2.02	2.36	2.91
	Standard Deviation		0.019246	0.022647	0.027421	0.032968	0.038054	0.041165	0.040636	0.03552	0.027317	0.023715
	Corrected Percentage		1.36	1.47	1.56	1.62	1.66	1.70	1.77	1.94	2.27	2.80
FG-6	A	1	1.481786	1.666391	1.829736	1.961715	2.060921	2.148572	2.26507	2.467902	2.816204	3.351031
		2	1.489562	1.674682	1.839552	1.974247	2.077135	2.168848	2.288693	2.492799	2.838916	3.367135
		3	1.484734	1.670016	1.833958	1.966315	2.065417	2.152002	2.265697	2.463033	2.802439	3.324993
	B	1	1.465896	1.650731	1.820186	1.963807	2.077632	2.178797	2.302482	2.501849	2.834361	3.343452
		2	1.486107	1.673754	1.844679	1.988239	2.100711	2.199846	2.3217	2.520248	2.853338	3.364155
		3	1.487311	1.670439	1.835947	1.97419	2.082759	2.180484	2.304149	2.507819	2.848705	3.368689
	C	1	1.453584	1.633417	1.79637	1.933134	2.041713	2.141634	2.270835	2.48484	2.841786	3.382811
		2	1.462565	1.642633	1.806061	1.943521	2.052798	2.153089	2.281996	2.494844	2.849718	3.387638
		3	1.473415	1.654462	1.818515	1.956009	2.064667	2.163928	2.291929	2.504607	2.860488	3.400637
	Average		1.48	1.66	1.83	1.96	2.07	2.17	2.29	2.49	2.84	3.37
	Standard Deviation		0.012823	0.01491	0.016067	0.016653	0.01746	0.018663	0.019287	0.018618	0.018571	0.023386
	Corrected Percentage		1.44	1.61	1.78	1.91	2.01	2.11	2.23	2.43	2.76	3.27
FG-7	A	1	1.720826	1.89807	2.074203	2.243859	2.401749	2.556266	2.724525	2.935808	3.222213	3.607956

		2	1.70771	1.880061	2.049873	2.212516	2.364155	2.514874	2.683656	2.901238	3.200229	3.603847
		3	1.719324	1.892548	2.063679	2.228053	2.381734	2.534725	2.705897	2.925913	3.227169	3.632416
	B	1	1.713975	1.887088	2.058182	2.223056	2.378045	2.53302	2.706305	2.92797	3.230226	3.636362
		2	1.735765	1.910104	2.084172	2.254331	2.416896	2.581247	2.76435	2.994296	3.300779	3.704589
		3	1.736835	1.912015	2.084791	2.250623	2.405533	2.559316	2.730441	2.949112	3.247481	3.648538
	C	1	1.739946	1.922593	2.103578	2.277128	2.437576	2.593293	2.762007	2.974445	3.264402	3.657096
		2	1.736588	1.916211	2.095495	2.269423	2.43277	2.59373	2.768888	2.986931	3.278981	3.667678
		3	1.733735	1.911605	2.08876	2.260132	2.420529	2.578265	2.750376	2.966247	3.257834	3.648359
	Average		1.73	1.90	2.08	2.25	2.40	2.56	2.73	2.95	3.25	3.65
	Standard Deviation		0.011816	0.014474	0.017901	0.021735	0.025392	0.028386	0.030361	0.031259	0.03124	0.030687
	Corrected Percentage		1.62	1.79	1.95	2.11	2.26	2.41	2.57	2.78	3.05	3.43

Table 25. Wall AB, Very Fine Sand to Fine Sand Sizes.

Sample Name	Run	Reading	69.183097	79.432823	91.201084	104.712855	120.226443	138.038426	158.489319	181.970086	208.929613	239.883292
AB-1	A	1	2.594256	4.006182	5.698522	7.438051	8.987394	10.048458	10.439231	10.064079	8.964251	7.351762
		2	2.603136	4.020647	5.71759	7.459616	9.008749	10.067037	10.453291	10.073184	8.96878	7.352569
		3	2.596623	4.00875	5.701939	7.442326	8.991796	10.051786	10.440283	10.062071	8.958784	7.342663
	B	1	2.621157	4.012411	5.68637	7.414171	8.959686	10.023151	10.418375	10.045166	8.942605	7.322968
		2	2.622369	4.007423	5.67169	7.38862	8.925405	9.986358	10.388257	10.031352	8.952424	7.357942
		3	2.6818	4.092848	5.778483	7.505024	9.034237	10.068349	10.425596	10.014141	8.879821	7.241586
	C	1	2.717854	4.119091	5.785956	7.487225	8.989569	10.002775	10.350831	9.944754	8.828381	7.214598
		2	2.721419	4.111875	5.768522	7.462283	8.961043	9.975087	10.327934	9.929249	8.821356	7.215333
		3	2.742804	4.141032	5.801584	7.493727	8.984954	9.986949	10.325544	9.913979	8.797055	7.187855
	Average		2.66	4.06	5.73	7.45	8.98	10.02	10.40	10.01	8.90	7.29
	Standard Deviation		0.059982	0.056883	0.048916	0.038135	0.03117	0.036774	0.050228	0.06257	0.069979	0.070875
	Corrected Percentage		2.24	3.42	4.83	6.27	7.56	8.44	8.75	8.42	7.49	6.13
AB-2	A	1	2.673783	4.184682	5.972024	7.789617	9.390205	10.465928	10.830789	10.392741	9.202492	7.491114
		2	2.712518	4.234248	6.027934	7.8447	9.435773	10.493566	10.833413	10.367304	9.149912	7.4179

		3	2.69727	4.220848	6.015909	7.832555	9.422062	10.4785	10.819987	10.361072	9.157125	7.442542
	B	1	2.473321	3.991386	5.809223	7.679819	9.352269	10.508808	10.954441	10.583681	9.439016	7.744457
		2	2.490661	4.001867	5.808938	7.667188	9.328552	10.478569	10.924154	10.559708	9.425418	7.741034
		3	2.482782	3.99862	5.811277	7.675242	9.341894	10.496258	10.945296	10.583547	9.451376	7.768156
	C	1	2.764437	4.279739	6.059555	7.85408	9.415562	10.442028	10.755622	10.275583	9.058538	7.338095
		2	2.777452	4.304132	6.093553	7.893179	9.453575	10.472553	10.773504	10.278692	9.047512	7.316625
		3	2.767844	4.290311	6.077431	7.87766	9.44193	10.46746	10.77643	10.288996	9.062923	7.333629
	Average		2.65	4.17	5.96	7.79	9.40	10.48	10.85	10.41	9.22	7.51
	Standard Deviation		0.129659	0.132719	0.120909	0.091944	0.046711	0.019703	0.076695	0.13094	0.170786	0.189219
	Corrected Percentage		2.35	3.70	5.30	6.92	8.35	9.31	9.64	9.25	8.19	6.67
AB-3	A	1	2.728653	4.21823	5.976434	7.75763	9.316703	10.352334	10.684839	10.229235	9.038793	7.343723
		2	2.738476	4.21969	5.96466	7.730688	9.276636	10.306008	10.642384	10.201234	9.033187	7.362233
		3	2.725681	4.212028	5.965742	7.742636	9.299357	10.336304	10.674756	10.229109	9.050858	7.36683
	B	1	2.600884	4.08537	5.85646	7.671269	9.283399	10.383371	10.782294	10.381839	9.227079	7.541714
		2	2.631615	4.12046	5.892398	7.703001	9.305075	10.389954	10.770399	10.351712	9.182107	7.488837
		3	2.625311	4.116129	5.890382	7.703702	9.309131	10.398055	10.783213	10.369308	9.203844	7.513043
	C	1	2.670569	4.116769	5.837306	7.596937	9.157479	10.21984	10.601653	10.208392	9.083352	7.442929
		2	2.665717	4.12482	5.861213	7.636899	9.210652	10.279805	10.659717	10.255222	9.111059	7.4475
		3	2.651108	4.106637	5.84202	7.619876	9.19884	10.275129	10.662613	10.264179	9.123551	7.460977
	Average		2.67	4.15	5.90	7.68	9.26	10.33	10.70	10.28	9.12	7.44
	Standard Deviation		0.049806	0.053707	0.056089	0.056851	0.057757	0.060991	0.066493	0.071374	0.072993	0.070031
	Corrected Percentage		2.26	3.52	5.00	6.52	7.85	8.76	9.07	8.71	7.73	6.31
AB-4	A	1	3.005842	4.392966	6.004523	7.60981	8.983261	9.856565	10.075951	9.580703	8.428837	6.837863
		2	2.996097	4.378452	5.986383	7.59089	8.967397	9.847472	10.076452	9.59173	8.449694	6.866407
		3	3.002131	4.391414	6.007533	7.619885	9.00203	9.883442	10.108118	9.613284	8.456341	6.855667
	B	1	3.034325	4.37819	5.943504	7.50653	8.846815	9.700656	9.915273	9.429229	8.298356	6.736393
		2	3.040667	4.384832	5.948921	7.509599	8.847075	9.698646	9.912575	9.428294	8.301757	6.745549
		3	3.051443	4.377982	5.920444	7.459455	8.779479	9.622603	9.839775	9.370578	8.268626	6.741567
	C	1	2.937766	4.290833	5.869487	7.452766	8.823817	9.720044	9.988478	9.561219	8.486621	6.966805
		2	2.935283	4.293768	5.877883	7.466006	8.841003	9.740073	10.010246	9.583464	8.507956	6.985886
		3	2.974835	4.342683	5.933275	7.522405	8.890739	9.774443	10.020765	9.565018	8.459437	6.912038

	Average		3.00	4.36	5.94	7.53	8.89	9.76	9.99	9.52	8.41	6.85
	Standard Deviation		0.042094	0.040538	0.05014	0.065288	0.078941	0.087019	0.089555	0.089478	0.090856	0.094855
	Corrected Percentage		2.78	4.04	5.51	6.98	8.24	9.05	9.26	8.83	7.79	6.35
AB-5	A	1	3.068882	4.400855	5.944167	7.483924	8.809972	9.667938	9.909163	9.468309	8.392132	6.879885
		2	3.100089	4.437047	5.979717	7.511663	8.822757	9.661613	9.88401	9.430605	8.351596	6.846917
		3	3.063949	4.39655	5.93639	7.468995	8.786644	9.639356	9.882737	9.453689	8.398592	6.911808
	B	1	3.062569	4.365175	5.879229	7.394128	8.702812	9.554161	9.801165	9.37799	8.328877	6.847856
		2	3.081575	4.388384	5.905117	7.419756	8.724213	9.567315	9.802763	9.366878	8.305909	6.816373
		3	3.092952	4.394039	5.901156	7.403244	8.693937	9.525069	9.75306	9.316681	8.263534	6.788724
	C	1	3.11754	4.460546	6.008179	7.543412	8.855632	9.69279	9.909792	9.446637	8.353432	6.832119
		2	3.159494	4.50212	6.042336	7.56253	8.853293	9.666681	9.8621	9.385004	8.28816	6.773881
		3	3.120455	4.469864	6.023858	7.563932	8.87852	9.715039	9.928478	9.459529	8.359091	6.830609
	Average		3.10	4.42	5.96	7.48	8.79	9.63	9.86	9.41	8.34	6.84
	Standard Deviation		0.032028	0.04559	0.058449	0.066895	0.069602	0.066796	0.060054	0.052106	0.045568	0.042505
	Corrected Percentage		2.85	4.07	5.48	6.88	8.09	8.86	9.07	8.66	7.67	6.29
AB-6	A	1	3.908551	4.836315	5.878355	6.875863	7.671168	8.085811	8.017508	7.443975	6.41592	5.10969
		2	3.918979	4.838299	5.868703	6.854232	7.640374	8.051972	7.988663	7.427984	6.418501	5.131564
		3	3.901819	4.822153	5.855466	6.845175	7.636001	8.052172	7.99347	7.437952	6.435036	5.157106
	B	1	3.831867	4.749986	5.78781	6.789426	7.599579	8.039725	8.005589	7.469198	6.476337	5.196824
		2	3.821304	4.732252	5.762059	6.757511	7.566044	8.011231	7.989711	7.472235	6.502062	5.244472
		3	3.830927	4.746429	5.780946	6.780083	7.590057	8.033552	8.007048	7.482215	6.503698	5.23889
	C	1	3.818615	4.741475	5.78132	6.781495	7.587617	8.024119	7.990484	7.461042	6.480743	5.214894
		2	3.882667	4.81796	5.861445	6.854562	7.64296	8.053857	7.990497	7.433254	6.431112	5.153231
		3	3.889268	4.824134	5.866383	6.857354	7.642854	8.050712	7.984801	7.425944	6.422949	5.143999
	Average		3.87	4.79	5.83	6.82	7.62	8.04	8.00	7.45	6.45	5.18
	Standard Deviation		0.040845	0.045617	0.047282	0.043881	0.034661	0.021247	0.01096	0.021055	0.036318	0.048549
	Corrected Percentage		3.57	4.43	5.38	6.30	7.04	7.43	7.39	6.88	5.96	4.78
AB-7	A	1	3.95254	4.877183	5.912761	6.902316	7.690722	8.102104	8.035238	7.46721	6.446761	5.147018
		2	3.940154	4.854808	5.879635	6.860058	7.643532	8.056817	8.00034	7.450673	6.454266	5.178904
		3	3.950851	4.867231	5.890354	6.865634	7.641547	8.047221	7.985806	7.436739	6.447698	5.1857
	B	1	4.052463	4.929779	5.905837	6.83066	7.55576	7.914571	7.811504	7.22854	6.214394	4.938297

		2	4.023042	4.915936	5.911816	6.859238	7.608096	7.988438	7.901749	7.326696	6.310796	5.024349
		3	4.075229	4.965786	5.951309	6.880524	7.605283	7.960593	7.852884	7.266127	6.249829	4.973537
	C	1	3.982466	4.866222	5.853204	6.795316	7.545611	7.936328	7.869876	7.323316	6.341739	5.090527
		2	3.986087	4.877446	5.871589	6.818951	7.571485	7.96081	7.889609	7.336151	6.346868	5.088637
		3	4.008957	4.887126	5.865297	6.795937	7.5329	7.910384	7.832702	7.279504	6.297303	5.052223
	Average		4.00	4.89	5.89	6.85	7.60	7.99	7.91	7.35	6.35	5.08
	Standard Deviation		0.047017	0.036298	0.030212	0.037351	0.052646	0.067837	0.07954	0.086215	0.088327	0.087127
	Corrected Percentage		3.67	4.49	5.41	6.29	6.98	7.33	7.26	6.75	5.83	4.66
AB-8	A	1	4.547491	4.933189	5.306778	5.59921	5.743203	5.674892	5.356217	4.800752	4.034398	3.162477
		2	4.520918	4.913697	5.293745	5.592974	5.745993	5.690349	5.389099	4.85386	4.109762	3.256686
		3	4.546795	4.950499	5.340426	5.645944	5.799618	5.737777	5.423431	4.870177	4.105767	3.2342
	B	1	4.304747	4.787484	5.28415	5.71554	6.003582	6.065003	5.848902	5.354438	4.607307	3.715309
		2	4.341318	4.826736	5.320687	5.746286	6.028471	6.086727	5.871584	5.381586	4.640962	3.753446
		3	4.315464	4.814729	5.327744	5.777036	6.086763	6.173683	5.986246	5.519828	4.796981	3.919295
	C	1	4.282691	4.753249	5.238535	5.657233	5.930199	5.976723	5.750557	5.255596	4.518056	3.641684
		2	4.314289	4.80155	5.297659	5.721741	5.996709	6.044432	5.821324	5.332331	4.603854	3.735846
		3	4.317373	4.8161	5.320923	5.750072	6.027019	6.074791	5.851219	5.36199	4.634392	3.767594
	Average		4.39	4.84	5.30	5.69	5.93	5.95	5.70	5.19	4.45	3.58
	Standard Deviation		0.114129	0.070106	0.030177	0.067714	0.131952	0.192103	0.241099	0.272355	0.28524	0.279533
	Corrected Percentage		3.87	4.28	4.68	5.02	5.23	5.25	5.03	4.58	3.93	3.16
AB-9	A	1	5.128339	5.725714	6.24356	6.596694	6.720377	6.567688	6.125454	5.438056	4.550359	3.580398
		2	5.115918	5.724019	6.251285	6.61118	6.739329	6.590217	6.152912	5.47246	4.594706	3.634305
		3	5.13007	5.761851	6.309226	6.681556	6.812281	6.656031	6.204367	5.506917	4.613307	3.642103
	B	1	4.915597	5.444974	5.919078	6.257867	6.395213	6.27752	5.883043	5.246047	4.407255	3.480579
		2	4.93174	5.499793	6.006831	6.368273	6.516283	6.397368	5.992374	5.339264	4.483329	3.541302
		3	4.92762	5.504267	6.019011	6.386571	6.538731	6.42188	6.017738	5.365854	4.513259	3.577554
	C	1	5.019557	5.542405	5.99833	6.308432	6.408978	6.251622	5.819086	5.151875	4.293603	3.359936
		2	5.026993	5.567581	6.041725	6.368851	6.483664	6.335625	5.906171	5.235235	4.367144	3.419854
		3	5.040098	5.594825	6.081021	6.41531	6.530313	6.37451	5.930041	5.239274	4.350458	3.384738
	Average		5.03	5.60	6.10	6.44	6.57	6.43	6.00	5.33	4.46	3.51
	Standard Deviation		0.086878	0.1145	0.136582	0.148419	0.149721	0.143136	0.132881	0.12276	0.114106	0.106359

	Corrected Percentage		4.36	4.85	5.28	5.58	5.70	5.57	5.20	4.62	3.87	3.04
AB-10	A	1	5.138789	5.716018	6.213255	6.54109	6.631076	6.437762	5.952802	5.231489	4.328277	3.366814
		2	5.157554	5.776917	6.311952	6.66756	6.772883	6.581734	6.08723	5.347708	4.420885	3.43518
		3	5.102971	5.742231	6.301807	6.683453	6.812984	6.640199	6.156961	5.421691	4.49614	3.511306
	B	1	5.102112	5.733739	6.2828	6.652477	6.769573	6.585186	6.091604	5.347402	4.413136	3.419568
		2	5.141198	5.799695	6.375533	6.768709	6.903356	6.727135	6.229863	5.468999	4.505707	3.475409
		3	5.152061	5.811644	6.38623	6.77644	6.907657	6.729171	6.231757	5.472686	4.512035	3.484401
	C	1	5.019241	5.578318	6.074405	6.420922	6.547318	6.399904	5.960582	5.272894	4.385729	3.422333
		2	5.000366	5.592565	6.122973	6.50067	6.651951	6.519968	6.086195	5.394432	4.496095	3.515575
		3	4.99694	5.580407	6.090284	6.439872	6.562264	6.409759	5.971243	5.295359	4.433771	3.50403
	Average		5.09	5.70	6.24	6.61	6.73	6.56	6.09	5.36	4.44	3.46
	Standard Deviation		0.066551	0.094894	0.119806	0.134458	0.136601	0.126901	0.108194	0.085252	0.063488	0.051042
	Corrected Percentage		4.47	5.00	5.48	5.80	5.90	5.76	5.34	4.70	3.90	3.04
AB-11	A	1	5.589235	6.104345	6.476995	6.637337	6.542358	6.183649	5.580006	4.809037	3.928602	3.049764
		2	5.556961	6.108817	6.519394	6.714325	6.647539	6.307104	5.710652	4.936078	4.043792	3.149428
		3	5.48147	6.037972	6.455409	6.660165	6.607763	6.286835	5.715078	4.967534	4.10122	3.225489
	B	1	5.59973	6.109482	6.48391	6.651379	6.564697	6.209341	5.59816	4.805764	3.890909	2.972046
		2	5.559718	6.093404	6.492824	6.683102	6.615315	6.273495	5.670863	4.882737	3.969421	3.050629
		3	5.50026	6.063118	6.491681	6.708158	6.662867	6.339176	5.751115	4.974032	4.068823	3.155396
	C	1	5.544073	6.09806	6.516506	6.723001	6.667815	6.334119	5.735361	4.947407	4.031832	3.109825
		2	5.517258	6.098595	6.543555	6.773021	6.735935	6.413634	5.818588	5.02637	4.100323	3.165964
		3	5.482896	6.070645	6.51855	6.748687	6.712598	6.394675	5.810151	5.035498	4.133956	3.227869
	Average		5.54	6.09	6.50	6.70	6.64	6.30	5.71	4.93	4.03	3.12
	Standard Deviation		0.043844	0.024549	0.026895	0.045643	0.063913	0.076699	0.083006	0.083951	0.083534	0.085628
	Corrected Percentage		4.89	5.37	5.74	5.91	5.86	5.57	5.04	4.35	3.56	2.76

Table 26. Wall DE, Very Fine Sand to Fine Sand Sizes.

Sample Name	Run	Reading	69.183097	79.432823	91.201084	104.712855	120.226443	138.038426	158.489319	181.970086	208.929613	239.883292

DE-1	A	1	2.436984	3.909457	5.669915	7.476465	9.085025	10.189273	10.6025	10.225227	9.099618	7.443657
		2	2.447505	3.924895	5.687888	7.493708	9.098173	10.195929	10.601874	10.218962	9.091063	7.437176
		3	2.471171	3.949467	5.710277	7.510154	9.104824	10.189977	10.581706	10.185207	9.046003	7.385133
	B	1	2.468737	3.939181	5.694981	7.492603	9.086321	10.169959	10.558478	10.158369	9.018435	7.364052
		2	2.525606	4.001361	5.754894	7.541241	9.114646	10.171612	10.530612	10.103913	8.944213	7.279854
		3	2.472003	3.940183	5.69148	7.483405	9.07195	10.153186	10.543705	10.150045	9.019345	7.372896
	C	1	2.571226	4.082618	5.864054	7.662669	9.228486	10.258484	10.575283	10.09967	8.89115	7.185955
		2	2.59097	4.108401	5.892632	7.689246	9.247824	10.266627	10.570498	10.083789	8.868617	7.163218
		3	2.577019	4.082832	5.857995	7.651182	9.213821	10.24375	10.563281	10.091983	8.888115	7.18696
	Average		2.51	3.99	5.76	7.56	9.14	10.20	10.57	10.15	8.99	7.31
	Standard Deviation		0.06004	0.078012	0.088551	0.086607	0.069875	0.04144	0.024129	0.054786	0.089309	0.111494
	Corrected Percentage		2.20	3.51	5.06	6.64	8.03	8.96	9.28	8.91	7.89	6.42
DE-2	A	1	2.834734	4.340667	6.08718	7.817558	9.283303	10.194813	10.390436	9.815072	8.5434	6.821986
		2	2.866019	4.370345	6.110236	7.829269	9.280055	10.175429	10.355876	9.769391	8.492777	6.774883
		3	2.861189	4.368962	6.114732	7.840523	9.296982	10.195002	10.374224	9.783006	8.499452	6.774544
	B	1	2.8246	4.311417	6.039378	7.757272	9.220647	10.140989	10.354028	9.798915	8.545496	6.836841
		2	2.867328	4.35998	6.089658	7.802847	9.253447	10.153259	10.339552	9.756076	8.477054	6.750978
		3	2.85902	4.340662	6.059077	7.763923	9.212076	10.117503	10.317826	9.754228	8.497214	6.789983
	C	1	2.768797	4.277206	6.031606	7.774914	9.258366	10.190703	10.408549	9.853593	8.59835	6.886651
		2	2.777545	4.28791	6.04106	7.780691	9.259677	10.189068	10.40758	9.858104	8.612735	6.912628
		3	2.830895	4.349983	6.103579	7.833265	9.292027	10.194434	10.38385	9.809836	8.548545	6.843682
	Average		2.83	4.33	6.08	7.80	9.26	10.17	10.37	9.80	8.54	6.82
	Standard Deviation		0.037098	0.034319	0.032706	0.031724	0.029998	0.028477	0.030881	0.038443	0.047765	0.054338
	Corrected Percentage		2.39	3.65	5.12	6.57	7.80	8.57	8.74	8.26	7.19	5.75
DE-3	A	1	2.920607	4.449476	6.198292	7.906175	9.325434	10.174251	10.300594	9.664354	8.350961	6.616403
		2	2.928021	4.444723	6.179173	7.872595	9.279377	10.120562	10.246372	9.617965	8.32013	6.605941
		3	2.913931	4.43606	6.178977	7.88268	9.29993	10.149325	10.279162	9.649306	8.344707	6.620254
	B	1	2.639935	4.19891	6.007407	7.802623	9.332357	10.301592	10.546857	10.00993	8.765176	7.058485
		2	2.605875	4.154327	5.957838	7.756623	9.299648	10.290018	10.560644	10.047131	8.81923	7.11882
		3	2.595176	4.126836	5.913216	7.698666	9.235563	10.229377	10.513294	10.020421	8.816912	7.13891
	C	1	2.666479	4.220384	6.015942	7.792543	9.302032	10.255155	10.492237	9.956175	8.719046	7.022793

		2	2.652643	4.211884	6.015843	7.802535	9.322189	10.283463	10.525297	9.989424	8.74765	7.042166
		3	2.638043	4.185803	5.9793	7.759008	9.277008	10.243095	10.496273	9.976633	8.753833	7.066752
	Average		2.73	4.27	6.05	7.81	9.30	10.23	10.44	9.88	8.63	6.92
	Standard Deviation		0.145575	0.133311	0.107035	0.067712	0.030039	0.065119	0.12615	0.180284	0.218312	0.232996
	Corrected Percentage		2.62	4.10	5.81	7.50	8.93	9.82	10.03	9.49	8.28	6.65
DE-4	A	1	3.093619	4.551204	6.195427	7.777594	9.066697	9.806828	9.86529	9.216774	7.945842	6.294544
		2	3.105197	4.558622	6.196551	7.771452	9.053595	9.78864	9.845062	9.198531	7.933697	6.291462
		3	3.111974	4.567162	6.208049	7.786379	9.071056	9.80581	9.857351	9.200739	7.92154	6.263822
	B	1	2.977787	4.438955	6.100627	7.713737	9.045935	9.836758	9.948838	9.347737	8.111215	6.475132
		2	2.971937	4.425914	6.082378	7.692902	9.024933	9.817104	9.930815	9.330666	8.094357	6.458124
		3	2.963872	4.402933	6.042466	7.637808	8.960567	9.753578	9.880384	9.303957	8.09768	6.490017
	C	1	2.929222	4.351421	5.979526	7.574324	8.910158	9.728157	9.887235	9.342432	8.161368	6.567771
		2	2.949572	4.377255	6.008194	7.600824	8.928245	9.732333	9.873895	9.311755	8.116724	6.516366
		3	2.96853	4.391609	6.015696	7.600138	8.918862	9.714892	9.849719	9.283016	8.085929	6.486256
	Average		3.01	4.45	6.09	7.68	9.00	9.78	9.88	9.28	8.05	6.43
	Standard Deviation		0.073252	0.084468	0.08889	0.083641	0.067469	0.044459	0.035776	0.06076	0.091497	0.112424
	Corrected Percentage		2.92	4.32	5.92	7.46	8.74	9.49	9.60	9.01	7.82	6.24
DE-5	A	1	3.71943	4.853892	6.091559	7.235251	8.106093	8.518829	8.383582	7.703967	6.555577	5.141596
		2	3.773624	4.912171	6.145913	7.276502	8.125693	8.511851	8.349179	7.646723	6.483	5.062555
		3	3.747088	4.873618	6.09748	7.223129	8.07437	8.47031	8.324483	7.643068	6.501594	5.100446
	B	1	3.662133	4.808345	6.067254	7.239293	8.141186	8.581382	8.466559	7.798864	6.655513	5.24164
		2	3.700498	4.841547	6.092463	7.254295	8.144041	8.570776	8.441261	7.758342	6.599529	5.17113
		3	3.688966	4.821912	6.065793	7.222925	8.111295	8.540443	8.416596	7.740997	6.589737	5.167874
	C	1	3.745979	4.887539	6.130088	7.273418	8.136758	8.535181	8.380928	7.682415	6.519336	5.097782
		2	3.769619	4.903721	6.134139	7.2625	8.110491	8.496823	8.336544	7.639865	6.485913	5.077998
		3	3.747448	4.881418	6.115029	7.250043	8.107947	8.506009	8.357223	7.668468	6.516483	5.103382
	Average		3.73	4.86	6.10	7.25	8.12	8.53	8.38	7.70	6.55	5.13
	Standard Deviation		0.038031	0.03591	0.028736	0.019984	0.022002	0.035299	0.048594	0.056834	0.059151	0.056561
	Corrected Percentage		3.59	4.68	5.88	6.98	7.82	8.21	8.07	7.41	6.30	4.94
DE-6	A	1	3.883785	5.034054	6.274631	7.402159	8.233627	8.584843	8.371855	7.610925	6.397112	4.940621
		2	3.879288	5.038317	6.28862	7.425984	8.266468	8.624304	8.414232	7.651376	6.4302	4.962421

		3	3.880854	5.020359	6.249398	7.366678	8.190755	8.539116	8.32841	7.575597	6.372192	4.928201
	B	1	3.762477	4.91704	6.168601	7.31878	8.189912	8.599575	8.46134	7.781855	6.637621	5.23091
		2	3.750209	4.907933	6.165719	7.324275	8.204227	8.620621	8.485268	7.804164	6.654641	5.24056
		3	3.800228	4.966259	6.225808	7.376802	8.238962	8.629458	8.463229	7.751626	6.57567	5.143271
	C	1	3.782993	4.919447	6.156287	7.296153	8.159856	8.562233	8.413832	7.720757	6.561303	5.142013
		2	3.82393	4.959357	6.189639	7.318244	8.167537	8.554875	8.392476	7.688012	6.520013	5.095632
		3	3.777902	4.9139	6.150661	7.292809	8.162631	8.574626	8.437326	7.752703	6.595519	5.170167
	Average		3.82	4.96	6.21	7.35	8.20	8.59	8.42	7.70	6.53	5.09
	Standard Deviation		0.053445	0.054172	0.053161	0.047721	0.037603	0.032737	0.04957	0.078414	0.104298	0.122005
	Corrected Percentage		3.73	4.85	6.06	7.17	8.01	8.38	8.22	7.52	6.37	4.97
DE-7	A	1	4.262536	4.787009	5.311503	5.743438	5.996547	5.9894	5.680654	5.090513	4.260026	3.314532
		2	4.204594	4.722531	5.248481	5.691654	5.966239	5.98836	5.71349	5.15475	4.349551	3.415394
		3	4.289709	4.805824	5.318256	5.733713	5.966123	5.936257	5.605863	4.997355	4.15762	3.207094
	B	1	4.215671	4.703387	5.195416	5.608469	5.863058	5.880381	5.615632	5.078688	4.297882	3.388537
		2	4.290491	4.780565	5.261496	5.649227	5.866493	5.841245	5.536031	4.96959	4.177123	3.274732
		3	4.232528	4.717031	5.197905	5.59245	5.823493	5.816968	5.533158	4.986551	4.211114	3.319339
	C	1	4.157687	4.677437	5.20302	5.642745	5.911454	5.927768	5.64944	5.092866	4.294296	3.37438
		2	4.152998	4.645989	5.14021	5.549334	5.793094	5.795599	5.518739	4.980255	4.217888	3.343996
		3	4.131416	4.63335	5.144216	5.577428	5.850457	5.881516	5.625695	5.094786	4.320814	3.42139
	Average		4.22	4.72	5.22	5.64	5.89	5.90	5.61	5.05	4.25	3.34
	Standard Deviation		0.059235	0.061854	0.065066	0.068505	0.070706	0.070407	0.068231	0.066526	0.066635	0.069697
	Corrected Percentage		3.96	4.43	4.91	5.30	5.54	5.54	5.27	4.74	4.00	3.14
DE-8	A	1	4.194243	4.761858	5.3355	5.81848	6.121528	6.157456	5.880649	5.304703	4.469859	3.500732
		2	4.123753	4.69322	5.278093	5.78173	6.113908	6.183691	5.941376	5.393912	4.577113	3.612331
		3	4.155188	4.714713	5.283339	5.765922	6.074538	6.122298	5.862905	5.307344	4.493439	3.542559
	B	1	4.063628	4.598989	5.152804	5.633685	5.954319	6.025643	5.798001	5.277049	4.495553	3.570094
		2	4.070633	4.613939	5.173612	5.657461	5.978927	6.050593	5.824922	5.308469	4.534532	3.616017
		3	4.043663	4.574469	5.122514	5.596478	5.910612	5.979424	5.756701	5.252174	4.495509	3.60319
	C	1	3.959694	4.507111	5.07982	5.586051	5.93652	6.037174	5.834879	5.331908	4.562052	3.642272
		2	3.923231	4.455627	5.015131	5.512438	5.860471	5.967538	5.780597	5.301674	4.556499	3.663108
		3	3.95609	4.50333	5.077206	5.584959	5.936725	6.038242	5.836052	5.331648	4.558126	3.632416

	Average		4.05	4.60	5.17	5.66	5.99	6.06	5.84	5.31	4.53	3.60
	Standard Deviation		0.094093	0.104673	0.109084	0.105333	0.093486	0.07577	0.055611	0.039507	0.038742	0.051544
	Corrected Percentage		3.78	4.29	4.82	5.28	5.58	5.65	5.44	4.95	4.22	3.35

Table 27. Wall FG, Very Fine Sand to Fine Sand Sizes.

Sample Name	Run	Reading	69.183097	79.432823	91.201084	104.712855	120.226443	138.038426	158.489319	181.970086	208.929613	239.883292
FG-1	A	1	2.956758	4.339322	5.924796	7.480214	8.78228	9.572231	9.705675	9.13656	7.933654	6.325231
		2	2.989332	4.368806	5.945756	7.486714	8.769144	9.537818	9.652403	9.071864	7.867579	6.268392
		3	3.010032	4.393689	5.970128	7.50395	8.772186	9.522224	9.617951	9.024308	7.816433	6.224604
	B	1	3.103328	4.493787	6.067728	7.588032	8.830879	9.545803	9.600085	8.965381	7.721393	6.103137
		2	3.104473	4.495107	6.069094	7.588021	8.827021	9.536115	9.584597	8.946735	7.703086	6.086956
		3	3.087665	4.471348	6.041171	7.560557	8.805348	9.524582	9.585412	8.958544	7.721857	6.107093
	C	1	3.065913	4.481761	6.077368	7.61022	8.856598	9.569783	9.622072	8.989032	7.751588	6.143915
		2	3.056032	4.478668	6.081722	7.621395	8.873237	9.590041	9.644266	9.011752	7.773724	6.164791
		3	3.0831	4.503762	6.100294	7.628826	8.865633	9.566006	9.605229	8.963032	7.722963	6.120528
	Average		3.05	4.45	6.03	7.56	8.82	9.55	9.62	9.01	7.78	6.17
	Standard Deviation		0.05313	0.062329	0.06584	0.058514	0.040207	0.023711	0.038559	0.062531	0.078606	0.083077
	Corrected Percentage		2.80	4.09	5.54	6.95	8.10	8.77	8.84	8.27	7.15	5.67
FG-2	A	1	3.197742	4.491001	5.94494	7.338589	8.465545	9.097173	9.112976	8.490419	7.3043	5.774593
		2	3.179608	4.461418	5.906223	7.294987	8.421898	9.057818	9.081314	8.468977	7.29555	5.780732
		3	3.197662	4.482301	5.928275	7.316331	8.440752	9.072856	9.091567	8.473751	7.293975	5.771696
	B	1	3.241325	4.543311	5.996609	7.37997	8.488048	9.096311	9.089781	8.453377	7.266515	5.751135
		2	3.223932	4.533427	5.99884	7.397698	8.522587	9.145017	9.146136	8.507311	7.307085	5.770167
		3	3.25493	4.567404	6.030184	7.419624	8.528769	9.132107	9.114461	8.461914	7.255432	5.72032
	C	1	3.118726	4.432524	5.910464	7.329818	8.483665	9.14232	9.185447	8.588477	7.423947	5.908996
		2	3.141517	4.455471	5.929916	7.341085	8.48177	9.1239	9.149509	8.53816	7.365543	5.851219
		3	3.176163	4.4844	5.945641	7.336915	8.453592	9.072988	9.082168	8.465478	7.299942	5.803304
	Average		3.19	4.49	5.95	7.35	8.48	9.10	9.12	8.49	7.31	5.79

	Standard Deviation		0.044439	0.04463	0.043588	0.040259	0.035306	0.032605	0.036207	0.044152	0.051829	0.0564
	Corrected Percentage		3.00	4.23	5.60	6.91	7.97	8.56	8.58	7.99	6.88	5.45
FG-3	A	1	3.188599	4.59134	6.158537	7.649421	8.841582	9.493488	9.482966	8.796607	7.523789	5.90686
		2	3.173471	4.565438	6.119112	7.597934	8.78438	9.441335	9.448462	8.789722	7.549434	5.961958
		3	3.192127	4.584644	6.136925	7.611674	8.790827	9.437355	9.430789	8.756047	7.498971	5.897615
	B	1	3.166388	4.552278	6.105254	7.589199	8.785216	9.452787	9.468176	8.81261	7.569957	5.975576
		2	3.22915	4.623129	6.173985	7.643759	8.814122	9.44885	9.429428	8.744746	7.48357	5.884988
		3	3.201126	4.596348	6.15136	7.628698	8.810379	9.458949	9.453496	8.778501	7.519554	5.91457
	C	1	3.279816	4.663037	6.199013	7.652604	8.808034	9.431641	9.405541	8.717833	7.455016	5.853926
		2	3.284941	4.677208	6.22011	7.676761	8.830756	9.448856	9.414149	8.716715	7.445297	5.839703
		3	3.249703	4.633888	6.173392	7.632809	8.796329	9.430084	9.415786	8.73959	7.486463	5.892156
	Average		3.22	4.61	6.16	7.63	8.81	9.45	9.44	8.76	7.50	5.90
	Standard Deviation		0.044575	0.042672	0.036722	0.028027	0.019953	0.019188	0.026264	0.034701	0.041295	0.04441
	Corrected Percentage		3.08	4.41	5.89	7.30	8.43	9.04	9.03	8.38	7.18	5.65
FG-4	A	1	3.482792	4.74261	6.119938	7.39761	8.380072	8.864465	8.754636	8.055386	6.852345	5.365428
		2	3.474015	4.744207	6.133259	7.420928	8.409383	8.894616	8.781125	8.075684	6.866039	5.373851
		3	3.469029	4.731805	6.112713	7.392877	8.375801	8.859232	8.749155	8.053075	6.858256	5.384172
	B	1	3.497374	4.751649	6.126645	7.405833	8.393058	8.882767	8.775686	8.071177	6.856879	5.347413
		2	3.451783	4.705562	6.082446	7.366901	8.364009	8.8691	8.782762	8.104256	6.915276	5.432143
		3	3.467789	4.722846	6.100547	7.384213	8.377286	8.873594	8.772899	8.076377	6.869165	5.373298
	C	1	3.413812	4.66841	6.054539	7.355646	8.37289	8.894831	8.81657	8.135059	6.93472	5.438663
		2	3.432245	4.680626	6.057396	7.34667	8.350822	8.860589	8.77246	8.084287	6.880134	5.381944
		3	3.40937	4.659279	6.039318	7.334527	8.348276	8.871263	8.799253	8.127284	6.936528	5.445561
	Average		3.46	4.71	6.09	7.38	8.37	8.87	8.78	8.09	6.89	5.39
	Standard Deviation		0.030813	0.034931	0.034736	0.029059	0.019244	0.013482	0.020649	0.029324	0.034	0.035655
	Corrected Percentage		3.29	4.49	5.80	7.03	7.98	8.45	8.36	7.70	6.56	5.14
FG-5	A	1	3.685465	4.629795	5.656188	6.599341	7.306847	7.620499	7.461092	6.832742	5.800683	4.543887
		2	3.718876	4.672973	5.703007	6.641241	7.33466	7.627432	7.444149	6.79503	5.749924	4.491397
		3	3.721478	4.659627	5.67339	6.598008	7.282686	7.573283	7.394563	6.755263	5.722773	4.47564
	B	1	3.705452	4.667101	5.704445	6.65235	7.360045	7.670976	7.507151	6.873783	5.836713	4.575003

		2	3.71237	4.682193	5.725189	6.675211	7.381457	7.688302	7.519102	6.880713	5.84003	4.577182
		3	3.661672	4.622755	5.665274	6.624721	7.349758	7.68136	7.538919	6.923679	5.899082	4.642328
	C	1	3.655745	4.584555	5.598257	6.534297	7.24129	7.56034	7.410982	6.796498	5.782055	4.544091
		2	3.662319	4.580734	5.580984	6.502843	7.197745	7.510179	7.361687	6.755942	5.756827	4.538009
		3	3.630534	4.552864	5.56421	6.503459	7.219391	7.551212	7.415319	6.810521	5.79935	4.557851
	Average		3.68	4.63	5.65	6.59	7.30	7.61	7.45	6.82	5.80	4.55
	Standard Deviation		0.032621	0.046484	0.058092	0.064487	0.065755	0.063822	0.060932	0.057915	0.054093	0.048897
	Corrected Percentage		3.54	4.45	5.44	6.34	7.02	7.32	7.16	6.56	5.58	4.38
FG-6	A	1	4.080208	4.949068	5.863848	6.667858	7.221495	7.390695	7.115473	6.418488	5.37277	4.149009
		2	4.085167	4.939724	5.839412	6.630909	7.177304	7.346284	7.077456	6.390764	5.35598	4.140254
		3	4.039541	4.893937	5.797649	6.59772	7.157287	7.342975	7.093392	6.42619	5.4098	4.208981
	B	1	4.043016	4.886611	5.78682	6.589777	7.154259	7.341656	7.087339	6.409669	5.38105	4.171741
		2	4.065948	4.911333	5.811623	6.611445	7.168407	7.343894	7.074407	6.379893	5.335866	4.111605
		3	4.079321	4.931221	5.834203	6.632246	7.183544	7.351331	7.074243	6.374477	5.328691	4.106345
	C	1	4.116765	4.990266	5.910286	6.719324	7.276022	7.444027	7.161298	6.448721	5.380922	4.131198
		2	4.117025	4.984058	5.895515	6.694705	7.241668	7.402383	7.117181	6.408865	5.353998	4.124309
		3	4.133027	5.00286	5.9157	6.713525	7.255106	7.405878	7.106114	6.381171	5.309495	4.067709
	Average		4.08	4.94	5.85	6.65	7.20	7.37	7.10	6.40	5.36	4.13
	Standard Deviation		0.03276	0.042247	0.048449	0.049597	0.045522	0.037417	0.028184	0.024765	0.030974	0.040421
	Corrected Percentage		3.97	4.81	5.69	6.47	7.01	7.17	6.91	6.23	5.21	4.02
FG-7	A	1	4.100126	4.667446	5.253504	5.758837	6.090934	6.15882	5.91422	5.369	4.559427	3.612992
		2	4.116716	4.703614	5.304201	5.81542	6.143326	6.197965	5.934646	5.369733	4.546287	3.591993
		3	4.145727	4.731497	5.329346	5.836665	6.160039	6.210102	5.941614	5.371066	4.538844	3.575371
	B	1	4.151529	4.741395	5.346784	5.865131	6.20146	6.262524	6.00047	5.429103	4.591216	3.613295
		2	4.209	4.779247	5.357097	5.843383	6.146923	6.17991	5.897936	5.317458	4.480796	3.512332
		3	4.157001	4.738357	5.333385	5.840193	6.164687	6.215414	5.946058	5.372068	4.536758	3.56621
	C	1	4.159309	4.737872	5.333647	5.843594	6.171565	6.223449	5.950502	5.36721	4.518254	3.534031
		2	4.158033	4.716845	5.286886	5.770256	6.076909	6.11975	5.853611	5.293945	4.479005	3.535425
		3	4.142753	4.706862	5.282077	5.768926	6.076362	6.116985	5.846694	5.281856	4.464248	3.518991
	Average		4.15	4.72	5.31	5.82	6.14	6.19	5.92	5.35	4.52	3.56
	Standard Deviation		0.030288	0.03115	0.03435	0.03955	0.044994	0.048428	0.048816	0.046136	0.042052	0.038942

	Corrected Percentage		3.90	4.44	5.00	5.47	5.77	5.82	5.57	5.03	4.25	3.35

Table 28. Wall AB, Medium Sand to Coarse Sand Sizes.

Sample Name	Run	Reading	275.42287	316.227766	363.078055	416.869383	478.630092	549.540874	630.957344	724.43596	831.763771	954.992586
AB-1	A	1	5.445705	3.559611	1.682311	0.124901	0	0	0	0	0	0
		2	5.443408	3.554767	1.672008	0.123465	0	0	0	0	0	0
		3	5.432748	3.543973	1.65778	0.121642	0	0	0	0	0	0
	B	1	5.408239	3.516516	1.617471	0.116357	0	0	0	0	0	0
		2	5.464278	3.587926	1.734536	0.132029	0	0	0	0	0	0
		3	5.322902	3.43177	1.507825	0.102394	0	0	0	0	0	0
	C	1	5.320369	3.450264	1.564829	0.11067	0	0	0	0	0	0
		2	5.327489	3.462511	1.58882	0.113976	0	0	0	0	0	0
		3	5.302786	3.441321	1.566619	0.111311	0	0	0	0	0	0
	Average		5.39	3.51	1.62	0.12	0.00	0.00	0.00	0.00	0.00	0.00
	Standard Deviation		0.06548	0.059377	0.071214	0.008982	0	0	0	0	0	0
	Corrected Percentage		4.53	2.95	1.36	0.10	0.00	0.00	0.00	0.00	0.00	0.00
AB-2	A	1	5.493062	3.526045	1.511715	0.099278	0	0	0	0	0	0
		2	5.409096	3.436819	1.387185	0.083136	0	0	0	0	0	0
		3	5.451502	3.492399	1.480105	0.095623	0	0	0	0	0	0
	B	1	5.735273	3.747396	1.767597	0.130938	0	0	0	0	0	0
		2	5.738515	3.756201	1.787857	0.133788	0	0	0	0	0	0
		3	5.765048	3.780982	1.81739	0.137473	0	0	0	0	0	0
	C	1	5.346292	3.391502	1.355524	0.079928	0	0	0	0	0	0
		2	5.319202	3.360867	1.310012	0.073951	0	0	0	0	0	0
		3	5.334506	3.37401	1.323796	0.075607	0	0	0	0	0	0
	Average		5.51	3.54	1.53	0.10	0.00	0.00	0.00	0.00	0.00	0.00
	Standard Deviation		0.185711	0.174149	0.209171	0.026156	0	0	0	0	0	0
	Corrected Percentage		4.90	3.15	1.36	0.09	0.00	0.00	0.00	0.00	0.00	0.00

AB-3	A	1	5.374827	3.438275	1.444977	0.092213	0	0	0	0	0	0
		2	5.413281	3.491979	1.538823	0.104915	0	0	0	0	0	0
		3	5.404992	3.473066	1.497573	0.099145	0	0	0	0	0	0
	B	1	5.556703	3.597884	1.618308	0.11327	0	0	0	0	0	0
		2	5.504162	3.548079	1.557614	0.105655	0	0	0	0	0	0
		3	5.528538	3.571456	1.58651	0.109295	0	0	0	0	0	0
	C	1	5.509518	3.597013	1.68957	0.124571	0	0	0	0	0	0
		2	5.490537	3.558802	1.609758	0.113469	0	0	0	0	0	0
		3	5.503724	3.571119	1.624441	0.115301	0	0	0	0	0	0
	Average		5.48	3.54	1.57	0.11	0.00	0.00	0.00	0.00	0.00	0.00
	Standard Deviation		0.062631	0.057113	0.073564	0.009527	0	0	0	0	0	0
	Corrected Percentage		4.64	3.00	1.33	0.09	0.00	0.00	0.00	0.00	0.00	0.00
AB-4	A	1	5.01476	3.219704	1.381371	0.090838	0	0	0	0	0	0
		2	5.048834	3.256898	1.43468	0.09779	0	0	0	0	0	0
		3	5.019947	3.213875	1.356603	0.087152	0	0	0	0	0	0
	B	1	4.947137	3.184193	1.385367	0.092877	0	0	0	0	0	0
		2	4.961376	3.202107	1.414445	0.096763	0	0	0	0	0	0
		3	4.986818	3.251494	1.51618	0.110888	0	0	0	0	0	0
	C	1	5.197532	3.439913	1.726847	0.136711	0	0	0	0	0	0
		2	5.213289	3.452087	1.737094	0.137848	0	0	0	0	0	0
		3	5.122393	3.350885	1.589127	0.118473	0	0	0	0	0	0
	Average		5.06	3.29	1.50	0.11	0.00	0.00	0.00	0.00	0.00	0.00
	Standard Deviation		0.098625	0.102787	0.147922	0.019432	0	0	0	0	0	0
	Corrected Percentage		4.69	3.05	1.39	0.10	0.00	0.00	0.00	0.00	0.00	0.00
AB-5	A	1	5.124792	3.38271	1.676631	0.131042	0	0	0	0	0	0
		2	5.106839	3.378406	1.692242	0.133686	0	0	0	0	0	0
		3	5.180869	3.482006	1.876616	0.158589	0	0	0	0	0	0
	B	1	5.123537	3.407823	1.750611	0.141739	0	0	0	0	0	0
		2	5.088349	3.371112	1.700358	0.135254	0	0	0	0	0	0
		3	5.07959	3.410257	1.830063	0.154047	0	0	0	0	0	0
	C	1	5.075909	3.335151	1.61666	0.123453	0	0	0	0	0	0

		2	5.032689	3.306778	1.602828	0.122396	0	0	0	0	0	0
		3	5.068628	3.323274	1.593978	0.120339	0	0	0	0	0	0
	Average		5.10	3.38	1.70	0.14	0.00	0.00	0.00	0.00	0.00	0.00
	Standard Deviation		0.042373	0.05329	0.099202	0.013628	0	0	0	0	0	0
	Corrected Percentage		4.69	3.11	1.57	0.12	0.00	0.00	0.00	0.00	0.00	0.00
AB-6	A	1	3.679213	2.282573	0.784063	0.033586	0	0	0	0	0	0
		2	3.716036	2.330454	0.863775	0.044285	0	0	0	0	0	0
		3	3.753727	2.376723	0.937304	0.054079	0	0	0	0	0	0
	B	1	3.781094	2.392289	0.939325	0.053773	0	0	0	0	0	0
		2	3.846533	2.469855	1.059305	0.069662	0	0	0	0	0	0
		3	3.836183	2.455907	1.035467	0.066449	0	0	0	0	0	0
	C	1	3.808988	2.427281	0.996061	0.061351	0	0	0	0	0	0
		2	3.745805	2.365743	0.918346	0.051512	0	0	0	0	0	0
		3	3.734134	2.352548	0.898839	0.04895	0	0	0	0	0	0
	Average		3.77	2.38	0.94	0.05	0.00	0.00	0.00	0.00	0.00	0.00
	Standard Deviation		0.055994	0.060221	0.085662	0.011161	0	0	0	0	0	0
	Corrected Percentage		3.48	2.20	0.87	0.05	0.00	0.00	0.00	0.00	0.00	0.00
AB-7	A	1	3.719144	2.322856	0.837109	0.040372	0	0	0	0	0	0
		2	3.770827	2.389036	0.946011	0.05496	0	0	0	0	0	0
		3	3.794488	2.425974	1.014765	0.064369	0	0	0	0	0	0
	B	1	3.545201	2.186837	0.719351	0.027149	0	0	0	0	0	0
		2	3.615501	2.240364	0.762818	0.031897	0	0	0	0	0	0
		3	3.582005	2.223223	0.765977	0.033081	0	0	0	0	0	0
	C	1	3.713523	2.360975	0.955147	0.05752	0	0	0	0	0	0
		2	3.705727	2.348495	0.931555	0.054286	0	0	0	0	0	0
		3	3.687672	2.346962	0.955309	0.058106	0	0	0	0	0	0
	Average		3.68	2.32	0.88	0.05	0.00	0.00	0.00	0.00	0.00	0.00
	Standard Deviation		0.084147	0.081028	0.106514	0.013747	0	0	0	0	0	0
	Corrected Percentage		3.38	2.13	0.80	0.04	0.00	0.00	0.00	0.00	0.00	0.00
AB-8	A	1	2.285395	1.427282	0.512293	0.024555	0	0	0	0	0	0
		2	2.366724	1.533272	0.948239	0.091578	0	0	0	0	0	0

		3	2.330268	1.491725	0.900399	0.085776	0	0	0	0	0	0
	B	1	2.762827	1.86219	1.184791	0.317555	0.046432	0	0	0	0	0
		2	2.800229	1.902797	1.168176	0.390345	0.012644	0	0	0	0	0
		3	2.96685	2.055088	1.251829	0.116316	0	0	0	0	0	0
	C	1	2.706377	1.820667	1.153181	0.296116	0.040951	0	0	0	0	0
		2	2.804106	1.925209	1.197815	0.441336	0.02316	0	0	0	0	0
		3	2.837401	1.971588	1.206963	0.712072	0.095953	0	0	0	0	0
	Average		2.65	1.78	1.06	0.28	0.02	0.00	0.00	0.00	0.00	0.00
	Standard Deviation		0.253263	0.230553	0.237504	0.22125	0.032404	0	0	0	0	0
	Corrected Percentage		2.34	1.57	0.93	0.24	0.02	0.00	0.00	0.00	0.00	0.00
AB-9	A	1	2.602311	1.715315	1.072839	0.248114	0.02904	0	0	0	0	0
		2	2.662978	1.799183	1.069399	0.607142	0.080038	0	0	0	0	0
		3	2.666379	1.802191	1.089744	0.593866	0.239311	0.063635	0	0	0	0
	B	1	2.539941	1.682889	1.059329	0.261011	0.033934	0	0	0	0	0
		2	2.588836	1.742992	1.044932	0.559452	0.209872	0.053124	0	0	0	0
		3	2.633973	1.796636	1.109743	0.61244	0.297907	0.119195	0.037707	0	0	0
	C	1	2.422762	1.575718	0.965386	0.174511	0.010143	0	0	0	0	0
		2	2.467344	1.60542	0.983287	0.176703	0.009994	0	0	0	0	0
		3	2.419035	1.572387	0.880281	0.434807	0.05128	0	0	0	0	0
	Average		2.56	1.70	1.03	0.41	0.11	0.03	0.00	0.00	0.00	0.00
	Standard Deviation		0.098463	0.095305	0.073458	0.191976	0.111003	0.043147	0.012569	0	0	0
	Corrected Percentage		2.21	1.47	0.89	0.35	0.09	0.02	0.00	0.00	0.00	0.00
AB-10	A	1	2.417962	1.571593	0.968144	0.189716	0.014969	0	0	0	0	0
		2	2.464395	1.601378	0.989009	0.200861	0.017592	0	0	0	0	0
		3	2.543265	1.702334	1.025888	0.546891	0.251463	0.093939	0.028847	0	0	0
	B	1	2.444043	1.600413	0.924048	0.467822	0.162505	0.039471	0	0	0	0
		2	2.460401	1.582945	0.876055	0.425008	0.049433	0	0	0	0	0
		3	2.472441	1.598351	0.902694	0.439507	0.139172	0.031559	0	0	0	0
	C	1	2.459319	1.593855	0.975661	0.17572	0.010016	0	0	0	0	0
		2	2.53121	1.662461	0.951756	0.465013	0.122637	0.021953	0	0	0	0
		3	2.576489	1.759051	1.093099	0.619151	0.324332	0.181543	0.142052	0.156759	0.182635	0.170156

	Average		2.49	1.63	0.97	0.39	0.12	0.04	0.02	0.02	0.02	0.02
	Standard Deviation		0.052341	0.063804	0.065586	0.163648	0.111688	0.060964	0.047125	0.052253	0.060878	0.056719
	Corrected Percentage		2.18	1.43	0.85	0.34	0.11	0.04	0.02	0.02	0.02	0.02
AB-11	A	1	2.225425	1.535773	0.99637	0.620295	0.379999	0.241948	0.166951	0.121393	0.088788	0.054443
		2	2.30961	1.607195	1.057648	0.673307	0.425198	0.27971	0.196421	0.146064	0.1053	0.066949
		3	2.392855	1.685496	1.123232	0.726018	0.473434	0.338993	0.283873	0.271884	0.268439	0.226593
	B	1	2.109831	1.393442	0.842805	0.473181	0.256461	0.15496	0.124559	0.12381	0.133516	0.109699
		2	2.187989	1.471481	0.921561	0.552901	0.335315	0.228592	0.186037	0.168531	0.155529	0.1167
		3	2.296273	1.581983	1.033069	0.663453	0.441729	0.327513	0.273978	0.246493	0.218398	0.166316
	C	1	2.243209	1.521046	0.96293	0.584894	0.35978	0.251248	0.213074	0.206631	0.200079	0.162938
		2	2.28943	1.563459	1.008891	0.640669	0.428647	0.332222	0.301303	0.295523	0.281941	0.225814
		3	2.38043	1.679253	1.141439	0.778446	0.559159	0.444965	0.389956	0.359455	0.323191	0.24804
	Average		2.27	1.56	1.01	0.63	0.41	0.29	0.24	0.22	0.20	0.15
	Standard Deviation		0.090143	0.093791	0.094259	0.091394	0.08684	0.083304	0.081747	0.083393	0.082597	0.071008
	Corrected Percentage		2.00	1.38	0.89	0.56	0.36	0.26	0.21	0.19	0.17	0.14

Table 29. Wall DE, Medium Sand to Coarse Sand Sizes.

Sample Name	Run	Reading	275.42287	316.227766	363.078055	416.869383	478.630092
DE-1	A	1	5.485503	3.553031	1.6013	0.112352	0
		2	5.485015	3.557668	1.615264	0.114379	0
		3	5.431489	3.505384	1.549075	0.105992	0
	B	1	5.425958	3.513357	1.580365	0.110631	0
		2	5.341055	3.431831	1.479405	0.097907	0
		3	5.437269	3.526272	1.599823	0.113189	0
	C	1	5.218648	3.2908	1.266507	0.069851	0
		2	5.202003	3.280119	1.261804	0.069536	0
		3	5.223052	3.297904	1.279989	0.0717	0
	Average		5.36	3.44	1.47	0.10	0.00
	Standard Deviation		0.117717	0.118216	0.155955	0.019977	0
	Corrected Percentage		4.71	3.02	1.29	0.08	0.00
DE-2	A	1	4.881171	2.991757	0.936764	0.029603	0

		2	4.846969	2.970154	0.928167	0.029108	0
		3	4.840947	2.959553	0.907173	0.026211	0
	B	1	4.903833	3.020041	0.982468	0.035703	0
		2	4.811608	2.926694	0.859029	0.019897	0
		3	4.86299	2.986254	0.949464	0.031827	0
	C	1	4.947892	3.057111	1.019808	0.040135	0
		2	4.983657	3.099558	1.085533	0.048842	0
		3	4.920079	3.043533	1.024258	0.041383	0
	Average		4.89	3.01	0.97	0.03	0.00
	Standard Deviation		0.055246	0.053963	0.069202	0.008815	0
	Corrected Percentage		4.12	2.53	0.81	0.03	0.00
DE-3	A	1	4.691967	2.825374	0.755518	0.007427	0
		2	4.703324	2.854836	0.823635	0.015324	0
		3	4.70659	2.848506	0.799844	0.012439	0
	B	1	5.120729	3.222625	1.223693	0.06581	0
		2	5.176326	3.271594	1.277264	0.072329	0
		3	5.212616	3.320044	1.359483	0.0834	0
	C	1	5.095372	3.207306	1.219502	0.065752	0
		2	5.101651	3.202118	1.194886	0.062063	0
		3	5.14178	3.253644	1.279824	0.073446	0
	Average		4.99	3.11	1.10	0.05	0.00
	Standard Deviation		0.22336	0.204931	0.238403	0.030054	0
	Corrected Percentage		4.80	2.99	1.06	0.05	0.00
DE-4	A	1	4.476128	2.710286	0.764085	0.012241	0
		2	4.483225	2.725743	0.797984	0.016146	0
		3	4.44235	2.675481	0.716179	0.007142	0
	B	1	4.652478	2.87475	0.958756	0.037733	0
		2	4.635381	2.858386	0.938619	0.035198	0
		3	4.688251	2.926723	1.051921	0.050393	0
	C	1	4.768245	3.004898	1.15103	0.062954	0
		2	4.719307	2.96034	1.099707	0.056614	0
		3	4.692464	2.93755	1.076353	0.053827	0
	Average		4.62	2.85	0.95	0.04	0.00
	Standard Deviation		0.119347	0.120288	0.158795	0.020809	0
	Corrected Percentage		4.48	2.77	0.92	0.04	0.00
DE-5	A	1	3.628602	2.163696	0.518791	0	0
		2	3.550367	2.089824	0.418181	0	0
		3	3.602206	2.151155	0.525492	0	0
	B	1	3.725029	2.252476	0.626168	0.009053	0
		2	3.642098	2.162851	0.491581	0	0

		3	3.644261	2.169547	0.509653	0	0
	C	1	3.583933	2.120381	0.457546	0	0
		2	3.579064	2.128486	0.49294	0	0
		3	3.593408	2.132744	0.481045	0	0
	Average		3.62	2.15	0.50	0.00	0.00
	Standard Deviation		0.051142	0.045341	0.056943	0.003018	0
	Corrected Percentage		3.48	2.07	0.48	0.00	0.00
DE-6	A	1	3.410512	2.045869	0.106433	0	0
		2	3.419559	2.039874	0.105765	0	0
		3	3.410998	2.017996	0.202031	0	0
	B	1	3.725651	2.262752	0.655208	0.012495	0
		2	3.72716	2.257234	0.636625	0.01026	0
		3	3.621422	2.149237	0.484133	0	0
	C	1	3.630729	2.167145	0.526056	0	0
		2	3.583142	2.120765	0.460118	0	0
		3	3.64543	2.169687	0.507929	0	0
	Average		3.57	2.14	0.41	0.00	0.00
	Standard Deviation		0.129543	0.089833	0.215207	0.005048	0
	Corrected Percentage		3.49	2.09	0.40	0.00	0.00
DE-7	A	1	2.362923	1.437433	0.420959	0.008599	0
		2	2.440248	1.491175	0.455348	0.011309	0
		3	2.233524	1.338784	0.180257	0.006733	0
	B	1	2.475419	1.57746	0.645072	0.039609	0
		2	2.366983	1.478787	0.532164	0.02566	0
		3	2.393608	1.536032	0.93037	0.088766	0
	C	1	2.44978	1.543238	0.587188	0.031811	0
		2	2.438551	1.602302	0.987251	0.189425	0.014013
		3	2.518346	1.626963	0.719763	0.049455	0
	Average		2.41	1.51	0.61	0.05	0.00
	Standard Deviation		0.082763	0.089614	0.252248	0.058156	0.004671
	Corrected Percentage		2.26	1.42	0.57	0.05	0.00
DE-8	A	1	2.491071	1.510081	0.429163	0.007306	0
		2	2.594216	1.601173	0.528371	0.020173	0
		3	2.546668	1.574834	0.527137	0.021027	0
	B	1	2.590653	1.670043	1.016722	0.09725	0
		2	2.638858	1.678737	0.680962	0.041214	0
		3	2.708888	1.815917	0.962922	0.080417	0
	C	1	2.663631	1.701064	0.706154	0.044313	0
		2	2.768813	1.872986	1.032582	0.089173	0
		3	2.646566	1.678654	0.668664	0.039273	0

	Average	2.63	1.68	0.73	0.05	0.00
	Standard Deviation	0.083668	0.113125	0.225563	0.032515	0
	Corrected Percentage	2.45	1.56	0.68	0.05	0.00

Table 30. Wall FG, Medium Sand to Coarse Sand Sizes.

Sample Name	Run	Reading	275.42287	316.227766	363.078055	416.869383
FG-1	A	1	4.522848	2.768634	0.857745	0.025957
		2	4.483745	2.746502	0.855342	0.02646
		3	4.456201	2.734104	0.86273	0.028127
	B	1	4.319485	2.590782	0.668382	0
		2	4.3045	2.577537	0.65215	0
		3	4.32165	2.591341	0.666438	0
	C	1	4.372752	2.652189	0.759631	0.013526
		2	4.391981	2.669099	0.778348	0.015413
		3	4.361259	2.651373	0.775529	0.015621
	Average		4.39	2.66	0.76	0.01
	Standard Deviation		0.07813	0.071682	0.085446	0.011676
	Corrected Percentage		4.04	2.45	0.70	0.01
FG-2	A	1	4.093843	2.463732	0.654585	0.005938
		2	4.116671	2.499733	0.723438	0.013722
		3	4.098985	2.475499	0.680813	0.008966
	B	1	4.097206	2.489798	0.725305	0.014291
		2	4.091603	2.463416	0.657014	0.006272
		3	4.049794	2.43043	0.63075	0
	C	1	4.235847	2.605535	0.838859	0.029452
		2	4.187343	2.567212	0.804753	0.025586
		3	4.163611	2.565245	0.836138	0.030629
	Average		4.13	2.51	0.73	0.01
	Standard Deviation		0.058003	0.058845	0.080635	0.011108
	Corrected Percentage		3.88	2.36	0.68	0.01
FG-3	A	1	4.153791	2.458937	0.535623	0
		2	4.229725	2.549126	0.686628	0.007368
		3	4.15808	2.474601	0.579284	0
	B	1	4.233386	2.544117	0.671004	0
		2	4.152609	2.475486	0.592004	0
		3	4.169015	2.479885	0.576855	0
	C	1	4.117776	2.43909	0.535826	0

		2	4.104264	2.426798	0.519867	0
		3	4.159683	2.482167	0.601208	0
	Average		4.16	2.48	0.59	0.00
	Standard Deviation		0.043519	0.041653	0.058214	0.002456
	Corrected Percentage		3.98	2.37	0.56	0.00
FG-4	A	1	3.774835	2.236681	0.493073	0
		2	3.7792	2.237365	0.48737	0
		3	3.808565	2.28161	0.579226	0
	B	1	3.723466	2.231504	0.298422	0.01376
		2	3.83432	2.287222	0.551274	0
		3	3.772156	2.225117	0.460031	0
	C	1	3.832587	2.278488	0.525617	0
		2	3.773947	2.220989	0.44336	0
		3	3.837263	2.281083	0.525857	0
	Average		3.79	2.25	0.48	0.00
	Standard Deviation		0.038126	0.027843	0.082028	0.004587
	Corrected Percentage		3.61	2.15	0.46	0.00
FG-5	A	1	3.207164	1.912826	0.459753	0
		2	3.163752	1.879177	0.427824	0
		3	3.155378	1.877533	0.437736	0
	B	1	3.232335	1.931729	0.476143	0
		2	3.236312	1.937038	0.486265	0
		3	3.297318	1.991664	0.547835	0.00725
	C	1	3.224263	1.943568	0.523947	0.005695
		2	3.2387	1.974852	0.59246	0.013585
		3	3.230107	1.942389	0.515285	0
	Average		3.22	1.93	0.50	0.00
	Standard Deviation		0.042379	0.038385	0.053606	0.004891
	Corrected Percentage		3.10	1.86	0.48	0.00
FG-6	A	1	2.878494	1.711539	0.197399	0
		2	2.873211	1.709435	0.200438	0
		3	2.951754	1.795377	0.304711	0.025674
	B	1	2.911985	1.753989	0.255665	0.015591
		2	2.83673	1.69868	0.088265	0
		3	2.836594	1.705215	0.088808	0
	C	1	2.834493	1.667249	0.085682	0
		2	2.852418	1.72115	0.08983	0
		3	2.790452	1.640278	0.084247	0
	Average		2.86	1.71	0.16	0.00

	Standard Deviation		0.047692	0.044962	0.086097	0.009441
	Corrected Percentage		2.79	1.67	0.15	0.00
FG-7	A	1	2.663105	1.724808	0.773502	0.054082
		2	2.60039	1.680849	1.042979	0.101024
		3	2.607406	1.656313	0.664441	0.039552
	B	1	2.589341	1.591501	0.508112	0.017361
		2	2.503751	1.523083	0.446925	0.009195
		3	2.553441	1.566845	0.493563	0.01604
	C	1	2.511616	1.518736	0.421491	0.006036
		2	2.587594	1.65465	0.6907	0.043767
		3	2.537601	1.629423	0.990647	0.094757
	Average		2.57	1.62	0.67	0.04
	Standard Deviation		0.050906	0.07111	0.229662	0.035481
	Corrected Percentage		2.42	1.52	0.63	0.04

Table 31. GRADISTAT (Blott and Pye 2001) Results for AB-1, AB-2, and AB-3.

		AB-1	**AB-2**	**AB-3**
Sample Type		Unimodal, Poorly Sorted	Unimodal, Moderately Sorted	Unimodal, Moderately Sorted
Textural Group		Muddy Sand	Sand	Muddy Sand
Sediment Name		Coarse Silty Fine Sand	Moderately Sorted Fine Sand	Coarse Silty Fine Sand
Method of Moments [Arithmetic (μm)]	Mean	160.6	164.6	163.5
	Sorting	87.34	84.34	85.30
	Skewness	0.381	0.390	0.391
	Kurtosis	2.860	2.948	2.922
Method of Moments [Geometric (μm)]	Mean	124.3	132.2	130.0
	Sorting	2.492	2.311	2.363
	Skewness	-2.215	-2.417	-2.373
	Kurtosis	9.290	10.99	10.62
Method of Moments [Logarithmic (φ)]	Mean	3.008	2.919	2.944
	Sorting	1.317	1.209	1.240
	Skewness	2.215	2.417	2.373
	Kurtosis	9.290	10.99	10.62
Folk and Ward Method (μm)	Mean	143.1	149.7	147.8
	Sorting	2.070	1.951	1.981
	Skewness	-0.324	-0.287	-0.296
	Kurtosis	1.568	1.548	1.551
Folk and Ward Method (φ)	Mean	2.804	2.740	2.758
	Sorting	1.049	0.964	0.987
	Skewness	0.324	0.287	0.296
	Kurtosis	1.568	1.548	1.551
Folk and Ward Method (Description)	Mean	Fine Sand	Fine Sand	Fine Sand
	Sorting	Poorly Sorted	Moderately Sorted	Moderately Sorted
	Skewness	Very Fine Skewed	Fine Skewed	Fine Skewed
	Kurtosis	Very Leptokurtic	Very Leptokurtic	Very Leptokurtic
Mode (μm)		170.2	170.2	170.2
Mode (φ)		2.558	2.558	2.558
D_{10} (μm)		40.94	63.83	58.38
D_{50} (μm)		152.5	155.7	154.8
D_{90} (μm)		279.9	280.2	280.3
(D_{90} / D_{10}) (μm)		6.837	4.389	4.801
(D_{90} - D_{10}) (μm)		239.0	216.3	221.9
(D_{75} / D_{25}) (μm)		2.118	2.020	2.046
(D_{75} - D_{25}) (μm)		113.5	109.4	110.5
D_{10} (φ)		1.837	1.836	1.835
D_{50} (φ)		2.713	2.683	2.692
D_{90} (φ)		4.610	3.970	4.098
(D_{90} / D_{10}) (φ)		2.510	2.162	2.234
(D_{90} - D_{10}) (φ)		2.773	2.134	2.263
(D_{75} / D_{25}) (φ)		1.488	1.460	1.467
(D_{75} - D_{25}) (φ)		1.083	1.015	1.033
Total Sand		87.3%	90.2%	89.4%

Total Mud (Silt & Clay)	12.7%	9.8%	10.6%
Very Coarse Sand	0.0%	0.0%	0.0%
Coarse Sand	0.0%	0.0%	0.0%
Medium Sand	15.7%	15.9%	15.9%
Fine Sand	48.0%	50.0%	49.3%
Very Fine Sand	23.6%	24.3%	24.2%
Very Coarse Silt	4.2%	3.0%	3.5%
Coarse Silt	4.2%	3.3%	3.6%
Medium Silt	1.9%	1.4%	1.5%
Fine Silt	1.1%	0.9%	0.9%
Very Fine Silt	0.7%	0.6%	0.6%
Clay	0.6%	0.5%	0.5%

Table 32. GRADISTAT (Blott and Pye 2001) Results for AB-4, AB-5, and AB-6.

		AB-4	**AB-5**	**AB-6**
Sample Type		Unimodal, Poorly Sorted	Unimodal, Poorly Sorted	Unimodal, Poorly Sorted
Textural Group		Muddy Sand	Muddy Sand	Muddy Sand
Sediment Name		Very Coarse Silty Fine Sand	Very Coarse Silty Fine Sand	Very Coarse Silty Fine Sand
Method of Moments [Arithmetic (μm)]	Mean	155.5	156.2	130.2
	Sorting	87.66	88.48	88.87
	Skewness	0.424	0.454	0.614
	Kurtosis	2.859	2.875	2.853
Method of Moments [Geometric (μm)]	Mean	118.1	119.2	87.63
	Sorting	2.584	2.533	3.090
	Skewness	-2.163	-2.090	-1.634
	Kurtosis	8.991	8.678	6.023
Method of Moments [Logarithmic (φ)]	Mean	3.082	3.068	3.512
	Sorting	1.369	1.341	1.628
	Skewness	2.163	2.090	1.634
	Kurtosis	8.991	8.678	6.023
Folk and Ward Method (μm)	Mean	135.8	136.0	95.71
	Sorting	2.137	2.132	2.778
	Skewness	-0.337	-0.327	-0.425
	Kurtosis	1.531	1.495	1.268
Folk and Ward Method (φ)	Mean	2.880	2.879	3.385
	Sorting	1.096	1.092	1.474
	Skewness	0.337	0.327	0.425
	Kurtosis	1.531	1.495	1.268
Folk and Ward Method (Description)	Mean	Fine Sand	Fine Sand	Very Fine Sand
	Sorting	Poorly Sorted	Poorly Sorted	Poorly Sorted
	Skewness	Very Fine Skewed	Very Fine Skewed	Very Fine Skewed
	Kurtosis	Very Leptokurtic	Leptokurtic	Leptokurtic
Mode (μm)		170.2	170.2	148.3
Mode (φ)		2.558	2.558	2.757
D_{10} (μm)		35.48	37.27	19.72
D_{50} (μm)		147.1	147.0	119.9
D_{90} (μm)		275.2	277.8	255.2
(D_{90} / D_{10}) (μm)		7.756	7.453	12.94
(D_{90} - D_{10}) (μm)		239.7	240.5	235.5
(D_{75} / D_{25}) (μm)		2.202	2.224	3.202
(D_{75} - D_{25}) (μm)		114.5	115.9	128.0

D_{10} (φ)	1.862	1.848	1.970
D_{50} (φ)	2.765	2.766	3.060
D_{90} (φ)	4.817	4.746	5.664
(D_{90} / D_{10}) (φ)	2.587	2.568	2.875
(D_{90} - D_{10}) (φ)	2.955	2.898	3.694
(D_{75} / D_{25}) (φ)	1.505	1.513	1.692
(D_{75} - D_{25}) (φ)	1.139	1.153	1.679
Total Sand	85.6%	85.7%	73.5%
Total Mud (Silt & Clay)	14.4%	14.3%	26.5%
Very Coarse Sand	0.0%	0.0%	0.0%
Coarse Sand	0.0%	0.0%	0.0%
Medium Sand	14.8%	15.1%	10.8%
Fine Sand	46.1%	45.6%	37.0%
Very Fine Sand	24.8%	25.0%	25.8%
Very Coarse Silt	5.2%	5.5%	11.2%
Coarse Silt	4.4%	4.3%	7.1%
Medium Silt	2.0%	2.0%	3.3%
Fine Silt	1.2%	1.2%	2.1%
Very Fine Silt	0.8%	0.7%	1.3%
Clay	0.8%	0.6%	1.4%

Table 33. GRADISTAT (Blott and Pye 2001) Results for AB-7, AB-8, and AB-9.

		AB-7	**AB-8**	**AB-9**
Sample Type		Unimodal, Poorly Sorted	Unimodal, Poorly Sorted	Unimodal, Poorly Sorted
Textural Group		Muddy Sand	Muddy Sand	Muddy Sand
Sediment Name		Very Coarse Silty Fine Sand	Very Coarse Silty Fine Sand	Very Coarse Silty Very Fine Sand
Method of Moments [Arithmetic (µm)]	Mean	129.1	106.6	111.7
	Sorting	88.11	90.27	89.45
	Skewness	0.633	1.065	1.150
	Kurtosis	2.879	3.788	4.430
Method of Moments [Geometric (µm)]	Mean	87.59	62.14	69.57
	Sorting	3.035	3.594	3.347
	Skewness	-1.632	-1.159	-1.364
	Kurtosis	6.129	4.185	5.018
Method of Moments [Logarithmic (φ)]	Mean	3.513	4.008	3.845
	Sorting	1.602	1.846	1.743
	Skewness	1.632	1.159	1.364
	Kurtosis	6.129	4.185	5.018
Folk and Ward Method (µm)	Mean	95.62	68.02	76.88
	Sorting	2.721	3.390	3.079
	Skewness	-0.408	-0.352	-0.352
	Kurtosis	1.235	1.086	1.230
Folk and Ward Method (φ)	Mean	3.387	3.878	3.701
	Sorting	1.444	1.761	1.623
	Skewness	0.408	0.352	0.352
	Kurtosis	1.235	1.086	1.230

Folk and Ward Method (Description)	Mean	Very Fine Sand	Very Fine Sand	Very Fine Sand
	Sorting	Poorly Sorted	Poorly Sorted	Poorly Sorted
	Skewness	Very Fine Skewed	Very Fine Skewed	Very Fine Skewed
	Kurtosis	Leptokurtic	Mesokurtic	Leptokurtic
Mode (μm)		148.3	148.3	129.1
Mode (φ)		2.757	2.757	2.957
D_{10} (μm)		20.55	10.45	13.81
D_{50} (μm)		118.3	85.10	92.63
D_{90} (μm)		253.3	235.2	235.1
(D_{90} / D_{10}) (μm)		12.33	22.50	17.02
(D_{90} - D_{10}) (μm)		232.7	224.7	221.2
(D_{75} / D_{25}) (μm)		3.202	4.838	3.795
(D_{75} - D_{25}) (μm)		126.8	124.9	117.1
D_{10} (φ)		1.981	2.088	2.089
D_{50} (φ)		3.080	3.555	3.432
D_{90} (φ)		5.605	6.580	6.178
(D_{90} / D_{10}) (φ)		2.829	3.151	2.957
(D_{90} - D_{10}) (φ)		3.624	4.492	4.089
(D_{75} / D_{25}) (φ)		1.688	1.853	1.725
(D_{75} - D_{25}) (φ)		1.679	2.275	1.924
Total Sand		73.2%	59.7%	64.6%
Total Mud (Silt & Clay)		26.8%	40.3%	35.4%
Very Coarse Sand		0.0%	0.0%	0.0%
Coarse Sand		0.0%	0.0%	0.1%
Medium Sand		10.5%	8.3%	8.2%
Fine Sand		36.6%	26.6%	28.0%
Very Fine Sand		26.2%	24.8%	28.3%
Very Coarse Silt		11.8%	16.1%	16.0%
Coarse Silt		7.2%	10.5%	8.5%
Medium Silt		3.2%	5.8%	4.3%
Fine Silt		1.9%	3.5%	2.8%
Very Fine Silt		1.3%	2.1%	1.9%
Clay		1.4%	2.4%	2.1%

Table 34. GRADISTAT (Blott and Pye 2001) Results for AB-10, AB-11, and DE-1.

		AB-10	**AB-11**	**DE-1**
Sample Type		Unimodal, Poorly Sorted	Unimodal, Poorly Sorted	Unimodal, Poorly Sorted
Textural Group		Muddy Sand	Muddy Sand	Muddy Sand
Sediment Name		Very Coarse Silty Very Fine Sand	Very Coarse Silty Very Fine Sand	Coarse Silty Fine Sand
Method of Moments [Arithmetic (μm)]	Mean	112.2	118.0	160.2
	Sorting	90.16	108.0	87.11
	Skewness	1.341	2.487	0.326
	Kurtosis	6.197	13.47	2.862
Method of Moments [Geometric (μm)]	Mean	70.08	73.57	120.8
	Sorting	3.349	3.237	2.700
	Skewness	-1.397	-1.345	-2.326
	Kurtosis	5.115	5.434	9.292

Method of Moments [Logarithmic (φ)]	Mean	3.833	3.749	3.049
	Sorting	1.743	1.684	1.433
	Skewness	1.393	1.305	2.326
	Kurtosis	5.112	5.382	9.292
Folk and Ward Method (μm)	Mean	77.84	81.50	144.4
	Sorting	3.065	2.893	2.145
	Skewness	-0.359	-0.291	-0.346
	Kurtosis	1.268	1.294	1.767
Folk and Ward Method (φ)	Mean	3.683	3.617	2.792
	Sorting	1.616	1.532	1.101
	Skewness	0.359	0.291	0.346
	Kurtosis	1.268	1.294	1.767
Folk and Ward Method (Description)	Mean	Very Fine Sand	Very Fine Sand	Fine Sand
	Sorting	Poorly Sorted	Poorly Sorted	Poorly Sorted
	Skewness	Very Fine Skewed	Fine Skewed	Very Fine Skewed
	Kurtosis	Leptokurtic	Leptokurtic	Very Leptokurtic
Mode (μm)		129.1	112.5	170.2
Mode (φ)		2.957	3.156	2.558
D_{10} (μm)		14.01	17.10	34.82
D_{50} (μm)		93.65	92.99	153.0
D_{90} (μm)		233.8	240.9	278.0
(D_{90} / D_{10}) (μm)		16.69	14.09	7.985
(D_{90} - D_{10}) (μm)		219.8	223.8	243.2
(D_{75} / D_{25}) (μm)		3.680	3.394	2.083
(D_{75} - D_{25}) (μm)		115.6	111.2	111.4
D_{10} (φ)		2.097	2.053	1.847
D_{50} (φ)		3.417	3.427	2.709
D_{90} (φ)		6.158	5.870	4.844
(D_{90} / D_{10}) (φ)		2.937	2.858	2.623
(D_{90} - D_{10}) (φ)		4.061	3.816	2.997
(D_{75} / D_{25}) (φ)		1.708	1.662	1.476
(D_{75} - D_{25}) (φ)		1.880	1.763	1.058
Total Sand		65.3%	66.2%	87.6%
Total Mud (Silt & Clay)		34.7%	33.8%	12.4%
Very Coarse Sand		0.0%	0.0%	0.0%
Coarse Sand		0.2%	1.4%	0.0%
Medium Sand		7.9%	7.8%	15.5%
Fine Sand		28.3%	26.7%	48.7%
Very Fine Sand		28.8%	30.3%	23.4%
Very Coarse Silt		15.8%	16.9%	2.9%
Coarse Silt		8.1%	7.6%	3.9%
Medium Silt		4.0%	3.6%	2.1%
Fine Silt		2.8%	2.4%	1.5%
Very Fine Silt		1.9%	1.6%	1.1%
Clay		2.1%	1.7%	0.9%

Table 35. GRADISTAT (Blott and Pye 2001) Results for DE-2, DE-3, and DE-4.

		DE-2	**DE-3**	**DE-4**

Sample Type		Unimodal, Poorly Sorted	Unimodal, Poorly Sorted	Unimodal, Poorly Sorted
Textural Group		Muddy Sand	Muddy Sand	Muddy Sand
Sediment Name		Coarse Silty Fine Sand	Coarse Silty Fine Sand	Coarse Silty Fine Sand
Method of Moments [Arithmetic (μm)]	Mean	153.7	155.2	148.1
	Sorting	85.00	85.87	86.76
	Skewness	0.333	0.318	0.356
	Kurtosis	2.818	2.844	2.777
Method of Moments [Geometric (μm)]	Mean	115.5	114.8	105.8
	Sorting	2.690	2.815	2.975
	Skewness	-2.231	-2.270	-2.076
	Kurtosis	8.856	8.719	7.607
Method of Moments [Logarithmic (φ)]	Mean	3.114	3.122	3.241
	Sorting	1.428	1.493	1.573
	Skewness	2.231	2.270	2.076
	Kurtosis	8.856	8.719	7.607
Folk and Ward Method (μm)	Mean	136.4	138.7	126.2
	Sorting	2.164	2.231	2.419
	Skewness	-0.357	-0.368	-0.414
	Kurtosis	1.692	1.849	1.815
Folk and Ward Method (φ)	Mean	2.874	2.850	2.986
	Sorting	1.114	1.158	1.275
	Skewness	0.357	0.368	0.414
	Kurtosis	1.692	1.849	1.815
Folk and Ward Method (Description)	Mean	Fine Sand	Fine Sand	Fine Sand
	Sorting	Poorly Sorted	Poorly Sorted	Poorly Sorted
	Skewness	Very Fine Skewed	Very Fine Skewed	Very Fine Skewed
	Kurtosis	Very Leptokurtic	Very Leptokurtic	Very Leptokurtic
Mode (μm)		170.2	170.2	170.2
Mode (φ)		2.558	2.558	2.558
D_{10} (μm)		31.13	29.06	23.37
D_{50} (μm)		146.9	148.4	141.7
D_{90} (μm)		269.3	271.4	266.4
(D_{90} / D_{10}) (μm)		8.651	9.339	11.40
(D_{90} - D_{10}) (μm)		238.2	242.3	243.1
(D_{75} / D_{25}) (μm)		2.130	2.109	2.246
(D_{75} - D_{25}) (μm)		109.7	109.6	112.4
D_{10} (φ)		1.893	1.882	1.908
D_{50} (φ)		2.767	2.752	2.819
D_{90} (φ)		5.005	5.105	5.419
(D_{90} / D_{10}) (φ)		2.645	2.713	2.840
(D_{90} - D_{10}) (φ)		3.113	3.223	3.511
(D_{75} / D_{25}) (φ)		1.480	1.476	1.507
(D_{75} - D_{25}) (φ)		1.091	1.076	1.167
Total Sand		86.1%	86.7%	83.5%
Total Mud (Silt & Clay)		13.9%	13.3%	16.5%
Very Coarse Sand		0.0%	0.0%	0.0%
Coarse Sand		0.0%	0.0%	0.0%
Medium Sand		13.7%	14.1%	13.0%

Fine Sand	47.6%	47.9%	45.4%
Very Fine Sand	24.9%	24.6%	25.2%
Very Coarse Silt	3.8%	3.0%	4.5%
Coarse Silt	4.4%	3.9%	4.6%
Medium Silt	2.3%	2.3%	2.6%
Fine Silt	1.5%	1.7%	2.0%
Very Fine Silt	1.0%	1.3%	1.5%
Clay	0.9%	1.1%	1.3%

Table 36. GRADISTAT (Blott and Pye 2001) Results for DE-5, DE-6, and DE-7.

		DE-5	**DE-6**	**DE-7**
Sample Type		Unimodal, Poorly Sorted	Unimodal, Poorly Sorted	Unimodal, Poorly Sorted
Textural Group		Muddy Sand	Muddy Sand	Muddy Sand
Sediment Name		Very Coarse Silty Fine Sand	Very Coarse Silty Fine Sand	Very Coarse Silty Fine Sand
Method of Moments [Arithmetic (μm)]	Mean	129.0	129.0	99.54
	Sorting	86.37	85.51	86.45
	Skewness	0.502	0.498	0.979
	Kurtosis	2.715	2.715	3.457
Method of Moments [Geometric (μm)]	Mean	84.53	85.41	53.54
	Sorting	3.326	3.279	4.042
	Skewness	-1.694	-1.735	-1.074
	Kurtosis	5.803	6.022	3.560
Method of Moments [Logarithmic (φ)]	Mean	3.564	3.549	4.223
	Sorting	1.734	1.713	2.015
	Skewness	1.694	1.735	1.074
	Kurtosis	5.803	6.022	3.560
Folk and Ward Method (μm)	Mean	92.76	94.19	57.66
	Sorting	2.998	2.938	3.916
	Skewness	-0.488	-0.481	-0.415
	Kurtosis	1.490	1.508	1.071
Folk and Ward Method (φ)	Mean	3.430	3.408	4.116
	Sorting	1.584	1.555	1.969
	Skewness	0.488	0.481	0.415
	Kurtosis	1.490	1.508	1.071
Folk and Ward Method (Description)	Mean	Very Fine Sand	Very Fine Sand	Very Coarse Silt
	Sorting	Poorly Sorted	Poorly Sorted	Poorly Sorted
	Skewness	Very Fine Skewed	Very Fine Skewed	Very Fine Skewed
	Kurtosis	Leptokurtic	Very Leptokurtic	Mesokurtic
Mode (μm)		148.3	148.3	148.3
Mode (φ)		2.757	2.757	2.757
D_{10} (μm)		15.87	16.87	6.221
D_{50} (μm)		121.6	121.6	79.92
D_{90} (μm)		249.1	247.9	224.2
(D_{90} / D_{10}) (μm)		15.70	14.69	36.04
(D_{90} - D_{10}) (μm)		233.2	231.1	218.0

(D_{75} / D_{25}) (μm)	2.992	2.920	5.745
(D_{75} - D_{25}) (μm)	122.6	120.6	124.4
D_{10} (φ)	2.005	2.012	2.157
D_{50} (φ)	3.040	3.040	3.645
D_{90} (φ)	5.978	5.889	7.329
(D_{90} / D_{10}) (φ)	2.981	2.927	3.398
(D_{90} - D_{10}) (φ)	3.973	3.877	5.172
(D_{75} / D_{25}) (φ)	1.648	1.632	1.924
(D_{75} - D_{25}) (φ)	1.581	1.546	2.522
Total Sand	74.7%	75.1%	57.2%
Total Mud (Silt & Clay)	25.3%	24.9%	42.8%
Very Coarse Sand	0.0%	0.0%	0.0%
Coarse Sand	0.0%	0.0%	0.0%
Medium Sand	9.9%	9.7%	6.9%
Fine Sand	38.5%	38.7%	26.0%
Very Fine Sand	26.3%	26.8%	24.2%
Very Coarse Silt	8.9%	9.1%	14.9%
Coarse Silt	6.5%	6.4%	9.8%
Medium Silt	3.5%	3.3%	6.4%
Fine Silt	2.6%	2.4%	4.9%
Very Fine Silt	1.9%	1.9%	3.4%
Clay	1.9%	1.9%	3.4%

Table 37. GRADISTAT (Blott and Pye 2001) Results for DE-8, FG-1, and FG-2.

		DE-8	**FG-1**	**FG-2**
Sample Type		Unimodal, Poorly Sorted	Unimodal, Poorly Sorted	Unimodal, Poorly Sorted
Textural Group		Muddy Sand	Muddy Sand	Muddy Sand
Sediment Name		Very Coarse Silty Fine Sand	Coarse Silty Fine Sand	Very Coarse Silty Fine Sand
Method of Moments [Arithmetic (μm)]	Mean	102.9	143.4	137.6
	Sorting	88.47	87.11	88.25
	Skewness	0.929	0.348	0.396
	Kurtosis	3.310	2.700	2.670
Method of Moments [Geometric (μm)]	Mean	55.27	98.78	90.71
	Sorting	4.074	3.160	3.361
	Skewness	-1.085	-1.937	-1.768
	Kurtosis	3.555	6.734	5.881
Method of Moments [Logarithmic (φ)]	Mean	4.177	3.340	3.463
	Sorting	2.026	1.660	1.749
	Skewness	1.085	1.937	1.768
	Kurtosis	3.555	6.734	5.881
Folk and Ward Method (μm)	Mean	59.46	113.3	98.49
	Sorting	3.941	2.681	3.005
	Skewness	-0.430	-0.478	-0.520
	Kurtosis	1.063	1.821	1.717
Folk and Ward Method (φ)	Mean	4.072	3.142	3.344
	Sorting	1.979	1.423	1.588
	Skewness	0.430	0.478	0.520

	Kurtosis	1.063	1.821	1.717
Folk and Ward Method (Description)	Mean	Very Coarse Silt	Very Fine Sand	Very Fine Sand
	Sorting	Poorly Sorted	Poorly Sorted	Poorly Sorted
	Skewness	Very Fine Skewed	Very Fine Skewed	Very Fine Skewed
	Kurtosis	Mesokurtic	Very Leptokurtic	Very Leptokurtic
Mode (μm)		148.3	170.2	170.2
Mode (φ)		2.757	2.558	2.558
D_{10} (μm)		6.278	18.66	14.82
D_{50} (μm)		83.93	138.0	131.9
D_{90} (μm)		230.4	262.4	258.7
(D_{90} / D_{10}) (μm)		36.70	14.06	17.45
(D_{90} - D_{10}) (μm)		224.1	243.7	243.9
(D_{75} / D_{25}) (μm)		5.832	2.365	2.611
(D_{75} - D_{25}) (μm)		129.4	114.8	119.8
D_{10} (φ)		2.118	1.930	1.951
D_{50} (φ)		3.575	2.858	2.923
D_{90} (φ)		7.315	5.744	6.076
(D_{90} / D_{10}) (φ)		3.454	2.976	3.115
(D_{90} - D_{10}) (φ)		5.198	3.814	4.125
(D_{75} / D_{25}) (φ)		1.950	1.533	1.585
(D_{75} - D_{25}) (φ)		2.544	1.242	1.385
Total Sand		58.5%	81.3%	78.3%
Total Mud (Silt & Clay)		41.5%	18.7%	21.7%
Very Coarse Sand		0.0%	0.0%	0.0%
Coarse Sand		0.0%	0.0%	0.0%
Medium Sand		15.7%	12.2%	11.4%
Fine Sand		48.0%	44.1%	41.8%
Very Fine Sand		23.6%	25.0%	25.0%
Very Coarse Silt		4.2%	4.9%	5.9%
Coarse Silt		4.2%	4.9%	5.5%
Medium Silt		1.9%	3.2%	3.7%
Fine Silt		1.1%	2.4%	2.9%
Very Fine Silt		0.7%	1.7%	2.0%
Clay		0.6%	1.5%	1.8%

Table 38. GRADISTAT (Blott and Pye 2001) Results for FG-3, FG-4, and FG-5.

		FG-3	**FG-4**	**FG-5**
Sample Type		Unimodal, Poorly Sorted	Unimodal, Poorly Sorted	Unimodal, Poorly Sorted
Textural Group		Muddy Sand	Muddy Sand	Muddy Sand
Sediment Name		Very Coarse Silty Fine Sand	Very Coarse Silty Fine Sand	Very Coarse Silty Fine Sand
Method of Moments [Arithmetic (μm)]	Mean	139.8	132.2	117.9
	Sorting	86.40	86.86	88.24
	Skewness	0.355	0.427	0.610
	Kurtosis	2.676	2.654	2.744
Method of Moments	Mean	94.70	85.85	69.39
	Sorting	3.251	3.417	3.798
	Skewness	-1.886	-1.705	-1.362

[Geometric (μm)]	Kurtosis	6.422	5.626	4.312
Method of Moments [Logarithmic (φ)]	Mean	3.401	3.542	3.849
	Sorting	1.701	1.773	1.925
	Skewness	1.886	1.705	1.362
	Kurtosis	6.422	5.626	4.312
Folk and Ward Method (μm)	Mean	106.6	93.03	74.84
	Sorting	2.810	3.083	3.547
	Skewness	-0.498	-0.519	-0.511
	Kurtosis	1.825	1.629	1.198
Folk and Ward Method (φ)	Mean	3.230	3.426	3.740
	Sorting	1.491	1.624	1.826
	Skewness	0.498	0.519	0.511
	Kurtosis	1.825	1.629	1.198
Folk and Ward Method (Description)	Mean	Very Fine Sand	Very Fine Sand	Very Fine Sand
	Sorting	Poorly Sorted	Poorly Sorted	Poorly Sorted
	Skewness	Very Fine Skewed	Very Fine Skewed	Very Fine Skewed
	Kurtosis	Very Leptokurtic	Very Leptokurtic	Leptokurtic
Mode (μm)		148.3	148.3	148.3
Mode (φ)		2.757	2.757	2.757
D_{10} (μm)		16.73	13.75	8.765
D_{50} (μm)		134.4	126.2	108.7
D_{90} (μm)		258.2	252.0	241.4
(D_{90} / D_{10}) (μm)		15.44	18.33	27.54
(D_{90} - D_{10}) (μm)		241.4	238.3	232.6
(D_{75} / D_{25}) (μm)		2.419	2.785	4.433
(D_{75} - D_{25}) (μm)		114.4	120.5	135.4
D_{10} (φ)		1.954	1.988	2.051
D_{50} (φ)		2.896	2.987	3.202
D_{90} (φ)		5.902	6.185	6.834
(D_{90} / D_{10}) (φ)		3.021	3.110	3.332
(D_{90} - D_{10}) (φ)		3.948	4.196	4.783
(D_{75} / D_{25}) (φ)		1.540	1.613	1.854
(D_{75} - D_{25}) (φ)		1.274	1.478	2.148
Total Sand		80.3%	76.4%	67.9%
Total Mud (Silt & Clay)		19.7%	23.6%	32.1%
Very Coarse Sand		0.0%	0.0%	0.0%
Coarse Sand		0.0%	0.0%	0.0%
Medium Sand		11.4%	10.3%	8.8%
Fine Sand		43.2%	40.3%	34.3%
Very Fine Sand		25.7%	25.8%	24.8%
Very Coarse Silt		5.2%	6.9%	10.1%
Coarse Silt		5.0%	5.8%	7.7%
Medium Silt		3.4%	3.9%	5.1%
Fine Silt		2.6%	3.0%	3.9%
Very Fine Silt		1.9%	2.1%	2.7%
Clay		1.7%	1.9%	2.6%

Table 39. GRADISTAT (Blott and Pye 2001) Results for FG-6, FG-7.

		FG-6	**FG-7**
Sample Type		Unimodal, Poorly Sorted	Unimodal, Poorly Sorted
Textural Group		Muddy Sand	Muddy Sand
Sediment Name		Very Coarse Silty Fine Sand	Very Coarse Silty Fine Sand
Method of Moments [Arithmetic (µm)]	Mean	113.0	103.4
	Sorting	84.56	87.31
	Skewness	0.657	0.920
	Kurtosis	2.787	3.317
Method of Moments [Geometric (µm)]	Mean	68.46	57.24
	Sorting	3.603	3.925
	Skewness	-1.386	-1.131
	Kurtosis	4.589	3.763
Method of Moments [Logarithmic (φ)]	Mean	3.869	4.127
	Sorting	1.849	1.973
	Skewness	1.386	1.131
	Kurtosis	4.589	3.763
Folk and Ward Method (µm)	Mean	75.34	62.24
	Sorting	3.337	3.754
	Skewness	-0.468	-0.422
	Kurtosis	1.193	1.081
Folk and Ward Method (φ)	Mean	3.730	4.006
	Sorting	1.738	1.908
	Skewness	0.468	0.422
	Kurtosis	1.193	1.081
Folk and Ward Method (Description)	Mean	Very Fine Sand	Very Coarse Silt
	Sorting	Poorly Sorted	Poorly Sorted
	Skewness	Very Fine Skewed	Very Fine Skewed
	Kurtosis	Leptokurtic	Mesokurtic
Mode (µm)		148.3	148.3
Mode (φ)		2.757	2.757
D_{10} (µm)		10.47	7.217
D_{50} (µm)		102.2	85.31
D_{90} (µm)		233.0	228.9
(D_{90} / D_{10}) (µm)		22.25	31.72
(D_{90} - D_{10}) (µm)		222.5	221.7
(D_{75} / D_{25}) (µm)		4.246	5.446
(D_{75} - D_{25}) (µm)		127.8	127.3
D_{10} (φ)		2.102	2.127
D_{50} (φ)		3.291	3.551
D_{90} (φ)		6.578	7.114
(D_{90} / D_{10}) (φ)		3.130	3.344
(D_{90} - D_{10}) (φ)		4.476	4.987
(D_{75} / D_{25}) (φ)		1.808	1.912
(D_{75} - D_{25}) (φ)		2.086	2.445
Total Sand		66.3%	59.3%
Total Mud (Silt & Clay)		33.7%	40.7%
Very Coarse Sand		0.0%	0.0%
Coarse Sand		0.0%	0.0%
Medium Sand		7.6%	7.4%
Fine Sand		32.6%	27.5%
Very Fine Sand		26.0%	24.4%

Very Coarse Silt	12.2%	14.3%
Coarse Silt	8.4%	9.8%
Medium Silt	4.7%	6.1%
Fine Silt	3.4%	4.4%
Very Fine Silt	2.4%	3.0%
Clay	2.4%	3.1%

APPENDIX D:

AGE-DEPTH MODELS

AGE-DEPTH MODEL R CODE

```
#Set up for BCHRON

library(Bchron)

#Load Tables

C14_WallAB =
read.csv("BchronTables/C14_WallAB_BchronTable.csv")
OSL_SG_WallAB =
read.csv("BchronTables/OSL_SG_WallAB_BchronTable.csv")
OSL_SG_WallDE =
read.csv("BchronTables/OSL_SG_WallDE_BchronTable.csv")
OSL_SG_WallFG =
read.csv("BchronTables/OSL_SG_WallFG_BchronTable.csv")
OSL_SA_WallAB =
read.csv("BchronTables/OSL_SA_WallAB_BchronTable.csv")
OSL_SA_WallDE =
read.csv("BchronTables/OSL_SA_WallDE_BchronTable.csv")
OSL_SA_WallFG =
read.csv("BchronTables/OSL_SA_WallFG_BchronTable.csv")

Combined_C14_SG_OSL_WallAB =
read.csv("BchronTables/Combined_C14_OSL_SG_WallAB_BchronTab
le.csv")

#Create expanded "Normal" calibration curve[2]

ExpandedNormalData =
read.csv('ExpandedNormalCalibration.csv')
CreateCalCurve(name='ExpandedNormal',
               cal_ages =
ExpandedNormalData$CalibratedDate,
               uncal_ages =
ExpandedNormalData$UncalibratedDate,
               one_sigma = ExpandedNormalData$Error)

#Calibrate C14 Ages

agesLCC_C14_WallAB = BchronCalibrate(ages=C14$Age,
                          ageSds=C14$Error,
```

---

[2] The normal distribution calibration curve included with BChron did not cover the ages produced by some of the older OSL samples. In order to include the OSL ages in the BChron model, I created a calibration curve for normally distributed data, called "ExpandedNormal" that would allow for the inclusion of ages up to 100,000 yr BP.

```
                          positions=C14$Depth,
                          calCurves=C14$CalCurve,
                          ids=C14$ID)

#Plot C14 Age Calibrations

summary(agesLCC_C14_WallAB)
plot(agesLCC_C14_WallAB,withPositions=TRUE)

#Create C14 Age-Depth Model for Wall AB

LCCmod_C14_WallAB = Bchronology(ages=C14_WallAB$Age,
                     ageSds=C14_WallAB$Error,
                     calCurves=C14_WallAB$CalCurve,
                     positions=C14_WallAB$Depth,
                     ids=C14_WallAB$ID,
                     predictPositions=seq(0,140,by=1))

#Plot C14 Age-Depth Model

plot(LCCmod_C14_WallAB,
     main="Last Canyon Cave, Wall AB, Radiocarbon",
     xlab='Age (cal years BP)',
     ylab='Depth (cm)',
     las=1,
     xlim=c(250000,0))

#Create Single-Grain OSL Age-Depth Models

      #Wall AB (Single Grain)

LCCmod_OSL_SG_WallAB = Bchronology(ages=OSL_SG_WallAB$Age,
                     ageSds=OSL_SG_WallAB$Error,
                     calCurves=OSL_SG_WallAB$CalCurve,
                     positions=OSL_SG_WallAB$Depth,
                     positionThicknesses =
                         OSL_SG_WallAB$Thickness,
                     ids=OSL_SG_WallAB$ID,
                     predictPositions=seq(0,140,by=1))

      #Wall DE (Single Grain)

LCCmod_OSL_SG_WallDE = Bchronology(ages=OSL_SG_WallDE$Age,
                    ageSds=OSL_SG_WallDE$Error,
                    calCurves=OSL_SG_WallDE$CalCurve,
                    positions=OSL_SG_WallDE$Depth,
                    positionThicknesses =
                    OSL_SG_WallDE$Thickness,
```

```
                    ids=OSL_SG_WallDE$ID,
                    predictPositions=seq(0,140,by=1))

      #Wall FG (Single Grain)

LCCmod_OSL_SG_WallFG = Bchronology(ages=OSL_SG_WallFG$Age,
                    ageSds=OSL_SG_WallFG$Error,
                    calCurves=OSL_SG_WallFG$CalCurve,
                    positions=OSL_SG_WallFG$Depth,
                    positionThicknesses
                    =OSL_SG_WallFG$Thickness,
                    ids=OSL_SG_WallFG$ID,
                    predictPositions=seq(0,140,by=1))

#Plot Single-Grain OSL Age-Depth Models

      #Wall AB (Single Grain)

plot(LCCmod_OSL_SG_WallAB,
     main="Last Canyon Cave, Wall AB, Single-Grain OSL",
     xlab='Age (years BP)',
     ylab='Depth (cm)',
     las=1,
     xlim=c(250000,0))

      #Wall DE (Single Grain)

plot(LCCmod_OSL_SG_WallDE,
     main="Last Canyon Cave, Wall DE, Single-Grain OSL",
     xlab='Age (years BP)',
     ylab='Depth (cm)',
     las=1,
     xlim=c(250000,0))

      #Wall FG (Single Grain)

plot(LCCmod_OSL_SG_WallFG,
     main="Last Canyon Cave, Wall FG, Single-Grain OSL",
     xlab='Age (years BP)',
     ylab='Depth (cm)',
     las=1,
     xlim=c(250000,0))

#Create Small Aliquot OSL Age-Depth Models

      #Wall AB (Small Aliquot)

LCCmod_OSL_SA_WallAB = Bchronology(ages=OSL_SA_WallAB$Age,
```

```
                    ageSds=OSL_SA_WallAB$Error,
                    calCurves=OSL_SA_WallAB$CalCurve,
                    positions=OSL_SA_WallAB$Depth,
                    positionThicknesses
                    OSL_SA_WallAB$Thickness,
                    ids=OSL_SA_WallAB$ID,
                    predictPositions=seq(0,140,by=1))

     #Wall DE (Small Aliquot)

LCCmod_OSL_SA_WallDE = Bchronology(ages=OSL_SA_WallDE$Age,
                    ageSds=OSL_SA_WallDE$Error,
                    calCurves=OSL_SA_WallDE$CalCurve,
                    positions=OSL_SA_WallDE$Depth,
                    positionThicknesses =
                    OSL_SA_WallDE$Thickness,
                    ids=OSL_SA_WallDE$ID,
                    predictPositions=seq(0,140,by=1))

      #Wall FG (Small Aliquot)
LCCmod_OSL_SA_WallFG = Bchronology(ages=OSL_SA_WallFG$Age,
                    ageSds=OSL_SA_WallFG$Error,
                    calCurves=OSL_SA_WallFG$CalCurve,
                    positions=OSL_SA_WallFG$Depth,
                    positionThicknesses =
                    OSL_SA_WallFG$Thickness,
                    ids=OSL_SA_WallFG$ID,
                    predictPositions=seq(0,140,by=1))

#Plot Small Aliquot OSL Age-Depth Models

      #Wall AB (Small Aliquot)
plot(LCCmod_OSL_SA_WallAB,
     main="Last Canyon Cave, Wall AB, Small Aliquot OSL",
     xlab='Age (years BP)',
     ylab='Depth (cm)',
     las=1,
     xlim=c(250000,0))

      #Wall DE (Small Aliquot)
plot(LCCmod_OSL_SA_WallDE,
     main="Last Canyon Cave, Wall DE, Small Aliquot OSL",
     xlab='Age (years BP)',
     ylab='Depth (cm)',
     las=1,
     xlim=c(250000,0))

      #Wall FG (Small Aliquot)
```

```
plot(LCCmod_OSL_SA_WallFG,
     main="Last Canyon Cave, Wall FG, Small Aliquot OSL",
     xlab='Age (years BP)',
     ylab='Depth (cm)',
     las=1,
     xlim=c(250000,0))

#Export CSVs of model results
write.csv(summary(LCCmod_C14_WallAB), file =
"ModelResults/GranulometryAges_C14_WallAB_REVISED.csv")
write.csv(summary(LCCmod_OSL_SG_WallAB), file =
"ModelResults/GranulometryAges_OSL_SG_WallAB_REVISED.csv")
write.csv(summary(LCCmod_OSL_SG_WallDE), file =
"ModelResults/GranulometryAges_OSL_SG_WallDE_REVISED.csv")
write.csv(summary(LCCmod_OSL_SG_WallFG), file =
"ModelResults/GranulometryAges_OSL_SG_WallFG_REVISED.csv")
write.csv(summary(LCCmod_OSL_SA_WallAB), file =
"ModelResults/GranulometryAges_OSL_SA_WallAB_REVISED.csv")
write.csv(summary(LCCmod_OSL_SA_WallDE), file =
"ModelResults/GranulometryAges_OSL_SA_WallDE_REVISED.csv")
write.csv(summary(LCCmod_OSL_SA_WallFG), file =
"ModelResults/GranulometryAges_OSL_SA_WallFG_REVISED.csv")

#Calculate sedimentation rates
sedrate_AB_14C = summary(LCCmod_C14_WallAB, type =
'sed_rate',  useExisting = FALSE)
sedrate_AB_SGOSL = summary(LCCmod_OSL_SG_WallAB, type =
'sed_rate',  useExisting = FALSE)
sedrate_DE_SGOSL = summary(LCCmod_OSL_SG_WallDE, type =
'sed_rate',  useExisting = FALSE)
sedrate_FG_SGOSL = summary(LCCmod_OSL_SG_WallFG, type =
'sed_rate',  useExisting = FALSE)

#Export CSV of sedimentation rates
write.csv(sedrate_AB_14C, file =
"ModelResults/SedimentationRatesWallAB_14C.csv")
write.csv(sedrate_AB_SGOSL, file =
"ModelResults/SedimentationRatesWallAB_SGOSL.csv")
write.csv(sedrate_DE_SGOSL, file =
"ModelResults/SedimentationRatesWallDE_SGOSL.csv")
write.csv(sedrate_FG_SGOSL, file =
"ModelResults/SedimentationRatesWallFG_SGOSL.csv")

#Plot sedimentation rates

#Wall AB Radiocarbon
plot(sedrate_AB_14C[,'position_grid'],
sedrate_AB_14C[,'50%'], type='l', ylab = 'Years per cm',
```

```
xlab = 'Depth (cm)', ylim = range(sedrate_AB_14C[,-1], xlim
= 10000))
lines(sedrate_AB_14C[,'position_grid'],
sedrate_AB_14C[,'2.5%'], lty='dashed')
lines(sedrate_AB_14C[,'position_grid'],
sedrate_AB_14C[,'97.5%'], lty='dotted')
title(main = 'Sedimentation Rates in Wall AB, Radiocarbon')

#Wall AB Single-Grain OSL
plot(sedrate_AB_SGOSL[,'position_grid'],
sedrate_AB_SGOSL[,'50%'], type='l', ylab = 'Years per cm',
xlab = 'Depth (cm)', ylim = range(sedrate_AB_SGOSL[,-1]))
lines(sedrate_AB_SGOSL[,'position_grid'],
sedrate_AB_SGOSL[,'2.5%'], lty='dashed')
lines(sedrate_AB_SGOSL[,'position_grid'],
sedrate_AB_SGOSL[,'97.5%'], lty='dotted')
title(main = 'Sedimentation Rates in Wall AB, SG OSL')

#Wall DE Single-Grain OSL
plot(sedrate_DE_SGOSL[,'position_grid'],
sedrate_DE_SGOSL[,'50%'], type='l', ylab = 'Years per cm',
xlab = 'Depth (cm)', ylim = range(sedrate_DE_SGOSL[,-1]))
lines(sedrate_DE_SGOSL[,'position_grid'],
sedrate_DE_SGOSL[,'2.5%'], lty='dashed')
lines(sedrate_DE_SGOSL[,'position_grid'],
sedrate_DE_SGOSL[,'97.5%'], lty='dotted')
title(main = 'Sedimentation Rates in Wall DE, SG OSL')

#Wall FG Single-Grain OSL
plot(sedrate_FG_SGOSL[,'position_grid'],
sedrate_FG_SGOSL[,'50%'], type='l', ylab = 'Years per cm',
xlab = 'Depth (cm)', ylim = range(sedrate_FG_SGOSL[,-1]))
lines(sedrate_FG_SGOSL[,'position_grid'],
sedrate_FG_SGOSL[,'2.5%'], lty='dashed')
lines(sedrate_FG_SGOSL[,'position_grid'],
sedrate_FG_SGOSL[,'97.5%'], lty='dotted')
title(main = 'Sedimentation Rates in Wall FG, SG OSL')
```

“EXPANDEDNORMAL” CALIBRATION CURVE

Table 40. “ExpandedNormalCalibration.csv” Table Used for “ExpandedNormal” Calibration Curve.

UncalibratedDate	CalibratedDate	Error
-100	-100	0
500000	500000	0

DETAILED PLOTS OF AGE-DEPTH MODELS

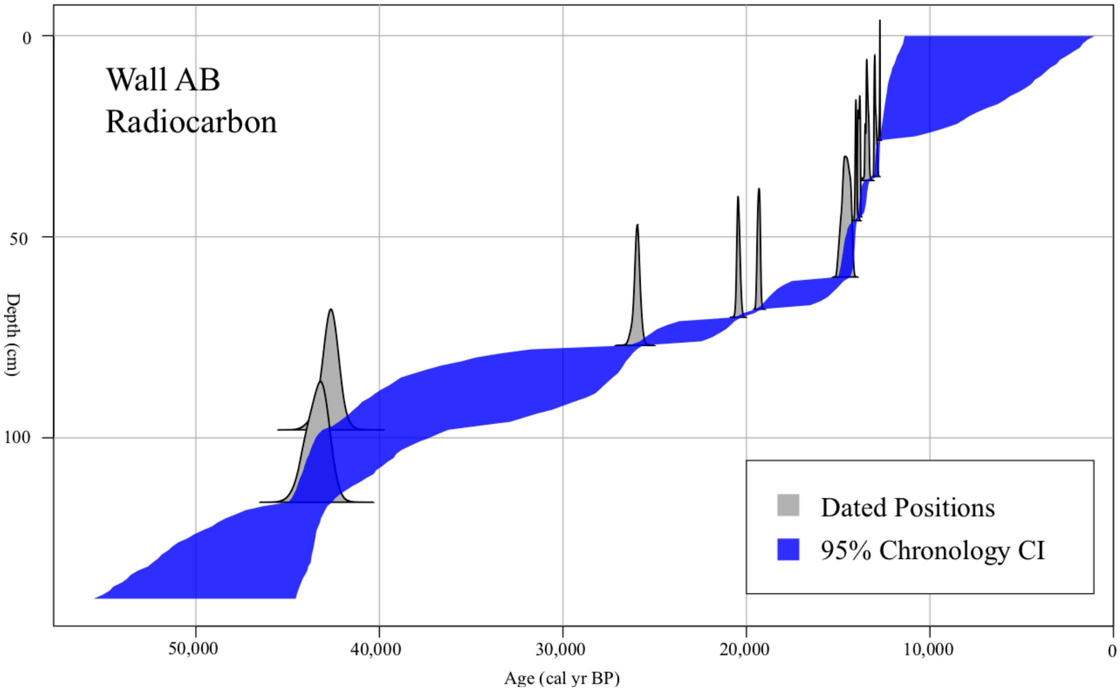

Figure 40. Detailed view of the radiocarbon age-depth model for Wall AB.

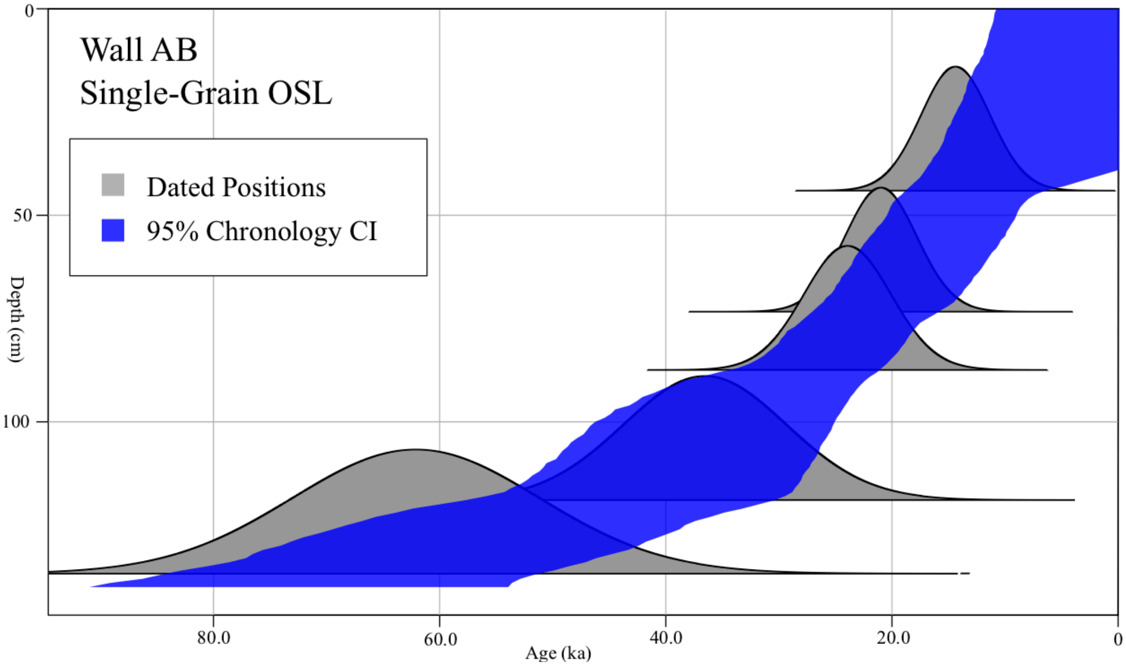

Figure 41. Detailed view of the single-grain OSL age-depth model for Wall AB.

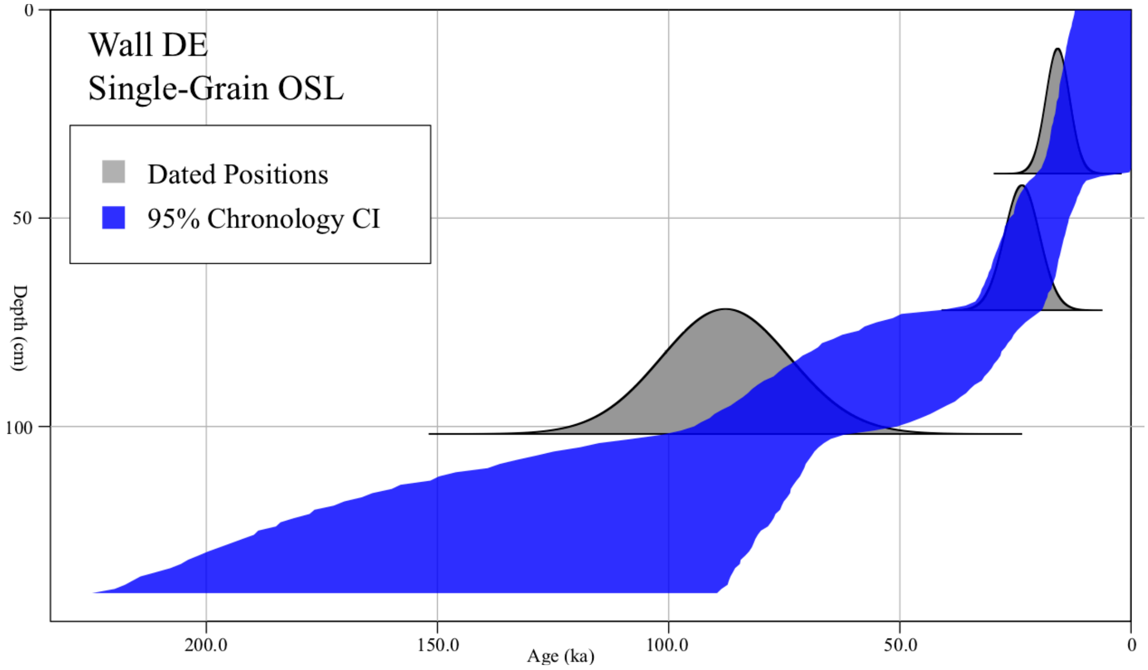

Figure 42. Detailed view of the single-grain OSL age-depth model for Wall DE.

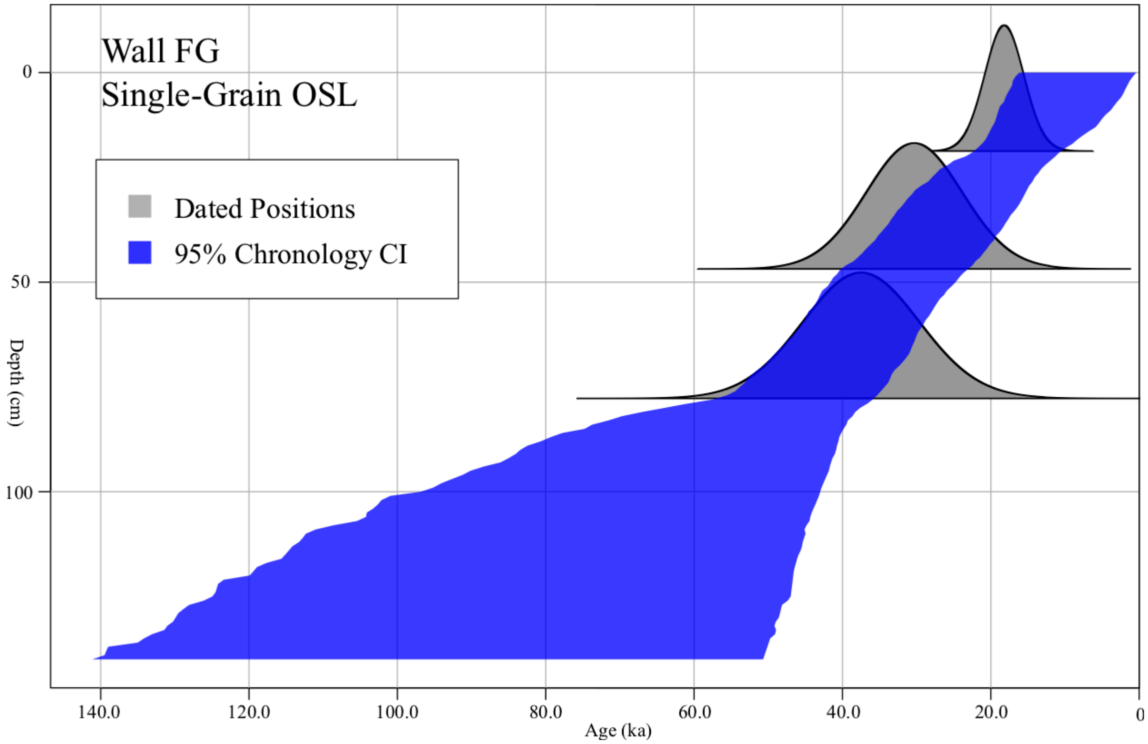

Figure 43. Detailed view of the single-grain OSL age-depth model for Wall FG.

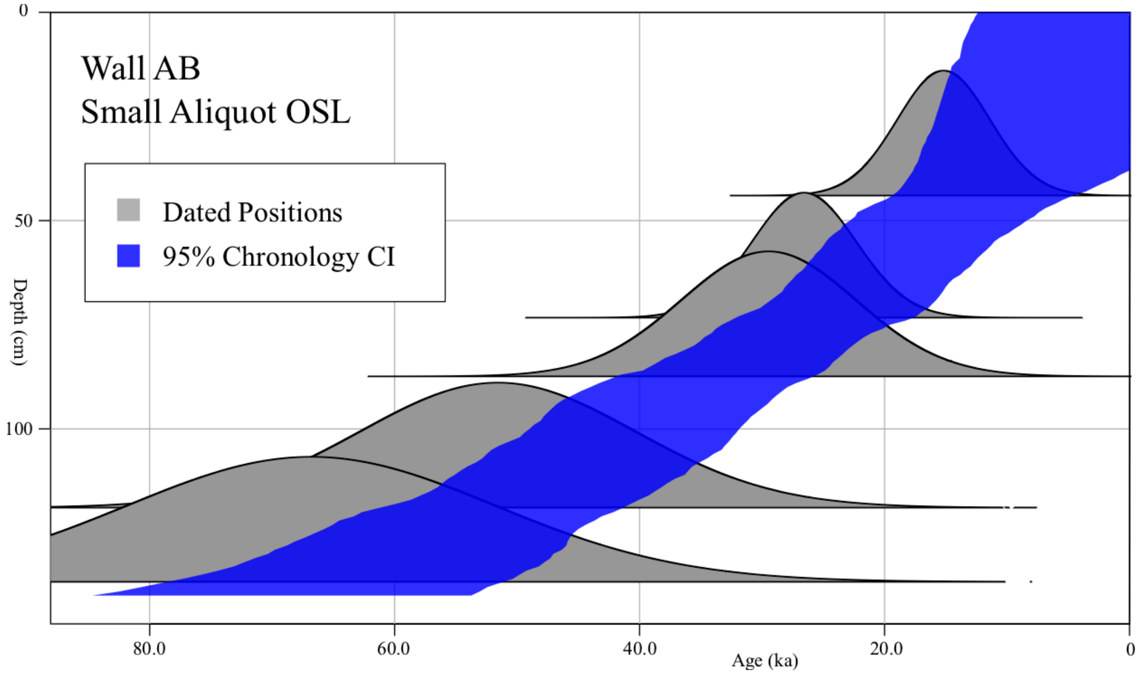

Figure 44. Detailed view of the small aliquot OSL age-depth model for Wall AB.

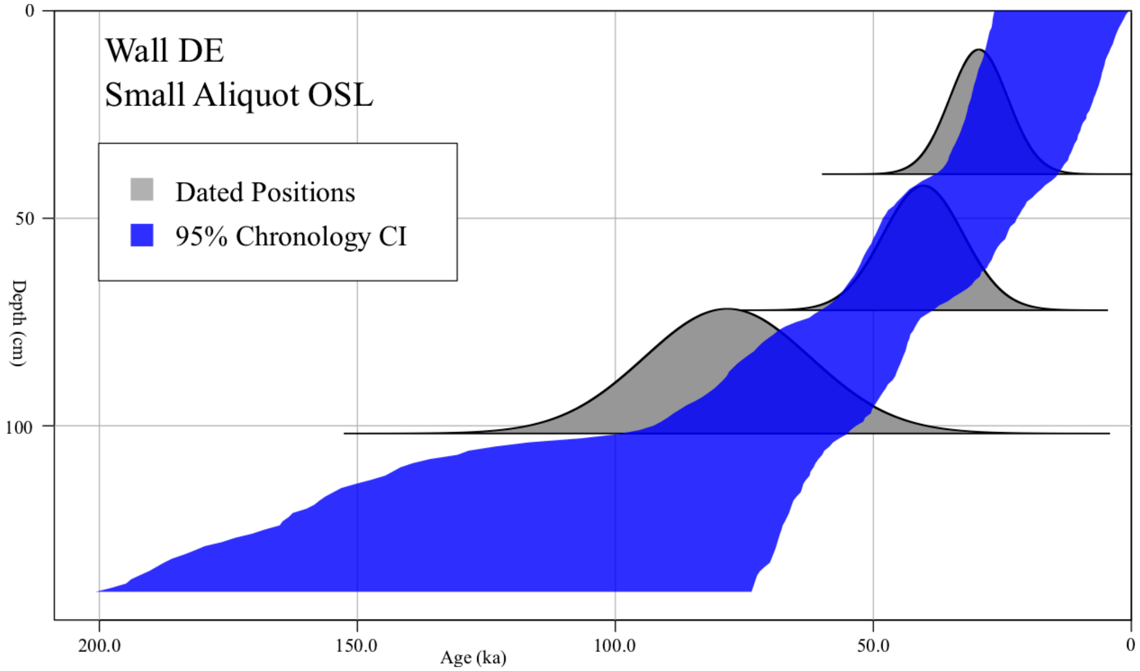

Figure 45. Detailed view of the small aliquot OSL age-depth model for Wall DE.

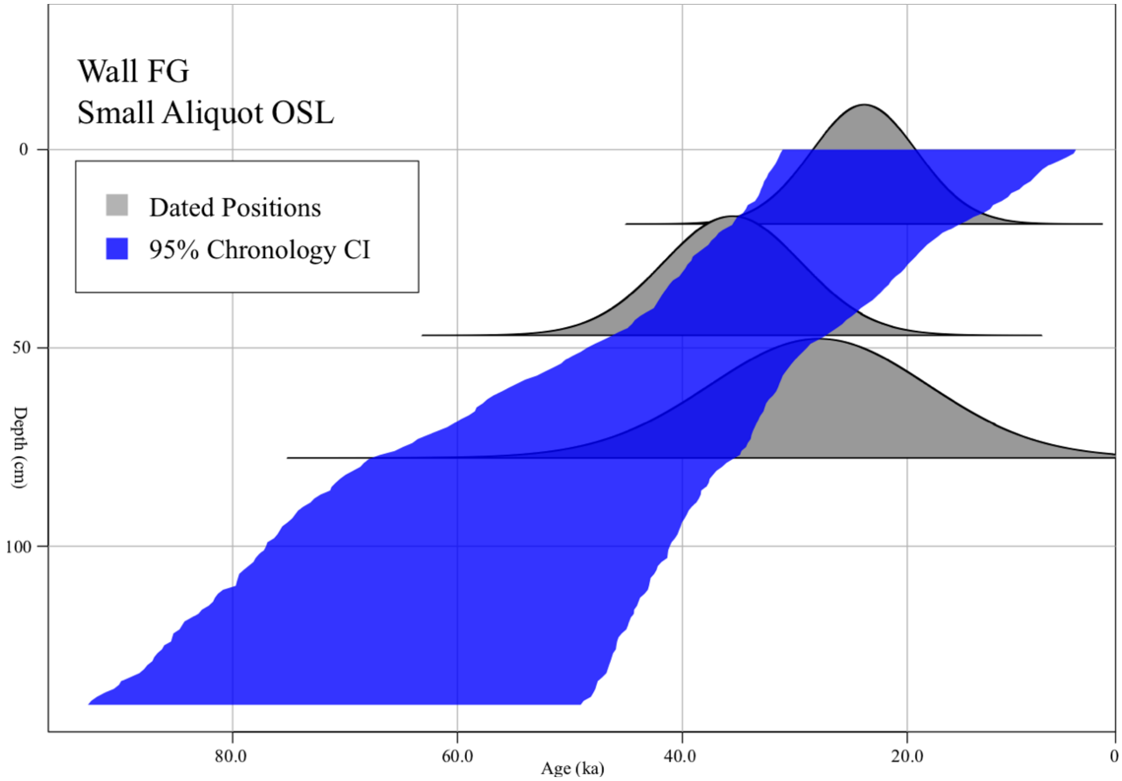

Figure 46. Detailed view of the small aliquot OSL age-depth model for Wall FG.

TABLES OF AGE-DEPTH MODEL RESULTS

Table 41. Results of Radiocarbon Age-Depth Model in Wall AB

Depth (cm)	2.5% Quantile	10% Quantile	50% Quantile	90% Quantile	97.50% Quantile
0	371.7	1385.6	4847.5	8451.4	9900.375
1	650	1766.9	5155	8689.1	10108.225
2	1016.85	2150.9	5444	8900.7	10285.2
3	1289.95	2475.7	5776.5	9164.6	10431.275
4	1529.875	2804.8	6071	9335.7	10491.325
5	1708.3	3173.6	6424	9552	10671.9
6	2004.475	3493.1	6731.5	9720.2	10745.425
7	2266.65	3740.4	7046	9928.1	10907.15
8	2582.95	4076.5	7391	10109.5	11035.25
9	2737	4338	7637.5	10317.7	11256.125
10	3165.1	4662.4	7944	10514.3	11457.325
11	3602.675	4972.1	8231.5	10709.6	11563.3
12	3945.775	5342	8498	10876.4	11702.2
13	4337.4	5747.8	8802	11010.6	11779.625
14	4783.1	6160.1	9070.5	11213	11923.3
15	5244.925	6561.3	9365.5	11355.6	12090.25
16	5579.875	7021	9678.5	11610	12146.8
17	6076.975	7448.4	9946.5	11753.4	12240.225

18	6337.925	7742.7	10234.5	11867.1	12303.1
19	6553.85	8187.4	10521.5	11989.3	12361.125
20	7110	8617.4	10821	12104.4	12422.025
21	7544.65	9002.6	11089.5	12217.3	12472.1
22	8162.85	9410.5	11380.5	12325.1	12520.1
23	8592.625	9921.3	11697.5	12432.7	12574.025
24	9302.975	10446.9	12054	12543	12632.025
25	10110.325	11151.6	12375	12634	12687
26	12583.725	12713	12730	12761	12780.025
27	12604.475	12733	12763	12831.1	12878
28	12633.725	12747	12796	12869	12917.025
29	12721.175	12758.9	12821	12900.1	12947
30	12731.95	12774.9	12847	12927	12973
31	12738	12789.9	12870	12947.1	12991
32	12745.9	12807	12895.5	12970	13006
33	12768.95	12825.9	12924	12988	13020.025
34	12795	12857	12953	13009	13033.025
35	12877	12921	12999	13046	13063
36	13289.925	13330.9	13421	13520.1	13554.025
37	13346.975	13391.9	13485	13602.2	13689.025
38	13372.95	13431	13531	13665	13729.075
39	13403.95	13464	13574	13707	13764.025
40	13431.95	13491.8	13611	13741.1	13794
41	13460.975	13527.9	13652	13771	13820.025
42	13489	13569.9	13693	13796.1	13845.075
43	13545	13617	13739	13827	13874
44	13608.975	13681	13780	13862	13903
45	13774	13788	13838	13912.1	13946
46	13976.975	14003	14049	14092	14110.025
47	14008.975	14047	14107	14238.1	14339.15
48	14033	14067.9	14151.5	14319.1	14446.025
49	14049.975	14091.9	14194.5	14393	14520.025
50	14066.925	14110.9	14235	14460.1	14597.025
51	14077.975	14131	14279	14515.1	14667.05
52	14089	14153	14317	14562.1	14723.025
53	14112.925	14180.9	14363	14602.2	14769.1
54	14124	14204.7	14404.5	14648.2	14804.025
55	14149	14232.9	14445.5	14692.2	14840.175
56	14173.975	14267.9	14487.5	14746	14877.025
57	14209.975	14303.8	14529	14786	14908.15
58	14244.95	14345	14574	14825.1	14947.125
59	14278.975	14387.9	14625.5	14881	14990.05
60	14335	14461	14720	14959	15066.025
61	14701.875	14903.8	15361	16732	17690.4
62	14910.75	15177.5	15959	17471.6	18262.025

63	15100.675	15479.6	16505.5	17922.6	18503.025
64	15335.6	15816	17049	18276	18713
65	15609.85	16230.8	17602.5	18578.5	18880.175
66	16061.325	16675	18165.5	18859.1	19047
67	16669.975	17429.8	18733	19099.1	19201.05
68	19197.925	19231	19319	19419	19456
69	19527	19704.8	19887	20056	20227
70	20270.95	20333	20447	20539	20594.025
71	20611.675	20769.9	21275	22891.4	24181.825
72	20836.75	21092.8	22055	23789.3	24676.475
73	21039.9	21478.8	22830.5	24463.7	24996.525
74	21349.7	21951	23582	24932.5	25331.625
75	21833.45	22519.7	24343	25326.9	25620.15
76	22542.6	23337.9	25141	25677	25873.05
77	25586.875	25745.3	25959	26193	26355.125
78	25962.875	26173	26884.5	29287.2	31068.5
79	26129.725	26446.8	27748.5	30776.2	33508.95
80	26284.925	26734.9	28528	31833.7	34585.225
81	26403	27001	29167.5	33280.5	35615.225
82	26584.7	27319.7	29932.5	34311.3	36618.5
83	26752.9	27672.9	30581	34972.3	37324.95
84	26999.95	28083.7	31271.5	35680.8	38188.525
85	27280.775	28512.8	32029	36235.1	38874.375
86	27634.225	28835.9	32727.5	36980.2	39308.4
87	27987.375	29373.5	33407.5	37656.2	39755.25
88	28390.325	29855.5	34075	38315.1	40045.075
89	28742.625	30410	34893	38981.8	40463.6
90	29109.45	31021.4	35641.5	39395.5	40711.6
91	29578.875	31574.6	36352	39865.8	40967.525
92	30100.875	32130.1	37062	40294.7	41186.425
93	30819.5	32752	37798	40689.1	41512.45
94	31510	33519.9	38502.5	41036.6	41754.2
95	31876.5	34375.3	39300	41393.4	41947.175
96	32262.75	35251.6	40127	41745.1	42155.025
97	32826.55	36223.3	41082	42128.8	42464.15
98	33560.25	37471.7	42192.5	42781	43085.125
99	34611.8	38033.1	42354.5	42961.1	43255
100	35156.725	38384.5	42454.5	43059	43373.15
101	35556.85	38870.4	42542.5	43152.3	43501.05
102	36052.825	39206.2	42643	43238.1	43624.325
103	36443.25	39384.4	42711	43346.6	43808.075
104	36653.85	39658	42788	43456	43958.475
105	36950.25	40175	42859	43558.5	44109.2
106	37369.25	40620.3	42933	43672.3	44220.45
107	37661.575	40903.2	42999	43759.3	44270.475

108	38138.5	41055.1	43083.5	43873.5	44333.175
109	38574.625	41309.6	43152	43971.1	44423.9
110	38833	41593.4	43234.5	44053.3	44606.25
111	39485.525	41859.3	43308	44161	44698.225
112	39991.225	42078.4	43378	44249.6	44898.15
113	40531.7	42379.7	43474.5	44336	45004.95
114	41098.175	42566.4	43566	44430.5	45117.1
115	41887.875	42750.9	43664.5	44590.1	45200.075
116	42707.875	43047.9	43843	44770.1	45452.9
117	43031.8	43404.4	44471	45878.7	46890.025
118	43148.85	43675.5	44839	46609.4	47669.275
119	43294.8	43894	45184.5	47245.1	48660.125
120	43384.525	44069.7	45515	47900.5	49449.325
121	43488.75	44235.9	45803.5	48488.2	50413.6
122	43599.875	44432.6	46088	48988	51138.5
123	43705.875	44585.6	46392	49512	51708.325
124	43847.25	44829	46706	49943.4	52066.325
125	44067.025	44965.9	47057	50387.2	53147.875
126	44217.35	45126.8	47384	50819.8	53712.35
127	44349.875	45278.9	47678	51304	53892.525
128	44440.975	45490.7	47985.5	51821.3	54357.55
129	44603.95	45670.4	48355	52390.1	54969.475
130	44787.925	45875.1	48692.5	52750.6	55560.8
131	44921.4	46041.3	48968.5	53338.5	56216.775
132	44989.4	46260.9	49294.5	53792.5	56664.125
133	45073.725	46543.2	49658.5	54099.3	57315.475
134	45119.4	46685	50012.5	54680.4	57916.575
135	45208.65	46936.9	50263	55165.4	58439.175
136	45440.725	47076.9	50619.5	55650.7	58888.675
137	45643.85	47289.9	50888.5	56073.9	59348.1
138	45703.575	47514.5	51183.5	56530.9	59876.975
139	45778.95	47747.2	51579	56930.2	60555.3
140	45837.85	47976.8	51961.5	57388.4	60901.475

Table 42. Results from Single-Grain OSL Age-Depth Model in Wall AB

Depth (cm)	2.5% Quantile	10% Quantile	50% Quantile	90% Quantile	97.50% Quantile
0	-69	-69	1378.5	6778.2	9868.6
1	-69	-69	1595	7039.4	10070.9
2	-69	-69	1854.5	7373.1	10310.4
3	-69	-69	2103	7563.1	10413.375
4	-69	-69	2294	7707	10572.2
5	-69	-69	2554.5	8004.2	10738.225
6	-69	-69	2790	8257.3	11080.775

7	-69	-69	3014.5	8447	11257.25
8	-69	-69	3198	8694.6	11414.225
9	-69	-69	3436	8976.7	11668.1
10	-69	-69	3610.5	9148.4	11846.425
11	-69	-69	3838.5	9313.7	12020.6
12	-69	-69	4039.5	9547.7	12120.3
13	-69	-69	4214.5	9761.9	12179.35
14	-69	-69	4426	9981.1	12315.925
15	-69	-69	4647.5	10132.5	12420.2
16	-69	-69	4811	10209.5	12573.475
17	-69	-69	5009.5	10299.8	12789.325
18	-69	-69	5194	10425.2	12970.75
19	-69	-69	5361	10660	13314.15
20	-69	-69	5633.5	10824.9	13417.525
21	-69	-69	5833.5	10945.5	13520.9
22	-69	-69	6014	11242.4	13658.4
23	-69	-69	6195	11424	13792.325
24	-69	-69	6377.5	11652.5	13911.725
25	-69	-69	6553	11837.5	14083.4
26	-69	-69	6733.5	12051.5	14195.75
27	-69	-69	6977	12225	14323.575
28	-69	-69	7182	12363	14583.275
29	-69	-69	7377.5	12555.9	14704.3
30	-69	-69	7581	12693	14867.05
31	-69	-69	7805	12837.6	14977.4
32	-69	-69	8082.5	13006.9	15160.025
33	-69	-69	8315.5	13237.1	15345.7
34	-69	419.2	8557.5	13467	15698
35	-69	1197.5	8851.5	13658.3	16105.675
36	-69	1905.7	9183	13923.8	16388.9
37	-69	2488.1	9469	14134	16556.875
38	-69	3112.6	9766.5	14308.5	16788.075
39	-69	3726.7	10043	14558.6	16883.175
40	79.575	4271.9	10289.5	14769.1	17067.475
41	1165.75	4792.8	10556.5	15011.5	17467.375
42	2273.65	5395.6	10932	15383.7	17665.15
43	3368.2	6362.4	11413	15785.4	18156.275
44	4503.4	7162.3	11958	16371.5	18565.975
45	5502.35	7874.6	12528.5	16784	18806.35
46	6459.275	8490.4	12951.5	17115.4	19130.125
47	6904.925	8860	13266.5	17407.1	19415.25
48	7252.45	9251.4	13501.5	17665.6	19631.45
49	7685.4	9495.5	13799.5	17900.8	19974.425
50	7908.25	9909.7	14115	18129.1	20226.025
51	8176.45	10221.9	14354	18457	20473.375

52	8479.525	10503.6	14611.5	18757.8	20578.175
53	8743.25	10743.8	14818	19036.6	20741.875
54	9043.975	11106.6	15060	19280.3	21158.975
55	9240.525	11351.6	15394	19469.2	21399.8
56	9522.975	11581.5	15725.5	19658.9	21653.25
57	9846.7	11814.7	15986	19885.8	21747.325
58	9988.475	12137.9	16233	20146.4	21916.725
59	10454.475	12494.9	16514.5	20379	22179.625
60	10751.65	12781.6	16759.5	20612	22443.55
61	11032.65	12996.7	16992.5	20871.1	22732
62	11294.75	13262.7	17265.5	21047.3	22828.075
63	11587.075	13640.9	17495	21177.3	23154.275
64	12019.55	14055.6	17745	21361.9	23186.025
65	12616.3	14521.1	18022.5	21631.7	23453.7
66	13006	14774.8	18282.5	21975.1	23646.35
67	13505.65	14951.6	18514.5	22286.1	23936.7
68	13815.6	15283.8	18779.5	22533.3	24215.825
69	14125.025	15594.9	19086	22755.9	24508.175
70	14488.925	15990.1	19386.5	22993.3	24927.25
71	14954.125	16340.7	19798.5	23313.8	25346.125
72	15537.85	16925.9	20257.5	23757.6	25907.025
73	15884.6	17327.9	20779	24341.7	26556.2
74	16406.675	17889.7	21198.5	24751	26973.3
75	16841.925	18367	21706.5	25324.6	27547.225
76	17240.725	18827.7	22082.5	25666.2	27932.675
77	17523.775	19131.7	22418	26027.5	28102.05
78	17814.5	19561.1	22710	26336.7	28552.175
79	17984.9	19892.8	22996	26639.1	28787.425
80	18270.575	20163.7	23376.5	27011.9	29283.625
81	18651.475	20410.6	23654.5	27372.4	29679.975
82	19066.575	20720.1	23976.5	27776.7	30187.375
83	19434.875	20976.9	24256	28162.4	30455.25
84	19834.225	21245	24598.5	28543.4	30874.075
85	20047.725	21552.7	25041	28945.6	31167.925
86	20362.575	21795.5	25557.5	29413	31662.225
87	20663.475	22241.8	26069	30213.4	32721.025
88	21205.625	22770.5	26684.5	31044.7	33220.45
89	21698.975	23154.2	27211	31732.3	33764.6
90	22032.875	23600.6	27687	32321.4	34605.725
91	22355.725	23971	28145	32924	35380.275
92	22567.85	24338.3	28564	33375.2	35990.4
93	22786.85	24587	28952	33764.7	36736.95
94	23006.275	24852.6	29290	34312.5	37377.675
95	23156.625	25050.8	29697	34920.9	37939.25
96	23423.15	25279.9	30019.5	35479.1	38543.8

97	23675.6	25508.5	30312	36018.1	39203.45
98	23984.5	25875	30676	36473.1	39791.425
99	24171.975	26262.4	31079.5	36804.8	40125.925
100	24363.45	26556.1	31482	37354	40475.5
101	24750.825	26906.9	31860	37724.9	41458.15
102	25013.05	27231.8	32180.5	38161.1	42031.55
103	25197.05	27540	32567.5	38619.4	42460.95
104	25459.1	27850	32973	39060.2	43090
105	25639.825	28183.1	33368.5	39620.3	43289.575
106	25862.7	28438.5	33765.5	40156.3	44045
107	26034.25	28840.9	34077	40486.6	44245.45
108	26212.975	29060.5	34376.5	41097.5	44561.325
109	26412.525	29469.3	34734.5	41578.2	45146.925
110	26509.55	29802.1	35096	42056.8	45586.65
111	26665.925	30113.9	35448.5	42504.8	45952.8
112	26945.875	30431.2	35749.5	43000.7	46313.525
113	27253.8	30726.6	36182.5	43418.3	46853.35
114	27706.8	31035.7	36594	43940.9	47269.2
115	28279.175	31335.3	37080	44463	48067.825
116	29117.575	31737.9	37445	44940.5	48687.25
117	29652.8	32104.4	37914	45546.4	49499.4
118	30026.6	32635.8	38637.5	46388	50484.5
119	30436.8	33111.8	39470	47375.6	51506.725
120	31016.575	34030.4	40549.5	48803.5	52680.725
121	31885.85	35137.7	41814	49992.3	54350.55
122	32437.8	35815.4	42922	51482.1	55711.625
123	32860.075	36352.6	43924	52529.2	57406.6
124	33222.75	37159.1	44831.5	53368.1	58596.05
125	33580.3	37748.9	45526.5	54542.7	60423.35
126	33905.875	38422.1	46291.5	55322.1	61509.075
127	34488.15	39025.8	46831	56302.9	62796.775
128	34557.525	39506.6	47537	57369.9	63859.25
129	35011.725	40003.1	48314	58319	64610.5
130	36080.325	40490.8	48992	59302.9	65972.35
131	36717.825	41052.6	49651.5	60276.3	67276.15
132	37494.625	41649.5	50370	61606.7	68761.85
133	38173.175	42193.7	51197	62676.8	69733.625
134	38598.325	42942.7	52010.5	63974.9	71209.825
135	39265.975	43884.6	53158	65689.5	72541.225
136	40025	44893.2	54622	67669.2	74702.675
137	41124.625	46171.6	55738.5	69803.8	76416.4
138	41949.2	47139.3	56673.5	71689	78314.75
139	42510.2	48118.2	57600.5	72726.9	80264.15
140	43267.25	48681	58254.5	73494	80958.35

Table 43. Results from Single-Grain OSL Age-Depth Model in Wall DE

Depth (cm)	2.5% Quantile	10% Quantile	50% Quantile	90% Quantile	97.50% Quantile
0	-69	628.8	4486.5	9921.1	12876.8
1	-69	1054.7	4868	10104.8	13030.375
2	-69	1383.8	5132.5	10277.1	13215.15
3	-69	1649.6	5368	10400.3	13481.825
4	-69	1878.7	5614	10608.6	13651.2
5	-69	2213.4	5879.5	10811.3	13748.325
6	-69	2502.8	6116.5	10956.8	13824.55
7	-69	2805.6	6330.5	11114.4	13956.9
8	-69	3085.3	6589	11258.6	14188.95
9	-69	3406.7	6837	11485.7	14380.25
10	-69	3685.5	7054.5	11693.8	14555.475
11	-69	4001.7	7344	11847.4	14733.925
12	-69	4266.7	7588	12051.6	14935.45
13	-69	4504.7	7839.5	12237.1	15052.95
14	-69	4736.7	8094.5	12409.4	15199.425
15	-69	4973.9	8370	12528	15342.325
16	83.1	5214.4	8592	12707.4	15424.125
17	535.5	5438.2	8817	12827.1	15594.15
18	896.25	5702.5	9064.5	13090.2	15731.175
19	1260.35	5913	9278.5	13301.1	15899.7
20	1636.825	6114.1	9531.5	13523.7	15981.775
21	1808.575	6321.6	9778.5	13745.6	16166.95
22	1882.8	6533.6	10056	13978.3	16486.15
23	2413.975	6711.2	10273.5	14247.6	16624.25
24	2607.575	6912.7	10524.5	14420.4	16768.05
25	2725.4	7127.7	10749	14526	16981.2
26	3057.675	7333	10958.5	14708.7	17113.875
27	3641.575	7601.2	11192	14961.5	17303.75
28	3861.825	7845.6	11431	15187.1	17562.2
29	3982.625	8073.8	11669.5	15363.1	17848.75
30	4103.425	8301	11919	15699.7	18066.425
31	4232.65	8521.4	12180	15953.3	18283
32	4835	8768.9	12443	16195.6	18599.3
33	5258.025	8898.8	12675.5	16475	18846.4
34	5689.45	9112	12957.5	16719.1	19097.4
35	5969.625	9272.5	13246.5	16933.7	19539.875
36	6420.325	9595.4	13490	17173.4	19790.925
37	6826.75	9839	13736.5	17446.9	20093.925
38	7419.625	10231.8	14046	17838.5	20691.375
39	7883.725	10506.9	14354.5	18235	21102.5
40	8347	10870.9	14730.5	18831.3	21594.9
41	8894.825	11390.1	15189	19545.3	22135.7

42	9199.75	11893.4	15579	20067.4	22826.025
43	9735.675	12155.4	15859.5	20471.1	23266.35
44	10207.8	12501.8	16098.5	20766.3	23786.55
45	10668.875	12754.3	16312.5	21113.8	24020.45
46	10969.625	13021.6	16573	21392	24273.125
47	11355.75	13333.5	16904.5	21772.3	24524.775
48	11625.1	13622.7	17169.5	21938.1	24894.8
49	11900.85	13824.2	17476	22224.7	25092.75
50	12149.85	14086.2	17746.5	22472.7	25364.475
51	12297.425	14295	18023	22619.1	25433.45
52	12588.275	14469.7	18304.5	22850.4	25576.125
53	12840.025	14716.3	18530	23129	25861.525
54	13101.925	15033.6	18757	23364.7	26068.35
55	13290.875	15259.9	19085	23670.7	26234.15
56	13615.475	15493.3	19349	23849.1	26438.125
57	13685.525	15746.6	19618	24131	26837.625
58	14044.625	15945	19915	24421.7	27214.5
59	14175.7	16125	20167	24718.9	27783.35
60	14408.425	16316.2	20381	24917.3	28028.4
61	14629.85	16566.8	20657.5	25185.3	28546.925
62	14842.5	16875.7	20953.5	25478.6	28914
63	15107.925	17074.4	21185.5	25691.6	29124.375
64	15289.675	17361.8	21473	25974.1	29467.625
65	15622.325	17558	21703.5	26240.2	30279.25
66	15956.575	17789	21984.5	26482.8	30600.425
67	16188.425	18090.1	22254.5	26678.1	31201.35
68	16385.675	18424.5	22488.5	26858	31866.45
69	16508.775	18761.2	22800.5	27178.3	32374.1
70	17048.55	19082.7	23222.5	27455	32997.8
71	17490.925	19648.8	23878	28347.8	36496.625
72	18378.425	20585	24889.5	31651	40833.475
73	19733.3	21706	26529.5	36989.1	47395.125
74	21219.7	23383.1	28930.5	41840.5	56000
75	22847.625	25014.3	31150	46143.2	63908.4
76	24194.95	26385.2	33355.5	49923	67613.8
77	25339.7	27766.4	35261	53639.5	71173.925
78	26353.95	28991.4	37203.5	56383	74131.625
79	27034.5	30449.2	39242	59120.3	75774.975
80	27820.425	31454.8	41256.5	61855.6	79105.2
81	28426.825	32510.8	43206.5	63960	79703.825
82	29151.625	33474.4	45361.5	66195.1	81987.875
83	29931.85	34770.3	47239	68417.5	83400.525
84	30865.9	35876.8	49210	70205.5	85017.75
85	31935.2	37056.8	51281.5	72167.9	87649.025
86	32785.625	38212.6	53132.5	74019.2	89648.8

87	33852.375	39689.1	54989.5	76031.3	90596
88	34525.375	41147.9	56834.5	78050.7	92020.15
89	35841.55	42482.6	58879	79742.1	93386
90	36733.225	43820.8	60645.5	81328.8	94804.5
91	37818.975	45499.6	62238.5	83296.6	96160.6
92	39527.45	47563	63948	85896.4	97988.125
93	40144.525	49403.9	65533.5	87275.7	100165.8
94	41731.55	51422	67205.5	88804.7	102524.6
95	43209.75	53684.2	68927.5	90986.7	105172.4
96	44288.95	56066.7	70654.5	93276.3	108143.05
97	46160.8	58661.7	72304	96188.8	110493.7
98	48899.175	60721.9	74076	98479.8	112808.35
99	51884.5	62944.9	75999.5	102098.6	115308.5
100	56919.15	66074.8	78086.5	105565.8	118370
101	61437.7	68925.8	80863	109342.3	120776.525
102	65708.45	71744.3	83824	113410.5	125188.9
103	67580.55	73618.4	87374.5	117310	127585.05
104	69722.475	75325	89887.5	120930.1	132166.6
105	71055.025	76373.8	91908	122761.9	136304.4
106	71825.8	77158.9	93219.5	124644.5	140741.55
107	72863.95	78094.8	94725.5	125814	143809.425
108	73688.925	78725.3	95840	127886.5	146578.375
109	74026.125	79256.2	97215.5	130322.7	151192.7
110	74568.525	79794.2	98485.5	131687.3	155744.075
111	75104.375	80296.6	99803	133204	159102.4
112	75313.325	80800.7	101051.5	134308.8	161639.575
113	75748.575	81498.7	102672.5	135730.8	164076.8
114	76302.7	81979.6	103731	136822.8	170366.35
115	77079.2	82508.2	105130.5	138307.1	171664.325
116	77644.3	83254.1	106325	139427.2	172234.25
117	78038.825	83826.9	107214	141470.6	174158.05
118	78429.9	84510.6	108261	142735.4	178375.325
119	78655.25	84904.1	109176	144550.4	178568.25
120	79263.55	85283.2	110543	147176.7	179611.675
121	80075.95	85932.7	111569.5	148966.4	181244.875
122	80264.35	86545	112529.5	149824.9	184473.425
123	80856.5	86874.5	113185.5	152490.4	185796.625
124	80995.05	87630.9	114212.5	153528	186663.35
125	81236.3	88615.9	115366.5	155204.7	188736.275
126	81634.625	88980.6	116821	156928.5	190622.125
127	81936.525	89470.3	117935	158042.6	192735.325
128	82403.15	90122.4	119016.5	160056.5	194164.525
129	82797.3	90875.7	120012	161934.7	195426.775
130	83157.45	91325.8	121073.5	163494.2	196671.7
131	83266.05	91688.7	122135	165119.4	200872.375

132	83374.65	92318	122793	166284.8	204140.85
133	83484.225	92799.8	124026	167212.8	205232.85
134	83701.475	93400	125211.5	168755	206299.55
135	84106.85	94540.2	126125.5	170816.6	207365.65
136	84252.875	95084.9	126791.5	171670.4	210136.8
137	84397.925	95475.4	127785	173392.6	212087.65
138	84543.95	96033.8	128723	174889.6	215284.55
139	84961.4	96261.6	129800	176550.3	215418.575
140	85206.025	96758.1	130554.5	178409	215550.075

Table 44. Results from Single-Grain OSL Age-Depth Model in Wall FG

Depth (cm)	2.5% Quantile	10% Quantile	50% Quantile	90% Quantile	97.50% Quantile
0	3922.2	7853.7	14100	19181.5	21123.55
1	4161.575	8074.7	14314	19280.4	21187.6
2	4549.925	8519.2	14502	19465.8	21272.15
3	4894.775	8658	14682.5	19560.8	21348.325
4	5043.95	8865.6	14849.5	19734	21426.6
5	5805.075	9151.7	15092.5	19798.2	21519.525
6	6194.775	9413.4	15285.5	19853.2	21630.675
7	6420.9	9746.8	15499.5	19940.7	21721.9
8	6663.825	10097.6	15711	20069.5	21845.2
9	7099.7	10459.7	15903	20207.1	22022.475
10	7352.95	10936.5	16102.5	20340.7	22111.925
11	7686.675	11401.5	16339.5	20532.2	22236.925
12	8007.475	11826.9	16563	20660.9	22343.15
13	8744.625	12282.5	16772	20809.5	22498.1
14	9608.25	12815.4	16941.5	20966.1	22783.075
15	10323.175	13142.6	17179	21168.5	22973.375
16	11057.725	13585.3	17531.5	21375.8	23064.8
17	11641.425	14035.1	17946.5	21585.2	23360.125
18	12489.2	14497.7	18294.5	21914.3	23688.275
19	13346.175	15065.7	18675	22465.3	24156.25
20	13923.725	15497.5	19168	23035.9	25209.725
21	14234.675	15972.2	19550.5	23388.7	25981.725
22	14534.6	16387.3	19881	23785.6	26702.8
23	14814.65	16758.7	20277.5	24293.1	27023.8
24	15209.625	17034	20584.5	24704.2	27651.875
25	15384.875	17259.8	20901	25080.1	28124.8
26	15448.85	17481.8	21240	25446.8	28409.775
27	15606.7	17727.2	21595	25930.9	28921.05
28	15718.6	17971.2	21894.5	26287.2	29097.575
29	15903.375	18269.8	22276	26577.4	29205.725
30	15967.7	18455.9	22576.5	26994.5	29531.05
31	16179.575	18651.5	22888.5	27492.6	29711.975

32	16211.4	18948.5	23154.5	27922.1	29947.5
33	16320.1	19136.1	23443.5	28231.6	30301.425
34	16387.175	19341.6	23740	28593.2	30644.5
35	16439.15	19560.5	24074.5	28905.5	30995.825
36	16524.325	19731.5	24336.5	29296.6	31330.95
37	16591.125	19941.5	24582.5	29629	31744.35
38	16660.65	20139.9	24907.5	30068.1	32071.4
39	16804.875	20329.9	25237.5	30467.8	32547.125
40	16998.775	20468.6	25614.5	30892.2	32959.075
41	17195.725	20574.8	26036	31269.7	33407.7
42	17387.55	20699.5	26318	31648.5	33744.5
43	17796.725	20896.8	26687	32068.7	34338.275
44	18072.675	21284.2	27041.5	32509	34668.3
45	18189.725	21601.5	27563	32976.6	35353.025
46	18583.725	21849.9	28103	33584.1	35998.025
47	19061.125	22195.9	28627	34176.7	36541.1
48	19421.825	22610.6	29207	34606	36932.425
49	19796.425	23231.5	29621	35075	37597.975
50	20113	23776.8	29993.5	35406.6	38170.8
51	20697.7	24058.2	30376	35896.3	38810
52	21323.85	24449.5	30688	36296.3	39121.05
53	21687.775	24707.5	31087.5	36653.1	39779.025
54	22023.375	24975.7	31400.5	36941.3	40134
55	22245.675	25215.7	31773.5	37152.6	40581.225
56	22487.95	25469.7	32125.5	37453.1	40885.025
57	22742.15	25624.8	32441.5	37749.7	41219
58	22912.725	25929	32770.5	38081.8	41617.175
59	23094.525	26246.8	33042.5	38410.6	42043.6
60	23246.85	26534.7	33333.5	38688.3	42336.375
61	23489.35	26825.2	33528.5	38909.6	42665.225
62	23681.225	27026.1	33823	39291	43001.2
63	23816.925	27218.3	34076.5	39650.2	43352.8
64	23995.875	27461.1	34314.5	40009.3	44144.1
65	24342.75	27732.8	34498.5	40420.8	44670.225
66	24630.6	27854.9	34782.5	40905.3	45072.275
67	24969.975	28090.7	35026	41517.7	45502.075
68	25143.625	28385.8	35253.5	42068.9	45912.375
69	25431.65	28571.7	35469	42686	46117.4
70	25488.85	28755.9	35760	43185.7	46668.8
71	25597.3	28970.4	35984	43725.5	47225.375
72	25720.975	29220.1	36193.5	44328.2	47757.4
73	26080.575	29693.6	36448	44946.4	48502.25
74	26404.775	29855.3	36818.5	45621.4	49087.35
75	26791.925	30262.7	37181.5	46251.4	49365.575
76	27162.475	30530.1	37550.5	46912	50037.175

77	27448.775	31183.9	38033.5	47519.6	51142.275
78	28082.35	31503.7	38491.5	47968.1	52050.5
79	28519.475	31938.1	39036.5	48701.1	52674.95
80	28863	32377.5	39361.5	49198.9	53485.15
81	28990.55	32653.8	39651.5	49510.1	54093.275
82	29123.225	32848.3	39907	49996.6	54420.45
83	29251.6	33152.5	40201.5	50412.1	54839.575
84	29498	33242.9	40430.5	50868.3	55388.25
85	29585.025	33501.6	40633.5	51312.6	55904.1
86	29661.35	33703.6	40917.5	51755.2	56226.3
87	30081.85	33875	41061	52236.9	56546.925
88	30229.675	33969.4	41291.5	52568.5	57124.7
89	30327.075	34095.9	41428.5	52897.3	57435.775
90	30439.4	34262.6	41558.5	53117.6	57593.05
91	30476.7	34406.5	41681	53303.7	58564.8
92	30659.475	34490.3	41837.5	53824.3	59232.25
93	30770.5	34681.1	42065	54183.5	59720.975
94	30880.55	34866.1	42205.5	54548.3	60247.325
95	30990.8	35109.4	42396.5	54824	60457.325
96	31103.175	35312.9	42588	55082.4	60995.525
97	31214.6	35472.3	42759	55543.5	61394.475
98	31326.025	35597.6	42903	55677.3	61613.375
99	31690.625	35735.8	43037	55839.5	61957.6
100	31710.95	35927.5	43177	56085.4	62082.7
101	31828.575	36055.4	43409.5	56264.6	62388.525
102	31884.55	36147.9	43658	56331.2	62755.675
103	31934.775	36242.2	43803.5	56603.3	63198.375
104	32520.975	36460.2	44025	56794.1	63350.875
105	32556.575	36557.8	44096	56882	63963.35
106	32681.55	36707.1	44300	57023	64108.3
107	32904.55	36778.5	44494	57333.1	64254.3
108	33018.225	36936.9	44731	57596.2	64709.7
109	33060.425	36994.8	44915.5	57820.5	65007.7
110	33164.475	37107.6	45083.5	57969.2	65457.9
111	33498.15	37333	45184	58216.3	66033.1
112	33802.9	37478.9	45321	58558.6	66723.725
113	33840.475	37613.4	45434.5	58776.7	66769.85
114	33877.05	37766.5	45666	59002.6	66814.75
115	33913.65	37922.5	45794.5	59389.1	67051.75
116	34081.875	38061.9	46182	59652	67370.1
117	34119.45	38247.1	46385.5	59854.2	67685.95
118	34195.975	38348.8	46563	60276.1	68160.9
119	34263.175	38440.7	46727	60578.3	68306.65
120	34268	38509.3	46896	60812.2	68617.3
121	34493.9	38675.3	47125.5	61041.3	68832.525

122	34663.2	38766	47293	61279.6	68920.35
123	34726.125	38878.5	47479.5	61507.4	69141.7
124	34828.05	38957.1	47570.5	61767.8	69227.55
125	34973.825	39125.7	47781	62012.3	69482.1
126	35126.45	39238.7	47952	62258.5	69727.625
127	35182.55	39289.3	48140	62596.3	70662.925
128	35213.3	39373.2	48331	62796.5	70995.45
129	35283.95	39445.9	48558	63097.6	71239.25
130	35375.375	39557.3	48707.5	63236.4	71761.025
131	35408.3	39664.6	48848.5	63399.2	72024.225
132	35440.7	39846.3	49030	63754	72172.475
133	35515.9	39988	49202.5	63975.6	72706.1
134	35550.7	40021.6	49369	64396	73368.95
135	35655.725	40151.7	49514.5	64756.1	73540.25
136	35671.75	40234.6	49654.5	65149.5	73920.775
137	35689.35	40323.9	49864	65224.2	74209.7
138	35768.425	40500.5	50003	65564.3	75157.65
139	35918.925	40556	50202.5	65704	75704.4
140	36066.875	40636.3	50328.5	65937.1	75772.125

Table 45. Results from Small Aliquot OSL Age-Depth Model in Wall AB

Depth (cm)	2.5% Quantile	10% Quantile	50% Quantile	90% Quantile	97.50% Quantile
0	-69	-69	517.5	5599.3	9006.65
1	-69	-69	897	5898.1	9479.3
2	-69	-69	1140	6297.6	9670.175
3	-69	-69	1404.5	6637.7	10073.05
4	-69	-69	1619.5	6917	10504.175
5	-69	-69	1794.5	7259.5	10715.75
6	-69	-69	1999.5	7478.7	10876.975
7	-69	-69	2160	7685.4	11033.075
8	-69	-69	2351	7959.6	11438.05
9	-69	-69	2537	8145.8	11630.9
10	-69	-69	2697.5	8530.1	11883.525
11	-69	-69	2915.5	8806.5	12017.05
12	-69	-69	3084.5	8948	12233.275
13	-69	-69	3247	9243	12451.9
14	-69	-69	3458	9490.2	12654.55
15	-69	-69	3663.5	9697.9	12789.8
16	-69	-69	3903	9983	12913.85
17	-69	-69	4132	10189.7	13089.925
18	-69	-69	4413.5	10415.7	13256
19	-69	-69	4653.5	10731.3	13465.425
20	-69	-69	4904	10906.8	13611.6
21	-69	-69	5136.5	11076.5	13789.975

22	-69	-69	5358.5	11299.7	13943.95
23	-69	-69	5567.5	11453.4	14078.2
24	-69	-69	5800	11629.1	14347.425
25	-69	-69	6081	11804.9	14503.225
26	-69	-69	6238	12157.3	14804.775
27	-69	-69	6500	12390.4	15037.1
28	-69	-69	6829	12580.7	15204.35
29	-69	-69	7089.5	12777.4	15380.225
30	-69	-69	7311	13032.7	15545.625
31	-69	-69	7541	13277.9	15622.825
32	-69	-69	7831	13398.7	15740.675
33	-69	-69	8179.5	13704.1	15903.15
34	-69	-69	8509.5	13869.2	16099.275
35	-69	514.2	8838	14139.1	16213.15
36	-69	1253.8	9162	14383.5	16461.7
37	-69	1767	9421	14717.6	16587.475
38	-69	2611.5	9690.5	14991.3	16914.5
39	-69	3369.9	10178	15303.5	17138.6
40	-69	4304.4	10482	15563.2	17455.075
41	579.725	4829.3	10896	15857.1	17716.175
42	1592.625	5543.6	11265	16256.8	18004.925
43	2820.45	6432.4	11938.5	16626.1	18630
44	3859.325	7371	12579.5	17211.5	19362.1
45	5440.3	8314.4	13417	17965	20302.15
46	6471.775	9056.5	14101	18693	21066.775
47	6879.05	9613.6	14655.5	19305.1	21989.4
48	7235.375	10053.5	15057	19804.9	22535.35
49	7680.35	10641.5	15590	20263.8	22874.875
50	8579.775	11017.1	16162	20783	23428.575
51	9005.775	11565.4	16570	21302.6	24058.9
52	9462.475	12010.5	16945	21879.2	24460.65
53	9773.375	12412.7	17358	22441	25272.125
54	10204.55	12946.2	17774	23037.5	25738.125
55	10474.65	13303.6	18265	23446	26248.3
56	10780	13672.3	18844.5	23739.3	26482.45
57	11084.175	14045.3	19307	24103.3	26944.875
58	11517.7	14442.1	19696	24498.6	27417.925
59	12231.35	14949.8	20208	25017.2	27853.075
60	12520.375	15538.4	20693.5	25461	28291.9
61	12832.625	15917.9	21091	25925.5	28538.625
62	13375.575	16374.3	21593	26303.5	28876.125
63	13763.95	16774.7	22021.5	26759	29173.4
64	14117.6	17231.3	22473.5	27132.4	29463.1
65	14498.7	17779.7	22999	27556.1	29763.325
66	15011.75	18265	23404.5	27951.6	30188.7

67	15726.75	18647.3	23898.5	28484.3	30832.675
68	16194.975	19081.7	24395	28945.1	31289.275
69	16724	19456.6	24880	29304.5	31941.225
70	17367.85	19982.9	25422	29819.9	32489.85
71	18150.575	20575	25924	30384.6	33307.2
72	18840.25	21229.6	26663	31089.9	34032.825
73	19608.15	22098.7	27464.5	32011.5	35027
74	20354.375	22948	28268	32731.2	36033.225
75	21095.15	23864.7	29096.5	33717.1	36948.575
76	21701.625	24708.4	29566.5	34663.9	37850.5
77	22540.85	25370.9	30048.5	35289.7	38704.6
78	23440.025	25968.9	30523	36147.5	39351.825
79	24171.4	26507.5	31028.5	36737.4	40552.525
80	24541.95	27097.5	31477.5	37394.9	41162.75
81	24999.25	27584.5	31990.5	38029.3	41942.05
82	25392.725	28158.2	32421	38716.9	42956.25
83	25762.375	28641.9	32954.5	39323.9	43875.825
84	26293.45	29067.1	33427.5	40007.7	44828.15
85	26814.45	29547.6	34028.5	40693.6	45836.25
86	27555.075	30135.3	34740	41597.8	47083.75
87	28388.925	30728.6	35576.5	42737.6	48254.375
88	29185.25	31395.9	36573	44138.5	49219.775
89	30001.725	32214.6	37702.5	45477	50671.075
90	30803.125	32945.8	38701	46319	51524.95
91	31110.8	33444.5	39492.5	47481.4	52092.45
92	31675.95	34085.3	40100	48185.6	52760.375
93	31974.9	34706	40811.5	49184.8	53644.725
94	32572.1	35222.2	41519	49574.7	54202.2
95	33262.425	35943	42075.5	50250	54989.125
96	33929.925	36499.8	42752.5	50837.8	55654.95
97	34389.9	37090.4	43491.5	51680.1	56146.5
98	34797.825	37625.8	44155	52224.4	56999.575
99	35151.9	38046.8	44843	52975.5	57842.625
100	35701.675	38527.8	45489.5	53517.1	58497.275
101	36076.75	39249.5	46114	54015.4	59308.9
102	36434.7	39828.8	46675.5	54872.9	60025.15
103	36982.525	40217.2	47311	55592.3	60941.225
104	37423.45	41110.9	47859.5	56317.4	61840.75
105	38020.025	41482.2	48474	56903.6	62522.3
106	38627	41973.9	49318.5	57740.9	63114.125
107	38979.5	42507.3	49938.5	58316.6	63471.55
108	39772.925	43078.6	50487	58708.6	64472.1
109	40040.15	43491.5	51192.5	59222.3	65505.55
110	40486.1	44223.4	51722.5	59876	66044.525
111	41351.875	44949.5	52278.5	60426.4	66547.775

112	42015.325	45608.9	52929.5	60893.5	67211.225
113	42796.3	46273.9	53544.5	61423.1	67825.85
114	43439.725	46833.3	54120.5	62360.5	68908.1
115	44329.575	47505.9	54794	62742	69595.05
116	45094.5	48352.4	55421	63098.4	70328.95
117	45767.8	49147.7	56099	63568.4	71982.375
118	46501.475	49908.8	57099.5	64581.1	72758.3
119	47585.025	50787.7	58114	65326	73884.3
120	48193.25	51789.8	59303.5	65904.9	74341.775
121	48937.675	52653.7	60391.5	66975.5	74712.2
122	50080.2	53582	61093.5	67452.7	75356.85
123	50559.55	54285.6	61735.5	68025.9	75595.125
124	50903.2	54761.7	62336.5	68669	76014.6
125	51607.25	55212.3	62929	69184.4	76260.725
126	51971.575	55684.5	63536.5	69657.8	76635.2
127	52462.9	56314.8	64120	70226.4	76979.975
128	52775	56652.8	64503	70816.3	77404.625
129	53357.95	57076.9	64887	71329.1	77550.4
130	53884.5	57768.4	65457	72044.3	77652.85
131	54324.325	58319.7	65978	72677.9	78486.825
132	55031.2	58789.9	66470.5	73295.8	78867
133	55750.85	59431.9	67015.5	73930	79157.75
134	56380.425	60258.9	67607.5	74583.6	79687.725
135	56724.15	60823	68241.5	75454.9	80476.3
136	57427.95	61841.2	69145.5	76513.7	81639.625
137	58305.575	62640.8	70158	77762	82922.1
138	59196.425	63440.2	71169.5	79163.3	84522.025
139	60079.8	64532.8	72149.5	80428.1	85677.15
140	60880.325	65106.4	72907	81218.3	86438.35

Table 46. Results from Small Aliquot OSL Age-Depth Model in Wall DE

Depth (cm)	2.5% Quantile	10% Quantile	50% Quantile	90% Quantile	97.50% Quantile
0	462.125	1881.7	9842.5	21689	26830.125
1	1092.45	2749.4	10532	22099.8	27005.3
2	1553.9	3306.8	11108	22500.6	27204.6
3	1879.725	3805.8	11724.5	22713.7	27412.975
4	2166.875	4288	12362	22960.7	27620.775
5	2523.325	4722.5	12800.5	23170.8	27799.775
6	2760.375	5255.1	13201	23572.3	27999.05
7	3013.875	5623.6	13863	23911	28197.35
8	3287.175	6093	14343.5	24143	28396.6
9	3568.25	6486.5	14951.5	24423.4	28596.075
10	3811.775	6805.6	15288	24708.2	28873.15
11	3936.45	7220.4	15625	25093.2	29091.95

12	4388.675	7626.7	15981	25426.1	29364.6
13	4674.575	8157.6	16371	25667.3	29512.1
14	4957.975	8634.4	16813.5	25899.8	29840.65
15	5182.85	9075	17206	26170.1	30097.075
16	5387.8	9468.6	17648.5	26401.7	30279.475
17	5593.575	9945.3	18053.5	26668.6	30567.15
18	5972.525	10424.3	18462	26939.1	30684.125
19	6192.775	10838.8	18872.5	27202.1	30872.425
20	6497.375	11348.3	19355.5	27535.8	31070.175
21	6898.675	11794	19768.5	27775.4	31283.025
22	7087.475	12077.1	20192	28008.1	31495.625
23	7258.325	12566	20618.5	28310	31700.95
24	7626.025	12945.5	21105	28560.3	31906.375
25	7880.475	13494.6	21578.5	28868	32110.85
26	8359.9	13893.7	22093	29112.2	32314.825
27	8649.325	14365.5	22553	29361.3	32520.95
28	9379.675	14770.1	23084	29679.2	32710.425
29	9657.95	15219.4	23598.5	30032.2	32933.125
30	10452.975	15627.3	24051.5	30372.5	33171.8
31	11326.425	15936.8	24500	30657.3	33448.05
32	11559.65	16424.9	25009.5	31004	33783.225
33	12695.6	16992.2	25561.5	31427.8	34197.85
34	13659.925	17512.7	26083.5	31738.4	34583.15
35	14372.95	18084.9	26586	32141.6	34852.75
36	14712.875	18656.7	27235	32693.1	35342.8
37	15678.375	19095.4	27892	33225.5	35838.075
38	16672.2	19909	28672	33822.2	36665.5
39	17337.925	21111.4	29518	34632.7	37516.225
40	18494.4	22395.4	30273	35529.7	38614.275
41	19642.325	23384.2	30978.5	36412.1	39512.225
42	20634.025	24131	31661.5	37254.8	40299.05
43	21395.275	24987.9	32223	38031.5	41332.475
44	22069.675	25728.2	32837	38755.8	42586.125
45	22890.95	26500.4	33405.5	39344.8	43302.925
46	23527.925	27104	33863.5	39903.8	43951.4
47	23950.75	27648	34357	40361.5	44553.65
48	24356.65	28238	34843.5	40918.8	45144.125
49	24744.725	28706.7	35297.5	41251.7	45853.35
50	25081.75	29239.4	35725.5	41977.1	46352.725
51	25355.95	29723.9	36137.5	42626.7	46765.325
52	25786.425	30318.9	36668	43054.1	47372.2
53	26163.275	30779.2	37170	43752.2	47932.2
54	26540.125	31303.4	37576	44260.3	48318.075
55	27084.75	31717.3	38054	44730.6	48714.925
56	27475.4	32270.1	38467	45361.2	49253.375

57	27936.3	32689.9	38881.5	46049.5	49520.675
58	28187.925	33051.5	39439.5	46624.2	50362.075
59	28426.625	33491.8	39910	47124.5	50969.8
60	28692.85	33765.6	40422	47598.6	51377.8
61	29177.175	34210.9	40980.5	48147.3	51739.375
62	29818.975	34655.1	41547	48742.9	52121.175
63	30710.375	35109.4	41960.5	49333.9	52835.65
64	31201.9	35439	42637	49903.9	53201.075
65	32300.025	35941.4	43187	50365.7	53721.175
66	33408.475	36540.4	43679	50844	54267.8
67	34000.3	37051.1	44114.5	51458	55031.425
68	34560.875	37540.3	44696	52174.2	55557.875
69	35362.4	38247.2	45360.5	52773.2	56175.075
70	35918.475	39198.4	46046.5	53396.3	57230.05
71	36428.75	40023.8	46994	54505.5	58594.725
72	37649.375	41118.6	48414	56268.1	60929.325
73	38992.975	42317.5	49831.5	57793.4	63335.9
74	40648.675	43848	51401.5	59494.7	65365.15
75	42043.175	45093.3	53046	61852.7	68253.1
76	42859.125	46321	54477.5	63941.2	70716.35
77	43579.725	47437.2	55771.5	65447.4	72779.275
78	44282.35	48490.8	56922.5	67051.9	76113.925
79	45269.675	49404.7	58185.5	68563	78026.175
80	45870.925	50263.7	59279	70005	78516.5
81	46589.9	51401.3	60353	71511.3	79994
82	47086.275	52435.8	61506	72774.3	81254.325
83	47459.025	53405	62660	74288.1	81750.55
84	48073.925	54376.7	63745.5	75554.2	82858.15
85	49185.575	55318.3	64649	76702.3	84107.075
86	49684.425	56218.1	65575.5	77918.8	85622.375
87	50765.925	56872.3	66643	78902.5	86522.775
88	51327.575	57700.9	67653	79978.6	87417.35
89	52009.475	58782.3	68746.5	81070	88288
90	52885.6	59862.5	69929	82078.4	89730.875
91	54101	60668.5	70879	82983.3	90692.225
92	54636.475	61569.1	71920	84046.2	91419.525
93	55126.15	62515.3	72988	85193.4	92456.95
94	55903.875	63675.8	74040	86439.5	93444.7
95	57475.65	64571	75289.5	87543.4	95954.525
96	58494.875	65654.1	76435.5	88720.1	97200.675
97	59343.5	67203.5	77714.5	89892.1	99014
98	60693.525	68229.1	79183.5	91198.9	100041.475
99	62318.7	69464.3	80656.5	92386.2	102187.075
100	65044.05	70862.6	82308.5	93797.3	104215.1
101	68430.85	72981	84631	95996.4	108912.525

102	70519.65	74429.5	87392.5	99452.7	112314.7
103	71697.875	76100.1	89741.5	104879.2	121877.025
104	72712.375	77457.3	91542.5	108760.1	124539
105	73986.65	78501.1	92720.5	110789.5	128489.7
106	74986.025	79546.5	93695	113203.6	132392.4
107	75651.9	80421.5	94919	115804.7	134336.875
108	75882.85	81059.2	96050	118537.1	137356.75
109	76418.125	81813.1	97213.5	120517.4	139902.975
110	76669.5	82437.1	98143.5	122117.6	140654.4
111	76748.775	83251.7	98896.5	123938.9	142611.65
112	77106.475	83780.5	99977	126213.8	144544.85
113	77530.025	84532.2	100852	128939.7	146510.45
114	77698.675	85179.9	101763	130746.4	149828.8
115	78039.075	85892.3	102594	132522	151724.475
116	78459.1	86334.2	103408.5	134225.2	155352.1
117	78699.025	87012.5	104276	136342	157497.275
118	78990.8	87502.3	105545.5	137883.3	160985.775
119	79184.875	88022.6	106453.5	139983.2	163944.625
120	79563.475	88445.4	107536	140796.8	164886.3
121	79917.025	88904.3	108507.5	142218.8	166773.8
122	80246.15	89489.8	109398.5	144188.9	169104
123	80509.9	89895.5	110438.5	145805.3	170482.25
124	80773.625	90217.8	111858	148147.9	173152.85
125	81039.075	90677.6	112724.5	148945.3	175073.275
126	81477.6	91366.6	114088.5	150747.5	177439.2
127	81954.875	91979.6	114907.5	153220.7	179899.75
128	82455.625	92358.6	116061	154489.2	181373.425
129	82913.625	93441.7	116952	155564.6	182682
130	83347.85	93863.5	117707.5	156620.1	183933.575
131	83869.975	94459.6	118859.5	158121.4	185199.85
132	84357.3	94864.1	119679	160438.2	185923.125
133	84578.225	95229.4	120513.5	162416.5	187752.15
134	84719.025	95609.5	121356.5	164427.6	189033
135	85170.075	95869	122009	165869.6	191008.525
136	85540.725	96421	123061.5	167125.6	192815.25
137	86244.025	96722.9	124026	168897	198399.325
138	86494.25	97149.4	124829.5	170592.9	200380.375
139	87140.925	97940.1	125855	171986.2	201246.775
140	87371.575	98158.8	126993.5	173256	201706.35

Table 47. Results from Small Aliquot OSL Age-Depth Model in Wall FG

Depth (cm)	2.5% Quantile	10% Quantile	50% Quantile	90% Quantile	97.50% Quantile
0	13328.575	17578.8	22521.5	27285.1	30688.7

1	13388.9	17624.6	22588.5	27324.2	30748.2
2	13402.4	17673.9	22648	27371.3	30804.15
3	13509.6	17700.8	22704	27435.3	30881.525
4	13521.1	17749.1	22740.5	27500.9	30995.325
5	13819	17817	22808.5	27571.4	31136.3
6	14016.55	17910.5	22824.5	27593.7	31209.4
7	14118.625	18029.3	22839.5	27657.3	31319.85
8	14136.225	18102.2	22861	27697.8	31461.5
9	14146	18161	22936.5	27744.3	31505.65
10	14154.825	18180.1	22982.5	27772.3	31646.075
11	14235.225	18236.8	23058.5	27795.8	31684.1
12	14551.8	18306.7	23130.5	27802.2	31718.475
13	14667.975	18480.9	23171	27905.2	31752.85
14	14681.85	18662	23227.5	27968	31877.25
15	15115.8	18693.8	23303	28016.9	32083.825
16	15143.875	18818.1	23369.5	28065	32127
17	15186.625	18987.8	23478.5	28343.2	32320.2
18	15412.925	19201.7	23561.5	28477.2	32475.05
19	15693.45	19406	23674.5	28557.1	32876.575
20	16196.2	19535.5	23808	28737.9	33072.525
21	16549.95	19676.1	24009.5	28950.1	33222.45
22	16737.25	19894.7	24170.5	29165	33396.775
23	17143.2	20085.9	24372	29330.8	33549.15
24	17410.325	20245.8	24569.5	29547.3	33665.125
25	17612.325	20455.5	24744	29750.2	33730.775
26	17945.975	20605.4	24912	29909.4	33809.875
27	18188.95	20809.9	25105.5	29996.1	33895.55
28	18345.15	20981.5	25290.5	30123.5	33980.6
29	18557.875	21208.7	25445.5	30266.3	34065.175
30	18824.25	21349.4	25616.5	30380.4	34102.05
31	18904.4	21581.6	25777	30571.4	34191.025
32	18995.875	21792.8	25967	30766.8	34272.275
33	19128.425	21945.2	26107.5	30957.4	34478.65
34	19296.125	22134.4	26278.5	31143.5	34740.875
35	19385.225	22219.9	26429	31344.4	34942.75
36	19429.875	22338	26559	31451.4	35070.9
37	19543.65	22531.5	26696.5	31573	35167.775
38	19794.925	22685.7	26868	31835	35330.35
39	19910.175	22929.4	27007	32008.8	35491.025
40	20040.25	23058.2	27135.5	32134	35634.5
41	20222.625	23213.7	27286	32341.8	35757.5
42	20378.725	23395.6	27499	32522.4	35979.2
43	20587.825	23529.8	27692	32735.8	36120.525
44	20769.075	23671.1	27867.5	32959.4	36303.475
45	20862.425	23792.8	28052	33151.7	36409.875

46	20980.2	23945.8	28191.5	33439.3	36594.375
47	21107.025	24165.8	28373.5	33712.7	36731.5
48	21233.625	24379.9	28548.5	33887.1	36923.725
49	21360.225	24620.2	28721	34014.4	37065.525
50	21485.875	24855.6	28920.5	34135.1	37193.225
51	21612.475	25026.6	29075	34238	37395.225
52	21671.875	25206.9	29211.5	34356.3	37489.975
53	21728.9	25361.7	29352	34532.3	37615.225
54	21785.9	25449.3	29521	34725.3	37769.7
55	21842.9	25576.9	29703	34833	37925.175
56	21899.9	25698	29826	35033	38066.375
57	21956.925	25792.6	29994.5	35108.7	38299.35
58	22013.925	25887.5	30151	35302	38479.575
59	22070.925	25978.2	30311.5	35483.6	38601.4
60	22201.075	26071.5	30476	35608.2	38756.525
61	22334.075	26243.1	30656.5	35738	38880.1
62	22471.525	26362.2	30797.5	35842.9	38990.625
63	22608.75	26541.8	30959.5	35939.1	39128.1
64	22741.25	26680.6	31145	36036.1	39305.55
65	22873.725	26802.2	31304	36158.4	39445.925
66	23007.2	26914.3	31467.5	36258.4	39655.05
67	23142.025	27020.1	31624.5	36451.7	39837.025
68	23279.325	27108.8	31778.5	36544.4	39951.625
69	23414.7	27209.5	31898.5	36667.9	40108.175
70	23487.85	27314.5	32047	36898.3	40263.75
71	23563.625	27416.3	32189	37212.2	40420.025
72	23792.45	27556.1	32357.5	37369.1	40645.075
73	23959.35	27638.8	32515.5	37566.6	40753.225
74	24094.625	27727.7	32679.5	37743.4	40884.125
75	24246.6	27828.4	32817	37916	41088.55
76	24422.575	27985.8	32977	38110.1	41297.55
77	24500.95	28182.5	33118	38340	41484.6
78	24562.275	28190.7	33242.5	38493.2	41552.95
79	24566.325	28365.7	33352.5	38677.3	41646.65
80	24570.375	28515.9	33416.5	38769.6	41947.35
81	24574.425	28580.6	33528	38850.9	42019.325
82	24578.45	28594	33585	38915.7	42091.05
83	24582.5	28619.5	33650	39125.1	42124.625
84	24586.55	28652.1	33687	39249.7	42188.3
85	24589.625	28680.1	33743.5	39438.3	42430.85
86	24593.675	28684.8	33775.5	39597	42543.2
87	24597.725	28690.4	33828	39661	42718.125
88	24601.775	28695.1	33898.5	39743.3	42894.725
89	24605.825	28699.8	33948	39821.1	43015.4
90	24609.875	28705.4	33990	39959.2	43139.725

91	24612.95	28711.6	34071	40038.5	43179.225
92	24617	28734.8	34124	40093.6	43600.75
93	24622.95	28763.5	34200.5	40138.3	43734.05
94	24628.9	28794.8	34209.5	40240.8	43865.05
95	24634.85	28818.4	34214	40295.3	43900.925
96	24640.8	28846	34233.5	40383.9	44101.375
97	24646.75	28865	34246.5	40578.6	44201.925
98	24651.7	28901.1	34256	40628	44392.925
99	24657.65	28926.5	34291.5	40683.6	44526.425
100	24663.6	28930.5	34314.5	40736.7	44661.125
101	24669.625	28936.5	34379.5	40853.2	44795.55
102	24686.725	28971.4	34450.5	40894	44914.375
103	24710.275	29014.4	34493.5	40970.7	45013.3
104	24723.7	29059	34524.5	41152	45114.15
105	24752.95	29102	34575.5	41177.5	45228.65
106	24753.925	29142.6	34599.5	41218.6	45343.175
107	24756	29158.4	34622.5	41284.8	45457.675
108	24766.775	29186.1	34655.5	41328.9	45569.7
109	24814.575	29214	34687.5	41431.1	45682.425
110	24862.375	29239.7	34711.5	41526.9	45801.025
111	24910.175	29250.9	34793.5	41577.9	45867.075
112	24918.025	29254.9	34841.5	41622.6	45935.3
113	24920.975	29258.1	34868.5	41637.6	46015.975
114	24924.9	29262.1	34888	41707.3	46083.3
115	24927.85	29273.5	34929	41787.7	46180.875
116	24930.8	29310.8	34961	41827.3	46278.45
117	24933.775	29314.8	35006	41903.1	46376.975
118	24937.725	29317.8	35049.5	41919.2	46474.55
119	24940.8	29332.3	35087.5	41963.3	46572.1
120	24943.875	29388.4	35115	41982.1	46850.625
121	24946.95	29444.6	35135	41997.2	46931.025
122	24951	29462.5	35175.5	42112.7	47017.875
123	24954.075	29478	35187.5	42241.3	47103.725
124	24957.15	29498.4	35195	42334.9	47231.175
125	24961.2	29530	35214	42433.5	47276.125
126	24964.275	29534.7	35220.5	42522.2	47380.55
127	24967.35	29539.4	35250.5	42569.1	47483.625
128	24970.425	29544.1	35273	42591.6	47526.125
129	24974.475	29548.8	35291	42636.5	47549.475
130	24977.525	29557.6	35317.5	42665.5	47636.075
131	24979.625	29567.9	35343.5	42729.4	47655.025
132	24980.75	29578.2	35390	42818.5	47698.675
133	24980.9	29588.5	35459	42862.9	47740.9
134	24982.025	29597.9	35480.5	42902.4	47782.15
135	24983.15	29608.2	35504.5	42939.7	47824.4

136	24983.3	29615	35539.5	42976.1	47866.975
137	24984.425	29632.9	35580	43037.7	47998.05
138	24985.55	29643.1	35615	43078.3	48223.7
139	24985.7	29653.9	35649	43138.8	48240.45
140	24986.825	29666.1	35669.5	43262.5	48256.625

TABLES OF SEDIMENTATION RATES

Table 48. Sedimentation Rates in Wall AB According to the Radiocarbon Age-Depth Model

Depth (cm)	2.5% Quantile	10% Quantile	50% Quantile	90% Quantile	97.50% Quantile
1	19	34	106	447.2	994.025
2	19	34.9	105	439.5	988.1
3	18.975	34	105.5	424.2	868.6
4	19.95	34	106	430	876.45
5	19.975	34	106	427.1	972.1
6	19.975	34	106.5	441	929.075
7	20	34	106	442.2	910.55
8	20	34	107	404.3	821.025
9	20	34	109	392.2	882.1
10	20	35	109	398.1	837.45
11	20.975	35.9	112	417.6	952.05
12	20	36	110	415	1003.475
13	20	35.9	110	385.3	847.125
14	20	36	107	402.1	922.675
15	20	36	106	398.5	770.125
16	20.975	36	108.5	409.6	887.275
17	20	36	108	436.1	923.525
18	21	38	116	404	847.225
19	22	40	117	419.4	1078.35
20	23	42	121	404.3	914.725
21	23.975	43	126	415.2	1109.325
22	24.975	44.9	137.5	392.3	889.025
23	25	47	148	463	889.025
24	25.975	50.9	165.5	551.2	923.625
25	26	56	194.5	668.2	1107.775
26	31	61	247.5	1255.4	2352.275
27	8	13	30	96	158.15
28	5	11	26	51	78
29	5	9.9	24	38	68.05

30	5	9	22	36	54.175
31	5	9	22	37	60.025
32	4	9	22	36	60
33	5	9	23	39	58.025
34	6	11	26	51	80
35	7	13	29.5	84.2	161.025
36	282	332	435	543	604
37	12	21	47	149	233.075
38	10	17	42	78	122
39	10	15	37.5	62	94
40	9	14	35	57	81.025
41	9	14	35	57	82.05
42	8	14	35	57	86.025
43	9	15	37	63	92.05
44	9	16	40	78	119.025
45	11	19	47	144	256.125
46	87.975	125	206	272	298.05
47	9	16	48	197.1	321
48	8	14	40	106	173.025
49	7.975	13	35	77.1	132.025
50	8	12	31	66	124
51	7	12	29	61.1	95.1
52	6	12	29	61.1	110.05
53	7	12	29	60	106.025
54	6	12	29	61	103.075
55	6	12	30	62	109.05
56	6	12	30.5	64	119
57	7	12	32	69	120
58	8	13	35	85	145
59	7.975	14	39	103.1	157
60	11	17	48	197.2	376
61	158.975	269.9	580.5	1660.3	2732.35
62	141.95	230.9	553	834.2	1513.025
63	132.825	214.9	505	660.3	1057.1
64	124.925	205	474	623	1018.1
65	126.975	202.9	492.5	627.3	1120.075
66	134.975	208	505	677.3	964.075
67	139.975	227.9	554	928.1	1306.025
68	164.975	286	585	1928.2	2834.025
69	221.8	389.9	550	673	878.025
70	224.9	406.8	557	710.3	909.025
71	246.95	378.9	789	2259.1	3451.975
72	216.975	322.7	760.5	1040.6	1577.55
73	189.975	298.8	705.5	856.1	1372.35
74	182	281.9	685.5	835	1197.375

75	177	307.7	727.5	886.3	1535.175
76	180.95	327	766	1145.5	1607.125
77	215.975	401.7	795	2092.3	3270.275
78	159	294	795.5	3153	6776.875
79	150.95	270.8	724	1815.8	3009.075
80	142.975	249	632.5	1448	2451.475
81	131	229	579	1300.2	2257.425
82	122	207.8	542.5	1304.1	2119.8
83	121	205	518	1229.3	2185.35
84	117.975	195.7	503	1194.7	2179.525
85	114.9	194.9	490	1105.2	1953
86	106.975	192	483	1140	2317.05
87	104.95	190	462.5	1037.1	1720.825
88	104.975	189	472.5	1056.1	1988.05
89	101.975	188.9	474.5	1050.1	2380.425
90	101.975	186.8	477.5	1071	2060.225
91	106.95	188.9	471	1012.7	1950.1
92	113.925	193.9	479	1023.2	2044.25
93	121.9	202	509.5	1165.6	2187.95
94	128	210	520	1209.4	2272.725
95	132	234.9	559.5	1293.4	2633.175
96	138.975	243.9	603	1462.6	2393.325
97	147	274	725.5	2039.4	3477.475
98	165.75	301.8	806	3536.7	5972.375
99	13.975	27	87.5	407.1	843.25
100	11	23	70.5	249.8	464.275
101	10	19	61	211.1	399.025
102	10	18	56	181	346.125
103	10	18	54	165.2	325.05
104	9	17	53	155	312.25
105	8	17	53	154.1	325.1
106	9	17	53.5	150	333.075
107	8	16	53	173.1	382.05
108	9	17	52	163.4	360.05
109	9	17	51	150.1	308.05
110	9	17	51	153.1	333.175
111	10	17	52	155.1	321.3
112	9	17.9	56	167	345.125
113	10	19	59	174	334.225
114	11	20.9	64	196.2	382.15
115	12	24	74	246.1	504.375
116	13	28	92	431.9	1067.15
117	31	59.9	266.5	1282.5	2172
118	30	55	206.5	688.1	1460.3
119	30	54	178	505.9	1049.675

120	29	50.9	158	462.1	1002.05
121	27.975	48.9	147	482.1	1010.65
122	26.975	44	137	421.1	970.4
123	24.975	42	131	426.2	868.175
124	24	41	127	424.3	1071.35
125	23.975	40	123.5	444.2	1025.05
126	23	39.9	122	471.1	1066.05
127	23	39	120	449	999.125
128	23	39	118	434.2	995.1
129	23	38	113	390.2	758.15
130	23	38	112	393	822.125
131	23	37	109	396.1	905.375
132	23	38	111	417.4	1145.55
133	22.975	37.9	111	431.2	1050.1
134	23	37	109	441	1032.4
135	22	37	107	424.4	1036.225
136	22	38	107.5	406.8	1093.55
137	21.975	38	105.5	428.7	894.025
138	22	37	107	390.3	1219.225
139	21.975	37	108.5	399.7	1218.5
140	22	36	108	399.2	861.5

Table 49. Sedimentation Rates in Wall AB According to the Single-Grain OSL Age-Depth Model

Depth (cm)	2.5% Quantile	10% Quantile	50% Quantile	90% Quantile	97.50% Quantile
1	0	0	150	547.3	1109.775
2	0	0	145	475.1	976.525
3	0	0	143	467.2	935.025
4	0	0	140	426.2	872.275
5	0	0	135	379.2	788.35
6	0	0	133	336.4	690.1
7	0	0	131	319.1	663.375
8	0	0	127.5	307.1	636.4
9	0	0	126	301.1	576.05
10	0	0	124.5	286.1	579.5
11	0	0	124	273.5	473.075
12	0	0	125	271	482.025
13	0	0	124	271	497.25
14	0	0	123.5	269.1	483.15
15	0	0	123	265	420.55
16	0	0	123	268.1	475.175
17	0	0	124	274	473.075
18	0	0	125	281.1	482.025

19	0	0	125	270	466.175
20	0	0	128	284	490.025
21	0	0	129	286	495.1
22	0	0	131	300.1	499.125
23	0	0	132	306.1	578.05
24	0	0	135	316.1	581.075
25	0	0	137	315.1	565.325
26	0	0	141	326.2	580.025
27	0	0	143	330	582.025
28	0	0	146	335.1	616.275
29	0	15.3	150	351.1	854.025
30	0	35.8	154	356.1	834.325
31	0	39	158	380.7	741.75
32	0	42	160.5	399.1	730.825
33	0	48	164.5	404.1	775.05
34	0	53	167	431	752.075
35	0	60	171	449.1	856.25
36	0	65	177	495	931.525
37	0	66.9	179	512.7	1059.2
38	0	74	189	577.2	1628.475
39	21.975	78.9	196.5	673.2	1392.675
40	36.925	80.9	202	695.7	1263.975
41	43.975	86	210.5	794.7	1458.025
42	46.975	87	221	931.4	1623.85
43	54	88	233.5	1094.3	2243.225
44	55.975	90	243	1550.6	4309.15
45	39	81.9	301.5	1430.8	2830.95
46	38.975	75	252	845.3	1579.95
47	37.975	69.8	224.5	661.8	1343.8
48	33.975	63	199	573	1056.05
49	33	61	183	502.2	971.025
50	30.975	58	173	466.1	797.1
51	31	58	169	473.1	872.125
52	30	55	168	466	877.05
53	27.975	54	159.5	466	936.35
54	26.975	52.9	151	441.3	783.15
55	27	53	150.5	432.1	809.225
56	26.975	53	151	463.2	981.575
57	27	53	147	441	905.075
58	27.975	53	147	441.6	966.35
59	26.975	51	143	440	862.15
60	27.975	52.9	148	441	991.9
61	27	52	150	440.1	907.225
62	28	53	149.5	467.2	1129.85
63	28	53	153.5	463.2	895

64	28	53	155.5	429	908.1
65	28	52	157	445.5	908.4
66	28	52.9	164	464.2	1106.725
67	27.975	52	172	463	1010.875
68	28	54	176	479.1	854.05
69	31	60	187.5	502.1	981.225
70	33	61.9	199	552.4	1153
71	33.975	66.9	214	610	1067.25
72	36.975	72	231.5	707.1	1392.15
73	40	77	276	1088.3	2108.3
74	97.975	167.9	458	1762.3	3502.975
75	54.95	114	374.5	1105.9	1876.425
76	53	104.9	324	819.1	1388.6
77	51.975	95	296	707	1212.1
78	50	92.8	281.5	661.1	1171.325
79	49.95	87.9	275	639.2	1051.55
80	47	87	265.5	643.4	980.25
81	47.975	88.9	259.5	619.2	928.2
82	47.975	90.9	260	622.1	1027.9
83	48.975	93.9	262	630.4	1062.025
84	49.95	99	273	643.4	1062.55
85	56.95	108	293	713.2	1200.675
86	58.975	112	325.5	789.2	1287.85
87	76.95	126	373.5	1046.5	2126.1
88	144	233.9	598.5	2478.6	5216.825
89	64	126.9	529	1816.4	4051.65
90	60.975	115.9	452.5	1300.3	2531.725
91	59.975	108.9	408.5	1139.5	2208.875
92	56.95	103	383.5	1092.8	2137.325
93	53.975	100.9	376	1007	1779.925
94	52.975	94	356.5	949.2	1705.125
95	51	93.9	344	928.9	1784.05
96	51.975	93.9	331.5	900.3	1652.9
97	52.95	93	322	881.1	1672.875
98	50	93	325.5	861.9	1630.075
99	50	93.9	326	861.4	1792.3
100	49	91.9	314	892	1835.75
101	48.95	87.8	303	836.1	1726.05
102	44	89.9	302.5	877.1	1964.4
103	41.975	85	306	832.1	1816.4
104	40.95	84	309	835.1	1653.075
105	41.95	84.9	310	880.2	1744.2
106	41.975	85	303	832	1836.375
107	40.95	85	302	849.3	1820.55
108	41.95	87.9	301	854.1	1610.075

109	41.975	90	292	836.4	1805.55
110	41.95	91.9	301	854.2	1560.225
111	41.975	92.9	307.5	862.4	1641.425
112	42.95	92	317.5	911.6	1940.125
113	44	96	324.5	960.4	2019.35
114	44	97	347	1031.3	1874.375
115	43.975	100.8	378	1095	2131.725
116	51.975	109	403	1168.1	2184.6
117	57.975	115.9	433.5	1346.7	2495.15
118	62.95	133.9	491	1692	3250.25
119	164.95	266.9	744	3511.6	6256.3
120	160.85	331	1152.5	4154.6	8120.45
121	159.9	310.7	995	2598	4656.075
122	148.9	283.9	914	2223.3	3553.475
123	143.925	260	858	2041.9	3213
124	130.875	248	837	1919.8	3034.075
125	132	241.7	807	1890.4	3040.025
126	124.9	231	789.5	1889.4	3047.95
127	120.975	221	776	1811.1	2753.225
128	118.975	220	749	1727.2	2608.025
129	111.975	221	737	1725.3	2670.9
130	107.95	229.5	746	1748.4	2595.325
131	106.9	231.9	783	1781	3211.625
132	111.975	238.9	798.5	1817.3	2743.375
133	117.875	248	834	1903.5	3484.325
134	116.875	253.9	867.5	2062.4	3844.125
135	121.975	256.9	924.5	2368.3	4002.625
136	131.975	301.9	1059.5	2952.9	5505.65
137	279.95	476.8	1392.5	5507.4	10814.95
138	115	246	876.5	3979.6	7018.65
139	114	217	791.5	2829.4	5048.725
140	112.975	204	698	2255.7	4270.325

Table 50. Sedimentation Rates in Wall DE According to the Single-Grain OSL Age-Depth Model

Depth (cm)	2.5% Quantile	10% Quantile	50% Quantile	90% Quantile	97.50% Quantile
1	0	0	185	517.3	1564
2	0	0	183.5	424.2	1094.175
3	0	0	179.5	396.4	833.075
4	0	0	179	391	681.025
5	0	0	179	379.1	619.7
6	0	0	177.5	373.1	609.1
7	0	0	177	368	571.075

8	0	0	178	368	525.05
9	0	0	176.5	361.1	467.075
10	0	0	176	359.2	454.175
11	0	0	176	358.1	442.075
12	0	0	178	361	454.175
13	0	0	179.5	360.1	461.025
14	0	0	179.5	358.1	461.075
15	0	0	180	358.1	475.075
16	0	0	181	360.1	478.025
17	0	0	185	362.1	479.025
18	0	0	187.5	367.1	536.125
19	0	0	188.5	369.3	583.075
20	0	0	189	376	557.675
21	0	0	193	380	553.75
22	0	0	194	385.3	627.1
23	0	0	197	394	652
24	0	0	198	395	651
25	0	0	199.5	396.1	663.025
26	0	0	203.5	417.1	687.85
27	0	0	207	422.1	749.025
28	0	0	214	442.3	841.1
29	0	0	220	480.4	1071.1
30	0	0	228	585.3	1216.3
31	0	0	237.5	663.1	1284.675
32	0	0	243	732.6	1423.225
33	0	0	250	832.4	1624.55
34	0	0	260	935.6	1945.225
35	0	55.8	269	1068.6	2220.2
36	0	88	285	1275.9	2480.325
37	0	105	293	1559.6	3213.35
38	9.75	125.9	310	2065.7	4076.3
39	79.975	142	328	3508.7	6804.425
40	108.95	166	487	2881.7	7196.05
41	51	99.9	325.5	1227.1	2304
42	48.975	92.9	292	920	1589.075
43	45.925	82	263	792.4	1364.225
44	42	77.9	247	687.2	1250.025
45	40	74.9	235.5	657.5	1250.025
46	39	73.9	228	594.4	1179.15
47	38	70.9	217	558.1	1069.825
48	37	67	210	557	1087.075
49	37	68	203.5	564	1347.35
50	36	65.9	197	564.1	1520.125
51	36	65.9	192.5	534.1	962.35
52	34.975	65.9	191	544.2	1052.125

53	34	65	189	540.1	1052.55
54	31	60.9	186	533.1	976
55	31.975	61.9	184	537.3	1138.15
56	33	65.9	187.5	537.2	1167.575
57	33	66.9	188	540	1171.025
58	33.975	67.9	188	530.4	1196.675
59	32.975	68	188	539.5	1179.325
60	32.975	69	189	544.1	948.275
61	33.975	68	191	535	1139.75
62	33.975	68	195	538.1	1239.025
63	33.975	67.9	197	545.1	1094.7
64	34	68	204.5	575.1	1293.4
65	37.975	71	208.5	589.1	1297.7
66	37.95	74.9	217	592.2	1251.05
67	38.975	75.9	222	633.2	1253.525
68	39	76.9	235	652.2	1242.3
69	39.975	82	248	675.3	1228.35
70	41.975	86.9	262.5	750.6	1512.4
71	45.975	96	295.5	1047.1	2059.9
72	49.975	105	342.5	1676.6	3380.65
73	381.775	683.8	1940	8572.3	15973.35
74	323.975	583.4	1729	5352.6	8773.325
75	296.95	538.7	1558	3997	6850.3
76	281.95	512.9	1416	3440.1	6367.725
77	282.925	488.8	1336.5	3225.4	5811.6
78	279.95	475.6	1298.5	2998.1	5661.1
79	277.925	472.7	1219.5	2639.7	5100.975
80	280.95	458.8	1183.5	2491.5	5066.325
81	278	452.9	1142	2400.4	4379.475
82	274.9	450.8	1131.5	2492.7	4956.95
83	278	458.8	1114	2539.2	5082.75
84	273.925	463.8	1095.5	2507.9	5132
85	268.975	456.9	1071.5	2456.9	4798.175
86	266.85	454.7	1064	2412.9	5966.125
87	273.9	455	1071	2392	5199.525
88	270.95	456	1057	2317.6	4357.2
89	265.875	455.9	1044.5	2391.2	4924.675
90	269.925	455	1053	2377.5	4936.225
91	266.85	456	1068	2497.2	5455.2
92	274.975	458.8	1083.5	2407.8	4265.45
93	273.925	459.9	1090.5	2424.2	4489.375
94	274.975	459.9	1105	2481.9	4548.975
95	276.925	482	1143	2543.4	4365.4
96	278	481.9	1205	2710	4410.325
97	280.925	486.9	1271	3016.6	4855.65

98	288.975	511.4	1333	3195.5	6059.575
99	293.95	521.8	1385.5	3430.1	6446.625
100	301.95	554	1545.5	4150.2	7863.55
101	321.825	633.9	1739.5	5912.4	10207.85
102	569.975	913.6	2551.5	11036.9	22979.55
103	264.925	475	1979	9359.6	18518.675
104	259.975	445.9	1642	6023.1	11417.125
105	251	407.8	1505	5032.4	9625.75
106	250	404.8	1382	4419.8	7729.925
107	249.975	401.8	1298	4035	7198.225
108	237.95	384.8	1238	3888	7635.75
109	224.975	363	1156.5	3730.5	7051.35
110	219.975	352.8	1102	3295.5	7066.325
111	214.8	340.8	1049	3188.7	7205.4
112	194.975	328	1033.5	3468.7	6960.75
113	194	325.9	1001.5	3714.3	8086.725
114	194	318	991	3558.5	8051.475
115	193	311.9	959.5	3523.3	8583.225
116	193.975	309.9	941.5	3264.5	8043.975
117	193	309.9	941	3364.4	7133.9
118	192.9	299.9	922.5	3234.1	7698.55
119	186.975	296.7	907.5	3242.7	7649.15
120	186.975	295.7	911	3253.7	7068.625
121	187	302.7	905	3262.5	7418.775
122	187.925	309	905	3510.1	7657.65
123	184.925	299.9	902.5	3524.9	7878.025
124	182.875	300.9	922.5	3559.3	7400.275
125	182	299	921.5	3571.9	7775.625
126	182.975	298.5	903	3519.4	8399.225
127	185.975	301.9	884	3239.2	7215.325
128	184.925	308.6	884	3171.7	6955.25
129	182.875	309	877.5	3057.1	6543.275
130	176.975	308.9	885.5	3155	7020.7
131	175.875	305.9	885.5	3129.6	7068.15
132	172.95	304	885	3039.6	6492.45
133	169.85	304.9	886.5	3118	6985.725
134	170.85	306.8	903.5	3214.4	8089.625
135	169.875	296.9	895	3140.7	6684.325
136	164.975	295.8	897.5	3114.3	6045.6
137	164.975	294.9	893	3277.3	8101.325
138	163.925	280	878.5	3171.2	6963.45
139	159.9	277	890.5	3141.4	6995.875
140	154.925	278	871	3181	7433.125

Table 51. Sedimentation Rates in Wall FG According to the Single-Grain OSL Age-Depth Model

Depth (cm)	2.5% Quantile	10% Quantile	50% Quantile	90% Quantile	97.50% Quantile
1	61	110	343.5	901	1819.425
2	61.975	111	341	837.1	1500.6
3	61.975	110.9	346	855.1	1533.9
4	60.95	110	343	850.9	1456.075
5	61.975	111.9	343.5	830	1334.05
6	61.975	111	340	811.2	1403.25
7	60.975	114.9	355.5	827.1	1634.725
8	61	120	360	831.7	1501.55
9	62	116	359	851.4	1582.025
10	62.95	119	364.5	850.6	1638.4
11	66	119.9	366.5	830.1	1520.125
12	67	123.9	368.5	862.2	1573.825
13	67.975	124.9	369	837.1	1366.375
14	70.925	131.9	373.5	865.8	1611.725
15	70.925	133.7	378.5	956.8	1618.4
16	71.975	135	397	969	1967.325
17	76	145	421.5	1099.6	2220.875
18	84.975	152	465	1405.9	2761.15
19	172.975	257	611	2222.9	4424.525
20	99.95	172.8	501	1734.4	3418.55
21	86.975	159	439.5	1266.2	2193.1
22	77.875	141	409.5	1083.4	1910.325
23	72.95	136.8	388.5	958.1	1510.525
24	67.975	130	380	908.1	1501.2
25	61.975	126.9	370.5	905.4	1502.2
26	59	121	355	877.1	1460.05
27	62.95	117	359	849.8	1444.45
28	59	119.9	347.5	848.3	1429.025
29	59	116	345	797.3	1299.9
30	59.975	113	331	793.5	1434.475
31	62	115.9	330	784.1	1286.125
32	66	113.9	325.5	783.2	1417.55
33	67	114.9	322	808.3	1572.125
34	66	113	322.5	782	1289.525
35	66.975	113	333.5	793.2	1234.375
36	65.95	112.9	328.5	791.1	1421.55
37	64	108.9	327	792.1	1300.075
38	63.975	108.9	333	815.1	1465.35
39	62.975	115.9	337	811.4	1340.075
40	62.95	120	353.5	828.1	1326.075
41	62.975	122.9	359	862.9	1528.275

42	64	124.9	374	897.1	1492
43	64	125	380.5	927.3	1794.5
44	67	129	398	1022.1	2111.075
45	70.95	139	420.5	1136.1	2115.2
46	78.9	148.9	460	1301.5	2680.325
47	153.975	255.9	605.5	2314.6	4692.025
48	64	132	469	1821.5	3332.65
49	63	119.9	389.5	1188.7	2160.625
50	59	112	344.5	1058.5	2042.275
51	52.975	107	319.5	997.2	1969.1
52	49.975	100.8	301.5	919.3	1868.325
53	43	90.8	288.5	919	1660.175
54	43	89.9	276.5	782.3	1389.525
55	42.975	89.9	277	793	1514.2
56	41.975	89	276.5	801.5	1550.175
57	40	84.9	266	764.2	1526.275
58	39	86.9	256.5	720	1364.1
59	39	88	256	719.2	1534.025
60	39	87.9	255	782.3	1466.775
61	40	83.9	256	771.3	1467.725
62	41	84	255	780	1587.075
63	40.975	85	254.5	748.6	1641.05
64	40	83	254.5	703.1	1499.075
65	41	80	253	749.4	1389.075
66	41.975	81.9	254	681.6	1288.275
67	41	82	254	713.5	1420.675
68	41.975	84	256.5	734.4	1409.2
69	40.975	83.9	256	721.4	1545.45
70	40.975	85	270.5	757.3	1603.5
71	43.975	86.9	270	753.1	1637.55
72	46	86.9	268	747.9	1539.6
73	46.975	92	278.5	830.8	1448.55
74	49	98.9	291.5	843.6	1602.3
75	51.975	106.9	319	961	1914.425
76	52.975	106.9	346	1072.6	2096.3
77	55	110.9	390	1302.8	2580.625
78	165.975	250.8	703.5	2824	5149.35
79	102.95	191.9	700	3062	7730.225
80	97.95	180.9	636	2397	5518.625
81	91.975	166.8	562	2008.2	3824.675
82	92.975	163.9	554.5	1936.2	3656.35
83	88.975	163.8	524	1868.2	3499.225
84	86	157.9	514	1869.8	3548.525
85	85	156.9	505	1842.1	3657
86	84	151.9	480.5	1759.5	3120.65

87	84	155.9	469.5	1612.1	3120.525
88	82.95	149.8	463.5	1506.5	3071.2
89	80	146.8	465	1385.6	2399.125
90	80	143	460.5	1407.7	2871.875
91	82.925	145.8	444	1430.1	2871.05
92	80	142.9	441.5	1386.3	2979.775
93	83	141	443	1357	2871.875
94	84	141.9	436.5	1324.2	2871.7
95	83	139	438	1383	3431.15
96	84	137.8	429	1394.3	2622.3
97	83	140	435	1433.8	2819.225
98	82.975	137	411	1395.1	2898.35
99	78	133.9	408	1319.1	2873.525
100	78.975	134.9	409	1333.1	2659.5
101	78	134.9	421.5	1359.5	3140.025
102	78	135.9	426.5	1289.1	2928.4
103	78.975	131.8	426	1306.5	3088.025
104	78	130.9	427	1311	2649.225
105	78	135	426	1305.1	2895.475
106	78	135	411	1311	2696.8
107	77.975	129.9	395	1259.6	2688.15
108	78	128.9	393	1294	2807.325
109	78	131	387	1321.3	2946.1
110	77	128.9	392.5	1367.4	3118.2
111	70.975	128	398.5	1370.1	3032.175
112	73.9	131	396	1333.3	3117.9
113	70.975	131.9	394.5	1360.1	2926.525
114	70.975	129	392	1297.3	2784.55
115	70.975	127	383	1400.6	2914.425
116	70	128.9	383.5	1335.1	2893.525
117	71.975	124.9	365	1238.4	2569.15
118	69.975	125.9	366	1289.1	2441.875
119	69.975	124	369	1357.5	3377.8
120	70.975	122.8	365	1293	2893.975
121	69.9	116	366	1246.3	2650.8
122	65	117.8	369.5	1386.6	2639.025
123	64	112.9	366	1391.4	2877.4
124	63	112	365	1358.5	3169.95
125	63	114	369.5	1389.8	3169.925
126	65	116	371	1482	2948.6
127	65.95	118	366.5	1454.5	2805.5
128	65.975	116	364.5	1357	2657.25
129	64	115	350	1358.6	2610.025
130	67.95	115.9	357	1293.6	2910.375
131	67.95	116.9	367	1355.2	2611.8

132	66	115.9	375.5	1481.4	3322.675
133	64.95	116	365.5	1400.6	2688.075
134	67.95	120	366	1292.7	2600.225
135	65.975	121.9	369.5	1362.3	2717.125
136	62	116.9	365	1292.8	3013.725
137	62.975	116.9	372.5	1370	2875.05
138	61.925	116.9	371	1361.9	2848.825
139	61.975	116.9	366	1325.7	2845.775
140	63	117	365.5	1397	3148.025